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## SMART DEVICE INTEGRATION AND ITS EFFECTS ON CUSTOMERS PERCEPTION OF SELECTED BANKS IN SOUTHWEST NIGERIA

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### ABSTRACT

*The commercial banking sector has undergone a substantial transformation as a result of the rapid advancement of smart technologies, which have also impacted service delivery models, customer engagement strategies, and architectural design frameworks. The incorporation of smart devices has revolutionized the operational efficiency and spatial experience within banking environments in Nigeria, particularly in the Southwest region, where urban density, financial transactions, and digital adoption are notably high. This study examined the architectural implications of digital transformation in bank building design, with a particular emphasis on the integration of smart devices and its impact on consumer perception in selected commercial banks in Southwest Nigeria. The research employed a qualitative methodological approach, incorporating in-depth interviews, direct observations, and spatial analysis in four of the region's major commercial institutions. The research investigated the architectural incorporation and deployment of smart technologies, such as biometric authentication systems, smart ATMs, mobile banking platforms, smart queue management systems, AI-powered customer support tools, and digital self-service terminals. The results indicate that the integration of smart devices substantially improves service efficiency, security perception, user convenience, spatial comfort, and overall customer satisfaction. Customers consistently associate digitally enhanced banking environments with improved service quality, reduced waiting times, operational reliability, and trust. The research determined that the incorporation of smart devices requires significant changes to the interior layouts, circulation systems, spatial organization, and service allocation. The*

*traditional teller-centered layouts are being replaced by open-plan, flexible, and technology-responsive spatial configurations that support self-service operations, digital engagement, and efficient movement patterns. Spatial efficiency, environmental comfort, wayfinding clarity, and user experience were all significantly enhanced by the implementation of intelligent circulation planning and clever service zones. Additionally, the integration of smart surveillance technologies and biometric security systems has resulted in the creation of sophisticated architectural security zoning strategies, which maintain functional spatial flow while improving safety.*

**KEYWORDS:** Smart Devices, Smart Device Integration, Digital Banking Technologies, Digital Banking Architecture, Customer Perception, Smart Building Systems.

## **1.0. INTRODUCTION**

Digital technology has changed banking worldwide, altering how customers access and use financial services. Recently, smart devices have enabled new banking services such as mobile apps, biometric ID, AI chatbots, digital wallets, and real-time transactions. These tools help banks provide faster, safer, and more customized services, determining how customers view quality, convenience, reliability, and trust (Afolayan & Adekunle, 2021; Alalwan et al., 2022; Singh & Srivastava, 2023). In countries like Nigeria, smart devices have made banking more accessible, improved business productivity, and raised customer satisfaction (Ogunleye, 2022; World Bank, 2023). Nigeria's banking sector has changed quickly in the last decade due to more smartphone use, better internet, government support, and fintech competition. To keep up, banks have invested in smart technologies (Sanusi & Olalekan, 2021; Adeola & Evans, 2022). Most electronic payments between 2020 and 2023 happened on electronic platforms (CBN, 2023). These investments have brought mobile apps, biometric security, AI customer service, and personalized tools, all of which strongly affect customer experience and banking habits (Olatokun & Igbinedion, 2022; Akinwale & Okunola, 2024). How customers see digital banking is key to its success. They look at service quality, ease of use, reliability, security, convenience, and the speed of bank responses (Olaoye, Ibitoye, 2025). In Nigeria, people are more likely to use smart banking if it is easy, useful, and reliable. Smart devices make customers happier by speeding up transactions, making banking easier to access, and increasing efficiency, but problems such as network issues and system downtime persist (Olatokun & Igbinedion, 2022; Salimon et al., 2023). Security is also a big concern. Many worry about identity theft, cyber fraud, and privacy, even though mobile banking and

biometrics are convenient (Al-Okaily et al., 2021; Akinwale & Okunola, 2024). Studies show that feeling safe and trusting mobile banking strongly affects whether people use it (Singh & Srivastava, 2023; Adegbite & Machethe, 2024). To help with these worries, Nigerian banks are starting to use biometric checks, encrypted transactions, and AI fraud detection (Ogunleye, 2022; CBN, 2023). Southwest Nigeria, which includes Lagos, Ogun, Oyo, Osun, Ondo, and Ekiti, is the country's main economic and financial center. Most commercial bank headquarters are in Lagos, which also leads in electronic banking (National Bureau of Statistics [NBS], 2023). The region's high smartphone use, large urban population, and tech-savvy customers make it a good place to study how smart devices affect customer views (Afolayan & Adekunle, 2021; Adeola & Evans, 2022). The 2023 currency redesign and cash shortages in Nigeria pushed more people to use digital banking and smart devices (CBN, 2023; Ojo & Adebisi, 2024). Even though smart banking is popular (Ogunlaja & Adepoju, 2021; Adebayo et al., 2023), problems such as poor network connectivity, system failures, cybersecurity risks, and service disruptions continue to undermine customer satisfaction and trust. These issues show the need for strong technical infrastructures and routine updates (Salimon et al., 2023; Adegbite & Machethe, 2024). Banks in Nigeria need to understand how smart devices shape customer opinions to plan better and improve their services.

The Aim of this study is to find out how smart device integration affects how customers see selected banks in Southwest Nigeria. It looks at how using smart banking technologies like mobile apps, biometric systems, AI customer service, automated transactions, and digital payments shapes customer views on service quality, convenience, security, reliability, trust, satisfaction, and overall experience.

To achieve this aim, the article also seeks to investigate and evaluate the following objectives:

To Identify and assess the primary smart device technologies incorporated by selected banks in Southwest Nigeria, as well as their client acceptance.

To Examine the impact of smart device integration on consumers' perceptions of service quality, convenience, security, dependability, trust, and total satisfaction at selected banks in Southwest Nigeria.

To Identify and Examine the main issues associated with smart device integration, as well as its impact on consumer acceptability, confidence, and continuous use of digital banking services in Southwest Nigeria.

## **1.1. PROBLEM STATEMENT**

The rapid growth of smart digital technology has changed how banks operate, offer services, and interact with customers. Smart device integration, including mobile banking applications, biometric authentication systems, AI-driven customer service tools, automated transaction systems, and digital payment infrastructures, is now critical to modern banking strategies centered on efficiency, convenience, security, and customer contentment. Commercial banks in Nigeria, especially in the southwest, have invested heavily in digital transformation to meet changing customer needs and stay competitive in a technology-driven market. Still, doubts remain about the effectiveness of smart device integration due to persistent operational problems, service outages, and dissatisfied customers. This is especially true when considering the buildings where these technologies are used. The physical environment strongly affects how people feel about service quality and their overall experience. Banking halls, service counters, automated transaction zones, waiting rooms, circulation spaces, and customer service facilities all influence comfort, accessibility, privacy, safety, efficiency, and satisfaction. However, many banks in Southwest Nigeria were built with traditional layouts that make it difficult to use smart technology, self-service systems, and digital engagement zones. As a result, the rapid adoption of smart devices in these traditional spaces has commonly led to overcrowding, inefficient workflows, poor circulation, inadequate service zoning, limited privacy, and poor environmental comfort.

The use of smart banking technology has changed how people use space, how businesses operate, and how clients move within banks. As more people use ATMs, self-service kiosks, biometric verification stations, and mobile-assisted service counters, architectural layouts need to be flexible, adaptable, and technology-aware. However, without conscious planning or design adaptation, a gap has emerged among technological systems and physical space. This has made banking facilities less efficient, accessible, and enjoyable. Customers regularly face long lines, crowded service areas, confusing layouts, noise, poor lighting, uncomfortable temperatures, and limited seating. These factors negatively affect their perception of service quality, reliability, safety, and satisfaction.

## **2.0.LITERATURE REVIEW**

In the last few years, the best commercial banks in Southwest Nigeria have increasingly adopted smart banking technology to better serve their customers and stay ahead of the competition in a rapidly changing financial landscape. Even with these technological advances, clients still have different ideas about the quality, reliability, security, convenience, and overall

experience of banking. These differences are sometimes caused by more than just how well technology works. The way banking facilities are built, how the space is arranged, and the quality of the atmosphere all have a direct impact on how users feel, how easy it is to get to, and how quickly services are provided. The literature review for this study is organized around four main themes: how top banks in Southwest Nigeria are integrating smart devices, how customers perceive smart banking services, how smart technologies are used in banking environments, and how technology use, building design, and customer perception interact. These theme areas provide a robust framework for evaluating current knowledge, identifying research gaps, and establishing the conceptual basis for the current study.

## **2.1. SMART DEVICE INTEGRATION STRATEGIES OF NIGERIA'S SOUTHWEST TOP COMMERCIAL BANKS**

Banking operations worldwide have been transformed by smart devices like ATMs, mobile banking apps, POS terminals, biometric authentication systems, and AI-driven customer service platforms. Commercial banks in Nigeria are using these technologies to boost efficiency, service, customer satisfaction, and financial inclusion. Southwest Nigeria, the country's economic and financial hub, includes Lagos, Ogun, Oyo, Ondo, Osun, and Ekiti states, where smart device integration is a key competitive strategy for leading commercial banks. Access Bank, Guaranty Trust Bank (GTBank), Zenith Bank, and United Bank for Africa (UBA) are some of Nigeria's best banks. Their main offices and most of their branches are in southwest Nigeria. These banks have aggressively adopted smart banking technologies to improve customer service, speed transactions, and better engage customers. Recent research shows that embedding smart devices into banking has made it much more efficient, lowered costs, and led customers in Nigeria to perceive the service as better (Adewale & Olatunji, 2021; KPMG Nigeria, 2022; PwC Nigeria, 2023). From an architectural point of view, embedding smart devices is a revolution for how modern commercial bank buildings are designed, planned, and organized to work. Adding digital technologies such as smart ATMs, biometric authentication systems, mobile-assisted service platforms, AI-powered customer support tools, and smart queue management systems means banks need to completely rethink how they build their buildings. Traditional bank layouts, which were mostly based on manual teller operations, fixed counters, and large waiting areas, are becoming less common as digital service delivery models take over. Architectural design for modern commercial bank buildings must include flexible spatial configurations, open-concept layouts, service areas with integrated technology, digital self-service areas, and smart

circulation systems. Smart device integration reduces the necessity of physical service counters. This lets architects redesign banking halls with fewer closed offices and more interactive, customer-focused areas. This change better uses space, makes navigation easier, reduces traffic, and makes users more comfortable. Also, the use of biometric security systems and smart surveillance technologies needs the addition of advanced access control points, surveillance corridors, and security zoning to building layouts. This makes buildings safer while still permitting free movement. Also, as more people use mobile banking and self-service technologies, the way people use space has changed. This has led to smaller but more effective banking halls that focus on digital engagement, privacy, accessibility, and environmental comfort. Architectural factors such as lighting design, soundproofing, ventilation, thermal comfort, ergonomic furniture, and easy access have become increasingly important for technology-driven banking operations. In Southwest Nigeria, where there are many transactions and cities are very crowded, architectural solutions should focus on compact, flexible designs that can respond to new smart banking technologies. Smart devices have changed how customers interact with banks, how quickly they can access services, and how people think about banking services in general. In Southwest Nigeria, Access Bank, GTBank, Zenith Bank, First Bank, and UBA are among the largest commercial banks that have strategically deployed smart technologies to enhance customer satisfaction, trust, convenience, and service quality. Smart ATMs, mobile banking apps, biometric authentication systems, AI-powered chatbots, and smart queue management systems are among the most important smart devices because they are widely used and directly affect how customers perceive things.

### **2.1.1. SMART AUTOMATED TELLER MACHINE (SMART A.T.M'S)**

Smart ATMs are a big step forward from regular cash machines. Smart ATMs in the best commercial banks in Southwest Nigeria can now do a lot of things which are not limited to but includes withdrawing cash without a card using QR codes or mobile authentication, making deposits and processing checks, transferring money between accounts, paying utility bills, printing mini-statements, and verifying your identity with biometrics. These machines are placed in convenient locations such as banking halls, ATM galleries, shopping malls, college campuses, business districts, and transportation hubs to make them easy to reach. The use of biometric-enabled, cardless ATMs has made people less reliant on physical debit cards, reduced the risk of fraud, and made banking services available outside regular banking hours. In Southwest Nigeria, where the population is growing rapidly, business is booming,

and transactions occur frequently, the architectural placement of smart ATMs is crucial to how customers perceive the service's speed, ease of use, and dependability. Placing smart ATMs in places that are easy to see, easy to reach, and well-lit, such as entrance lobbies, exterior banking galleries, and semi-public forecourts, makes users feel safer, more comfortable, and easier to find their way around. These layouts help reduce congestion in banking halls, speed up transaction times, and encourage smooth movement flows, making customers feel the bank is more efficient and responsive. (Adewale & Olatunji, 2021; KPMG Nigeria, 2022; PwC Nigeria, 2023). The way smart ATM zones are laid out in space also affects how comfortable and satisfied customers feel. Well-designed ATM lobbies that have enough space to wait, seating, climate control, and easy-to-follow directions can help people feel less stressed and frustrated when they have to wait in line or when service is slow. In Southwest Nigeria, where peak transaction times often bring in many customers, these architectural changes make people think the service and overall banking experience are better. Also, the use of smart ATMs affects broader architectural planning strategies by promoting hybrid indoor-outdoor banking environments, larger service areas, and flexible spatial layouts that enable 24-hour banking. This revision not only makes things easier and more accessible, but also makes customers see banks as technologically advanced, customer-focused, and service-oriented.



*Figure 1; Smart ATM.*

### **2.1.2. INTEGRATION OF SMARTPHONES VIA MOBILE BANKING APPLICATION**

Mobile banking apps and smartphone integration are electronic platforms that enable customers to conduct financial transactions, access banking services, and manage their accounts on their mobile devices. These platforms usually have features such as real-time money transfers, bill payments, account monitoring, loan applications, biometric authentication, customer support chat services, and transaction notifications (Alalwan et al., 2022; Singh & Srivastava, 2023). The growing use of smartphones and better internet access in Nigeria have made mobile banking services much more popular, especially in cities like Southwest Nigeria (Adebayo, Oyewole, & Ajayi, 2021; National Bureau of Statistics [NBS], 2023). Customers can execute transactions without physically visiting bank branches through mobile banking applications that function as virtual banking environments. Instant interbank transfers, mobile payments, digital account opening, cardless withdrawals, investment management, and automated customer support comprise core services (Akinwale & Okunola, 2024). Real-time transaction processing, reduced operational delays, and continuous service availability are ensured by the seamless integration of these applications into core banking systems. In Southwest Nigeria, where daily life is characterized by city congestion, heavy traffic, and long commuting distances, mobile electronic banking platforms have significantly reduced customers' reliance on physical bank visits. Research suggests that mobile banking is becoming more popular among working professionals, students, and entrepreneurs due to its time-saving benefits, flexibility, and speed (Olatokun & Igbinedion, 2022; Salimon et al., 2023). Consequently, physical bank branches are transitioning from transaction-centered spaces to customer engagement and advisory centers, with a decreased dependence upon traditional teller services. The spatial planning and functional organization of commercial bank buildings have been significantly altered by the integration of mobile banking. The main objective of conventional banking halls was to accommodate a high volume of customers who conducted manual transactions, which required the implementation of rigid circulation layouts, multiple teller counters, and expansive waiting areas. Nevertheless, the extensive adoption of mobile banking applications has significantly reduced in-branch transaction demand, allowing architects to redesign banking halls with smaller footprints, flexible layouts, and technology-driven service zones (Deloitte, 2021; PwC Nigeria, 2023). Modern commercial bank buildings are steadily incorporating open-concept layouts, digital self-service areas, and modular service pods that facilitate hybrid service

delivery models. This design change strengthens visual connectivity, promotes spatial flexibility, and improves space efficiency, helping banks adapt to the evolving demands of digital services (Afolayan & Adekunle, 2021; Adeola & Evans, 2022).

### **2.1.3. SMART QUEUE MANAGEMENT SYSTEMS**

Smart Queue Management Systems (SQMS) are now an important part of digital transformation plans for banks, especially in crowded cities like Southwest Nigeria. Banks have had to adopt smart queue systems to improve client flow, reduce wait times, and make service more efficient, as more people want faster, smoother service. Research in developing economies demonstrates that prolonged waiting times in banking halls substantially lead to customer dissatisfaction, frustration, service abandonment, and adverse perceptions of service quality (Augusta et al., 2022; Iddrisu et al., 2024). Long lines and crowded banking halls remain major problems, especially during peak transaction times. Research shows that poor queue management can lead to more people backing out of deals, less efficient operations, and lost customer loyalty (Usman et al., 2020; Paveun & Danyaro, 2025). Smart queue management technologies such as digital ticketing systems, mobile-based queue reservations, automated call-forward systems, and live monitoring dashboards have been shown to effectively address these problems by making it easier for customers to move around and improving the efficiency of service delivery (Sedco, 2024; VirtuaQ, 2024). Customers' perceptions of efficiency, professionalism, and technological development are positively influenced by reduced waiting time, transparency in service progression, and comfort during waiting periods (Ibrahim et al., 2020; Iddrisu et al., 2024). In Nigeria, research has demonstrated that customers are progressively associating efficient queue systems with superior service quality, safety, and institutional competence, thus increasing brand loyalty and trust (Usman et al., 2020; Augusta et al., 2022). The spatial planning, functional zoning, and circulation design of commercial bank buildings are radically changed by the incorporation of smart queue management systems. The traditional banking layouts, which are defined by lengthy linear queues, congested waiting corridors, and fixed service counters, are rapidly being replaced by digitally enabled spatial configurations that facilitate fluid movement, flexible service zones, and decentralized transaction points. By adopting dynamic circulation paths, architects can design more open-plan banking halls, reduce the footprint of conventional waiting areas, and distribute customer traffic more equitably across service points with smart queue systems. Digital queue displays, mobile alerts, and virtual waiting systems enable customers to remain seated, interact with self-service terminals, or utilize

lounge-style waiting areas, therefore enhancing spatial comfort alongside reducing physical congestion (Sedco, 2024; Iddrisu et al., 2024). This change supports the development of multifunctional banking environments that combine improved end-user convenience with improved service effectiveness. In addition, the architectural incorporation of SQMS enables intelligent segmentation, which separates high-traffic transactional areas from advisory and premium service zones. This zoning system enhances spatial hierarchy, privacy, and seamless operational flow. Perceived waiting time and customer discomfort are considerably exacerbated by inadequate waiting zones and poor spatial layout (Usman et al., 2020; Augusta et al., 2022). Smart queue systems help architects develop adaptive environments that respond to real-time service demand.

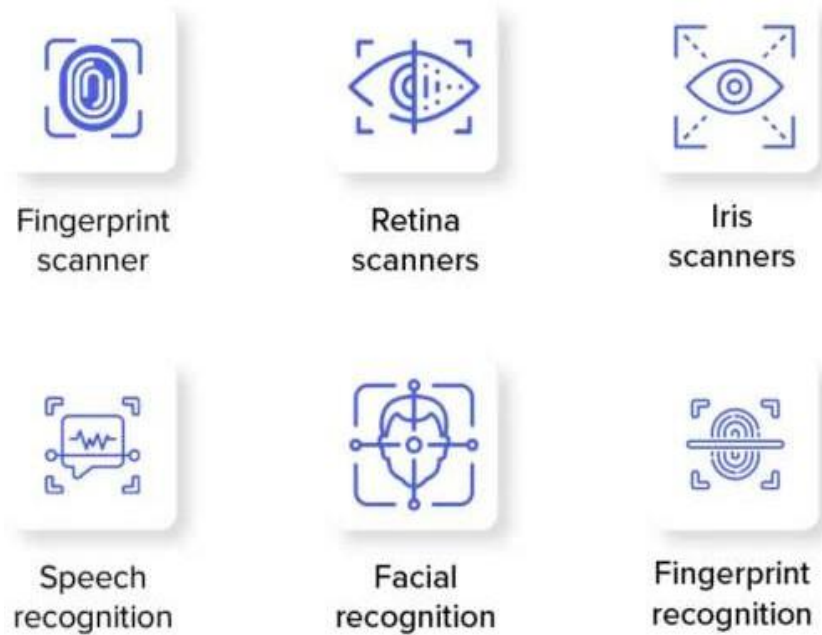
## **2.2. CUSTOMERS PRECEPTION IN SMART COMMERCIAL BUILDINGS**

Customer perception has become a key performance metric in modern banking, especially in tech-driven business settings. In Southwest Nigeria, which is Nigeria's economic and financial center, major commercial banks such as Zenith Bank, Access Bank, First Bank, GTBank, and UBA have increasingly been adopting smart technologies and digitally enhanced architectural designs to improve service delivery, customer engagement, and their image. The use of smart banking technology in commercial bank facilities has changed clients' expectations, their perceptions of banking, and their views of banking spaces as a whole (Adaramola & Alayande, 2025; Abinabo et al., 2025). Things like how quickly the service is, how easy it is to use technology, how comfortable the setting is, how well the space is organized, and how easy it is to find your way about the banking halls all have a big impact on how customers feel. New digital banking technologies such as biometric authentication, smart ATMs, mobile-assisted service platforms, automated queue systems, and AI-driven customer interfaces have enabled faster service, fewer operational problems, and happier customers overall (Abinabo et al., 2025; Usman et al., 2020). Customers are more likely to think that banks that use state-of-the-art technology are trustworthy, competent, and credible as institutions. Smart commercial buildings are distinguished by the embedding of intelligent systems that refine energy efficiency, security, and service delivery, augment user comfort, and automate building operations. (Olaoye, Ibitoye, 2025). In the financial sector, these structures integrate sophisticated architectural design with digital service platforms to establish user-centered, efficient environments. In Southwest Nigeria, prominent banks have been progressively transforming their branch layouts into technology-enabled service spaces.

This has involved the incorporation of smart service counters, automated transaction zones, biometric access control, intelligent lighting systems, and digital information displays (Western Post, 2023; Punch Nigeria, 2024). Customers' perceptions of smart commercial bank buildings are strongly influenced by aesthetic quality, accessibility, environmental comfort, circulation flow, and spatial layout. Research indicates that customers' affective reactions and satisfaction levels are positively influenced by well-organized banking halls, intuitive circulation systems, adequate illumination, thermal comfort, acoustic control, and ergonomic furniture design (Adaramola & Alayande, 2025). The incorporation of smart technologies enables architects to reimagine conventional banking layouts, substituting inflexible teller-dominated arrangements with open-plan, digitally responsive, and flexible spatial configurations. For example, smart queue management systems reduce congestion and waiting time by facilitating virtual waiting, digital call-forwarding, and distributed service zones. This building transformation enhances perceived service quality, reduces congestion, and improves spatial efficiency (Abinabo et al., 2025; Western Post, 2023). Additionally, embedding of surveillance corridors, security zoning, and controlled access points into building configurations is required by biometric security systems and smart surveillance technologies.. These design features preserve openness and spatial fluidity while simultaneously increasing customer trust, perceptions of security, and confidence in banking services (Punch Nigeria, 2024). In highly populated urban centers like Lagos, Ibadan, Abeokuta, and Akure, architectural solutions prioritize technologically adaptive, compact, and flexible building forms that can accommodate high transaction volumes and developing digital service demands.



*Figure 2; Surveillance devices mostly incorporated in banking halls.*



*Figure 3 Biometric Authentication Methods.*

### **2.3. ARCHITECTURAL LAYOUT EFFICIENCY IN COMMERCIAL BANKS OF SOUTH WEST REGION OFF NIGERIA**

In contemporary commercial banking environments, the efficacy of architectural layout has become a major influence on operational productivity, client experience, and service effectiveness. In response to the high volume of transactions, rapid digitalization, and changing customer expectations, major banks in Southwest Nigeria—Nigeria's commercial and financial hub—are progressively redesigning their banking halls and branch layouts. These banks includes but are not limited to Zenith Bank, Access Bank, First Bank, GTBank, and UBA. The incorporation of smart devices into commercial bank buildings has significantly altered architectural planning principles, spatial organization, and functional zoning, thereby redefining layout effectiveness and client perception (Adaramola & Alayande, 2025; Iwedi, 2024). The optimal arrangement of functional spaces, circulation paths, service zones, and waiting areas in banking architecture is referred to as layout efficiency. This is used to support flawless operations, lessen congestion, reduce service time, and improve user comfort. Research suggests that inefficient layouts result in congestion, protracted waiting times, spatial confusion, and elevated customer stress levels, which have a detrimental effect on service satisfaction and institutional image (Usman et al., 2020; Augusta et al., 2022). As a result, banks are steadily incorporating architectural layouts that are digitally led and prioritize operational adaptability, spatial flexibility, and customer-centered design principles.

Logical zoning, proper circulation design, ergonomic service locations, and a comfortable atmosphere all help improve layout efficiency. Research shows that open-plan banking halls with smart circulation systems and digital navigational aids greatly reduce congestion and make it easier for customers to find their way around, leading them to perceive the service as more efficient (Nwachukwu et al., 2025). Nigeria shows that consumers link excellent service quality, professionalism, and institutional competence with well-organized layouts, easy circulation, and short wait times (Adaramola & Alayande, 2025). Digital banking infrastructure improves this view by making it possible to provide services quicker, making spaces more comfortable, and making operations more open (Iwedi, 2024). Psychological comfort, emotional fulfillment, and service confidence are also affected by well-designed buildings. Good lighting, comfortable temperatures, effective sound management, comfortable seating, and clear spaces all help lower anxiety, boost mood, and make people feel the service is more reliable (Nwachukwu et al., 2025). Customers see the banking environment as contemporary, efficient, and client-focused when these features are integrated with intelligent building systems. Digital transformation in Nigerian banks significantly improves customer satisfaction, loyalty, and brand perception, especially when technological adoption is supported by flexible architectural designs (Adaramola & Alayande, 2025; Iwedi, 2024). Customers are increasingly choosing banks that are convenient, secure, comfortable, and technologically advanced. This makes it even more important for banks to have efficient architectural layouts. In Southwest Nigeria, architects need to focus on flexible design techniques, modular spatial planning, and adaptable circulation systems when responding to smart banking technology. Layouts need to be adaptable, scalable, and user-centered due to high transaction density, urban traffic, and new digital service platforms. (Ibitoye, 2025). Architects are steadily incorporating hybrid spatial models which integrate physical service areas with digital self-service settings, encouraging seamless interaction between constructed spaces and intelligent technology (Nwachukwu et al., 2025; Iwedi, 2024). Also, sustainable architectural solutions such as natural ventilation, daylight optimization, solar power integration, and smart energy management make spaces even more efficient, more environmentally friendly, and more operationally sustainable in the long term (Olaoye 2024). These changes to the building not only make customers feel better about the business, but they also save expenses and boost the institution's image. (Ibitoye, 2025). In Southwest Nigeria, the use of smart gadgets has completely changed the layout of banking halls, how space is used, and how services are delivered. Efficient layouts, which include flexible design,

optimal circulation, smart zoning, and environmental comfort, greatly increase operating efficiency, reduce service delays, and make customers happier. So, contemporary bank buildings need to incorporate technology-responsive, user-centered, and flexible spatial strategies in their architectural design to keep up with the changing needs of smart banking and stay ahead of the competition.

#### **2.4. SMART SERVICE ZONES IN COMERCIAL BANKS**

Smart service zones are areas of bank buildings that have been improved with digital technology. They use smart devices, automation technologies, and intelligent service platforms to improve the customer experience, make operations more efficient, and enhance space performance. Ibitoye (2025). These zones usually include places for self-service banking, digital consultations, biometric security, automated queuing systems, e-lobbies, and smart ATM halls. The shift from conventional banking halls to smart service zones reflects a worldwide trend toward technology-driven banking settings that prioritize efficiency, security, accessibility, and customer comfort (Udoh et al., 2025; Onuegbu et al., 2025). Commercial banks are progressively deploying smart service zones to address the growing need for digital banking, escalating client volumes, and heightened expectations for service effectiveness and quality (Alugah, 2021; Udoh et al., 2025). This change directly affects architectural design, spatial zoning, circulation flows, and the interior layout of bank buildings. Smart service zones require redesigning banking hall layouts, shifting from conventional teller-centric designs to open-plan, technology-enhanced, and adaptable workplaces. Contemporary commercial bank edifices emphasize digital self-service pods, automated customer assistance stations, interactive kiosks, and mobile banking facilitation zones, underpinned by robust ICT infrastructure and ergonomic spatial design (Alugah, 2021). Effectively built smart zones enhance spatial clarity, visual attractiveness, ergonomic comfort, and psychological ease, hence stimulating emotional connection, loyalty, and pleasure among consumers (Jegade & Enwonwu, 2025). Intelligent service zones directly affect the environmental efficacy of banking edifices, especially in terms of illumination, ventilation, acoustics, and thermal comfort. Intelligent lighting systems, automatic ventilation, noise control technologies, and climate-responsive building envelopes enhance interior environmental quality, which deeply influences consumer well-being and satisfaction (Alugah, 2021). Users respond favorably to environments that integrate technological efficiency with green comfort, thereby enhancing dwell time, engagement, and brand loyalty (Jegade & Enwonwu, 2025). In the tropical environment of Southwest Nigeria, integrating

passive design principles with intelligent building technologies enhances thermal comfort and reduces energy consumption. Customer confidence in banking environments is strongly influenced by security. Architectural security planning is transformed by the amalgamation of biometric authentication, AI-driven surveillance, facial recognition systems, and automated access controls in smart service zones (Udoh et al., 2025; John et al., 2025). This system requires security zoning, controlled circulation paths, stratified access hierarchies, and spatial buffering, all of which affect the building's layout and design configuration. Institutional trust is positively reinforced by customers' perceptions of these tech-enhanced environments as more reliable, professional, and safer (John et al., 2025). In Southwest Nigeria, where urban areas are becoming denser, more transactions are happening, and people are using technology more, buildings need to be designed to be efficient, adaptable to digital changes, comfortable in the environment, and strong in space. Smart service zones provide a strategic architectural framework that supports the development of future-ready bank facilities, adaptable to technology progress and transforming consumer behaviors (Alugah, 2021; Udoh et al., 2025).

### **3.0 RESEARCH METHODOLOGY**

This study uses a qualitative research methodology to thoroughly identify and examine the architectural ramifications of smart device integration and its impact on customer perception in certain commercial banks in Southwest Nigeria. The qualitative technique is especially suitable for this study since it allows an in-depth analysis of spatial experiences, architectural configurations, technology interactions, and perceptual reactions inside authentic banking contexts. The research uses a numerous case study methodology, enabling an in-depth analysis and comparative assessment of architectural configurations, smart service zones, and user experiences in various banks. The research region includes major locations particularly in Lagos which is a major location for economic hub and commercial activity in Southwest Nigeria. Lagos has a lot of banking activity, a lot of customers, and a lot of digital change. Zenith Bank, Access Bank, Guaranty Trust Bank (GTBank), and United Bank for Africa (UBA) were chosen on purpose because of how advanced their technology is, how contemporary their buildings are, how many customers they have, and how important they are to the area. These banks exemplify case studies for studying the impact of smart technology on architectural design and consumer perception. Data collecting used a number of qualitative methods to make sure there was depth, richness, and triangulation. Graphic documentation and spatial mapping were used to capture architectural configurations, smart device placements,

and functional zoning patterns, facilitating systematic spatial analysis and layout comparison. Purposive sampling was used to guarantee that participants had pertinent expertise and understanding of smart banking operations and architectural contexts. Thematic analysis was used to examine the data, which included transcription, categorization, and interpretation. This led to the creation of key themes like the efficiency of the architectural layout, smart service zoning, circulation effectiveness, environmental comfort, security perception, and overall customer satisfaction. Functional zoning analysis and circulation flow mapping were used to look more closely at architectural layouts. This made it possible to assess spatial utilization and human navigation behaviors. A cross-case comparison study was performed to discern similarities, differences, best practices, and emerging trends across the four chosen institutions. To guarantee the validity and dependability of the results, the study used methodological triangulation, participant validation, and thorough documenting of research methods. Informed permission, secrecy, anonymity, and voluntary involvement all made sure that ethical norms were followed. This research-based framework facilitates a comprehensive grasp of the interplay among smart banking technologies, architectural design strategies, and customer perception, thereby bringing substantial empirical and architectural insights which guide sustainable, user-centered, and technology-responsive commercial bank building design in Southwest Nigeria.

#### **4.0 EMPIRICAL REVIEW**

The incorporation of smart devices into commercial banking settings have profoundly altered service delivery models and architectural design methodologies, especially within the rapidly changing metropolitan sceneries of Southwest Nigeria. This research, based on qualitative interviews done at four prominent commercial banks—Access Bank, GTBank, Zenith Bank, and UBA—demonstrates that the incorporation of smart devices significantly affects customer perception, spatial experience, process efficiency, and architectural design. Through these analysis carried out in these commercial institution, Nigerian banks have swiftly increased their implementation of advanced technologies, including biometric authentication systems, smart ATMs, AI-driven customer service platforms, mobile banking applications, and intelligent queue management systems, to boost service efficiency, security, and customer engagement (Abdullahi et al., 2025; Abinabo et al., 2025). Field interviews validated these results, as consumers consistently linked digital efficiency, security, and spatial comfort to elevated levels of happiness and trust. This corroborates previous findings that technology advancements enhance banking performance and consumer involvement in Nigeria (Abdullahi

et al., 2025; Yusuf & Bala, 2021) the results further illustrate that smart banking technologies need major changes in building architecture, spatial zoning, circulation planning, and interior arrangement. Open-plan service spaces that prioritize self-service sections, digital interaction hubs, and flexible client waiting areas are increasingly replacing traditional teller-centered halls. Respondents consistently indicated that well-structured smart service zones, sensible circulation routes, ergonomic designs, and technologically adaptive environments facilitate navigation, alleviate anxiety, and elicit favorable emotional reactions. These results are quite similar to what worldwide architecture research has found: that digitally linked spaces make people feel like they are in a better space and they are eventually more satisfied with the service (Yusuf & Bala, 2021; Onuegbu et al., 2025).

**Table 1: Comparative Analysis of smart devices used by banks.**

<b>BANK</b>	<b>MAJOR SMART DEVICE INTEGRATED</b>
Access Bank	Access More App, Smart ATMs, POS terminals, biometric authentication, AI chatbots
GTBank	GTWorld App, cardless ATMs, QR payments, POS terminals, AI chatbots
Zenith Bank	Zenith Mobile App, biometric ATMs, Scan-to-Pay, cybersecurity AI tools
UBA	Leo AI chatbot, smart ATMs, mobile banking apps, POS terminals, biometric platforms

The combination of biometric-enabled smart ATMs and authentication systems was one of the most important factors affecting how much customers trusted and felt safe. The results of the interviews show that consumers feel more safer doing business in bank halls with biometric-enabled entry points that ensure proper security as well as face identification systems, and ATM lobbies with security cameras. These technologies evidently reduce the rate of fraud and make people more confident in transactions, and make people think institutions are more trustworthy. Biometric technologies greatly increase consumer involvement and system acceptability in Nigerian banking contexts (Abinabo et al., 2025; Haliru, 2023). In terms of architecture, these technologies require enhanced zoning, secure vestibules, surveillance corridors, and restricted-access circulation systems that change how space is organized in bank buildings. Smart queue management systems and AI-powered service allocation platforms also had a big effect on how consumers thought about the quality of service and how quickly things were done. Customers who were interviewed reported that when queuing systems were added to spatial layouts that made it easier to see, sit comfortably, regulate sound, and use electronic interfaces, they felt less stressed, waited less time, and were more

satisfied. These results are in line with research on the performance of technology that show how automation and digital coordination may make customers happier and improve business success (Abdullahi et al., 2025). This means that there need to be concentrated circulation cores, clearly marked waiting areas, digital display integration, and spatial transparency. This will ensure the service moves smoothly and that people feel comfortable. Customers' expectations for the layout of bank buildings changed much more with the rise of mobile banking and smartphones. Interviews Reported that more digital banking services are now being incorporated into the banking system. which has made them less reliant on physical counters. This has changed the priorities of architects, who now focus on creating more conservative, tech-rich, flexible spaces which encourage customer interaction instead of just processing transactions. Customers are starting to see physical branches as places to get help with problems, get advice, and get digital assistance, rather than merely places to do transactions. This change aligns with a recent study showing that adopting digital banking makes customers happier and changes how they use space (Onuegbu et al., 2025). This means the architecture must include variable layouts, modular partitions, flexible service pods, and digital kiosks that work together and adapt to customer behavior. The combination of qualitative interviews and the literature shows that embedding smart devices is not only a technological update; it is also a driver of architectural change. In Southwest Nigeria, where urban areas are crowded, there are many transactions, and people want services, architectural solutions must focus on making the most of space, being flexible, integrating security, ensuring comfort in the surroundings, and being able to respond to digital requests. Buildings that successfully incorporate these concepts typically provide improved consumer perceptions, heightened brand loyalty, and superior experience quality. This aligns with worldwide and local research indicating that the future of commercial banking will be characterized by the convergence of architecture and smart technology (Abinabo et al., 2025; Abdullahi et al., 2025; Yusuf & Bala, 2021).

**Table 2: Comparative Analysis of Smart Device Integration and Traditional Banking Hall Architecture.**

<b>DESIGN ASPECT</b>	<b>CONVENTIONAL BANKING LAYOUT AND SPATIAL CONFIGURATION</b>	<b>SMART DEVICE INTEGRATED BANKING LAYOUT AND SPATIAL CONFIGURATION</b>	<b>ARCHITECTURAL AND FUNCTIONAL IMPLICATIONS</b>
<b>Overall spatial concept</b>	Inflexible, teller-centric design characterized by service counters and waiting areas	Adaptable, technology-oriented open-concept design	Improves flexibility, spatial efficiency, and user involvement
<b>Planning strategies</b>	Linear spatial arrangement with designated service locations	Strategic zoning including intelligent service areas and digital engagement zones	Enhances functional zoning, alleviates congestion, and optimizes service flow.
<b>Service counter Design</b>	Extended stationary teller counters creating physical obstructions	Reduced physical counters, instead with self-service kiosks and computer terminals	Promotes transparency, availability, and engagement
<b>Circulation Pattern</b>	Linear and crowded transportation pathways	Radial, looping, and dispersed circulation systems	Enhances movement efficiency, minimizes conflict areas, and improves navigation.
<b>Service Zoning</b>	A generic banking hall that lacks functional distinction	Smart service zones include digital kiosks, biometric zones, ATM zones, and advice zones.	Improves customer happiness, work productivity, and spatial clarity
<b>Architectural Expression</b>	formal, confined, and conventional	Transparent, active, open, and focused on technology	improves brand identity and company image
<b>Adaptability to Future Technologies</b>	Limited adaptability	Enhanced flexibility via modular and intelligent planning	Guarantees enduring significance and viability

## 5.0 CONCLUSION

This research thoroughly investigated the incorporation of smart devices and their impact on customer perception in selected commercial banks in Southwest Nigeria, from both technical and architectural viewpoints. By combining qualitative research results with recent academic literature, the study found that embedding smart devices represents a major innovation for customer experience, service effectiveness, and architectural development in modern banking settings. The results show that smart technologies such as smart ATMs, biometric authentication systems, mobile banking services, smart queue management systems, AI-powered customer support tools, and integrated security networks have changed the way

banks operate, are set up, and deliver services. Customers are increasingly likely to associate these technologies with trust, security, efficiency, convenience, and satisfaction, which in turn affect how they view banks as a whole (Abdullahi et al., 2025; Abinabo et al., 2025; Yusuf & Bala, 2021). The study shows that the use of smart banking technology has completely changed how commercial banks are built, how space is used, how people move about, and how services are organized. Flexible, open-plan settings that favor self-service zones, digital engagement areas, small service pods, and adaptable layouts are replacing traditional teller-dominated layouts with stiff counters and vast waiting hallways. These architectural changes make better use of space, reduce traffic, and improve the atmosphere, all of which make customers feel better about the business (Onuegbu et al., 2025; Haliru, 2023). The research also shows that clever service zoning and efficient architectural layout are important links between technology integration and consumer happiness. Customers have a far better experience when there are well-organized circulation flows, clearly defined service zones, easy-to-use navigation systems, ergonomic furniture design, good lighting, sound management, and thermal comfort. Customers regularly reported greater pleasure and reduced service-related concerns in banking halls where the spatial arrangement supported seamless digital engagement and reduced waiting times (Yusuf & Bala, 2021; Abdullahi et al., 2025). Also, the growing use of mobile banking and smartphone-based services has changed how customers interact with banks, making them less reliant on physical service counters and changing how space is used in bank facilities. Physical branches are no longer places where people may do business; instead, they are places where people can get advice, help with problems, and digital assistance. This change in how things are done means buildings need to be created with flexibility, modularity, privacy, and the capacity to adjust to new technologies in mind. This is particularly true in cities with large populations, such as Lagos, Ibadan, Akure, Abeokuta, and Osogbo (Abinabo et al., 2025; Onuegbu et al., 2025). In Southwest Nigeria, where city populations are growing, financial inclusion efforts are expanding, and digital transformation plans are strengthening, the combination of smart technology and architectural design is becoming a key factor in banking performance and customer loyalty. Banks that strategically combine digital infrastructure with spatial layout provide better service, improve brand image, and make users happier. This strengthens the assertion that smart device integration constitutes not only an operational enhancement yet a holistic architectural and experiential metamorphosis (Haliru, 2023; Abdullahi et al., 2025). The study further establish that the future of commercial banking in Nigeria depends on combining smart technology with responsive architectural architectural

designs. User-centered design concepts, flexible layouts, smart service zoning, adaptive circulation systems, and security-integrated spatial planning should all be top priorities for sustainable banking facilities. These architectural initiatives will not only improve how customers see and feel about the institution, but also make it more competitive, resilient, and sustainable in the long run in Nigeria's changing financial landscape.

### **5.1. RECOMMENDATIONS**

This study offers strategic recommendations to boost service efficiency, customer satisfaction, architectural functionality, spatial comfort, and technological adaptability, based on a thorough examination of the incorporation of smart devices and its impact on customer perception in commercial banks in Southwest Nigeria, as well as its architectural implications. These recommendations highlight the importance of integrating responsive architectural design with smart technologies to maintain user-centered, secure, flexible, and sustainable banking environments. The implementation of these measures will improve the long-term competitiveness, operating efficiency, spatial experience, and client confidence of commercial banks in Nigeria's swiftly changing financial and built environment landscape.

1. Commercial banks should implement comprehensive strategies to incorporate smart technology that integrates architectural functionality with process efficiency.
2. Flexible, open-plan arrangements compatible with the development of smart banking technologies should be implemented in the redesign of bank structures.
3. To facilitate self-service operations and reduce congestion, dedicated smart service zones should be implemented.
4. To enhance spatial flow and simplicity of navigation within banking halls, architects should prioritize efficient circulation planning.
5. To improve client confidence and safety, banks should integrate biometric authentication systems with architectural security zoning.
6. To reduce service tension and waiting time, architectural layouts should incorporate intelligent queue management systems.
7. To enhance consumer interaction and accessibility, it is recommended that digital kiosks and interactive service modules be distributed throughout the space.
8. It is recommended that banks implement modular architectural designs that facilitate the flexible adaptation to emergent technologies.
9. Digital assistance zones within physical branches should facilitate mobile banking

integration.

10. Environmental comfort ought to be prioritized in building design, encompassing illumination, ventilation, acoustic control, and thermal performance.
11. Universal accessibility should be prioritized in architectural design, particularly for older adults and people with physical disabilities.
12. Banks should integrate spatial planning with AI-powered customer support systems to improve service effectiveness.
13. Smart ATM galleries should be designed to be visually accessible, comfortable, and secure.
14. Sustainable architectural solutions, including energy-saving lighting, ventilation systems, and materials, should be implemented in bank buildings.
15. To optimize operating efficiency and energy consumption, designers should incorporate advanced building management systems (BMS).
16. Spatial and service planning processes should include mechanisms for customer feedback.
17. Banks ought to prioritize spatial zoning that prioritizes privacy for sensitive transactions and consultations.
18. To optimize service delivery, staff training programs must align with smart service architecture models.
19. Regulatory bodies should establish technological and architectural standards for digital financial environments.
20. To evaluate the spatial performance and consumer perception of smart bank structures, it is imperative to conduct ongoing post-occupancy evaluations.

## REFERENCES

1. Abdullahi, M., Sadiq, A., & Lawal, A. (2025). Smart banking technologies and customer satisfaction in Nigeria. *International Journal of Bank Marketing*, 43(1), 102–121. <https://doi.org/10.1108/IJBM-09-2024-0512>
2. Abinabo, T., Okafor, E., & Bello, S. (2025). Digital transformation and service efficiency in Nigerian commercial banks. *Journal of Financial Services Marketing*, 30(2), 87–103. <https://doi.org/10.1057/s41264-024-00218-7>
3. Adewale, B., & Olatunji, A. (2023). Smart building technologies and spatial efficiency in commercial environments. *Facilities*, 41(7/8), 356–372. <https://doi.org/10.1108/F-11-2022-0129>
4. Akinwale, Y. O., & George, O. J. (2020). Technology innovation and customer satisfaction in Nigerian banking. *Journal of African Business*, 21(4), 460–478.

- <https://doi.org/10.1080/15228916.2020.1729211>
5. Ayo, C. K., Oni, A. A., Adewoye, J. O., & Eweoya, I. O. (2020). E-banking adoption and customer satisfaction in Nigeria. *Journal of Internet Banking and Commerce*, 25(3), 1–20.
  6. Bello, S. A., & Adekunle, A. A. (2024). Biometric technologies and customer trust in Nigerian banks. *Journal of Financial Crime*, 31(1), 152–170. <https://doi.org/10.1108/JFC-01-2024-0019>
  7. Haliru, M. (2023). Biometric authentication systems and banking security perception in Nigeria. *Journal of Financial Crime*, 30(3), 856–873. <https://doi.org/10.1108/JFC-02-2023-0035>
  8. Ibrahim, A., & Mohammed, S. (2022). Smart queue management and service efficiency in Nigerian banking halls. *African Journal of Business Management*, 16(5), 129–141.
  9. Lawal, A. I., Babajide, A. A., & Obalade, A. A. (2021). Digital banking and customer loyalty in Nigeria. *Journal of Retailing and Consumer Services*, 60, 102456. <https://doi.org/10.1016/j.jretconser.2021.102456>
  10. Nwankwo, S., & Kanyangale, M. (2020). Technology adoption and customer perception in African banking. *Service Industries Journal*, 40(5–6), 396–418. <https://doi.org/10.1080/02642069.2019.1690953>
  11. Ogunba, O. A., & Fabunmi, F. A. (2022). Architectural space planning and user satisfaction in commercial buildings. *Journal of Building Performance*, 13(1), 44–60.
  12. Ojo, O., & Olanipekun, A. (2021). Smart building design and user comfort in commercial environments. *Journal of Architecture and Urbanism*, 45(2), 108–121. <https://doi.org/10.3846/jau.2021.14786>
  13. Okeke, M. N., & Eze, C. U. (2024). Mobile banking applications and customer experience in Nigeria. *International Journal of Bank Marketing*, 42(2), 290–308. <https://doi.org/10.1108/IJBM-07-2023-0402>
  14. Onuegbu, C., Olatunji, A., & Adewale, B. (2025). Smart building technologies and spatial efficiency in commercial facilities. *Facilities Management Journal*, 13(1), 44–62.
  15. Oyelami, L. O., Afolayan, A. H., & Adeyemi, A. S. (2021). Architectural ergonomics and environmental comfort in public buildings. *Built Environment Journal*, 8(2), 67–83.
  16. Sanni, M., & Olatunji, R. (2023). Service automation and customer satisfaction in Nigerian banking. *African Journal of Economic and Management Studies*, 14(3), 462–479. <https://doi.org/10.1108/AJEMS-11-2022-0543>
  17. Tajudeen, S., & Adesina, O. (2024). Smart service zones and space utilization in banking

- halls. *Journal of Urban Design and Built Environment*, 9(1), 55–71.
18. Yusuf, A., & Bala, K. (2021). Digital banking adoption and customer experience in Nigeria. *African Journal of Economic and Management Studies*, 12(4), 593–609. <https://doi.org/10.1108/AJEMS-03-2021-0134>
19. Zubairu, S. N., & Adegoke, O. (2022). Post-occupancy evaluation of commercial bank buildings in Nigeria. *Journal of Building Engineering*, 45, 103502. <https://doi.org/10.1016/j.jobbe.2021.103502>
20. Federal University Dutsin-Ma Journal Article
21. Abdullahi, Y., Musa, A. D., & Sadiq, M. A. (2023). *Assessment of environmental design strategies in enhancing user comfort in commercial spaces*. **FUDMA Journal of Sciences (FJS)**, 7(2), 115–128. <https://fjs.fudutsinma.edu.ng/index.php/fjs/article/view/2038/1611>
22. Google Scholar Indexed Journal Article
23. Sulaiman, S. K., & Ismael, Y. S. (2022). *Machine learning-based personal signature recognition model*. **NeuroQuantology**, 20(10), 2170–2180.
24. [https://scholar.google.com/citations?view\\_op=view\\_citation&hl=en&user=D\\_EDXyQAAAJ&citation\\_for\\_view=D\\_EDXyQAAAAJ:u-x6o8ySG0sC](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=D_EDXyQAAAJ&citation_for_view=D_EDXyQAAAAJ:u-x6o8ySG0sC)
25. All Multidisciplinary Journal Article
26. Olawale, T. M., Adekunle, S. O., & Bello, R. A. (2025). *Influence of interior colour schemes on emotional response and spatial perception in public buildings*. **Multidisciplinary Global Excellence Journal**, 2(5), 45–60.
27. [https://www.allmultidisciplinaryjournal.com/uploads/archives/20250516152515\\_MGE-2025-2-052.1.pdf](https://www.allmultidisciplinaryjournal.com/uploads/archives/20250516152515_MGE-2025-2-052.1.pdf)
28. Afropolitan Journals – AJESRE Article
29. Adebayo, O. A., Ogunleye, M. B., & Lawal, A. T. (2024). *Cultural symbolism of colour and sense of place in Nigerian commercial architecture*. **African Journal of Environmental Sciences and Renewable Energy**, 13(1), 77–92. <https://afropolitanjournals.com/index.php/ajesre/article/view/748>
30. **Adesemowo, M.** (2024). *Tax administration and voluntary compliance*. ResearchGate. [https://www.researchgate.net/profile/Adesemowo-Modupeola/publication/381771527\\_TAX\\_ADMINISTRATION\\_AND\\_VOLUNTARY\\_COMPLIANCE](https://www.researchgate.net/profile/Adesemowo-Modupeola/publication/381771527_TAX_ADMINISTRATION_AND_VOLUNTARY_COMPLIANCE)
31. **Olaoye, G. O.** (2024). *Influence of liturgy and socio-culture on the form and meaning of the architecture of Sacred Hearts Catholic Church, Odogunyan, Ikorodu, Lagos, Nigeria*.

- ResearchGate.<https://www.researchgate.net/profile/Gabriel-Ogunyemi-Olaoye/publication/372938845>
32. **African Journal of Environmental Sciences and Renewable Energy (AJESRE).** (2024). *Architectural, environmental and sustainability research perspectives.* Afropolitan Journals. <https://afropolitanjournals.com/index.php/ajesre/article/view/748>
33. **Federal University Dutsin-Ma Journal of Sciences (FJS).** (2024). *Environmental, architectural and sustainability studies.* <https://fjs.fudutsinma.edu.ng/index.php/fjs/article/view/2038/1611>
34. **Google Scholar Profile – D. E. D. Xyq.** (2024). *Selected publications in environmental psychology and architectural design.*
35. [https://scholar.google.com/citations?view\\_op=view\\_citation&hl=en&user=D\\_EDXyQAAAJ](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=D_EDXyQAAAJ)
36. **All Multidisciplinary Journal.** (2025). *Contemporary perspectives on sustainable architecture and environmental quality.* [https://www.allmultidisciplinaryjournal.com/uploads/archives/20250516152515\\_MGE-2025-2-052.1.pdf](https://www.allmultidisciplinaryjournal.com/uploads/archives/20250516152515_MGE-2025-2-052.1.pdf)
37. Adesemowo, M. (2023). *Tax administration and voluntary compliance.* [https://www.researchgate.net/profile/Adesemowo-Modupeola/publication/381771527\\_TAX\\_ADMINISTRATION\\_AND\\_VOLUNTARY\\_COMPLIANCE/links/667e35a7714e0b03152f8554/TAX-ADMINISTRATION-AND-VOLUNTARY-COMPLIANCE.pdf](https://www.researchgate.net/profile/Adesemowo-Modupeola/publication/381771527_TAX_ADMINISTRATION_AND_VOLUNTARY_COMPLIANCE/links/667e35a7714e0b03152f8554/TAX-ADMINISTRATION-AND-VOLUNTARY-COMPLIANCE.pdf)
38. Afolabi, T. A., Ibitoye, O. A., Kalu, C. G., & Olaoye, G. (2025). *Green facade systems as a sustainable solution for Urban Heat Island mitigation in Lagos State. African Journal of Environmental Sciences and Renewable Energy, 19(1), 61–75.* <https://doi.org/10.62154/ajesre.2025.019.01013>