

# Digital Technology and the Transformation of the Nigerian Banking System: The Operators' Perspective

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## Abstract

*The rapid development of digital technology through the years, and the rails provided by the internet for connectivity remains the most important development that has impacted change and driven massive improvement in the operation of banking and financial services. It has brought in its wake huge disruptions in product roll-out and the way products are delivered. The entry of technology companies into financial services cannot be overlooked in discussing these changes. Nigeria has not been left behind in this evolution. Instead, the Nigerian banking industry has been the forerunner in digital initiatives in Africa that have transformed the banking and financial services landscape in the past years. The Payment System Vision (PSV) project from 2007 has been an important catalyst in this transformation of the Nigerian payments system. Similar transformation initiatives in trade services have resulted in the creation of innovative products/services and infrastructure resulting in enhancement in speed and efficiency in service delivery, security, as well as convenience to consumers. The emergence of new technologies has continued to shape or disrupt life as it is known in different sectors. The face of banking today, the interconnection between players and interoperability have benefited from these emerging technologies. This paper will be reviewing global digitisation trends, underlying technologies, the Nigerian context, and the state of banking infrastructure today. It will also look at the emerging new technologies that will or should define the future of financial services in Nigeria, the current state of play, and the need to ride the wave of global trends to define the way into the future.*

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## I. Introduction

One of the significant impacts of the lockdowns associated with the 2020 COVID-19 pandemic has been an acceleration of digital transformation and the use of digital technologies across all spheres of human endeavour. In banking, this transformation has changed how banks interact with customers, accelerated innovation and the launch of new banking products. It has enabled significant internal banking process automation, leveraging new technologies, facilitated data-driven sales,

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improved customer experience, and enhanced flexibility in the provision of banking services.

For Nigerian banks, key impacts have been the migration of customers to digital channels without extensive marketing investments and a significant upsurge in customer initiated electronic transactions. The inability of the customers to move around and access these products and services physically due to the restriction on movement forced the drive to seek alternative ways of accessing financial products and services. The new way of work also evolved as stakeholders had to adapt very quickly to the changes in buying behaviour and service expectations of their customers.

## II. What is Digital Technology and Digital Transformation in Banking?

Matt et al. (2015) and Hess et al. (2016) describes digital transformation as the consideration of how products, processes and organisations can be changed through the use of new, digital technologies. Digital technology broadly refers to all electronic tools, automatic systems, technological devices, and resources that generate, process or store information. It cuts across basic technology such as websites to the advanced, which includes artificial intelligence/machine learning, blockchain technology, voice interfaces and chat-bots.

Digital transformation in banking is the operational and cultural shift towards integrating digital technology into all areas of the bank, optimising operations and value delivery to customers. The author opines that banks which can successfully implement their digital strategies, could see tremendous benefits (Alonso, 2022).

Digital technology, and its use in banking, is driving a transformation and has been doing so for over a decade. According to European Central Bank, digital transformation is a must for banks as changing customer needs, together with pressure to reduce costs and increase efficiency provides banks with no option, but to embrace technology. Bank customers have been moving from traditional branch-based banking to online and mobile alternatives for a decade now; the pandemic merely accelerated it. In Europe, the number of digital users has increased by 23.0 per cent since the start of the pandemic Hakkarainen (2022).

In Nigeria, digital transformation in banking has been driven by a combination of:

- regulatory reforms,
- Nigerian banks' quest for improved efficiency and cost reduction,
- customer demands for new modes of interaction with banks, and
- entrance of new players leveraging new technologies.

PSV2020 launched as PSV2010 in 2007 set the course for some of these changes. Nigeria Interbank Settlement System (NIBSS) has played a significant role in driving transformation in banking as can be said of several fintech companies, some of which are now Unicorns.

### III. Digital Technologies and Transformation in Banking

According to Iansiti and Levien (2004), as cited in Omarini, 2017, "Digitisation is changing the rules of the game through possible disruptions of business models, and this results in the emergence of a much more complex and dynamic ecosystem for growth and innovation". The digital infrastructure has accelerated the emergence of new technologies – social media, cloud computing, analytics and big data, wearable devices, 3D printing and intelligent autonomous systems. Digital transformation is the driving force of the third industrial revolution which concerns the development of new information and communication technologies, where the increased usage of digital devices and digital platforms are transforming the way customers do banking, change market expectations, and transform the model of financial intermediation.

In discussing the impact of digital transformation in banking in Nigeria, we will be looking at the changes that have happened in customer interaction, transformation in internal banking processes and industry-driven digital transformation over the past few years. We will also look at how Citi® approached these developments and introduced products and services that leverage emerging technologies to enhance customer experience.

### IV. Digital Transformation in Client Interactions

The effect of digital transformation and introduction of technology in banking in Nigeria is aptly illustrated by the disappearance of tally numbers from banking halls in Nigeria. For those not familiar with this, as recent as three decades ago, the banking halls of Nigerian banks were filled with customers waiting to withdraw cash from their accounts, and numbered tiles (similar to

parking tags) were handed to the customers as they walk into the banking halls. As the tellers call out these numbers, the customers present them to be served. In addition to this, bank records then were kept on ledgers and passbooks, making access slow and tedious. Like every manual process, there were a lot of issues with delays, errors, dissatisfied customers, stressed out workers, etc. However, the digitisation of bank records made it easy for customer records to be accessed and worked on by the tellers. This resulted in significant reduction of the wait times for transactions in the banks.

The introduction of online Automated Teller Machines (ATM) to Nigerian bank customers further improved the customers' experience as they no longer needed to keep to banking hours (which typically means leaving work as banking hours was same with working hours) to access services. The ATM itself has evolved from being just a cash collection device to a cash deposit device. In addition, interoperability meant that customers could access cash and now carry out other banking services from any ATM irrespective of the provider. Since the ATM, newer channels of interaction have evolved. Online banking and mobile banking have gained rapid adoption in the country with customers able to access their banks, execute transactions anywhere and anytime via digital devices.

Citibank introduced its online banking platform "CitiDirect®" to Nigerian customers in 1999. Back then, poor communication infrastructure impacted adoption. Today, advancement in telecommunications technology and other cutting-edge technology driving increasing internet penetration is spurring online and mobile banking adoption. Nigerian banks have both online banking and mobile banking as channels to serve customers today.

The introduction of Unstructured Supplementary Service Data (USSD) technology and mobile applications (apps) have further entrenched mobile banking not just for transaction initiation but for other services including customer onboarding, transaction enquiry, etc.

As an operator, Citi understands the importance of technology in a banking relationship. We continue to invest in digitising our products and solutions – enabling us to provide our customers with a seamless integration experience that brings high degrees of visibility, control, automation, and rich data flow, combined with flexibility in connectivity, encryption, and formatting standards. Our CitiDirect platform provides customers with a single platform to access all their accounts globally, providing robust security and access controls based on sophisticated user authentication, latest data encryption,

and varying levels of access privileges. CitiDirect is also available in mobile and tablet forms via the CitiDirect Mobile App, allowing users to receive notifications and authorise payments using their digital devices.

To facilitate the most efficient transmission of information for Corporates, Citi offers direct host-to-host connectivity to ERP platforms over a range of data transmission options – files, SWIFT or API.

As banks increase digital interactions with customers, the protection of financial assets from fraud must increasingly be at the forefront. At Citi, we offer various trusted identity solutions to provide the necessary security credentials and assurance frameworks allowing customers to transact with confidence.

Our Citi Payment Outlier Detection® (CPOD) solution provides customers with a sophisticated machine learning-based outlier detection tool that helps identify outlier transactions that do not conform to routine behaviours and patterns of transactions. It was designed with direct feedback from customers who have perceived Artificial Intelligence (AI) to be the solution to their legacy rule-based tools which are difficult to frame, cumbersome to update, and potentially expensive to maintain.

Another key area for digital transformation is information access and reconciliation. Citi has embedded data analytics and robust reporting capabilities to its CitiDirect platform. At a transactional level, Citi Payment Insights® (CPI) provides payment status updates via a visual tracker, making payment tracking as simple as tracking a package, through the power of SWIFT GPI and Big Data. The solution applies to multiple payment methods such as Cross Border transfers, Automated Clearing House (ACH) and Instant Payments.

On reconciliation, Citi has Payer ID and/or Virtual Account solutions which provides dedicated account(s) for each payer and allows details of the payer to be included in the beneficiary customer statements. For more complex reconciliation, Citi has collaborated with a Fintech leveraged AI and machine learning on a Smart Match solution. Citi® Smart Match is able to analyse various sources of information (receivable, credit entries, and uploaded documents) and present a reconciled outcome.

Finally, customer onboarding and trade is also starting to see transformative effect of digital technology. Digital onboarding facilitates quicker onboarding

by allowing electronic document uploads. This same technology is changing how customers interact with banks for trade transaction initiation. More on trade digitisation coming up.

## V. Digital Transformation in Internal Banking Processes

The impact of digitisation in banking is not limited to customer interactions. Banks globally are also leveraging digital technology to improve internal processes. Most of these internal transformations are in areas of customer onboarding, trade processing and internal record keeping. There are also shared market platforms driving these changes.

In Nigeria, the Nigeria Inter-Bank Settlement System (NIBSS) launched the e-reference platform, for example, to simplify the process of validating account opening references. Prior to launch, references provided to a bank as part of account opening requirement are manually validated between banks. The e-reference portal provides a digital platform to digitise the reference form and allow electronic validation.

Document digitisation extends to processes within banks. Most banks, including Citi, in Nigeria have put processes in place to digitise documents at the point of entry into the bank. Once digitised, the paper version is sent into archive and only digital versions are used for bank's internal validation and processing requirements. Document digitisation has significantly improved transaction processing time while also providing complete audit trail on document flow.

A lot more transformative effects are in internal trade processes. Trade process digitisation in Nigeria was spearheaded by the Central Bank of Nigeria (CBN) and Nigerian Custom Service (NCS) with the Form M digitisation via the Single Window Platform (SWP) in 2015. Following the success, Form A and Form NXP have also been digitised. Nigerian banks have built in digital process to take advantage of this key market development.

At Citi, we believe in building a more agile trade business that is simple, transparent, and high impact for our clients and internal stakeholders. Citi has invested in use of digital and virtual signatures via our DocuSign platform. DocuSign provides a framework for accepting Client Trade Facility Documents & Transactional Instructions as Virtual Documents (scanned / wet ink signatures & Digital Documents signed through DocuSign). The solution provides benefits of increased efficiency and controls, cost reduction,

improved cycle time and STP, enables a fully online process with no paper and generally improves the overall customer experience. Citi is executing on a trade API strategy which aims to expand scope and speed of API tool developments across wider Trade Products, Product Processors and with External Partners. APIs shall be used to improve on Transaction and Client Self Services enabling real-time transaction status, transaction initiation/amendments, transaction delivery and general queries. APIs are also being deployed to enhance internal trade applications integration. More recently and in partnership with Fintechs, Citi is exploring digitisation of the entire trade process using blockchain technology. The multi-bank blockchain platform is an ecosystem of banks, corporates, developers, users offering products, such as electronic Standby Letter of Credits (eSBLC), various risks, discounting, and Bank confirmations.

Advancement in digital technologies such as Optical Character Recognition (OCR), Artificial Intelligence and Machine learning is transforming trade documentation checking. At Citi, we have leveraged these technologies to enhance Documentary Trade Process Automation for trade documents Checking; Deployed Rule Based Engines and Machine Learning Tools; Reduce Operational Cycle Times across Documentation Scrutiny and enhance efficiencies and Faster Turnarounds for customers.

## VI. Industry-Driven Digital Transformations in Nigeria

As earlier mentioned in the introduction, there have been several industry-led digital transformations in Nigerian banking sector. At the heart of this transformation is the PSV2020 vision of the CBN. The PSV2020 was aimed at creating a payment system that is nationally utilised and internationally recognised (Nelson, 2015). Successes from PSV2020 are across governance and legal framework in terms of passing into law the CBN Act of 2007 and Evidence Act of 2011. More importantly, PSV2020 has delivered on several infrastructural enhancements and new product launches such as:

- EMV Cards based platform (Infrastructure);
- Nigerian Central Switch (Infrastructure);
- SWIFT Based RTGS platform (Infrastructure);
- Clearing System Enhancements – cheque centralisation and truncation (Infrastructure);
- Interoperability – payment terminal service aggregation (Infrastructure);
- Nigeria Uniform Bank Account Number (Infrastructure);
- Bank Verification Number (Infrastructure);
- Direct Debit Mandate Management System (Infrastructure);

- Trade Documents - forms M, A & NXP – Digitisation (Infrastructure);
- NIBSS Instant Payment (New Product);
- NIBSS Automated Payment System (New Product);
- Mobile Money Payment (New Product); and
- eNaira (New Product).

The impact of these PSV2020 initiatives on Nigerian banks is significant and can best be explained using Table 1 below.

Table 1: 8-Year Nigeria Payment Trend

Products	2012	2020 Aug YTD	% Change
Cheques	12,161,694	11,612,206	-5%
ATM	375,513,154	968,433,479	158%
POS	2,587,595	382,845,859	14695%
ACH	28,941,559	125,273,977	333%
Mobile	2,297,688	449,745,924	19474%
Instant Payment	4,449,654	3,432,692,730	77045%

Source: Central Bank of Nigeria.

As can be seen from the table, there has been a geometric increase in the volume of electronic transactions. The migration to electronic modes of payment by bank customers has driven enhancements of banking platforms to scale for volumes. The offset from these investments is increased revenue and reduction in operational cost that supported manual modes of payment – cash and cheque.

These initiatives have also dropped operational cost in banks. For example, 10-digit NUBAN has reduced transfer failures due to wrong account numbers. BVN has helped to reduce incidents of fraud since each bank customer can be uniquely identified. Biometric authentication that will leverage BVN will further help to reduce fraud especially for card-present-transactions.

Financial inclusion will help to provide more transparency in financial transactions across the value chain. The introduction of mobile money specifically through payment service banks and the eNaira will help improve financial inclusion. The benefit to banks will be reduction in volume of cash in circulation, which will reduce cash handling cost. We have already seen a drop in cash handling costs following launch of cashless policy and various initiatives around management of cash in the system.



Trade document digitisation will reduce complexity of trade transaction processing and complement banks' use of digital technologies to internally enhance their trade transaction processing.

We will further discuss a few of these changes to show the impact of these changes in the industry and the economy in general.

## VII. Bank Verification Number (BVN)

Bank Verification Number (BVN) was launched by CBN in collaboration with the Bankers Committee in February 2014. It was "a part of the overall strategy of ensuring effectiveness of the Know Your Customer (KYC) principles, and the promotion of a safe, reliable, and efficient payments system. The BVN gives a unique identity across the banking industry to each customer of Nigerian banks" (Central Bank of Nigeria, 2017).

The importance of a digital identification platform was brought to the fore by the COVID-19 global pandemic. As people could no longer physically meet, a lot of activities that took place physically and could not be postponed had to be migrated to virtual platforms. Virtual platforms meant that physical identification of the participants in the transaction was no longer possible. Commerce, social payments, and a lot of other public activities were affected by this. Commercial activities as simple as ordering for food was migrated to online/virtual platforms, resulting in an increase in social commerce and the attendant risks in trusting that what you ordered and paid for will be delivered by the seller without disappearing.

Social payment was another area where it was very important to confirm the beneficiary's identity as they were no longer physically coming for identification. Gaps in this area resulted in losses for a few governments during the pandemic. However, Estonia and a few other countries that already had a digital identification database did not face the same problem. They relied on their existing database to identify the vulnerable in the society and ensured that benefit payments were not diverted. The key was probably in setting up a prior database to avoid the risk of enrolling the wrong beneficiaries.

The importance of a credible identity database as an enabling infrastructure is very clear. The lack of such an existing database in Nigeria gave rise to the need for the BVN in Nigeria, as the enrolment into the national database managed by Nigeria Identity Management Company (NIMC) was not consistent with the number of accounts existing in the country. The growth in

enrolment into the national database supported by harmonisation of the existing biometric/identification platforms in the country will go a long way in supporting the growth of other digitisation efforts.

The BVN database has also facilitated the introduction of Global Standing Instructions (GSI) aimed at strengthening consumer credit culture in the country. This ensures that financial institutions can recover their loans from any other account linked to the BVN of the defaulting creditor in another bank. This effectively closes the door on creditors who borrow from one financial institution, refuse to pay, while doing good business elsewhere.

### VIII. Digitisation of Trade Documentation

Documentary trade has always been largely dependent on paper, and this is made worse in a regulated currency environment like Nigeria. Transaction flow in this sector is evidenced via documentation leading to the popular mantra that banks deal in documents. The fulfilment of a trade obligation creating a need for payments to be made is evidenced by the presentation of stated documents.

In line with global trends, CBN working with other relevant government agencies embarked on a digitisation of this aspect of transactions via various committees. This culminated in the creation of Nigeria's single trade window, creating a platform for operators to process trade transactions in an electronic environment. The portal is integrated with insurance companies, transport operators and other relevant stakeholders. It is being enhanced by the digitisation of statutory forms like Forms M, A, and NXP.

Digitisation of Nigeria's trade is following digitisation best practices. Starting from digitisation (creation of a digital version of a physical instrument), the next stage should be using the digitised data and technology to improve on the existing process with digital transformation being the ultimate destination. Digitisation of trade is aimed at converting paper documentation to digital forms to facilitate straight-through processing and improve visibility and transparency. This stage appears to be largely completed. The next stages will be the employment of advanced technology solutions – machine learning, artificial intelligence, and analytics to further improve on current process using APIs and next generation channels.

While the trade digitisation process has commenced, there is still a lot of ground to be covered. Blockchain and other technological advancements

have made trade's new ecosystem digital. Operators in this sector have leveraged blockchain technology to create and track agreements and monitor the flow of goods. This leads to improvement in visibility across the trade ecosystem.

Optical character readers are today used to read and digitise traditional paper-based documentation to enable faster processing and eliminate or reduce manual touchpoints in the processing of these documents. This has led to an improvement in turnaround times and an improvement in risk controls and accuracy.

Operators in this segment have also been engaging in various partnerships with Fintechs and other operators to further the digitisation agenda. A few examples of these partnerships will be mentioned for illustration.

Komgo,<sup>6</sup> - a multi-bank digital platform for trade finance. It uses new technology to facilitate letter of credit transactions and manage other aspects of trade resulting in improved productivity.

Contour Network<sup>7</sup> - a digital network using blockchain technology to improve trade finance flows. Membership includes banks, corporates and other ecosystem partners that are brought together on one decentralised platform.

TradeLens<sup>8</sup> - the providers of eBL (electronic bill of lading). Launched by the partnership between a major shipping line and a technology giant, the eBL is expected to result in a significant change in trade flows when it is fully live.

The objectives of the above partnerships and initiatives are simple: improved efficiency, reduced costs, improvement on controls and making the trade process more transparent to all stakeholders.

## IX. Nigerian Central Switch

The Central Bank of Nigeria, through NIBSS, introduced a central switch, "Financial hub regulator ensuring ubiquitous card acceptance, optimal use

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<sup>6</sup> <https://www.komgo.io/>

<sup>7</sup> <https://contour.network/>

<sup>8</sup> <https://www.tradelens.com/>

of installed payments switches capacities, Interconnectivity and Interoperability for modern electronic retail payment services to the banking public in Nigeria." (Nigeria Inter-Bank Settlement System, n.d.)

The central switch ensures interoperability between different providers of payment solutions. Interoperability ensures that every card works in every point-of-sales (POS) terminal and every ATM in Nigeria. The same applies to accounts being able to interact with each other and lately, mobile payment operators.

The central switch establishes a single point of connectivity for all operators in the market and removes the need for multiple integration to various operators to access their services. The switch has provided a framework infrastructure for innovation and rollout of products in the transaction services by NIBSS. The shared market infrastructure strategy of the CBN/NIBSS makes the products accessible to consumers of financial services at low cost.

Products driven by the central switch include NIBSS e-Billspay, NIBSS Instant Payment, Payment Terminal Service Aggregator, Mobile Payment Interoperability, Corporate Lounge, Central Payment Gateway, Account Verification Service, QR Code Payment Standard, and Settlement Services.

#### X. Central Bank Digital Currency (CBDC) – The eNaira

The Central Bank of Nigeria launched the eNaira on October 25, 2021, making Nigeria the largest country to launch a central bank digital currency. The eNaira is issued at par value with the Naira and is a liability of the CBN. There are various reasons why the CBN issued a CBDC. It is mainly meant to further the country's digital adoption and introduce further efficiency into payments. The World Bank estimates that 54.0 per cent of Nigeria's population are between the ages of 15-64 years (World Bank, 2022). The presence of potential digital natives according to Prensky (2001), creates a big opportunity for digital adoption. In addition to the above, the introduction of eNaira is expected to contribute positively to the achievement of CBN's financial inclusion goals by making eNaira wallets accessible to financially excluded Nigerians who can conduct their transactions through agent banking across the country.

## XI. Regulations

While the Central Bank of Nigeria has done a lot in fostering digital innovation via the various initiatives listed and discussed above, the greater impact has been made in enabling regulations and guidelines to serve as guardrails for the safe and secure implementation of these initiatives.

One of the key aspects of CBN's role in Nigeria is to "promote a sound financial system in Nigeria". The conflict between regulation and innovation has been the topic of several discussions (Lumpkin, 2010). "The interaction between financial regulation and innovation is a two-way street, however. It is not just that, change in the financial sector could also impact the way regulation is conducted. Regulatory initiatives will also affect the direction and speed of transformation in the financial sector, with all the implications for monetary policy, financial stability and the way firms and households manage their finances" (Benoit, 2018).

The CBN has walked this thin line effectively by issuing guidelines and regulations to govern the deployment of innovations into the Nigerian financial system in a safe manner. The establishment of the various PSV2020 workstreams and committees provided a great opportunity for CBN to get feedback and input from the various stakeholders in the market. This resulted in the crafting of rounded regulations that took into consideration the various perspectives – operators', regulators' and consumers'.

## XII. Emerging Technologies and Impact on Banking and Financial Service into the Future

Technology and innovation will continue to push the frontiers of change and improvement across all sectors and segments of human endeavour. The trajectory of development and transformation in banking services that we have seen so far has resulted in progress made in driving reduction in operating cost, fraud reduction and continuous improvement in customer experience.

Several emerging technologies have been suggested to drive the change that is evolving across sectors and should define the expected transformation of future of economies (Fong et al., 2021). A number of these will impact banking across the three dimensions of Client Interaction, Internal/backend processes and Industry infrastructure.

- 5G – 5<sup>th</sup> generation mobiles network that enables new types of network designs to connect virtually everyone and everything together, including machines, objects, and devices. It is expected to strengthen existing use cases of products and services and power brand new experiences.

- Augmented/Virtual Reality (VR) – technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. Virtual reality creates a totally artificial environment, typically for marketing campaigns and collection of unique user data.

- Distributed Cloud – portfolio of fully managed hardware and software solutions which extend cloud infrastructure; architecture where multiple clouds are used to meet compliance needs. The offering creates flexibility, more agility and opportunity for innovation.

- Artificial Intelligence (AI) – the development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making and language translation.

AI applications will penetrate the entire spectrum of the financial industry operations across front, middle, and back offices. Customer facing applications include tailored products, personalised user experience, analytics services, intelligent service robots & chat interfaces, and automated transactions. Machine learning, an aspect of AI will become increasingly important in building competitive advantage across industries. For banking, the use of AI will yield greater operational efficiency and the replacement or augmentation of human decisions by advanced diagnostics.

- Blockchain / Distributed Ledger Technology (DLT) – Digital system for recording the transaction of assets in which the transactions and their details are recorded in multiple places at the same time. Transactions are recorded with immutable cryptographic signatures called hash, with benefits of transparency, tamperproof, immutability, and decentralisation, with few entry barriers and low cost. Blockchain is finding use cases in the digitisation of trade processes as earlier noted and the development of more resilient infrastructure/platforms for interaction between stakeholders in multibank ecosystems.

- Internet of Things (IoT) – these are physical objects with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the internet or other networks, supporting digital transformation and the development of new business models and offerings. Banking uses IoTs to improve customer service and security

management, automate core processing through efficient collection and processing of information, improve customer experience, and embed banking service into wearables. Several use cases exist in financial services, including Connected Payments and Smart Branches.

- Robotics – Use of machines to perform tasks done traditionally by humans, process automation, transaction processing, fraud detection, etc., are typical use cases. Opportunities include innovating the workforce by offering much greater agility, transparency, and speed. A key use case in Financial Services is the deployment of Robotics Process Automation (RPA) in banks.

In future, traditional financial institutions will need to bring their considerable resources to bear to stay on top of the gathering wave of financial industry disruption.<sup>17</sup>

- 3D printing – an additive manufacturing process that creates a physical object from a digital design, with the benefits of ensuring flexible and sustainable solutions, while reducing the cost of customisation of products.

### XIII. Way Forward: Into the Future

The CBN has done so much in fostering innovation and a level playing field in Nigeria's financial industry. However, in this fast-paced world of digital innovations, things are changing so fast that if we stop growing, we might get run over.

Emerging technologies are disrupting life as we know it. The availability of and ease of access to knowledge and information has driven the pace of innovation and changes that we have seen so far. There is confidence that Nigeria will continue to keep pace with and stay ahead in some instances in the adoption of new technologies that will define the future direction of innovation, the evolution of business models and channels. The regulator needs to keep pace with, and if possible, stay ahead of such developments to make necessary pronouncements and provisions for the safe and secure introduction of such technology into the market.

The timely release of circulars and guidelines by CBN has made it easy for operators in the market. These regulations announce the introduction of these new services and serve as building blocks for the operationalisation of these services to the public. This ensures that the interests of all are protected. They establish standards and a level playing field for all the operators and protect the consumers. The regulatory examiners also use these regulations and circulars as the basis for their examinations.

While a lot has been done in the digitisation of payment and receivables, significant efforts still need to go into digitalisation of the processes around international trade. This is very important as the sector is very interconnected and the countries that are at the forefront of these changes will reap significant cost reduction and advantages of improved process efficiency and enhancement in user experience. The documentary nature of this sector has made it very manual and prone to errors and expensive. We need to seek for new ways to leverage technologies such as DLT/Blockchain to digitise and interconnect players and stakeholders in this space.

#### XIV. Conclusion

The importance of digitisation and the introduction of technologies to banking has been shown to have resulted in ease of access to banking and financial services, improved customer interaction and customer experience and generally led to an increase in productivity. Of course, there are challenges that come with the changes which necessitates increasing investment in areas such as information security, resilient operating infrastructure and generally securing and protecting the ecosystem from unauthorised intrusion and challenges of cybersecurity. This is essential to sustaining the trust and faith that users of these service repose in the system.

Citi in its role as a key provider of global banking services to corporations, financial institutions and governments, continues to advise governments and central banks on digitisation and digitalisation trends across the globe.



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