

DESIGN PAPER FOR THE eNAIRA



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Abbreviations

AML	Anti-Money Laundering
BIS	Bank for International Settlements
BVN	Bank Verification Number
CBDC	Central Bank Digital Currency
CBN	Central Bank of Nigeria
CFT	Combating the Financing of Terrorism
CoG	Committee of Governors
DLT	Distributed Ledger Technology
ECB	European Central Bank
FI	Financial Institutions
FinTech	Financial Technology Company
GDPR	General Data Protection Regulation
KYC	Know Your Customer
NIBSS	Nigeria Interbank Settlement System
NIN	National Identity Number
NIP	NIBSS Instant Payment
NDPR	Nigeria Data Protection Regulation
PoC	Proof of Concept
RTGS	Real Time Gross Settlement
TIN	Tax Identification Number
TWG	Technical Working Group

Executive Summary

Central banks play an essential role in the economy by providing a robust, safe, efficient, and inclusive payment system. They provide monetary and financial stability as well as the safest form of money to the populace - Central Bank Money. As technology evolves and advances, it is critical that Central Banks also evolve to continue to play their role and Central Bank Money adapts to take advantage of these opportunities provided by new technologies. Today is one of those moments where new technology offers the central bank an enormous opportunity to play its role even better, thereby improving the society and economy of their nation.

Distributed Ledger Technology (DLT) has emerged as one of the transformational technologies of the last decade and its introduction is gathering significant pace around the world. DLT allows for highly transparent, secure, tamper-proof transactions between parties, and creates trust even when the parties have no reason to trust each other.

Critical use cases include identity management, supply chain verification, land registry and many more. Perhaps the most important use cases are payments, where DLT can ensure secure, tamper-proof, verifiable transactions in a much simpler way as settlement and payment are the same process. As a result, the cost of payments is significantly reduced.

For this reason, many central banks are investigating how using new technologies through issuing CBDC could potentially alleviate several policy problems. Central Banks are either studying the concept, trialling the concept or in some cases – such as The Bahamas Sand Dollar – have already moved into full implementation of the CBDC.

The Central Bank of Nigeria (CBN) began its CBDC journey in 2017, with extensive study, consultations, identification of use cases and the testing of the CBDC concept in a Sandbox environment.

Based on this preliminary work, the CBN is now ready to launch Nigeria's CBDC – ***the eNaira***. The eNaira is the digital equivalent of the cash Naira. Put simply, ***“same Naira, more possibilities”***. The eNaira – like the physical Naira – is the official tender of Nigeria and is a liability of the CBN. The eNaira and Naira will always be exchanged 1:1.

The CBN believes the eNaira will make a significant positive difference to Nigeria and Nigerians, including:

- Improving the availability and usability of Central Bank money
- Supporting a resilient payment system ecosystem
- Encouraging financial inclusion
- Reducing the cost of processing cash
- Enabling direct welfare disbursements to citizens

- Increasing revenue and tax collection
- Facilitating Diaspora remittances
- Reducing the cost and improving the efficiency of cross-border payments

In introducing the eNaira, the CBN has given careful consideration to the entire payments and financial system ecosystems and has designed the eNaira and the development of the eNaira over time to complement and strengthen these ecosystems. While the launch of the eNaira is an important event, it is one milestone on a long journey. The eNaira is a process, not a single step. Over time, the CBN believes the robust ecosystems that will be built on the eNaira platform will ensure Nigeria and Nigerians receive all the benefits from the eNaira.

This design document gives much more detail on the critical dimensions of the eNaira, including the eNaira design and architecture, the initial eNaira functionality, what roles different economic actors play as the eNaira is introduced, the risks of the eNaira and how they will be mitigated, and the eNaira Implementation roadmap. These critical details should give comfort to Nigerians that the eNaira has been well-conceived and the launch of the eNaira has been robustly planned.

The eNaira – ‘same Naira, more possibilities’

1. Introduction

Many central banks are investigating how using new technologies through issuing CBDC could potentially alleviate several policy problems. Central Banks are either studying the concept, trialling the concept or in some cases – such as The Bahamas Sand Dollar – have already moved into full implantation of the CBDC

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While most Central Banks are on their CBDC journey, different jurisdictions have different priorities, and a range of design choices can address individual country preferences and have implications for interoperability and cross-border payments. For example, the United States (US) have articulated their intent to evaluate CBDC on its ability to improve the payment system. The European Central Bank (ECB) has emphasised the potential for a digital Euro to further enhance the digital economy and support European sovereignty and stability. The ECB, Bank of Japan, Bank of Canada and Sveriges Riksbank highlight the prospect of declining cash use and the need for low-cost, low-risk, and efficient cash-like CBDC design. Japan also emphasises the stability and efficiency of payment and settlement systems, along with universal access, instant payment capability, and interoperability, as requirements of the CBDC.

In this context, it is critical that the CBN carefully think through how Nigeria's CBDC – the eNaira – will be designed and implemented to serve the unique needs of Nigeria and Nigerians, based on our unique circumstances.

Hence, the purpose of this Design Document is to give a detailed view of how the CBN is approaching the development of the eNaira based on these unique needs and circumstances. This will provide Nigerians – and all actors within the payment system, such as individuals, banks, Telcos, FinTechs and merchants – a deep understanding of the eNaira concept. This will ensure that all eNaira participants (and all Nigerians) know what to expect on the eNaira journey and understand how the eNaira will develop over time. It is hoped that this will provide confidence in the CBN's preparedness for the eNaira.

This Design Document includes the following key sections:

- Opportunities for the eNaira in Nigeria's evolving payments landscape
- Objectives and Design Principles

- eNaira Design and Architecture
- Assessing the risks and impact of the eNaira
- eNaira implementation roadmap

Like the eNaira itself, the Design Document is also a work in process. The CBN welcomes continued input on these design elements from all Nigerians as we work together to develop the eNaira so that it develops in a way that delivers all the benefits to Nigeria envisaged by the CBN.

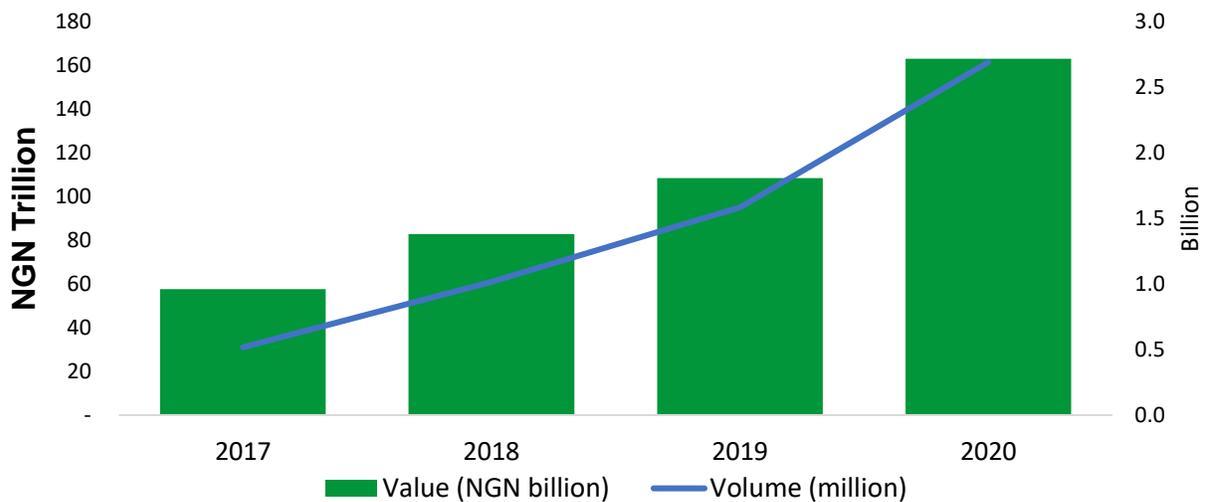
2. Opportunities for eNaira in Nigeria’s Evolving Payment Landscape

2.1 Nigeria’s Evolving Payment Landscape

Over the last decade, the payment landscape in Nigeria has significantly evolved with the rise in digital payments. New market roles have emerged on the back of this trend and so also new market players who are changing the dynamics of the payment industry by offering a redefined value proposition to customers.

This evolving payment landscape in the country has fuelled the growth in digital payment¹ with 2.7 billion transactions valued at NGN162.9 trillion as at 2020 and is 1.06 times larger than the size of the country’s NGN154.3 trillion 2020 GDP². The shift from the use of cash to digital payments signifies a headline objective of the CBN towards fostering the development of a digital economy.

Figure 1: Volume and Value of Digital Payments (2017 - 2019)



Source: Nigeria Interbank Settlement System

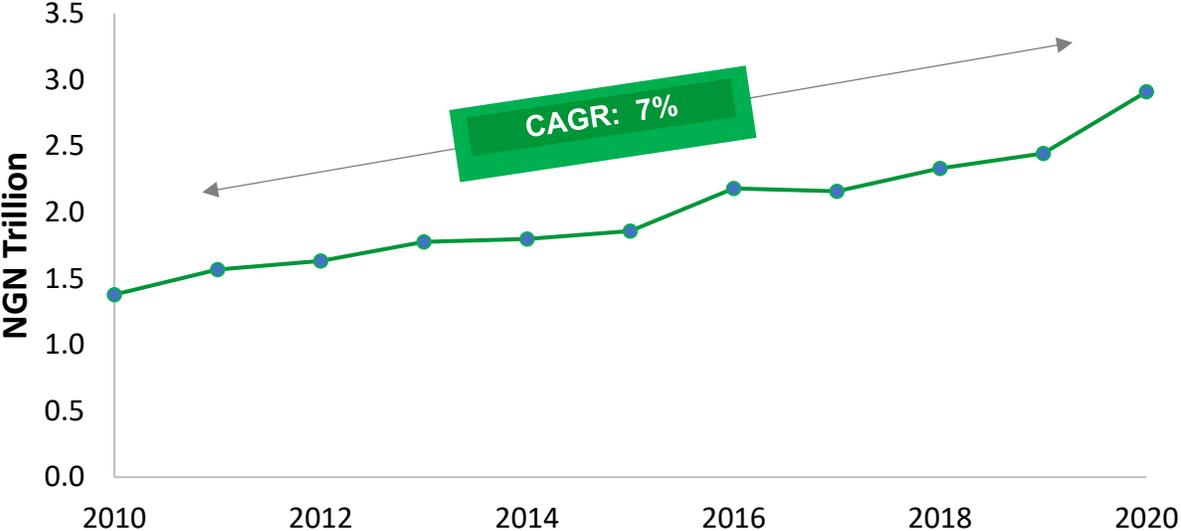
However, cash still remains a core component of Nigerian society as currency in circulation has grown at a CAGR of 7% over the last 11 years. The CBN has tried to

¹ The digital payments include only NIP, PoS and Web transactions

² National Bureau of Statistics

address these trends with numerous policy measures which have in part fuelled the rise in digital payments. The eNaira is as such another drive by the Bank to reduce cash usage but holistically to address other fundamental economic and policy objectives.

Figure 2: Currency-in-Circulation (2010 – 2020)



Source: Central Bank of Nigeria

Beside the eNaira payment drive, other policy measures that have facilitated and enabled the rise in digital payments and the overall resilient and innovation centric initiatives include:

a. The Cash-less Policy

In January 2012, CBN introduced the cash-less policy, which has three primary objectives:

- The development and modernisation of Nigeria’s payment systems to drive economic growth.
- The provision of more efficient payment options and wider reach to achieve cost reductions in banking services while driving financial inclusion.
- Increasing the effectiveness of monetary policy in managing inflation and driving economic development.

This policy has contributed significantly to a more digital economy and fostered the entry of new market players. Many of these new players (FinTechs) are innovating with new digital payment solutions.

b. National Financial Inclusion Strategy (NFIS)

In 2012, Nigeria adopted a national financial inclusion strategy aimed at increasing access to financial services for citizens from 36% per cent in 2010 to 80% by 2020. In 2018, the target for financially included Nigerians was revised to 95% by 2024. A direct consequence of the financial inclusion drive was the emergence of the agent banking initiative that seeks to extend banking services to underserved and unbanked rural communities. As a result of this initiative, numerous market participants have emerged with business models focused on driving financial inclusion in the country.

c. Bank Verification Number (BVN)

The introduction of the BVN identity framework in 2014 laid the foundation for standardizing KYC measures across the industry. The BVN enabled the digitisation of account opening services and eased access to digital financial services across the country. Today, the BVN has become the standard for uniquely identifying customers in the Nigerian financial system and has been leveraged by financial technology companies in broadening their reach and scaling quickly.

d. Shared Agent Network Expansion Facility (SANEF)

Closely related to the financial inclusion drive was the establishment of SANEF in 2018. SANEF is an initiative of the Central Bank of Nigeria (CBN), supported by Deposit Money Banks (DMBs), Nigeria Interbank Settlement Systems (NIBSS) and Licensed Mobile Money Operators/Shared Agents set up to accelerate financial inclusion in Nigeria by recruiting an additional 500,000 agent outlets to deliver financial services to rural communities.

The broad line objectives of the Shared Agency Network Expansion Facility (SANEF) include:

- i. Deepening Financial Inclusion in Nigeria
- ii. Driving financial literacy and campaign awareness via radio, social media, and community engagements
- iii. On-boarding 40 million low income unbanked and underserved Nigerians into the financial system
- iv. Increasing financial access points and shared agents to 500,000 in 2 years
- v. Supporting attractive financial products and services such as Savings Accounts, Micro-Credit, Micro-Insurance and Micro-Pensions etc. for low-income earners in Nigeria

SANEF is financed by the CBN in collaboration with other industry players and their financial commitment continues to foster innovation and investment in delivering financial services across the country.

e. Licensing framework for Payment Service Banks

The licensing framework for payment service banks was created to further drive financial inclusion. The framework has enabled market players with established networks and payment capabilities to enter the market and support the CBN's financial inclusion goal to reach financially excluded communities and deliver solutions tailored to meet their needs.

f. License Categorisation for the Payment System

Consistent with these emerging payments trends and with the mandate of a stable, resilient, and innovation-centric payment ecosystem, the CBN created new license categories for the payment system. The new license categories have provided regulatory clarity to Nigeria's evolving payment landscape and continues to enable innovation and support overall growth of the payment system.

Table 1: License Categorisation for the Payment System

S/N	License Category	Permissible Activities
1.	Regulatory Sandbox	Digital Financial Innovation Financial Application Development and Testing
2.	Payment Solution Services	
a.	Super-Agent	Agent Recruitment Management
b.	Payment Terminal Service Provider	<ul style="list-style-type: none"> ● PoS Terminal Deployment and Services ● PoS Terminal Ownership ● Payment Terminal Application Developer ● Merchant / Agent Training and Support
c.	Payment Service Solution Provider	<ul style="list-style-type: none"> ● Payment Processing Gateway and Portals ● Payment Solution / Application Development ● Merchant Service Aggregation and Collections
3.	Mobile Money Operations	<ul style="list-style-type: none"> ● E-money issuing ● Wallet creation and management ● Pool account management ● Super-agent service
4.	Switching and Processing	<ul style="list-style-type: none"> ● Switching ● Card Processing ● Transaction Clearing and Settlement Agents Services ● Non-banking Acquiring Services ● Super-Agent ● Payment Service Solution Provider Services ● Payment Service Solution Provider Services

g. The establishment of the NIBSS payment infrastructure

The NIBSS payment infrastructure is instrumental to the growth and stability of Nigeria's payment landscape. The infrastructure facilitates interoperability, connects every financial institution within the country, provides real-time delivery of value for digital payments and creates efficiencies and resilience through shared-services provision.

2.2 Opportunities for eNaira to support monetary and financial stability

Stability is fundamental to any payment system and at its core, the eNaira will be built on this objective and will bring a greater level of stability and resilience to the Nigeria payment system. Beyond this, maintaining monetary and financial stability will be prime objectives and so also the drive towards a financially inclusive economy which is a key enabler for overall economic growth.



Figure 3: Opportunities with eNaira

a. Enable Direct Welfare Disbursements to Citizens

The COVID-19 pandemic tested the effectiveness of payment systems globally and highlighted gaps especially in the distribution mechanism of welfare incentives. In some

instances, cash was distributed due to lack of visibility and adaptability of existing payment infrastructure to new and emerging modes of value transfer.

The eNaira provides a clear means for the government to send direct payments to citizens eligible for specific welfare programs more rapidly than through other means. This ensures that accountability is achieved, and the right persons get the funds. When a need arises, such as in times of economic crises, the central bank can also serve as a government agent and execute eNaira transfers to individuals and businesses affected. The eNaira will make it possible for governments to make targeted welfare payments to citizens directly, without the need for any intermediary. This will reduce the cost of delivering welfare benefits to citizens in need of welfare support and ensure the right people are receiving support.

b. Facilitate Diaspora Remittances

Remittances are a key source of foreign exchange for countries in sub-Saharan Africa, source of funds for financially excluded communities and a potential economic growth enabler. In Nigeria, it is a key source of foreign exchange as US\$23.8 billion flew into the country in 2019. The flow of remittance into Nigeria highlights its strategic position in sub-Saharan Africa as it is the top destination for remittance flows. Also, the country accounted for a 12.5% drop in overall flow to sub-Saharan in 2020 due to its 28% decline in 2020 which can be attributed to the COVID-19 pandemic.

Growth in remittance flow is a key objective of the CBN and this was highlighted by its “Naira 4 Dollar” initiative which incentivized Nigerians by paying them NGN 5 for every US Dollar received via the remittance channel. While that has helped stimulate remittance flows, the issue of cost is still paramount. The sub-Saharan Africa region remains the most expensive region in the world to send money to, sending US\$200 costs an average of 8.2% and as high as 19.6%³.

The eNaira would provide a secure and cost-effective process for remittances and ultimately boost remittance flows. It would also reduce the number of remittances flowing through informal channels as the cost of remittance will be significantly low. Ultimately, the eNaira will make remittances easier, faster, and cheaper.

c. Reduce the Cost and Improve the Efficiency of Cross-Border Transactions

Cross-border trade is vital for all economies, including Nigeria. However, the current international payment options are slow and expensive. The eNaira can help streamline this process and significantly reduce the time taken for transactions to be confirmed as it

³ World Bank Press Release on “Defying Predictions, Remittance Flows Remain Strong During COVID-19 Crisis” (May 12, 2021)

allows real-time cross-border foreign exchange payment-versus-payment transactions for traded goods and services. Also, the eNaira gives Nigeria the ability to transact separately, thereby reducing the demand for correspondent banking services and SWIFT international financial messaging and payment systems for the clearing and settlement of trade.

3. Objectives and Design Principles

Resilience, financial integrity, and continuous innovation are hallmarks of any sustainable payment system and they define the underlying objectives which monetary authorities seek to achieve. With the eNaira, the CBN seeks to: **enable households and businesses to make fast, efficient, and reliable payments, while benefiting from a resilient, innovative, inclusive, and competitive payment system.**

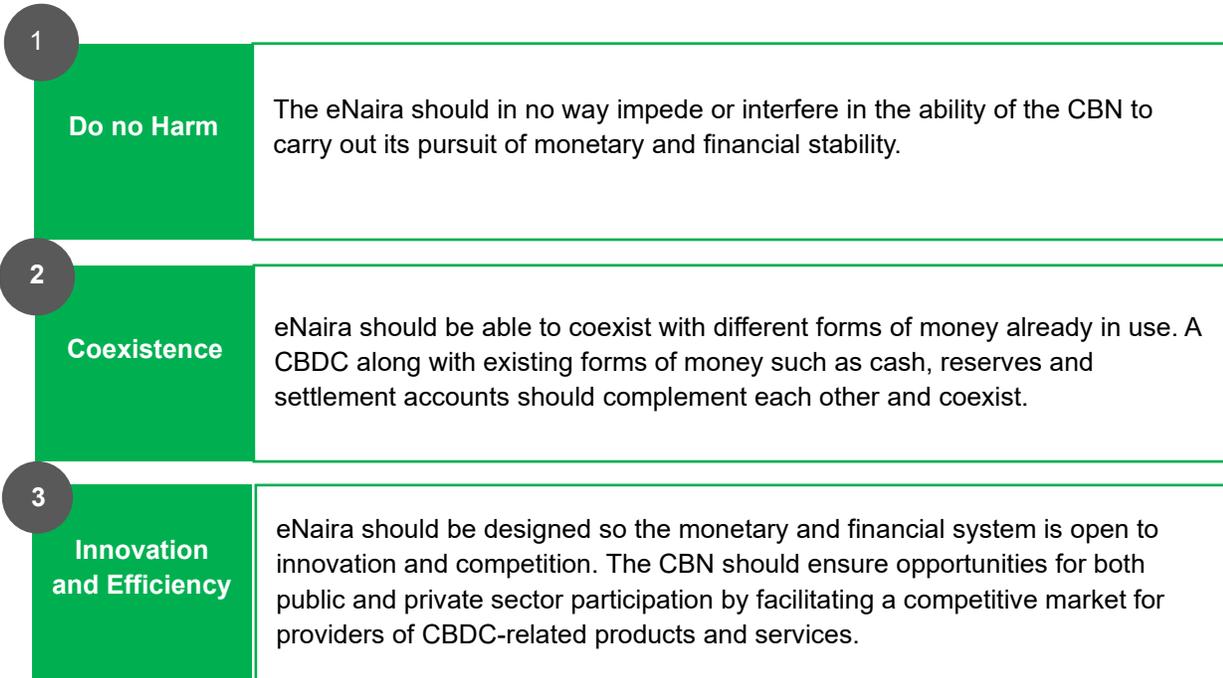
In driving this core objective, the eNaira will also deliver on key economic objectives of the CBN highlighted below which will impact overall economic growth and that generate significant social and economic benefits for all Nigerians.



Figure 4: Objectives of the eNaira

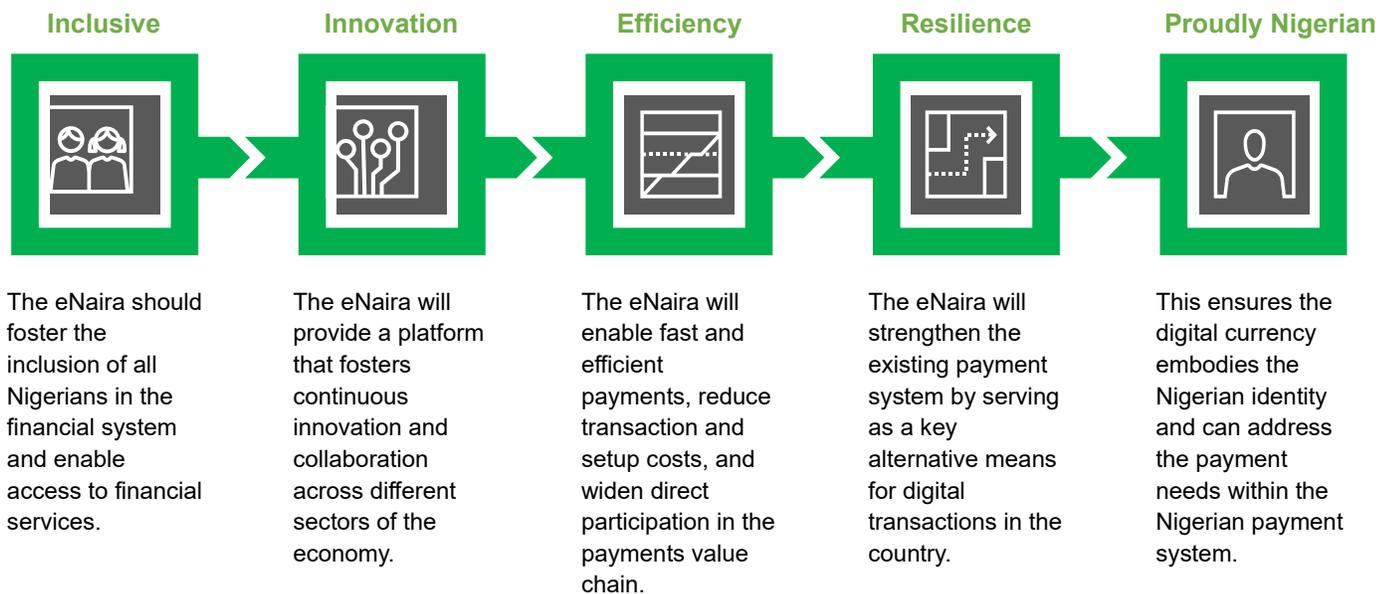
3.1. Design Principles

The design principles encapsulate the overall objectives of the eNaira payment system. They outline its core pillars as a medium of exchange and as a payment system. Primarily, the eNaira must meet three common principles espoused by the Bank for International Settlements.



Based on the three general principles from the BIS and in consideration of the objectives of the eNaira, the CBN has developed five Nigeria-specific principles that will guide the design of the eNaira:

Figure 5: eNaira Design Principles



4. eNaira Design and Architecture

In designing the eNaira, the CBN has been taken into consideration four key design elements based on the recommendations from the World Economic Forum, Bank of

International Settlement (BIS) and Coalition of Central Banks on CBDC implementation as they align with the overall objective of the eNaira.

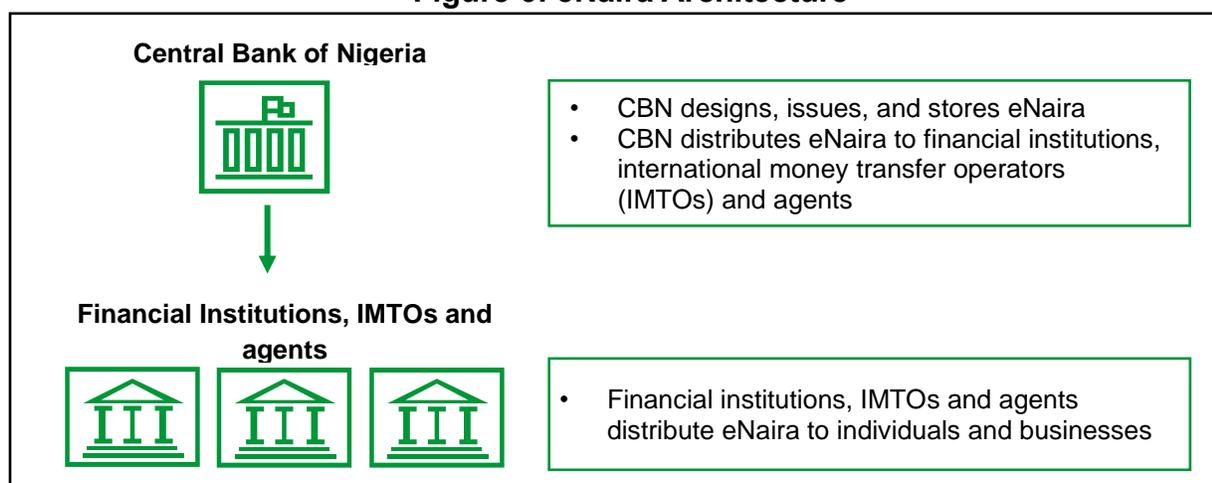
4.1. Design Elements

The design elements include: Architecture, Infrastructure, Access, and Interlinkages.

4.1.1. Architecture

The eNaira will be a hybrid CBDC or a two-tiered CBDC architecture. With this architecture, the CBN will be responsible for issuing the eNaira while it will leverage the existing financial system and actors such as the financial institutions in directing engagement with users for distribution of the CBDC, payment facilitation, dispute resolution and other roles as may be defined by the CBN.

Figure 6: eNaira Architecture



Source: Central Bank of Nigeria

It is important to note that under this architecture, the CBN will still retain control over the eNaira payment system and will be responsible for issuing the digital currency, managing the wallet, and maintaining a central ledger of all transactions. The CBN will also be responsible for providing the overall framework for implementation, monitoring and driving further innovation.

Meanwhile, the role of financial institutions and other payment service providers will be to handle and process retail payments while also providing other payment services layered on the eNaira payment system.

The CBN has adopted this architecture based on its policy objectives and mandate and also because it preserves its core function to provide oversight, guidance and ensuring overall stability and integrity of the financial system.

4.1.2. Infrastructure

The eNaira infrastructure is based on the distributed ledger technology (DLT) and this will support the two-tiered model architecture which the CBN has adopted. However, considering the core requirements of financial systems which include:

- Users to be identified based on underlying identity frameworks
- Payment networks to be permissioned to prevent intrusion
- High transaction throughput performance
- Low latency of transaction confirmation
- Privacy and confidentiality of transactions and data pertaining to business transactions

The Hyperledger Fabric variant of the DLT has been adopted for use as it inhabits the above requirements. The Hyperledger Fabric is an open-source enterprise-grade permissioned distributed ledger technology (DLT) platform, designed for use in enterprise contexts and accommodates the underlying requirements highlighted above. In addition, Hyperledger supports a modular architecture which is a key consideration for the eNaira system, and it has a robust security architecture, is configurable, versatile, optimisable, scalable, and open to innovation.

With the Hyperledger infrastructure, the CBN will be able to effectively support and manage the wallets while financial institutions and other regulated market players will act as nodes on the network to provide transaction processing, confirmation, record immutability and most importantly, to distribute eNaira to users.

4.1.3. Access

Inclusion is a core objective of the CBN and is highlighted as one the design principles for the eNaira. To ensure inclusive access while also ensuring the integrity of the financial system, the account based CBDC model has been chosen for the eNaira.

The account based CBDC model at its core mirrors the progress made on the National Financial Inclusion Strategy which enables access to financial services by leveraging last mile networks to identify users and to provide banking services through channels such as PoS and USSD. With the account-based model, the CBN seeks to enable access by leveraging the existing identity infrastructure in Nigeria such as the BVN, NIN, TIN, etc., to uniquely identify individuals and corporate entities. Specifically, identity frameworks such as the NIN will enable access for the financially excluded as they can be uniquely identified thereby enabling the provision of financial services. These identity systems will help ensure a robust KYC framework positioned to enable access for all Nigerians.

4.1.4. Interoperability

The eNaira has broad use cases beyond the domestic market as it has the potential to avoid fragmentation and promote global cooperation in the long term as well as support a more connected and inclusive world. Interoperability between the eNaira and other CBDCs has been factored into the overall design of the eNaira. This will help drive the business case for cross-border payments and could potentially address issues of dollarisation of the economy which is a key issue that sub-Saharan African countries including Nigeria faces.

4.2 Platform Model

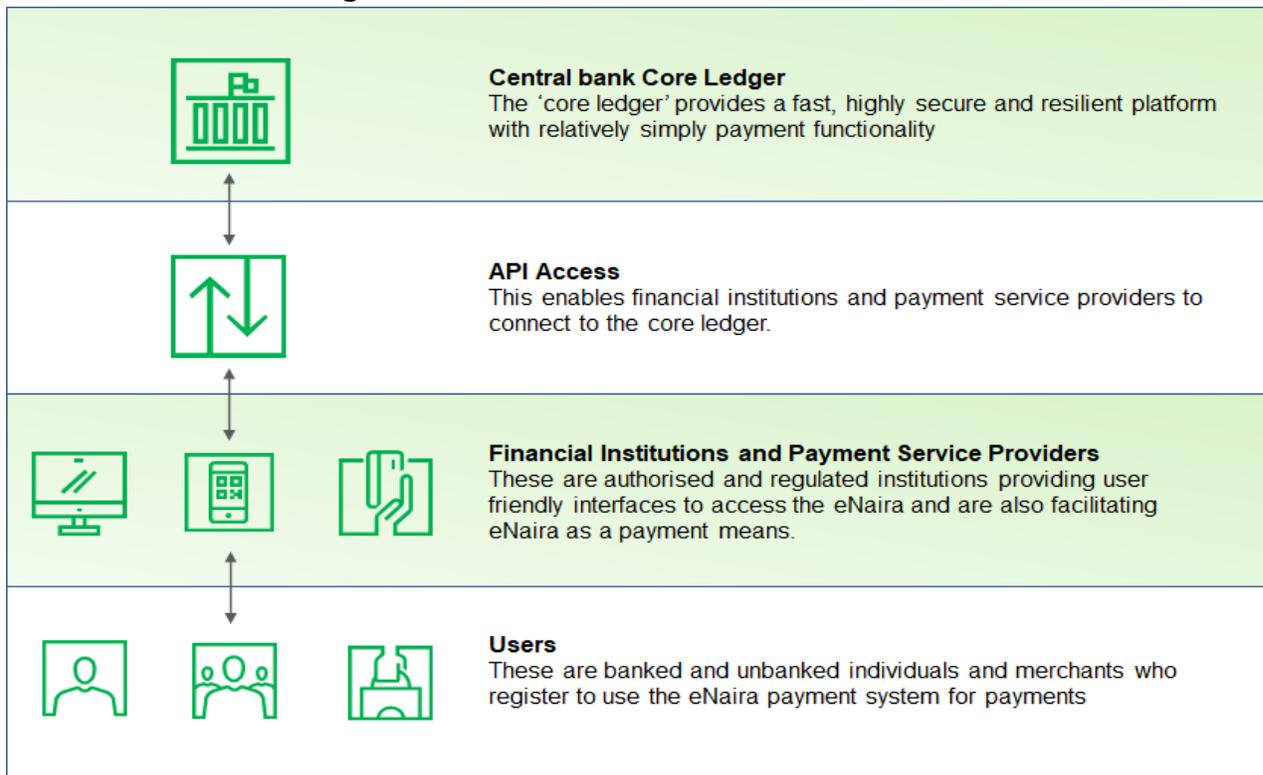
The design of the eNaira follows a platform model which incorporates the CBN's design principles. The model entails building a technology platform and leveraging the existing structures and roles in the payment system to deliver additional value for users.

In this model, the eNaira would serve as a payment platform on which the financial institutions and payment service providers can innovate and create layered payment services to enable broad use cases for eNaira.

To implement this model, three key elements will need to be provided: (1) a core ledger provided by CBN which will serve as the core of the platform and will enable transactions to be recorded and payments to be processed, (2) financial institutions suite that enable financial institutions distribute and enable payment services for users and (3) payment service providers module which will enable organisations such as financial technology companies, mobile money operators to create an additional payments functionality thereby building the eNaira payment ecosystem.

This layered model is far becoming the go-to-market approach for payment services globally. The model at its core drives inclusiveness, innovation and interoperability which are baseline requirements for payment services in Nigeria. Also, to ensure the smooth operation of this model, the CBN will define regulations to guide all market participants. Specifically, regulations around operations, compliance with existing AML/CFT guidelines, privacy and data protection, dispute resolution and consumer protection will be defined.

Figure 7: Platform Model for Retail CBDC



Source: Central Bank of Nigeria

4.3 The eNaira Payment Functionalities

The eNaira will complement existing payment options available via the mobile banking apps, point of sale terminals, USSD, quick response code, Internet banking amongst other channels. The eNaira payment system will offer a broad range of services which will expand as adoption arises and new use cases are developed. Although not all the services will be available at go-live, however, the eNaira has limitless possibilities to deliver value, fast, efficiently and at little to no cost to users.

4.3.1 eNaira Wallet Tiers and Transaction Limit

The eNaira is an open system that is accessible to all Nigerians based on a tiered KYC structure as shown in figure 9:

Table 2: Individual Wallet Tiers and Limit

Tiers	Category	Requirement	Daily Transaction Limit (NGN)	Daily Cumulative Balance (NGN)
0	Non-Bank Account Holders	Telephone number (awaiting NIN verification)	20,000	120,000
1	Non-Bank Account Holders	Telephone number (NIN verified)	50,000	300,000
2	Bank Account Holders	BVN	200,000	500,000
3	Bank Account Holders	BVN	500,000	5,000,000

Source: Central Bank of Nigeria

Based on this tier structure, the Bank Verification Number (BVN) and the National Identity Number (NIN) will serve as unique identifiers. Each wallet is tied to a BVN or NIN depending on the tier and can only be used once to prevent duplicate identities and wallet creation on the eNaira platform. Both individuals and corporate account holders will be able to create wallets and use the platform for transactions. Corporate account holders will create merchant wallets with no limits.

Table 3: Merchant Wallet Limit

Category	Requirement	Daily Transaction Limit (NGN)		Daily Cumulative Balance (NGN)
		Send	Receive	
Bank Account Holders	BVN, TIN and Bank confirmation	No Limit	No Limit	No Limit (with auto sweep trigger)

Source: Central Bank of Nigeria

Transactions from merchant wallets may be transferred to the merchant bank accounts as there is no limit on the volume or value of transactions that can be transferred.

4.3.2 Interest Earnings and Redemption of eNaira

The eNaira has been designed to mimic the physical Naira and as such will not earn interests. This only closely aligns with the overall framework of the eNaira which is to complement existing banking products and services and not destabilise the existing system.

The eNaira is a digital representation of the physical Naira and as such shares all its characteristics including its value. The conversion rate for the eNaira to cash is at par, hence 1 Naira will equal 1 eNaira.

4.3.3 Regulation

As a new form of central bank money and payment, regulation will be key to the effective working of the eNaira payment system. This is considering that only a handful of countries have implemented the CBDC. There is a steep learning curve which the CBN must go through and as part of that process it must be open to defining and redefining regulations to promote an open, innovative, and resilient payment system.

Currently, the CBN has been evaluating various aspects of the eNaira, the role market participants will play and defining the use cases. While these activities will help provide clarity on the roadmap towards full implementation, there are a lot of uncertainties and regulations must be adaptive enough to respond to the evolving landscape.

Specifically, the propensity for informal use cases can evolve and the difference between the value of the eNaira to the physical Naira and moves by market players to drive disinterest in the system. These are potential challenges which an effective regulation could help address by providing clarity and guidance on roles and responsibilities.

4.3.4 Compliance with AML/CFT

The eNaira payment system will be compliant with AML/CFT guidelines to ensure the integrity of the financial system. To achieve this, the CBN has adopted an account based CBDC. Through this CBDC option, CBN will be able to identify users on the platform using the identify frameworks: BVN and NIN. However, considering that the CBN is adopting a platform model to market, it means it would rely on financial institutions and other payment service providers to deliver layered value-added services on the eNaira platform. The CBN as such alluded to the fact that the role of AML/CFT checks will be handled by financial institutions who have close proximity and provide value added services to customers.

To facilitate this process, customers will have the option to choose their preferred banking partner during the onboarding process and customers will be linked to that bank⁴. The linked banks will as such be responsible for performing AML/CFT checks on the users and ensuring overall compliance.

4.3.5 Privacy and Data Protection

This is a key concern for would be adopters of eNaira especially with regards to anonymity in making payments which is available with cash. The eNaira system is built with deep considerations around privacy and data protection and in compliance with the National Data Protection Regulations (NDPR).

⁴ The customer linking process is a core aspect of the user onboarding process to access eNaira. The linking process enables financial institutions to provide support to users and carry out function such as AML/CFT checks.

Data protection remains fundamental to the core design of the eNaira system and users will be able to determine how their data is used, shared, and processed. While users will have control of their data, the eNaira system is designed in line with AML/CFT guidelines in order to guide against the illicit flow and use of funds. This will ultimately ensure that the CBN builds a safe, trusted, and resilient payment system with high level integrity.

5. Assessing and managing the risks and impact of eNaira

The eNaira as a new form of central bank money could potentially break grounds especially as it enables households and businesses to access central bank money. It could also strengthen the effectiveness of the CBN's monetary policy rates driving economic and monetary stability. However, it also risks disrupting the banking landscape and creating far reaching consequences that could affect the wider economy.

Of immediate concern is the potential for disintermediation and the impact on banking funding and credit availability. Although this could be a potential call for financial institutions to revisit the objective of realigning their business models with modern realities. It also brings to the fore how technological innovations are reshaping our world, the opportunities they present but most importantly, the unforeseen risks and exposures they create.

We have outlined possible risks that could arise from the implementation and adoption of eNaira.

5.1. Strategic and Policy Risks

The CBN has continuously reiterated its commitment towards promoting a strong and resilient payment system. This commitment is also in line with its broad objectives of monetary and financial stability. However, the implementation of the eNaira presents risks to the existing financial system and its participants and could potentially affect overall stability.

a. Risk of Disintermediation and its impact on financial stability

The eNaira as an alternative store of value is designed for households and businesses to hold and use for payments. For this payment ecosystem to be established, these parties will need to convert some of their existing bank deposits into eNaira and hold the eNaira in wallets not held in the bank. The conversion of bank deposits to eNaira affects the banks in the form of:

- Reduction in deposit liabilities and in the availability of funds for bank lending
- Negative impact on the ability and capacity of banks to lend to the real economy
- Fall in liquidity and challenges in liquidity management
- Fall in credit assets and shrinking balance sheet

The shrinking of the industry's balance sheet is the disintermediation process. While the risk of disintermediation is an inevitable consequence of an effective CBDC adoption, the risk return trade-off is a key consideration. Although banks can effectively mount a response by shifting from retail funding towards more wholesale fund source, this could potentially affect their overall cost of funds, high interest on credit assets, negative impact on profitability and disruption of the existing strategies which banks have tailored to the retail market. Specifically, patterns of stringent capital management measures may emerge as banks maintain a conservative stance in lending and reassess their investment in financial inclusion drive which is a long-term objective towards creating new value for their business.

The CBN is wary of this risk and have restricted the eNaira payment system to micro payments. In addition, limits have been placed on wallets to enforce this. The CBN has also reiterated its focus on reducing cash usage which is outside of the commercial bank money and looking to drive its introduction into the banking system.

b. Exposure of the payment system to uncertainties

CBDC as a payment system is still fairly new and only a few countries have completed implementation and are driving adoption. There is as such a lot of unknowns and how this will affect the current payment system and what the risks are. The CBN has reiterated that the eNaira payment system will leverage the existing payment infrastructure to deliver more value at lower costs, however, the potential impact on existing payment channels is still unknown.

To address the uncertainties around the exposures to the current payment system, the CBN has put in place a governance structure that will continuously evaluate the risk and exposures of the eNaira to the current payment system.

c. Complexities and the risk of further financial exclusion

At its core, CBDCs are complex systems that are delivered through simple channels offering ease, convenience, efficiency, and value for money. As a concept, people are likely to struggle to understand how this differs from the money in their bank account which is a digital representation of cash deposits. More so, maximising the value and use cases of the eNaira depends largely on devices with internet capabilities. The eNaira thus risks further alienating sections of the population who are uneducated, lack exposure and access to internet services or digital devices.

According to the National Commission for Mass Literacy, Adult and Non-formal Education (NMEC)⁵, it estimated that 35% of the nation's adult population was illiterate (i.e., 37.1million) and the CBN risks losing adoption to the segment of the population.

To mitigate this risk, the Bank factored in the need for inclusiveness as part of the core design principle of the eNaira. This principle has enabled the Bank to focus on simplicity and ease of use ensuring that Nigerians without internet enabled phones can access the service. Also, there are marketing and sensitisation campaigns to deepen the understanding of eNaira amongst the population.

5.2. Operational Risks

The introduction of a new payment system has inherent risks based on the overall design and architecture. With the eNaira there are risks that could arise from its day-to-day use and from the overall management of its operational processes.

Operational risks could impact the adoption of eNaira

The implementation and adoption of eNaira presents operational risks that could arise from core aspects of design which include:

- Legal considerations around stakeholder obligations, responsibility for risks and exposures on the eNaira platform, intellectual property rights
- The central bank's internal organisation and processes
- Failed dispute resolution mechanisms resulting in financial losses especially for merchants
- Reliability, adequacy, and safety of IT Infrastructure to support the eNaira payment system
- Governance and decision making on the eNaira payment system
- Outsourcing and 3rd party risks

All the above operational risks can have a negative impact on a novel payment platform like the CBDC. The Bank has considered these risks and provided adequate measures through the eNaira operational guidelines to mitigate them.

5.3. Cybersecurity Risk

Digital technologies face underlying cybersecurity risks. As a digital innovation, eNaira faces inherent cybersecurity risks which must be adequately addressed. The introduction of eNaira amplifies cyber vulnerabilities and increases the surface area of attacks to now include central banks, in addition to the overall economy.

⁵ <https://www.thisdaylive.com/index.php/2019/04/12/the-growing-illiteracy-in-nigeria/>

The threat of cyber hacks and financial loss by users

While the underlying technology behind eNaira has proven to be resilient, there have been cases in the cryptocurrency landscape where exchanges have lost over US\$2.02 billion to hackers⁶. The threat of loss and intrusion is real, and these may be further exacerbated by users who may try to exploit vulnerabilities within the eNaira payment system for illicit gains. More so, users may be exposed to fraudulent schemes by individuals or crime syndicates that aim at getting unauthorised access to their wallets to spend their eNaira.

While it may be argued that there is a strong preference for hard currencies such as US Dollar, Euro and Pounds Sterling, Nigeria's successful implementation of a digital currency puts it in the spotlight and creates a greater visibility for the Naira and highlights the advanced nature of its financial system.

To address the cybersecurity risk, the CBN will provide IT security governance over the eNaira system, conduct regular IT security assessments to identify vulnerabilities and harden the system. Also, traditional security core of confidentiality, integrity, and availability (CIA) together with strong internal control measures will be implemented to address exposures and enhance overall security on the platform.

In addition, key preventive measures such as: performing architecture risk analysis to identify potential flaws in the security design of the eNaira system and security threat modelling of the design, data flow and integration to identify threats and provide appropriate countermeasures will be adopted.

5.4. Reputational Risk

A core fundamental that drives trust in new innovations is the brand identity and reputation of the promoters and key stakeholders. As a new innovation, eNaira faces an acceptance hurdle highlighted by questions around the need for it and this could become more difficult if there is a failed launch / deployment of the eNaira. This presents a unique challenge and a potential reputational risk exposure to the CBN as the project sponsor of the eNaira.

Perceived impairment of the CBN's abilities to deliver on its core mandate

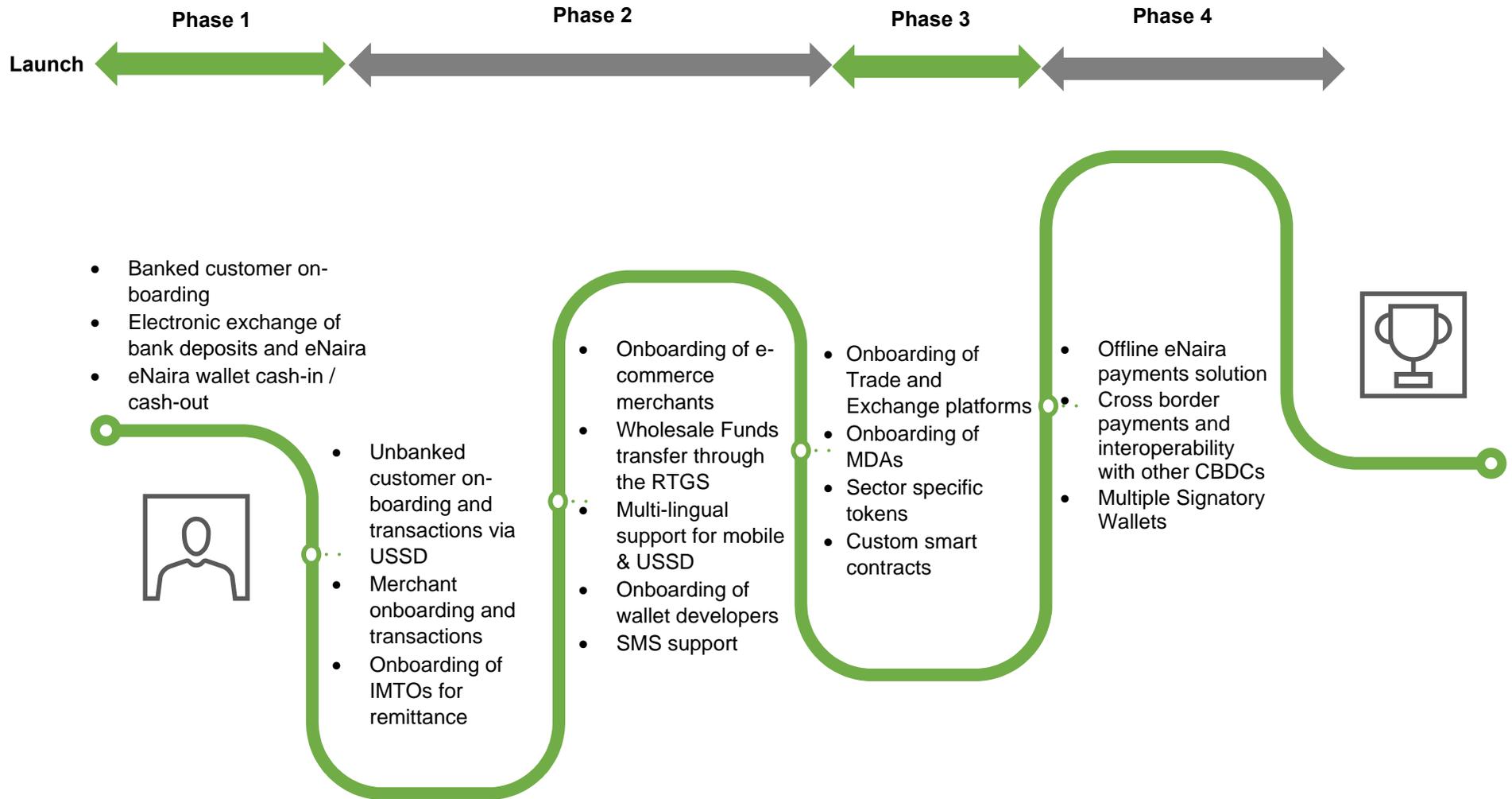
Reputational risks are not quantifiable, the damage can be irredeemable particularly as it relates to the CBN delivering on other aspects of its objective of ensuring monetary & financial stability and in building a cash-less and digital economy. While the need to meet timelines as defined in the eNaira roadmap is critical, more so is the ability of the eNaira to deliver on its value proposition and remain true to its core objective and its underlying design principles.

⁶ <https://www.bbc.com/news/technology-58331959>

To counter this risk, the CBN will collaborate with stakeholders to clearly articulate use cases that solve current needs, define a clear value proposition for households, businesses, and key market players such as financial institutions, actively collaborate with the stakeholders in the payment system and conduct active sensitisation campaigns.

6. eNaira Implementation Roadmap

The roadmap to full implementation of the eNaira will be in 4-phases.



7. Conclusion

Nigeria has one of the most advanced payment systems in the world, enabled by progressive policies of the CBN to foster innovation, resilience, consumer protection and overall stability. This payment system has enabled the country's growing digital economy, making it a benchmark for payment systems in sub-Saharan Africa and globally.

In furtherance of these achievements, the CBN has followed with keen interest the discussions and considerations of CBDCs by central banks across the world. The CBDC offers potential benefits which clearly mirrors the CBN's overall objective of driving a more cash-less, inclusive, and digital economy. To consolidate on the gains of previous policies, the CBN has chosen to implement its own CBDC.

Specifically, the drive for financial inclusion, achieving a truly cash-less society, supporting a resilient payment system, reduction in the usage of cash and the associated cost in providing it, and increased monetary policy effectiveness are prime considerations that have motivated the adoption of a CBDC.

The country's CBDC termed "eNaira" adds to the Nigerian payment system, an alternative channel built on efficiency, resilience, interoperability, universality, and high-level security.

The success of the eNaira means inclusive access to all Nigerians and the ability to enable low cost and highly efficient payments. It means value for money and an alternative to the country's existing payment system built for resilience and innovation. The development of the eNaira has been through the active collaboration between the CBN and stakeholders within and outside the financial system in the areas of interoperability, regulation, data usage and security protection.

With innovation comes new risks especially on the integrity and stability of the financial system. The CBN has taken careful consideration of these risks and has implemented safeguards and policies to maintain the integrity of the financial system. Specifically, there will be adherence to the AML/CFT standards and mechanisms in order to preserve the financial stability of Nigeria's payment system.

The eNaira has been designed with these careful considerations and retains its current uniqueness but with more possibilities in its digital form. It is the Bank's hope that the eNaira will drive the digital economy agenda and foster a more prosperous Nigeria.