



eNAIRA PAYMENT SYSTEM

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

eNaira is the Nigerian digitized physical Naira presently utilized and circulated by the Central Bank of Nigeria (CBN) in conformity with the CBN Act, Segment 19. The eNaira is designed with a strong security architecture that makes it difficult for anyone to duplicate or create fake units. No eNaira unit is the same with the other. This research seeks to provide all actors within the payment system with a deep understanding of the eNaira payment system. The outstanding features of eNaira were discussed which include eNaira design principles and architecture, wallet tiers of eNaira and transaction limit, and the security architecture of eNaira. With these fundamental details revealed, it is expected that Nigerians should believe that the eNaira will boost the digital economy by enabling a low-cost and highly efficient payment system.

Keywords: eNaira; CBDC; payment system; digital currency.

1. INTRODUCTION

The worldwide use of the web and cell phones has contributed to the emergence of new types of money and money related payments [1,2]. To carry out suitable and successful monetary exchanges, electronic currencies and payments are introduced. Digital money implies any means of payment that exists in an absolutely electronic form [3], while electronic payments are ways of making transactions online through an electronic medium. The development of computerized money or electronic payment has been encouraged by the advancement of blockchain built on decentralized record innovation, which offers a safe peer-to-peer financial exchanges and auditable and straightforward exchange of resources, consequently increasing digital trust among online users [4,5]. The advantages of digital currency are numerous. Online traders benefit through more

proficient and less costly services for e-commerce and transborder payments [6,7].

On June 24, 2021, CBN propelled a project to produce and issue government-controlled computerised currency in Nigeria called eNaira. eNaira is Central Bank Digital Currency (CBDC) that offers a unique form of money designated in Naira. These financial innovations have positive effects on different aspects of capital markets and the financial system at large. When this happens, there is usually a noticeable attention from all key players in the academics, enterprise, and government [8,9]. With the eNaira, it is anticipated that people and businesses can make quick, proficient, and genuine payments which should be the hallmark of any viable payment system. The overall idea of eNaira payment system is to cultivate a strong, inventive, comprehensive, and competitive payment system that offers reduce

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transaction and setup costs. The intent of this article is to highlight the salient features of eNaira and its prospects in the contemporary Nigeria.

2. RELATED WORKS

Several researched articles have been proposed for the design of eNaira Payment system. The related researched works are discussed below:

- a. Ozili, [10] proposed a redesign of the eNaira payment system for payments and macroeconomic effectiveness. The paper explained the design features which the eNaira should possess in order to become very effective in offering payments and macroeconomic policy solutions. The paper further suggests that the eNaira should have an interest-bearing status, improved security features and should offer users zero transaction cost on eNaira transactions.
- b. Research on The eNaira - Opportunities and challenges by Chukwuere, [11] highlighted the overview of eNaira, future hope, and problems in the implementation of eNaira. In the article, a literature review method was used to analyse eNaira, its prospects and challenges for CBN and the entire Nigerian citizens extensively. The study further revealed that eNaira is faced with a lot of problems and there is need to address the existing problems to fully harness the opportunities offered by eNaira.
- c. In Obiora et al. [12] The authors carried out a study on how eNaira affects the economic Performances of selected banks in Nigeria. To obtain primary data, a survey study was issued to the staff of the concerned banks with international approval and banking license. Statistical analysis conducted using Kendall's Coefficient of Concordance revealed that the use of eNaira significantly improved the economic performances of commercial banks in Nigeria.
- d. Ozili, [13] investigates the general outlook, prospects and challenges facing CBDC in Nigeria. From their research, it is expected that eNaira, also known as Central Bank Digital Currency should offer Nigerians better economic policy transmission, seamless transactions and increased inclusive finance. In line with [14], the study also discovered that the implementation of eNaira can cause problems to the financial system already in existence as individuals and businesses will be prone to cyber attacks and other security breaches. Common problems pointed out include rising digital incompetency, cyber

attacks, information theft, and the unwarranted activities of banks in a full-blown CBDC economy.

3. MEANING OF eNAIRA

eNaira is the Nigerian official electronic Naira (eNaira) approved and issued by the CBN in agreement with CBN Act section 19. The eNaira will be exchanged the same rate as the conventional Naira. This suggests that one eNaira is the same as the conventional Naira. It is built on a distributed open ledger technology that makes it difficult for anyone to duplicate or create fake units. Each eNaira note will be unique and different.

4. CRYPTOCURRENCY VERSUS eNAIRA

eNaira is basically government-owned electronic money designed to be more secure than cryptocurrency. eNaira is a valid currency issued and supported by Nigerian authority and its worth is the same as Nigerian official currency, whereas Bitcoin and other crypto-currencies have no support of established authorities. The Nigerian eNaira will maintain the same exchange value as the physical Naira and will not vacillate as a result of market influence at a diverse rate from the conventional Naira. Unlike Bitcoin cryptocurrency, that might lose half of its worth overnight or may twofold by the following week. High fluctuations of crypto-currencies due to speculative activities have affected its acceptability as means of payments in e-commerce [15]. The Nigerian electronic Naira basically facilitates exchanges and provides stability in digital economy, in this manner reducing the need for carrying naira about.

5. HOW eNAIRA WORKS

The electronic Naira would be made accessible to banks and other financial institutions by CBN. One of the core responsibilities of the banks and other financial institutions is to distribute eNaira to individuals and merchants and to maintain a digital wallet where eNaira could be collected from the CBN. Other roles include, verification of ID, processing of eNaira payment, and eNaira wallet generation for customers.

6. HOW TO USE THE eNAIRA PLATFORM

The electronic naira Speed App is accessible at Play Store or Apple Store for download and signing up. During sign up, the user is expected to provide all the necessary requirements and Privacy Policy. Terms and conditions also apply. With the eNaira App, a customer can identify a bank of his choice, linked to

his account, and make transactions. Fig. 1, shows various steps for signing up with eNaira platform. Search for the *eNaira Speed Wallet* app from Google play stores, and when it appears, tap the *Install* icon to begin the download and installation process. Signup to commence the process once the installation process is completed. From the *Select Your Bank* menu, choose your bank and when this is done, the *Create Account* page will show for you to input your *Phone Number* linked with your bank account and *Password*. The phone number must be a minimum of twelve (12) characters. When this is done, the next page will require you to input your name, Birth Date, State, Account Number, and BVN. Once you click on the *Continue* button, a mail for wallet activation will be sent to you via your registered email that is already linked to your BVN on successful validation of your details. To activate eNaira Speed wallet, click on the link sent to your email. Login with the Username and Password you created at the time of Sign up process to fund and have access to your e-wallet.

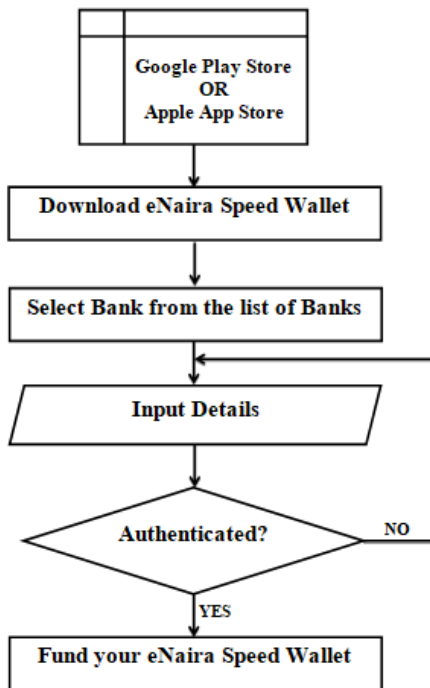


Fig. 1. Steps for signing up with eNaira platform

7. eNAIRA DESIGN PRINCIPLES

The design principles of the eNaira were based on the three (3) general principles adopted by Bank for International Settlements (BIS). In the design principle, all the major objectives of the electronic Naira payment system were captured including its core function as a legal tender [16].

The three (3) common principles espoused by BIS are:

- (a). The electronic Naira should not prevent CBN to perform and pursue its economic and financial sustainability.
- (b). The existing types of money in circulation should coexist with eNaira.
- (c). The design of eNaira should pave way for innovation and competition. CBN should ensure active participation of private and public sectors by encouraging an open market for those who provide eNaira services and products.
- (d). These three (3) universal principles developed by the Bank for International Settlements and in line with eNaira core objectives formed the basis for Nigerian five (5) specific design principles. They are as follows:
 - (a) INCLUSIVE: The electronic Naira should promote access to valuable and cheap financial products and services for Nigerians.
 - (b) INNOVATION: The electronic Naira should provide a support that promotes sustained innovation and cooperation across diverse areas of the Nigerian economy.
 - (c) EFFICIENCY: The electronic Naira will foster quick and proficient payments, subsidized transaction and initial costs, and broaden active participation in the payment scheme.
 - (d) RESILIENCE: The electronic Naira should enhance the payment system already in existence by serving as an alternative means for e-commerce transactions in Nigeria.
 - (e) PROUDLY NIGERIAN: This guarantees that the e-money within the Nigerian payment scheme reflects the identity of Nigeria and should take care of its payments needs.

8. ARCHITECTURE OF eNAIRA

The CBN adopted this architecture because it preserves its core function to ensure the financial system is stable and reliable based on its policy objectives and mandate. The eNaira is a three-tiered CBDC architecture consisting of:

- (i) CBN
- (ii) Commercial banks and other financial institutions
- (iii) Individuals and Businesses

8.1 CBN

In this architecture, the CBN designs, issues, and stores eNaira. Central Bank of Nigeria distributes eNaira to commercial banks and other financial institutions. CBN maintains a centralized ledger for

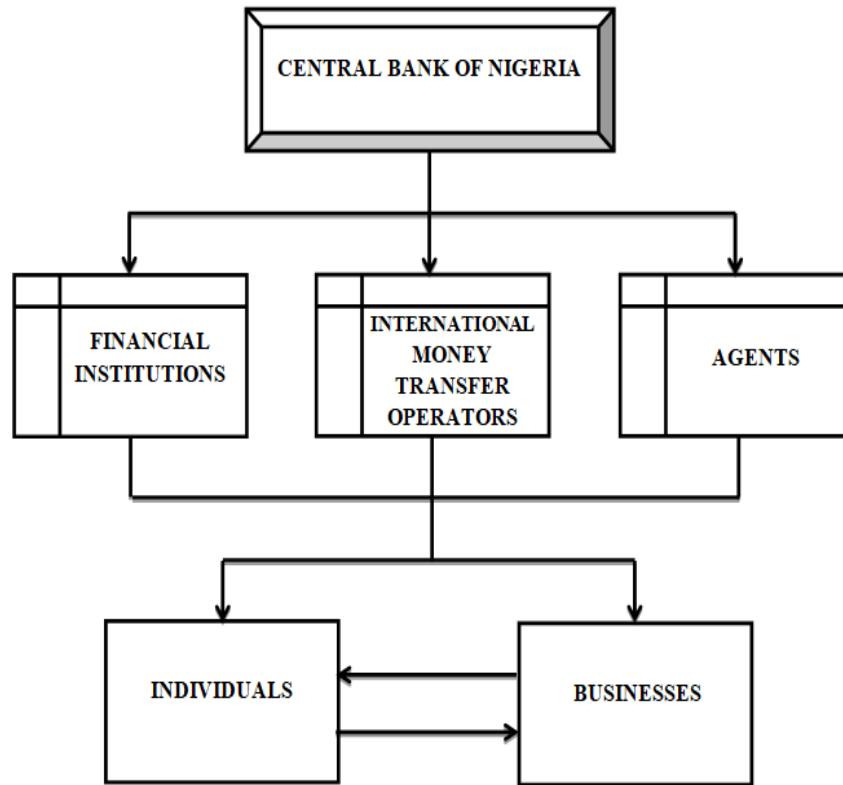


Fig. 2. Architecture of eNaira

all the transactions made and in-charge of both the eNaira payment system and how the e-wallet is used. The Apex bank of Nigeria also provides a platform to implement, monitor and drive further innovation.

8.2 Commercial Banks and other Financial Institutions

Commercial banks and other financial institutions are to process and manage payments for consumers, businesses and public sectors. They also provide other payment services on the electronic Naira payment scheme. Their major responsibility is to distribute eNaira to individuals and businesses. It is their duty to report and account to the Apex bank of Nigeria on how the electronic Naira is circulated and used. Commercial banks and other financial institutions are expected to use sophisticated software tools to maintain to a reasonable extent Know-Your-Client identity and Anti Money Laundering capabilities.

8.3 Individuals and Businesses

These are banked and unbanked individuals and merchants who register to use the eNaira payment system for payments. The architecture of electronic

Naira wallet is designed with outstanding features. It is highly interactive, well secured with strong confidentiality settings. With the tap of a button, users can pay for goods and utilities conveniently. When retail customers purchase specific quantities of eNaira from their account, a debit alert occurs at the Naira account, while a credit transaction of the same value takes place at the eNaira account.

9. eNAIRA TRANSACTION LIMIT AND e-WALLET TIERS

The eNaira is an open system that is accessible to all Nigerians based on a tiered Know Your Customer (KYC) structure as shown in Table 1.

In this tier structure, the unique identifiers are BVN (Bank Verification Number) and NIN (National Identity Number). The electronic Naira wallet is linked to a NIN or BVN based on tier structure. To avoid duplication of identities and wallet creation, each wallet is used once on the electronic Naira platform. Individuals and business bank account holders can create wallets and make use of the electronic Naira platform for transactions. Business bank account holders can also create business accounts without limits.

Table 1. Individual and merchant 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)	20,000.00	120,000.00
1	Non-Bank Account Holders	Telephone number (NIN verified)	50,000.00	300,000.00
2	Bank Account Holders	BVN	200,000.00	500,000.00
3	Bank Account Holders	BVN	500,000.00	5,000,000.00
4	Merchant	BVN, TIN and Bank confirmation	No Limit	No Limit (with auto sweep trigger)

Source: Central Bank of Nigeria

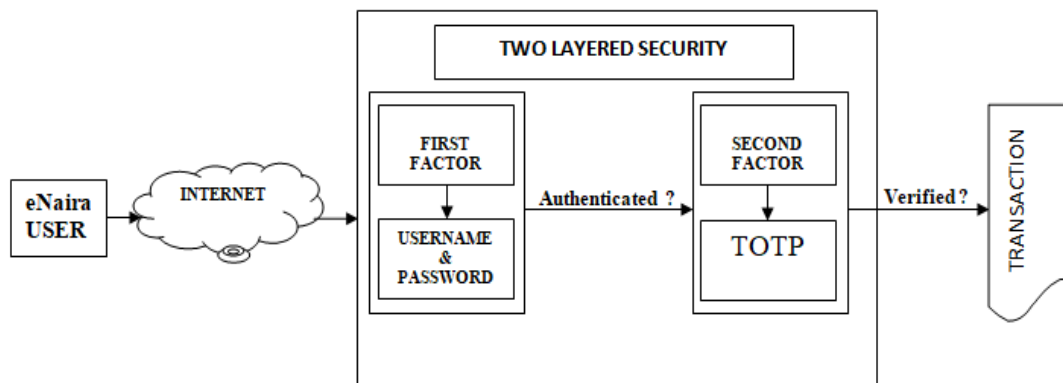


Fig. 3. eNaira security architecture

10. SECURITY ARCHITECTURE OF eNAIRA

The electronic Naira implores two-step verification technique and cryptographic algorithm to ensure that customers’ wallets are safe. Data Protection and Privacy is of great concern to eNaira users, especially for anonymous transactions which is also obtainable in cash payments. The design of the electronic Naira system follows the National Data Protection Regulations that centers on data protection and privacy. The security architecture has an enabling platform that determines how users can share, use, and process data in line with Combating the Financing of Terrorism laws. The intent is to ensure a secure, reliable, and fault tolerance electronic payment system with strong data integrity. Digital technologies are prone to Cyber Security attacks. Cyber Security vulnerabilities are on the increase since the emergence of the electronic Naira, and noticeably the attack domain did not only capture the CBN alone but the overall economy. To mitigate these vulnerabilities, the Apex bank of Nigeria has provided security facilities

in place to secure the electronic Naira platform coupled with regular security checks to uncover vulnerabilities and safe guide the system. To ensure privacy, reliability and accessibility, mechanisms and procedures have been employed internally to guide against vulnerabilities and improve the overall security of the eNaira system. Fig. 3 shows the security architecture of the electronic Naira payment scheme using a two-step verification scheme.

Two-step verification is a strong, security in depth strategy that needs more than a simple password to login. It offers greater security for eNaira payment system. It is based on the concept that users are who they claim to be by requiring them to identify themselves with a combination of password or PIN and One-Time Passcodes (TOTP). The electronic Naira user only gains access to the website and other services after login with their usernames and passwords. If the login credentials are correct and validated by the authenticating server, it means that the user is eligible for the second factor. An OTP is sent to the second-factor device of the user for

identification, confirmation and approval from the second-factor device.

11. CONCLUSION

The salient features of the Nigerian electronic Naira were revealed, several of which are of great concern to the Central Bank of Nigeria. Designing a well structured and secure digital currency goes with actualizing important objectives such as; issuers' financial stability and integrity, protecting customers, and to foster novelty and competition. The eNaira is designed and implemented to serve the exclusive needs of Nigerians as regards to financial guiding principle efficiency. To meet the overall objectives of CBN, the Nigerian electronic Naira should offer promising prospects to include cashless, active financial participation, and digital economy.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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