

## BLOCKCHAIN TECHNOLOGY, CRYPTOCURRENCIES AND FINANCIAL INCLUSION IN NIGERIA

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### Abstract

*The study examined blockchain technology, cryptocurrencies and financial inclusion in Nigeria. Two research questions and one hypothesis guided the study. A correlational research design was adopted to achieve the central aim of the study. The population of this study comprised all the Small and Medium Scale Enterprises (SMEs) operators in Ogun East Senatorial District of Ogun East, Nigeria. A total of 200 SMEs operators were selected for the study using purposive and stratified sampling methods. Two research instruments were used for data collection, namely: Benefits of Blockchain Technology Questionnaire (BBTQ) and Benefits of Cryptocurrencies Questionnaire (BCQ). The descriptive statistics of mean and standard deviation were used in answering research questions 1 and 2, while the research hypothesis were tested using the t-test statistic. The findings of the study revealed that blockchain technology and cryptocurrency promote financial inclusion in the Nigeria economy. Scalability, interoperability, energy consumption, privacy, security, non-regulation, complexity, inefficient networking, inappropriate skills set and inadequate financial resources were the key drivers and challenges of adopting blockchain-based financial services. The blockchain-based financial services was found to be better than the traditional financial services in terms of accessibility, affordability and usability. The adoption of blockchain technology and cryptocurrency reduced the transaction cost and increase the speed of the financial transaction in the economy. The blockchain-based financial services increased the financial inclusion in the economy by providing access to the underserved population. The blockchain-based financial services also create new economic opportunities and reduce poverty in Nigeria economy by proving access to capital and financial services for SMEs operators. The use of blockchain technology and cryptocurrency increase financial literacy and capability among the low-income individual in Nigerian economy. The blockchain-based financial services also improve the overall efficiency and effectiveness of the financial services of financial system, thereby leading to economic growth and development. It was recommended among others that government policies should focus on improving networks and financial access points and the need to continue doing.*

**Keywords:** Blockchain Technology, Cryptocurrencies, Financial Inclusion, Nigerian Economy.

### Introduction

Nowadays, government of every nation seems to be committed towards ensuring citizens have equal access to financial services and other benefits. Financial inclusion refers to the availability and equality of opportunities to access financial services. It can also be seen as a process by which individuals and businesses can access appropriate, affordable, and timely financial products and services which include banking, loan, equity, and insurance products. The authors of this manuscript that financial inclusion is the effort to make financial products and services available and affordable to all individuals and businesses. Financial inclusion involves the use of formal financial services to provide financial access to people. Ozili (2022) defined financial inclusion further as the ease of access,

availability and usage of the formal financial system by all members of the economy. The author further defined financial inclusion as the provision of affordable financial services to people.

In Nigeria, financial inclusion can be used to accelerate economic diversification in the country, and consequently yield economic gains and shared prosperity (Adeola & Evans, 2017). This implied that financial inclusion can promote employment generation, economic development through poverty reduction, wealth creation to help and improved standard of living. However, there appear to be obstacles to financial inclusion in Nigeria. On the demand side, the lack of proper awareness about existing financial services, rising financial illiteracy, superstitious and religious beliefs about banking services, high transaction costs and the general lack of interest in banking products and services by some segment of the rural population (Ozili, 2022). On the supply side, lack of adequate bank branch penetration, unwillingness of banks to sustain financial inclusion programs due to high costs, and the unwillingness of banks to bear the social cost of a bank-led financial inclusion programme seems to be among the factors affecting financial inclusion in developing country including Nigeria (Ozili, 2022). Based on these unpleasant circumstances, stakeholders in Nigeria financial sector need to look forwards on how to integrate financial inclusion into the banking sector in the country. Although, different literature has raised multiple factors that can promote financial inclusion of which blockchain is among (Nwosu, 2021).

According to Ajayi, Madewa, Fatoye and Oladipo (2022), blockchain is a financial instrument that could be of help in these circumstances (for example, the supply and demand sides, as exemplified above) in order to promote financial inclusion by promoting financial inclusion. A blockchain is an organized, decentralized, unchangeable database that facilitates the recording of network transactions. A Blockchain emerged as a technology that may be employed in a variety of industries and firms in recent years. It is claimed to be the technology that will make financial and business transactions simple, effective, safe, and inexpensive (Ajayi et al., 2022). A Blockchain refers to the sequential linking of blocks holding transaction data to form a chain, so creating a decentralized database (Alaka & Adewuyi, 2020). This distributed ledger records of all financial transactions that occur inside a network without the need for a centralized chairperson to issue new blocks, as any member can begin transactions with another member. A Blockchain could therefore be seen as a distributed and decentralized repository system that handles a growing list of participants' validated data inputs. To guarantee transparency accountability, and ease of use, the entire financial document is assembled into a digital database containing all recorded transactions. A Blockchain is a decentralized system of financial transaction because it does not require a central authority to function, like a bank or a credit card firm. The first application to emerge as a result of the development of a blockchain technology was Bitcoin (Alaka & Adewuyi, 2020). A Bitcoin is a decentralized digital money in which all users have equal access to purchasing, selling, and exchanging power. While a blockchain may appear to be the ideal solution to centralized forms of transaction that required third-party organization, it is not devoid of its flaws and shortcomings that must be examined and overcome. A Blockchain technology has emerged as the solution to the centralized nature of current banking systems. The ultimate objective of a blockchain technology is to create a decentralized and distributed system for processing transactions in which no third party can access or modify the related data (Yli-Huumo, Choi, Park & Smolander, 2020).

Another financial instrument for the promotion of financial inclusion is a cryptocurrency. Nwosu (2021) opined that a cryptocurrency is still an emerging financial technology but fast-growing alternative finance solution for many around the world. A cryptocurrency technology currently estimated to be growing at a rate that is faster than the rate of the growth the internet since in the 1990s. It is important to note that the growth rate of a cryptocurrency is largely influenced by young people aged 18-36 (Torpey, 2019). Due to the increasing demand for modern smartphones (which enable cryptocurrencies transactions), there has also been a growth in their adoption rate in less-developed countries (LDCs) such as Nigeria. Cryptocurrencies have been argued to be a better medium to accelerate global financial inclusion, but the nascent stage of the technology emergence has made this possibility really challenging. However, the subject matter of cryptocurrency is believed to have a positive relationship with financial inclusion. This in turn can brings about financial development which has been established to be a necessity for economic growth (Nwosu, 2021). According to Nwosu (2022), with the growing use of

cryptocurrencies for payments and other financial transactions globally more Fintech are rolling out their technology platforms to provide access to cryptocurrencies for the growing population of their customer base. Examples are PayPal, Square, Piggyvest, Trove among others. However, Piggyvest and Trove have suspended their cryptocurrency services due to the Central Bank of Nigeria's (CBN) restrictions on regulated banking and non-banking financial institutions issued in February, 2021 (CBN, 2021).

As younger people seek better financial solutions, cryptocurrency is the next logical step in the growth of advanced financial transactions, particularly in Nigeria. Traditional methods of running technology-enabled organizations are rapidly being challenged by blockchain alternatives. Individuals now have more power over the fate of their favourite companies and transactions thanks to a blockchain-based application. In addition, cryptocurrencies are presenting themselves as an opportunity for income growth among young people. Many young people now turn to cryptocurrencies for day trading, short-term investing, play-to-earn and similar platforms such as crypto coaching, working for crypto-based businesses or peer-to-peer trading. Some other persons use cryptocurrencies to receive their income for jobs done for clients in other countries (Nwosu, 2022).

### **Statement of the Problem**

For impoverished rural communities, financial inclusion plays a critical role in shielding them from income shocks and offering accessibility to remittances, thereby improving their resilience and livelihoods. Despite the growing importance of financial inclusion of the rural area of the Nigeria economy, a significant portion of the population remains excluded from it. However, financial inclusion in Nigeria have been a source of challenge; a situation whereby majority of Nigerians do not have equal opportunities to financial services and even some never have bank accounts. This circumstance seems to prevent governments from allocating resources to each citizen account directly as a way of enhancing their financial inclusion in the country. The benefits of financial bank activities and other related revenues from the government are missing in home and family of many Nigerians which could be as a result of poor nature of financial inclusion in the country. However, government through the efforts of Central Bank of Nigeria (CBN) have taken some steps toward improving financial inclusion of Nigerians, despite that Nigerians financial inclusion still among the poorest in the committee of the nations including Nigeria. This study examined the interplay between blockchain technology, cryptocurrencies and financial inclusion in Nigeria.

### **Purpose of the Study**

The central aim of this study is to examine the levels of and the interplay between blockchain technology, cryptocurrencies and financial inclusion in Nigeria. Specifically, the study seeks to examine:

1. how blockchain technology and cryptocurrency can promote the financial inclusion in Nigerian economy.
2. the key drivers and challenges of adopting the blockchain-based financial services in Nigerian economy.
3. if there are any differences between blockchain-based financial services and traditional financial services in terms of accessibility, affordability and usability?

### **Research Questions**

The following research questions will guide this study:

*Research Question 1:* How can blockchain technology and cryptocurrency promote the financial inclusion in Nigerian economy?

*Research Question 2:* What are the key drivers and challenges of adopting the blockchain-based financial services in Nigerian economy?

### **Research Hypothesis**

*Research Hypothesis:* There are no significant differences between blockchain-based financial services and traditional financial services in terms of accessibility, affordability and usability.

## **Methods**

### ***Research Design***

The research design for this study was correlational research design. The reason for adopting this research design in this study was that the design helped the study to investigate the extent to which the independent variables relate to the dependent variable.

### ***Population and Sampling Procedure***

The population of this study comprised of all the SMEs operators in Ogun East Senatorial District of Ogun State, Nigeria. This senatorial district comprised nine (9) local government areas in the state. A total of 200 SMEs operators in Ogun East Senatorial District of Ogun State, Nigeria were selected for the study using purposive and stratified sampling methods. A purposive sampling method helped the authors to used its discretion in selecting the sample size for the study and a stratified sampling method helped in ensuring gender sensitivity.

### ***Research Instrument***

Two research instruments were used for data collection and they are Benefits of Blockchain Technology Questionnaire (BBTQ) and Benefits of Cryptocurrencies Questionnaire (BCQ). The BBTQ was a self-structured instrument geared towards eliciting information from respondents regarding the benefits of blockchain technology towards the attainment of financial inclusion. The responses rating scales are as follows: Very Low Extent (VLE), Low Extent (LE), High Extent (HE) and Very High Extent (VHE). The BCQ on the other hand was a self-structured instrument geared towards eliciting information from respondents regarding the significance of cryptocurrencies towards the attainment of financial inclusion. The responses rating scales are as follows: Very Low Extent (VLE), Low Extent (LE), High Extent (HE) and Very High Extent (VHE).

### ***Validation and Reliability of Instruments***

To ensure validity of the study instruments, copies of BCQ and BBTQ were made available to the researcher's supervisor and three experts. All the corrections done by the experts were incorporated in the final versions of the instruments before they were taken to the field. To ensure reliability of the instruments, 10 copies were administered on the SMEs operators in Lagos State. The data collected were subjected to a Cronbach's alpha in order to determine the level of reliability coefficients of the instruments. Reliability coefficients of 0.93 and 0.95 for BCQ and BBTQ were obtained.

### ***Data Collection Procedure***

A letter of introduction was collected from the Head of Business Education Department, Tai Solarin University of Education, Ijagun, Ogun State and were presented to the selected SMEs owners to determine the authors interest. Thereafter, the consent of the respondents was sought to participate in the study. The exercise was conducted within four (4) weeks with the help of four trained research assistants. However, a total of 200 copies of the questionnaires were administered and only 194 were retrieved, which established 97% return rate.

### ***Data Analysis***

The descriptive statistics of mean and standard deviation were used for answering the research questions raised in the study. The inferential statistic of t-test was used for testing the research hypothesis proposed in the study. The decisions criteria for answering the research questions was any mean score equal to 2.5 or above was regarded as agree, while any mean score bellow 2.5 was regarded as disagree. The decisions criteria for testing the research hypothesis were established at a 0.05 probability alpha level of significance.

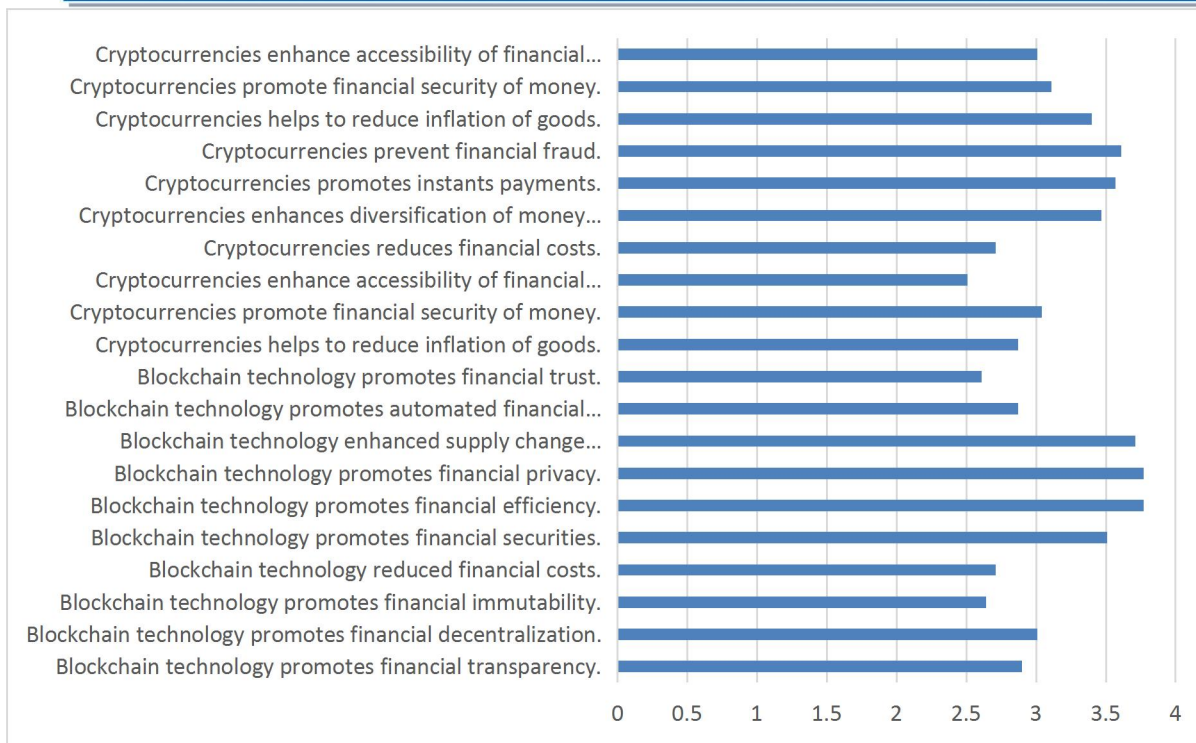
## Results

*Research Question 1:* How can blockchain technology and cryptocurrency promote the financial inclusion in Nigerian economy?

**Table 1: Mean and Standard Deviation on How Blockchain Technology and Cryptocurrencies Promote Financial Inclusion in Nigerian Economy.**

Items	Mean	SD	Decisions
To what extent does blockchain technology promote:			
Financial transparency.	2.90	.950	Low Extent
Financial decentralization.	3.01	.712	High Extent
Financial immutability.	2.64	.948	Low Extent
Financial costs.	2.71	.819	Low Extent
Financial securities.	3.51	.756	High Extent
Financial efficiency.	3.77	.641	High Extent
Financial privacy.	3.77	.641	High Extent
Supply chain management.	3.71	.705	High Extent
Automated financial transaction.	2.87	.793	Low Extent
Financial trust.	2.61	.952	Low Extent
<b>Cluster Mean</b>	<b>3.15</b>		
To what extent does cryptocurrencies promote:			
Inflation of goods.	2.87	.947	Low Extent
Financial security accessibility.	3.04	.647	High Extent
Financial transaction.	2.51	.752	Low Extent
Financial costs.	2.71	.783	Low Extent
Monetary transfer diversification.	3.47	.793	High Extent
Instant payments.	3.57	.791	High Extent
Financial fraud prevention.	3.61	.728	High Extent
Inflation of goods.	3.40	1.027	High Extent
Financial security.	3.11	1.110	High Extent
Financial transaction accessibility.	3.01	1.198	High Extent
<b>Cluster Mean</b>	<b>3.13</b>		

Source: Field Survey, 2024



**Figure 1: Bar-Chart showing How Blockchain Technology and Cryptocurrencies Promote Financial Inclusion in Nigerian Economy.**

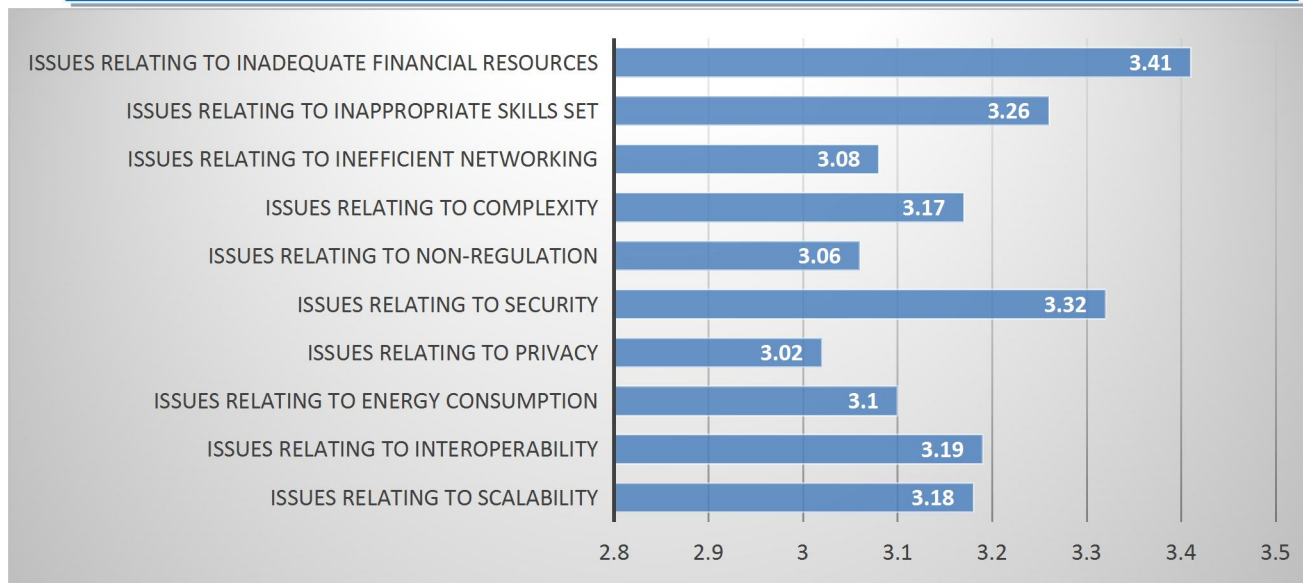
Table 1 revealed that cluster mean for blockchain technology and cryptocurrency are 3.15 and 3.13 respectively and these mean values greater than the bench mark of 2.50. That is, (3.15 and 3.13 > 2.50), this implied that blockchain technology and cryptocurrency promote financial inclusion in Nigerian economy.

*Research Question 1:* What are the key drivers and challenges of adopting the blockchain-based financial services in Nigerian economy?

**Table 2: Mean and Standard Deviation on Key Drivers and Challenges of Adopting the Blockchain-Based Financial Services in Nigerian Economy.**

Items	Mean	SD	Decisions
Issues relating to scalability	3.18	.967	High Extent
Issues relating to interoperability	3.19	.937	High Extent
Issues relating to energy consumption	3.10	.904	High Extent
Issues relating to privacy	3.02	.884	High Extent
Issues relating to security	3.32	.802	High Extent
Issues relating to non-regulation	3.06	.900	High Extent
Issues relating to complexity	3.17	.837	High Extent
Issues relating to inefficient networking	3.08	.831	High Extent
Issues relating to inappropriate skills set	3.26	.783	High Extent
Issues relating to inadequate financial resources	3.41	.888	High Extent
<b>Cluster Mean</b>	<b>3.18</b>		

Source: Field Survey, 2024



**Figure 4.2 Bar-Chart showing Key Driver and Challenges of Adopting Blockchain-Based Financial Services in Nigerian Economy.**

Table 2 revealed that cluster mean was 3.18 and the benchmark mean value of 2.50. Since,  $3.18 > 2.50$ , this implied that scalability, interoperability, energy consumption, privacy, security, non-regulation, complexity, inefficient networking, inappropriate skills set and inadequate financial resources were among key driver and challenges of adopting blockchain-based financial services in Nigerian Economy.

*Research Hypothesis:* There are no significant differences between blockchain-based financial services and traditional financial services in terms of accessibility, affordability and usability.

**Table 3: Comparing blockchain-based financial services and traditional financial services in terms of accessibility, affordability and usability**

Groups	Mean	SD	df	t-cal	p-value	Decision
Blockchain-based financial services	58.67	7.584				
Traditional financial services	53.73	7.984	3	25.75	0.01	Significant

Significant ( $P > 0.05$ ), moderating variables accessibility, affordability and usability

Table 3 showed that the t-value is 25.75, the degree of freedom (df) is 3 and  $P = 0.01$  since  $t = 25.75$ ,  $P < 0.05$  it implied that blockchain-based financial services is better than traditional financial services in terms of accessibility, affordability and usability as showed in the mean values of blockchain-based financial services (58.67) greater than that of traditional financial services (53.73).

### Discussion

The analysis of research question 1 showed that blockchain technology and cryptocurrency promote the financial inclusion in emerging Nigeria economy. This finding concur with the study of Ibrahim and Odunlami (2022) who found that blockchain technology and cryptocurrency were among the two instruments that can be used to enhance financial inclusion in the country. The analysis of research question 2 indicated that scalability, interoperability, energy consumption, privacy, security, non-regulation, complexity, inefficient networking, inappropriate skills set and inadequate financial resources were among key drivers and challenges of adopting blockchain-based financial services. This finding agree with the study of Alaka and Adewuyi (2020) who found that blockchain technology has great impact on financial industry, and it is essential for gaining a thorough understanding of this subject matter. They concluded that protection, interoperability, energy consumption, privacy, security, non-regulation, complexity, inefficient networking are among the key drivers of adopting blockchain-based

financial services. The analysis of research question 3 indicated that blockchain-based financial services is better than traditional financial services in terms of accessibility, affordability and usability. This finding were in consonant with the study of Abdumalik and Akeem (2022) who investigated the effects of cryptocurrency and blockchain-based on the development of digital currency in Nigeria and found that the two aforementioned technology financial instrument are better that the old traditional method of financial inclusion.

## Conclusion

Having examined blockchain technology, cryptocurrency and financial inclusion in Nigeria, the following conclusions were drawn based on the findings of the study that a Blockchain technology and cryptocurrency are promoting financial inclusion in emerging Nigeria economy. Scalability, interoperability, energy consumption, privacy, security, non-regulation, complexity, inefficient networking, inappropriate skills set and inadequate financial resources were among key driver and challenges of adopting blockchain-based financial services. Blockchain-based financial services is better than traditional financial services in terms of accessibility, affordability and usability. Adoption of a blockchain technology and cryptocurrency reduced transaction cost and increase the speed of financial transaction in the economy. A Blockchain-based financial services increase financial inclusion in the economy by providing access to underserved population. A Blockchain-based financial services create new economic opportunities and reduce poverty in Nigeria economy by proving access to capital and financial services for small business and entrepreneurs. The use of a blockchain technology and cryptocurrency increase financial literacy and capability among low-income individual in new Nigeria economies. A Blockchain-based financial services improve the overall efficiency and effectiveness of financial services of financial system leading to increased economic growth and development.

## Recommendations

Based on the findings of the study, the following recommendations are provided:

1. Government policies should be focus on improving networks and financial access points and need to continue doing so while also pushing ahead with ID onboarding and refocusing the approach to financial education.
2. Government policy initiatives to foster financial inclusion and digital finance should be implemented and more on improving digital financial literacy, upgrading digital infrastructure, and promoting Fintech incubation and sound practices in Fintech operations, notably digital lending.
3. Government should synergy with mobile money along these lines could also help further digitize government finance, for example in social cash transfers. Remittance cost savings as a bridge vehicle in the existing remittance process may also be substantial and promote financial inclusion.
4. The Government needs to invest in research on this subject. The educational level of Blockchain is still in its infancy. This is not distant from the reality that there is not much understood about the technology itself, as most still perceive blockchain primarily revolves around cryptocurrencies.
5. There is an urgent need for a regulatory framework to be implemented shortly for Blockchain technology, to enable room for wider adoption and to safeguard against the exploitation of the technology. The Financial Action Task Force (FATF) guidelines/recommendations may be and should be utilized as a reference for coming up with a policy or framework on the technology.
6. Criteria should be set for security, privacy, and integrity: The necessity for building up security and privacy standards needs to be by global norms. There are data privacy worries on the technology, but, how you utilize the technology inside your ecosystem can alleviate those concerns on data privacy.
7. The need for international and local collaboration cannot be over-emphasized because



blockchain technology is still in its early days and a lot of collaboration between nations and locally stakeholders will go a long way to bridge the gap between what we know and don't know about the technology.

8. There is a lot that can be done to increase the number of blockchain professionals in the area on a local level, thus it is important to focus on capacity and skill building. We must increase our blockchain expertise and understanding.
9. More awareness on the benefits of cryptocurrencies' needs to be created, transaction costs need to be lowered and a principle-based regulatory system that each crypto Fintech in Nigeria must adopt should be created. These will reduce friction and ease the adoption process.
10. There is the need for the reduction of transaction costs (both fees and time taken) of using cryptocurrencies.

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