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Impact of Blockchain Technology on Financial Technology in Nigeria

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Abstract:- A blockchain is an organized, decentralized, unchangeable database that facilitates the recording of network transactions. Blockchain has evolved as a technology that may be employed in a variety of industries in recent years. It is claimed to be the technology that will make transacting simple, effective, safe, and inexpensive. The primary goal of this work was to investigate the impact of blockchain on financial technology in Nigeria.

A systematic review was adopted for this paper. The search method began with the identification of digital libraries and web resources that were screened for relevant materials. Six scholarly papers were chosen after screening relevant literatures. Data were retrieved in a methodically and organized into four major themes; concept, importance, impact, and challenges of blockchain on financial technology in Nigeria.

The findings indicate that blockchain technology has the potential to improve the efficiency of numerous areas of the financial industry. It can improve and change cross-border payment, trade finance, capital markets, as well as financial reporting and compliance. It also simplifies the process of getting to know your consumer.

Blockchain deployment is expected to disrupt the banking and financial systems by enabling a new method of payment, speedier trade execution, a secure ledger, smart contracts, and a variety of other advances. As a result of the finding, this work motivate policymakers to return to the boycott on blockchain exchanges in Nigeria and by understanding these challenges, they can discover arrangements to them and this in turn will offer assistance the nation colossally.

I. INTRODUCTION

In several areas, technology has played a key role in transforming our everyday lives. Nevertheless, the growth of innovative online business tools is directly attributable to the internet's dynamic environment. Moreover, technology has spawned entirely new economic sectors that did not exist a few decades ago [1]. One of the most significant contributions of technology is the introduction of whole new channels via which businesses and their customers may connect and collaborate in an incredibly seamless and effective manner. The financial and banking sector has not historically dispersed or controlled the mechanisms by which individuals and companies exchange currency. Therefore, if a digital payment or currency transfer is required, a bank or credit card company must act as a middleman. This system also ensures that all businesses, including those dealing with entertainment, gambling, applications, etc., utilize the same mechanism and that a fee from the financial institution or credit card issuer is charged to each transaction. Since the system is centralized and maintained by a third party, it is incapable of providing privacy.

The term "blockchain" refers to the sequential linking of blocks holding transaction data to form a chain, so creating a decentralized database. This distributed ledger records all financial transactions that occur inside a P2P network without the need for a centralized chairperson to issue new blocks, as any member can begin transactions with another member [2]. Blockchain is a distributed and decentralized repository system that handles a growing list of participants' validated data inputs. To guarantee transparency and ease of use, the entire document is assembled into a digital database containing all recorded transactions. Blockchain is decentralized because it does not require a central authority to function, like a bank or credit card firm. The first application to emerge as a result of the development of blockchain technology was Bitcoin. Bitcoin is decentralized digital money in which all users have equal access to purchasing, selling, and exchanging. While 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 concerns that must be examined and overcome [3]. Blockchain technology is touted as the solution to centralization worries. The ultimate objective of blockchain technology is to create a decentralized, distributed system for processing transactions in which no third party can access or modify the related data [4].

Financial technology is now an integral element of the overall growth of the financial industry. This is because it involves the exploitation and mixing of several technologies, such as Data Science and Artificial Intelligence, Hardware, and software, to give the business a variety of services, including "Platform as a Service" (PaaS) and "Software as a Service" (SaaS). On the other hand, it is essential to learn about Blockchain's benefits for the banking business and to research its prospective uses [5].

According to [6], the potential applications of blockchain technology are broad and generally acknowledged, necessitating an urgent need for more development, research, and investment [6]. From the perspective of the financial industry, the development of Blockchain has not only had a notable impact but has also resulted in the birth of an exceptionally competent data repository. However, according to [7] it is typical to

investigate blockchain's areas of application for them to become important resources for enhancing financial consideration, as opposed to only being another plan of action for the financial regions. To gain insight into the strategic planning processes of financial institutions and to foresee the future of strategic planning, we will analyze the real-world uses of Blockchain in banking institutions in 2017 in this analysis.

As explained by [8], FinTech might serve as a case study in two ways. The major focus of the first dimension is on commercial banks, microfinance institutions, telecommunications businesses, etc. that are experiencing digital transformation by employing big data and other cutting-edge technology to update and improve their offers. Moreover, there are firms in the field of innovation that intend to apply their ideas to enhance monetary systems. For example, Facebook, Apple, Google, Ant Financial (China), Jingdong Finance (China), and Tencent (China) all began with the purpose of avoiding financial transactions. However, as a last alternative, they choose to nurture their variations of monetary administrations to fulfill the wants of their clients and develop new kinds of innovative financial scenes.

According to [6], the banking sector is attracted to Blockchain technology due to its qualities. These features include the likelihood that circumstances enable individuals to establish assurance more quickly and the capacity to alter the financial mindset and environment. However, blockchain technology is still in the research and adoption phases. Several difficulties have been highlighted, including adaptation, security, and protection, among others. To prevent being hacked, the financial sector needs a greater understanding of the Blockchain business and the creation of effective solutions to the highlighted concerns. This administrative work will thus offer an overview of Blockchain technology, examine its applicability in the banking industry, and study associated problems. During the assessment, we also discovered several basic obstacles and ethical considerations associated with the use of Blockchain technology. When the outline is complete, the parties consulted are directed and broken down to reach a decision or resolution regarding how to successfully address the identified difficulties. Preventing assaults and efforts to hijack financial transactions on a blockchain needs excellent transaction integrity, security, and node anonymity [9]. However, blockchain technology several fascinating concerns, such as smart contracts, licensing, cryptocurrency, etc. Therefore, the focus of this paper will be on blockchain technology and bitcoin, examining how they have impacted financial institutions in Nigeria and the issues that have developed as a result.

A. Aim

The purpose of this study is to develop a definition of the blockchain technology idea in Nigeria, with a focus on the services provided by financial technology (Fintech). We will investigate several of the benefits of this technology as well as some of the issues associated with it and possible solutions.

B. Significance of Study

This paper will give an overview of blockchain adoption nationwide, with an emphasis on the accounting industry. The merits and downsides of this new development will be examined. Since it can reach the largest number of people, it may increase average salaries. It will also assist in the protection of personal information, the prevention of dishonor, the enhancement of efficiency, and the management of one's reputation. As part of our examination, we will cover some real-world applications of blockchain technology.

C. Limitations of the study

This work will be limited in terms of implementation of proposed solutions due to the government policies on the use of cryptocurrencies in Nigeria.

II. LITERATURE REVIEW

A. BLOCKCHAIN TECHNOLOGY

In 2008, Satoshi Nakamoto invented Blockchain technology to circumvent or avoid intermediaries like financial institutions, hence enabling peer-to-peer transactions [10]. Satoshi Nakamoto suggested a peer-to-peer distributed ledger for the purpose to be realized. In this instance, both the payer and the payee can perform a transaction across the network, using encryption and agreement mechanisms to create immutable exchanges [11-13]. One of the most important objectives of any payment or financial structure is to prevent double-spending. That is, a framework is in place to identify or track who possesses the funds, and the individual who possesses the funds should be authorized to spend them only once to prevent double-spending. Using an agreement mechanism, blockchain technology solves the dual spending problem [14].

Blockchain technology incorporates both technological and non-technological elements. The incorporation of such advanced characteristics allows for the exchange of valuable products with or without the participation of a certified or centralized organization [11]. Because of this, one could claim that there is a growing interest in this technology. Because it provides characteristics such as anonymity, decentralization, security, and data integrity without the need for intermediary entities or a centralized authority [3]. In comparison to centralized systems, blockchain's decentralized characteristic can facilitate data transparency [3]. It is important to note, however, that because Network users of the public blockchain can choose to act anonymously, institutions that require much more data from their end-users, such as Know Your Customer (KYC) validation, can drastically reduce their privacy standards.

Initially, blockchain served as the underlying infrastructure for cryptocurrencies such as bitcoin. However, over time it has shown to be more advantageous than merely the technology behind bitcoin. Financial institutions are optimistic that this will reduce the cost of operational functions such as international payments, trading, and settlements [15]. This confidence sets the way for a potential upheaval in the financial industry, which might have far-reaching ramifications for future financial transactions.

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Blockchain's decentralized nature offers the potential to lower costs now associated with centralization [12]. Guo and Liang have confirmed this by agreeing that operational risks, delays, and fraud in the financial industry may be mitigated by implementing blockchain technology, however, it is still important to highlight that blockchain networks remain sluggish (Guo [12]. Getting a whole network to consensus may be time-consuming and energy-intens because peer2peer nodes must function as both servers and clients [16].

Blockchain is unchangeable and secure. This indicates that there is a 99.9% possibility of not being hacked or altered without having complete control of the network's machines. However, the idea is elementary when considering the influence of blockchain on any business, notably Fintech. Blockchain, the technology powering bitcoin transactions, is a decentralized, public, digital ledger that validates the integrity of the associated entries [16]. They noted that the emergence of bitcoin corresponded with the initial use of blockchain technology. As of this writing, Bitcoin is still the most discussed and acknowledged use of blockchain technology. Bitcoin was envisioned by [14] as a decentralized computerized cash installment system comprising a public transaction record called Blockchain [14]. According to [16], one of bitcoin's fundamental characteristics is its ability to maintain the value of its currency independently of any central authority [16]. Following this, [12] discuss how bitcoin has caught the interest of organizations and networks and how it remains the most advanced blockchain-based money.

B. Similarities and differences between Blockchain and Cryptocurrency

It is imperative to know the similarities and as well as the significant difference between Blockchain and Cryptocurrency because this will guide us to understand the possible impact they have on the economy and how the technology can shape business transactions in the financial sector in a developing country like Nigeria [4]. Below are some highlighted differences between the aforementioned keywords.

a) Differences:

Blockchain	**Cryptocurrencies**
Inborn Nature Blockchain is a capacity innovation utilized for saving information on decentralized networks. A blockchain can be utilized for putting away various kinds of data past cryptographic money exchange records.	Cryptographic money is a vehicle of the trade like the US dollar.
Monetary Value The blockchain does not have any monetary value.	All cryptocurrencies have a financial worth
Utilization Blockchain innovation has utilizes past cryptographic forms of money. Blockchain can be utilized to keep exchanges in banking, medical services, production network, and retail.	Digital currency is computerized cash, which can be utilized for purchasing labor and products and for a venture.
Versatility Blockchain innovation is decentralized and conveyed everywhere. There is no single place where all records of a blockchain are put away	Digital forms of money, albeit held in blockchain, can be gotten to by using versatile wallets. For example, if you have a bitcoin wallet, you can utilize it anyplace for executing with parties tolerating bitcoin.
Accountability Being a public ledger, blockchain offers a great level of transparency. Anyone can sign up for a blockchain network and access the data there.	Digital currencies offer obscurity. In this way, while anybody can see the source/objective of a bitcoin exchange, nobody can realize who is behind the exchange.

b) Similarities

Immaterial	Cryptocurrencies and blockchain both have an ethereal nature. Like the US dollar or the Nigerian naira, cryptocurrencies are ethereal digital assets that you cannot physically hold. The blockchain that is used to store cryptocurrencies is decentralized and does not exist in a single location or data center.
Enhanced	Blockchain technology and digital currencies are both progressive innovations. Digital currencies are based on the basic breakthrough of blockchain. Compared to conventional data sets, blockchain is substantially higher level and more secure. More innovatively advanced than physical or paper-based monetary standards are digital forms of money.
Intertwined	The most famous cryptographic currency in the world, bitcoin, first emerged on blockchain to record transactions. Blockchain is used by all main digital currencies to record exchanges. In the unlikely event that someone buys a new bitcoin, it is stored in a blockchain for bitcoin.

C. BLOCKCHAIN TECHNOLOGY IN NIGERIA

The operations inside the keeping cash division are not digitalized and not as strong as they claimed to be. There's a need to move from the current system to a more profitable one with, steady trades inside the foremost brief time, a more grounded security system against security breaches, blackmail and versatality. Most of the trades made by banks incorporate center individuals and as such banks are not truly financially free. As a run, the show, the trade of stores to a farther account takes a longer time to be credited since of the bureaucracy related to overseeing an accounting system. The rise of blockchain inside the budgetary division has brought almost in a more capable advantage transport, banks can by and by move saves, particularly from a Nigeria keeping cash account to an inaccessible account with irrelevant threats, there are calculations in the blockchain framework outlined to resolve any unanticipated issues. [8][9]. Administrations within the money related division other than banks and money-related education are persistently improving their frameworks with the assistance of cutting-edge innovation to remain pertinent by giving reasonable administrations at lower costs. Managing an account and other money-related institutions should expect to adopt new blockchain innovations to preserve their position within the environment. The monetary administration industry is the foremost examined of the numerous utilize cases for Blockchain. Here is the basic blockchain utilize cases for banks and budgetary teach in terms of effectively keeping money exchanges [8] [10] [11]. Blockchain empowers banks and associations to form cross-border cash exchanges that convey real-time settlement and spare costs by advancing liquidity and dispensing with compromise, coming about in a Hitch-free Worldwide Installment. It permits a fast interbred exchange. In differentiate to installment frameworks such as Western Union.

D. Fintech in Nigeria

As the evolving financial technology sector in Nigeria continues to expand, the future opportunities are enormous and 13% of Nigeria's GDP is currently served by ICT [17]. Nigeria is evolving into a competitive environment that offers a market for Fintech startups to succeed and eventually evolve into a multibillion-dollar industry. A total of $55.37 million was generated by Nigerian Fintech start-ups, which is more than the amount generated combined in Q1 2018 and Q1 2019. Fintech startups accounted for 82.2% of the overall investment earned in Nigeria's start-up space (Techpoint.africa report, 2020). Nigerian regulators are now trying to find a balance between developing business rules to keep up with the constantly changing Fintech environment and, on the other hand, aggressively launching legislation to drive innovation. The Central Bank of Nigeria and the Nigerian Inter-Bank Settlement System (NIBSS) recently sponsored the launch of the first groundbreaking Fintech industry sandbox initiated by Financial Services Innovators with the goal to reduce barriers to entry into the Fintech space, especially concerning regulation and licensing. This is one of the programs and actions by which Nigerian regulators are seeking to encourage financial inclusion, security, transparency, and the protection of customers [17]. The cashless policy was introduced in an attempt to encourage financial inclusion, which has led to a boom of Fintech start-ups providing ways to make banking available to rural areas of Nigeria. Fintech is now leveraged by conventional financial service providers (banks) to maximize customer loyalty and stay competitive in the ecosystem of financial services. This led to rapid changes in the market for payment services. By 2022 it is predicted that 62% of customers in Nigeria would be accessing financial services via mobile applications [17].

In the Nigerian economy, the impact of disruptive technology has been primarily seen in the fields of retail banking, payment and distribution systems, lending, finance, and financial management. Presently we can state that practically all banks in Nigeria are now operating and promoting strong usage of mobile and online banking and application systems that allow their clients to access bank

services, such as checks and bill payments, and so on. Fintech also creates considerable disruption in the way banks provide consumer services, particularly consumer banking services. Payment and bill collection processes have advanced considerably over the past years, following the growth of electronic payment and distribution systems such as Quickteller, Paga, Flutterwave, Remita, and Paystack, which are primarily non-banking entities that incorporate the payment side of commercial operation [18]. These payment system providers have grown substantially. No laws or standards regulating stakeholders in this field have existed until recently. Previously, interested parties contacted the CBN for approval. To overcome this challenge, in Nigeria in 2018 the Bill Payments Regulation was issued by the Commission and in Nigeria, in 2019 the Electronic Payments and Collections Regulation was introduced to ensure the protection of stakeholders. Different levels of government have incorporated Fintech players in Nigeria to assist in receiving government revenue. The Federal Inland Revenue Service has, for example, launched numerous electronic tax services such as e-Tax payments to pay all federal taxes as well as fees via payment channels like Interswitch and Remita. All transfers presently are made through the Remita online transfer portal to the single treasury account of the Federal Government of Nigeria [19].

E. Importance of Blockchain Technology?

The majority of the global economy is supported by the banking industry. No other middleman in the global financial system is as massive or well-established as banks. Digitalization has had a significant impact on the financial services industry. Digital currency and digital payment have essentially replaced prior monetary systems, such as barter and commodity money, followed by fiat currency. ATMs, EFTs, e-clearing, RTGS, i-banking, debit/credit cards, and m-banking are just a few of the banking advances made possible by technological progress over time [20].

The banking industry is now extremely reliant on technology, making blockchain a potentially game-changing innovation. Using cryptographic hash functions, blockchain technology can record immutable blocks of transactions. It eliminates the middleman. Although blockchain technology is still in its theoretical beginnings, it has the potential to substantially disrupt banking and financial institutions. Because of this, there may be a significant shift in the economic structure. In the past two decades, the IT sector has grown and developed at a dizzying speed [20]. Technology has altered nearly every economic area. Regulation and compliance make it tough to enter the banking business; nonetheless, Fintech companies have emerged as a significant challenge to traditional banks. Combining "finance" with "technology," "fintech" refers to enterprises that utilize cutting-edge IT to provide banking and associated services. They provide payments, clearing and settlements, trading and investing, digital currencies, and other services. Fintech's advent and the innovations it introduces to the delivery of improved financial services mark a substantial shift in the sector.

Typically, financial technology companies thrive at tackling specific challenges where conventional banks fail. Due to fintech's benefits in terms of speed, cheap cost, dependability, and transparency, banks may face competition from fintech businesses. Banks were long the unquestioned leaders in the payment industry, but Fintech firms are currently making significant inroads. A bank transfer across international boundaries can take anywhere from one to five working days and often costs between $40 and $50. (TransferWise). Fintech makes it possible to send remittances quickly, cheaply, and without effort. The speed at which fintech allows clearing and settlement cannot be matched by banks. The usage of digital currencies and digital wallets is growing. Apple, like several other companies, provides its users with a digital wallet that may be used to make purchases or apply for credit. Facebook aims to deploy Libra, a digital currency for payments, in 2021. As more individuals utilize and get accustomed to Fintech, banks may anticipate an increase in competitiveness [21].

Along with artificial intelligence, robotic process automation, big data, etc., blockchain is considered a potential future technology. Numerous financial organizations, including banks, private equity firms, start-ups, and others, are paying close attention to blockchain. After completing a transaction via blockchain technology, several prominent financial institutions are keen to incorporate it into their operations. Among these institutions are J.P. Morgan, Bank of America, Merrill Lynch, HSBC, and several others [20]. The decentralized and unchangeable ledger of blockchain may herald a new era in the history of record keeping. However, banks are not the only organizations that may profit from blockchain technology. It might considerably enhance the backend of the banking sector and reduce operational expenses. When it comes to solving the issues now afflicting banks, blockchain technology is vital. The key advantages of blockchains are their enhanced productivity, lower costs, increased transparency, and lack of middlemen [21]. First, blockchain increases the efficiency of a transaction by eliminating the requirement for an intermediary to make a phone call. Automated systems are faster and more efficient than people in keeping and managing records. Additionally, it minimizes the overall transaction and operation costs. It is possible to settle transactions and release payments without paying the fees of a middleman or commission-based broker. Encryption is used to ensure that all transactions on a blockchain are secure. By disseminating blockchains, all participants can view transaction details in real-time, thereby enhancing the trustworthiness of the network. Since this year.

Through a digital deposit procedure, consumers can see their transactions finalized in as little as 10 minutes, allowing a bank client to serve the unbanked or those who do not have access to traditional banking services. Additionally, the various platforms used in blockchain are designed with an improved security system and lending network. Lastly, better financial services can be enjoyed when services such as check cashing, and payday are being replaced by cryptocurrency-based solutions.

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III. IMPACT OF BLOCKCHAIN TECHNOLOGY ON THE FINANCIAL INDUSTRY

Examining the several ways in which blockchain technology has affected the financial industry is essential for gaining a thorough understanding of this subject. The financial industry has benefited from several blockchain technology advantages.

- **Protection**. The advent of Blockchain technology has solved significant issues and diminished the need for centralized information intermediaries such as system administrators. In addition, it permits customers to utilize error-free, tamper-proof, and obfuscation-free apps without fear of harmful outsiders or fraudulent operations. As a result, it is nearly hard to govern or hack blockchain technology.
- **Scalability**. It is possible to modify the number of blocks in a blockchain by the number of transactions. Scalability is one of the several advantages of blockchain innovation. It offers an undertaking arrangement with global reach and enhanced primary net integrity. Additionally, it enables individuals and secret chains to interact with one another
- **Responsibility**: Due to its distributed structure and how it records transactions, blockchain gives maximum transparency to both parties (sender and receiver), removing the need for a third party to serve as a "bridge of trust." In addition, it adheres to the accepted standards, protocols, and procedures. In addition, both participants in a transaction are aware of the information stored in the block containing it
- **Secrecy**: With blockchain technology, a transaction requires only the sender and the recipient, removing the need for intermediaries like banks and credit card firms. It has maintained the bank's activities confidential and safe while increasing the financial system's efficiency, credibility, and transparency
- **Trust**: Users are more receptive to blockchain's major role in adoption due to the enhanced privacy and transparency it offers. It also makes it much simpler for individuals in corporate networks to collaborate effectively, handle information accurately, and achieve the appropriate agreements
- **Highly effective**: Because it can manage unforeseen peaks in network demand, blockchain increases performance. The private and mixed network may be able to handle hundreds more transactions per second as an extra benefit
- **Programmability**: Blockchain enables the automation of business logic since it increases both efficiency and confidence. Moreover, it encourages the creation and deployment of smart contracts, which are non-modifiable software once it has been implemented.

IV. CHALLENGES OF BLOCKCHAIN ADOPTION IN NIGERIAN FINTECH

In any case of the fervor around this unused innovation, it will unavoidably contain blemishes that will anticipate it from being completely utilized. When it comes to blockchain selection and usage, there are different imperatives; a few are around the world, but others are impossible to miss in a creating nation like Nigeria.

- **Technical knowledge**: Despite the improving quality of Blockchain, Nigerians are unfamiliar with all the technical paradigms, and there is no correct documentation to assist users in obtaining accurate information. Nigerians are unable to directly ask questions or have their doubts answered. This is perhaps one of the reasons the Nigerian government has a negative stance towards it.
- **Infrastructure**: Problems with the infrastructure could reduce the effectiveness and efficiency of blockchain processes. For example, just a small percentage of Nigerians have an internet connection, and those who do have it rarely have excellent quality, uninterrupted service. The country's internet penetration must increase for blockchain applications to be properly implemented and utilized by the Nigerian economy.
- **Task Complexity**: A rise in the volume of transactions carried out in Blockchain necessitates an increase in the blockchain network's bandwidth.
- **Security in the system**: While the blockchain is safer than old centralized systems, more research into its future security is required.
- **Others**: There are many issues to be concerned about, including informational privacy, architectural and design risk, ambiguous criteria, integrations threat, information technology regulatory risks, cybersecurity, outside entity threat, user conspiracy, protection, and supplier vulnerability. Before establishing a blockchain solution, the government and stakeholders must assess the associated business, legal, and technological risks.

V. CONCLUSION

Governments confront various issues postured by blockchain, counting security, getting to law authorization forms, and the presentation of cryptocurrencies as an unused sort of resource. The ecosystem's objective is to construct administration instruments that will help them in exploring the specialized world whereas moreover comprehending a few of the foremost basic components of a vital approach. This paper has investigated the blockchain technology idea or strategy as well as its potential within the Nigerian environment as well as its current focal points. We have at that point investigate the focal points of this innovation and suggestions to handle the challenges that the blockchain postures. These proposals are implied to motivate policymakers to return to the boycott on blockchain exchanges in Nigeria and by understanding these challenges, they can discover arrangements for them and this in turn will offer assistance to the nation colossally.

VI. RECOMMENDATIONS

- 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.
- There is an urgent need for a regulatory framework to be implemented shortly for Blockchain/DLT 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.
- 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.
- 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.
- 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.

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