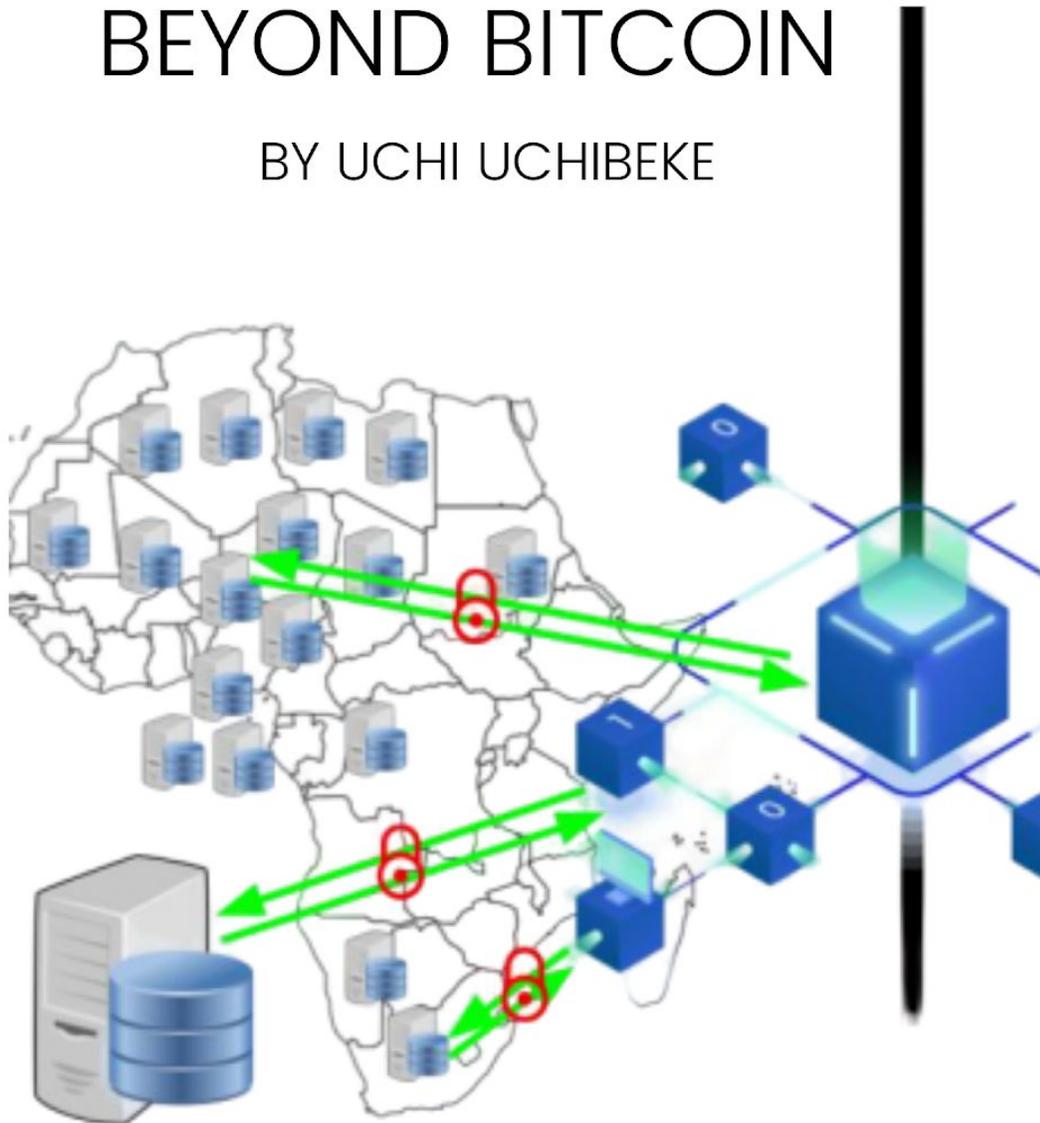


# BLOCKCHAIN BEYOND BITCOIN

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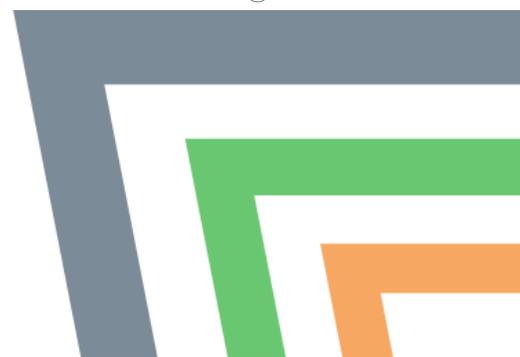


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## Introduction

Blockchain technology revolutionizes the way we store and share data by storing data in a Secure, Flexible and, auditable way. In fact, Harvard Business Review even said it has the "Potential to create new foundations for our economic and social systems."

Blockchain is a network of computers that all agree on a unified ledger of information. The distributed ledger records transactions in a secure, flexible, verifiable and permanent way. Transactions in a blockchain can be an exchange of an asset, the execution of the terms of a smart contract, or an update to a record. Blockchain technology is revolutionizing the way we store and share data and other digital artifacts. It, thus, has the potential to digitally-enable businesses and opens new forms of revenue generation as it has done with Bitcoin and other cryptocurrencies.

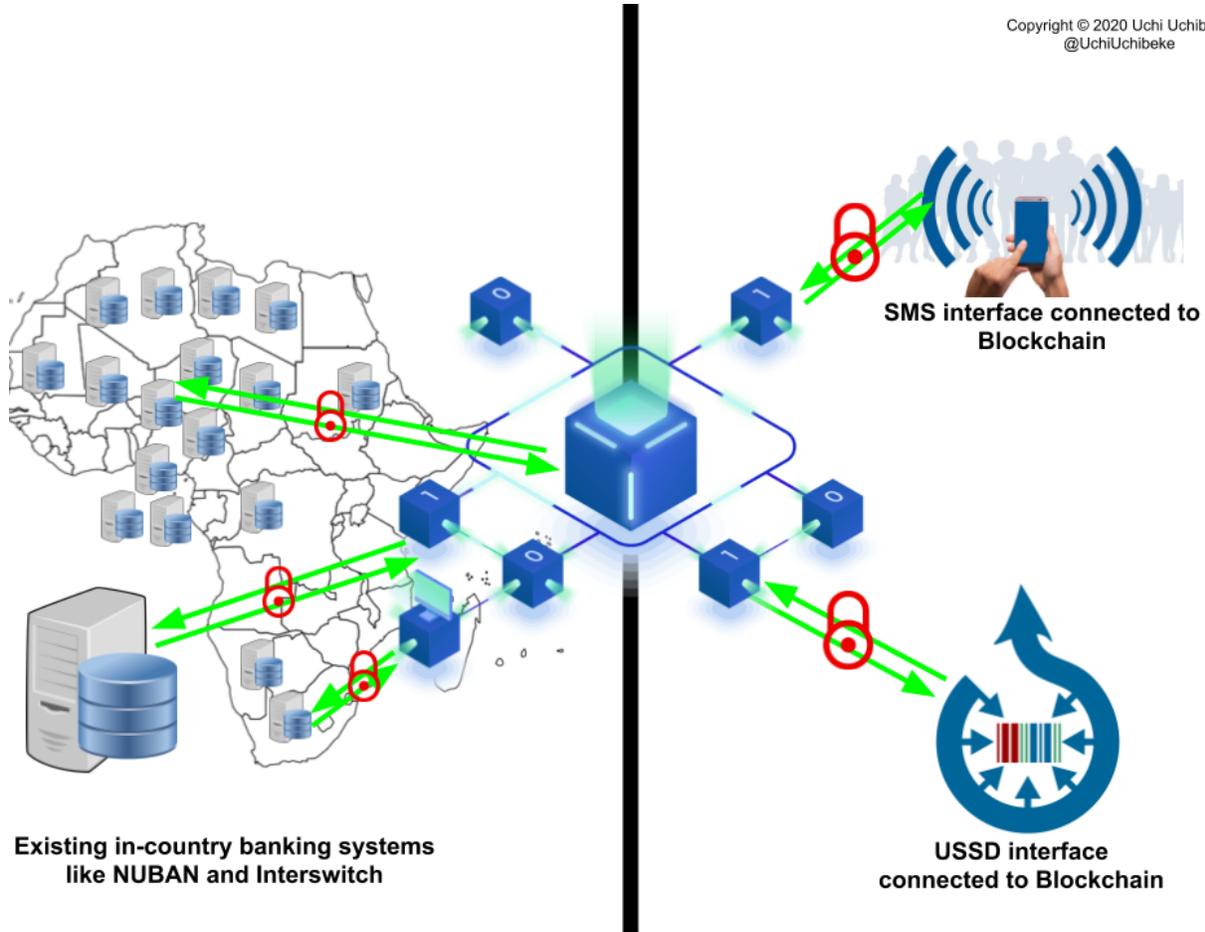


## The benefits of Blockchain

The benefits of Blockchain does not only lie in cryptocurrencies but in the opportunities provided by the technology itself. Public blockchains like the bitcoin blockchain work well for cryptocurrencies. However, financial institutions, governments, and enterprises desire some control and privacy hence the shift towards private and permissioned or permissionless blockchains. Private blockchains, like Hyperledger Fabric, have seen wide adoption by financial institutions like the big banks in Canada and IBM because they provide the benefits of Blockchain in a private and permissioned manner. There are four key benefits that make blockchain crucial for rapid transformation in the 4th industrial revolution (Industry 4.0):

1. Tamper-proof: A completely documented history of all data and changes are available in the chain
2. No single point of failure: If a node fails, the rest of the network compensates
3. Ransomware Resistant: Viruses like WannaCry would have to compromise every single node at the same instant in order to hold the data hostage
4. Cryptographically secure: Uses industry best cryptography to make the data tamper-proof





A sample Blockchain Network to illustrate how African countries can trade without US Dollars.

## Blockchain in the Wild

### Royal Bank of Canada 1000x faster

Why? The problem

At the bank, data was not shared among different lines of Businesses in the same Bank due to technical or business reasons. It felt like customers were redoing their Driver training and test every single time you wanted to buy a new car or rent one. That would be pretty tedious, right?

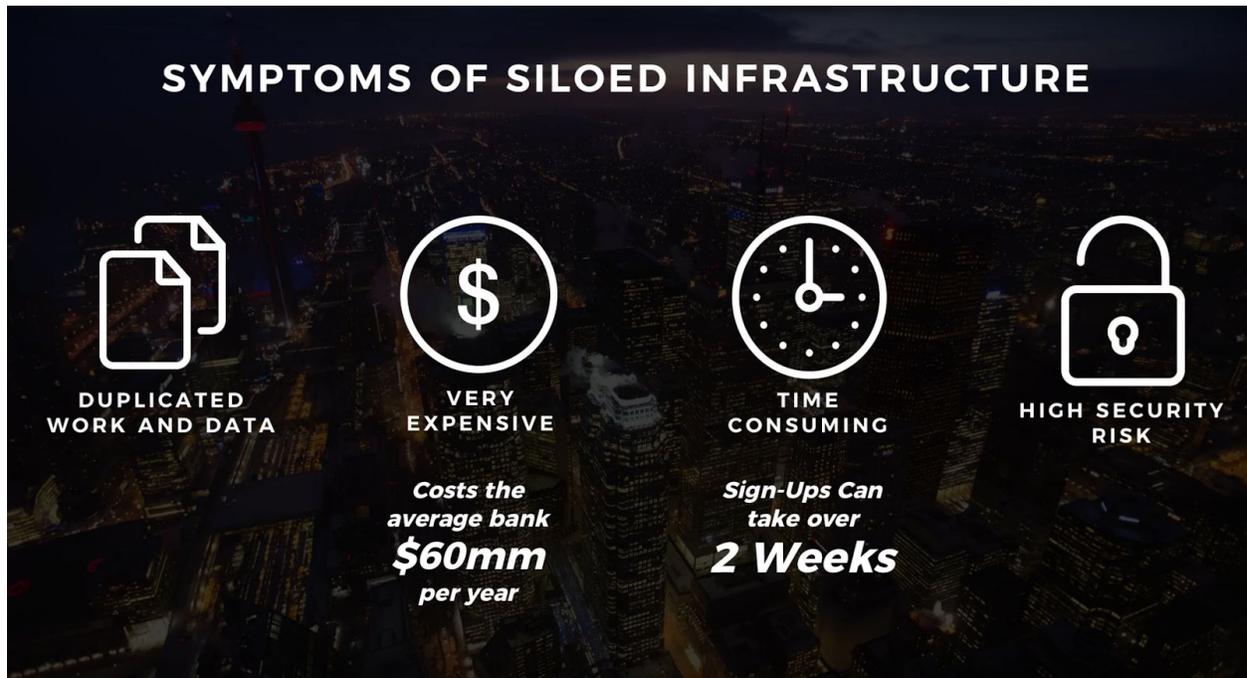


Imagine a Bank customer, Alex, walks into the bank to sign up for a product or service, let's say a savings account with the Private/Personal Banking division of the bank, he has to go through a rigorous background check; which consists of things such as reconfirming his identity, risk tolerance and so much more! All this information is then stored in the bank's private/personal banking database. Now, let's say that Alex wants to sign up for an investment account within the Securities division of the bank. He would have to redo the entire signup process because sharing data between lines of business is, unfortunately, is very challenging. Not only for technical reasons but for business ones too. This leaves Alex buried by all the paperwork from the products and services he's signed up for across the Bank. This creates a frustrating client experience for him. The lengthy process that occurs when a client signs up for an account with another line of Business can take up to 2 weeks before the client is signed up. That's because, at the bank, they need to meet KYC and AML regulations.

## Challenges

1. There is duplicated work for employees as well as duplicated data across the bank
2. It's very expensive to get to know our clients, in fact, it costs the average bank \$100 million dollars for this process.
3. Its very time consuming, as I mentioned earlier it can take a while for the client to be signed up
4. Lastly, the current process is not as secure as it should be!





## How tech was used in the company

To solve the challenge, a team was put together to understand the challenge. Because this was a process challenge and there were many back-office processes that happen before a client is onboarded, the team studied the employees, traveled to bank branches to talk to managers and client services staff and interviewed many executives before coming up with a Blockchain client identity management ecosystem called VERI. VERI is a scalable ecosystem that manages the digital client identity and product signup process across different lines of business, using Blockchain Technology.

VERI offers many of the benefits of blockchains as outlined below:

### Benefits offered by Blockchain

#### Permissioned and Private

VERI was built using a permissioned and private blockchain, so only clients can start the signup process. That means, only the departments that need to see the data, can access it.



### Flexible

Since it is flexible, it's very easy to cater to the needs of different Lines of Business, and they can create custom workflows on the blockchain.

### Permanent

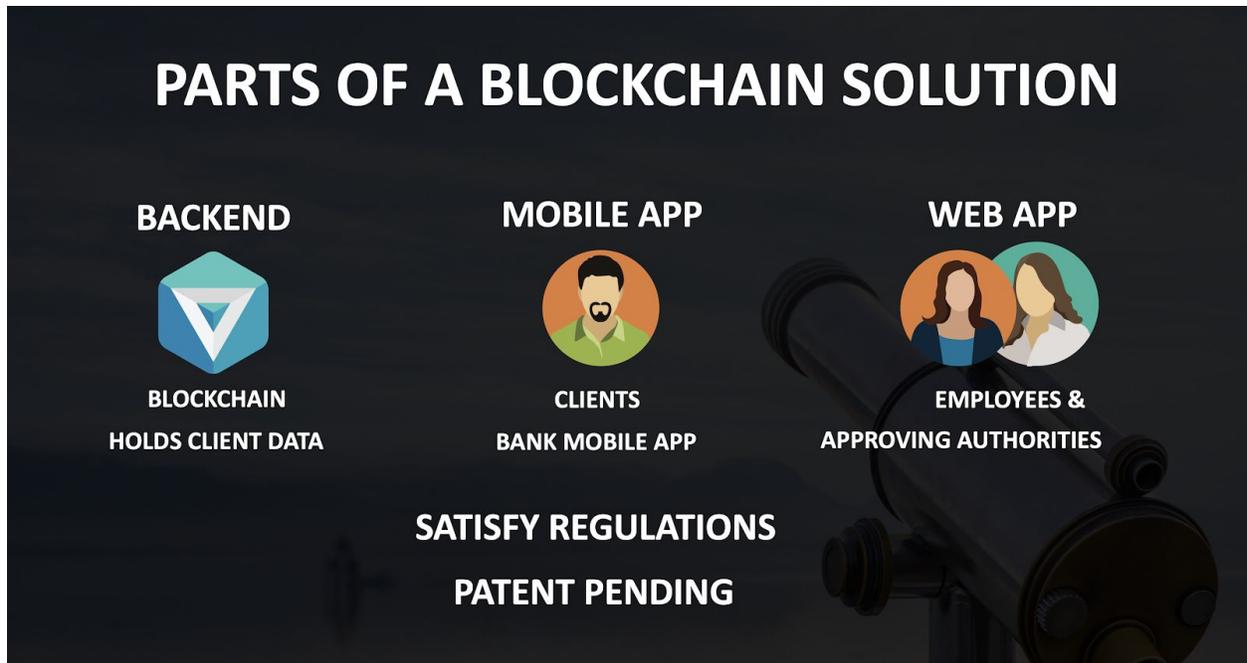
Blockchains allowed the bank to keep a permanent record of data, and it's a history of changes, which makes auditors happy and keeps the Bank at ease knowing data keeps its integrity. This creates one verifiable source of information.

And lastly, due to it's distributed and decentralized nature, there's no single point of failure and provides high availability

### Components of the Solution

- A backend Blockchain which is where the magic happens,
- A mobile application used by existing clients of the bank, which is baked right into the existing Bank app, and
- A Web App used by employees and approving authorities.





When a client wants to sign up for a product, they use their verified digital identity to automatically fill out the application form. Depending on the custom workflow specified by the line of business, the employees of the Bank can review and approve the submission so that the account can then be opened. This verification process satisfies the strict regulatory requirements. The process developed by the team is patent-pending both in the USA and Canada.

## Benefits to the Company

The solution not only solves the Banks data sharing problem but also has additional benefits. Three of the foremost benefits include:

1. It helps the bank understand clients by giving them a holistic view of clients so they can provide personalized products and services
2. It saves the Bank up to \$33mm dollars annually
3. And it reduces a 2 weeks process to 20 minutes ie 1,000x faster

This all improves the client experience.



## Future and potential of the product

The team used two lines of business as use cases for the new Blockchain solution but they designed Veri to be highly scalable so the bank can plug in services from Credit card, Mortgage, and other departments at the bank so clients can use their digital identities to sign up for services in these departments. They do this by providing an interface that allows the bank's employees to add custom workflows and forms without any technical skills.

The solution has the potential to power services for asset exchange, settlement and cognitive analytics. The possibilities are endless and in the future, a Bank with this solution can potentially allow smaller banks and companies to use their platform for user identity verification and make money in the process.

## Buycoins Africa: Naira to Cryptocurrency Platform

### Why? The problem

There was no easy way to buy Cryptocurrencies using your Nigerian Naira or bank account. People had to buy US dollars then use that US dollar to buy the Cryptocurrencies.

### Challenges

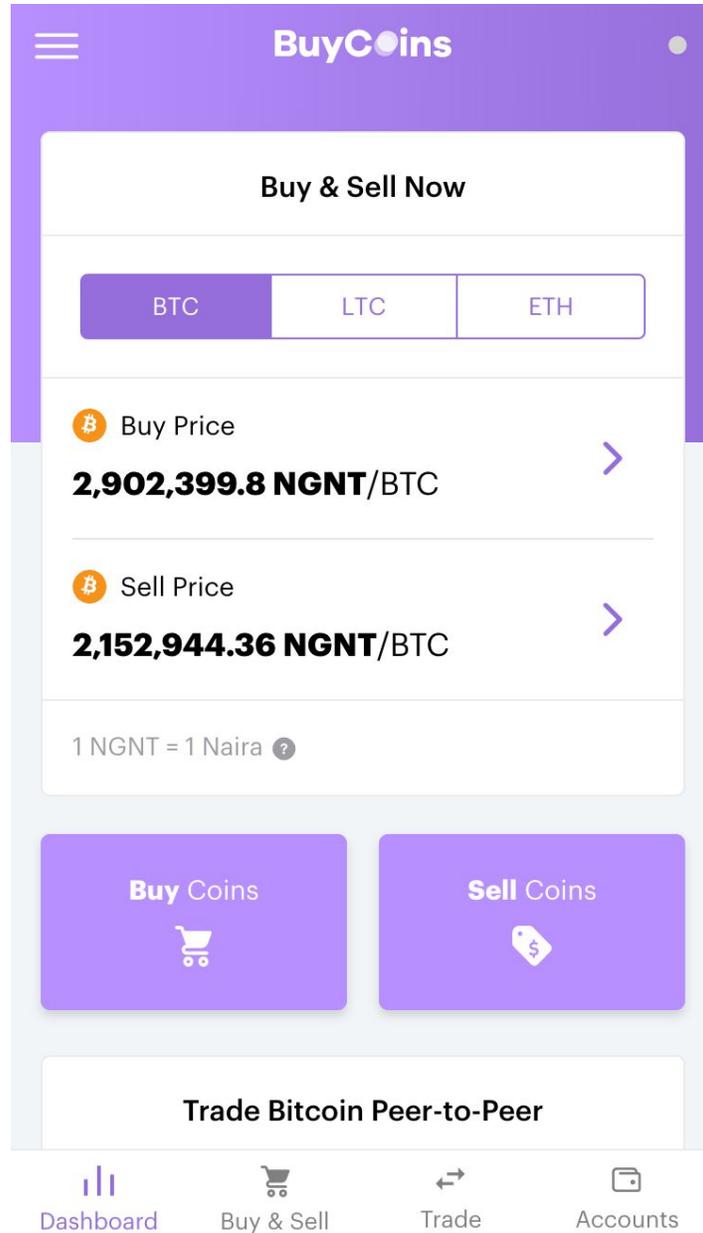
1. There is duplicated work and for Nigerians who needed Cryptocurrencies because they had to spend time to transfer to US dollars and then to Cryptos.
2. It's very expensive to get to own Cryptocurrencies in Nigeria, in fact, it costs the average user 5% of the amount they are spending.
3. Its very time consuming, as mentioned earlier it can take a while for the client to finally have access to the Crypto
4. Lastly, the current process is not as secure as it should be!

### How tech was used in the company

They provide a Blockchain platform that serves users' needs of buying, selling, storing or transferring Bitcoin, Ethereum, and Litecoin - as conveniently and quickly as possible.



To solve the challenge, the founders put together a team of Designer, Developers, and product people. Next, they built mobile apps that likely connect to a Blockchain network to securely store, process and update user and transaction information.



Buycoins Africa enables users to do the following:

#### Create an account

Users can sign up for a free account on the Buycoins website or mobile iOS or Android applications.

#### Verify identity

Users, using their Bank Verification Number, phone number, and Nigerian bank account, Buycoins quickly & securely verify that the user is who they say they are.

#### Buy (or sell) Cryptocurrency instantly

Buy (or sell) in a matter of seconds. We don't have any hidden fees or charges. Just choose a coin, look the price, and pay via a Naira Token account.

### Benefits the Company and Africa

The Buycoins platform provides a seamless way to buy/sell Cryptocurrencies across Africa hence enabling commerce between Nigeria and other countries without the need to exchange to US dollars first For the company, three areas that the benefits are:

1. They make a profit from trade fees charged for peer-to-peer transactions and other fees and from data play. From their website, they mention that their margin on peer-to-peer trading transactions is only 0.4%. Although this is lower than any other platform on the continent like LocalBitcoins (1%), Remitano (1%), and Paxful (1%), Buycoins still makes \$40 for every \$10,000.
2. And it reduces the time it takes to complete the purchase of Cryptos to 0 because transactions are completed and settled instantly.

### Future and potential of the product

The team used two lines of business as use cases for the new Blockchain solution but they designed Veri to be highly scalable so the bank can plug in services from Credit card, Mortgage, and other departments at the bank so clients can use their digital identities to sign up for services in these departments. They do this by providing an interface that allows the bank's employees to add custom workflows and forms without any technical skills.



The solution has the potential to power services for asset exchange, settlement and cognitive analytics. The possibilities are endless and we believe that blockchain has the potential to change the way we do business and to transform the Bank to a truly digitally enabled bank.

## Challenge - Blockchain Beyond Bitcoin

### Description

The objective of this challenge is to get familiar with practical applications of Blockchain, and how your industry/company/Africa can benefit from the technology, today.

You will not provide any specific implementation details for this assignment, rather you will analyze existing Blockchain solutions that exist and evaluate how companies around the world have used Blockchain. Specifically, you will be proposing two applications/use cases of Blockchain to determine its potential for Africa.

### Blockchain Applications

How can Blockchain be used in the industry or company you work at?

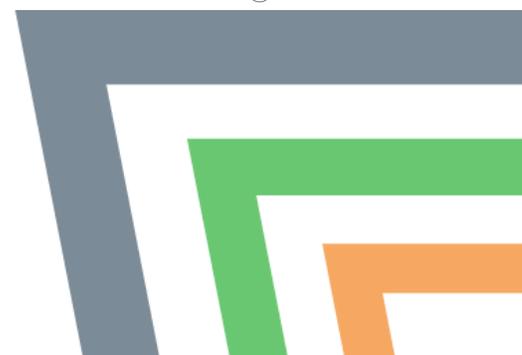
#### Application 1: Blockchain solution for existing Companies

This objective of this application is to explore the potential of Blockchain for existing African companies/businesses. Your proposed application of Blockchain should cover the following. Potentially, the submission should be broken down into the following sections.

- What is the problem that exists
- What challenges does the company/customers face before of the above problem
- How Blockchain will be used to solve the challenge
- What benefits does your proposed solution have over existing systems
- What is the future potential of your proposed solution
- References

#### Application 2: Disruptive use of Blockchain to accelerate industry 4.0 adoption

Consider how Blockchain can be used to provide a solution in an area that no African company is currently tackling. Assuming you have the technical skills, the technology infrastructure, and the team to build a new Blockchain solution from the ground up, what will that be?



Again, your proposed application of Blockchain should cover the following. Potentially, the submission should be broken down into the following sections.

- What is the problem that exists
- What challenges does the company/customers face before of the above problem
- How Blockchain will be used to solve the challenge
- What benefits does your proposed solution have over existing systems
- What is the future potential of your proposed solution
- References

## Tasks

For both applications 1 and 2 above, clearly articulate:

1. **Business Justification:** Why do companies/people need the solution you're proposing?
2. **Tech Justification:** Why is Blockchain the ideal technology for your proposed solution? Why not just a Database?
3. **Future prospects:** What is the magnitude of the impact your proposed solution will have for Africa?

## Submission

All submissions must be saved as a PDF document and uploaded to the [Challenge's Google Form](#).

## Grading

This challenge is not graded but if you're willing and able to put in the work to bring your ideas to life, we might be able to build a team to make it happen. The team will comprise of:

1. **Tech Talent** from AfricaHacks and NaijaHacks
2. **Tech Infrastructure** from Amazon Web Services and
3. **Business Mentorship** from London, Canada based BizSkills Academy

This is an individual assignment. You are encouraged to discuss the general concepts with your others, but the specifics for the applications in this assignment should be done completely individually. People that copy work directly from the internet will be doing a disservice to themselves since the purpose of this assignment is to open a new world of possibilities for the People.



# Frequently Asked Questions and Answers for Executives and Business Leaders

## 1. Why not use a database? How is blockchain better?

Blockchains and Databases are not opposites of each other. Blockchains do use databases themselves, but Blockchains add some great benefits.

Blockchains are distributed throughout the entire network, so they're ransomware resistant to viruses like WannaCry.

Most importantly, Blockchains enforce trust between 3rd parties. The 3rd party could be a client, and they need to trust a Bank and the Bank need to trust them. By putting the power to unlock the signup process into the client's hands, the bank prevents the possibility of fraud, like the Wells Fargo case where employees were signing up clients for products and services that clients never asked for.

## 2. How many nodes (Servers) do I need for blockchain Solution?

Some solutions start with 4 Nodes for a minimum viable product. However, Blockchain networks can easily add more nodes as the need arises. Additionally, with Public blockchains like Ethereum, you do not need to host a node.

## 3. How does blockchain allow a company to get useful statistics/analytics?

Because Companies will have a permanent record of truth and customers allow the company to view the information, they will have a holistic view of the client are able to track data about client information changes as well as client mobility through the Company.



#### 4. How do I migrate existing clients and add new ones to the Blockchain to the blockchain?

A new client has to fill out a form like they always would normally do. However, the difference for the Blockchain solution is that the information they fill out will be readily available to them whenever they want it across any line of business that is authorized to view it. The experience doesn't change for completely new and existing clients. There will be a data migration process that should not affect the existing system.

#### 5. Are blockchain solutions production-ready? What will make the solutions I build at my company production-ready?

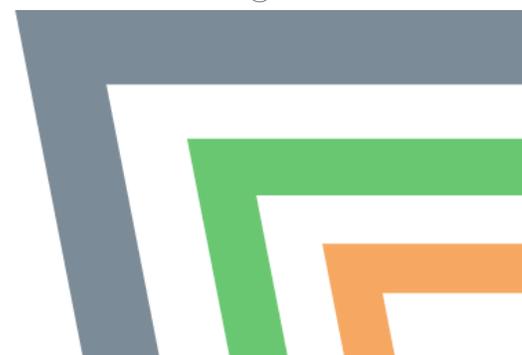
Blockchain POCs can be implemented in as little as 4 months. After the POC stage, solutions still need to be worked on for scalability and robustness. For a solution to be production-ready, measures including QA testing and some refinements, depending on the stakeholder feedback, need to be carried out. However, Blockchain technology gives us additional confidence in the security of the system.

#### 6. Why is the KYC/AML process as existing institutions not as secure as it should be?

The KYC/AML process in many institutions is paper-based and it exchanges many hands. The process essentially becomes a game of telephone, the more people who are needed in the transaction correlates to a higher probability of a bad actor being able to exploit the data.

#### 7. Do company employees need to download a new app to use a Blockchain system. Will adding Blockchain change our workflow?

A Blockchain system can be designed to allow companies and their departments to define custom workflows by exposing services that they can connect to. This allows employees and partners to continue to use the interface that they are familiar with and love.



## 8. How easy is it to scale a Blockchain solution to multiple locations and departments of a company?

Theoretically, if every department and sub-department wants to join a Blockchain network, the system can be designed to support plug and play modules. However, the biggest challenge is a Business one and not a technical one since many companies or departments in a Company will prefer not to come onboard or share data.

## 9. What blockchain framework can I use? Why should I choose that over other alternatives?

Hyperledger Fabric is a great Blockchain solution for large companies because it is great for private blockchain and enforces privacy through permissioning. Ethereum is good for smaller and newer startups.

## 10. What gives a blockchain solution a competitive edge on other digital systems for secure communication?

The competitive edge of a Blockchain solution comes from how blockchain stores and shares data. For some context, an immutable record of all actions or data manipulations that happen on the blockchain is stored, this means that any letter's history can be reliably traced. Also, with permissioning, only the client and authorized employees and partners can view, process or update data.

