

BLOCKCHAIN TECHNOLOGY

THE FUTURE OF AFRICA'S DIGITAL ECONOMY

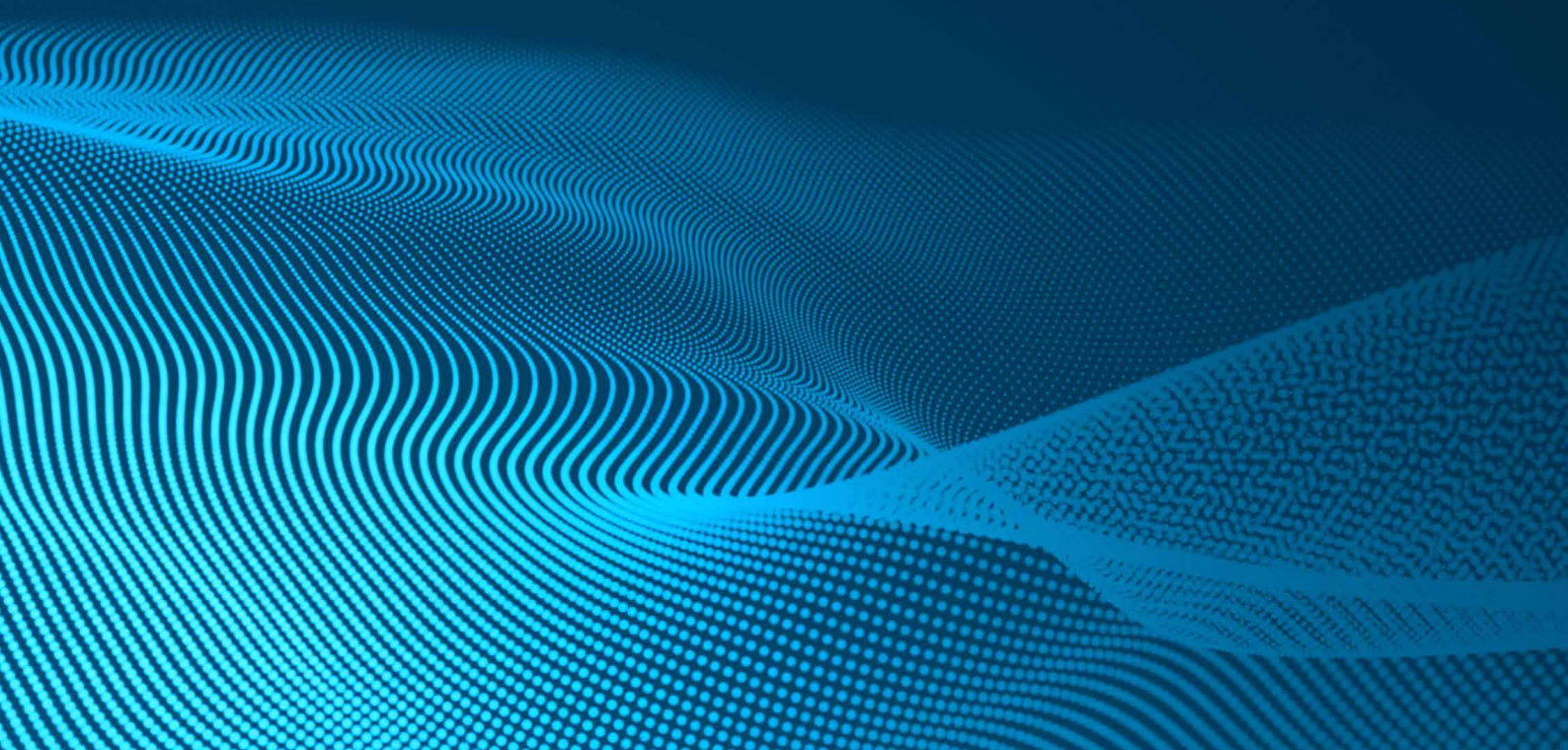


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Over the years, we've witnessed technological advancements across different sectors/industries, which have become rapidly accepted universally.

Blockchain technology, although only just emerging, has gained popularity in modern societies and is rumoured to be the next big thing, just like the internet was in the 1990s.

What are the possibilities of 'owning your bank' or making money transfers without relying on third parties or worrying about exorbitant transaction fees? Businesses can also share information freely and improve processes without fear of malicious actors interfering with their system.

These possibilities are not futuristic projections, as they are currently being enjoyed by early adopters of the block chain technology. The use cases above only scratch the surface of the different advantages of block chain technology, we'll dig in deeper as this paper progresses.

The blockchain is a chain of blocks that solves the problem of centralization, hence it is said that Blockchains are decentralized digital ledgers which utilize cryptographic algorithms to verify the creation and transfer of digitally represented information over a peer-to-peer network.

The Economist calls the blockchain technology "the trust machine", because "people who typically have no particular confidence in each other can collaborate without having to go through a neutral central authority."

Simply put, blockchain is built on these principles;

Decentralization: With Blockchain, there is no central point of control. The absence of intermediaries promotes the ease and speed of transactions as it doesn't require verification from any central authority.

Transparency and Auditability: Blockchain transactions are traceable as participants have access to every record and can validate identities without intermediaries. This automatically encourages accountability between participants.

Security and Privacy: Background checks on individuals are carried out through cryptography and permission is given only to authorized individuals. Furthermore, users can decide to remain anonymous, therefore protecting their identity on the network and maintaining confidentiality

Major Players

The blockchain community operates under either of these networks; often called types, we'll refer to them as major players in this paper;

Public Blockchain Networks

A public blockchain is one that anyone can join and participate in. Bitcoin, Ethereum, Tezos and the likes, fall into this category. Under this network, access is guaranteed for everyone and security of the blockchain is ensured.

Private Blockchain Networks

Although similar to the public blockchain network, an organization is responsible for controlling participation by users. This implies that the network is accessible to only authorized and known users. Participants and users have the right to upload data records. A few examples include Hyperledger, Ripple, MultiChain, etc.

Hybrid Networks

A type of blockchain technology that combines elements of both private and public blockchain. It lets organizations set up a private, permission-based system alongside a public permissionless system, allowing them to control who can access specific data stored in the blockchain, and what data will be opened up publicly.

Consortium or Federated Blockchains

Federated blockchain or consortium blockchain is a blockchain technology where multiple organizations govern a decentralized platform. It's not a public platform rather a permissioned/private platform.

Blockchain and Cryptocurrency

It is impossible to discuss blockchain without discussing cryptocurrency; a major beneficiary of the blockchain technology.

Cryptocurrency is a digital payment system that doesn't rely on banks to verify transactions. Instead of being physical money that is carried around and exchanged in the real world, cryptocurrency payments exist purely as digital entries to an online database that describe specific transactions, all powered by blockchain.

Bitcoin

This is the first, oldest and most popular cryptocurrency in the world. Created in 2009, it has since recorded considerable success over the years. At its launch, a bitcoin cost just a few cents but at the time of writing this paper (Sept 2021), a bitcoin is currently priced at \$43,000. As a means of payment, Bitcoin is being accepted by a growing number of merchants, prompted by transaction fees that are generally less than 2-3%.

Ethereum

Ethereum, although not as popular as Bitcoin, has recorded a good level of popularity and growth since its inception in July 2015. An Ether currently sells for \$3,428 dollars in the crypto market. Unlike Bitcoin that focuses on payments, Ethereum offers more as it makes it possible to run "smart contracts", autonomous programs that automatically execute actions validated beforehand by the stakeholders. An Insurance company, Insurance Gian AXA is recorded to utilize the Ethereum blockchain to manage insurance contracts and to process payments.

Other Cryptocurrency worthy to note are Dogecoin, whose price skyrocketed after receiving backing from Tesla CEO Elon Musk. It has however reduced in value as a coin is currently worth only \$0.25. Cardano which prides itself in being a more sustainable and balanced coin is currently worth \$2.40. Litecoin, who shares similar technology as Bitcoin but generates blocks at even a faster rate is worth \$180.90

Application of Blockchain Technology

Blockchain technology, although very prominent in the banking/ payment industry as popularized by the likes of Bitcoin and Ethereum, other opportunities and use cases of blockchain have been identified which would be discussed below.

Attracted by the different advantages of the blockchain technology such as decentralization, security and transparency, other industries have jumped on this trend, implementing strategies that meet the current realities.

Finance Sector: The financial industry recognises the impact of blockchain technology in generating new revenue, reducing risk in business operatives, delivery efficient processes amongst others benefits, and as such, are beginning to infuse blockchain technology in their business processes.

The digitization of financial instruments, such as digital assets, smart contracts and others seem to be the focus of financial industries, given its advantages. These instruments will redefine the processes of commercial and financial markets, creating a new and valuable shift. Functions within the financial sector such as Capital Market, Asset Management, Payment & remittance, banking & lending, trade finance, insurance, etc, can take advantage of this revolutionary technology and adopt it in their business operations.

Education: The education sector is fast adopting blockchain technology to their processes. As education has become more diversified, methods and operations within the sector have changed accordingly. Issuance of certification, storage of educational credentials, payment of fees, etc are processes that can be done seamlessly via the blockchain technology.

Land Management: The problem of land management in respect to ownership and forgery of documents, can easily be solved through blockchain. Information can be stored on the ledger. Because of the decentralized nature of block chain, information cannot be forged and transparency is maintained with transfer of property ownership. For example, Sweden, Georgia and Ukraine¹⁶ property registers are being moved on to the blockchain.

Law: Smart contracts, a set of promises, in digital form that relies on blockchain technology to prevent falsified documentation, can seamlessly be adopted and automated with blockchain technology. Contracts, transfer of ownership, delivery of goods or services can be traced without the need for a trusted third party.

Governance: Transparency of government processes, secure online voting system and control of public expenditure are some of the benefits of implementing blockchain technology in governance. Citizens' data can also be managed and securely stored on blockchain enabled platforms.

Health: Patients or medical reports can be stored on a blockchain. This ensures a smooth flow of operation, in terms of transfers, within hospitals. Patient care and health personnel's duties are generally improved, as records are easily accessible and continuously updated.

Supply Chain: With the blockchain, companies make supply chains, shipments and deliveries completely transparent. By using the blockchain, companies will benefit from more trust for users.

Travel: Blockchain allows loyalty programs to be managed transparently for the customers and streamlined for the company. It also provides a reliable and automated system for on-line booking as well as identity or insurance management

Insurance: Intelligent contracts, or self-executing contracts, have emerged with this technology, more precisely thanks to the Ethereum network. These stand-alone programs execute automatically the terms of a contract, without human intervention, based on reliable data sources capable of providing the required information.

Africa and Blockchain Technology

In Africa, the adoption of blockchain technology is slow but progressive. Popularized by the upsurge of Bitcoin, individuals and businesses are beginning to embrace the new phenomenon. Motivated by the several advantages attached to the revolutionary technology, it is expected that this new trend will be the order of the day in several African communities in the years to come.

A few African countries have adopted the decentralized approach, especially in the banking and finance sector. Banks in South Africa such as BSA, First National Rand, Investec, Nedbank, Standard Bank, and the South African Reserve Bank, utilize an encrypted, secure distributed database. The private banks have adopted a private blockchain while the rest have adopted public blockchain.

Kenya is not left out. The introduction on BitPese, a money remittance platform that converts digital currency such as Bitcoin to the local African currency without the involvement of third parties, is gaining ground in the country. Nigeria also recently announced Bitt Inc as technical partners for their digital currency, eNaira, that is set to launch before the end of 2021.

In the Land Management sector, Rwanda has an initiative called Bitland, which leverages the Ethereum blockchain to protect land ownership by making land details available to the public. Rwanda,

In the transport sector in Kenya, the National Transport Safety Authority(NTSA) has linked many state agencies to its service with the aim of alerting security about vehicle's insurance and other important details like ownership.

This will eventually lead the country to a point where all vehicles will have an electronic sticker on the windscreens detectable via use of special gadgets, thereby helping to recover stolen vehicles.

In the education sector, Nigeria has utilized the Blockchain technology as its government agencies have collaborated with Cryptography Development Initiative of Nigeria (CDIN) in the education sector.

In Kenya the health sector has put in place a smart platform that employs the Blockchain technology, nearly all public hospitals share a common hub where data like the use of public resources and hospital management can be monitored. The action is being achieved through the development of a cloud-based database.

Other use cases or applications that have developed in Africa are;

- Online payment systems for fast growing e-commerce across Africa
- International money transfer system, between African diaspora and their countries. • Land security system (cadastral management), already being tested in some African countries
- System for combating counterfeit medicines that decimates our poorest populations
- System of traceability of the different raw materials and other mining products of our country (secure route, identifying and reliable actors, removal of intermediaries not indispensable, etc.)
- Copyright management system
- System for the attribution and monitoring of public procurement

(Source: Blockchain Technology in Africa Draft Report)

In Africa, the benefits of blockchain technology are enormous. Some include;

- Facilitates cross-border transactions:
- Reduces the high cost of remittance payment:
- Enables access to financial services
- Ensures privacy
- Creates jobs
- Improves business environment and fosters healthy competition.

Challenges

We cannot deny that poor infrastructure, lack of human resources and capital, and political forces pose major challenges to the success and general adoption of blockchain technology in Africa. But even more, technical, regulatory and institutional challenges are major aspects that are crippling the acceptance of Blockchain by both businesses and individuals in Africa.

Technological Issues: Although technology development is progressing, there are still hindrances that need to be addressed and attended to, if this technology is to be adopted fully by users. Some of the challenges, although not limited to include;

- i. Scalability and Transaction speed of decentralized ledger systems, especially those in the public domain like bitcoin
- ii. Network security and protection against potential cyberattacks, case in point, Ethereum.
- iii. Data privacy protection.

Regulation: Another major challenge is the resistance from government and other agencies responsible for authorization. Reasons for this vary but lack of understanding the benefits of new technologies is a common denominator.

While cryptocurrencies have self-regulating mechanisms, there is still a need for localised frameworks that guide start-ups and organisations using blockchain technology to solve local problems.

Skills Development: Despite the rise of fintechs and software development, there is still a huge gap in expertise. Blockchain technology is labour intensive, from installing to feature development, mining and security. This calls for skill development amongst technical enthusiasts.

Finally, although these challenges seem to have been slowing down the adoption of cryptocurrencies and blockchain technology, the future of decentralised models of trust remains optimistic.

The Way Forward

With a very promising future, it is important that both private and public stakeholders make necessary adjustments and infuse blockchain technology into their policies.

It is important that stakeholders invest in proper infrastructure, engage responsible bodies with the aim of influencing policy and regulation changes that will favour the adoption of Blockchain technology.

Skills and development is also key, there needs to be a critical mass of skilled human resources in terms of developers, integrators and administrators that can build and maintain the system this technology will be operating.

Finally, Blockchain technology has the potential to foster innovation and broaden access to banking systems for entire countries and provide greater access to financial services in developing and emerging markets like the African continent.

Therefore, African financial institutions need to position their business strategically to embrace this new and disruptive technology.

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