AFRICA BLOCKCHAIN INSTITUTE

Algorand FOUNDATION

AFRICA BLOCKCHAIN REPORT 2022

..accelerating Blockchain Innovation Across Africa

2ND EDITION

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The work culminating into this report was funded by the **Algorand Foundation**

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A MESSAGE FROM THE **EXECUTIVE DIRECTOR**

Kayode Babarinde

Executive Director
Africa Blockchain Institute

Welcome to the Second Edition of the Africa Blockchain Report, a yearly publication of fact finding, and evidence based research, on the continental wide deep activities of the use of Blockchain Technology, more specifically with focus on four countries: Ghana, Egypt, Rwanda, and Zimbabwe.

Africa is a continent with a lot of potential for blockchain technology. There are many countries on the continent that are well positioned to take advantage of this new technology. According to the MIT Sloan Management Review, blockchain technology could be as 'fundamental as the Internet' in shaping the future of business. Assuredly, this would mean business not just in Europe and the Americas but also in Africa. Africa is home to people and is not free of its problems and these problems can be solved with the likes of transparency and automation that blockchain technology provides.

Though cryptocurrency adoption in Africa has been accelerating, data and insights for other African Blockchain-related applications are *"fragmented and thinly spread,"* hence, the Africa Blockchain Report, with the core objective of bringing forth the missing pieces of actual blockchain technology use cases from across the continent, Africa.

In this Report, you get insights on blockchain activities in case study countries, stages of blockchain startups, learn from ecosystem stakeholders, amongst others. I am super proud of the Research Team that has put this Report together, for their resilience and commitment, in delivering this Report.

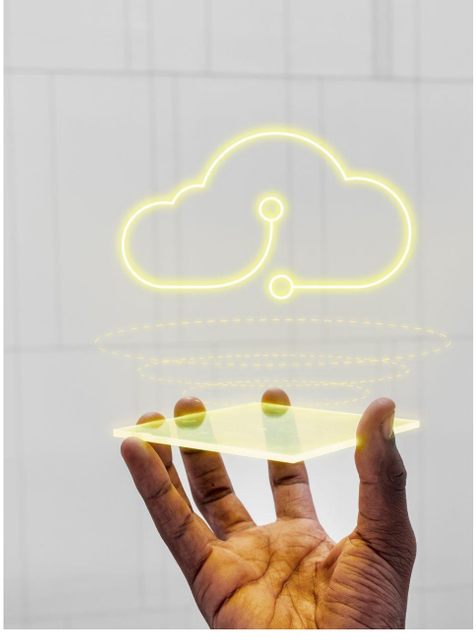
At Africa Blockchain Institute (ABI), we believe that Africa is a treasure chest waiting to be opened and blockchain technology is the key. This is why we focus our efforts to champion initiatives that drive digital transformation in Africa through blockchain technology.

I hope you find this Report resourceful. Special appreciation to the Algorand Foundation for supporting this research, as we look forward to the Year 2023.

It is a great delight to expand and extend this research to other countries after the first edition published in September 2021. We learned a lot of valuable lessons from the first edition and this motivated us to spread our inquisitive tentacles to other countries that has now led to the release of second edition. Many thanks to the Algorand Foundation for the continuous support on this research project.

In this second edition, we focused on Rwanda, Ghana, Zimbabwe and Egypt. The goal remains to shed light on grassroots blockchain innovation in these countries and also to understand the blockchain misconceptions going on in these regions. It has been six month of digging, asking and collecting valuable data and we are proud to eventually put this report in your hands.

THE EDITOR



We are confident that this report will further contribute to the knowledge pool in the blockchain industry in Africa, useful for investors, ecosystem players, government and policy makers in their research and decision making on blockchain innovation across the region studied.

A systematic curation of the thoughts and ideas of the stakeholders have been done, complimented with the data collected from the blockchain startups and innovators. The data reporting has also been done in such a way that it makes information retrieval easier for any reader of this report. This is a material that will serve the immediate needs of researchers and also a reference material for the future.

Enjoy reading!

Oluwaseun David ADEPOJU
Editor, Africa Blockchain Report.

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AFRICA BLOCKCHAIN INSTITUTE

Africa's foremost Blockchain Think-Tank that is reimagining the possibilities of Blockchain Education, extensive Evidence-Based Research, and High-End Deployment solutions, for Digital Transformation in Africa.

ABI wants to inspire and multiply the kind of technology disruption that furthers innovation, decentralization, and other areas of scholarship that will best serve Africa. The Institute is committed to generating strategic programs, deploying solutions, and researching policies, by working with others in solving Africa's great challenges, using blockchain technology. ABI brings together leading experts in government, business, and academia, from all over the world to provide the highest quality research, and teachings, that push the boundaries of human knowledge.

For more information, visit
https://africablockchain.institute/

ALGORAND FOUNDATION

The Algorand Foundation is a not-for-profit organization that has a vision of a borderless, frictionless economy built on public, decentralized blockchain technology. The Foundation envisions a wide breadth of applications being built on the Algorand protocol by a new, broader community of blockchain and mainstream developers. The Foundation is committed to facilitating this innovation in a sustainable and eco-friendly manner.

For more information, visit
https://algorand.foundation.

Table Of Contents

Each Country Case Section Contains:
Current Government Policies and perceptions about blockchain technology, activities, as well as accounts from key stakeholders in the country's blockchain industry.

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INTRODUCTION & PURPOSE

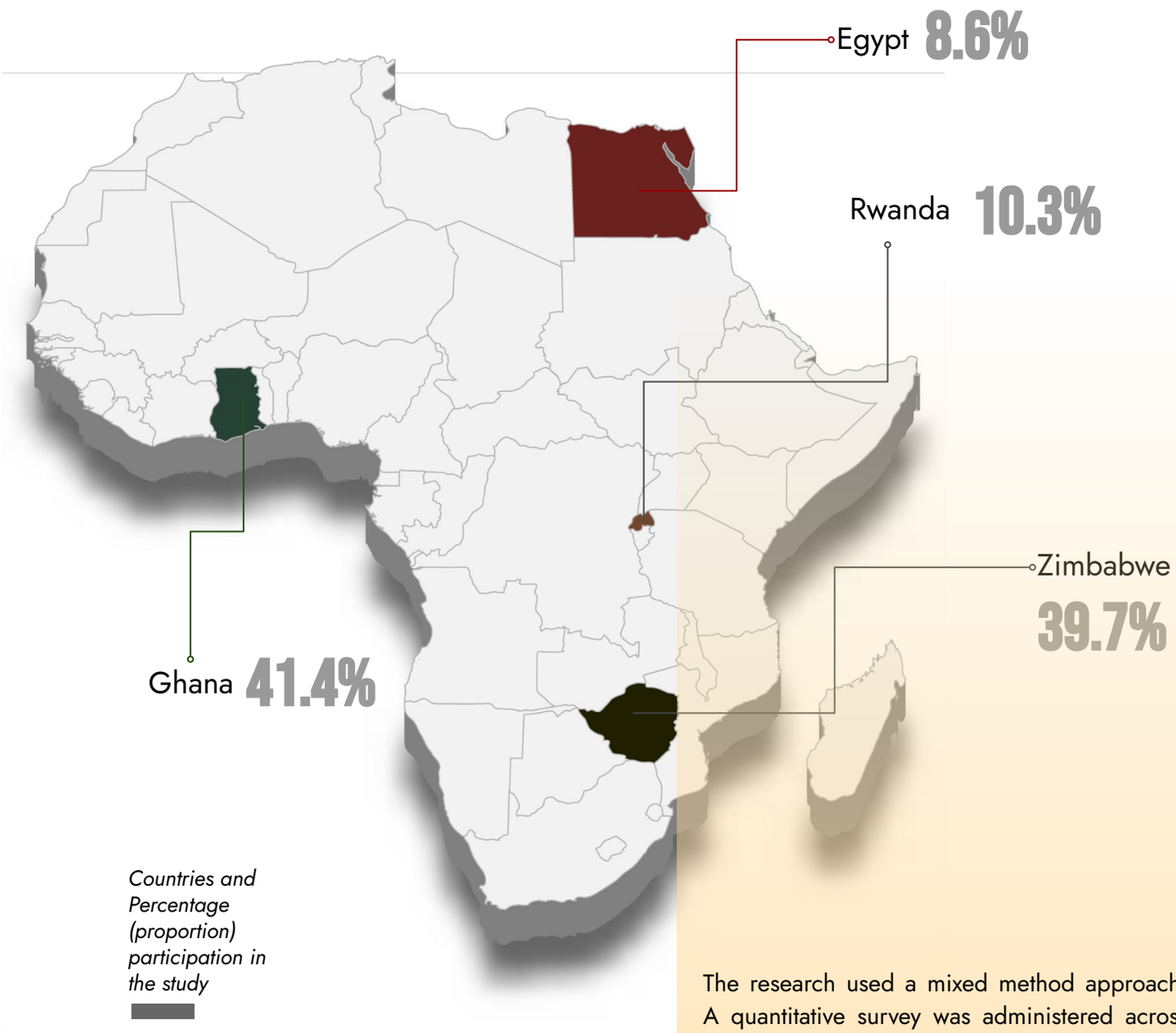
The industrial revolution ushered in a number of new technologies, one of which, Blockchain, has significantly increased the potential for disruption across all sectors of society. While many people are still figuring out how to use this technology and what it can do, others are already familiar with everything it can do, including its applications for Smart Contracts, Decentralized Autonomous Organizations (DAO), DeFi (Decentralized finance), and Cryptocurrency exchange interoperability. It is vital to highlight that Blockchain technology was initially faced with distrust and misinformation, especially in Africa. Many uninformed Africans have associated Blockchain with scams, Ponzi schemes, and other types of financial fraud due to the prevalence of crypto-related conspiracy theories. Due to the lack of information and orientation on how the technology operates, many Africans have fallen victim to fraudulent investment schemes, tarnishing the reputation of "blockchain" throughout the continent.

We cannot deny the importance, significance, and utility of Blockchain in a multitude of industries despite the fact that many Africans are uninformed of or have a completely false understanding of the technology. The technology's potential for digital economy entrepreneurs and public-sector partners in Africa is even more enticing. This research project aimed to examine the current state of Blockchain activity in Africa. The purpose of this practitioner study is to teach the African and global audience about Blockchain use cases, success stories, common misconceptions, and future expectations for the technology. In Africa and throughout the world, blockchain technology has been misunderstood as an enabler of Ponzi schemes, dark web operations, money laundering, and cryptocurrency fraud. Many regions of Africa still have a high level of ignorance regarding this technology; therefore, it is time to change the narrative. In cooperation with the Algorand Foundation, the Africa Blockchain Institute conducted continent-wide research to highlight Blockchain activities by technology business founders, Blockchain pioneers, and technology ecosystem stakeholders in Africa.

In a nutshell, this report's material portrayed the following research objectives:

- To gain in-depth knowledge of the use of blockchain technology in Africa.
- To bridge the knowledge gap between academic blockchain technology research and Industrial blockchain use and application.
- To produce an African blockchain report that is data-rich and genuinely representative of the actual situation of use cases, innovation and application of Blockchain in Africa.

SCOPE AND METHODOLOGY



Countries and Percentage (proportion) participation in the study

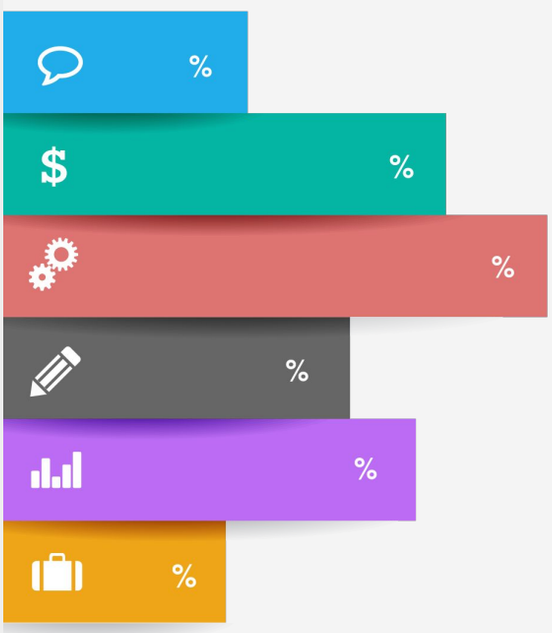
Survey Respondents

The startup companies that participated in this study have been sampled from the general entrepreneurship and innovation ecosystem as either originally blockchain companies, or those who have just integrated the blockchain technology into their operations. The sampling strategy was purposive but since response rate was low, snowball technique was applied to discover new participants.

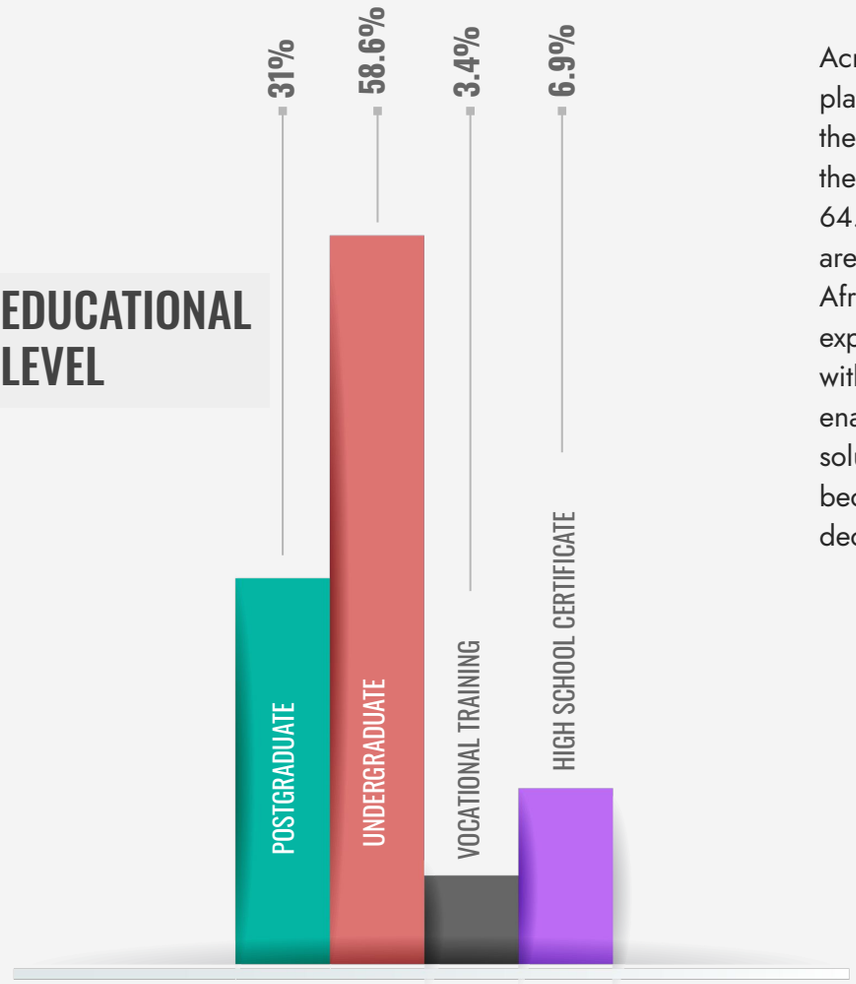
The research used a mixed method approach. A quantitative survey was administered across tech-hubs, including freelance blockchain innovators in four African countries (Rwanda, Ghana, Egypt and Zimbabwe). An in-depth qualitative interview was done by interviewing selected key ecosystem players in the four countries.

SUMMARY OF BLOCKCHAIN ACTIVITIES IN CASE STUDY COUNTRIES

The data shows that the blockchain ecosystem in Ghana and Zimbabwe are more robust compared to Rwanda and Egypt with evidence of more practical use cases and aspiring startups working with the technology. A number of interesting and positive conversations are happening across these four countries from the government and private sector and there is hope that concrete regulatory structures and policies will be made in these countries to further accelerate the adoption and increase the use cases.



EDUCATIONAL LEVEL

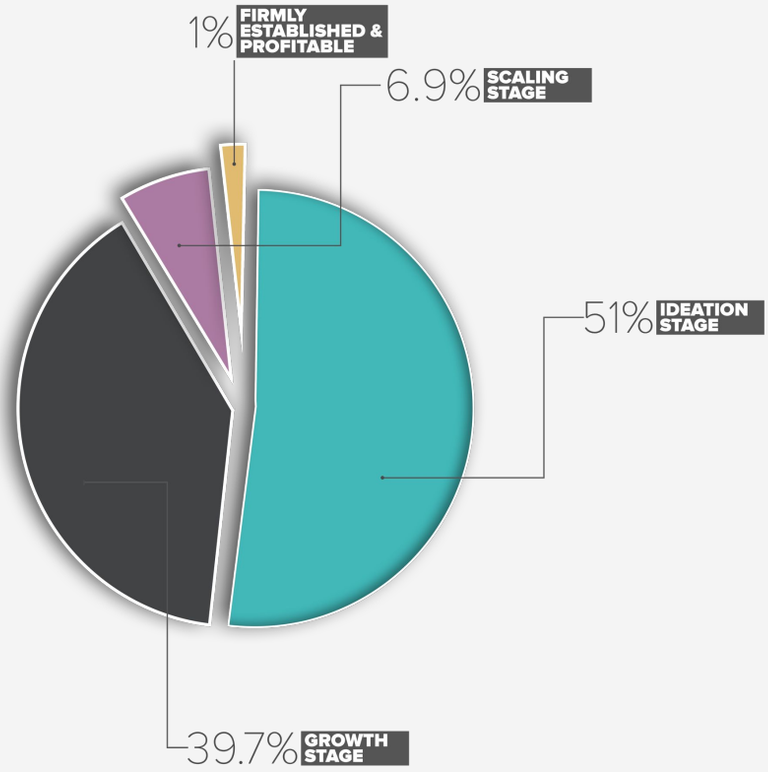


Across the four countries where the study took place (Rwanda, Zimbabwe, Ghana and Egypt), the Blockchain solution builders are mostly under the age of 30 with an overall percentage of 64.4% while those that are under the age of 40 are 23.7%. This data speaks to the fact that African young people are building and experimenting with Blockchain technology and with the great ecosystem support, investment and enabling regulatory environment, Blockchain solutions across several layers of the society will become mainstream within the next Africa decade.

It is interesting to note the influence of educational levels within the innovation of blockchain technology. According to data form the fours countries, 58.6% of the respondents are undergraduate students while 31% are at the postgraduate level of education. ***This data speaks to how advanced education creates curiosity, passion to solve problems and the desire to experiment with new technologies.*** With this insight, Blockchain companies should begin to take their tertiary education programs more seriously as there are great opportunities to accelerate Blockchain talents through the higher education learning spaces in Africa. The data also helps in reflecting how Blockchain education can go viral with **Blockchain Education Curriculums** being delivered in Universities in Africa since there are already enthusiasts, especially the undergraduate students.

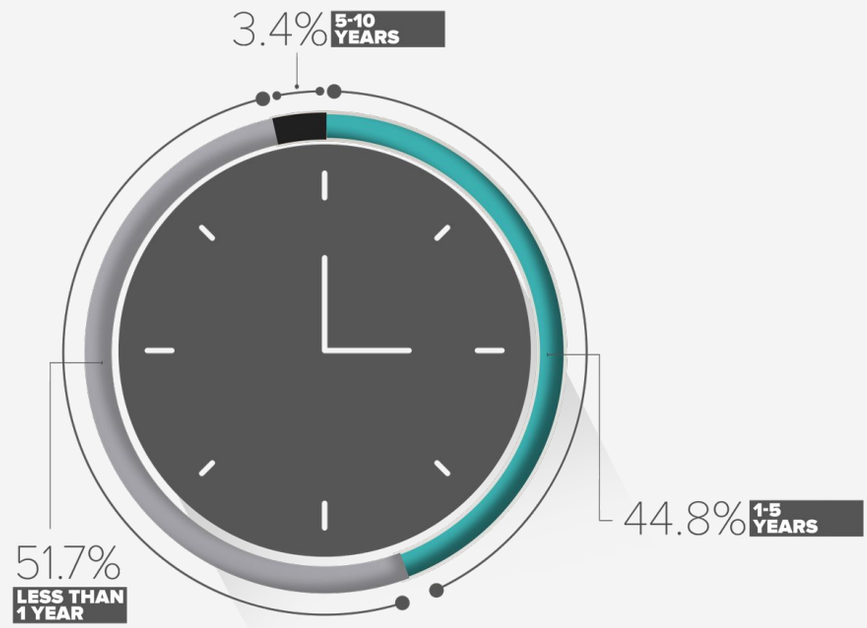
DEVELOPMENT STAGE OF BLOCKCHAIN STARTUPS

A significant percentage of the startups are still in the ideation stage at 51% followed by 39.7% for those at the growth stage. Only 1% out of all the startups contacted are firmly established and profitable. This is a huge opportunity for more blockchain incubation and acceleration programs. The terminology "startup" itself is a risk but with the right support, mentorship and investments, we can help scale these ideas steadily till they overcome the valley of death on their various blockchain innovation ecosystems.



DURATION SPENT DEVELOPING BLOCKCHAIN SOLUTION

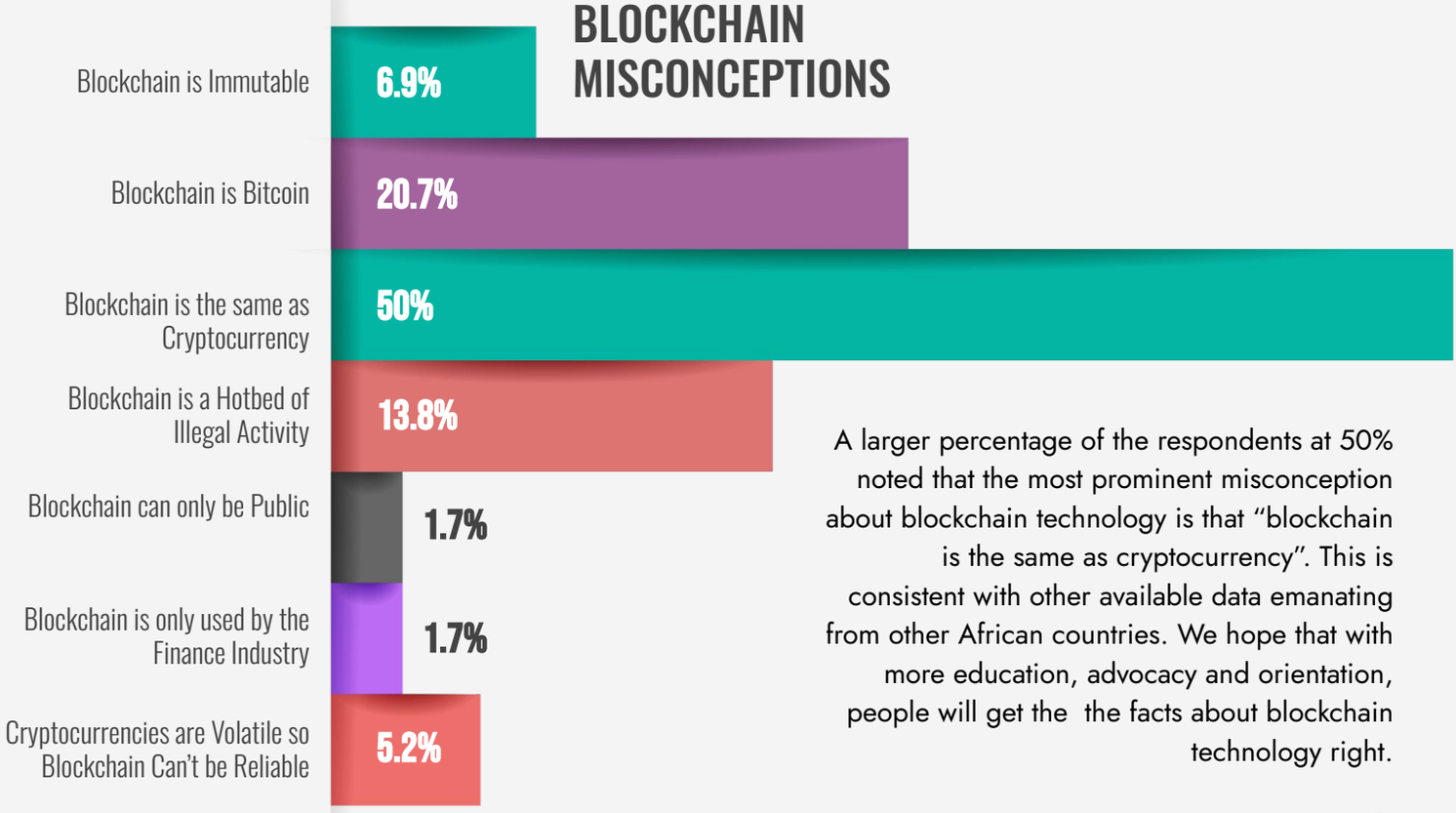
A larger percentage of the companies are between the first and the fifth year of their operations as 51.7% have operated for less than a year and 44.8% have operated in the space of five years. This makes the Blockchain ecosystem in these countries a virgin ground for investment, mentorship, experimentations and upskilling. As young and fresh ecosystems, there are numerous opportunities for growth and investments to future proof the use cases of the technology.



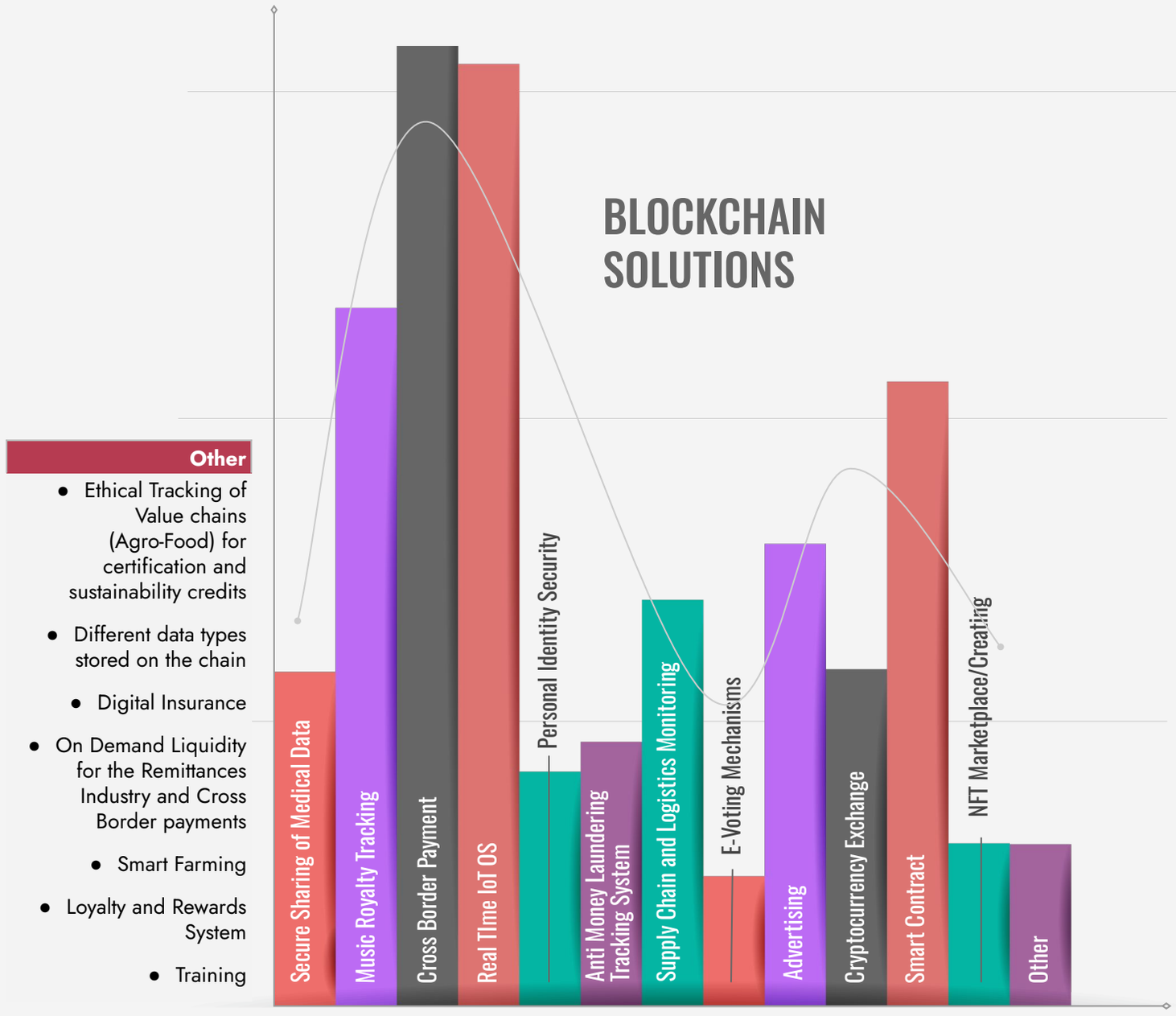
GENDER DISTRIBUTION AMONG STUDY PARTICIPANTS

Across the four countries where the study took place (Rwanda, Zimbabwe, Ghana and Egypt), a larger percentage of the respondents are male at 96.6% and females at 3.4%. This gives the African Blockchain Ecosystem a new opportunity to design programs such as incubations, hackathons and other initiatives that are specifically designed for the females who are passionate and interested in Blockchain technology. Organizations such as the Black Women Blockchain Council are pioneering initiatives to ensure gender equality and inclusive contributions to Blockchain and we hope that more organizations will design future programs to ensure inclusivity in the Blockchain ecosystem of Africa and specifically in these four countries.

BLOCKCHAIN MISCONCEPTIONS

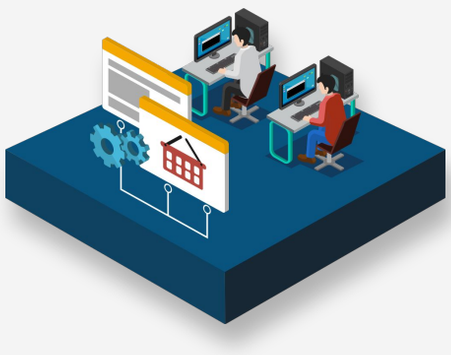


A larger percentage of the respondents at 50% noted that the most prominent misconception about blockchain technology is that "blockchain is the same as cryptocurrency". This is consistent with other available data emanating from other African countries. We hope that with more education, advocacy and orientation, people will get the the facts about blockchain technology right.



The blockchain solutions that have remained consistent in terms of their popularity in recent reports, including this one are smart contracts at 19.4%, cryptocurrency exchange platforms at 15.4%, NFT Marketplace/Creation of NFT's at 12.1%, cross-border payment at 10.5%, Identity Management Systems at 8.1% and Supply chain Track and Trace at 7.3%. An interesting perspective on this data is that in the last three years of Non-fungible Tokens mainstreaming, African countries have taken great advantage of it especially in the art space and it is impressive to see a few startups building its marketplace for other creatives to list and sell their NFT's. Smart contracts also took a predominant space among blockchain activities in the four countries. It is evident that most businesses on the continent today welcome the opportunity to cut through the bureaucracy and over regulation prevalent in most countries and this has consequently boosted the use of smart contracts.

The other solutions stated by the respondents are Ethical Tracking of Value chains, Agro-Food) for certification and sustainability credits, Digital Insurance, On Demand Liquidity for the Remittances, Smart Farming and Loyalty/Reward systems through tokenization.



KEY CHALLENGES FACED BY BLOCKCHAIN STARTUPS

Key Challenges	Percentage
Market Misconception of Blockchain	49.2%
Regulatory Issues	44.1%
Lack of Funding	55.9%
Lack of Access to Blockchain Incubators	23.7%
Insufficient Access to Blockchain Skills Training	42.4.3%

*multiple response

The challenges startups are facing in building blockchain solutions are not too far apart from one another in ranking as the issues seem to be the same across the four countries of study. Lack of funding was the highest ranking challenge faced by most of the startups (55.9%). This was followed by market misconception of blockchain technology at 49.2%, regulatory issues at 16% and skills training at 15.3%.

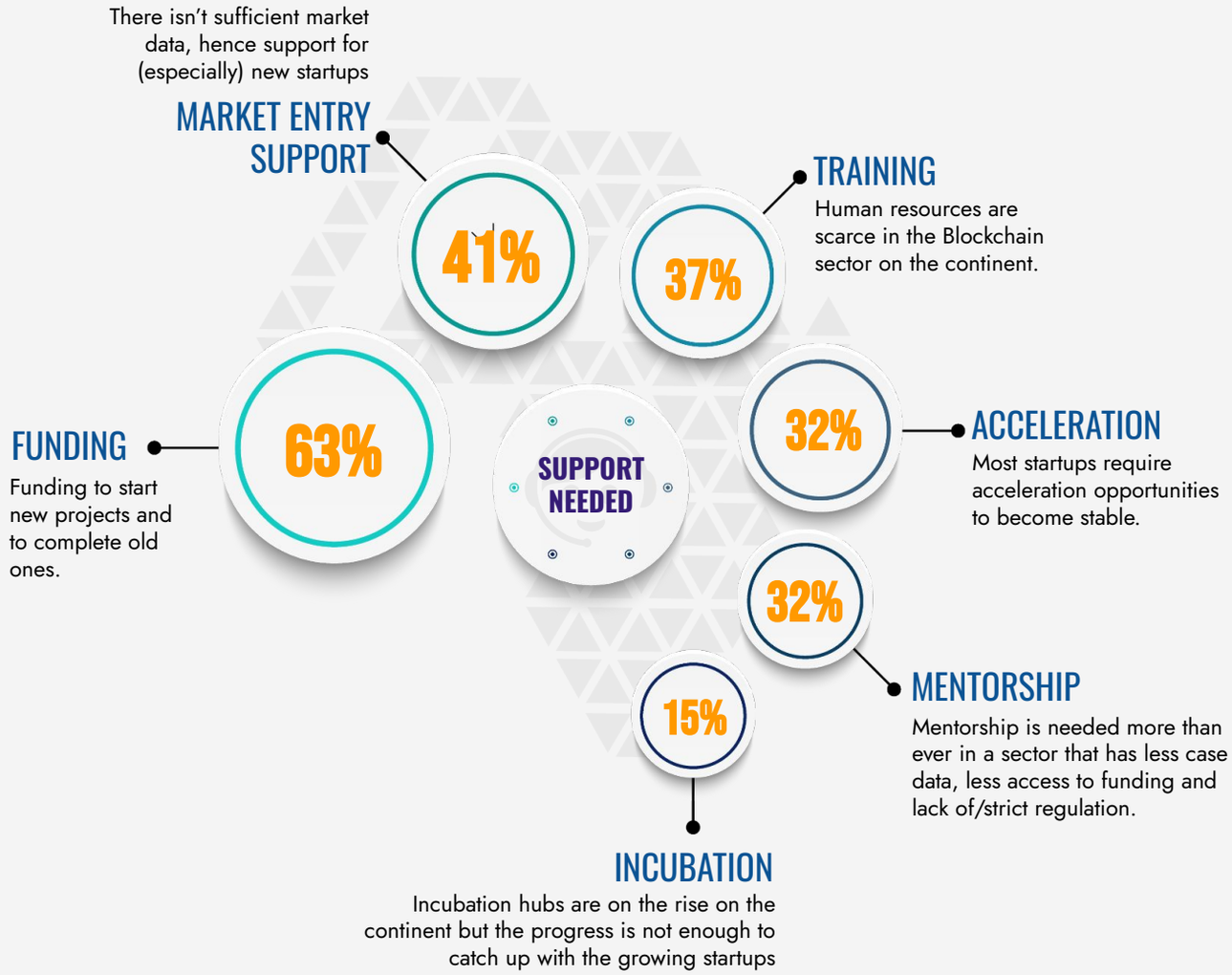
With these countries working on their regulatory sandboxes, the future is bright in surmounting these challenges for the healthy mainstreaming of blockchain in the next few years. This might consequently pave way for better processes for funding application and auditing laws.

Lack of funding may be perceived and focused on as the major issue but "investment goes in the direction of value"; the blockchain startup ecosystems in these countries will attract more investors when the ecosystem embraces the innovation fully and innovators are able to experiment and create more impactful use cases. The other challenges stated by some of the respondents is data availability to build a number of blockchain solutions.

"investment goes in the direction of value"

SUPPORT NEEDED

Consistent with the data on challenges faced by blockchain startups, a larger percentage of the respondents at 62.7% noted that funding is the support they need to scale their blockchain solution. Other supports noted are market entry support, training, acceleration, mentorship and incubation. The other supports noted by the respondents are Empirical Case Data, Regulatories and legal/policy support, Niche/Specific Market, Proof of concept support and availability of Arabic contents especially for markets such as Egypt.



AFRICA
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BLOCKCHAIN
ECOSYSTEM COUNTRY CASES

Progress on Blockchain Policy and Startups

RWANDA
GOVERNMENT BLOCKCHAIN POLICY AND STRATEGIC PLANS

Rwanda, the land of a thousand hills, has been featured in international media as an innovation hub in Africa. The fact that it is commonly referred to as the "Singapore" of Africa lends credence to its massive transformation, technological growth, innovation investment, and its overall status as the innovation "Mecca" of Africa. Rwanda, which ranks only behind Mauritius as the second-ranked nation in Africa for ease of doing business, continues to demonstrate leadership in innovation readiness as a suitable innovation testing site for numerous technological innovations in Africa. The Rwandan government's embrace of the first drone-powered medical products delivery business, Zipline, and its hosting of East Africa's largest entrepreneurial incubator and accelerator, Norrsken House, are examples of its commitment to technological innovation.

Rwanda has been open to Blockchain technology the same way it has welcomed innovation from other technologies such as Internet of Things (IoT) and Artificial Intelligence and Robotics. In spite of Rwanda's "wait-and-see" position and particular stances on cryptocurrencies, the country has embraced blockchain technology, began exploring its usage, and approved blockchain-based businesses.

On the cryptocurrency use case of the blockchain, the National Bank of Rwanda in its Global Insight publication by Samuel Baker and Nyirakanani Regine stated some of the positions of the Rwandan Monetary Landscape Stakeholders on Cryptocurrencies. A notable statement in the publication stated:

"In Rwanda, the BNR under the monetary targeting framework has been using money supply to control inflation. Cryptocurrencies however, are circumventing the established money system. If they continue gaining popularity and be widely used, they may render this system obsolete, and so complicate the conduct of monetary policy. This calls for action from Central Banks" (BNR Global Insight, 2017).

Despite the National Bank of Rwanda's cautious approach to cryptocurrencies, it is reassuring to note that Rwanda has welcomed blockchain as a technology by exploring its other use cases in mining and land title records administration.

It is however encouraging to see that despite the National Bank of Rwanda's Wait and See Approach to Cryptocurrencies, Rwanda has gone ahead to embrace blockchain as a technology by exploring its other use cases in areas such as mining and land title records management. In an article titled *"Will blockchain fix the mineral traceability woes?"* published in the New Times Rwanda on the 22nd of October 2018 by Collins Wai, a clear explanation was made on the potentials of blockchain in the traceability of mining misconducts and illegal trades in minerals. The opening statement of the article stated thus;

"The persistent concerns by miners and other players along the mining industry value chain regarding the high costs of implementing mineral traceability could find a solution in blockchain technology".

The preceding statement provides plausibility to the capacity of blockchain technology to facilitate operational transparency in any value chain, in this case the mining value chain. Circulor is the company focused on disrupting this mining value chain. Moreover, in an exclusive conversation with Circulor's chief executive officer, Douglas Johnson-Poensgen:

"Circulor's technology will bring greater transparency to the tantalum supply chain. Our blockchain platform will empower consumers to understand where the materials in the products they buy come from and also make it harder for materials that are not ethically sourced to pass through the supply chain".

As at the time of this report, it is unclear if the innovation was eventually adopted by the stakeholders in the mining industry but the prototype impressed the Mining Association Petroleum and Gas Board of Rwanda. Its then chairman Jean Malic Kalima confirmed this when he stated:

"After piloting across the value chain with PRG plc and reviewing performance and reception, the sector stakeholders will consider approaches to its adoption or integration".

Worthy of mention was the allocation of a part of Rwanda's ICT budget to the development of emerging technologies, more importantly Blockchain in the 2020 fiscal year budget as stated by Emmanuel Mugisha in a Newtimes article dated December 12, 2019. The minister of ICT and Innovation, Paula Ingabire revealed the plans at the meeting of the Blockchain Association of Rwanda where she was a guest of honor. In her words;

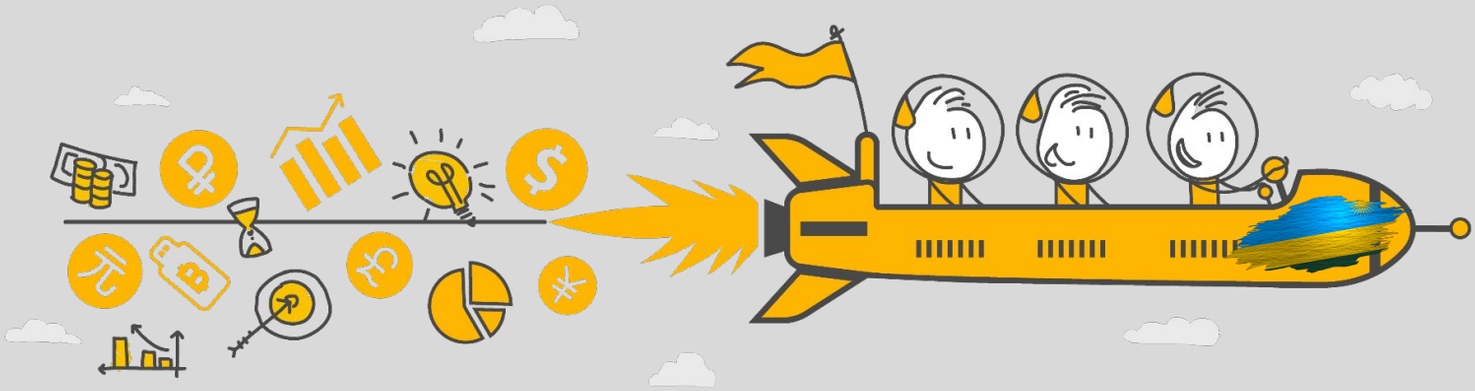
"Blockchain, just like the whole list of fourth industrial revolution technologies, is one of the areas that we are very supportive of as a government and how we build that industry and grow it over time".

In a more recent development, the Rwandan Government through the Ministry of Environment unveiled the app Ubutaka, a blockchain powered digital solution for land title registration management. According Athanase Akumuntu, a business analyst in the Ministry of Environment, as stated in a New Times article dated November 2, 2021 by James Karuhanga:

"Ubutaka is an innovative application that incorporates the use of a fingerprint scanner, signature pad, and camera (for the collection of biometric data against non-repudiation); Public Key Infrastructure (PKI) for identification of notaries and Registrars; and a public blockchain for safekeeping of land-based transactions in an open and transparent manner".

This innovation is an offshoot of a memorandum of understanding signed in 2018 amongst the Rwanda Land Management and Use Authority (RLMUA), Rwanda Information Society Authority (RISA) and Medici Land Governance (MLG) to develop a paperless, secure, and fully interoperable system, later named Ubutaka App to implement paperless land registration starting by the transfer of voluntary sale transaction. The prototype has been running since April 2021 and hopefully, this innovation becomes the benchmark for land records management for other African countries.

Rwanda is a highly innovative nation, embracing new technology that can improve the efficiency and effectiveness of delivery of public services to its citizens, as seen by the cases listed above and the many more that are in the pipeline. Rwanda is unquestionably becoming the innovation hub for other African nations to learn from its application of innovation and willingness to experiment with fresh ideas.



ENTREPRENEURIAL/STARTUP BLOCKCHAIN ECOSYSTEM & COMMUNITIES

Classification	Entity	Service	Website
Blockchain Community	Rwanda Blockchain Association	Blockchain community building, advocacy and innovation support	http://www.blockchain.rw
Blockchain Innovation	SPENN	Financial Inclusion and financial value exchange interoperability	https://www.spenn.com
Blockchain Education	Africa Blockchain Institute	Blockchain Education, Training, deployment and research	https://africablockchain.institute/
Charity through Blockchain	Built with Bitcoin Foundation	Charity and Philanthropy	https://www.builtwithbitcoin.org
Blockchain Innovation	YellowCard	Cryptocurrency Exchange	https://yellowcard.io
Blockchain Innovation	hiveOnline	Fintech and Financial Inclusion for the Unbanked	https://www.hivenetwork.online

RWANDA BLOCKCHAIN ASSOCIATION

The Rwanda Blockchain Association is a community of young people coming together to drive conversations, bounce ideas and support the blockchain innovation ecosystem in Rwanda. The goal of the association as stated on its webpage is to;

"advance trust, transparency, safety and innovation through distributed technologies and services" (Blockchain.rw, 2020).

Furthermore, the association aims to continue engaging the government and policy makers in making clear, through advocacy, the potentials of blockchain technology and the benefits of a decentralized future in Rwanda. The preceding paragraph can be corroborated with the part of the statement of the web page of the association explaining why the association exists, which states thus;

"We're committed to creating deep partnerships — within and between technology and government — to share knowledge, identify opportunities, and co-create a digital future that's more transparent, more inspiring and more secure" (Blockchain.rw, 2020).

It is worthy of mention that the Rwanda Blockchain Association has contributed immensely to the awareness, embrace and adoption of the blockchain technology in Rwanda through its various programs, meetups and media portrayal programs for the blockchain technology. The association is also a major player in the national blockchain policy conversations. It is hoped in the years to come, the association will chaperon yet bigger initiatives to support and spotlight blockchain innovators in the country and attract partnerships that will yet accelerate the blockchain solutions for Rwandans in Rwanda.

SPENN

The very first Blockchain based fintech, SPENN launched in Rwanda in 2018 as collaboration between Blackbonds and I&M bank. According to Julius Bizimugu in a New Times article published on the 5th of June, 2018, he described SPENN as follows:

"SPENN was developed by Blockbonds, a Norwegian financial technology company that is working to formally financially include the unbanked population which remains relatively high in the country". (Julius Bizimugu in New Times, 5th June, 2018).

The article further stated that unlike many other blockchain technology platforms, SPENN uses a different model whereby it removes the need for cash by digitalising national currencies. The partnership between Blockbonds and I&M bank created the first financial technology on the blockchain to digitize the Rwandan Francs.

SPENN has continued to grow and expand its operations since its launch in 2018 and it has continued to build on its vision of including the excluded in the financial market by creating easy access to financial interoperability across the country while maintaining transparency and security of value on the blockchain.

YELLOW CARD

Yellow Card is a cryptocurrency exchange that offers the safest way to buy and sell bitcoin in Rwanda. Users can also store their crypto with their bitcoin wallet on Yellow Card. integrated with the SPENN platform, users can purchase bitcoin with Rwandan Francs and also sell on the same platform. Rwanda is one the countries where YellowCard is operating and it has continued to contribute to the possibilities of Blockchain Technology Implementation in Rwanda and other neighboring countries. YellowCard is not only a business but also an education platform through its YellowCard Academy which is focused on bringing financial literacy to the doorstep of all Africans through a simple yet granular approach of education.

AFRICA BLOCKCHAIN INSTITUTE

The Africa Blockchain Institute, Africa foremost Blockchain Think Tanks launched in Rwanda in January 2020 with the purpose of investing in Blockchain Capacity Development through education, training, research, hackathons and incubation programs. As announced in an article that preceded the launch of the Institute, the Executive Director of the first Blockchain Education and Research Organization in the country stated why they chose Rwanda as the hub of operations;

"We chose Rwanda because it is gradually becoming the technology hub of Africa, demonstrated by many tech businesses opening shop in the country" (Babarinde in New Times, December 20, 2019).

In terms of economic potentials of the Blockchain technology in Rwanda, He noted that:

"The Rwandan economy has been growing steadily, earning a reputation as one of Africa's fastest-growing economies" (Babarinde New Times December 20, 2019).

His comment on the leadership of the country also confirms that Rwanda has the right leadership in driving innovation and creating an enabling environment for the fourth Industrial Revolution technologies. The leadership of the country, he said, is very forward-looking and supportive of technology. He noted;

"The country encourages innovation, thereby creating an enabling environment for businesses to thrive. The ease of doing business is great, and the policies are very supportive" (Babarinde in New Times: December 20, 2019).

In collaboration with the Rwanda Blockchain Association and other local partners in government and in the private sector, the institute has continued to drive various initiatives in accelerating the adoption of blockchain technology and to build the capacity of young entrepreneurs and developers in blockchain technology in Rwanda. The Made in Rwanda Blockchain Hackathon, the very first blockchain hackathon in Rwanda, was organized by the African Blockchain Institute between March and June of 2021. The hackathon spawned home-based blockchain innovators working in a variety of industries, including agriculture, e-commerce, and blockchain for social good. This study project is also one of ABI's initiatives for highlighting Blockchain Innovation in Rwanda, enabling development and investment prospects for the technology, and facilitating policy engagement and regulatory framework discussions.

BUILT WITH BITCOIN FOUNDATION CHARITY

As stated on the website of the foundation, Built with Bitcoin Foundation is a humanitarian organization devoted to creating equitable opportunity by providing clean water, access to quality education, sustainable farming, and humanitarian support, all powered by Bitcoin and cryptocurrencies. The charity was set out to build 100 communities, improving the physical, mental, environmental, and financial health of those in need—one Bitcoin at a time.

A number of projects have been implemented in some communities in Rwanda, powered with the value of bitcoin. Under its school project in Rwanda which focuses on providing an education to nourish the minds of the youth, creating jobs for teachers, groundskeepers, and security personnel, while fostering a safe environment for villagers to meet and build community. The foundation built a Nursery school in June 2017 and a Primary school in July 2018.

Under its Water Distribution projects, BWBF, has built 150,000-250,000 liter capacity (40,000-66,000 gallons) water infrastructure, 2-step filtration system (biosand and chlorination) and a Pumping system powered by solar system. The purpose of the water project is to create filtration centers that can provide health benefits for people, but also allow them to have more time to spend with their families, work, or go to school.

While justifying why Bitcoin is the engine powering the charity work, the foundation stated:

"Bitcoin is fast, cost-effective, and transparent. It allows our Foundation to work beyond normal business hours, send funds in full, and be able to track the flow of work. The Blockchain unlocks the real potential for peer-to-peer work. It allows us to focus on the human beings of the communities we are building and not just see our work as transactional. Bitcoin solves this".

This type of charity work connected with blockchain technology is a great innovation and this is a testament to the scale of Corporate Social Responsibilities that Blockchain companies can begin to undertake to build communities and make people's lives better in many underdeveloped communities globally. It is expected in the next few years, many charities such as the Built with Bitcoin Foundation will emerge from different parts of Africa and they will create change and investment in the local economy through the dividends of the Blockchain Technology.

HIVEONLINE

hiveonline is a fintech startup headquartered in Copenhagen, Denmark, with subsidiaries in Stockholm, Sweden and Kigali, Rwanda. HiveOnline gives communities of unbanked businesses, primarily women-led, access to formal finance through a digital reputation. They are supporting village savings groups with blockchain technology with their MVP accounting app, and building on this to help cooperatives, agricultural associations and their members create more sustainable farming communities.

One of hiveOnline's blockchain solutions is a blockchain based e-vouchers that facilitates efficient, secure, low-cost distribution of agricultural inputs, emergency aid and much more. Built with blockchain technology, these vouchers are fully traceable and self-auditing, slashing administration costs and increasing donor confidence.

STAKEHOLDER SNAPSHOTS

Blockchain Misconception in Rwanda

I believe that blockchain is multidimensional. The fact that ***blockchain is a technology and not crypto*** is a prevalent misconception among those who have yet to fully grasp it. It is a development from the classic database, where humans had centralized control, to a new method of data storage that is more safe and transparent. Many people see Blockchain as cryptocurrencies or token movement where they can simply buy things, but I believe blockchain is much more than that. Another important point is that many individuals view Blockchain as a bubble undergoing a period that will eventually burst. In my honest assessment of the technology, I view it as the subsequent progression and stage of the internet..

The Future of Blockchain

In the next ten years, I envision blockchain completely changing the financial sector. Currently, person-to-person transactions have been made complicated. With the current system, there are thousands of middlemen, resulting in costly transaction fees.

Emmanuel Mohehin
Technical Delivery Manager
Andela Rwanda

Blockchain is "...a new way of storing data that is more secure and more transparent."

Blockchain misconception in Rwanda

I believe a popular misconception is that Blockchain is Bitcoin. The emphasis has been on cryptocurrencies, and people tend to overlook the Blockchain's primary utility, its interoperability, intelligence, and decentralization. It's not only about being able to send Bitcoin here and there; it's also about building trust and determining how to use blockchain as a decentralized technology.

Openness of Rwanda to Innovation

I think ***Rwanda is generally open to innovation and it is amazing how the environment is supporting a lot of idea experimentation when it comes to new technologies and digital initiatives, Blockchain Inclusive.*** I know Yellow Card, SPENN, and a few other platforms who have come into the system in recent times and I know the blockchain ecosystem will continue to grow.

Kome Sideso
Senior User Experience Designer
Co-creation Design Lab Kigali, Rwanda

Blockchain Misconception in Rwanda

The most common misconception is that anything associated with the blockchain is fraudulent. There is also the general attribution of ***Blockchain as Bitcoin*** and vice versa. So many people are not educated about this technology and this is responsible for most of the wrong notions attributed to the technology. Another misconception is that the ***control of the blockchain technology as a whole is from some unknown location which is dangerous to people onboarding solutions on the blockchain.***

Blockchain Regulation in Rwanda

The *regulatory environment for blockchain in Rwanda is still a gray area.* First of all, there is no license for crypto companies to operate in Rwanda and *it is neither allowed nor prohibited*. However, in the next five years, I think the National Bank said that it's working on a resolution,and we are hopeful that they come up with a regulatory soundbox that allows innovators in the blockchain to begin to solve societal problems with the blockchain.

Robert Mugisha
Yellow Card

Blockchain Misconception in Rwanda

Conceptually, **blockchain makes a whole lot of sense with the whole decentralized structure**. The main challenge rather than misconception for me is the way *many stakeholders on the technology have not been able to break it down in such a manner that people can understand it granularly*. I have personally been in a few forums where blockchain was being discussed and the explanation of the technology still remains complex for many to comprehend. This is a sign that more work needs to be done on the education and orintration side of the technology.

Blockchain Openness in Rwanda

The government is obviously quite receptive to innovation from the beginning. I have essentially heard of a handful of blockchain-related projects coming into the country. **They are quite supportive of the entire notion of decentralization, particularly blockchain**. In most cases, blockchain and cryptocurrency are conflated but based on the exposure I've had and the people with whom I've interacted from the government, *they are very open to innovate continuous experimentation of new technologies.* I should also note that there is a government-driven project built on blockchain, particularly for Land Management Systems.

Blockchain in Rwanda in the Next 10 Years

From where I stand, it will be different from what it is today, but the pace in my opinion is fairly slow. *Adoption may be somewhat sluggish until the corporate sector and government demonstrate its practical applications.* Adoption will increase if there are a greater number of local players who own the technology.

Steve Shema
Founder and CEO, Exuss

Blockchain Misconception

I believe that the situation is improving for many people. The message is beginning to penetrate, especially with the advent of the web3 concept. People have begun to think about blockchain in a broader sense, yet a large number of individuals continue to believe that it is nothing but speculation. Therefore, they believe that they are useless tokens that are being created out of thin air, and that people are simply trading them in an attempt to make money. They do not comprehend that these tokens reflect a new method of Internet organization. This is a significant misconception.

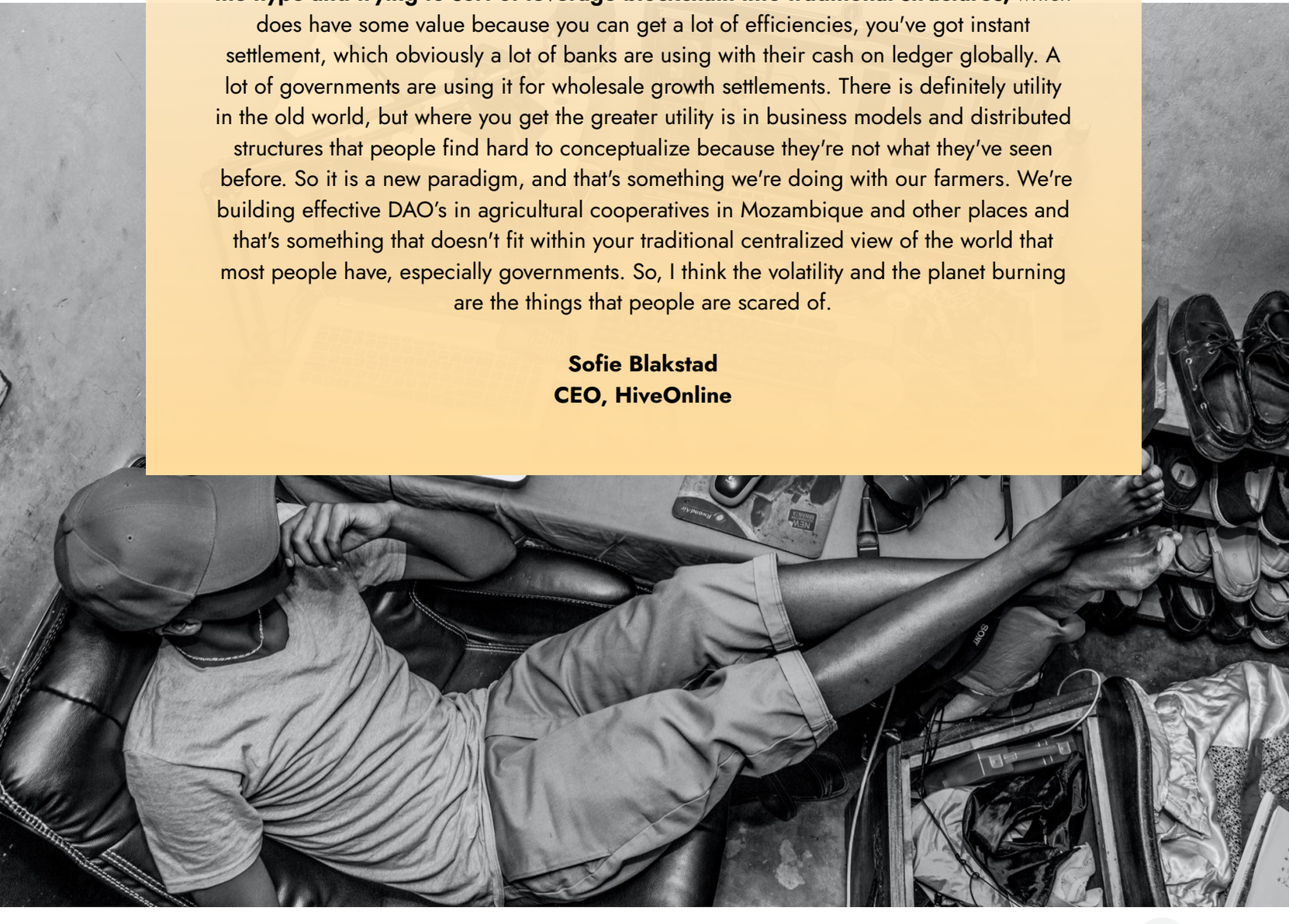
Shaun Musuka
Head of Research, African Crypto Research

{Blockchain misconception}

I think one of the big misconceptions is that a lot of people **equate blockchain with cryptocurrency** and as we know, cryptocurrency is one of the assets that you can hold on a blockchain, but it's not the same thing and I spend a lot of time telling people, blockchain is a lot more than Bitcoin. Some of the conversations we always have are; **"First of all, it's killing the planet".** Well, actually, no, **we're on a low low energy blockchain, which uses less energy than printing paper money and we're looking also at other distributed ledger solutions, which are even lower energy.**

Another thing is the utility of blockchain which is partly tied up with business structures and business models which are non-traditional. So t**he real value of a blockchain is when you're using it in a distributed model**, and most government structures, nearly all government structures and most corporate structures are still very hierarchical and very centralized and I think for that reason, **there's been a lot of experimentation following the hype and trying to sort of leverage blockchain into traditional structures,** which does have some value because you can get a lot of efficiencies, you've got instant settlement, which obviously a lot of banks are using with their cash on ledger globally. A lot of governments are using it for wholesale growth settlements. There is definitely utility in the old world, but where you get the greater utility is in business models and distributed structures that people find hard to conceptualize because they're not what they've seen before. So it is a new paradigm, and that's something we're doing with our farmers. We're building effective DAO's in agricultural cooperatives in Mozambique and other places and that's something that doesn't fit within your traditional centralized view of the world that most people have, especially governments. So, I think the volatility and the planet burning are the things that people are scared of.

Sofie Blakstad
CEO, HiveOnline



GHANA

GOVERNMENT BLOCKCHAIN POLICY AND STRATEGIC PLANS

Ghana has remained a consistent player in technological innovation in Africa. With prominent technology hubs and robust technology entrepreneurship ecosystem, Ghana continues to build its innovation ecosystem through its vibrant youth and professionals.

As it was the case for the governments of many African countries in the embrace of Blockchain technology which came through the introduction of the cryptocurrency use case, the bank of Ghana on the 22nd of January, 2018, published a communique titled "Digital and Virtual Currencies Operations in Ghana". In the communique, Caroline Otoo, the then secretary of the Bank of Ghana stated thus'

"The Bank of Ghana has taken notice of recent developments in the use, holding, and trading of virtual or digital currencies (also known as cryptocurrencies), such as Bitcoin in Ghana. The Bank of Ghana wishes to notify the general public that these activities in digital currency are currently not licensed under the Payments System Act 2003 (Act 662)". (Bank of Ghana, 2018).

The position of the government of Ghana as stated above seems generally similar to the earliest position of many African countries' governments on the adoption of cryptocurrency while many have however gone ahead to explore other use cases of the blockchain technology outside of cryptocurrency. One interesting question that has been raised in many quarters is;

Could Blockchain technology have enjoyed an early adoption and experimentation by governments of African countries if the first use case of Blockchain they were introduced to was not cryptocurrency?

While the above question continuously begs for answer, we cannot deny that one of the biggest responsibilities of any government is to ensure economic stability of their economies and the volatility of cryptocurrencies could not but make them take a back seat or rather "wait and see" approach in exploring the use crypto currencies by their citizens. Despite government warnings against the usage of cryptocurrencies, over 900 thousand Ghanaians, or 3.01 percent of the country's entire population, presently hold cryptocurrency. (TrippleA.io, 2021). It is estimated that over 900 thousand people, 3.01% of Ghana's total population, currently own cryptocurrency (TrippleA.io, 2021).

On a more exciting note, the Central Bank of Ghana in February, 2021 announced the launch of a pilot of its fintech regulatory sandbox with focus on blockchain technology. According to Handagana (2021) in CoinDesk,

"The Central Bank of Ghana has launched a fintech regulatory and innovation live testing pilot that will give preference to projects using blockchain technology".

It has always been a sign of relief for the African Blockchain Ecosystem to see that despite the reservations of several African governments on cryptocurrencies, they are demonstrating growth mindsets in exploring other use cases of Blockchain technology and are willing to engage in dialogues, conversations, and policy-related engagements on the core benefits the technology offers.

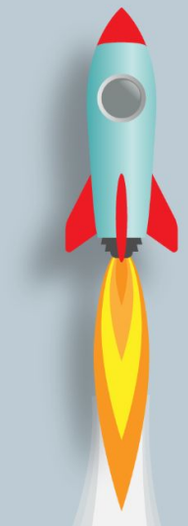
In the Central Bank of Ghana's official news release establishing the regulatory sandbox, it was claimed that blockchain technologies will be prioritized:

"Within the broad categories outlined, the Bank of Ghana would give preference to products and services leveraging blockchain technology, remittance products, crowdfunding products and services, e-KYC (electronic know your customer) platforms, RegTech (regulatory technology), SupTech (supervisory technology), digital banking, products and services targeting women financial inclusion and innovative merchant payment solutions for micro, small and medium sized enterprises (MSMEs)" (Central Bank of Ghana, 2021).

It is encouraging to see the Blockchain Innovation Regulatory efforts from Ghana and hopefully the piloted sandbox begins to help spotlight various Blockchain Innovation and use cases for government efficient and economic development.

ENTREPRENEURIAL/STARTUP BLOCKCHAIN ECOSYSTEM

Ghana's Blockchain Innovation Regulatory Efforts are positive, and perhaps the piloted sandbox can assist in highlighting various Blockchain Innovation and use cases for government efficiency and economic growth.



Some of the established names are listed below:

Startup	Solution	Year Founded	Website
Ben Ben	Land Title Registry	2014	**www.benben.com.gh**
vFundZone	Cryptocurrency Exchange	2019	**www.instagram.com › vfundzone**
Yensesa	Blockchain Banking	2018	**www.sesacash.com**
Sika Plus	Cryptocurrency Exchange	2017	
Cedi4dollar	Cryptocurrency Exchange	2018	**www.cedi4dollar.com**
EwalletGH	Cryptocurrency Exchange	2018	
BitAfrika	Cryptocurrency Exchange	2017	**www.bitafrika.com**
Mazzuma	Decentralized Payment	2015	**www.mazzuma.com**
CoinCola	Cryptocurrency Exchange	2016	**www.coincola.com**
MinoHealth	Health Records Management	2017	**www.minohealth.org**
Complete Farmer	Digital Agriculture	-	**www.completefarmer.com**
KudiGo	Retail	-	**www.kudigo.com**
Bitsika	Cryptocurrency Exchange and cross border payment		**www.bitsika.africa**

STAKEHOLDER SNAPSHOTS

Prof. Nii Narku Quaynor - *Africa's "father of the Internet"*

Blockchain Misconceptions

The blockchain misconception is quite normal. There were misconceptions during the introduction of the internet and every new facet of it, which came around including telephony, the voice over IP, including the consolidation of various messaging platforms. They all generated lots of misconceptions. Now, this one in particular is getting its own bashing from; you might say some mishaps that were going on within the financial services overall in the region, which may or may not have had anything to do with the technology. But nonetheless, it got slapped with it. Of course, ***the technology itself has some learning period and invariably, as people understand it better, it begins to feel more and more comfortable or see how to manage the so-called risks,*** generally. In this case, the barrier is also heightened by the fact that it's an attempt to disrupt something that everybody is familiar with and so everybody questions it. And of course, considering that every time a technology challenges a particular way of doing things, interested stakeholders also respond in one way or another, so all these are to some extent at play. In other words, I'm saying, we've had misconceptions in the area of the technology itself and how it works. We've had issues regarding viewing it as more of a Ponzi scheme/pyramid scheme. We've had all those things we've also had; you might say association with criminality. So those will be the general areas. I will say that we have misconceptions.

Blockchain Regulations and Sandboxes

I live here in Ghana so my assessment may in fact not be the right assessment, but nonetheless, I am here and I have been playing in this industry since the 70's. The assessment is no different from the situation, in my opinion, anywhere else on the continent. I mean, it really normally takes a microscope to see the difference. It takes a microscope to see a real difference between any of the African countries regarding the stage of readiness in an assessment. We can look at these assessments maybe from a lot of different angles. We can look at the assessment from the angle of the policy regime, which you mentioned "sandboxes". Yes, Ghana has a sandbox, the Central Bank has a sandbox and I am currently participating in a sandbox. I understand that there is a sandbox also emerging at the Securities Exchange Commission of Ghana. That also may be a factor in this reasoning. In terms of openness, it's there, but it's not there. You see, it is there in the sense that anybody is able to come and do business here and participate in the sector. So from that point of view it's open. But from the point of view of the openness that we preach in terms of the internet, open to not only participation but contributing to the actual policies themselves, meaning the bottom up itself, making some rules for itself and things like that. I'm not sure we're quite there. ***Often what you see is that policy is top-down, and when they have a certain position, they invite a few people.*** I don't know how that is determined, maybe a random collection of people and then you have a consultation. However, what you really want is a larger group of people who don't normally talk to come in a very open setting and work with you to decide what really the policy should be.

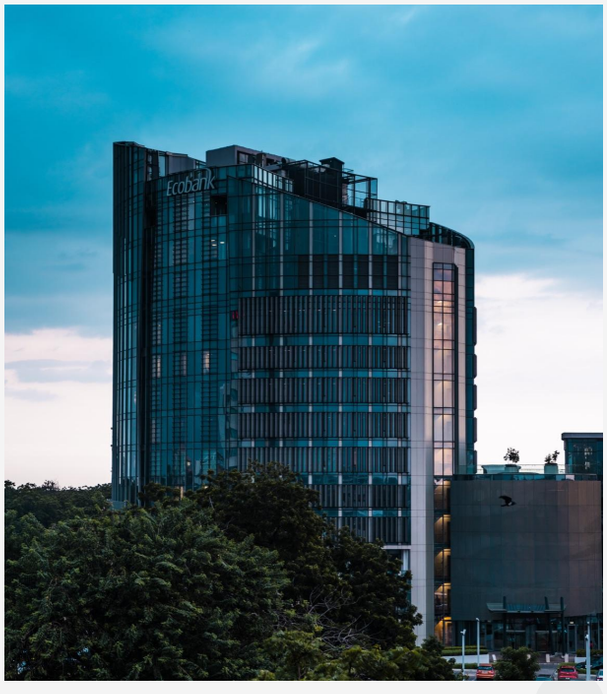
"...the barrier is also heightened by the fact that it's an attempt to disrupt something that everybody is familiar with and so everybody questions it."

This is not about dialog or discussion, it's more about the community decision making in terms of the Bottom-Up multi-stakeholder approach. So, I have some concerns regarding the openness, back there. The Securities Exchange commission, on the other hand, took the stance that; ***"this is a bad thing for you and anyone who is doing anything with it should be reported".*** And so that created some kind of, you might say, tension or the market went underground. But on the education front, I know different organizations continue to teach blockchain technology. I personally continue to teach it at the University of Cape Coast as well. Of course, we run our blockchain academy and also participate in the blockchain network conferences; so ***we try to maintain a sense of, maybe engagement on the subject because there are major problems from where we sit, regarding managing of keys and also being responsible and adhering to too many of these things.*** So I hope that gives you some sense of us. There is a community and we cannot hide it. Recently, some young guys came to visit four or five of them, it turned out they had a community of 500 people.

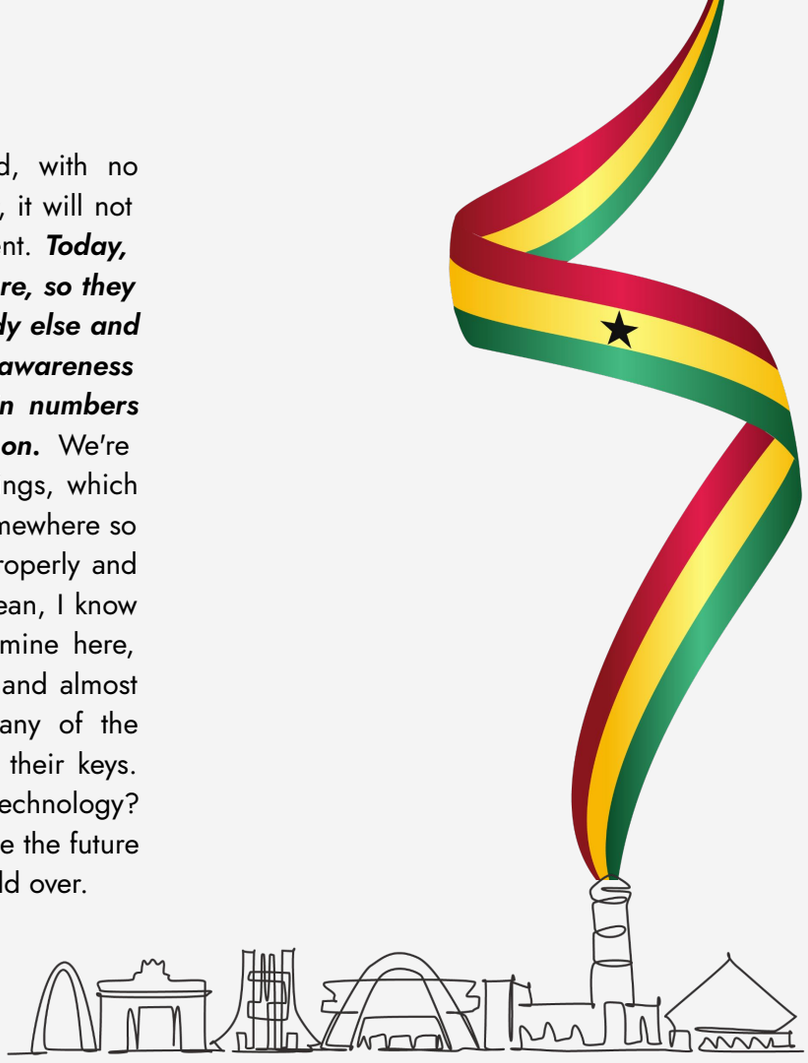
Blockchain Future in Ghana

The evolution of blockchain in Ghana is slow. So what I can tell you honestly, is based on the experience of watching the internet and what happened, because that was a massive technology adoption much bigger than even this one. But then if you notice, in the early days of the Internet, there were so many Internet Service Providers (ISP's). There were over 100 ISPs in Ghana at the time. The telecom companies were late in coming into that space. They didn't want to even come but today, who are the providers of the internet? The telecoms. So if I'm to look at a ***crystal ball, you know, I can tell you that the future parties with respect to not blockchain in general but respect to cryptocurrencies of the tomorrow will be the banks.*** And on the development side, the portion that is disturbing because we can do something about it is that it's going to consolidate much the same way that things in the content side or application side consolidated too; the Googles, the Amazons, the Facebooks. So, there is going to be consolidation. ***So many of the artisans today will not be the champions of tomorrow.*** We need consolidation and that applies to all the different areas.

On the other hand, we are going to see a much more stiff environment to work with blockchain and also work with cryptocurrencies because policies would have evolved, in my opinion, to recognize in one form or fashion. *With the e-cedis (Central Bank Digital Currency) of Ghana, the next step will be to accept the others who are nearby of value or significance*. So, there would have been a lot more appreciation of the cryptocurrency side of the fence. I believe ***we are also going to be expecting to see laws that recognize all virtual assets with specific reporting requirements and so on.*** So this is the kind of thing that we should be expecting. And of course, you know, we have always had a few of our innovations break out, but you and I know that most startups die. Based on this data, I would like to advise ***artisans to make use of all the immediate opportunities the blockchain brings before the consolidation happens.*** Also, with consolidation, the technology becomes more obscure. So the barrier to entry gets larger as a supplier, but as a user, it gets lower. I mean, the environment will change sufficiently that it will not be as delicate as it is now, for instance, **nobody regulates wallets for now but tomorrow, custodians will be regulated**.



Many of the exchanges are running wild, with no control, they even do exit scams. Tomorrow, it will not be. It's going to become a safe environment. ***Today, people don't even know what their keys are, so they end up spending their money on somebody else and the money's gone. There'll be a lot more awareness of those things, just as we recognize pin numbers associated with mobile money and so on.*** We're going to now learn that you have these things, which you can't hold, but you have to put them somewhere so you have to choose where you put them properly and you have to learn how to protect them. I mean, I know many people who you know, we used to mine here, you know, a significant amount of mining, and almost every instance we gave away coins. Many of the people we gave these things to have lost their keys. But is that the cost of building or adopting technology? Consolidation is coming and it will determine the future of the technology, not only in Africa but world over.



Professor Nii Quaynor
Africa's Father of the Internet

"Consolidation is coming and it will determine the future of the technology, not only in Africa but world over."

Blockchain Misconceptions

Many ***people believe that blockchain is for scammers,*** hackers, criminals and for gamblers. However, its perception has been improving so far. The construct has been changing from "it is used by hackers and crimes to now; It's used by speculators". Some other people believe that investing in blockchain can get them rich quickly and it's been abused by the first test in the ecosystem. From the ***government side, the government still may not fully understand the technology and the potential it holds***. So they are not also in the crypto ecosystem but they are only involved in CDBC, which we are not sure about. We are not sure yet how it's going to inter operate with cryptocurrency systems, whether they will ban cryptos one day after launching the CBDC. We don't have details on this yet.

Cryptocurrencies and the Ghana CBDC

The government is working on the e-cedis as a pilot but we don't have a lot of information on it. Not much has been released to the public but it seems they may be following them the B. I. S model (The Bank for International Settlements Model). They released a certain model about how CDBCs should operate and so on and I think that is influencing the Ghanian CBDC design.

Blockchain Ecosystem in Ghana in the Next 10 years

It seems at the moment that the government will not be so friendly about the crypto ecosystem but I believe in spite of that it is still going to explode and grow exponentially because a lot more people are entering it. With DeFi and so on, people are learning more about new applications of the blockchain and there's a lot more platforms where people can go online and find information. I feel that *within five years, there may be some pressure on the government to reconsider their stance*. The government may not support this immediately but I believe it will grow ***when the government discovers that Ghanaians are becoming part of an international financial ecosystem, they're going to adopt it.***

Blockchain Use Cases and Development Skills in Ghana

I don't see a lot of things happening in Ghana with non-financial use cases of the blockchain technology. I mean you may hear about some agricultural supply chains doing experiments and so on but I've not seen anything concrete. So I can't really comment on that. But as you know, there are strong non-financial use cases. On the development skills front, from where I look, and the groups I belong to, there are not a lot. I am in some African groups, but most of the developers are from Nigeria or from Kenya and I may be the only developer there. So, I think it's not growing as fast as other places, like Nigeria. There are a lot of developers in Ghana but I don't know a lot of blockchain developers.

Ganzaro Omar
Chairman, Ghana Blockchain Association

Blockchain Misconceptions

I think the misconception starts with the use case of blockchain in the financial space. I think many people got it all wrong. Looking at the African continent, you realize that there's an increase in poverty. So you realize that the youth, especially the millennials, are interested in avenues where they can actually make money and sustain their lives. This makes many young people take interest in the technology because of its financial promise. ***Blockchain created a room for people who wanted to actually run away from the surveillance*** - the central bank. So that opened an avenue for people to actually use it for other means that wasn't permitted by the Central Bank of Ghana. You realize that there were issues with young people losing a chunk of their money in some of these cases.

Blockchain Use Cases in Ghana

In the Ghanaian ecosystem, the stakeholders realized that ***there was a deficit when it comes to understanding what blockchain technology is***. So this actually created a room for conferences to actually be held. So we have the blockchain conference that is held every year. So aside from cryptocurrency, there is a use case found in **certifications** because in this country for some past years, we have recorded issues when it comes to certification. Some of these issues have happened in key institutions like the University of Ghana, where the management information systems regarding academic records have been compromised. There is a startup called AUTHICERT and they actually have a platform where schools can actually issue their certifications on the platform. They authenticate, validate, and it's also highly immutable. This is actually a great use case in the educational sector. Three years ago, our vice President was interested in the drive of digitization and digitalization and he created a room for our key issues to be resolved, i.e. the land registry. We have a huge challenge when it comes to land acquisitions. The country liaised with IBM in addition to Bem-Bem. Bem-Bem is also interested in some of these blockchain use cases. They built a particular platform where they could digitize all the lands in the country to the best of their capacity. Now some of the land registry data is stored on the blockchain platform. This actually helped when it comes to land disputes and the court cases and all land litigation issues.

In addition, we also realized the awareness aspect where we found stakeholders coming together to form new platforms where they would constantly be updating some of the use cases of blockchain. I also took inspiration from that by creating the blockchain news Ghana, where I create credible news regarding the use cases of blockchain. And I actually drive traffic for people to actually understand it. So these are some of the use cases when it comes to blockchain technology, the land registry aspect, the educational aspect and the finance aspect.

Blockchain in Ghana in 5 years

The pillar on which blockchain technology thrived in many parts of the world is "community" and I believe it is the same in Ghana because ***the language of blockchain is collaboration and inclusion***. I think the fact that the bank of Ghana has been able to come out with a sandbox that actually provides certain directions when it comes to building the digital solutions for blockchain is a progress in the right direction. I believe that that will push the adoption of blockchain further. Now, the educational aspect is kind of missing because I've not seen institutions like University of Ghana and other Universities take an interest in blockchain technology education, except Accra technical university that started some crash courses in Blockchain technology. So looking at all these things that I have mentioned, I believe that in the next five to 5 years, blockchain technology will begin to actually see more use cases and applications. I make reference to the Gartner research where they stated that ***in the next five to 10 years, SMEs i.e startups and small firms will actually be the key drivers when it comes to the adaptation of blockchain technology as compared to large firms.***

Amin Aryanah
Founder and CEO, Rumi's Engage

Blockchain Misconceptions

I think that there are four major misconceptions of blockchain currently in the ecosystem. The first thing being that blockchain is a financial tool. That is the biggest issue currently. What really happens is that **when anyone uses the word finance, the first word anyone thinks when it comes to new technology and finance is "It's a scam"**. That's what many people think. Not many people understand that blockchain is more or less a really powerful tool for storing information and value at the end of the day. So that's the first misconception. The second misconception I think about blockchain is the fact that; **people don't know if it's going to be free, or whether there's going to be a cost incurred to it.** So for example, if you go on to any blockchain, like any blockchain application in the world, not many of them talk about how revenue is generated and I think that's fair, because again, the blockchain, there's a lot more internal ways of making money and you don't necessarily need to charge the customer as long as you're willing to onboard the customer and educate the customer. The **third misconception is that blockchain is primarily some sort of a transaction interface.** Many people do not realize that you can literally create your entire world on blockchain without interacting with a single human being. So that's another big misconception.

Blockchain in Ghana in 5 Years

I think **the explosion of blockchain in Ghana is going to be exponential**. Living and working in Ghana in the last 7 years has shown me that Ghana will one day become a superpower in Africa. **The talent ecosystem is very collaborative here because Ghanaians love to learn from themselves and from other people from outside of Ghana**. This is the foundation of success in growing the blockchain ecosystem. So I think the usage of blockchain in Ghana is going to blow. Obviously one of the growth of that is going to be cryptocurrency and we should all accept that because people are starting to become more and more comfortable with it. One of the key things which **Ghana is doing right now is getting into an identification pattern with linking your passport to Ghana card, SIM card to Ghana card, and also mobile money**. Identity piece is very critical and I think **the uptake of financial services available on the blockchain will be very critical for Ghana**, and I think that's what's going to happen. I also think that the Ghanian government is looking out for the long term growth of the country. While I think there is immediate collateral damage, I think there is a lot of sense in what they're thinking with the long term. I'm currently launching a FinTech product, and I'm **working a lot with the Bank of Ghana to make sure you know, our regulations are right.** They're pretty observant right now of crypto even though they don't have a policy arm for it yet. **Ghana usually seeks to consult a lot of stakeholders for a policy to come into play.** So in those regards, what is really happening right now is that the Ghanian government has not put out a motion where they're against blockchain, and they've not put out a motion that they are for blockchain. They're just watching and observing what the people's uptake would be.

Ashwin Ravichandran
Portfolio Advisor, Meltwater, Ghana

Blockchain Misconceptions

I think the ***biggest misconception is the fact that because it is associated with cryptocurrency***, it is the type of technology that is used for illicit activities. So I think without any doubt, that is one of the biggest misconceptions. Cryptocurrency, being one of the most popular use cases and the reason why people will say such things about blockchain technology, using cryptocurrency for illicit activities is also the same thing as using fiat currencies. I mean, people have used fiat currencies from time immemorial to launder money. So anything of value can be used for all of these things. I mean, if you check tax evasion, people have evaded tax before the advent of cryptocurrency but people forget that and concentrate on the bad side of crypto maybe because of the anonymous model. ***Also, the fact that it is decentralized, people feel that it can be used for rebellion.***

In the real sense of it, cryptocurrency and blockchain generally brought a new opportunity where person to person, company to company can transact without having the need for any middlemen in a decentralized way.

Blockchain in Africa in 5 years

I think that blockchain is going to make a lot of progress in that, it's going to help us solve a lot of the problems that we have on the African continent. And if you look at it, if you look fundamentally at the kind of issues that the African continent has, the first thing is the fact that we are not really unified in terms of cross-border payments in terms of trade. And those, I think those are very key for any continent or anybody. As people would say, Africa is a country because if you go anywhere, you can easily identify a lot of similar issues. So Africa is a country in terms of the kind of problems we have. So I think maybe in five years, I will see a lot of progress.

Olubunmi Fabanwo,
Convener, Banks and Blockchain

EGYPTIAN GOVERNMENT BLOCKCHAIN POLICY AND STRATEGIC PLANS

There have been some recent exciting developments with the use of Blockchain technology in Egypt. It is important to take a historical journey into how things have evolved since the early 2015.

The evolution of the Blockchain application and use in Egypt dates back to 2015 according to Cointelegraph (2019). The evolution is highlighted below.

Timeline	Innovation and Decision
May 2015	First Bitcoin Exchange Service platform **Yellow Exchange** launched in Egypt.
July 2017	The government of Egypt decided that Egyptian banks can only deal with **official currencies** without exceptions.
August 2017	The first **crypto-fiat** exchange launched
December 2018	Central Bank of Egypt reportedly working on **digital version of the Egyptian Pound**
May 2019	Central Bank of Egypt announces draft law in **crypto-related activities**

There have been notable advancements in blockchain innovation in Egypt, including use cases and applications for logistics and shipping services. Charlie Barlett of TheLoadstar.com revealed in a story dated March 8, 2022 that Misr Technology Services, an eighty percent state-owned corporation, has extended its partnership with CargoX to deliver Ethereum blockchain services for the next five years. In an effort to further implement the National Single Window for Foreign Trade Facilitation Treaty, this is being done (NAFEZA). CargoX's representative emphasized why such collaborations were reached in order to maintain innovation with blockchain technology:

"When the government dives into the data and realizes that such a one-stop shop will increase government revenues, improve compliance, increase efficiency in resource allocation and facilitate cross-border trade in general, the choice for single window instead of many is obvious." (Theloadstar, 2022).

It is impressive to see Egypt innovate the cargo industry with blockchain technology. This will undoubtedly influence other state owned companies to look into the economic transformation that the application of the blockchain technology can bring to their businesses.

ENTREPRENEURIAL/STARTUP BLOCKCHAIN ECOSYSTEM

The blockchain startups ecosystem in Egypt has been growing steadily but surely. The foundation of the startup ecosystem came through the vibrant ecosystem events that have been organized by various Blockchain stakeholders and leaders in Egypt. One of the earliest groups to pioneer Blockchain meetups and ecosystem collaboration is called "Egypt Blockchain". One cannot also deny the strong interests of individuals who have continuously predicted the potentials of blockchain technology on the Egyptian economy. One such individual was Economist Hernando de Soto who according to an article in the American Chamber of Commerce in Egypt by Brenna Cusack stated that

"using blockchain to create formal property titles for real estate could release 360 million USD into the Egyptian Economy over five years" (Amcham, 2018).

Other individuals who have contributed immensely to the the blockchain startup ecosystem in Egypt are El Heraway (Blockchain Advocate), Tamer Ahmed (Business Development Leader at iHub), Nour Haridy (Founder of Lamarkaz, the foremost blockchain development startup in Egypt), Sameh El-Ansary (The co-founder of Novelari), Khalifa Hassan (Blockchain Engineer), Rami Khalil and Omar AbdelRasoul (co-founders of Blockchain Egypt) and many more.

It is also worthy of mention that there have been a number of blockchain focused incubator programs since 2017 in Egypt, The co-founders of Blockchain Egypt launched the first Blockchain incubation program in Egypt but this was halted by the government due to regulatory issues. However, the Nile University, in collaboration with IBM, Novelari and zk Capital held the first blockchain bootcamp program in April 2018 under the title " decentralizing the future" *(The Startup Scene, 2018)*.

Below are some of the startups using blockchain technology in their business model in Egypt.

Company	Website	Solution	Year Founded
Pravica	https://pravica.io/	Communication and Privacy	2019
Codeaku	-	Blockchain Education	2018
Lamarkaz	-	Blockchain Research and Development	2017
zk Capital	https://zkcapital.substack.com	Blockchain Investment	2017
swvl	https://www.swvl.com/	Blockchain based Ridesharing in collaboration with concordium.	2017
Red Cab LLC	http://www.redcab.com	Blockchain based peer to peer transportation system	2017
Bypa-ss	https://www.bypa-ss.com/home	Blockchain based health records management	2019

STAKEHOLDER
SNAPSHOT

Blockchain Misconceptions

"Blockchain technology definitely has a lot of misconceptions but the first one I would like to talk about is more about **the government. Blockchain seems to be a mystery for them**, because efforts to change all transactions from centralized to decentralized is very critical for any governments of the world. This is not even specifically about Egypt but even reports coming from the EU proves the same. We cannot deny that if we misuse the blockchain technology, it may cause damage to any economy and to security but if used and applied correctly, **we can truly achieve a truly decentralized future** through the involvement of the government in regulations. I would like to state that **we cannot continue to deal with Blockchain as a threat** because what we are doing is to give the authority of value back to the users, which is very critical. Another misconception is that blockchain is all about cryptocurrencies. Blockchain can be applied in various situations.

Blockchain Innovation

On the Blockchain Innovation side, there is a lot that needs to be done by the technical startups exploring blockchain technology in Egypt. I look forward to them **building more Blockchain solutions outside of the most popular use case of cryptocurrencies.** I believe they also need to do a lot of **upskilling to be able to build competitive solutions** with the Blockchain technology. For Blockchain to thrive well in Egypt, the policies that should be in place are not specifically policies about blockchain alone but a holistic innovation supporting policies that drives the successful implementation of the fourth industrial revolution technologies. Including blockchain".

Ashraf Ali

Innovation & Entrepreneurship Director at EITESAL NGO

Blockchain seems to be a mystery to the government

De-centralization is possible with government involvement in regulation

Building more Blockchain solutions outside of the most popular use case of cryptocurrencies

Blockchain Regulation

"Speaking of Blockchain regulation, it's good to mention that ***a few days ago, Egypt issued a new law related to fintech,*** mainly finance technologies within Egypt, in collaboration with the Egyptian central bank. It's a huge leap toward applying fintech and advanced technologies within the finance sector in Egypt. In general, ***Egypt is not closed in terms of banning and all that.*** The central bank is flexible, but it is not approaching the complete embrace of Blockchain regulation in a fast way. ***The government itself is doing their own research and reflecting on their own solution or ideas regarding application of blockchain*** or even emerging technologies, but in another way, they provide this ***flexibility for commercial banks to adopt some blockchain solutions.*** For example, Ripple has some partners within the commercial banks in Egypt. So it's not a ban in terms of blockchain technology. The central government, the parliament, the central bank and the ministry of finance are all enthusiastic toward providing new laws, which is mainly the challenge in every country to have a law that defines new technology, not a law that defines papers and old ledgers.

Blockchain Innovation

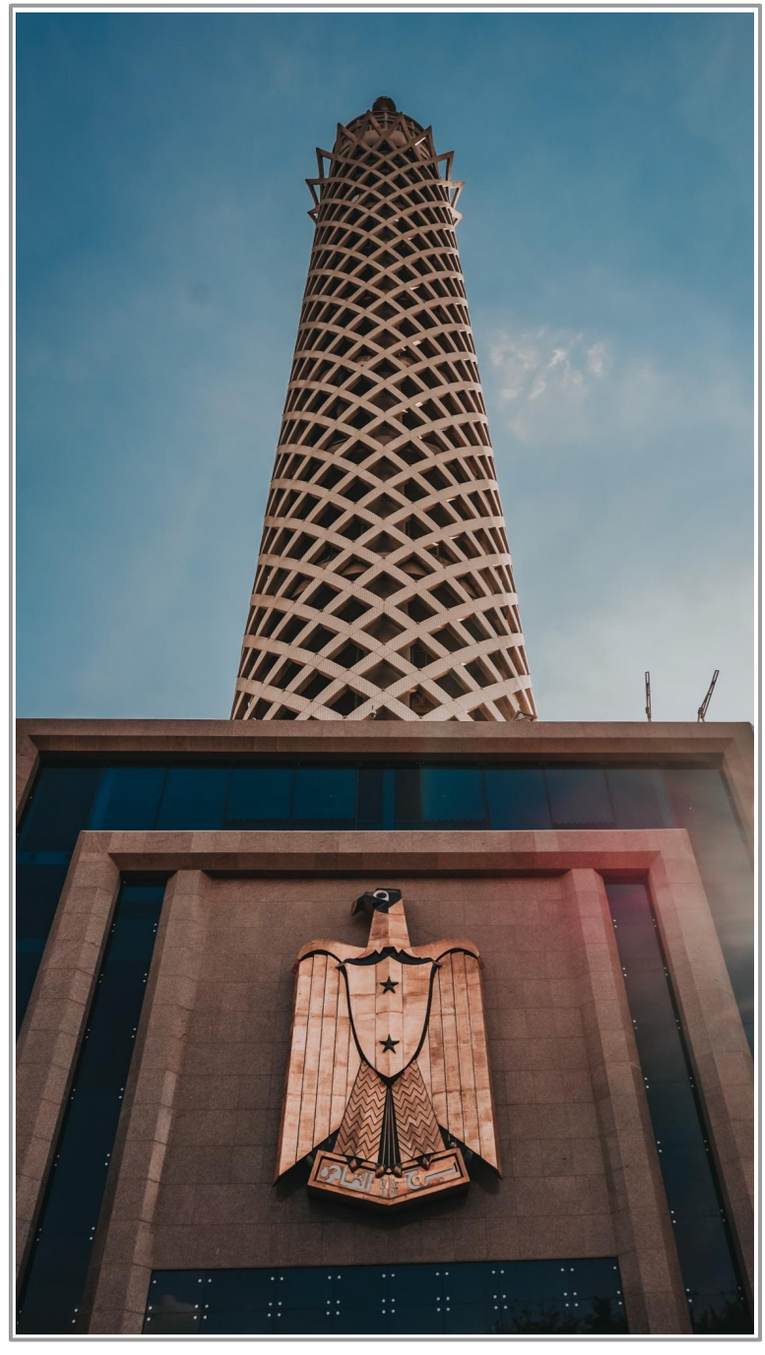
My company intentionally selected Egypt to be our gate to enter the African market because we are very sure that this is the potential market for the near future. Talking about blockchain applications, I believe that one of the, biggest projects in terms of application of a blockchain, mainly the NFT part would be the approach toward the Ministry of Tourism in Egypt, because Egypt has a huge legacy of tourism and antiquities - which is the biggest legacy of the world. So there is currently some communication with the Ministry of Tourism in Egypt. I believe this is one of the major projects, but it will take time again, regulation and approaching the right way to adopt NFT within this sector mainly. Other than that, I believe ***traceability is one of the huge applications of blockchain, mainly also supply chain, health care sectors and energy, because we know that the energy sector is somehow a need for Africa in terms of green energy, solar energy and all other energy alternatives.*** The applications of blockchain in the energy sector are huge, and this is mainly what we are focusing on as blockchain leaders in our R&D center in Canada to provide new patents related to blockchain and energy for developed countries and developing countries. So this is one of the biggest, I believe, sectors that will be booming in Africa because of the need for energy.".

Charbel Ghostine,
Managing Partner at Blockchain Leaders & USI, Cairo

Blockchain Misconceptions

I would say that the main misconception of the Blockchain Technology in Egypt is that ***people think blockchain is cryptocurrency.*** This is the reason why in my organization, we are doing some digital literacy about the digital skills and everything related to the new technologies. We are trying hard to enrich the knowledge of the people on new technologies but we still have some restrictions about the blockchain knowledge sessions which I believe will get better overtime.

Despite the slow adoption, a lot of people are interested in blockchain in different ways and in different applications, so I believe some ***people right now are exploring the fintech and decentralized financial services in their startup and into the blockchain system***, and also the smart contracts. They study how blockchain can affect the new digital transformation for Egypt's future . An example that confirms that ***people are exploring blockchain solutions is the NFT Arabia***. It is also a new startup working with the blockchain system and non fungible tokens, so it is still at the growth stage. Still, many people don't know about it or maybe afraid of some regulations that people don't understand but it will surely be one of the biggest blockchain projects that will come out of Egypt.



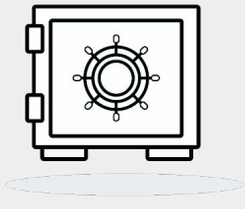
Blockchain Policy

On the policy and regulation front, things are actually pretty good and evolving. The government is developing new policies, new laws like the Egypt forward initiatives. The Ministry of Communication for example is very flexible and agile toward the technologies, so it's very promising. ***In five years, I think blockchain technology is going to be normalized in Egypt because I'm telling you, a lot of startups are using the blockchain system for their fintech startups or the NFT Arabia startup***. It is going to be very common in Egypt, and this will force the government to recognize it.

Taha Ali Eladawy
Merck Innovation Center

Blockchain Misconceptions

"The most common misconception of blockchain technology is that **people misunderstand blockchain as if it is actually cryptocurrency**. They think that everything related to blockchain is only in the cryptocurrency wallet, especially people who are not technology aware and not even in the financial sector. The disadvantage of this misconception is that people miss the big picture, which is the technology itself. I always try to explain to people that the blockchain is a technology like artificial intelligence, like IOT, like machine learning, which can be used in various situations. And I explain also to them that a lot of the usage of blockchain is outside the cryptocurrency world and also there are other use cases. I give examples of things like, the clearance to shipping system for the logistics, which emerged and the IBM are using it right now to clear the containers shipment from port to port. The other common misunderstanding is ***they don't realize that there is something called private blockchain, or that you can build a blockchain which is not for the public***, but only privately used by specific entities or organizations who are only connected, and there is no access from the outside world without permission. So they think that all blockchain networks are public like cryptocurrency.



Blockchain Innovation and Problem Solving

Of the most pressing problems that Blockchain can solve, I think the biggest problem that ***blockchain can solve are all the problems related to tracking some assets or tracking some transactions***. So for example, the tracking of illegal transactions - for example, when someone buys a home or buys a car from someone else, we need to be able to track this. There is an entity which is a governmental entity for that but they don't even use computers right now in all the sections and not all the transactions are registered on IT systems. I believe this is an area where I had seen in Dubai that they are using the blockchain specifically for this purpose and this is very good because with the blockchain technology, all the transactions that can be registered and nothing can be tampered with. So having these kinds of records in the transaction is really good through the blockchain. The other thing that I see is ***certifications***, like for example, University certification or any kind of training or professional certificates, and they are registered through the blockchain system. This can also be a good example of or a good application for the blockchain in Egypt. It can also be used in terms of ***money transmitter***, but not specifically as a cryptocurrency but just as something to record the transactions themselves. I think those are the best examples where I think it can be used.

One of the biggest challenges now in Egypt in exploring Blockchain solutions is ***the difficulty in finding the right calibers of Blockchain developers***. ***There is currently no specific institution or place where you can teach people blockchain technology. People learn it by themselves based on their own trial, but if they don't get a job in this domain right away, they just skip it".***

Tameer Ahmed
Advisor, Startup Finance, GIZ

Blockchain Misconceptions

I think that people are using a blockchain as just a database without real need for it. For example, we already have the Import/Export Authority use it to upload the shipping documents for the mandatory stop required by all the importers to Egypt. This system ensures that they upload their import data before shipping but this is still largely a government initiative. Therefore, there is a real need for decentralization and the whole concept of blockchain. They just use it as a standard database and in this case they can just use, you know, the internal system and they can keep their data there. I believe this system does not necessarily need blockchain. This is number one. And I think the second concept is that **people should really understand the concept of private blockchain** and the public one, because they have completely different applications and completely different usage. I think these two main pillars need to be resolved before moving on with the real application of blockchain.

Areas of Blockchain Applications in Egypt

I think **supply chain will be a major area.** There is a lot of mistrust between the different parties in the supply chain to really put the real data there, to really be readable, through the supply chain. I think there is an opportunity there to develop something to connect the supply chain information about the real demand and inventory across the supply chain, using blockchain. I think there is an opportunity to implement a smart contract here. The second application which is a big issue in Egypt is the ***control and the ownership of properties***. I think the government can develop something there. And here, the immutability of the information is very important because people can do a lot to play with this data. Furthermore, there is a need for Blockchain application in education because of course we see some fake certificates and I believe the government can begin to create a blockchain for the university certificates to forestall fakery.

Dr Mohammed Grida
CEO, 2B

ZIMBABWE

GOVERNMENT BLOCKCHAIN POLICY AND STRATEGIC PLANS

The time leading to 2021 has been a rocky one for Zimbabwe when it comes to the Blockchain technology and for its cryptocurrency use case. In fact, an article published by a staff writer of Techzim on October, 15, 2021 described the situation thus;

"Cryptocurrencies and Zimbabwe have been water and oil since the Reserve Bank of Zimbabwe (RBZ) banned traditional financial institutions from conducting business with crypto exchanges. Many have made the argument that cryptos and blockchain technology could be one of the solutions that could help Zimbabwe in its economic strife". (Techzim, 2021).

It is encouraging to note that despite the stillness of the government on Blockchain and Cryptocurrency use, a group by the name of " The Zimbabwe Blockchain Think Tank" has been the earliest and biggest advocate of the Blockchain Technology in Zimbabwe and they have been consistent in engaging the government through advocacy and information publications.

In October 2021, a 25 pages publication by the "The Zimbabwe Blockchain Think Tank", led by Prosper Mwedzi surfaced online. The publication, titled " **Towards Virtual Assets Regulation and Adoption of Blockchain Technologies in Zimbabwe's Context**". The tonality of the publication was not only passionate, but it also stated in clear terms what Zimbabwe is missing out by not integrating into the Blockchain Ecosystem. In the opening Abstract of the publication, one could literally feel the heartbeat of the writers as they made vivid the global valuation of the Blockchain and Crypto Economy and the Economic Prosperity Potentials that the technology carries for Zimbabwe.

Below is quoted the Abstract from Mwedzi's publication:

"This paper is aimed at informing the Zimbabwean public, legislators and policy makers on the importance of blockchain technology also known as distributed ledger technology. The use cases set out in this paper are not exhaustive but simply aim at highlighting the importance of the technology through a mixture of local case studies and evidence from empirical research. The major barrier to adoption in the Zimbabwean set up is the current ban on the banking sector from servicing Virtual Asset Service Providers. This has resulted in Zimbabweans being left out from participating in this emerging market whilst those who are taking part face challenges when they realize gains from their investments. More importantly, the situation has resulted in a skills gap in the market. There is no capital flowing into the economy to fund individuals and businesses to enable them to build local solutions due to uncertainty. In the second quarter of 2021, blockchain and virtual asset startups in the US received a total of $4.4 billion in Venture Capital Funds. From January 2019, a total of 40 bills were introduced to the US Congress concerning blockchain technology and virtual assets. The whole market for virtual assets has grown to over $2,2 Trillion globally and is expected to keep growing. The country risks getting left behind in this global redistribution of power over the global financial system if nothing is done urgently to address the current situation. When US companies like Tesla buy bitcoin, an investor based in Zimbabwe benefits through the increase in value of assets they hold without need to leave the country. This technology is leveling the playing field and is likely to lead to the global redistribution of wealth. The use cases are not only limited to tokens but pervade the economy. It is in this context that this paper has been commissioned". (The Zimbabwe Blockchain Think Tank, 2021).

While we cannot categorically say that this publication got to the reading table of policy makers in Zimbabwe, it is still very much where the government of Zimbabwe stands in their regulation of the technology. The popularly held position of the government remains the content of the communique published by the Reserve Bank of Zimbabwe, 2018 which states that all virtual assets/ cryptocurrencies transactions are banned by the banks.

Mentioning specific cryptocurrencies such as as bitcoin and litecoin in the communique, the first paragraph stated:

"Further to the Press Statement issued by the Reserve Bank of Zimbabwe (the Reserve Bank) on 20 December 2017 on the use of virtual currencies in Zimbabwe, the Reserve Bank wishes to reiterate that virtual currencies or cryptocurrencies such as ***Bitcoin*** *and* ***Litecoin*** *do not have legal tender status as they are neither issued by the Reserve Bank nor guaranteed by the government".* (Reserve Bank of Zimbabwe, 2018).

To confirm that the government is aware of cryptocurrencies exchange platforms operating in the country, the second paragraph also mentioned specific exchanges in their disclaimer. It stated:

"The Reserve Bank of Zimbabwe has not authorized or licensed any person or entity or exchange for the issuance, sale, purchase, exchange or investment in any virtual currencies/coins/tokens in Zimbabwe. Exchanges such as ***Bitfinance*** *(Private) Limited (****Golix)*** *and* ***Styx24*** *are not licensed or regulated by the Reserve Bank".* (Reserve Bank of Zimbabwe, 2018).

Company	Solution	Website
FlexID	Blockchain Powered Digital Identity	https://www.flexfintx.com
E-livestock Global	Track and Trace for Cattle well being	https://elivestockglobal.com/~elivesto/
Golix	Crypto Exchange	http://golix.io
Goldma	Gold backed Cryptocurrency	Goldma.io
SUNFund Africa	Blockchain Project Incubation and Crypto Consulting	https://sunfundafrica.wixsite.com/zimbabwe

Blockchain Misconceptions

I would have to start with Bitcoin, because that's the greatest of what these misconceptions are. I think the misconceptions have evolved in phases. There is the phase where people got scammed with bitcoin pyramid schemes. That phase passed, then we came to a phase where it was more like, "Okay, we understand blockchain, we think there's opportunity there".

Blockchain Use Cases & Application in Zimbabwe

I participated with a couple of Zimbabweans on a paper on blockchain use cases for Zimbabwe, and this included financial services, financial inclusion, agriculture and other use cases. Bottom line is this; we queue a lot here and people make money off the fact that they are able to do rent seeking, because people are queuing. So this is where it is for land. ***Blockchain would transform our councils totally because one of our biggest issues in the country is people having to queue for years to get allocated land in the country.*** Now, putting that on the blockchain will be fabulous, because we get to see who came in first. Let's talk about agriculture and talk about financial services. I am glad to say that there are some startups that are working in these directions, frustrated of course, but trying to show leadership in that space. I'm very passionate about what could potentially happen if we were to adopt blockchain, you know, for the ordinary person, and it's not something people in Zimbabwe cannot do. Zimbabweans are literate. Mobile penetration is extremely high, mobile Money has done extremely well and it is probably bigger than the banks themselves. You know, if there was a way of ***getting USSD connected to blockchain somehow***, it could take off in many ways. It is one of those spaces where the use cases are so high in Zimbabwe, so I would say that the greatest issues have been will. The ***political will***, and then not only that, the big corporations have not also been exploring the potentials but can we blame them?. ***We have a crypto ban from the Reserve Bank, so you know, that's really where we are.*** I feel that *in the next five to 10 years, we will be forced to get into this because the rest of the world is moving*. And so we don't really have a choice.

Blockchain in Zimbabwe in 5 - 10 years

I would like to say where I see us in less than five years before going to five years projections. With the hope of younger and vibrant leaders in Zimbabwe, we are hopeful that Zimbabwe will start moving in the right directions in the shortest possible time for Blockchain innovation. With open ears and readiness to innovate by the government, blockchain cannot but become one of the technologies that will blossom in Zimbabwe.

The status quo remains where I see us in five years. I'm sorry, ***I have to launch everything off our politics, because everything just hinges on that.*** To be honest, like I said before, the first question is political will, it is not that we are not ready. Zimbabweans are opening up to ideas. People are very huge on digital literacy and know literally almost all Zimbabweans can read and write. You know, people say that we overrate ourselves, but the truth is people are literate. Now I feel like we can convert that to something phenomenal. In agriculture, we keep telling ourselves we are agro-based and we really aren't, we actually make more from mining, remittances and other things. So I believe ***the update of Blockchain in Agriculture, remittances, mining and land title management will be massive in the next decade in Zimbabwe*** because of the openness and the level of literacy of the people.

Kudzai Mubaiwa
Founder, iZone Hub and Money Zim

Blockchain Potentials in Zimbabwe

I have continually seen the potential for this technology because **it is being used in various sectors different from financial services.** You've got nearly every industry getting disrupted. However, the technology hasn't got to a point where it's being massively deployed, especially in the African region and in Zimbabwe specifically. I think this technology is going to be very transformational. **It will enable most of the sectors in the economy to streamline some of their processes and make them more efficient.** I think adoption is going to go up as more people become **aware and knowledgeable** and we start to **develop the base of experts** who are able to develop blocks on blockchain. I think at the moment, **the major challenge is skills shortage** and also the point that, when at the beginning it was all about bitcoin, that's what most people know about blockchain. If you say blockchain to someone who is not as familiar with other things outside crypto, they will straight away, say, bitcoin. And in some ways it's been good, but in other ways it's been bad because it's not really managed to sell the full potential which this technology can have on other various sectors in the economy.

So I think **Africa will have an opportunity to deploy these solutions because the transparency and the mechanics of blockchain make it really successful**, especially for countries like Zimbabwe, where there are many problems in terms of accountability. There are so many things which this technology is going to be able to address, but they need to be deliberate about it. **They need to know and identify the use cases where it will have the most impact.** And if we think about things like, for example, you know, ***land ownership is a crisis in Zimbabwe right now because people are trying to sell land which they don't own or can't access collateral from the land because people don't know who owns what. If all this information can be put on a ledger and people are able to verify and track the ownership of land and be able to be certain***, it can unlock a lot of value in the economy.

More farmers will be able to use their land as collateral and access capital, and you can finance even building on the land because someone would be willing to give you a loan to build a house or a business premises. They will be able to know that they can secure what they're giving, because the issue of who owns what becomes easier and clearer for everyone. At the moment, you have to go to whoever holds the register all for land, and these are all still mostly physical records where they have to go through files to find out who owns what, and some of the information may be missing. If you have an ideal solution based on blockchain and you have a land solution based on blockchain and these technologies can interact with each other, you know you have won half of the fight because then you are just left with other logistical issues of putting together actors who are able to provide the capital.

Blockchain Skills Development and Investment Zimbabwe

The most pressing investment in Blockchain now would be people and skills investment. People who can code blockchain on blockchain and also, investing in businesses, startups which are interested in developing this. That would be a huge deal. You can get venture capital funds as long as you have a good idea, you can get funding for it because, sometimes your idea just sells itself and people just gravitate towards it to give you that money when you need it.

Blockchain Regulations in Zimbabwe

The main challenge, I think, is regulation in Zimbabwe. Currently, it's a very grey area for blockchain, and it doesn't need to be, especially when we talk about tokens and cryptos. It doesn't need to be this grey. People need to have this opportunity to know that if you do this particular thing, you will be fine. You are allowed to test your technology. **We shouldn't be scared of this technology like what the current situation appears to be**. So there is a need for good policies. The relevant government departments need to come up with some friendly policies for blockchain technology, **make it very targeted and thoughtful because you see most of these cryptos we see on the market right now, they are being developed from different parts of the world** - mostly from the US and India. They are solving problems which are peculiar to the situation for which they are created for. In Africa we have our own problems which are peculiar to the African continent.

I believe if the policies are in place, we can enable the youth to be able to take part in this global phenomenon. If you look at it, you know **the way blockchain is going right now, it kind of is comparable to the early days of the internet. Most people would be asking you; "why do I need an email"**. Not many people have got emails, you know, "I'm not going to be able to communicate with many people anyway". But think about it now, how many people use email today, and how many people still use the normal postal system? And you see the efficiencies it has brought from emailing and you can email someone in the US and they will get their message instant. **The internet has become like the plumbing for finance.** Most people now do transactions online, so it's gone beyond just email and you've got the website, e-commerce and all. But it's all been enabled by good policies. If governments had gone on to shut down the internet in the early days we wouldn't have gotten where we are now. And when you look at blockchain, especially in the payments sector, you'll see crypto coins and other tokens coming up now - like non-fungible tokens, which are now being used for art. We are now having a second layer on the internet, which is for payments and also brings finality to a payment transaction. However, **these things are not going to happen as fast as we would want them to unless governments have an open mind and have good policies which enable it.** We are not even talking about money, we are simply talking about the environment where these companies and young people can come into the market to test their technologies and analyze the market as long as they're not causing harm to anyone. **They should be allowed to do this at lower costs without having to make them meet the same sort of regulatory requirements which you would expect a bank to meet** because that's not going to work. They're not going to even be able to lift off the ground because the costs would be inhibitive and consequently stifle innovation.

Prosper Mwedzi
Zimbabwean Fintech Lawyer

Blockchain Misconception in Zimbabwe

I think it is a very misunderstood technology and even beyond this, people just don't understand or know what it is. You talk about blockchain and people ask you what it is you are talking about. I believe there is a **huge knowledge gap because people haven't really interacted with it** here. There are a few Zimbabwe developers who are working in the space but even then, it's also still something that is very new and it's a nascent area. I'll give you an example. We worked on a blockchain project recently and we had to pause for a bit because of a lack of developers who could really crunch the solution we are trying to build. **The capacity of developers is low and a lot of them don't understand diverse blockchain solutions.** So if a developer doesn't understand, then how is a layman or lay-woman supposed to get there?. I think the **biggest misconception there is it's just about money or, you know, about like, yeah, cryptocurrency** and all of that. I think that would be the leading misconception.

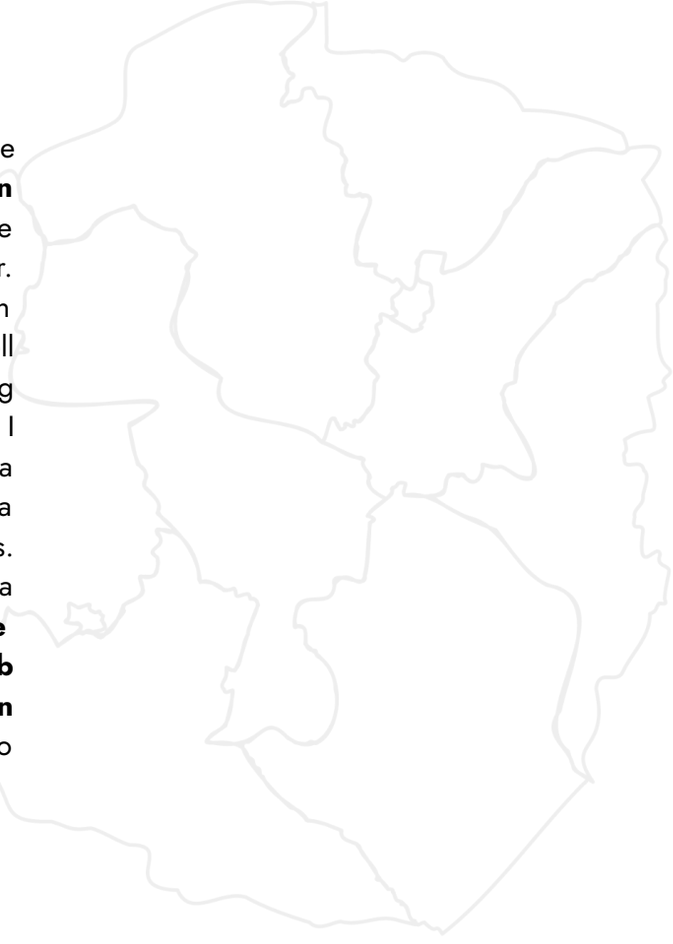
Blockchain Regulatory Environment in Zimbabwe

Considering the acceptance of other technologies such as the Internet of Things and Artificial intelligence, I feel that **blockchain is still behind in acceptance and in regulations**.This can be attributed to some of the misconceptions we talked about earlier. We had a blockchain startup, which was like the first blockchain startup providing the opportunity for people to buy and sell bitcoin but it was eventually shut down. The lack of understanding of the technology makes the regulatory environment quite strict. I mean, I know there are discussions around it in government fora and all of that, but there's a lot of **mistrust.** I would say we have a mixed bag, but yes, still some mistrust and some faint interests. There have been questions on how to regulate blockchain in a way that makes sense. **The Reserve Bank of Zimbabwe recently launched a sandbox but it is more for lab experimentation rather than addressing the real blockchain innovation regulations**. So with the sandbox, the idea was to also kind of look into the 4IR technologies in general.

Blockchain in the Next 10 Years in Zimbabwe

I think it is definitely going to grow. I feel like it's one of those things; **"if you can't beat them, join them". In a way, that is going to happen because it is a very strong and impactful technology**. I don't think that trying to regulate it strictly is really going to have an effect on the market. I am also very hopeful that governments as well as organizations will embrace it in a larger and more engaging way.

Tadzoka Pswarayi
Co-founder, Impact Hub, Zimbabwe



Blockchain Misconception in Zimbabwe

I think it is very much similar to what you find in plenty of other African countries. The misconception really did come around because, blockchain was introduced synonymously with bitcoin and thus, you know, it was being seen for arbitrage purposes. However, the situation on the ground **when it comes to local individuals, it's far much different than the regulatory perception** in such that in Zimbabwe, much like Nigeria, we've had a plethora of currency issues. These ***currency issues have necessitated the need for people to adopt cryptocurrencies when it comes to remittances and P2P transfers, as the value of the local currency itself has since plummeted and continues to inflate.*** So you have sort of two different perspectives: You have the perspective of the regulator that wants to continuously impose a centralized control and monetary and fiscal policy versus the typical perception on the ground, which sees cryptocurrencies as a hedge against inflation for some people. But most importantly, it is a utility for cross-border transfers and to preserve the value of their funds against inflation. So that's sort of been what's been happening in terms of perceptions here in Zimbabwe. The blockchain itself, sort of, has had a much slower start. And that's because, with blockchain technology really, it comes down to the utility. So we **haven't had that many companies actually implementing enterprise level blockchain solutions**. We've had a few successful case studies, for example, there is the work that we are doing in Flex ID. There's also what MasterCard did when it came to e-livestocks and trading. You also have other organizations experimenting, but we're still yet to see that catalyst moment where a mass adoption becomes the word of the day.

Challenges in Building Blockchain Solution in Zimbabwe

The first challenge was actually **educational** in the sense that we actually had to go back to the basics and redefine how we were implementing our problem statement, especially to the target market. Our company is primarily B2B, meaning that we actually work with different organizations such as financial and telecom institutions, and even the government. When we started this around 2018 getting into 2019, virtually nobody was working on any enterprise level blockchain solution. For the most part, it was the first time that they were hearing about it. What we managed to do is that **we managed to break down our solution to its most basic components.** In many cases, we wouldn't actually acknowledge the blockchain itself until the point where the customer themselves would see that their centralized problems are not insurmountable with traditional ways. And that's when it would come full circle for them that only a decentralized solution would actually fix this problem. So it was a lesson that took some time to learn because actually having to talk with executives and corporates through that educational process isn't easy, especially in Africa. **What also makes it difficult is a lack of successful case studies**, even regionally at a scale level. So it's much easier if you give an example and say MTN is using blockchain to do ABCD. It means any of the banks are going to want to investigate and they're going to deploy resources for that.

So **we are not yet there in Africa where you have a big blue chip name**. Adopting a decentralized solution and an app that is being used daily by multiple people (I'm speaking aside from crypto transactional platforms), which are the most popular form of blockchain applications when it comes to enterprise level, then the land is still very much left to be tilled. There's still a lot of opportunity in that area.

The **biggest challenge initially was academics**. The second challenge also then became the **skill set** when it came to integrating the solution itself. Our developer talent pool in sub-Saharan Africa very much still needs to catch up to the rest of the world. And when it comes to decentralized applications, there's only a handful of developers you're are going to find on the continent that can successfully implement and even integrate these solutions. So **we've had to also develop sort of a training layer for organizations,** which we are going to work with. And so we do train their developers on the basics of the technology. We also have made it extremely easy to access our APIs and SDKs such that someone with traditional programming skills isn't going to have a tough time actually integrating this. We've presented FlexID to different ministries. In some cases, we got extreme pushback because the solution wasn't aligning anymore with the incentives of the incumbent players and incumbent executives. So that was an African problem. But I'll say it's quite typical. So those are some of the challenges we experienced with FlexID.

The Future of Blockchain in Zimbabwe

The future of blockchain is extremely exciting, and I would definitely speak from a regional and continental perspective. I think now we're at a time (we're seeing this with FlexID as well), where **organizations are now far more willing to adopt some of these solutions into their everyday suites** and I think blockchain applications have also come a long way. *They are now much easier to integrate, much more well-defined, and the problems that they are solving are becoming much more clearer as opposed to maybe three or four or five years ago*, where it wasn't exactly sure where blockchain was actually going to then sort of disrupt or fix a problem. I see a great future when it comes to **electronic KYC and digital identity**. I see a lot of **adoption when it comes to supply chain solutions**. Africa and especially in West Africa, has an extreme problem of counterfeit pharmaceutical products. And there are a couple of startups in the space that have been working predominantly on supply chain solutions. And so, from Africa's perspective, **blockchain will only really have an impact in those areas where access was traditionally a problem**.

It's also going to be extremely impactful, in areas where the infrastructure is now very expensive to replicate to our Western counterparts. So one of the major advantages, obviously, of blockchain is that it allows us to adopt and actually take an extra step further than what you find with traditional systems in most Western countries. I see a future, **definitely payments are going to continuously be on top for some time but the enterprise applications are now coming on top**. I also see a great future in **healthcare**. That is an area which we are also working in to digitize healthcare credentials, prescriptions, health records and sort of have this mobility. But if Africa fully capitalizes on its promise of the **Africa Continental Free Trade Agreement, what it means is that you're going to have a much more extreme need for decentralized solutions for identity and document verification across the entire African continent**. E-commerce is also going to become much more integrated across the region, and there will be a lot of need to be able to have supply chain solutions that are able to trace coffee from Rwanda all the way to Tanzania and vice versa. That for me on a continental level is quite exciting. And then on a global level, you do have an extra layer of exciting applications, especially in DeFi, but for Africa, I feel (based on our experience), we need to zone in on our problems a little bit more seriously so that we can actually have real world use cases.

NFTs are all fun, but an NFT isn't really going to help someone in rural Nigeria who just wants to be able to easily access finance or open an account; someone who wants to sell their produce to international markets and get a fair equitable value for their product. So in Africa, **we really need to have a sort of this Africa focused development approach and increase our collaboration**. I think increased collaboration by fintechs and by other startups would help us build an African stack, which is what my vision for blockchain in Africa is.

Victor Maponga
Founder, FlexID

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RECOMMENDATIONS

This research has availed us the opportunity to glean and dive deeper into the various issues surrounding the Blockchain Ecosystem in the countries of focus ranging from misconceptions, to innovation and use cases. The following are the summaries of the edition;

- The insights from the four countries of focus of this research shows that the **governments of many African countries have started setting up committees and working groups to work on the understanding of the Blockchain technology** and their sources of education and information still remains the private sector. This creates an opportunity for the Blockchain private sector to stop standing aloof but go in to engage governments and policy makers.

- Insights from the data showed that a larger percentage of African **young people have been experimenting with the Blockchain technology and the deal breaker for many of them is the lack of regulatory sandboxes** and favorable experimentation policies. It is high time governments moved from the "wait and see" approach to " experiment and see" approach with the Blockchain technology when it comes to policy making and web3 technology regulation.

- There is a need for **gender balance in Blockchain Innovation in Africa.** Technology Leaders in collaboration with the private sector should facilitate more programs that get more women into the Blockchain Innovation Ecosystem.

- Investors, accelerators and incubators have **massive opportunities in Africa as many young talents are striving daily to build Blockchain solutions.** It is predictably noted in the study that Intentional incubation and acceleration combined with funding might possibly make the Blockchain ecosystem in Africa grow geometrically in the next five years.

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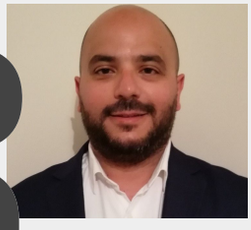			
	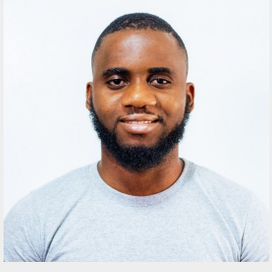		
		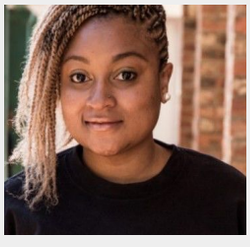	
			

Appendix

STARTUP COMPANIES INVOLVED IN THE STUDY

NAME OF (STARTUP) COMPANY	COMPANY WEBSITE	SOCIAL MEDIA LINK
Thesis Frame	https://www.linkedin.com/in/eman-h-6a40ab124	https://www.linkedin.com/in/eman-h-6a40ab124
SecureState (Real Estate Smart Contract)	https://linkedin.com/in/eslammostafa	linkedin.com/in/eslammostafa
BlockCenter	https://drive.google.com/file/d/1EYHzpN5_ejwchdg5h3Zlf0nKHbEoFCAQ/view	https://youtu.be/sXPTfiRodgE
JMP Africa		
wavechem	https://www.wavechem.co.zw	
Cochlear Media	https://finaliters.com	https://instagram.com/finaliters?igshid=YmMyMTA2M2Y=
Farm Technologies	https://www.twitter.com/farmtech_zw	www.facebook.com/farmtech_zw
Solarpro	https://www.solarpro.co.zw	https://twitter.com/solarprozim?s=21&t=7zpuI-Tdfer1DrwfH_hEpQ
Umojalands	https://www.umojalands.com	https://m.facebook.com/search/top/?q=umojalands%20-%20farmland%20exchange%20marketplace&tsid=0.793859849969215&source=result
Minted Reward	https://mintedreward.com	https://twitter.com/mintedreward?s=21&t=7zpuI-Tdfer1DrwfH_hEpQ
Freelance	https://notavailable.com	NA
Farm Metrics	https://www.farmmetrics.co.zw	https://twitter.com/farm_metrics?s=21&t=7zpuI-Tdfer1DrwfH_hEpQ
Fresh in a Box	http://freshinabox.co.zw	
BitFlex FinTech	https://bitflex.app	https://twitter.com/bitflexcrypto?s=21&t=7zpuI-Tdfer1DrwfH_hEpQ
Cryptogem Global	https://cryptogem.global	

NAME OF (STARTUP) COMPANY	COMPANY WEBSITE	SOCIAL MEDIA LINK
Techvivid Holdings	https://www.techvividholdings.com	https://www.facebook.com/techvividholdingspvtltdZW/
Nokoro Industries		
Wiv Technology		
Tinya		
Tigere Housing Company	https://www.tigerehousing.co.zw/	https://www.f6s.com/tigere-housing-company
Mator	https://mator.co.zw/	https://twitter.com/matorzw/status/1441350598507614208?s=21
Blockwood Capital	https://twitter.com/BlockwoodCap	https://twitter.com/BlockwoodCap
Swapps Finance	https://swapps.finance	@swapps_finance
Brighter Digital Group	https://www.brighterdigitalgroup.com	brighterdigitalgroup, @LtdBrighter
Yellow Card	https://yellowcard.io	Yellow Card
Kouroundé Strategies	https://www.kourounde.com	
HiveOnline	https://www.hivenetwork.online/	
Yegobox	https://yegobox.com	
Tudu Technologies	https://tudutechnologies.com	@tuduafrica on Instagram and Twitter
The Central focus	https://www.thecentralfocus.blogspot.org	N/A
	https://www.tommielorm134@gmail.com	www.ajbeadsgh_16
Akrosystems	https://akrosystems.com	@akrosystems
Bravoó Industries	https://Bravo6industries.org	@mega4131
devReachour	https://devreachout.com	devReachour
Dev lab	https://instagram.com/dev.lab1?utm_medium=copy_link	https://instagram.com/dev.lab1?utm_medium=copy_link
Echo Stars	https://echostar.com	@echo_star
BAITTON	http://www.instagram.com/dsbaitton	http://www.instagram.com/dsbaitton
exness	https://www.exness.com	www.enesss.com
Mazzuma	https://mazzuma.com/	https://twitter.com/OfficialMazzuma https://instagram.com/officialmazzuma?utm_medium=copy_link

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https://www.facebook.com/groups/BlockchainEgypt/
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Old Mutual Eight2Five
techzim
MSU
Tech Hub harare
Techhub Harare and Eight to 5
Freelance
Farm Metrics
cLabs
Computer society of Zimbabwe
Nokoro Industries
Github
Blockwood Cap
Formerly MUZINDA HUB & HYPERCUBE
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Yellow Card
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Fintech
Norrsken
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Web development
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