International Journal of Cryptocurrency Research

Publisher's Home Page: https://www.svedbergopen.com/

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Blockchain Challenges in Africa

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Abstract

In Africa, cryptocurrency tends to be sold with a large trade margin which can even reach 100% due to several reasons. Firstly, bitcoin in Africa is very difficult to mine because of the climate and lack of infrastructure. Also, cryptocurrency is in big demand in Africa as national currencies are vulnerable to hyperinflation. Besides that, since there are only a small number of virtual currency retailers they are able to set high prices. The relative financial stability of digital money and the opportunities for profit make cryptocurrencies very popular in Africa.

Keywords: Climate change, Africa, Cryptocurrency, Blockchain platform, Digital money

Blockchain is a wide-ranging and flexible type of data structure which operates under the principles of a Distributed Ledger Technology (DLT). A DLT refers to a novel and fast-evolving approach to recording and sharing data across multiple data ledgers which each have the exact same data records and are collectively maintained and controlled by a distributed network of computer servers.

With the emergence of blockchain (a protocol that eliminates intermediaries), it is possible to establish an auditable encrypted ledger that can record energy consumption, credit histories (which are relevant when there is a need for access financing), as well as provide energy trading between households; giving consumers more control of their energy requirements and consumption.

In 2017, a non-profit, Energy Web Foundation (EWF), started developing an open source, scalable blockchain platform with the aim of creating a market standard for the energy industry to build upon and run their own blockchain-based solutions. A business-as-usual attitude will not change the energy outlook of Africa. First, Blockchain will inspire fast adoption of a decentralized energy system in places with or without electricity. Second, it will not only increase productivity among small energy consumers, but new ways of defining energy end-use will emerge[1].

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[1] Nsikak, John. (2018). Blockchain Can Revolutionise the Energy Industry in Africa. *WEF.* URL: https://www.weforum.org/agenda/2018/11/blockchain-will-change-the-face-of-renewable-energy-in-africa-here-s-how/

A member of a blockchain system, or a node, can only add a transaction that is verified by other nodes. Before a block can be added into a chain of blocks, or a blockchain, a consensus mechanism is needed to verify that the block meets predetermined criteria and rules of the system such as no double recording of the same data. The validation activity, called hashing, includes solving an assigned mathematical problem. The correct answer to this problem is called a nonce. Once a node finds the nonce, other nodes verify it, and then a cryptographed identifier, called a hash, is given to the transaction. A hash consists of numbers and letters. Then, a block of data consisting of this cryptographed, digital identification is created. Hashing and consensus-reaching computations are done using computer software. After a consensus is reached, the new, identified, cryptographed, validated block can be added to the blockchain. The new block will be linked to previous blocks in the same chain, such as to blocks that contain previous transactions of the same data or asset. When a block is added to a chain, system members will be informed and own a copy of the block (not the data) in the distributed ledger accessible to them. If a block needs to be changed, another consensus mechanism is needed.

A block has two parts. First, a header, which includes a unique block reference identification number, the time the block was created, and a link back to the previous block; and the content, which usually is a validated list of digital assets and instruction statements, such as transactions made, their amounts, and the addresses of the parties to those transactions. A blockchain data ledger consists of unique blocks that each connects to individual transactions.

Blockchain technology is playing an important role in the fourth industrial revolution. It can eliminate existing environmental problems, change the way the global environment is managed, and bring people to a new level of quality.

Research breaks down the sectors in which distributed ledger technology can bring significant benefits into six areas: climate change, the conservation of Earth's biodiversity, the challenges of the world's oceans, air purity, weather resistance, and resistance to natural disasters. Each direction, in turn, is divided into narrower segments.

The potential of blockchain in the environmental safety sector is usually not taken into account by developers, investors, and governments. But this is the only way to unblock and monetize the value that is contained in the new ecosystems.

The technology of the distributed ledger should focus on the possibilities of helping mankind solve global environmental problems and expand opportunities for societies.

Africa is the second largest continent in the world in terms of both territory and population. There are 55 states located on the continent. Economies in Africa differ from country to country. In Africa, cryptocurrency tends to be sold with a large trade margin which can even reach 100% due to several reasons. Firstly, Bitcoin in Africa is very difficult to mine because of the climate and lack of infrastructure. Also, cryptocurrency is in big demand in Africa as national currencies are vulnerable to hyperinflation. Besides that, since there are only a small number of virtual currency retailers they are able to set high prices. The relative financial stability of digital money and the opportunities for profit make cryptocurrencies very popular in Africa.

The Blockchain Association of Africa is set to launch innovation centers related to blockchain across Africa in line with the association's goals. This joint force also stirs towards promoting technology education, community outreach, and local talent in order to increase blockchain adoption across Africa. Business value on the African continent is expected to increase from this[2].

Blockchain will ensure that Africans are now stakeholders in what the continent has to offer and it all starts with education. This partnership will ensure that the upcoming generation is equipped with the right skills and expertise to move the continent further. Blockchain Association of Africa is based in South Africa, Uganda and Nigeria with an aim to equip each and every stakeholder with the best Blockchain education, acumen and tools. The association has partners in Zambia, Dubai, Ghana, Kuwait, Namibia, Zimbabwe, India, Kenya, and Botswana and streamlines its aim to shaping Africa's future. Its organization is one that creates meeting avenues for cross-continent blockchain stakeholders to drive collaboration, innovation, and education.

An Innovation Center will be formed in Tanzania, South Africa, Rwanda, and Uganda under the body of Blockchain Worx's Blockchain according to plans. The Blockchain Innovation Centre will help both private

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[2] URL: https://medium.com/@uabachain/united-africa-blockchain-association-ab37e1f3d45c

and public institutions to understand and leverage the blockchain**.** Blockchain Worx is a FinTech-RegTech venture with its headquarters in Singapore. Their initiative offers solutions such as anti-money laundering transaction monitoring systems and securities tokenization platforms. The third partner, Afriplains Digital is a next-generation technology services company based in Tanzania. With the use of technologies like the blockchain they solve business and socio-environmental issues. The group will set up Blockchain Innovation Centers across South Africa, Uganda, Rwanda and Tanzania to drive awareness and education, and help organizations in Africa harness the potential of Distributed Ledger Technology for digital enablement[3].

The world is undergoing technological development at an unprecedented and explosive pace. Considered the "Fourth Industrial Revolution," this exponential growth will fundamentally alter the way we live, work, and relate to one another. These changes are further accelerated by the advent of blockchain technology and are perhaps most palpable on the African continent.

With much of the continent still dealing with the multi-generational ripples of colonialism, Africa's systems and infrastructure are badly broken; built from the bones left behind by their colonizing nations. The majority of African states are still considered developing nations—some half-century post-colonization—and many continue to struggle with armed conflict, corruption, and poverty as a result. Herein lies Africa's greatest opportunity: to leverage blockchain technology from the very start across every industry, systematically. Today, much of Africa has an opportunity to leapfrog the development mistakes of the West by reimagining entire systems of production, financial services, and governance fueled by blockchain, positioning itself as the ultimate unicorn case study.

It is obvious that Africa needs technological innovations to jump a generation and catch up with other countries. The continent can indeed turn the lack of infrastructure from a disadvantage into an asset. It offers a blank playground to test and validate new concepts such as mobile payment, which has quickly ned ground, as it remains the major mean of payment for a wide majority of Africans.

With the Internet of Things (IoT) and Artificial Intelligence (AI), low banking rates and booming mobile services, blockchain technology represents a real opportunity for Africa. In fact, beyond crypto-currency (virtual currency not guaranteed by the central bank such as *Bitcoin*), the blockchain consists of a decentralized and non-falsifiable register, allowing transactions to be validated almost instantly and without a central control unit. Called a trust machine, the blockchain technology will provide the confidence that the continent still lacks today and will contribute to its development by streamlining its financial circuit.

In addition to its "secure" and "transparent" nature, the attractiveness of the blockchain lies in the diversity of its applications, including agriculture, public administration, finance etc. This disruptive technology, which first appeared in 2008 in the aftermath of the global financial crisis, can be used in all areas where a trusted intermediary is required.

Although it is difficult at the moment to assess the long-term effects of the use of blockchain, the paradigm shift that this technology induces will impact many areas. Emerging countries, particularly in Africa, are an exceptional field of exploration.

Blockchain platforms are also able to provide more access to capital. The report notes that this could be trillions of dollars, starting with investments at the retail level and ending with charitable donations for inefficient economies and developing countries.

Blockchain can also be used to create a new system of automatic warning for natural disasters and solve the issue of the formation of humanitarian assistance based on transparent information exchange, thereby increasing the effectiveness of disaster management. These systems are not only limited to disaster relief, as they can also be implemented to transform the existing monitoring, reporting, and loyalty testing process in many organizations and industries.

Why Blockchain for Africa? Blockchain technology is still relatively new in Africa, but it has the potential to completely revolutionize the economy in this region. Here are a few ways Blockchain could reshape business and financial services in the region. With this technology you can trade value with another person without having a third party as an intermediary. Blockchain will get rid of cumbersome, costly and bureaucratic legacy systems because it removes the middleman. The right application of this technology could assist in elevating

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[3] URL: https://www.prnewswire.com/ae/news-releases/blockchain-association-of-africa-announces-strategic-partnership-with-afriplains-digital-and-blockchain-worx-singapore-826074085.html

the level of smart services provided to citizens in Africa from a cost, time and efficiency perspective. Creating an 'Internet of value' Blockchain not only stores information, but anything of value, including money, equities, bonds, titles, deeds, contracts and other kinds of financial assets. Blockchain technologies offer the opportunity to create an economy that is not only about goods and services, but is also more open, inclusive and fair. This is particularly relevant for Africa where a large portion of the population is unbanked. These people are excluded from the global economy because they can't open a bank account without a birth certificate, passport or utility bill or because they have insufficient funds. With Blockchain, trust is established through mass collaboration and intelligent algorithms rather than through centralized intermediaries like banks or governments. The system is also fully transparent because transactions can be viewed and corroborated by anyone else using the system. For Africa, this could alleviate many of the problems arising from corruption and fraud. The implications of this are important, not only for the financial services industry but also across most aspects of society.

Traditionally the financial services industry has always been a centralized unit of operations, meaning they are more vulnerable data breaches and cyber-terrorism. Blockchain can improve security and encrypt data during transactions, rather than when the data is moving or at rest. Because Blockchain is shared among a large number of users, it's virtually impossible to hack into or corrupt, and once a transaction has taken place, it cannot be reversed.

The world of Blockchain is nebulous, complex and fast-changing, and definitions and classifications are not cast in stone. As the technology matures and new models of transaction flows and applications are being developed, definitions and classifications continue to evolve[4].

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