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Trust the Masked Stranger: Unveiling the African Stokvel's Blockchain Enticement

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Research Paper

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ABSTRACT

Blockchain technologies offer platforming services on which African stokvels can be implemented. stokvels emerged as cooperative and self-help schemes for marginalized communities in South Africa. stokvel members contributing to a blockchain-managed common fund do not have to worry about trusting their peers because transactions on a blockchain are claimed to be transparent and irrefutable. Blockchain technology's consensus mechanism and its decentralized architecture ensure that authority is shared amongst peers, and none has monopolistic powers over the common fund. The blockchain is thus, at face value, seen as espousing the true spirit of cooperative and participative decision-making akin to African Ubuntu - the value system behind the African stokvel. This article critically analyses the superimposition of blockchain technology on African values-driven systems such as the stokvel. The paper problematizes two assumptions that are often taken for granted - that blockchain technology espouses the values of Ubuntu and that its implementation as an enabling technology for self-help financial schemes such as the African stokvel enhances the values of Ubuntu. The paper contributes to the literature that evaluates the implementation of financial technologies, particularly, blockchain technology in managing the transactions of cooperative self-help schemes in an African setup. It is argued and concluded that blockchain technology, like most other technological innovations, brings with it the comforts of Western modernity, while eroding the core values of Ubuntu such as care, pity, and empathy which are the founding values of the African stokvels. The recommendation made to African societies is to be cautious when adopting and using financial technology platforms such as blockchains as they are incompatible with African norms and probably designed to serve the profiteering agendas of technopreneurs.

KEYWORDS

Blockchain, Ubuntu, Stokvel, Decoloniality

INTRODUCTION

Blockchain technology is suggested as an enabling technology for financially including the marginalized and the unbanked members of society (Larios-Hernández, 2017). A blockchain is an immutable, distributed, transparent, and secure record of transactions (Swan, 2015; IBM, 2023). The technology operates by combining blocks of data in a chained structure that is historically traceable to prevent tampering and forgery (Xu et al., 2020). Initial applications of the blockchain concept were in the field of cryptocurrencies such as Bitcoin, Ethereum, and Tether. The technology's application now extends to fields beyond cryptocurrencies such as distributed storage systems, proof-of-location, healthcare, and decentralized voting (Miraz & Ali, 2018). The Bitcoin blockchain technology is seen by blogger Kohler (2023) as an effective financial technology for managing transactions of cooperative funds such as stokvels. A stokvel is a group of trusting people who regularly pool resources, such as money for self-help purposes (Schulze, 1997). Kohler (2023) recommends the use of the Bitcoin blockchain platform for managing cooperative and mutual fund schemes such as the stokvel because of mechanisms that make it difficult to forge transactions or steal from the fund without detection.

South African stokvels emerged as voluntary and self-help organizations for Black people who were excluded from financial systems such as banking and insurance during the period of Apartheid (Schulze, 1997). The term stokvel morphed from the phrase *'stock fair'*- a rotational cattle auction system conducted by 19th-century English settlers in the Eastern Cape region of South Africa where the person hosting the auction received contributions, termed a stock fair, from participants (Verhoef, 2001). A slightly different account is provided by Ramagoshi (2016) who explains that, in a South African context, the stokvel was an unpaid cooperative effort of community, relatives, and friends aiding a neighbour in completing tasks such as thatching a hut or harvesting a crop. The original stokvel was thus, an informal social structure built on friendships, communalism, and trust (Verhoef, 2001). Modern-day stokvels have varying goals, from pure savings, funeral contributions, birthday parties, and investment (Bophela & Khumalo, 2019). The commercialization and monetization of the stokvel concept has seen it take on formalized structures. Most South African stokvels, for example, operate under a constitution, as banking institutions require it to operate an account. A typical stokvel constitution prescribes membership rules, leadership, contributions and benefits, termination of membership, as well as any other operational considerations (NASASA, 2021). The notion of a stokvel, as a cooperative self-help scheme, is not peculiar to South Africa. These self-help schemes are prevalent in most parts of Southern African communities, for example, they are called *chamas* in Kenya (Rodima-Taylor, 2022).

Van Wyk (2017) regards the South African stokvel as a manifestation of the African Ubuntu values system in that stokvel members strive for collective survival under conditions of marginalization. Ubuntu is an African moral philosophy identifiable in the larger parts of Southern African societies of Bantu origin (Broodryk, 2005). This is evidenced by a similar linguistic root across many languages of Southern Africa. In the South African Xhosa language, the philosophy is referred to as *Ubuntu*, in Zimbabwe's Shona language it is *Unhu,* in Malawian Chewa and Tumbuka it is *uMunthu* and in Tanzanian and Kenyan Swahili language they call it *Utu* and it is called *vumuntu* in Mozambican Xitsonga (Sambala et al., 2019). Ubuntu denotes what it means to be a human - that is treating everyone with respect, granting them dignity, caring for others, fostering brotherhood, sharing, having a good disposition towards others, being sympathetic, and reconciling after conflict (Kamwangamalu, 1999).

There have been attempts to associate the founding principles of blockchain with the African values of Ubuntu. The DisruptAfrica (2018) website expresses this association between Ubuntu and blockchain technology as follows: "*There is a beautiful symmetry in how Blockchain, at its core, a network of members that work to achieve the greater good of the community as a whole, supports an ancient African philosophy like Ubuntu, which envisage similar aspirations, on a continent where the technology perhaps has the biggest potential to produce change in the lives of everyday people."* Blogger Kohler (2022) claims that the Bitcoin Blockchain espouses the cooperative principles of Ubuntu by arguing that Bitcoin nodes survive attacks by cooperatively enforcing the same rules and allowing different miners to compete against each other for a reward, thus keeping each other honest in the process.

Blockchain is an emerging technology that is disrupting the digital landscape (Zutshi et al., 2021). It is, therefore, important to scrutinize the assertion made by DisruptAfrica (2018) and blogger Kohler (2022) that there are similarities between blockchain technology and Ubuntu, considering emerging Afrocentric and postcolonial discourses such as decoloniality. African scholar Ndlovu-Gatsheni (2015) denounces Western modernity for creating problems in Africa for which no solutions exist. They propose strong pushbacks against pillars of Western civilization, namely post-colonialism, as the way forward for the previously marginalized African societies. Blockchain, like many other computing technologies, is conceived in the global north hemisphere with typical Western assumptions of what it means to be fair, rational, and equal. The African stokvel is, thus, an apt focal point for a critical analysis of attempts to superimpose financial technology systems on African values-driven systems. Rodima-Taylor (2022) studied the use of Financial Technologies (FinTech) as a platforming service for African values-based self-help financial schemes namely the stokvels of South Africa and the chamas of Kenya. Their (Rodima-Taylor, 2022) conclusion is that the use of FinTech in cooperative and self-hep schemes is financial exploitation through loans disguised using terms that resonate with African interdependence such as Ubuntu. The following research questions and the research's contributions are, therefore, put forward.

IMPORTANCE & CONTRIBUTION OF THE STUDY

The main research question for this study is "Does implementing blockchain as an enabling technology of the African stokvel system enhance the values of Ubuntu?". It will be addressed through the following sub-questions; firstly "What is the underlying concept of a blockchain?", then "How do the core tenets of blockchain technology compare with the values of Ubuntu?" and the last one is, "What are the implications of using blockchain technology as an enabling platform for stokvel Systems?".

Answering these questions enriches literature that evaluates the implementation of blockchain technology in managing the transactions of cooperative self-help schemes against the backdrop of the philosophical tenets of Ubuntu using the South African stokvel concept as a case study. Rodima-Taylor (2022) criticizes the adoption of FinTech in 'stokvel-like' systems for enticing users with debt-inducing credit. Their argument is based on historical, political, and social injustices of colonial and post-colonialism-era inequalities. This paper brings a different angle to this argument by problematizing the use of blockchain technology in stokvels based on the architectural configuration of blockchain systems itself. It argues that blockchain technology implementation has a demutualizing effect on the African-values-driven self-help schemes such as the stokvel. African social and humane endowments such as togetherness, empathy, forgiveness, help, and solidarity that are at the core of the original stokvel are diminished when key decision-making processes and judgments are automated and programmed as software settings and smart contracts.

The rest of this article is organized as follows; - The next section outlines the research methodology. This is followed by an examination of the fundamentals of blockchain technology with a focus on the concepts of an immutable ledger, decentralization and trust, consensus mechanisms, and smart contracts. The follow-up section criticizes blockchain technology foundations using the lens of Ubuntu - the founding philosophy on which the African stokvel is conceived. The next section then argues that blockchain technology, like other financial technologies, is conceived in commercial and profit-driven contexts and its adoption as an enabling technology for African stokvels has a demutualizing effect. This is the erosion of social capital such as mutual trust, care, togetherness, and reciprocity that is embedded in communal societies through an overreliance on inhumane technology-driven decision-making done by smart contracts, cryptography, and consensus algorithms. In conclusion, African researchers and scholars are urged to invest in efforts that mitigate the intended and unintended consequences of financial technology implementations that undermine the best aspects of African culture and values.

RESEARCH METHODOLOGY

This research is qualitative in nature in nature and adopts the problematization approach in a literature review context. Problematization, as a research methodology, orients with social constructionism, feminism, postmodernism, and critical theory- and can be used to challenge prevalent assumptions in both practice and theory (Alvesson & Sandberg, 2011). It discourages hero-worshiping established trends or conforming to prevailing literature by encouraging researchers to use literature to create their new worldviews (Chatterjee & Davison, 2020). It avoids the failings of gap-spotting and gap-plugging that are used in traditional literature reviews that leave underlying assumptions in the literature and its theories unquestioned (Alvesson & Sandberg, 2011, Chatterjee & Davison, 2020). Literature articles in this study are, consequently, selected purposefully to assist in challenging the claims made by DisruptAfrica (2018) and others such as blogger Kohler (2022) that there are similarities between blockchain technology and Ubuntu. A cooperative self-help scheme popular in South Africa that is called a stokvel – seen as a manifestation of Ubuntu - is used as a case in the critical arguments. Figure 1 illustrates how the problematization approach was used to answer the research questions in three phases.

The Conceptual Framework

Figure 1

Conceptual Framework
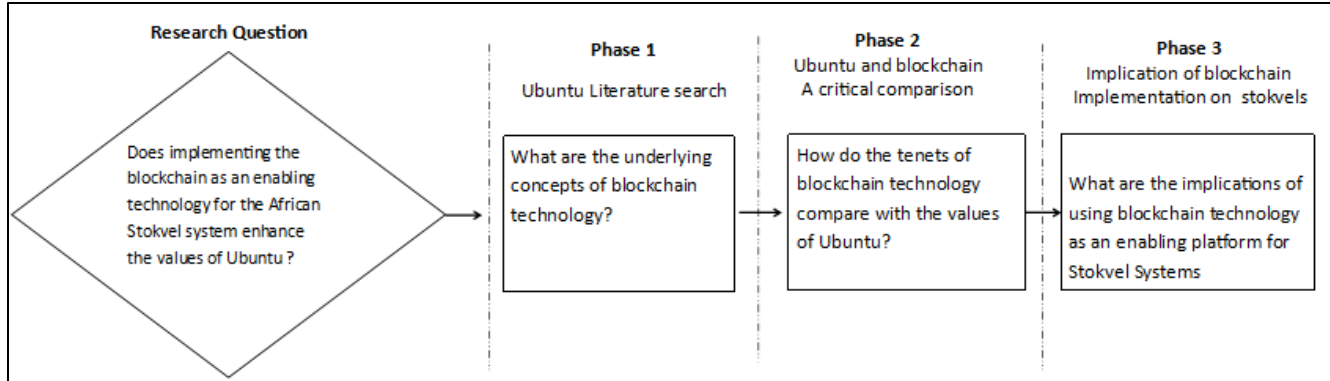
Phase 1: Ubuntu literature search

The first phase of the research method involved searching articles that provide insight into the key principles of blockchain technology. The Google Scholar search engine was used to find highly cited articles and relevant articles on blockchain technology using a combination and variation of the following two search strings.

- *"Blockchain technology principles"*
- " Principles of blockchain technology"

Table 1 provides a list of the five articles that were selected for studying and establishing key principles of blockchain technology. The list was established based on relevancy and citation score. The level of citation of the articles was assumed to indicate the value of scholarship associated with their contribution to the topic. The IBM website source was selected to include a practitioner's perspective. A systematic and exhaustive literature review was not seen as necessary in this case because the aim was not to fill and spot gaps in the literature but to establish generally established principles of blockchain technology that could be used as a basis for comparison with Ubuntu values systems.

Table 1: List of blockchain articles.

Article on Blockchain Technology	Cited by
Lin, I.-C., & Liao, T.-C. (2016). A Survey of Blockchain Security Issues and Challenges. International Journal of Network Security, 19(5), 653–659. https://doi.org/10.6633/IJNS.201709.19(5).01	1404
Tasca, P., & Tessone, C. J. (2017). Taxonomy of blockchain technologies. Principles of identification and classification. arXiv preprint arXiv:1708.04872.	357
Zeng, S. Q., Huo, R., Huang, T., Liu, J., Wang, S., & Feng, W. (2020). Survey of blockchain: principle, progress and application. Journal on Communications, 41(1), 134-151.	67
Liu, Y., Lu, Q., Yu, G., Paik, H. Y., & Zhu, L. (2022). Defining blockchain governance principles: A comprehensive framework. Information systems, 109, 102090.	17
IBM (2023). What is Blockchain Technology - IBM Blockchain, IBM. Www.ibm.com. https://www.ibm.com/topics/blockchain	n/a

Phase 2: Critical Analysis of Blockchain and Ubuntu

A critical comparison of blockchain technology and Ubuntu was done based on the values and expectations that Ubuntu places on the comparable aspects of blockchain technology such as consensus, control, trust, and decision-making. A search of literature focusing on the core principles and values of the Ubuntu philosophy that relate to blockchain technology such as trust, sharing, governance, decision-making, security, privacy, and trust was done to facilitate this comparison. The search phrases that were used on the Google Scholar search engine were a variation of the following.

- "Ubuntu and trust"
- "Ubuntu and sharing"
- "Ubuntu and decision making."
- "Ubuntu and transparency"
- "Ubuntu and control"

Stage 3: Evaluation of Implication of Blockchain of Stokvels

The implications of superimposing blockchain technology as an enabling platform for the African stokvel- a manifestation of Ubuntu ethos- are finally discussed.

# BLOCKCHAIN TECHNOLOGY

What is a blockchain?

The central concept of a blockchain is an irrefutable and immutable record of transactions. It has morphed through three generations: Blockchain 1.0, 2.0, and 3.0 (Sarmah, 2018; Xu et al., 2020). According to Cao et al (2023), Blockchain 1.0's main application was digital currencies and payments, Blockchain 2.0 introduced smart contracts and smart assets and Blockchain 3.0 saw the wider application of technology beyond financial markets to industries such as the supply chain, transportation, entertainment, retail, healthcare, and information management.

There are varying typologies of blockchain technology that are based on participants. A simpler one categorizes them as public, private, permissioned, and consortium (Lin & Liao, 2017). The public blockchain is open and operates without a central authority, while access to a permission blockchain is controlled (Polge et al., 2020). Private blockchains are limited to invited participants, and the operator often has control over participating nodes' actions, such as limiting who can edit, or execute consensus protocols (IBM, 2023).

Figure 2 illustrates how a blockchain operates at a conceptual level.

Figure 2

The Blockchain Concept
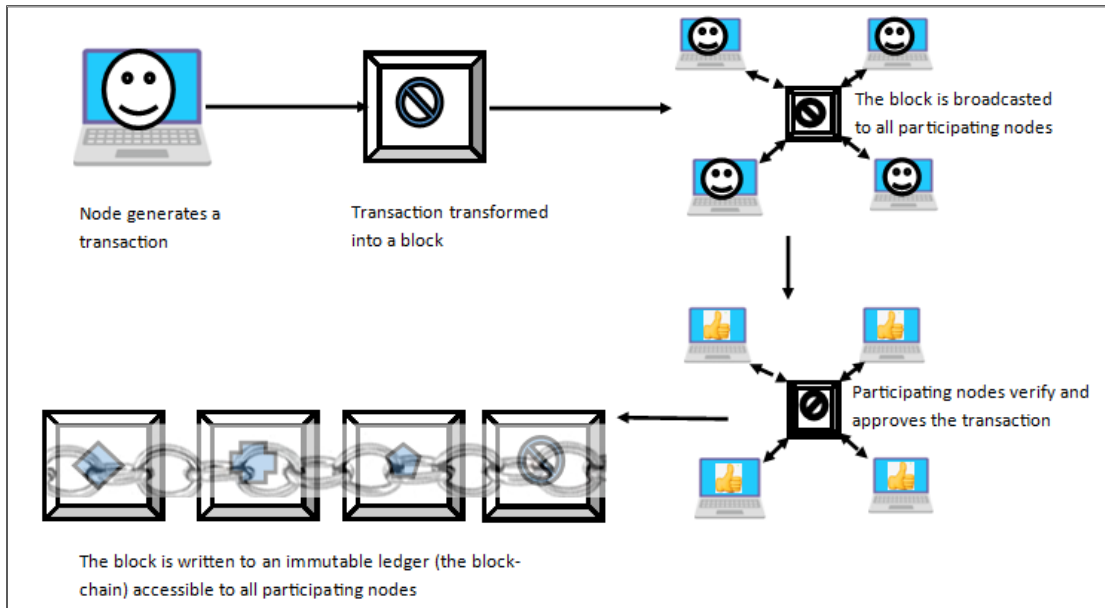
Adapted from (Dey, Ghosh, & Chakrabarti, 2022)

A node in a blockchain represents a participating computer in the decentralized peer-to-peer network (Dey et al, 2022). Every node has the power to initiate a transaction that is transformed by the blockchain platform into a block of data (Lin & Liao, 2017). The block is then sent to all participating nodes for verification and approval and once a consensus is achieved, the block is written to an immutable ledger that is accessible and verifiable by all nodes (Dey et al, 2022).

Fundamental aspects of a blockchain

The key concepts that define blockchain technology as gleaned from selected articles are presented in Table 2.

Table 2

The key principles of blockchain technology

Source	Recurrent concepts about blockchain technology
Tasca & Tessone (2017)	*Decentralization of consensus, Transparency,* ***Secure and tamper-proof***, ***Immutability***, *automated* ***smart contracts***, *limited Storage.*
Zeng et al., (2020)	***Centralization and Decentralization***, ***distributed ledger technology***, *cryptocurrency, peer-to-peer network,* ***intelligent contracts***
Liu et al., (2022)	*The level of* ***decentralization***, *incentives to achieve* ***consensus***, *the* ***transparent*** *decision process for* ***trust***, *accountability, ecosystem-level governance, legal compliance, and ethical responsibility.*

Lin, I.-C., & Liao, T.-C. (2017)	*Decentralized, Transparent, Open Source, Autonomy., Immutable, Anonymity*
IBM (2023).	*Distributed ledger technology, Immutable records, Smart contracts*

The five enduring concepts that were found from scanning the sources are as follows: -

1. It is an immutable and irrefutable ledger.
2. It uses a decentralized, distributed architecture.
3. It is based on a trust and consensus mechanism.
4. A smart contracting system automates decision-making.
5. Cryptography is used to control access.

Immutable and Irrefutable Ledger

Immutability implies that a blockchain transaction, once approved and written to the shared ledger, cannot be changed, or tampered with without detection (Tasca & Tessone, 2017; Politou et al., 2019). This is achieved by assigning a unique hash value to each completed block, where any changes to it will generate a different hash value that can be used to detect tempering (Narayanan et al., 2016). The dictionary definition of irrefutability implies the availability of strong evidence that is difficult to dismiss - something that cannot be denied (Cambridge Dictionary, 2023). Blockchain transactions are linked in a historical chain and nodes can refer to previous blocks to validate preceding transactions (Hofmann et al., 2017). The linked and chained structure ensures that all transactions are transparent and verifiable by participating nodes. Nodes may not, therefore, surreptitiously modify the ledger transactions without detection. A decentralised and distributed architecture makes this immutability possible.

Decentralized, Distributed Architecture

Blockchains are built on decentralized and distributed architectures (Tasca & Tessone, 2017; Zeng et al., 2020; Liu, 2021; Liu et al., 2022; IBM, 2023). The decentralized and distributed architecture of the peer-to-peer blockchain network guarantees that both resources and decision-making are not controlled by a central authority in the system (Tasca & Tessone, 2017; Zeng et al., 2020; Liu et al., 2022). All node holds a copy of the shared ledger, and decentralized decision-making ensures that modifications must be agreed upon by all the peers through a consensus mechanism (The World Bank, 2018). The distribution and decentralization of nodes, thus, help ensure the security, and reliability of records managed by a blockchain system (Sarmah, 2018). A consensus mechanism ensures that all nodes agree on operations that are done on the shared ledger (the blockchain).

Trust and Consensus.

Blockchains are different from centralized financial transaction systems that use a trusted intermediary such as a bank as the guarantor (Murabito, 2019). They are a *'trustless'* network of peers (Liu 2021). Nodes do not have to trust each other in the traditional sense of believing that your compatriot will honour their obligation. There are several consensus mechanisms by which agreements are reached in the peer-to-peer blockchain network, but the two most common ones are the Proof of Work (PoW) network and Proof of Stake (PoS) (Liu, Lu, et al., 2022, Lin & Liao, 2017). In the PoS consensus mechanism, nodes in the peer-to-peer network (called miners) compete to solve a complex mathematical puzzle needed to write

a block on the chain (Tasca & Tessone, 2017). The first node to get the correct answer broadcasts it to all nodes in the network for validation and receives payment for the work done, hence the term '*proof of work' (*Nguyen& Kim, 2018). The PoW protocol uses enormous energy and computing resources (Liu, Lu, et al., 2022). Cheating or hijacking the systems through double spending is discouraged by the enormous amount of computing power and electricity that need to be expended to achieve the feat (Auer, 2019). Resource commitments in terms of computing power and electricity are, thus, a demonstrable commitment to the network. The Proof of Stake (PoS) consensus mechanism seeks to avoid the energy and computational commitments used in the Proof of Work. Nodes that commit to adding a block to the blockchain for a reward must stake a considerable amount of their crypto assets that they will forsake if their proposal is proven incorrect (Nguyen et al., 2019). Nodes with higher stakes (bets) are selected for the right to mine a block thus making the process quicker and more efficient as the need to compete and deploy resources such as computing power and electricity, as in PoW, is removed (Lepore et al., 2020). Nodes that are highly invested in the blockchain are incentivized to act honourably for fear of losing their stake if the blockchain collapses (Lin & Liao, 2017).

Smart contracts

A smart contract is a self-executing code programmed into the blockchain that is triggered to complete a task when certain conditions are met(Lepore et al., 2020. Smart contracts are hosted on each participating node and are a mechanism for codifying trust relationships and enforcing agreements without the need for central or third-party enforcement agents such as banks (Singh et al., 2020; Khan et al., 2021). Smart contracts are, by design, irrevocable (Mohanta et al., 2018).

Security, transparency, and privacy

Encryption and decryption make transaction data inaccessible to unauthorized users and authenticate the identity of participants in a transaction (Zeng et al., 2020). Cryptographic algorithms make it possible to mask the identity of transacting parties whilst verifying their authenticity (Liu, Si, et al., 2022). Cryptographic algorithms are, thus, used to secure blockchain records by controlling who has access to the ledger and maintaining a level of secrecy for participants who want to conceal their identities.

A visualization of the relationship among the components of blockchain technology listed above is presented in Figure 3.
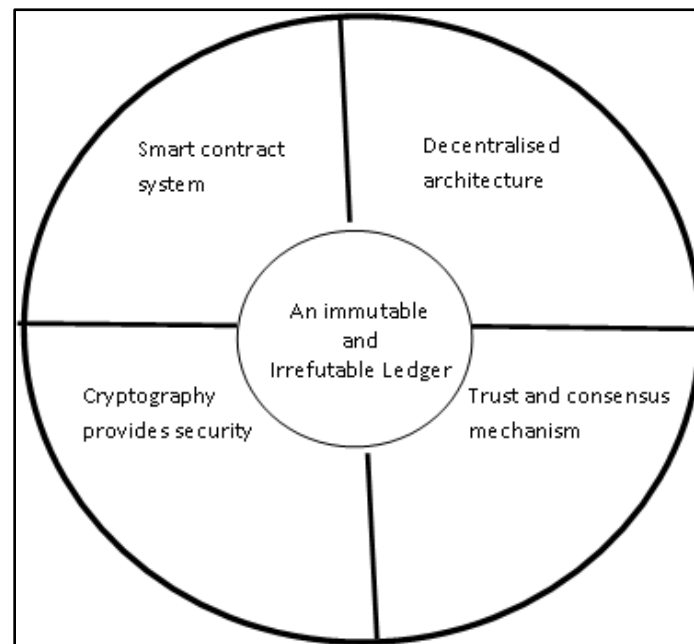
Figure 3

The key concepts of blockchain technology

Figure 3 conceptualizes the blockchain as an immutable and irrefutable ledger. This immutability and irrefutability are enabled by its design aspects concepts, namely a decentralized and distributed network architecture that ensures no node has absolute power over the network. Blockchains have a universally applicable trust and consensus mechanism that governs the transactions amongst peers, and an irrevocable smart contracting system enforces universally agreeable rules. The next section examines these concepts as they relate to the Ubuntu values system.

UBUNTU PHILOSOPHY AND BLOCKCHAIN TECHNOLOGY

Part of answering the research question, *does implementing blockchain as an enabling technology of the African stokvel system enhance the values of Ubuntu?* requires an analytical comparison of the building concepts of blockchain against the tenets of Ubuntu. Ubuntu is the moral philosophy that defines humanity or humanness - what it means to be a human being (Dolamo, 2014). The highest accolade that can be bestowed on a human being is having Ubuntu implying that "*they are generous, hospitable, friendly, caring and compassionate. A person with ubuntu is open and available to others, affirming of others, does not feel threatened that others are better at something or more successful*" (Hailey, 2008:8-9). Collectivism is the hallmark of Ubuntu leadership and governance because its decision-making processes emphasize what is good for society and the collective (Asamoah & Yeboah-Assiamah, 2019). The notion of Ubuntu is broad; thus, this section explores a narrower spectrum of its concepts that are relatable to blockchain technology. These are immutability, irrefutability, smart contracting, trust, consensus, as well as decentralization.

Immutability, irrefutability, and smart contracting

The terms, immutable and irrefutable, as used in blockchain technology, suggest a certain degree of permanency (Politou et al., 2019). The notion of permanency as a function of immutability and irrefutability seems to be alien to Ubuntu's values as a social system. Dynamism is the hallmark of Ubuntu, and the notion of *permanency* is inconsistent in a social set-up that primes, reconciliation, finding each other, accommodation, and negotiations. Hailey (2008) elaborates on this dynamism by indicating that African cultures exhibit an endless capacity for consensus and reconciliation in that everyone has a chance to speak at a gathering until some mutual agreement is established. Negotiations and relations in Ubuntu's value systems are consultative and this must be contrasted with blockchain smart contracts that use coded logic that is indiscriminate. There are no considerations made on whether parties have made representations on the matter or whether the smart contract instructions were intended or legal in blockchain transactions (Lim et al., 2016). The smart contract mechanism aims at one and only one thing - enforcing a particular piece of software code that irreversibly binds the concerned participants when certain conditions are met. Blockchain smart contracts are, therefore, typical mercantile agreements synonymous with the 'pound-of-flesh' demands in Shakespeare's classic - *The Merchant of Venice*.[1] Permanency is therefore not consistent with Ubuntu's trust and consensus-building mechanisms.

Ubuntu Trust and Consensus Building

Hailey (2008) points out the notion of trust as a precondition for harmonious coexistence in Ubuntu values-based societies. The trust that they explain emphasizes ideals such as members in teams looking after each other, working for each other, and expecting goodwill from others. Ubuntu-based trust is about building networks of collaboration and reciprocity (Ncube, 2010). Ubuntu-based trust is a relationship built on utmost good faith (Bennett, 2011). Decision-making is collective in the African Ubuntu values system (Sambala et al. (2019). The collective decision-making, that is associated with Ubuntu, implies aggregating ideas from participating individuals to come up with an agreement through a process of deliberation and consensus building (Hamada et al., 2020). The Ubuntu philosophy is, therefore, a trusting, selfless, and collaborative value system. The blockchain, as indicated in the previous paragraphs, is a *trustless* network where peers use a consensus mechanism such as Proof of Work or Proof of Stake to agree on transactions. Peers do not have to trust each other but, they hold the power and mechanisms to check and punish a dishonest participant. The Proof of Work consensus mechanism makes the resources needed to hijack the network considerably huge to make the effort irrational and costly whilst the Proof of Stake punishes cheats by confiscating their stake. Consensus and trust in the Ubuntu value system are, thus, *built* but *enforced* in a blockchain setting. Decentralization and a distributed architecture are key aspects of enforcing blockchain consensus.

Decentralization and distributed control

Control and ownership, as they apply to governance in Ubuntu philosophy, emphasize "collective stewardship", accommodating diverse and minority views based on "grass-roots participation, consultation, and discussion" (Pansiri et al.,2021:177). Even assets such as land are held in trust by the

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[1] A merchant takes a loan to help a friend and stakes a pound of flesh as collateral the lender who demands the pound of flesh when the loan cannot be repaid with the intention of hurting the merchant.

king or chief for the collective benefit of the community (Nzimakwe, 2014). The Zimbabwean Shona language has an idiom, "*nyika vanhu*", whose literal translation is 'the land is the people" but politically implies a system of governance and resource management based on the devolved authority and bottom-up principles (Latham, 2002). This is different from blockchain technology which uses distributed ownership and decentralized control to force collaboration. There is no collective ownership of resources in the conceptualization of blockchain technology. It is a decentralized and distributed system of ownership where participating nodes hold a copy of the shared ledger as a mechanism to enforce consensus (Rutland, 2017).

Transparency and Privacy

Blockchains are excellent at secrecy and masking the identities of transacting parties through encryption (Liu, Si, et al., 2022). Secretive acts or protection of personal spaces is rarely regarded in Ubuntu philosophy because societal good takes precedence over personal liberties (Olinger et al., 2007). This stems from the fact that, in Ubuntu, an individual is viewed in the context of others. Ubuntu, however, accords inalienable rights to individual dignity as there is a realization that the dignity of the society stems from the dignity of its members (Murithi, 2007).

Ubuntu vs Blockchain

The comparisons made above suggest that the reason for irrefutability, distributed ownership, consensus, mechanisms, smart contracting, and encryptions that are used in blockchain technology is mistrust (blockchain is a trustless network). On the other hand, collective ownership and solidarity which are the basis of the Ubuntu philosophy ownership styles symbolize mutual trust. In Ubuntu philosophy, decisions are made after consulting the collective, and the solidarity of common ownership promotes cooperation (Nzimakwe, 2014). Society members trust each other and put resources in a common pool. They engage in *deliberations* that lead to mutual consensus. In blockchain systems, nodes mistrust each other to the extent of holding their assets. A euphemism for the trust system in blockchain systems can, thus, be expressed as '*I am watching you*' while in Ubuntu it becomes, '*I am with you*'. The next section explores this debate in the context of implementing blockchain technology on African stokvel.

IMPLICATIONS OF BLOCK CHAINING THE AFRICAN STOKVEL

It is evident that using blockchain as an enabling technology for implementing African stokvels brings with it the benefits associated with technology and Global north-defined modernity. Transactions on the collective fund are transparent to all, verification mechanisms exist to detect fraud, and consensus mechanisms ensure that decisions are not made by the powerful or corrupt few. In addition, smart contracts will irrevocably implement pre-agreements without fear or favor. It is, however, worth considering the cost at which these benefits come in the context of Ubuntu and the African context. Three positions are advanced, namely, that blockchain technology lures participants into trusting strangers, demutualizes the collective fund, and has monetary and hidden social costs.

Trust the stranger

One of the selling points of blockchain technology is that it provides check and balance systems on transactions to the extent that stokvel members do not have to know or even trust each other when they are investing in a collective and mutual fund. The fund can, thus, grow as a *trustless* network of peers as the role of trust can be easily delegated to consensus algorithms and smart contracts that will be embedded in blockchain technology. There is a fundamental incompatibility between blockchain technology and the premises on which the African stokvel is conceived that makes this proposal problematic. Cryptography, ciphering, and consensus mechanisms such as Proof of Work and Proof of Stake use mistrust as the basis of trust at a technical and operational level of the blockchain. The zero-trust security architecture (ZTA) that Alevizos et al., (2021) propose for protecting blockchain endpoints assumes that there is a hacker out there who is determined to take advantage of the system. This could be true in the cyber-world, but it is alien to Ubuntu-based social systems such as the stokvel. The African stokvel was, traditionally, a gathering of close associates who helped each other and, in the process, cemented social cohesion. The typical '*stock fairs*' were characterized by members who met regularly, checked on each other's welfare, had a meal together, and made their contributions to *help* one of theirs or towards a cause. They trusted each other in the typical *'I am my neighbour's keeper'* context. The blockchain stokvel persuades members to trust an unknown peer masked behind cipher and crypto codes who will most likely never pitch for their child's birthday or aunt's funeral. The social capital of basic honesty and reciprocity that emerge from personal and warm-body meetings is likely to be lost when consultation and negotiations are relegated to software, encryption, and cryptographic code.

Demutualization Through Technology

There is a real possibility of demutualizing the African stokvel using blockchain technology and platform economics. The term *'demutualization'* is loosely used, here, to imply participants' loss of control and consultative power to technological automation embedded in blockchain systems. Rodima-Taylor, (2022) opines that the conversion of humanitarian systems of mutual support, informality, and reciprocity systems, to technological profit-based platforms financed by capitalists may, in the end, disadvantage the very people the systems are intended to benefit. The African stokvel, birthed in Ubuntu ideology, was never conceived as an irrefutable and rule-based transactional entity designed for profiteering, as seen in the platform economies driven by FinTech innovation. A stokvel built on blockchain systems will inherently be controlled by rules and regulations of the technology of implementation that were crafted outside the mutual society. The smart contract, which religiously executes when conditions are met regardless of social and humane considerations such as emotion, care, and forgiveness that drive Ubuntu-based social settings is an example.

The Cost of Running the Stokvel on the Blockchain

Blockchain technology is hailed for removing the expense of dependable intermediaries such as banks, clearinghouses, and government central banks. This liberating euphoria associated with blockchain must be evaluated in the context of both its financial and, most importantly, social costs. Blockchains are not used for free, but a nominal fee called *gas*, is charged per transaction. Massification and profit by volume are the drivers of capitalist economics. Blockchain service providers tend to benefit from an increased number of transactions. Modern-day stokvels are, therefore, likely to fall prey to the temptation of

exponential growth enabled by platforming technologies such as blockchain that promise security. The history of social media should serve as a lesson. Facebook and Twitter were once touted as forces for democratic good when people self-organized against oppressive governments (Tucker et al., 2017). A few years later, the founder of Facebook, Mark Zuckerberg, appeared before the United States Joint Senate Committee on Judiciary and Commerce to testify on massive data security breaches that led to users' data being sold (Domonoske, 2018). The allure of personal security promised by blockchain systems must, therefore, be weighed against the power of data mining and analytical algorithms that FinTech companies deploy to understand user behaviour on these platforms. Typical African stokvel members, as alluded to earlier, are the poor and the marginalized who may not have a deeper understanding of the technological complexity that makes up these blockchain systems and are a likely soft target for spam advertisements.

CONCLUSION

Summary

Blockchain technologies are touted as enabling technologies for implementing modern African stokvel systems. The technology has advantages that come with all such platforming services. Transparency is enhanced through decentralized control and decision-making. Trust, security, and consensus mechanisms are already built into the design of blockchain technology, thus, eliminating the need for trusted third-party intermediaries such as banks when conducting financial transactions. The effort to know, believe, and verify a transacting partner is relegated to blockchain technology.

Conclusions

The challenge with the comforts, mediated by technology, in the context of socially driven systems such as the African stokvel, is the demutualizing effect of the technology. Social and humane functions such as togetherness, empathy, forgiveness, help, and solidarity that are at the core of African stokvel systems are lost when key decision-making processes and judgments are automated and programmed as software settings and smart contracts. Blockchains are typical platforming services conceived for profiteering purposes and the proposed modern-day stokvel is likely to end up as an assemblage of strangers masquerading as peers and divorced from the ideals of the founding philosophy Ubuntu. The assertion by the DisruptAfrica (2018) website and blogger Kohler (2022) that there are similarities between blockchain technology and Ubuntu, therefore, seems inaccurate.

The arguments raised in this paper highlight the difficulties of redesigning social systems using technology. The *blockchain-stokvel* implementation case shows the limitations of technology in addressing and accommodating social contexts. It also highlights the disadvantages of being a technological consumer. African communities must not only be content with misfitting technological conceptualization but also socially adjust to its limitations and the assumptions of its creators whose cultural values may not be consistent with African ethos.

Limitations of the study and opportunities for further research

This paper is a critical analysis of the implications of implementing blockchain technology as a financial technology to enable stokvel systems. The argument is sustained at a theoretical level and the articles that were selected to problematize this superimposition of foreign technologies on an African values-driven

system were purposefully selected. Empirical and ethnographic studies of stokvel participants who use blockchain technology in their operations will enrich the arguments presented in this paper by validating or dispelling the conjectures that are made in this article. It is also safe to assume that blockchain technology is here to stay and that it will continue to disrupt the technological landscape including the provision of financial services. The article is, therefore, not a call to abandon technological innovations such as blockchain that have numerous advantages for African stokvels such as convenience and ease of trade. African academics must consequently focus their efforts on preventing and mitigating the intended and unintended consequences of the technology's use and adoption that undermine the best aspects of African cultures such as *Ubuntu*, in this case. Blockchain developers and scholars are, therefore, urged to incorporate aspects that restore and promote African ethos into the conceptualization of blockchain systems and curricula. Islamic banking regulations that forbid businesses from charging interest and usury (Abasimel, 2022) are examples of how other societies have managed to protect the fabric of their most prized social values.

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