Smart democracies in Africa: legitimising Kenyan elections through blockchain technology

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Abstract

In numerous nations in sub-Saharan Africa, national elections are accompanied by allegations of – if not actual – malpractices, including electoral fraud, imprisonment of opposition candidates, and constitutional amendments to extend the limits of leaders' terms in office beyond what the electorate seems to desire. Often, these serve to exacerbate ethnopolitical and other tensions and conflicts among multiple factions. Such blemishes on the voting process reduce the legitimacy of the government in the eyes of the populace. If these elections were watertight, and, more importantly, were seen to be watertight, the governments elected through them would gain a measure of legitimacy. Consequently, sub-Saharan African states could move closer to lasting peace. Since the emergence of the cryptocurrency Bitcoin, the spotlight has slowly shifted towards the vast potential of its underlying technology: the blockchain. Where elections are concerned, this 'trustless' system has the capability to solve four critical issues in the voting process: lack of transparency, lack of election system security, constitutional amendments to change presidential term limits and the cost burden of the election process. However, the blockchain is not without its challenges. A legal framework acknowledging it as a tamper-proof source of truth where votes are concerned will be necessary. Regulations will also have to be crafted to ensure the network's independence, voter anonymity, and the equal say of every citizen. Other pertinent issues are the assignment of liability for errors, and of responsibility for updating the blockchain's code.

Introduction

Democratic theory assumes that respect for the dignity of adults involves enabling them to participate in the governance of their community. Since direct rule is not feasible for the mass of citizens, most people can share in self-government only through delegating authority to freely chosen representatives.

This entails popular election of representatives by universal adult suffrage, and a plethora of ancillary rights – this election is central to competitive politics (Jinadu, 1997, p. 1; Murphy, 1993, pp. 3-4). Upon its fairness hinges the very possibility of calling a state democratic (Mangu & Budeli, 2008, p. 1).

However, since the reintroduction of multiparty elections in the early 1990s (Cheru, 2012, p. 266),[1] almost every round of elections has dealt a heavy blow to the cause of African democracy. 1993 saw the resumption of the Angolan civil war, an event closely linked to the establishment of multi-party politics and causing considerable oppression of Angolan citizens, forcing them to adopt varying political identities (Pearce, 2012, pp. 442-455); in 1996, Zambia's Movement for Multi-Party Democracy (MMD) emerged victorious in an extremely flawed election (van Donge, 1998, pp. 75-83); and four years later, Cote d'Ivoire descended into civil war after Laurent Gbagbo seized power in a disputed election (Cheeseman, 2015, p. 1).

The trend continues: Nigeria's 2007 elections were yet another blemish in a string of deeply flawed elections, marred by immense rigging (Herskovits, 2001, p. 115); and a short while later, disputed elections in Kenya led to an eruption of mass slaughter (Hornsby, 2012, pp. 764-768).

In Kenya, electoral violence has been accompanied by a lack of political legitimacy, which, in turn, has been occasioned by, among other things, flawed electoral processes. This paper argues that free and fair elections, occasioned using blockchain technology, can contribute to building political legitimacy and avert electoral violence.

Section II examines the causes of electoral violence in Kenya and links the underlying causes to the more proximate cause of electoral malpractices. Section III explains political legitimacy from an African perspective and connects it to electoral security. Section IV details how a blockchain system can be used to create electoral security, proposing measures to counter the regulatory and liability challenges associated with the technology.

Elections, Land, Tribes and Conflict: The Case of Kenya

The 2007 elections preceded the worst outbreak of violence in Kenya's history. Over 1,100 people were killed, 3,500 people injured, and 350,000 displaced from their homes (Hornsby, 2012, p. 765). The incident provoked widespread concern: Kenya, formerly a bastion of political stability in Africa, had fallen (Kanyinga, 2009, p. 325). However, a closer analysis reveals that the disputed elections were merely an event around which pre-existing ethnic cleavages coalesced. Nor was this the first instance of political violence in Kenya's past:

[1] In the early post-independence era, political space was strangled in the name of national unity and development. However, the economic crisis of the 1980s brought with it mass discontent that found expression in popular uprisings as citizens began to demand sweeping political and economic reforms and the introduction of multiparty democratic systems of government. Since this coincided with the collapse of communism in Eastern Europe, African dictators could no longer count on Washington or Moscow to come to their rescue – they had to cede to the pressures from within their states. In 1990, all but five of Africa's (then) 54 countries were dictatorships; by 2000, most of these countries had introduced political reforms and had either become democratic or were in the process of becoming so.

politically instigated tribal clashes touching on land have been witnessed in Kenya from the first multi-party election in 1992 to that of 2007 (Kameri-Mbote & Kindiki, 2008, p. 173).[2]

Upon attaining independence, Kenya inherited a colonial economic regime that was more concerned with increasing the productivity of settlers' lands, and with protecting these settlers from a nationalist African-led backlash (Kameri-Mbote & Kindiki, 2008, p. 181). Little effort was made to construct balanced economies. Consequently, Kenya was left heavily dependent on its agricultural sector and bereft of the manufacturing sector, the skills, and the infrastructure needed for economic diversification. International aid was readily available, especially in the post-Cold War era, which reduced the incentive for the government to build effective revenue streams. As a result, land acquired an exaggerated importance as a resource (Cheeseman, 2015, pp. 17-20; Hornsby, 2012).

Kenya's colonial history also resulted in land acquiring *political* value. Colonial expropriation of land was followed by sequestering of Africans into 'native reserves', with solid socio-political boundaries preventing inter-ethnic political relationships from forming. Population pressure in the native reserves caused their productivity to decline. Aggravated Africans migrated into the white highlands in search of wage labour, or places to squat (Kanyinga, 2009, pp. 326-328).

In a bid to increase the productivity of native reserves, the colonial government introduced the *Swynnerton Plan*, by which land ownership in the reserves was to be formalised and individualised (Kameri-Mbote & Kindiki, 2008, pp. 183-185) – a move which has received sharp criticism for preparing the ground for ethnic and gender inequities among Kenyans (especially among the Kikuyu and the Kalenjin), and for failing to consider the need for ecosystem sustainability (pp. 181-183; Nyamu-Musembi, 2006; Kanyinga, 2009).

The independence government continued with land tenure reforms. A land purchase program was set up. Those who had the ability to pay would benefit. The salaried and those with political influence became the main beneficiaries of the program. Corruption and political patronage networks, facilitated by the poor state of the economy (civil society employment became a means of rewarding politically correct individuals, and an avenue for self-enrichment) (Okoth-Ogendo, 1993, pp. 69-74), cast an ethnic tinge on this redistribution of land (Kanyinga, 2009; Kameri-Mbote & Kindiki, 2008; Cheeseman, 2015). In the white highlands, this manifested itself as preferential treatment for Kikuyus (Kanyinga, 2009).

The Moi regime brought about substantial changes in the political landscape and was perceived to shift the balance of power in favour of the formerly disfavoured Kikuyus. The reintroduction of multiparty politics was, to the Kalenjin, an attempt to oust Moi from power (pp. 324-326) and, therefore, as part of a bid by the Kikuyus to ascend once more to dominance. Violence ensued in a pattern almost identical to the 2007 massacre (Kameri-

[2] Former president Moi defended the one-party state because he believed that multi-party politics would undermine the state, polarise the country along ethnic lines, and plunge it into ethnic violence. The accuracy of his assertions is unnerving.

Mbote & Kindiki, 2008; Kanyinga, 2009). The pendulum swung towards its original position in the Kibaki regime (Hornsby, 2012, pp. 697-764).

Together with the creation of ethnically exclusive sub-national enclaves in the form of districts (Kameri-Mbote & Kindiki, 2008, pp. 187-188), the sheer power of an imperial presidency which facilitated self-enrichment (Okoth-Ogendo, 1993, pp. 74-75), a first-past-the-post electoral system (cf. Cheeseman, 2015) and the fact that politicians would often play on ethnic division to garner support (Kameri-Mbote & Kindiki, 2008, pp. 187-188), this state of affairs has led to the emergence of an ethnicised, winner-takes-all political landscape.

Against this background, the true nature of electoral rigging becomes clear. Doubt as to the rectitude of an election reduces the legitimacy of elected leaders. Electoral irregularities cause them to be viewed by ethnic communities to which these leaders do not belong as usurpers and oppressors. The perceived restriction on access to land, which is a key resource, constitutes a grievance that lends itself to conflict (Kameri-Mbote & Kindiki, 2008).

The Case of Political Legitimacy in Kenyan Elections: The Role of Secure Elections in Enhancing Legitimacy

Political legitimacy is a basis of political institutions and of the decisions – about laws, policies, regulations and candidates for political office – made within them. When interpreted descriptively, legitimacy refers to people's beliefs about political authority and, on some occasions, political obligations (Peter, 2017).

Max Weber, an established sociologist, put forward a very influential account of legitimacy that excludes any regard to normative criteria. According to Weber, a political regime is legitimate if its participants have certain beliefs or faith with regard to that regime (Peter, 2017).

Allen Buchanan (2002, pp. 689-690), however, contends that an organisation has political legitimacy only if it is morally justified in exercising political power.[3] In contrast to Weber's descriptive view of political legitimacy, the normative concept of political legitimacy refers to some benchmark of acceptability or justification of political authority (the right to be obeyed) and obligation – this standard can be, among other things, tradition, or the co-ordination by the political authority of citizens' activities towards some common interest (Rothstein, 2009).

On one view, held by two renowned scholars – John Rawls and Ripstein – for example, legitimacy refers to the justification of coercive political authority. Whether a political body (such as a state) is legitimate and whether citizens have political obligations towards it depends, according to this this view, on whether the coercive political power that the state exercises is reasonable (Peter, 2017).

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[3] The exercise of political power, on the other hand, can be defined as the reliable attempt to achieve supremacy in the making, application, and execution of laws within a jurisdiction.

According to a widely held alternative view, legitimacy is linked to the justification of political power. This view suggests that political bodies such as states may be effective, or *de facto*, authorities, without necessarily being legitimate. They claim the right to rule and to create obligations to be adhered to, and as long as these claims are met with sufficient acquiescence, they are authoritative. Legitimate authority, in this view, differs from merely effective or *de facto* authority in that it actually holds the right to rule and creates political obligations to individuals (Peter, 2017).

With regard to some views, even legitimate authority is not sufficient to create political obligations to citizens of a particular state. This thought, propounded by Ronald Dworkin, an American philosopher, is that a political authority (such as a state) may be permitted to issue rules and regulations that citizens are not obligated to obey. Based on a view of this sort, some have suggested that legitimate political authority only gives rise to political obligations if additional normative conditions are met (Peter, 2017).

To determine the nexus between political legitimacy and peace, political legitimacy needs to be examined not only from an objective, but also from a subjective dimension. For peace to obtain, legitimate governments must also be *seen to be legitimate.*

A common view on legitimacy is that it rests on the act of free voting, as if it results from an effective form of articulation of the interests of the majority. However, as Rothstein (2009) shows using the example of Sweden, popular opinion may diverge from the long-term interest *and* opinion of the people.

In numerous African regimes, this 'subjective' legitimacy seems to stem from the conformity of leaders to cultural norms. The images of father, family and food dominate African political discourse: African leaders are seen as *fathers,* who are therefore expected to fulfil the functions of paternal figures in African societies: a) leaders, like fathers, are expected to be *providers, nourishers, and protectors,* who provide for their children's material well-being – hints of the same can be seen in Kenyan political discourse (Ghai, 2017); b) fathers have to *permit their children to grow up and eventually to succeed them* in power; c) while the father may 'eat', and even eat well, *limits are placed on how much he should consume*; and d) the rights of women may not be abused and, importantly, political leaders must willingly hear their voice and take advice from them, *as fathers and husbands do from their daughters and wives* (Schatzberg, 1993, pp. 450-455).

In Kenya, leaders have failed to fulfil these roles – arguably, this has resulted in a lack of political legitimacy (Schatzberg, 1993; Ghai, 2017). Fulfilment of these roles would legitimate political leaders as their subjects would feel that they had been treated justly.

The Effect of Electoral Security on Political Legitimacy

Political legitimacy can be improved by ensuring the electoral process is secure and safe: electoral security causes leaders in transition to be seen as 'allowing their children to succeed them in power' (Schatzberg, 1993, p. 452). However, free and fair elections can only create legitimacy up to a certain point – leaders would still have to fulfil the other paternal roles explained by Schatzberg (1993).

Electoral security can be defined as 'the process of protecting electoral stakeholders such as voters, candidates, poll workers, media, and observers; electoral information such as vote results, registration data, and campaign material; electoral facilities such as polling stations and counting centres; and electoral events such as campaign rallies against death, damage, or disruption' (Creative Associates International Inc., 2010, p. 5). In general, four kinds of electoral security can be identified: a) physical security; b) personal security; c) information security; and d) security involved with electoral events.

Physical security concerns the protection of facilities and materials, including the electoral commission headquarters and its district offices; registration and polling stations; political party offices; election observer offices; and media organizations (p. 5).

Personal security focuses on electoral stakeholders, including voters, public officials, election workers, security forces, candidates, party agents, election observers and media representatives (pp. 5-6). On the other hand, *information security* concerns protection of computers and communication systems employed in voter registration and vote tabulation, as well as associated sensitive election materials such as voted and un-voted ballots and voter registration lists (p. 6).

The last category deals with *security in electoral events,* which can be victimized by conflict. Events can be official in nature, such as voter registration programs or Election Day activities, but also associated events such as campaign rallies, debates, and political party and coalition meetings (p. 6).

Electoral security can enhance political legitimacy if accompanied by meaningful involvement of both incumbents *and* the opposition in electoral governance (Opitz, Fjelde, & Hoglund, 2013, pp. 713-716) – this could contribute towards a view of incumbents as paternal figures across ethnic divides in the country, and would legitimate them if they should win in the new electoral contest, and would prevent electoral violence. These leaders would then have the onus of creating lasting peace during their regimes.

Blockchain Technology and Electoral Security

Dimitri (2017) defines a blockchain as a type of database that stores multiple records in a block (like collating them onto a single sheet of paper). The blocks are linked to one another via cryptographic signatures. This therefore allows the chains to serve as a ledger which can then be shared with persons with appropriate permissions. The ledger's accuracy is corroborated in various ways known as consensus, which improves the accuracy of the information.

A blockchain can either be public or private. Public blockchains give access to all users. This access, however, can be one of two: a) read, or b) write permissions. Private blockchains, on the other hand, give access only to the listed trusted sources for the purposes of security and privacy. Despite the public access, the data in the blocks is encrypted with a key.

Blockchain technology comprises of two fundamental segments: transactions and blocks. Transactions are actions triggered by the user while blocks are is a collection of data

recording the transactions and the accompanying metadata such as the correct sequence and timestamp of creation. (Miraz & Ali, 2018)

Blockchain methods of functioning are very effective. To explain in a relevant way, the election process will suffice. A voter puts in their vote in the ballot (this is the transaction) and it must be included in an existing chain after validation. The validation is done by the participants in the blockchain ecosystem by applying a specific algorithm. The votes are then bundled up into a grouping (according to a polling station or candidate) known as a block. This new block is thereafter communicated to all participating parties and appended to the existing chain of blocks in the digital blockchain ledger.

The Blockchain's Relevant Security Features

Transparency

Rules are set on how the blockchain operates with its environment. This information on the several transactions is then stored in a database which is open access to everyone (Bruyn, 2017). This makes the verification of the credibility very simple. The transactions are also irreversible. In the event of any alteration to the blocks, the irregularities can be detected and presented before the court as evidence in election petitions.

Hashing

A hash is the unique digital fingerprint that is attached to a block in a specific chain (Miraz & Ali, 2018). The system takes in the input that enters the blocks and converts it into a format that is incomprehensible by humans. Only a person with the right key can unlock the block's content. This renders the system virtually impermeable to hacking techniques.

Improved Traceability

All the transactions are recorded in a log. This means that a trail is left of every action that has occurred within the blockchain. This trace limits instances of fraud and illegal alteration of the data that was previously stored. In the event of alteration by an illegal participant, the digital trace can be followed by digital forensic experts to the source of the hack.

Decentralization

Decentralization refers to the processes of data verification, storage, maintenance, and transmission on blockchain which are based on a distributed system structure (Chen, 2018). The trust is established via mathematical methods instead of centralized means. This means that no single entity holds absolute power or control over the blockchain system and poses a solid barrier to electoral rigging.

Anonymity

On the blockchain, the amount of information put forward on display can be controlled at the development stage of the system. Various data items can be concealed such as the voter's details, while other information, such as the vote cast, can remain visible. This anonymity embedded in the design is implemented via a technique called Confidential Transfers (Halpin & Piekarska, 2017).

Regulatory Challenges

Access to Write

The users allocated permission to write data in the blockchain must be clearly defined early on at the development stage. In this case, only the polling station machines should have authorization to enter new data. Other entities within the process have absolutely no ability to add to the blocks. The votes cast are the only data items to be stored on the blockchain and therefore access privileges ought to remain as so. Leaving rooms for other parties involved to participate at that capacity allows for loopholes that will easily lead to irregularities in the entire process.

One Voter, One Vote

Being that the blockchain is unable to detect multiple voting instances due to its anonymous nature, the authors propose user-level biometrics as a countermeasure. To ensure the success of this strategy, during registration, the fingerprints or retinal signatures of the voters must be collected and stored in a database.

The database information would be relayed on a large scale to all polling stations for the sole purpose of uniformity and security. This information will then be used to grant access to the voter to enter their vote after which they are marked as having cast. In the event one attempts a double entry, the system will deny them any access whatsoever, no matter the polling station at which the attempt is made – this eliminates the possibility of double voting.

Blockchain Forking

Because of the majoritarian manner in which transactions are validated on a blockchain system, people having devices with a computational power larger than the total power of half the people connected to the blockchain system could determine which blocks are added to the chain. This could interfere with the fairness of elections.

To prevent this, the government could prescribe a close range of computational power for devices to be connected to the system.

Internet Accessibility

The government would also need to put in place measures to increase internet penetration, or, alternatively, to provide internet access to all voters at all polling stations.

Liability Issues

Alteration of Votes

The method by which blockchain works makes the party liable for such alteration easily identifiable. Irregularities are detected in a reasonable amount of time by the environment set by the relevant parties at the stage of development. Moreover, the progress is constantly monitored in real time even by the citizens because they are provided reading permissions. Error detection software embedded in the blockchain provides extra support in spotting errors. When an irregularity is flagged, digital forensic scientists can trace it back to the source through its digital footprint. The responsible person(s) at the source of the disruption can then be charged as per the laws set.

Additionally, third-party developers are directly responsible for determining the cause of the alteration in their system.

Problems Associated with Implementation

Issues might arise during the implementation of the new technology. This might involve scaling problems, incompatible formats and even technologically inferior devices. It is therefore the responsibility of the third-party developers to diagnose and debug errors in the source code of the blockchain. Prior to the development, they must also openly define the requirements expected to enable the large-scale implementation of the blockchain system to avoid foreseeable issues. Lastly, only a single sourced third-party developer should be able to amend the code and ensure its smooth error-free operation.

Conclusion

This paper has attempted to show the nexus between political legitimacy, electoral security, and peace in the Kenyan context. While not without its obstacles to be overcome, blockchain technology is a tool with great potential to ensure the security, freedom, and fairness of elections, to create political legitimacy, and, therefore, to push Kenya at least one step further on the road towards lasting peace.

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