RESEARCH ARTICLE

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THE BALANCING ACT: 4IR AND AFRICAN DEMOCRACIES

SUMMARY

The essence of democracy enables citizens to exercise their freedoms and affords protection of rights and equal opportunities for all. Democracy is a complex system of government and various states exercise it differently. Despite the differences, there are universal features of a democratic system. The emergence of the Fourth Industrial Revolution (4IR) has transformed democratic societies and economies. Since its inception in the 18th century, the hallmark of the 4IR encompasses increasing technological capabilities, artificial intelligence, increased production, and portable technology. Undoubtedly, the 4IR will enhance people's quality of life and subsequently afford democratic governments opportunities and challenges. This article argues that, despite the benefits 4IR may yield, there are challenges, which if not addressed will undermine the essence of African democracies. The article concludes by urging African democracies to take part in the technological change, in order to maximise the unparalleled benefits of 4IR to strengthen democratic principles.

1. INTRODUCTION

The concept of democracy is a complex and broad one. This is evident in the absence of a universally accepted definition of democracy. In its literal sense, "democracy is the rule of the people, by the people, for the people".[1] Although democracy varies across states, its existence is meant to manifest freedom and equality. In situations where its core features are not respected and upheld, the consequence tends to cause violations of the fundamental rights of people. For democracy to flourish, people must challenge the *status quo*, for example, existing structures of norms, values, customs, traditions, and authorities. This is what Martin calls "dissentient democracy". Simply put, a democracy that values dissent as an essential core element for the people and for development.[2]

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1 Staffan 2006:1.
2 Martin 2013:2-3.

Democracy is necessary for human development.[3] This is the position because democracy is centred on the recognition and protection of people's rights, the latter being achieved when people are afforded opportunities to participate in government affairs. A relationship exists between democracy and development. As outlined earlier, democracy is a rule of the people by the people.[4] Development, on the other hand, can be understood as a process aimed at advancing people's way of life. This is buttressed in art. 1 of the United Nations Declaration on the Right to Development.[5]

The common characteristic between democracy and development is that they exist for the benefit of the people. This proves that democracy and development reinforce each other not only to enhance people's lives, but also to ensure the protection and enjoyment of their rights. Furthermore, for democracy to prevail, transparency and accountability ought to exist. These two elements are crucial for the development process. Thus, a weakened democracy leads to underdevelopment, political and economic instability, and inequality.

In order to strengthen the African democracies and subsequently their economies, social and political processes, there is a need for (re) industrialisation. Re-industrialisation is "a process of increase in the relative share of the industry in the structure of the Gross Domestic Product (GDP) through the establishment of new and the expansion of existing competitive industrial processes on the basis of smart specialization".[6] Similarly, Geoffrey *et al.* define reindustrialisation as "the structural transformation of industry into higher added value, more knowledge-intensive sectors and product groups, and the creation of major new technology-based industries and products serving new markets".[7]

Reindustrialisation is necessary for developing states, particularly if they have been deindustrialised[8] mainly because it is a natural element in the transformation process of a country.[9] In essence, re-industrialisation is an important process for universal remodelling and industrial development. In light of existing definitions of reindustrialisation, it is also imperative to appreciate that reindustrialisation is not a process solely centred on economic growth; it has a social and political aspect to it. To maximise this process socially and politically, a technological revolution must be embraced.

Embarking on the re-industrialisation process can possibly be a crucial initiative for economic growth and enhancement of sustainable economic development for African states. The increased economic growth will yield progress for the African continent and, in so doing, infrastructural development is necessary. This is possible through the recognition of technological

3 Coleman & Coleman 1997:25.
4 Kareem & Lawal 2017:340.
5 United Nations 1986:art. 1.
6 Konstantinova & Konarev 2015:358.
7 Rothwell & Armonk 1985:1.
8 Weiss & Tribe (eds.) 2015:113.
9 Johansson, Karlsson & Stough 2002:445.

advancement and economic evolution, thus aligning industries with such advancements and evolution. In order to maximise growth, industrial policies must be centred on economic growth and promote re-industrialisation.

A relationship exists between re-industrialisation and democracy. Strengthening national economies through reindustrialisation can strengthen democracy, as it promotes or calls for political equality, which is the equal standing of a group of people in decision-making in the form of equal decision power.[10] To strengthen this argument, one study showed that democracy may increase development, indicating that, if a country replaces its ruling system with democratic rule, it will experience 20 per cent GDP increase over a 25-year period. This buttresses the argument that democracy has effects on economic growth.[11]

Against this background, the article aims to demonstrate the relationship between 4IR, development, and democracy. It als seeks to demonstrate that taking part in 4IR will yield opportunities for the African continent including, but not limited to economic and agricultural growth; eradication of poverty and corruption, as well as transforming labour structures. With the opportunities in tow, it will further be presented that 4IR will challenge the essence of democracy.

Adopting a desktop research approach, the article starts by examining democracy. The discussions will be followed by a synopsis of the 4IR and primary instruments embracing technological change in Africa. Thereafter, the article outlines 4IR challenges on African democracies. Having acknowledged the challenges, the article submits 4IR opportunities that may strengthen African democracies.

2. UNDERSTANDING DEMOCRACY

There are various forms of democracy. The non-existence of a universal definition of this term has led to the definitional components of democracy being contested for years. For example some people contend that democracy is "a government system characterised by four key elements: a political system wherein people choose and replace the government through free and fair elements; people actively participate in politics and civic life; protection of human rights; and rule of law equally applies to all citizens".[12]

Others argue that democracy connotes eight essential elements: "the right to vote; right to be elected; the right of political leaders to compete for support and votes; free and fair elections; freedom of association; freedom of expression; alternative source of information, and institutions that are dependent on votes and other expressions of preference".[13]

10 See Erman & Näsström 2013.
11 Acemoglu, Naidu, Restrepo & Robinson 2019:127.
12 Diamond 2004.
13 Dalton, Shin & Jou 2007. See also Dahl 1971:3.

The difference in what democracy really means maybe because this term, unlike other ideologies or doctrines such as socialism and communism, has not been identified with a specific ideology or doctrine in mind.[14] In other words, the term 'democracy' comprises many elements or components that cannot be harmonised to a watertight definition.

To understand democracy, its historical origin ought to be traced. The term 'democracy' originates from two ancient Greek words: *demos*, meaning the people or the whole people, and *kratos*, meaning strength.[15] Given this understanding, democracy could be that which provides people with the freedom of deciding on the individuals who will serve them. The latter seems to support the view that implies "a political or an institutional arrangement for arriving at political, legislative and administrative decisions involving the majority".[16] At the more basic level, it requires a meaningful and extensive competition among people and organised groups.[17] This then results in a society in which ordinary citizens exert a relatively high degree of control over leaders.[18] It may be argued that this perspective elaborates on the doctrine of popular sovereignty, "a notion that the ultimate source of all authority exercised through the public institutions of the state originates in the people".[19] Although ideal, the main problem with this doctrine is that it becomes impossible to exercise in societies where a wide gap exists between the rich and the poor. To address this, Peonidis lays out conditions that may be adopted to decipher the determination of 'the people' in popular sovereignty.[20]

The observance of democracies in states shares commonalities. The most essential include that the law is supreme, all people are equal, freedom, the will of the people ought to be observed, and equal opportunities for all. Furthermore, studies have shown that an efficient democratic society is one that affords its people equal political opportunities, ensures everyone is given the freedom to develop their personalities,[21] and protects the rights and integrity of the people. Furthermore, the concept of loyal opposition is crucial in a democratic society and ought to be observed.[22] Kareem contends that all political opponents in a democratic country must share a common commitment to basic values.[23] Even though political oppositions may disagree, they must tolerate each other and each ruling party or individual must understand the role each has to play.[24]

14 Anuye, Ityavkasa & Deji 2017:31.
15 Sultana 2012:27.
16 Anuye, Ityavkasa & Deji 2017:31.
17 Anuye, Ityavkasa & Deji 2017:31.
18 Dahl 1956:3.
19 Lee 2016:1.
20 Peonidis 2013:3.
21 See Olatunji 2013.
22 Commonwealth Secretariat 2016:2.
23 See Kareem & Lawal 2017.
24 Olatunji 2013:69.

Overall, notwithstanding its complexity, democracy promotes people's freedom, governance, and the rule of law. However, it must be acknowledged that, as an ideal, democracy is threatened by various forces. These forces result in democracy becoming a system that may be used for beneficial and detrimental purposes.[25] Because of this, responsive and accountable public service is required in order for democracy to be fully harnessed.[26]

2.1 Core features of democracy

Democracy is characterised by a variety of core features. These features aim to distinguish democracy, as a system, from all the other government systems such as dictatorship, monarchy, aristocracy, and theocracy. The core features include the rule of law, the separation of powers doctrine, respect for human rights, democratic voting system, and public participation.

2.1.1 Rule of law

Rule of law is a principle that provides that the law is the supreme authority over the behaviour of people and the actions of government.[27] In other words, the rule of law provides that citizens and government officials must comply with, or be bound by the law. In addition, it is a legal principle that is of general application. It is "sanctioned by the recognition of authorities, and usually expressed in the form or logical proposition called a rule".[28] It ensures that government officials act in accordance with existing laws. In this manner, the law must be upheld by everyone and equally applied and decisions ought to be made as a result of the application of existing principles of law without intervention or discretion in their application.[29]

In general, there are two dimensions to the rule of law. First, the law should rule all people and the people should obey the law.[30] In other words, those who violate the law must be rightfully punished. Failure to do these will likely cause the decay of the democratic system. Secondly, the law must be capable of being obeyed. For this to occur, it is important that the law be ascertained or ascertainable.[31] In other words, the law must bring about legal certainty.

In addition to the dimensions, there are two theories of the rule of law: the formalist theory or the thin rule of law and the substantive approach or the thick rule of law. The thin rule of law provides that government must function within the limits of the law. Advocates for the thick rule of law argue that the concept of the rule of law has to provide for ideals of justice and fairness.[32] A thorough observation of the two dimensions and the theories of the rule

25 Box 2015:vii-viii.
26 Hamilton 2015:3.
27 Allan 2003:31.
28 Nolan & Nolan-Haley 1990.
29 Anuye, Ityavkasa & Deji 2017:29.
30 Fenwick & Phillipson 2003:79.
31 Anuye, Ityavkasa & Deji 2017:33.
32 See Valcke 2012.

of law lays bare the harmonisation of the two. For instance, basis of the first dimension is reflected in the thick rule of law theory or substantive approach to the rule of law.

The rule of law principle, democracy, and good governance are interconnected in a manner that democracy establishes an environment for the rule of law to prosper, while the rule of law exists to sustain democracy. Meanwhile, good governance exists to promote and strengthen both democracy and the rule of law. For true democracy to exist, governance must be in operation with the rule of law, failure of which, democracy will be profoundly absent.[33] In essence, the rule of law principle is an important apparatus for the functioning of a democracy, because it promotes trust, responsibility, and reciprocity.[34]

2.1.2 Separation of powers doctrine

The separation of powers doctrine is the embodiment of constitutionalism and essential in a democracy as it guards against abuse of power by individuals or institutions. It does so by emphasising that the powers of the three branches of government should be limited and that each branch should be allowed a role in holding the others to account.[35] In other words, the executive, judiciary, and legislature should confine themselves to their assigned responsibilities and not operate in absolute independence. The doctrine comes into effect by ensuring that balance is created between the three branches of government.

Furthermore, the separation of powers doctrine is essential to the rule of law (discussed earlier). It is crucial for the powers of the judiciary, executive, and legislature to be separated and balanced. In support of this, the rule of law ensures that power is limited in an effort to safeguard and strengthen freedom. In other words, for the rule of law to serve its purpose and democracy to be strengthened, the organs of government must be independent of each other. In light of this, it is imperative for the doctrine not to be limited to the view of an apparatus used to explore institutional realities. Instead, it should be viewed as a cornerstone of political ethics.[36] Overall, the separation of powers doctrine is a cornerstone of any democratic dispensation with its main purpose centred on the prevention of the abuse of power.

2.1.3 Respect for human rights

Human rights complement democracy and support all its essential objectives. For example, human rights promote respect and the advancement of people's rights and fundamental freedoms. Accordingly, governments are encouraged to establish measures to guarantee respect and protection of human rights. This includes ensuring that human rights are safeguarded and fulfilled.

33 Anuye, Ityavkasa & Deji 2017:29.
34 Anuye, Ityavkasa & Deji 2017:36.
35 Masterman 2010:13.
36 Balázs 2016:4.

Contextually, this implies that the government should prioritise and implement policies for the progressive realisation of human rights.[37]

The commonalities between democracy and human rights are that the two concepts are founded on principles of accountability, individual liberty, integrity, fair and equal representation, inclusion and participation, as well as non-violent conflict solutions.[38] Acknowledging that democracy is a human right and that democracy and human rights cannot be isolated from each other,[39] Kirchschlaeger provides challenges that are apparent in some democratic societies when right holders are not afforded an opportunity to participate in democratic decisions, and when the majority is in favour of something that violates the rights of the minority.

Democratic states are obligated to protect human rights, since the latter are part of a democratic system and thus become a frame of reference for democracy.[40] Democratic principles can be strengthened when democratic governments take an active role in the international community, particularly on issues of human rights and the ratification of human rights treaties.

2.1.4 Democratic voting systems

In politics, democracy advocates for the need of an opposition. This is buttressed in art. 21 of the 1948 Universal Declaration of Human Rights, which emphasises the need to participate in the political decision process. The article suggests that states perceive democracy as an institutional expression of the respect of an individual's autonomy; enabling one to take part in opinion manifestation and decision-making process in his or her legal system.[41]

Democracy is characterised by an election process, which is a system that affords citizens a platform to exercise their opinions on the transfer of power. This process maximises participatory democracy and grants citizens an opportunity to instruct or mandate politicians to represent them on their needs.[42] This is often reflected in a country that observes a multi-party system affording various political parties to stand for elections. This system often complements democracy, because it grants the minority an opportunity to have meaningful representation and to participate in the decision-making process. Furthermore, such a system enables people to challenge those in power through free and fair elections.

2.1.5 Public participation

Public Participation implies that people are given the opportunity to monitor, implement, and evaluate government actions. According to Creighton, "[p] ublic participation is a process by which public concerns, needs and values

37 Landman 2018:50.
38 Landman 2018:49.
39 Kirchschlaeger 2014:119.
40 Kirchschlaeger 2014:121.
41 Kirchschlaeger 2014:120.
42 Modise 2017:3.

are incorporated into the governmental and corporate decision-making. It is a two-way communication and interaction, with the overall goal of better decisions that are supported by the public."[43]

Public participation has to be characterised by applying administrative decisions and it should involve the public, by affording them some level of impact or influence on the decisions being made. In a democratic society, public participation is essential because it influences public policy goals. It is imperative for citizens to be involved and intervene on issues relating to public policy, in an effort to improve and realise the purpose of the policy. A democratic government that fails to give its people an opportunity to develop their political knowledge supresses the will of the people to participate on issues of government. To encourage citizens to participate, governments must afford them an opportunity to do so, grant them access to information and proper education. When people participate, the principle of accountability is promoted and there will be a shared decision-making process,[44] thus smoothening the interactions between citizens and politicians.

A true democratic government advocates participation by its citizens, thus enabling them to put in-check those with political power, eliminating civil oligarchies, and capturing of government institutions by the rich minority. Should it transpire that, after participation, citizens are not satisfied with the outcome, they might be tempted not to participate on other prevailing government issues, thus resulting in citizens losing trust in the political system, eliminating the moral legitimacy of the individuals elected "to govern, despite the officials' theoretical obligation to defend the interests of the citizens".[45] By contrast, if people are satisfied with the outcome, they are most likely to be motivated to participate again in the future.

It must be acknowledged that public participation cannot be isolated from public institutions, since the latter enable citizens to realise their interests and aspirations, together with contributing to the distribution of power in the decision-making process. This validates their role in a democratic society. When people trust public institutions, their level of public participation in politics increases.

African democracies can strengthen democratic principles, by encouraging public participation. Citizens are prone to participation in government or political affairs when they have trust in the government system. Carreira *et al.* lay down five fundamental practices to enhance trust in a democratic society, namely communication between citizens to define public goals; tolerance and acceptance of pluralism; consensus on democratic procedures; civic awareness among the actors competing for different purposes, and citizen participation in governing organisations.[46]

43 Creighton 2005:31.
44 Carreira, Machado & Vasconcelos 2016:1.
45 Carreira, Machado & Vasconcelos 2016:2.
46 Carreira, Machado & Vasconcelos 2016:5-6.

In light of the above core features of democracy, digital transformation can strengthen democratic values and have an impact on the social order. This includes policy and election processes and digital platforms increasing public participation and promoting transparency. By contrast, digital transformation can likewise destruct democratic values, negatively impact on the social order, by exacerbating the inequality gap, and inadvertently the violation of some basic rights. Against this background, the article proceeds with an overview on 4IR.

3. FOURTH INDUSTRIAL REVOLUTION (4IR): A SYNOPSIS

Over the years, technology has been the centre of education, social interactions, business, and development. Its advancement is unavoidable, as it is necessary and important for economic and societal growth.[47] Before tracing the evolution of 4IR, it is imperative to briefly delineate the meaning of technology and whether technological change is necessary.[48] Technological change is changing wherein the dominant technology is replaced with something new.

Different perspectives on technology have made it difficult to compose a watertight definition. For example, Grübler narrowly defines technology as the manufacturing of objects with the purpose of either improving human capabilities or enabling human beings to perform tasks they could not perform otherwise.[49] This definition is restricted to hardware and not software. Kumar *et al.* provide a broader definition of technology, stating that technology has two primary components. First, a physical component comprising items such as products, tooling, equipment, blueprint, techniques, and process. Secondly, an informational component composed of the know-how in management, marketing, production, quality control, reliability, skilled labour, and functional areas.[50]

With these two perspectives, it is evident that technological change is necessary for the functioning of society and the strengthening of the economy, because product output increases, communication among members of society is enhanced, and overall, the livelihood of those in society increases. With the benefits that technology may present, there are challenges such as cyber-bullying, identity theft, security breaches, and invasion of privacy.

It is imperative to trace the development of industrial revolutions in an effort to understand 4IR. The term 'revolution' denotes sudden and fundamental change. Throughout the history of mankind, various revolutions have occurred, resulting in technologies altering economic systems and social structures.[51] In 1760, steam engines were invented, including the usage of coal as the main energy source marking the era of the first industrial

47 Hetzler 2013:7.
48 See Majocha 2015:7.
49 Grübler 2003:20.
50 Kumar, Kumar & Persaud 1999:82.
51 See Schwab 2017.

revolution. At the time, dominant industries were textile and steel in terms of capital investments and value of output.[52] The second industrial revolution emerged in the 19th century, with technological breakthroughs in the chemical, oil, steel, and plastic industry. Its focus was to establish publicly funded centralised facilities for both education and scientific research. This revolution transformed communication and transportation, by creating automobiles and aeroplanes, in other words, characterised by the invention of an internal combustion engine.[53] The third industrial revolution unfolded in the 1960s and is often called the digital revolution. It brought forth semiconductors, mainframe computing, personal computing, and the internet.[54] The fourth industrial revolution is a revolution characterised by artificial intelligence (AI), biotechnology, and quantum computing,[55] "blurring the lines between the physical, digital, and biological sphere".[56]

4IR is inevitable. Given this, Boston Consulting Group proposed nine primary pillars of 4IR, namely the use of the cloud, augmented reality, big data and analytics, autonomous robots, simulation, horizontal and vertical integration, the industrial internet of things, additive manufacturing, and cyber security.[57] From these primary pillars, it can be deduced that 4IR is a revolution unique from its predecessors on the grounds that it has the capacity to transform society, government systems, as well as private and public sectors on a greater magnitude. Whether the transformation is positive or negative, the jury is out. Nevertheless, some studies reveal that, given this, 4IR can be beneficial for developing states if they play a role or take part in the revolution and maximise the opportunities it presents. In other words, as a developing continent, with high poverty and unemployment rate, the 4IR can be profitable for the African continent. To achieve this end, Africa must be a participant in this revolution which may yield the eradication of poverty and promote skills development and economic growth. Thus, it is imperative for democratic systems within the African continent to promote participation in the 4IR.

4. AFRICAN INSTRUMENTS ON INFORMATION COMMUNICATION AND TECHNOLOGY

It is critical for Africa to embrace technology and the opportunities it may yield towards the development of the continent. African states have shown interest and desire to take part in the technological change, as reflected in regional and continental initiatives.

The Economic Community of West African States (ECOWAS) has an Information Communications Technology Policy (ECOWAS Policy) that aims to set off promoting the development of economic and technological

52 Min, David & Kim 2018:90.
53 Mahomed 2018:93.
54 Dimitrieska, Stankovska & Efremova 2018:182-187.
55 Serrano-Palacio & Gómez-Paredes 2019.
56 Schwab 2016.
57 See Rüßmann *et al.* 2016.

infrastructure. The ECOWAS Policy aims to ensure the harmonisation and standardised Information Communications Technology infrastructure across the region.[58]

In 2001, some states of the Southern Africa Development Community (SADC) signed the SADC Declaration on Information and Communications Technology (SADCICT) acknowledging the need for technology for sustainable economic development and interaction with the world. Moreover, the rebirth of SADC lies in the technological infrastructure. The states are committed to make right the digital divide and the need to make use of technology to ensure that it contributes economically and reflective of languages, cultures, ideas, and diversity. The SADCICT further articulated how effective information communication requires an environment that is characterised by, among others, policy guidelines, legislation, reliable, efficient and scalable network infrastructure.[59] Regrettably, the SADCICT falls short of outlining workable timelines and practical efforts on how the commitments will be implemented.

Having acknowledged that digital transformation is fundamental for innovation, inclusive and sustainable growth, in 2020, the African Union adopted the digital transformation strategy for Africa (2020-2023) (AU Strategy). This adoptive took into account the role digital space could play for the continent and how digital transformation can contribute towards the achievement of Agenda 2063 and Sustainable Development Goals. It is imperative to note that the AU Strategy will be implemented in conjunction with other existing initiatives and frameworks such as the Policy and Regulatory Initiative for Digital Africa and the African Continental Free Trade Area (AfCFTA).[60] Compared to the SADCICT, the AU Strategy outlines specific objectives for the industrialisation of Africa and contribution towards the digital economy and support of the AfCFTA: build a secured single digital market in Africa; ensure that Africans are digitally empowered; implement laws, policies and regulations to stimulate and accelerate digital transformation for national, regional, and continental development. Impressively, the AU Strategy outlines and analyses the strengths, weaknesses, opportunities, and threats of a digital transformation strategy for Africa. Lastly, the AU strategy outlines policy recommendations and proposed actions.[61]

5. 4IR CHALLENGES ON AFRICAN DEMOCRACIES

Research has shown that 4IR will yield opportunities and challenges.[62] The opportunities of the 4IR include a shift in banking systems from the traditional physical systems to digital or mobile banking; transportation modification and an increase in the production of goods. Having said this, the 4IR opportunities will equally render challenges. For example, the introduction of unofficial

58 https://ecoslate.github.io/ecowas-sectors/ict/index.htm (accessed on 29 August 2023).
59 Southern African Development Community 2001.
60 African Union 2020:1.
61 African Union 2020:12-14.
62 Zervoudi 2020.

currencies that may devastate central banks or financial institutions;[63] violation of certain human rights, and an increase in unemployment due to technology substitution of human labourers who perform routine jobs. The failure to address these challenges will weaken democratic principles such as protection of human rights, the right to economically participate, and free and fair elections.

In summary, the African continent must seize the opportunities presented by 4IR and take part in the revolution. Should African democracies be unable to withstand 4IR, the recovery process (economic, social and political) may not be possible, and this may result in the destruction of government systems.[64]

5.1 Unemployment

One major concern of 4IR is that blue- and white-collar jobs will be automated, resulting in an increase in unemployment. This is due to the 4IR being centred on automation, which, according to Serrano-Palacio and Gómez-Paredes, will not only have a negative impact on low-income groups by creating job losses, but can also reduce social mobility and aggravate or fuel wealth and income inequalities.[65] Although this may likely be the case, Serrano-Palacio and Gómez-Paredes further argue that new and better jobs may be created.[66] Echoing this sentiment and considering the spread of digital infrastructure, it is possible that years from now, a greater percentage of people will be occupying completely different positions compared to the current generation. Although this may be the case, the implication of 4IR on jobs and its impact on economic growth cannot be ignored. To support this, the 2018 Future of Jobs Survey conducted by the World Economic Forum set out positive and negative trends that may influence business growth towards later years.

The survey shows that routine or repetitive jobs are at risk of 4IR since they are capable of being replicated by machine-learning algorithms.[67] The advantage of this replacement is that machines do not need an hour's break for lunch, they neither get ill nor go on leave, and they have better memory than human beings have, and, most importantly, they can be faster at any job.[68] While automation will increase productivity and subsequently deprive numerous individuals of employment, there will be an increase in production, new skills will be in demand, and jobs for the manufacturing of new products and services will be in demand.[69]

63 Lye 2017.
64 Lye 2017.
65 Serrano-Palacio & Gómez-Paredes 2019:832.
66 Serrano-Palacio & Gómez-Paredes 2019:832.
67 Hartmann & Hattingh 2018:8.
68 Northern Ireland Council for Voluntary Action "The impact of the Fourth Industrial Revolution on jobs and the future of the third sector", https://www.nicva.org/sites/default/files/d7content/attachments-articles/the_impact_of_the_4th_industrial_revolution_on_jobs_and_the_sector.pdf (accessed on 30 August 2023).
69 Vermeulen, Kesselhut, Pyka & Saviotti 2018:2.

Whilst navigating through 4IR and automated machines replacing the human element in routine jobs, it is essential for African states to establish and find workable solutions for those whose jobs have been lost. Failure to do this may result in social isolation, resulting in mistrust between individuals. At the centre of 4IR, is AI often associated with high-tech robotics and automation; the type of intelligence characterised by problem-solving, abstract reasoning, the use of past events to influence future events, and language usage. Despite the existence of a universal definition of AI, it is the core of 4IR. Its existence has proven to benefit various job performances including medicine, industry, and finance. As societies progress into the crux of this revolution, there will be a need to train and educate individuals to align their skills to the technological change.

5.2 Artificial intelligence, criminal justice, and judicial system

As AI is the driving force of 4IR and continues to evolve, a justice reform process must be underway. For example, assume an autonomous car runs over a pedestrian. Who bears criminal liability? The manufacturer? Or the owner of the vehicle at the time of the incident? Consider again, a driverless car has lost control and must swerve to either the left injuring a herd of cows or swerve to the right injuring workers? Can the car make a moral decision? These are legal and ethical challenges that must be considered for justice reform.

Since the dawn of AI, criminal syndicates have utilised it to engage in criminal activities. Such criminal activities can be identified as AI crimes, whereby illegal or harmful acts are perpetrated through digital structures or devices.[70] These types of crime have formative elements and can be perpetrated against national security, personals, or funds. Qatawenhe *et al.* outline the legal scope that distinguishes AI crimes from conventional crimes: crimes occurring in the automated data-processing and transaction environment; cooperation and complicity in damages for AI crimes; difficulty detecting AI crimes; crimes based on computerised data; difficult to prove, and transnational AI crimes.[71]

Cybercriminals can be regarded as a loss of opportunity to contribute to the development and management of cyberspace. Thus, these criminals demonstrate mental ability or intelligence with technical knowledge which they could have utilised to enable themselves to even become computer specialists. Unfortunately, their intelligence allows them to boast about their inability to infiltrate security systems, and show weakness in the systems, in order to gain and show their superiority. Such perpetrators remain free from criminal accountability, due to anonymity.[72]

The lack of existing legislation that covers the scope of conventional crimes committed through technology enables perpetrators to continue with their criminal activities. This is aggravated by the unavoidable telecommunication

70 Qatawenhe *et al*. 2023:144.
71 Qatawenhe *et al*. 2023:145.
72 Qatawenhe *et al*. 2023:146.

evolutions and the advancement and/or loopholes of conventional crimes committed technologically. In other words, this helps criminals improve on their skills, thus making it difficult for the law to provide guidance to prove or prevent such attacks. For instance, if laws do not evolve as rapidly as technology, conventional laws will become powerless to conform new crimes.[73]

5.3 Human rights

Another social and democratic aspect to consider is the protection of human rights. With developments of humanised robots such as Sophia the robot, it is yet to be determined whether humanoid robots should be afforded the same rights as human beings or juristic persons? Nonetheless, for the time being, the effects of 4IR on the protection and promotion of human rights will be outlined hereunder. The discussion is in accordance with the initial argument presented that, in the absence of proven frameworks or supervision, individuals, politicians and large corporations may through AI or algorithms, manipulate and weaponise 4IR, thus leaving individuals vulnerable to cyberspace.

5.3.1 Income and economic equality

In addition to the above, economic inequality must be addressed. Africa's history of colonialism has contributed to widening the gap between the rich and the poor. With this in mind, relevant questions are necessary. Is it possible that 4IR may not improve the quality of life of the average or poorest African population? Will the poorest of the poor have access to the digital world? With the possibility of routine job losses substituted by machine automation, the rich will become richer, risking state capture and the possibility of creating chaos within societies and subsequently destroying democratic principles.

5.3.2 Education

The long-term solution to the social implications of 4IR is reform in the education system of African democracies. It is without question that 4IR will affect the education system. It thus becomes imperative to reform the education system and for curriculums to be relevant to the 4IR. In essence, African democracies should impart knowledge and skills that people require to survive, contribute, and benefit from 4IR. In other words, the most valuable investment for African democracies would be to invest in its people for them to be compatible with 4IR.

Education is important for the advancement of mankind. Therefore, for societies to understand 4IR, societies ought to educate themselves on technological changes. Technology has long been integrated in the education sector, particularly in the advent of the COVID-19 pandemic lock-down period which saw the rise of online learning. Since then, technology continues to be utilised in the teaching and learning process whereby chatbots and generalists bots continue to interact with students.[74]

73 Qatawenhe *et al*. 2023:146 -147.
74 Lubinga *et al*. 2023:2.

Another challenge could also be the perception by teachers and academics on 4IR. If the teaching instructors perceive 4IR as being complex and difficult to use or adopt,[75] this may have a tremendous impact on the teaching and learning process and may affect how students learn and understand content. Moreover, if the idea of 4IR is not compatible with the values, needs, and functioning of the education sector, then challenges will be evident. For example, generally, the process of teaching requires students to be independent and constructive thinkers. However, online learning and the use of AI bots such as ChatGPT may prevent students from thinking constructively, affecting intellectual and assessment integrity.[76]

Considering the big gap of wealth inequality in African democracies, access to such technologies may be difficult. Technological devices may be high costs for students from impoverished or low GDP families. Furthermore, some schools may have insufficient financial resources to integrate AI or technology in their teaching and learning processes.[77]

5.3.3 Privacy

Privacy protection and security initiatives are critical in addressing 4IR challenges. Where the vast majority of individuals have personalised AI, their right to privacy may be infringed. The reason for this is that, for the AI to serve the needs of its owner, it may have to track and predict the owner's needs and its data could be stolen and exploited by cybercriminals. Simply put, 4IR may compromise people's privacy and security, and even threaten the lives of a population through cyberattacks on government services such as electricity grids or water supply systems.[78]

Generally, the forms of privacy, as outlined by Prosser, include "intrusion upon seclusion or solitude, or into private affairs; public disclosure of embarrassing private facts; false light publicity, and appropriation of name or likeliness".[79] From this general outline, other conceptions of privacy include information privacy covers the right to control the dissemination of one's private information; decisional privacy is characterised as the right to choose and make decisions without intrusion or inspection, *i.e.* being able to act as one desires free from unwanted observations or intrusion, and physical privacy which covers the right to "solitude, seclusion, and protection from unlawful searches and seizures".[80] According to Manheim and Kaplan, information privacy promotes democratic values by allowing people to do as they please without observation or interference from others, thus also promoting people's freedom from political participation, conscience, economic freedoms, and freedom from discrimination.[81] When such information is lost or when one has access to such private information, these freedoms

75 Lubinga *et al*. 2023:10
76 Lubinga *et al*. 2023:11.
77 Hameed and Hashim 2023:1797.
78 See Kitchin & Dodge 2017.
79 See Prosser 1960:389.
80 Manheim & Kaplan 2019:118.
81 Manheim & Kaplan 2019:118.

are violated, more especially when such information has been declared as confidential information.[82] With the evolution of 4IR, data is the life source of AI and, at times, personal data may be useful for big corporates. In other words, "personal data has become the most prized commodity of the digital age, traded on a vast scale by some of the most powerful companies in Silicon Valley and beyond. This is the result of datafication of society".[83]

AI poses a huge threat to privacy and data protection. For example, people may be under surveillance without their consent or have their data processed.[84] Manheim and Kaplan further assert that there is no privacy on the internet, with small file "cookies" that are surreptitiously on the user's hard drive, in order to track the user's movement across the internet space and deliver information to the servers.[85]

Generally, information plays a crucial role in democracy. More important, the ability to access public information allows citizens to understand the role of government and the decision-making process.[86] Unfortunately, AI may be utilised to disseminate misinformation on electoral campaign, and to engage in information warfare through social bots, in order to influence citizens.[87] For example, in 2007, Estonia experienced a cyberattack following conflict between itself and Russia. The attacks targeted websites, online services of public and private organisations, and even financial institutions and newspapers.[88]

Individual privacy is valuable as it allows an individual to, for instance, better calculate his or her behaviour and actions. In respect of relations with government, interactions between government and privacy have been contentious. At times, the former argues that privacy may be utilised to conceal criminal activities and, at times, the veil may be lifted in order to ensure law enforcement accordingly.[89] However, the line may be crossed when government persuades corporates to hand over private data, which could result in the exploitation and manipulation of people, in order to extract their human tendencies.[90] The Facebook data privacy scandal involves the collection of personal information of users around the world by a political consulting firm, Cambridge Analytica. The firms collected data through a personality test that informed users that their information will be used for academic purposes. The collected data was then used for political purposes and for political campaigns.[91]

82 Manheim & Kaplan 2019:118.
83 Manheim & Kaplan 2019:119.
84 See Rodrigues 2020.
85 Manheim and Kaplan 2019:124.
86 Neuman 2002:3.
87 Duberry 2022:159.
88 Duberry 2022:161.
89 Bartneck 2020:61.
90 Bartneck 2020:62.
91 Duarte 2020.

Apart from this, corporates may choose to access private data for sales or advertisements. This could include utilising AI systems to to collect data without consent or knowledge of consumers; to identify people who may choose to remain anonymous; to profile people, and to generate sensitive information.[92] Furthermore, consumer products such as smart devices and appliances are often associated with data exploitation. AI systems used to track individuals who may choose to remain anonymous.[93]

In all these instances, it is evident that 4IR and its systems can erode the right to privacy.[94] To prevent this, there is a need for security reform policies and mechanisms to prevent invasion of privacy and security breaches. In summary, in acknowledging the main objective of technology, which is to enhance people's lives, African democracies need to be cognisant of the fact that "automation may well be economically and socially unsustainable in the long run"[95] in the absence of proper frameworks.

5.3.4 Speech and expression

Freedoms of speech and expression are rights that are fundamental in the functioning of democracies. Human rights impose negative and positive obligations on states. That is, "obligations to refrain from implementing measures that interfere with the exercise of freedom of opinion and expression and (…) to promote the freedom of opinion and expression and to protect their exercise".[96] To distort these freedoms, AI can be used to censor citizens and the media in order to suppress their expression or speech. Moreover, in other instances, some states may use AI to coerce the press to promote digital authoritarianism.[97]

Reviewing and monitoring content shared on the internet is important for the management of the cybercommunity. However, the decision-making process in content moderation is often complicated when it involves AI or automated processes. According to Kaye, algorithms lack the ability to evaluate, for example, cultural context, detect irony or conduct, and when such content is blocked or restricted, it may be regarded as undermining people's right to be heard. Moreover, AI does not have the ability to conduct critical analysis that could accurately identify, for instance, extremist content or hate speech content shared online.[98]

92 "Art. 19, Privacy and freedom of expression in the age of Artificial Intelligence (25 April 2018) 17" https://www.article19.org/resources/privacy-freedom-expression-age-artificial-intelligence/ (accessed on 28 August 2023).
93 "Art. 19, Privacy and freedom of expression in the age of Artificial Intelligence (25 April 2018) 19" https://www.article19.org/resources/privacy-freedom-expression-age-artificial-intelligence/ (accessed on 28 August 2023).
94 Bartneck, Lütge, Wagner & Wels 2020:62.
95 Vermeulen, Kesselhut, Pyka & Saviotti 2018:1.
96 United Nations 2018.
97 Haas 2020:2.
98 United Nations 2018.

Corporates that provide, own, or control search engines and social media platforms utilise AI to seize through content in an attempt to identify and remove undesired content or deprioritise content.[99] In a report to the General Assembly, Kaye stipulated his observation with information in digital space: "I observed that the ways in which information is stored, transmitted and secured in the digital age uniquely affects the exercise of the right to hold opinions."[100]

This observation was expressed considering how either states or private actors may interfere with digital activities such as search engines, browsing history, or emails.[101]

5.3.5 Service delivery and e-voting

One of the challenges faced by African democracies and 4IR can be observed within the context of service delivery. If African societies lack adequate resources, digital technologies, and infrastructural support, not only will they be digital illiterate, but they will subsequently not be able to benefit from 4IR-designed service delivery.[102]

African democracies attempt to adhere to art. 21(3) of the United Nations Declaration of Human Rights which provides for periodic and genuine elections held by secret vote or equivalent voting procedures. Numerous African states continue to apply manual electoral system.

With the evident technological advancement, e-voting or internet voting is in line with the idea of e-governments. The latter denotes disseminating "information and communication technologies and the internet to enhance the accessibility to and delivery of all facets of government services and operations for the benefit of citizens, businesses, employees and other stakeholders (…) continuously transforming public services delivery systems.[103]

Numerous benefits can be attributed to election voting machines. For instance, the machines could have audio or tactile devices or any extra components to cater for people with physical impairments, reduce printing costs, tally results more quickly, reduce human error often associated with exhaustions from polling stations, and reduce overall costs of conducting elections.[104]

The advantages of e-voting is accompanied by challenges that may arise. For instance, programming errors that may affect the overall process and reliability of results, infiltration or 'hacking' of the system with malicious intent, thus leading to vote rigging or tempering of votes, and inability to recalculate votes in the absence of a paper copy.[105]

99 Haas 2020:2.
100 United Nations 2018:11.
101 United Nations 2018.
102 Layton-Matthews & Landsberg 2022:61.
103 Abu-Shanab *et al.* 2010:265.
104 Abu-Shanab *et al.* 2010:266.
105 Abu-Shanab *et al.* 2010:266.

In addition to this, Sambo also outlines the advantages and disadvantages of implementing voting systems based on the four identified types: kiosk internet voting, polling-place internet voting, precinct internet voting, and remote internet voting.[106] Some of the outlined advantages include elimination of long queues, flexible voting time, eliminate spoilt ballots, font size, and screen language modified. On the other hand, the disadvantages include misusing voter's identity card, limited access to internet or understanding of the internet, difficulty in verifying voter's identification, power outage affecting the process, voters closing the screen without submitting their vote, and costs of machines.[107]

In 2013, Kenya declared interest in exploring electronics in its electoral processes, with the legislative framework in place that provided a detailed procedure on the use of technology. The IEBC adopted various systems in the 2013 general elections.[108] The elections were termed a pilot study to enable Kenya to access the use of technology. Nonetheless, the technology failed during the voter identification and transmission of results.[109] In 2017, Kenya embedded technology as part of its electoral process. The results showed that President Uhuru Kenyatta won a second term. In August 2017, following the opposition leader Raila Odinga disputing the results, the Kenyan Supreme Court ordered the elections commission grant the opposition access to its computer server and electronic devices used in the vote count.[110] The opposition's argument was primarily centred on the flawed nature of the results from more than one third of the polling stations, due to irregularities in the "electronic transmission of copies of paper forms giving the results from each polling station".[111]

Abu-Shanab *et al.* reiterated on the seven design principles that ought to be considered for electronic voting system to be secured:

> first is proven security; all protocols and techniques must be mathematically proven secure. Second, trustworthy design responsibility; government security agencies should be responsible for creating secure voting system. Third, source code; must be published and made publicly accessible. Fourth, vote verification; it should be possible to verify that all votes have been correctly accounted for in the final election tally. Fifth, voters' accessibility; system should be accessible to all and easy to use. Sixth, ensure anonymization: techniques like onion routing must be used to ensure anonymization. And finally, expert oversight; team of experts selected and approved by all major parties taking part in election.[112]

106 Sambo 2022:42-43.
107 Sambo 2022:42-43.
108 Kigwiru 2019:1-6.
109 Kigwiru 2019.
110 Obulutsa 2017.
111 Obulutsa 2017.
112 Abu-Shanab *et al.* 2010:266.

The existence of a democracy requires the people to participate in the process. Any sense of negative perception or lack of confidence in the e-voting system may deter people from participating in the election process of their country. This may have an impact on the state of democracy because, for the latter to exist efficiently, people participation is paramount. The security and privacy issues that may arise in e-voting can distort the essence of African democracies. Moreover, if the results are not reliable, public trust will be distorted and trust in the government will be affected.[113]

5.4 Corporate cybersecurity

Large corporates often fall victim to cyberattacks that gain access to personal private files of individuals. In 2018, Marriot International issued an alert following a breach in its Starwood guest reservation database. Having received the alert, an investigation commenced to trace the unauthorised breach that resulted in the copying and encryption of information. At the time of the alert, the corporate believed that at least 327 million of guest information was accessed, some with names, addresses, telephone numbers, passport numbers, and so on.[114] In 2019, Capital One, a financial institution, was breached and personal information of Capital One credit-card customers and individuals who applied for their product was accessed.[115]

Fraudsters may utilise AI to enhance the profile of a small company or business to attract customers or investors, by using bots to disseminate false information and by artificially boosting the profile and value of the company, thus selling worthless stocks.[116]

5.5 Cybercrime

Criminal syndicates have taken advantage of technological systems and advance their abilities to commit crime online. Contemporary criminals are able to disrupt automated data-processing systems and utilise AI systems, codes, softwares and devices to steal information and identities, infiltrate private systems, or develop fraudulent methods to lure victims to provide personal information.[117]

Other cases where AI systems can be utilised would include advertising accommodation facilities online and requesting large sums of money to secure reservations, particularly targeting unsuspecting tourists who eventually deposit the funds by electronic transfers.[118] In 2020, authorities arrested a Nigerian and Kenyan national located in India for cloning ATM cards and

113 Sambo 2022:6-8.
114 https://news.marriott.com/news/2018/11/30/marriott-announces-starwood-guest-reservation-database-security-incident (accessed on 28 August 2023).
115 https://www.capitalone.com/digital/facts2019/ (accessed on 28 August 2023).
116 Köbis *et al.* 2022:3.
117 Qatawenhe *et al*.2023: 144.
118 Financial Intelligence Centre, case studies and indicators collection 14, https://www.fic.gov.za/Documents/CASE%20STUDIES%20&%20INDICATORS%20COLLECTION%20final.pdf accessed 26 August 2023.

withdrawing money fraudulently. The perpetrators allegedly fixed cloning devices in the ATM machines to recover banking details and passwords to enable them to make withdrawals.[119]

AI can also be a tool utilised for weaponisation. Fraudsters may use this technology in a variety of ways, for instance imitate hyper-realistic audio and visual content, also known as deep fakes.[120] For example, in 2019, scammers developed and utilised audiovisual content to carry out a heist, whereby they imitated the voice of a CEO of a United Kingdom-based energy firm attempting to steal USD240 000.[121]

State financial institutions may be victims of cybercrimes, whereby perpetrators gain access to the banking systems and accounts to transfer money to their beneficiary accounts. In such an instance, the Financial Intelligence Centre determined that at least R72.2 million was illegally transferred into over one thousand different accounts. In the second instance, at least R42 million was transferred.[122]

In January 2023, *CNN* reported that the email addresses of at least 200 million Twitter users were circulating on underground hacker platforms, thus jeopardising identities of anonymous user accounts and making it easier for cybercriminals to hijack their accounts.[123]

These examples and many others show that, as societies develop and technology advances, codes and models do the same. This may result in cybercriminals being more powerful in the absence of government officials advancing themselves.

5.6 Political propaganda

AI systems should not be utilised to impersonate non-existent people or human users for a political agenda and to manipulate the general public, particularly on social media platforms.[124] For example, Recep Tayyip Erdoğan played a video of his main challenger in a political rally. The video showed the challenger receiving endorsement from the Kurdistan Workers Party, a designated terrorist organisation in Turkey, the United States, and the United Kingdom. It was established that the video was two separate clips that were merged together. The video widely circulated online and Recep Tayyip Erdoğan won the election.[125] In another example, a deep fake depicted the Ukrainian President Volodymyr Zelenskyy instructing his soldiers to surrender to Russian forces.[126]

119 https://saharareporters.com/2020/10/30/nigerian-kenyan-nationals-arrested-cloning-atm-cards-stealing-india accessed 26 August 2023.
120 Köbis, Starke & Edward-Gill 2022:3.
121 Brewster 2021.
122 "Financial intelligence centre, case studies and indicators collection 16" https://www.fic.gov.za/Documents/CASE%20STUDIES%20&%20INDICATORS%20COLLECTION%20final.pdf (accessed on 26 August 2023).
123 Fung 2023.
124 Köbis *et al.* 2022:7.
125 Milmo 2023.
126 Appel & Prietzel 2022:1.

5.7 Corruption

It is not uncommon for AI developers to utilise the system for corrupt purposes. This situation may be termed 'corrupt AI', illustrating the "abuse of AI systems by (entrusted) power holders for their private gains".[127] This may occur in a variety of ways. For instance, an AI system is intentionally developed to engage in corrupt practices; a code or training data of an existing AI system is manipulated to engage in corrupt acts, or an AI system is applied in a corrupt manner.[128]

AI may also be utilised as a tool for collusion, where it uses algorithms autonomously coordinated to fix prices.[129] A 2018 report by United Kingdom's Competition and Market Authority "found evidence of widespread use of algorithms to set prices particularly on online platforms".[130] It also found that "simulation models confirm that some pricing algorithms can lead to collusive outcomes even where firms are each setting prices unilaterally".[131]

Scammers may also establish front or fictitious companies to siphon or transfer funds. For instance, a public official may divert public funds to such a company. In another instance, a company will be registered with a name similar to a legitimate existing company, open bank accounts for the duplicate company, and make account changes. The successful banking information will thus result in money being transferred to be falsified company instead of to the legitimate company.[132]

6. EXPLORING 4IR OPPORTUNITIES: AN AFRICAN PERSPECTIVE

It is imperative that, in the process of navigating through risks or challenges of 4IR, African democracies generate opportunities in various sectors. One of the major concerns of 4IR is its impact on jobs.

6.1 Employment

The future of jobs in the advent of 4IR has led to various conclusions. It may be argued, on the one hand, that 4IR will result in job losses and that 4IR will create jobs, on the other. With reference to the latter, research has shown that, as of 2019, technological enhancement has enabled employees to be more flexible whilst performing their duties. For instance, people can work from anywhere.[133]

127 Köbis *et al.* 2022:7.
128 Köbis *et al.* 2022:7.
129 Köbis *et al.* 2022:3.
130 Competition & Market Authority 2018:3.
131 Competition & Market Authority 2018:4.
132 "Financial intelligence centre, case studies and indicators collection 22" https://www.fic.gov.za/Documents/CASE%20STUDIES%20&%20INDICATORS%20COLLECTION%20final.pdf (accessed on 26 August 2023).
133 Northern Ireland Council for Voluntary Action "The impact of the Fourth Industrial Revolution on jobs and the future of the third sector" https://www.nicva.org/sites/

Bearing in mind that a number of jobs will be replaced by high-tech enhancements, jobs that are not characterised by human interaction will be in demand, including jobs related to guiding robot behaviour, technology analysts, software engineers, installers, and mechanics supervisors. Jobs that require human interaction and are safe from replacement include mental health practitioners, medical practitioners, and social workers. In addition, cutting-edge technology will be beneficial in the healthcare sector. For example, Buoy Health (an AI-based symptom and cure checker uses algorithms to diagnose and treat patients with illnesses),[134] Enlitic (a tool used for radiology diagnoses),[135] and Freenome (AI tool used to screen in diagnostic tests and blood work).[136]

Various skills will be required for disruptive technology. Individuals with mechanics, computer or programming skills will be in high demand, due to their knowledge on how to manage technologies. Given this, as AI advances, African democracies will require AI developers, including creative analysts and any jobs characterised by creativity.[137] Furthermore, the technology introduced will require complementary tasks, and people will have to be employed to control, programme, and maintain the technology.[138]

6.2 Agriculture

Income inequality exists and digital transformation may aggravate the *status quo*. Technology may be harnessed to minimise the inequality gap, eliminate poverty, and create jobs for African communities, particularly the impoverished. In other words, production processes will benefit from 4IR, and African democracies need to maximise production opportunities in an effort to eradicate the poverty that has plagued the continent. In an effort to do so, it is imperative for the continent to explore 4IR and its role in the increase of agriculture production. Investment in agricultural products will create businesses and employment opportunities and positively impact on the eradication of poverty and malnutrition. To achieve this, it is crucial to invest in agricultural machinery, in order to increase production and distribution of produce.[139]

default/files/d7content/attachments-articles/the_impact_of_the_4th_industrial_revolution_on_jobs_and_the_sector.pdf (accessed on 24 September 2020).

134 Pennic 2017.

135 Enlitic, "Reimagined healthcare requires reimagined intelligence" https://www.enlitic.com/ (accessed on 30 August 2023).

136 https://www.freenome.com/blog-freenome (accessed on 30 August 2023).

137 North Ireland Council for Voluntary Action "The impact of the Fourth Industrial Revolution on jobs and the future of the third sector" https://www.nicva.org/sites/default/files/d7content/attachmentsarticles/the_impact_of_the_4th_industrial_revolution_on_jobs_and_the_sector.pdf (accessed on 30 August 2023).

138 Vermeulen *et al.* 2018:3.

139 Serrano-Palacio & Gómez-Paredes 2019.

6.3 Transportation

Digital transformation may promote the AU's Protocol to the Treaty Establishing the Economic Community Relating to Free Movement of Persons, Right to Residence and Right of Establishment. That is to say, 4IR can transform the transportation industry and play a role in the implementation of the above-mentioned protocol. For example, the Government of Maharashtra intends to create the first hyperloop transportation system in the world, and in doing so, it has approved a hyperloop project and deemed it a public infrastructure project.[140] African democracies need to seize the opportunity to enhance its transportation industry. Lessons can be learnt from the Kingdom of Morocco and their creation of the LGV Maroc, which travels at 320km/h, 200mph and the South African Gautrain, which travels at 160km/h, 99mph.[141] This will promote the movement of persons and economic integration on the continent.

6.4 Identifying specialisation of industries

Apart from the transportation or agriculture industry, Africa ought to identify specialised industries. The wealth of a continent requires economic progression by increasing productivity in labour and technology industry. This calls for the need to specialise in industries. African democracies, individually or collectively, need to specialise in production in order to strengthen the Agreement Establishing the African Continental Free Trade Agreement.[142] Western states have identified their speciality;[143] the same is required for the African continent. Among the many specialisation opportunities, agriculture must be explored mainly because Africa is the poorest and underdeveloped continent, yet it is rich in natural resources. Transforming the agricultural sector, in line with 4IR, can not only alleviate poverty and underdevelopment, but it will also create employment and encourage innovation. If Africa makes use of its agricultural land, "combined with IT or digital technologies, precision farming, automation and genetic engineering", the African agricultural sector can transform into a high-tech agriculture sector.[144] This will ensure that the poorest of the poor, farmers, low-paid employees, those who were displaced by robotics or whose jobs were automated, take part in the growth of the industry and attain a portion of its wealth.

6.5 Public service delivery

The political arena will also experience a shift in the future. Public services will be in demand and the corruption rate in Africa may decrease. For years, voting systems on the African continent have often been plagued by scandals

140 NDTV 2019.
141 Le Roux 2018.
142 African Union 2018.
143 For example, China mainly exports electronic machinery and equipment, Germany and Japan, vehicles, and Switzerland, watches and pharmaceuticals
144 See Studwell 2013.

and violation of people's rights.[145] It may be argued that the introduction of electronic voting may enhance voting and transparency, prevent vote riggings (electoral fraud), and ensure that there is no duplication of votes.

Taking part in 4IR will enhance service delivery through digitisation of public services, in order to improve people's lives. In addition, digitalisation of public services will minimise corruption by public officials and enable governments to meet the needs of its people. Bearing in mind that the needs of the impoverished are rarely or slowly met, online services can provide this through access to information and digital services.[146] To achieve this, impoverished communities must have access to electricity and internet connections. Thereafter, access to high-speed internet connection, in order to enable them to interact with public officials. Furthermore, to improve service delivery, African democracies need to transform existing systems into those that are capable of delivering services more efficiently. In addition, the systems must be designed to provide service delivery to numerous individuals simultaneously and to enhance telecommunication.[147]

6.6 Corruption

The high rate of corruption on the African continent often implies misappropriation or theft of government funds. The establishment of a technologically advanced regulatory compliance system will be beneficial for the continent. The basis of such a system will be to monitor the flow of monies, verify and track transactions, and give notification to auditors and/or regulators of any inconsistencies or suspicious transactions.

AI systems can be utilised as a tool to combat corruption by detecting or predicting corruption risks or detect suspicious transactions that can later be investigated. Algorithmic systems may be put in place to regulate transactions, particularly within the context of the utilisation of public funds by public officials. Moreover, these systems may further be utilised to detect laundered monies by detecting irregularities in transactions.[148]

Tax authorities may utilise AI and machine learning to detect or predict tax evasions and monitor public procurement processes.[149] For example, the South African Revenue Services has incorporated AI, data science in its fraud-risk processes that enabled it to stop fraudulent refunds worth at least R61 billion.[150] It is imperative for African democracies to utilise AI, in order to ensure that an AI strategy is developed on how to project AI solutions to deliver service efficiently or oversee public procurement processes.

145 Amoah 2020.
146 Balkaran 2017.
147 Balkaran 2017.
148 Köbis *et al.* 2022:3.
149 Aarvik 2019:2.
150 Neethling 2023.

E-government may also promote the fight against corruption. E-government is generally defined as "the delivery of government information and services online through the internet or digital means".[151] This may occur when government is obliged to publicly publish data on its operations such as state contracts, public procurement, state funds, as well as salaries and assets of politicians.[152] Furthermore, due to the discretion of public officials when engaging citizens, they are susceptible to requesting or being offered a bribe. To eliminate this, a paperless government can minimise such incidences.[153] For example, considering the prevalence of police corruption, body cameras may be beneficial to deter officials from requesting or receiving bribes.

AI systems, machine learning or technological devices may contribute to openness, accountability, and transparency of public officials in the performance of their duties, thus promoting integrity and ethics in the public sector; and in detecting corrupt risks and opportunities for citizens.

Above all, to be pioneers of 4IR, social order has to be aligned with 4IR. African leaders, politicians, and the African people, in general, need to be cognisant of the reality of 4IR and deliberate on how they will shape social structures, governance, and economy. To harness 4IR, leaders, politicians, and other stakeholders should understand the need for economic development and comprehend the kernel of 4IR and the opportunities it holds. The latter will result in the capitalism of the 4IR.

In summary, despite the delineation of the challenges of technological advancement that African democracies may face, the reverse indicates that technology can strengthen democracies through skills development and job creation; development; economic growth; promote public participation; enhance human rights such as freedom of speech by enabling societies to express their opinions through social network platforms; promote transparency and accountability in public offices, and enable people to exert pressure on government to be transparent and account for their actions. This, in turn, will strengthen the separation of powers and the rule of law.

7. CONCLUSION

The development of the African continent may be attributed to various factors, one of which is democracy. Despite the non-existence of a watertight universal definition of democracy, its purpose is intended to ensure that all citizens actively participate in politics, the economy, and all matters paramount to all citizens. The dawn of 4IR and its characteristics continue to alter social engagements and the traditional way of life of citizens. As shown, there are drawbacks and concerns regarding the 4IR. Simultaneously, there are opportunities that may be beneficial for the development of African democracies. However, this will not be possible if African states do not commit to digital transformation. To strengthen democratic principles, 4IR opportunities ought to be explored for the development of the African continent. To do so, Africa must position herself to be a participant, and not an observer of the revolution.

151 Alshehri & Drew 2010:79.
152 Bordas 2022:11.
153 Bordas 2022:13.

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