Big data and disruptive technological innovations (DTI) are increasingly shaping and redefining how to evaluate governance in Africa. While invaluable, evaluating the impact of disruptive technologies on governance is not widespread. This article submits that notwithstanding some concerns and skepticisms about the role of DTI and big data on governance processes, there is no denying that DTI facilitate the exchange of information that is vital to the promotion of efficiency in various aspects of life, including the governance and political arena.
Key Messages

- Disruptive technologies and innovations are radically transforming governance processes globally.

- Although disruptive technologies play a critical role in helping with accomplishing improvements in policy making and efficiency in service delivery in areas such as agriculture, education, and healthcare, these achievements come with great risks and costs.

- Addressing the risks associated with disruptive technologies will entail a process whereby the data for evaluation is unbiased and of high quality, and involves updating of existing rules and regulations in the use of new technologies.

Introduction

One of the significant developments over the last two decades has been the emergence of various forms of information communication technologies (ICTs). Brennan, Subramaniam & van Staden (2019) have pointed out that disruptive technology and innovations (DTI) and other technological advances such as artificial intelligence (AI), the Internet of Things (IoT) as well as big data have led to unprecedented changes, often disrupting the way services have traditionally been produced and consumed. Additionally, they note that the ability to handle large volumes of digitized data in rapid and complex ways through these technologies has also increased our dependency on more open, multi-platform, networked structures. The issue that crops up is how these new developments are redefining how we evaluate the impact of DTI on Africa. DTI has contributed to the process of data being collected in real time, meaning that we are able to assess information in real time and react as such. However, as Mackenzie (2018) argues, data collection is not error-free, so if you make a prediction based on error, but the reality is different from the data being shown, there arises the issue of which one is the error.

One area which researchers have become interested in, is evaluating how DTI and big data are impacting the governance process. However, Hermanns (2008) argues that detailed analysis of possible effects of DTI on politics are scant. As he contends, “there are far fewer publications in the political science literature on the impact of mobile phone technology on politics and political behavior” (Hermanns 2008: 75). Moreover, the available literature deals with the role of DTI such as social media in Western democracies, with less emphasis being placed on the debate concerning emerging democratic environments and developing countries (Wolfsfeld, Segev & Sheafer 2013). Thus, evaluation of new DTI on governance, which is an important part of the process of providing valuable information to support the decision-making process (Sukai 2013: 77) is lacking in the African context. Undertaking an evaluation process in an independent and context-specific way is critical to realizing the success that most models aspire.
to (Segone et al. 2013: 8). Against this backdrop, this article examines how DTI is shaping and redefining how we evaluate governance in Africa. Specifically, it seeks to answer the following questions: What are the benefits of DTI on the broader governance landscape in African societies? What are some of the costs and concerns associated with the pervasive use of DTI and big data in governance? In answering these questions, the article’s thesis is that although DTI and big data enable governments and citizens to organize themselves at little cost, and the world is able to bear witness as well as facilitate the exchange of information that is vital to the coordination of various activities, the use of big data and DTI for negative purposes such as spreading misinformation and authoritarianism by governments cannot be underestimated.

DTI, Big Data & Governance

The disruption of traditional ways of communication and information exchange is a consequence of the rise of a new and powerful business model (mass data). According to Körner (2019), the spread of the data economy has become almost universal, as cheap access to smartphones and free content have made online behavior independent from people’s financial, ethnic, religious and political background. In the political and governance realm, DTI are playing a crucial role in shaping various political activism taking place in much of the world. Körner (2019) adds that people enjoy access to information that was unimaginable just a few decades ago, and the possibility to exchange and coordinate themselves worldwide in a matter of seconds. For billions of people, the digital transformation with which the smartphone is synonymous has brought enormous benefits and convenience—notably it has enriched societal discourse via new forms of multilateral communication. Agrawala (2019) opines that digital transformation and the concomitant availability of more data can improve policy design and making by lowering the cost of policy experimentation and evaluation. This view is shared by Nalubega & Uwizeyimana (2019) who contend that the innovations and technological advancements of the fourth industrial revolution (4IR) are uprooting and changing how societies do business and go about their daily work. These innovations and technological advancements have been referred to as a set of disruptive technologies that are transforming social, economic, and political systems, and putting pressure on leaders and policy-makers globally.

Likewise, DTI such as drones have been used to improve health care in countries like Rwanda and Tanzania, and most recently Ghana. Similarly, Massive Open Online Courses (MOOCs) have been employed to improve access to education in universities such as the University of Lagos, University of Cape Town, University of the Witwatersrand and Stellenbosch University (Nalubega & Uwizeyimana 2019). In the labor market, the growth in AI, coupled with machine learning, while transforming the workplace, also free up the need for human labor. AI has made it possible to automate a range of tasks by enabling machines to play an increasing role in drawing conclusions from data and then acting. Kahne & Bowyer (2018) also noted that increased technological advancements have resulted in the internet becoming a dominant force when it comes to how campaign funds are raised, outcomes are evaluated, perspectives are shared and discussed, and individuals are mobilized to act politically. The most fascinating ability of DTI such as social media is that it enables ordinary citizens to connect and organize themselves with little to no cost, and the world to bear witness. Social media such as Facebook and Twitter have become standard evaluation tools for citizens, representatives and governments to reach out to each other and exchange views, opinions and policy proposals (Körner 2019; see also Jotia 2018 on the Arab Spring).
Criticisms and Limitations of DTI & Big Data

Notwithstanding the benefits of the digital transformation, which has led to unprecedented access to and exchange of information for human communication and organization over the past years, Körner (2019) points out that digital technology has also amplified the spread of misinformation, echo chambers, and propaganda, thereby possibly contributing to rising populism and the polarization of democratic societies. Users across the globe enjoy ‘free’ services in the data economy, but underlying business models and a concentration of influence and wealth have raised pressing questions regarding privacy, data ownership and targeted manipulation for both economic and political purposes. For Körner (2019), the combination of big data and AI give governments unprecedented means to monitor, surveil, control and influence their citizens. For authoritarian states, these tools can help detect and prevent any kind of dissent at an early stage and prevent the formation of opposition and civil right groups that could challenge the concentration of the political and economic power of a ruling elite. As authoritarian governments can enforce access to all information and data collected and stored by private companies (which are often not clearly separated from the government anyway), the state’s means of monitoring and control can comprise all aspects of citizens’ lives (Körner 2019). Additionally, digital technology can also be used in established democracies to deliberately manipulate voters and distort the political discourse. Authoritarian states have also quickly learned to use surveillance technology, mass data and artificial intelligence to their advantage, both for domestic control as well as the erosion of democratic societies abroad. The continuous spread of conspiracy theories and other factually incorrect or highly biased information undermines citizens’ ability to identify and evaluate ‘objective’ or shared truth (Körner 2019).

To Agrawala (2019), while the availability of more data usually contributes to improvements in policies, it is not a panacea and comes with risks that will need to be tackled over the next decade: in some instances, less data is better than more. Particularly, digital transformation poses several challenges: the increased granularity of data and increased data-sharing between government agencies and across public-private partnerships can generate digital security vulnerabilities and concerns over individual privacy. Similarly, for Nalubega & Uwizeyimana (2019), the issue of privacy and data security, for example, is contentious as it regards the adoption of some disruptive technologies for data collection. Using phones to track daily movements and communications among people, analyzing people's moods on social media and using drones and geo-spatial tools to photograph private properties create a worrying environment for privacy in a community—and raise serious ethical questions for evaluation based on DTI. There is an increasing fear of trading of data, and this may spark conflicts and misunderstandings.

Monitoring and evaluation (M&E) personnel and departments have the challenge of ensuring that the collected data is safe from malicious acts; otherwise, it can put the individual or the entire country at risk or in a state of vulnerability. Moreover, with the adoption of some technologies, some key data may have strict and/or limited access, thus hindering extraction for analysis. Lack of critical data because of limited access can create a challenging situation for M&E personnel and departments. The complexity of the ethical issues pertaining to the deployment of disruptive technologies is also a huge challenge for the African public sector. Furthermore, in big data analytics, predictive analytics are emphasised, which contrasts

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with the experimental designs often employed in the current public sector M&E. Also, using big data from disruptive technologies solely to draw evaluation recommendations may be quite misleading as such data have a significant selection bias (Nalubega & Uwizeyimana 2019).

Another issue is that the increasing growth in mobile technology and rise in disruptive innovations in Africa have implications for labor employment, and raise the question of whether data scientists will encroach on the livelihoods and profession of evaluators. The technological transformations, while creating novel possibilities, again raise concerns about existing legal and regulatory frameworks in an emerging context. How are evaluators expected to navigate the emerging ecosystem, given that the data used by evaluators will be generated, controlled and disseminated in novel ways and formats (e.g., big data, block chain), and there are multiple actors involved with regulation, marketing and generation of data (e.g., drone technology, machine learning, AI, mobile apps, new social media, etc.)?

In the political arena, while it is often assumed that DTI such as social media are an effective tool in getting people to be easily involved in the political process and to improve political activism, Kaplan and Haenlein (2010) take a contrary view. They highlight how the use of social media has the potential of not only undermining representative government but also to create ‘depoliticization.’ They demonstrate how people can organize themselves to plan activities directly instead of working through their elected governments and other official representatives. Additionally, Rød & Weidmann (2015) have called into question the perspective that improvements in ICT, as embodied in the internet, have contributed to a global shift towards democracy, political participation and activism. They argue that the role of social media in recent popular uprisings against Arab autocrats has fueled the notion of ‘liberation technology’, namely that ICT facilitates organization of antigovernment movements in autocracies. For them, less optimistic observers contend that ICT is a tool of repression in the hands of autocrats, imposing further restrictions on political and social liberties.

Moreover, DTI as evidenced in social media, according to Allcott & Gentzkow (2017), create small, deeply polarized groups of individuals who tend to believe everything they hear, no matter how divorced from reality, as well as help foster an environment that enables those who are bent on creating and sustaining a divided and polarized society to continue. Allcott & Gentzkow (2017) add that social media has thus become the outlet through which “fake news,” which they define and conceptualize as intentionally and verifiably false news articles as well as distorted signals uncorrelated with the truth, can be delivered. As Persily (2017) points out, it is because of such concerns that several internet platforms (e.g., Google, Facebook, and Twitter) changed their policies concerning information on their sites to address perceived shortcomings of the communications environment. Finally, apart from internet connectivity facilitating digital censorship and the identification and arrest in authoritarian regimes of individuals critical of political power holders (Rød & Weidmann 2015), a critical limitation of political information found on social networking sites is the lack of quality and reliability – something that poses a challenge to evaluation.

Addressing DTI Concerns: The Way Forward

The 4IR is thought to bring about enormous benefits associated with increased efficiency and effectiveness in service delivery, including the highly anticipated opportunities related to automated and digital transformations (Nalubega & Uwizeyimana 2019).
Notwithstanding the benefits, as noted earlier, the growth in DTI comes with challenges for evaluation. So how should evaluators and policy-making elites, who are increasingly placed on the back-foot, address disruption, innovation and technological change? (Hasselbalch 2017). As Hasselbalch (2017) states, innovations often lead to accelerating changes, disruptions, and fundamental challenges for the economy, society and policy-makers that demand sweeping regulatory responses. It is in this regard that Nalubega & Uwizeyimana (2019) indicate that governments in African countries need to understand the challenges associated with DTI and thus adopt measures to mitigate the impact of the unpredictable and rapidly changing products and services created for the public. Similarly, the speed with which DTI is evolving calls for evaluators to anticipate and plan appropriately to respond to the changing landscape so as not to be caught flat-footed and be overtaken by developments. Indeed, it is because of some of the problems and concerns with DTIs identified above that an Afrocentric approach to evaluating the impact of digital technologies in the governance process in Africa has increasingly gained attention. Having an evaluation model that takes into consideration the contextual and institutional factors of the society represents an important aspect of helping that country achieve its objective of realizing independent evaluation tools and approaches. It is important that various stakeholders broaden their horizon and knowledge base regarding the role that technology plays to understand not only its benefits, but also its risks in order to succeed.

Also, given that it is extremely important to get the governance arrangements of disruptive innovations ‘right,’ Hasselbalch (2017) suggests that there is a need to gather information on the nature and expected impacts of the disruptions in order to figure out what is being looked at. In this vein, rather than just focusing on impact assessments, we should consider the full range of assessment exercises, as well as the highly political games that go into choosing between assessment regimes, organizing evidence and data within them, and dictating for what the assessments are used. Moreover, we should imagine and describe new forms of assessment, such as innovation assessment, that can rise to novel regulatory challenges (Hasselbalch 2017). To this end, Körner (2019) points out that governments need to update regulation, competition rules and supervision to account for the transformed requirements of the data economy. Companies need to ensure that their business models and products are compatible with constitutional rights and the integrity of democratic institutions and processes. Evaluators need to better understand the algorithms and designs behind their apps and devices as well as the mechanics of the data economy. Societies need an informed dialogue on data and technology ownership on how to share the fruits of technological progress and on how to prevent increasing asymmetries in wealth and power from destabilizing their foundations.

Significantly, as Nalubega & Uwizeyimana (2019) argue, in current M&E systems, substantial efforts are dedicated towards ensuring that the data to be used are unbiased and of high quality. The use of data from some disruptive innovations poses the challenge of having what can be termed an ‘early warning signal’ for crises to masquerade as the real data evaluators may use to draw conclusions on the impact of a given occurrence, program or policy that may have serious consequences. It is therefore important in the 4IR to clarify what qualifies as a ‘warning signal,’ to conduct research and to distinguish them from M&E. Finally, maximizing the opportunities in the 4IR requires multi-stakeholder efforts that call for an open mindset to fully explore the contributions from innovative ideas.

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This might require deep integration, or collaboration on long-term technology, to efficiently manage and control the highly complex and interdependent nature of the disruptive innovations. In the 4IR, it would be no surprise if some of the most powerful solutions to the challenges faced in Africa come from small start-ups or simpler collaborations rather than traditional large set-ups of public management. Therefore, emerging policies aimed at regulating or guiding the 4IR innovative technologies need to be adaptive, inclusive, sustainable and human-centered in order to address the increasing challenges of these new technological changes (Nalubega & Uwizeyimana 2019).

Conclusion

The focus of this article was on the role of DTI, big data, and their evaluation for governance in the African context. It noted that the use of DTI and big data can assist in effective and efficient evaluation of policies. The article argued that notwithstanding the concerns and skepticisms regarding the role of DTI and big data in the governance process such as helping with political mobilization and activism, there is no denying that DTI facilitate the exchange of information that is vital to the promotion of efficiency in various aspects of life, including the governance and political arena. Apart from DTI such as social media platforms facilitating the exchange of emotional and motivational contents in support of and opposition to protest activity, including messages emphasizing anger, social identification, group efficacy, and concerns about fairness and justice, their role in improving policy design through lowering the cost of policy experimentation and evaluation, is equally significant.
Endnotes

1. To Emmanuel & Stanier (2016) big data is the collection, processing, analysis and visualization of large volumes and a variety of structured and unstructured data sets that are difficult to process using traditional database and software techniques.

2. Fukuyama (2013) defines governance as a government’s ability to make and enforce rules, and to deliver services, regardless of whether that government is democratic or not. He notes two separate dimensions of governance: capacity and autonomy. The quality of governance is ultimately a function of the interaction of capacity and autonomy, and either one independently will be inadequate as a measure of government quality.

References


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