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ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE FRAME OF THE NEW AGE VIRTUAL CULTURAL COMMUNITY – EFFECTS ON AFRICAN COUNTRIES

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Abstract: *Artificial Intelligence (AI) is a contemporary, important and well-known field of the latest computer science. AI holds vast technological capabilities which are now considered as the future potential of companies, communities, and even countries. Specifically, AI cyber security technologies can assist countries to gain a significant impact in diplomacy and international affairs as well. Specifically, these gains could be highly important as implemented by third-world countries. The purpose of this article is to point out the effects of AI technologies on diplomatic and international affairs of African countries. The article elaborates how AI can provide these countries technologies that can compensate financial and military hegemony of the West. Moreover. AI has the potential to help African countries in becoming a real player in international relations, and to change the depressed discourse of the "other" hegemony. All this, of course, by understanding the meaning of culture for discourse and ultimately for diplomacy, while gaining meaning for the new potential of the West and accepting African culture, towards a possible change for both. The mechanism by which AI could benefit African countries is through flattening of the state network de facto eliminated by the Internet and social networks. Considering a very broad penetration of the cellular technology in these countries, AI could rapidly be distributed and therefore to create a new socio-cultural structure. In this article I will review the potential of AI on the social discourse in African countries as examples of rapid and profound change.*

Keywords*: Artificial Intelligence; African countries; Technological Superiority*

1. INTRODUCTION

Since the dawn of history, technological development was associated with significant military and diplomatic strategic advantage. In the past decade this pattern exponentially grew involving cutting-edge technologies which create invisible power in the hands of states which hold them. These technologies are based on Artificial Intelligence, meaning intelligence demonstrated by machines which is expressed by many applications such as cloud computing, big data analytics, quantum mechanics, blockchain, and other software and hardware applications. General AI seeks to accomplish this latter task: to empower a machine to learn and solve any number of problems, much as humans can. Most experts appear to agree that the accomplishments of narrow AI, though quite significant, are a long way from the requirements that must be met to replicate human-like reasoning as envisioned by proponents of general AI (Wang & Goertzel, 2012). The proper use and implementation of AI can facilitate a nation in the achievement of information, economic, and military superiority – all ingredients to maintaining a prominent place on the global stage (Tan, 2019).

It is now becoming clear that AI has become a new focus of international competition. AI is a strategic technology that will lead in the future; the world's major developed countries are taking the development of AI as a major strategy to enhance national competitiveness and protect national security; intensifying the introduction of plans and strategies for this core technology and trying to seize the initiative in the new round of international science and technology competition. However, AI systems could be developed and used not only in super-power states, but also in other countries, even third-world countries.

This paper aims to understand the way AI could enhance strategic diplomatic advantage of African countries by providing them powerful tools to compensate current gaps from industrial countries in many domains. This paper is theoretically relied on theoretical foundations of AI implementations in the

state-level and its influence on diplomacy and international affairs (Wang, & Goertzel, 2012; Cisse, 2018; van den Bosch, & Bronkhorst, 2018). From this theory perspective, states use AI to significantly improve their performance in both internal and external domains, in ways that could attribute a competitive advantage on other states and players in the international level.

2. ARTIFICIAL INTELLIGENCE (AI) AS A TECHNOLOGICAL SUPERIORITY

AI tools are considered of being a "game-changer" technology in shaping diplomatic affairs and international relationships. AI enables to analyze a large volume of data quickly than humans, identifying insights and trends that humans missed, and providing suggestions on how to improve diplomatic decision making (Wilner, 2018). Hence, using AI could assist in political forecasting, mining an increasing array of available data to better understand and predict political, economic, and social trends.

One of the most important aspects of using AI to achieve a diplomatic superiority is by enhancing military capabilities. AI-empowered systems that make it possible to locate, track, and target a variety of enemy weapons systems raises the possibility of striking strategic assets, such as aircraft carriers, mobile missiles, or nuclear weapons. This capability, and perceptions about its existence, could disrupt long held assumptions about deterrence stability, especially if it appeared possible to conduct a disarming counterforce strike against an adversary's retaliatory forces. Another strategic tool, AI provides to governments is societal surveillance. AI-guided probing, mapping, and hacking of computer networks can provide useful data for machine learning, including discovery of network vulnerabilities, identities, profiles, relationships, and other information that may be valuable for offensive and defence purposes (van den Bosch, & Bronkhorst, 2018; Masuhr, 2019). Therefore, super-powers such as U.S., Russia and China invest significant efforts in developing AI capabilities in the military and diplomatic domains. For example, in 2017, the US Intelligence Advanced Research Projects Activity (IARPA) commissioned a study which recommended ensuring that the US remains as the world's leading nation in AI technology. The study also recommended protecting the peaceful use of AI technology for businesses while mitigating any external risks posed by the military applications of AI technology (Allen & Chan, 2017). The US Department of Defense has allocated in 2017 about 7.4$ billion to AI, which represented 1.21% of the US military budget (Conger & Cameron, 2018). China also put AI as one of the most important national and international goals. In 2016, China was responsible for 17% of all AI investments worldwide, which was far behind the US, which was responsible for 66% of all AI investments (Columbus, 2017; Larson, 2018). To surpass the US, China plans a strategic investment of $150 billion in AI technology by 2030 (West & Allen, 2018). Global competition in military AI is already heating up. Considering the rising tide that is advancing AI prospects around the world, temporary advantages are unlikely to yield lasting military predominance (Apiecionek et al., 2015).

Indeed, technological advances in AI reshape the practice of diplomacy. AI technologies in image recognition and information sorting can make diplomatic compounds safer by identifying anomalies for potential vulnerabilities. In addition, language processing algorithms decrease language barriers between countries, allowing them to communicate to foreign governments and publics more easily.

3. USING AI AS STRATEGIC ADVANTAGE FOR AFRICAN COUNTRIES

Western countries enjoyed over the years significant resources which assisted them to gain a technological superiority in many fields. Unlike Western countries, African countries lack these resources, also lack the research and development culture. Hence, they are positioned in very low places in the international map. However, for the first time, using AI technologies could assist these countries to compensate their bad starting point. These technologies enable very fast and efficient data analyses in many domains, and hence, they provide these countries learning abilities which could boost their progress. AI has a large potential to drive economic growth, development, and democratization in these countries, and therefore to improve public services, and bettering the quality of life for many people (Cisse, 2018). AI can empower workers at all skill levels to be more competitive by enhancing human skills similar to industrial countries. There is an increasing awareness of the positive effects which AI has on African countries, in sectors such as security, agriculture, health care, and public and financial services. Recently, we are witnessing initial efforts of implementing AI systems in several countries at Africa in numerous domains.

As for **cyber security** domain, several countries begun using AI in order to enforce tighter supervision on their populations. For example, at March 2018, Zimbabwean government signed a strategic partnership with the Gunagzhou-based startup CloudWalk Technology to begin a large-scale facial recognition program throughout the country. The agreement, backed by the Chinese government's Belt and Road initiative, is intended to see the technology primarily used in security and law enforcement and most likely be expanded to other public programs. This process was driven by Chinese government in order to enhance its capabilities of civil surveillance (Mare, 2019).

In this vein, AI can also aid a variety of border security and homeland security applications. AI-driven perception, processing, and analysis is essential for gathering, sorting, and interpreting data to better inform human decision-making. There are several AI applications that superpowers (U.S. and China) use to increase homeland security, while one of the most important is border security.AI systems, can aid in monitoring borders through advances in automated surveillance and anomaly detection. Systems that monitor human emotional expression and behavior could aid in recognizing humans that appear nervous or are acting oddly, serving as a "sixth sense" at border crossings. AI systems used for game theory/risk assessment also could be valuable in determining where best to apply scarce resources and how to counter adaptive adversaries, such as drug traffickers. Indeed, such systems already are being used to improve security against poachers in Africa (Kumagai, 2018).

In the domain of **agriculture**, AI technologies such as machine learning, remote sensing, and data analytics improve productivity and efficiency at all stages of the value chain. This process enables small-holder farmers to increase their income through higher crop yields and greater price control, identify and precisely treat pests and diseases, monitor soil conditions and target fertilizer applications (Vasisht et al., 2017). For example, Microsoft is applying its Farm beats platform in developing countries by lowering the cost associated with densely deploying sensors, exploiting sparsely distributed sensors and aerial imagery to generate precision maps, and replacing expensive drones with smartphones attached to hand-carried, low-cost, tethered helium balloons (Jain *et al*., 2019; Kapetanovic *et al*., 2017.

Another important domain by which African countries could improve their stability and progress, is by using AI to improve **banking and financial services**. Digitization and innovation are two key factors in financial services providers' ability to grow (Kendall, Schiff, & Smadja, 2013). Financial institutions use AI tools to leverage analytics and data in order to create efficiencies, reduce costs, and improve customer experience. This technology will also enable them to automate their processes seamlessly to achieve improvements in frontline productivity and open new streams of revenue to remain competitive. Specifically, AI help improve financial institutions' risk management, credit allocation, and fraud detection capabilities, as well as increase their share of digital sales and transactions. Likewise, they should partner with FinTech startups for providing financial services (Okello *et al.*, 2018).

There is also initial evidence of using AI to enhance **medical services** in African countries. Specifically, mobile clinical decision support systems could widely improve healthcare provided in rural areas African countries. In a recently published study, Bellemo et al., (2019) used AI deep learning models in a population-based diabetic retinopathy screening programme in Zambia, a lower-middle-income country. Findings showed that AI systems have clinically acceptable performance in detecting referable diabetic retinopathy, vision-threatening diabetic retinopathy, and diabetic macular oedema in an under-resourced African population to reduce the incidence of preventable blindness. Other studies indicate that mobile clinical decision support systems AI-based could improve patient–provider relationships through increased trust and confidence, and that health workers believed the systems could improve their efficiency, competence, and self-confidence in their work (Adepoju *et al.*, 2017; Olajubu *et al.*, 2014).

These examples emphasise the role of AI in providing powerful solutions for developed countries in Africa in various domains. Hence, AI holds a major potential in narrowing large cultural gaps exist between them and industrial countries. The main mechanism that enable the fast penetration and implementation of AI tools in Africa is the deployment of cellular networks in many African countries. Hence, there is an increase in network coverage, also an explosive increase of cell phones user rates all over the world (Piette *et al.*, 2012). Mobile telephony has brought new possibilities to the continent. Across urban–rural and rich–poor divides, mobile phones connect individuals to individuals, information, markets, and services. In the last decade, mobile phones have greatly reduced communication costs thereby

allowing individuals and hereby allowing individuals and firms to send and to obtain information quickly on economic, social, and political topics (Jensen, 2010; Aker, 2010). As a response to increases in mobile phone coverage and adoption in Africa, mobile phone-based development projects have proliferated in a variety of sectors. Policy makers quickly understood the vast potential of the mobile phones among large proportions of the population in Africa. The main goal of each project differs significantly, but the underlying belief is that mobile phones can offer a useful platform for providing information and services. Specifically, the large coverage of mobile phone enable to implement AI tools applications such as civic surveillance to increase the ability of governments in Africa to control (Aker, & Mbiti, 2010).

4.CONCLUSIONS & ACKNOWLEDGMENT

AI is one of the most important technological development of the current era, which its potential is yet to be revealed. Using AI by nations has a tremendous and strategic consequences on military and diplomatic relations. Specifically, AI being incorporated into a wide array of security missions and diplomacy provides these nations a very significant tool in analysing data and achieving better decisionmaking processes, in a way that could give them a wide range of beneficial outcomes. As for African countries as third-world countries, AI could be an important opportunity to compensate their lack of resources. This paper reviewed some of the important directions by which African countries begun to use AI to improve social, financial, medical and security processes. These patterns are likely to increase in the coming decade, providing these countries significant resources to achieve some of the international power gained by industrial Western countries.

In order to this course of action to take place, African governments should promote technological development by encouraging innovation and investment. At the same time, as leading countries have shown, government engagement and experimentation with nascent technology can also be a powerful signal of trust and support local companies. According to African stakeholders, low government engagement, particularly at the policy level, has been a hindrance, and a stronger focus will encourage an early adoption of AI. Therefore, African governments should take a proactive approach and implement AI-friendly regulation, policies, and initiatives, specifically in two main domains. First, as for cybersecurity, African governments should adopt cybersecurity laws which guide for meaningful deterrence, clarify legal responsibilities, and create effective and reasonable enforcement mechanisms. In addition, authorities should assist individuals understand and properly manage the risks inherent in using AI technology. Second, in order to enhance the use in AI applications by users, it is necessary to increase trust in this technology by people. Hence, it is vital to establish a data privacy and security framework that individuals can trust encourages and empowers them to use AI-based solutions that require their data to work. Data privacy and security laws should aim to protect users' data without restricting the ability to move data across borders.

The implementation of these steps is not easy, but in order to unleash the power of AI for African countries, they are very important. Success will depend on the ability of governments to foster collaboration among all stakeholders — state and civil society, academia, industry, and national and international stakeholders. If these groups jointly embrace the challenges and opportunities of AI, Africa will reap the benefits of a vibrant AI ecosystem.

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