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# CHALLENGES HINDERING THE ATTAINMENT OF SMART CITIES

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The concept of smart cities has become a buzzword in most developing countries. Most professionals within developing countries are quick to adopt this idea in their every day discuss on developing the state of their nation, without actually considering what this concept means to the average individual on the streets. Even lesser consideration is given to the readiness of these developing nations in terms of adopting the concept of smart cities. It is based on this notion that this study, through the review of existing studies, assessed the readiness of cities in Nigeria in adopting the concepts needed for achieving smart cities. The study gives an insight on the challenges impeding the attainment of city smartness in the country. It was observed that solving the problems caused by rapid urbanization within cities is the first step towards making these cities "smart ready". Therefore, if cities in Nigeria are to attain city smartness, first looking inward and solving the endemic problems within these countries is necessary before adopting concepts of smart cities that have been mastered in developed countries. Although the submissions of this paper form part of a much larger ongoing study, it contributes to the body of knowledge as it brings to light the challenges that must be solved if cities in Nigeria are to ever become smart.

*Keywords*: Digital technology, ICT, Sustainable cities, Sustainability.

## 1 INTRODUCTION

Govender (2018) noted that cities by nature are businesses on their own due to their ability to generate income for the government through taxes. Considering this important nature of cities to human existence and socio-economic development, coupled with the continuous growth in population and rapid urbanization, the call for smart cities has become popular in recent times. This call is with a view to handle the impact of urbanization on; the environment, the lifestyle of people within the environment, and governance (Silva *et al.* 2018). Although the definition of a smart city is believed to be a complicated one, several descriptions have evolved for a city that is smart (Sikora-Fernandez 2018). The simplest descriptions are that smart cities are connected cities (Silva *et al.* 2018), smart cities are safe cities in terms of humans and cyberspace (Gceza 2018), and smart cities are data-driven cities (Govender 2018). Drawing from these simple descriptions, it can therefore be said that a smart city is a city that is interconnected through the use of information and communication technology (ICT), provide adequate measure of safety for its occupants in terms of their physical and information space, and uses the enormous data being generated within the city to make informed decisions that will better the lives of its citizens. On a more comprehensive view, Harrison *et al*. (2010) described smart cities as cities that have the

ability to connect the physical, social, business, information, and ICT infrastructure in a bid to increase the intelligence of the city.

A city is supposed to be advanced when compared to the rural areas. It is an environment that gives its dwellers a sense of belonging and some measure of fulfillment. Amer (2014) defined a city as a highly organized community. However, in some developing countries, particularly in Africa, most cities are far cry from what they should be. In fact, calling these places "cities" can be seen as a slur to areas with the true capabilities and characteristics of a city. Nigerian cities are no exception of this shortfall, with lack of necessary amenities characterizing major cities in the country. It is no gainsaying that rapid urbanization is one of the crucial issues in African cities in recent time. In fact, it is projected that by the year 2050, over half of Africa's population will be living in cities (Guneralp *et al.* 2017). Ogundare and Ogunbodede (2014) noted that in the case of Nigeria, there is a high rate of urbanization with a continuous rise in the population of the country. A major feature of the country's population is the increasing tendency for people to concentrate in cities, due to the city's ability to create settlement change and development for these individuals. This invariably puts severe pressure on available resources within these cities, with too many people depending on little infrastructure provisions. The resultant effect of this is poor and deteriorated infrastructures, poor living conditions, unhealthy environment, and the likes. According to Madikizela (2018) and Rees (2018), first solving these problems caused by rapid urbanization and making these cities "smart ready" is necessary, before trying to determine the route to take towards actually converting these existing cities into smart cities. It is based on this knowledge that this study through a review of literature assessed the challenges facing Nigerian cities in attaining city smartness with a view to proffering solutions that will increase the smart readiness of these cities.

## 2 OVERVIEWS OF SMART CITIES

Silva *et al.* (2018) described a smart city as one that applies the notion of the internet of things (IoT). In support, Kim *et al.* (2017) stated that IoT is one of the driving force behind smart city initiative all around the world as it provides the ability to monitor, manage and control devices, and to also create new information from a large sea of real-time data. In fact, it has been observed the smart cities adopt the use of ICT and IoT in city development, specifically in the aspect of government functionality, city operations, services deliveries, and intelligent analytics to optimize the services, production and usability (Kumar *et al.* 2018). It can, therefore, be seen that in describing what a smart city is, two aspects stand out, and they are the technological dimension and human dimension. The technological aspect deals with the networking of places using ICT deployment in every activity within a city in order to improve the standard of living within such city. However, it is clear that ICT alone will not give the desired improvement, hence the need for an enhancement in human capital and other forms of skill development among the citizens within the city (Kummitha and Crutzen 2017). Caragliu *et al.* (2011) also noted that the availability of ICT is not the only defining element of a smart city. The study went further to describe a smart city as one that invests in human and social capital and both traditional and modern communication infrastructure, and also allows for sustainable economic growth and high quality of life, through proper management of natural resources, and participatory governance.

## 3 CHALLENGES FACING CITY SMARTNESS IN NIGERIA

In 2016, the Governor of Lagos State signed a smart city deal with Dubai. The purpose of this deal was to transform Lagos, which is one of the major commercial cities in Nigeria, into a smart city – "the first in Africa". Unfortunately, aside mentioning of the signing of a memorandum of

understanding (MoU) to this effect, no significant information was given for the commencement of this mouth-watering project (Ekwealor 2016). In a similar vein, the government at the federal level proposed a partnership in smart cities initiative with Huawei, a technology company. This was with the intent of reshaping and managing the delivery of public service (IT News Africa 2017). Siba and Sow (2017) further noted that in June 2017, the Nigerian government announced that the "Nigerian Smart City Initiative", which was aimed at increasing the use of ICT innovations in the delivery of improved physical infrastructure and service delivery. The results of these initiatives till today are yet to be evident within major cities in the country, with the continuous deterioration of infrastructures and poor city life still being dominant features in most cities. This can be attributed to the inherent challenges being faced within the country acting as barriers to the proper implementation of smart city concepts in cities within the country.

One of such challenges is poverty. BBC News (2012) reported that poverty in Nigeria has risen with almost 100 million people surviving on less than a dollar per day. Okhiria and Obadeyi (2015) observed that despite the increase in economic growth, the citizens have remained significantly poor. In 2018, a report from the Brookings Institution showed that Nigeria is now the nation with the highest number of people living in extreme poverty. The country overtook India as home to the world's greatest concentration of extreme poverty (Vanguard 2018). George and Ukpong (2013) stated that the major causes of poverty include lack of employment, high level of dependent population and overpopulation. With this overpopulation comes increased pressure on the meagre available infrastructure needed for survival. This leads to all other negative happenings within the society. In fact, Muhammad (2012) described poverty as the "octopus dragging along multiple criminal and nefarious activities among young and old, male and female folks".

The place of education in societal development cannot be overemphasised. Kazeem and Ige (2010) described education as the mechanism that helps the society generate the necessary knowledge and skills needed for the society's survival and sustenance. Moreover, Amzat (2010) noted that improving education is a good start towards alleviating poverty within a nation. In Nigeria, the education system today is a far cry from what it used to be. A continuous degradation in the system is evident in the last two to three decades. Public institutions are now characterised with poor and decayed infrastructures, leaving students to learn in unconducive environment and graduating with half-baked knowledge. The present democratic era in the country has suffered several industrial actions by academic bodies in the higher institutions. These bodies' demands among others include the need for standard and up-to-date infrastructures in the higher institutions (Edukugho 2013). In a country where the poverty level is high and education system is poor, having a digitalised city is closed to impossible as Malabi (2018) has noted that education plays a vital role in achieving smart cities in developing countries.

As observed by George and Ukpong (2013), lack of employment also contributes greatly to the high poverty level in Nigeria. In 2016, unemployment rose by 65% within the country (Noko 2016). This problem has been linked with the country's low economic growth rate, the desire to acquire white collar jobs only, high movement of people into urban areas, rapid population growth, and poor education system (Adesina 2013). Another rising issue is that of terrorism which is a global phenomenon and a major threat to national and international security and stability. It is also described as a "criminal act, against civilians, committed with the intent to cause death or serious bodily injury, or taking of hostages, with the purpose to provoke a state of terror in the general public or in a group of persons or particular persons, or compel a government or an international organization to do or to abstain from doing any act". Across the country's six geopolitical zones of Nigeria, ethnic militias and other violent non-state actors have emerged with different motivations and strategies to challenge state authority (Mustapha 2009). This situation

is bound to scare away foreign investors that are ready to partner with the country in areas of infrastructural development and digital technologies needed for achieving city transformation. Issue of cybersecurity and digital safety is also a crucial issue that can be attributed to the adoption of technologies in a country like Nigeria where the cyber-crime rate is on the increase. Considering the importance of digital technologies and the internet in achieving of smart cities, the role of cyber insecurity in deterring the transformation of existing cities cannot be overlooked.

In addition, the epileptic power supply within the country is an issue that has been a reoccurring problem affecting digital technology adoptions (Oladapo 2007). This is coupled with the high cost, lack of access, and slow Internet connectivity in the country. In fact, Nigeria's Internet speed is so slow that Akamai (a global content delivery platform) ranked it as 114 out of 143 countries surveyed in May 2017 (Adepetun 2017). This is a major challenge for city transformation as a smart city has been described as a connected city (Friend 2018).

## 4 THE WAY FORWARD

The phrase "go digital or go home" is here to stay. Chambers (2017) noted that "the world will go digital: It will transform healthcare, enable people to live longer and be a huge disruption to society. Either you disrupt or you get left behind". Nigeria can no longer shy away from adopting current trends under the disguise of being a developing country. There is the need to adopt digital technologies in transforming of its cities and in providing better ways of living for its citizens. However, if this must be achieved, there is the need to first solve the inherent problems within the country that might serve as hindrances to the attainment of city transformation. No matter how laudable the proposed strategies for achieving smart cities within a country are, and the intent behind them, they are worthless if they are not contextualized. It is only by critically evaluating the problems within and solving them that the realization of smart ideas can be achieved (Madikizela 2018). This submission is further strengthened by the popular notion that "no two cities are alike" (Cowen 2017). Thus, understanding the problem peculiar to an area can help shape the solutions that will be attained, and only then can one think of bringing in smart notions to create a safe and happy city for its occupants.

Poverty alleviation programs are necessary for the adoption of new innovations. Through these programs, unemployment issues can be addressed. Similarly, more focus on the education is necessary. It has been observed that for smart cities to be achieved there must be cohesion, education, and utilization (Malabi 2018). It is only through proper education that the understanding in digital related practices and improvement on their utilization can be achieved. Through this improved education system, a reduction in crime rate can be attained as this will lead to acquiring of better jobs that will to a large extent reduce the rate of youths getting into criminal activities within cities and other areas of the country (Amzat 2010). There is the need for better partnering with countries and organizations that are excelling in combating issues surrounding cyber-crime. Increasing cybersecurity invulnerability will go a long way in increasing the chances of bringing the idea of the smart city into reality in the country. Increasing Government commitment towards delivering steady power supply is also crucial as this issue has been a reoccurring one within the country. Digital technologies needed to attain cities transformation require a steady power supply. In similar vein, creating strict sanctions on internet service providers is equally necessary as this is a major driver of the attainment of smart cities. These organizations with the support of the Government should be made to increase the quality of service delivery and by so doing create an enabling environment for cities transformation.

## 5 CONCLUSIONS

There is no shadow of doubt that cities in developing countries like Nigeria are in intolerable conditions. The need for a transformation of these cities into smart cities cannot be overemphasised. However, in order to conveniently attain this transformation, there is the need to evaluate the problems facing the country and proffer possible directions towards the attainment of a smart city in the country. Based on the review of existing literature, this study concludes that the challenges facing the transformation of Nigerian cities into smart cities are poverty, poor education, unemployment, terrorism which scares away foreign investors, cyber insecurity and poor digital information safety, poor power supply and poor internet connectivity. The study, therefore, recommends that the introduction of workable and realistic poverty alleviation programme to solve the issue of poverty and unemployment. Also, government and private investors need to place more focus on the education and intensify the fight again crimes both on and off the internet. Effort should also be made by the government to provide steady power supply and to create policies that will regulate the activities of internet service providers in ensuring better service delivery. It is believed that the submission of this study is a step towards achieving city readiness in the attainment of smart cities in Nigeria. However, the major limitation of the study is its dependence on existing literature. Hence, further studies hope to be conducted to harness empirical data within the study area to confirm the submissions of this study.

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