Cultural diversity -a challenge to smart cities development in Nigeria

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ABSTRACT

The standard of life of residents in urban areas could be enhanced by the transformation of cities and smartefforts.Information and communication technologies (ICTs), which must be integrated into functional sectors of society such as housing, health, education, energy, and transportation are some key drivers for this transition. Cultural diversity in Nigerian cities is among many hindrances to the use of ICTs to provide a good living standard for its citizens and visitors. However, culture has not been sufficientlydeliberated in issues of smart cities in developing countries, particularly Nigeria.This paper examinesthe diversity of culture as a challenge to smart city initiative, characteristics of culture,cultural challenges to ICT-driven development, and strategies to achieving culturally adaptable efficient smart cities in Nigeria. This study employs a literature review to explore concepts such as smart cities, culture, and ICTs to ascertain the challenges in Nigeria as a developing country with diverse cultures. Information was sourced from Elsevier,ScienceDirect, Google Scholar, MDPI, and ResearchGate databases. To assist researchers looking for related information for further investigation, the paper provides detailed information on recent articles on smart cities, culture, and ICTs. The findings provide invaluable insights for academics, policymakers, urban planners, and managers as well as advanced research frontiers.

KEYWORDS: Cultural Diversity, ICT, Nigeria, Smart City, Urban Development

I. INTRODUCTION

The unprecedented increase of the urban population has put considerable pressure on the infrastructure and service delivery of many metropolitan regions [1; 2]. This situation has created both opportunities and constraints for governments worldwide to experiment with new patterns for administering policy and delivering services to people via the use of technology. The shortfall extends beyond ensuring an adequate standard of living to ensure acceptable socio-economic development. The potential may be quantified if the public sector improves its efficiency and creativity in using ICT for service delivery to fight the migratory pressures that many cities worldwide are facing [3]. Urban areas are the hubs of human and economic activities, and with the potentials to generate synergies that will provide inhabitants with tremendous growth opportunities. Additionally, they generate a diverse range of challenges that may be difficult to handle when they grow in size and complexity as a consequence of the infiltration of persons from diverse ethnoreligious backgrounds and cultural imbalances. Also, socioeconomic differences are more pronounced in cities, and if not properly managed, their negative implications may exceed their positive effects. For that reason, cities must control their growth and enhance economic competitiveness while concurrently enhancing social interaction and cohesion, environmental sustainability, and overall quality of life.

According to [4], the global urban population increased from 13% in 1900 to 29% in 1950, 50% in 2005, and is projected to reach 60% by 2030. In a similar vein, [5] estimated that the trend is a reflection of the urban population's growth, which has increased from 220 million in 1900 to 732 million in 1950 and is expected to reach 4.9 billion by 2030 (annual rate of urban growth of 1.8%). According to the predictions above, urban areas will eventually house more than 60% of the world's population, with significant growth happening in Africa, Asia, and Latin America [6; 7; 8]. That is, rising urbanisation needs new tactics, policies, and technological innovations to address urban living's complexity, such as overcrowding, energy consumption, resource management, and environmental protection. As a consequence, as the world becomes more urbanised, cities with a high population density

must become more intelligent to offset the emerging urban management hazards. This alarming assumption poses a serious challenge to the conventional administration of urban centers and city lifestyles.

Therefore, using smart technology to solve the challenges inherent in megacities is long overdue. Technology is critical to these cities' functions in the new paradigm to make access to infrastructure and services efficient and effortless. While locating people and their activities close together is advantageous, it comes with a cost, particularly in Nigeria, where cultural segregation, ethnic and religious discrimination exist in the majority of metropolitan areas [9]. Through the use of technology, interconnectedness, and intelligence, the world has been liberalised to give superior service and make the most use of available resources. Unfortunately, Nigeria lags owing to want of technical ability, scarcity of infrastructure, underinvestment, and a public sector innovation deficit [10; 11]. The aforementioned shortage includes inadequate public project management tools, processes, and techniques, all of which are addressed by ICT intervention.

In addition, despite its enormous financial and human resources, Nigeria cannot boast of a smart city with modern infrastructure and public services, due to the uniqueness of cultural influences in the Nigerian regions, as well as ethnoreligious isolation and discrimination. As a result of religious and tribal sentiments, culture, as a way of life, has a significant influence on the growth and development of cities. Nigeria is a multiethnic and culturally diverse nation that has seen ethnic and cultural clashes [12; 13]. According to [14], although negative views of urbanisation problems are often stressed in Nigeria, the shortcomings of planning tools used to address them are often overlooked. Urban poverty, limited access to official land development, sprawl and slum settlements, and a lack of essential amenities all contribute to Nigeria's urbanisation challenge [15]. According to [15] and [16], these were the outcome of inadequate government policies and poor planning.

Furthermore, there are concerns about the lengthy process and high cost of obtaining planning approval, as well as the registration of property titles [17; 18]. As a result of the extensive process and high cost of obtaining planning permission, many people forego statutory approval, resulting in leap-frog growth cluttering many urban areas, building collapses, and exorbitant construction expenses [19]. On the other hand, [20] stated that although rules often exclude the majority of urban

stakeholders from planning processes, but the 1992 Urban and Regional Planning Law (URPL) nullifies the preceding verdict on planning process exemption. Official planning methods, to some extent, are devoid of Nigerian culture [1; 15], which is the bane of smart city development in developing countries such as Nigeria. The lives of individuals are closely related to cultural issues. As a consequence, if development is defined as a rise in the standard of living, development operations cannot afford to overlook the sphere of culture. [21],[22], and [23] established eight criteria for smart city initiatives: government, management, and organisation, technology, policy context, people and community, economics, physical infrastructure, as well asthe natural environment.

According to [24] and [25], information and communication technologies (ICTs) are critical drivers of smart city projects. Hence, integrating ICT into development activities, on the other hand, can transform the urban environment [26; 25]. They open up many opportunities and improve citizens' quality of life, but they also exacerbate disparities and create a digital divide [27]. Moreover, before integrating ICT, city managers should evaluate unique elements such as available resources, capability, and institutional readiness, as well as inequality, digital divide, and changing culture and habits [28], and also the urban fabrics. The diversity of people, their culture, religion, and anonymity are all features of metropolitan living that tarnish the social image of the Nigerian people and culture [29]. Despite the vital role of culture in human adaptation, social interaction, and economic activity, worries concerning the effects of culture on smart cities in developing countries, particularly Nigeria, have gotten less attention. As a consequence, this paper explores the challenges of cultural diversity to the smart cities initiative in Nigeria. To attain this purpose, the study examines the features of cultural diversity in Nigerian urban centers; addresses cultural adaptation barriers to ICT-driven city development; and proposes strategies for developing culturally efficient smart cities in Nigeria.

II. METHODS FOR COLLECTING AND ANALYSING THE LITERATURE

Numerous strategies were used to collect and assess the literature on this subject. Five databases were used to perform a thorough evaluation of the literature: Elsevier, ScienceDirect, Google Scholar, Academia, and MDPI. Between January 2017 and April 2020, the following keywords were used to conduct searches in the different databanks: ICTs, smart cities, cultural

diversity, and the rise of urban centers in Nigeria have all been fully investigated and analysed to provide a deeper understanding of their implications. Forty-nine (49) publications deemed relevant to this research were accessed and retrieved from the 92 articles discovered at the end of the search. The inquiry was undertaken to address the following concerns: What are the features of Nigerian cities' cultural diversity? What historical and cultural impediments exist for ICT-enabled urban development? How may Nigeria's smart city development ambitions be stymied by culture? What approaches are being used in Nigeria to construct culturally efficient smart cities? What are the good and bad repercussions of information and communication technologies on the Nigerian people and culture?

III. DISCUSSION OF THE LITERATURE REVIEWED

This section discusses the origins of the smart city concept; the interaction between smart cities and ICTs; the connection between cultural diversity and the rise of urban centers in Nigeria; and the linkage between culture and ICT adaptation.

The concept smart city

The concept of smart city has grown into a new paradigm in urbanism as a result of the usage of ICTs to enhancing urban adaptation and societal cohesion and has become one of the most often mentioned concepts in currentmunicipal government and governance [3; 30]. The concept developed as a consequence of critical connections between technological innovation, inventiveskills, the knowledge economy, environmental pressure, and political support from international organisations such as the United Nations (UN), the Organisation for Economic Cooperation and Development (OECD), and the European Union (EU) [31; 32; 33]. Consistent according to cultural beliefs, technology is perceived as weakening the roots of cultural varieties and habits and hence as interference to emphasising a technology-powered metropolis. This means that the dynamics of culture are employed to evaluate urban expansion.According to [34] and [35], the smart city paradigm is gradually establishing itself as a de-facto standard strategy for urban development in both established and developing economies. It could be considered as the use of technological solutions to improve the administration and efficiency of cities. Consequently, the citizens and communities that the smart city is intended to serve should be properly involved throughout the process to feel the impact on their quality of life and to become more informed, educated, and supportive [36].

The European Commission, for example, created the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) in 2012 [37]. According to [38], [39], [40], and [41], comparable initiatives have been established in China, such as the China Strategic Alliance of Smart City Industrial Technology Innovation (CSASCITI). Moreso, new digital technologies are being embedded in city and community infrastructures and services in the United States under the Federal Smart Cities and Communities Task Force (FSCCT). Similarly, in 2016, the Australian government established a national Smart Cities Plan (SCP) to equip Australian communities to participate in the digital economy [42].

Working Definition of Smart Cities:

A smart city is a concept of energy that outlines the advancementin urban activities. Although no globally recognised word exists, the following are plausibly viable definitions:

Author	Definition
[21]	A city that integrates physical, social, economic, and information technology infrastructure to impact its collective intelligence.
[43]	The use of smart computer technology to make urban infrastructure components and services more intelligent, interconnected, effective, and efficient, including administration, education, healthcare, public safety, real estate, transportation, and utilities.
[44]	A city that is well-balanced in terms of economics, people, government, mobility, environment, and housing, constructed on the intelligent combination of resources and activities of self-determining, self-sufficient, and conscientious inhabitants.
[45]	A city that integrates information technology with other organisational, design, and planning initiatives to dematerialise and accelerate administrative operations, and that contributes to the identification of novel, inventive solutions to city management complexity to promote

	sustainability and livability.
[33]	A smart city is a worldwide movement in urban policy that focuses on enhancing the quality of life for urban residents by utilising innovation and high technology to address the complex difficulties created by high population density.

As a result of the above, there are four characteristics of a smart city. To begin, it is defined by a high level of intellectual or human capital required to maintain ongoing innovation and confront threats. Second, smart cities strive for community cohesion which emphasises the benefits of culture in enhancing the quality of life and economic growth of city people. Third, smart city strategies emphasise the management of existing infrastructure, resource efficiency, and viable urban growth. Fourth, a smart city is undeniably powered by ICTs to respond spontaneously to urban life, resources, and development-promoting activities.

Smart cities and information and communication technologies

ICT is utilised to enhance the quality, performance, and interactivity of urban services, as well as to reduce costs and resource consumption and boost citizen-government interaction. Applications for smart cities are being developed to regulate urban drifts and to withstand real-time reactions. As a result, a smart city may be more equipped to adapt to crises than a city with a basic social compact with its residents. [46]and[47] reported that Nigeria has also eclipsed South Africa as a major investment destination with 55 active technological base hubs generating a total of US $94.9 million, compared to South Africa's US $60.0 million raised by 59 active start-ups. Additionally, Nigeria is Africa's largest technological market, accounting for 23% of Africa's internet users, with 122 million people online in December 2018 [48, 49]. Also, it has the highest telecommunications subscriber base with a teledensity of about 90% [50].

The rise of the technology industry creates new opportunities for employment and entrepreneurial development for the Nigerian urban population. For instance, according to a [51], technology corporations have started to serve the agricultural industry, employing more than 35% of the Nigerian labour force. Nigeria's agriculture industry is dominated by small-scale farmers who face significant hurdles. Essentially, technology facilitates market access, education, and financial services. As a result, technologically based enterprises such as Thrive Agric and Farmcrowdy are boosting sector development and employment while also enhancing Nigeria's food security.

According to [43] and [44], a city is considered to be smart when investments in human and social capital, conventional transportation, and contemporary (ICT) communication infrastructure contribute to sustainableeconomic development and good quality of life while also promoting cautious resource management via participatory governance. A smart city combines education and training, arts and culture, and commerce and business [52; 53]. A smart city is one in which conventional services and accessible infrastructure are made more adaptable, efficient, and sustainable through the use of information and communication technologies to the advantage of citizens [54; 55].

Nigeria's cultural diversityandthe smart city program

Culture, dating back to man's origin, is recognised as the foundation of knowledge for every group of humanity on the planet since each community's existence is based on its cultural values. Given this, scientific progress, which is also a characteristic of knowledge, cannot be divorced from human traditions; it either fosters socioeconomic and scientific progress or stifles cooperation between cultural values and scientific progress. [56]and[57] defined science as the art of producing, adapting, and communicating verifiable information for any nation's socio-economic progress. As a result, the growth of science cannot be divorced from the viewpoint of culture. As [58] stated, culture, which is identical to tradition, is the total of man's inventiveness manifested in his capacity to influence the natural world and organise his social life using institutions, norms, and values. Generally, each human organisation and settlement as well as the norms, rules, and values that define them, contribute to the management of their socioeconomic and political changes, creativity, and social interaction among ethnic groups, despite their varied views, behavioural patterns, inventive abilities, and scientific growth. According to [59], culture is a social process that encompasses a way of life; consequently, it can be deduced that a traditional system in every culture promotes survival, dominance, and control in terms of attitudes, ethics, knowledge, practices, values, beliefs, and rules.

Culture is what defines us as individuals and members of a certain civilisation. As

previously stated, this numinous definition of culture is a mirror of cultural activity, that is, how creative minds have interpreted and portrayed reality. Culture is gathered, experienced, and embedded in the genetic makeup of society by physical artefacts such as monuments and works of art and craft, but also through symbols, activities, public life and hospitality customs, festivals, rituals, and cuisine. The focus is mainly on the influence that cultural activities, as they are popularly understood, have on the socio-economic growth patterns of cities. [60]defined culture in two ways: first, as a physical product (tangible element) that exists at the intersection of production, consumption, and economic value; and second, as a tool for urban rebirth and place marketing, and as a process (intangible feature) that propels imaginative thought and creates unique social and economic patterns. Notably, social cohesiveness and order can only be maintained by population compromise [12]. Furthermore, although culture is constantly modified to new conditions to meet new beliefs, opportunities, crises, or threats, it is endlessly re-affirmed and redefined as a construct through the transferal process. Thus, the limit is on integrating multiple cultural identities through urban development.

Cultural variety is a massive and perplexing portent since nearly every civilisation is a cultural melting pot. [1]stated that Nigeria's population is diverse in a variety of dimensions. The nation is religiously varied, with African traditional beliefs, Muslims, Christians, and pockets of adherents of other religions all in the minority. According to [61] and [62], many Nigerian organisations benefit from diverse management viewpoints as a consequence of cultural diversity. Also, cultural diversity seems to be related to a range of political perspectives that result in a range of managerial styles [61; 1]. According to [63], another benefit of cultural variety in Nigerian is greater competitiveness. Globalisation and international interconnectedness according to [64] and [65], are also results of cultural variety that allows Nigerian organisations to benefit from international labour mobility. According to [66], ethnicity is a significant kind of identity in Nigeria, and Nigerians have the opportunity to provide a vast range of services due to their rich culture.

Several organisations across the country, for example, benefit from the different workforce due to the diverse backgrounds and skills of the individuals who contribute to widening the scope of provided services and products [66].The above argument might serve as a motivator to harness

cultural heterogeneity rather than a hindrance to technical growth, particularly for smart city efforts. In the same vein, [67] and [68] identified gender, ethnic origin, religion, age, class, and political affiliation as major social identities in contemporary Nigerian culture. These are dominant socio-cultural characteristics that prevail in diverse sections of Nigeria and have an undeniable influence on the administration of services, policies, and the nation's social, economic, and political stability. With ample evidence of these social identities' impact on Nigeria's social, economic, and political strata [69; 70], productive ingenuities centered on social identities have yet to be applied effectively.

Cultural and technological adaptation in Nigeria

Technological influence on society, which is fundamentally communication receivers and transmitters cannot be understated. The effect of ICT on the Nigerian people and culture is critical; so, the objective of this article is to establishthrough literature study, both the desirable and undesirable characteristics of ICT's impact on Nigerian people's values, customs, attitudes, habits, and general life. [71], [72], [73], and [74] illustrated how Nigerian society may develop, strengthen, and protect its cultural values while also ensuring that they are prominently represented in the global culture of smart city efforts. Sadly, rather than using technologies to rebrand Nigeria and Nigerians, they are seen as capable of orchestrating the extinction of cultural values. [71]and[72] stressed the need of focusing on how technology would help Nigeria achieve her economic goals and contribute to the global society in which her people live, rather than on how it might be used to undermine cultural values. Although ICTs may have a detrimental influence on the cultural diversity of Nigerians, they may also be beneficial in some ways. For instance, cable television networks allow any social group to record a picture of their civilisation and distribute it to others regardless of distance and time.

Historically, African cultures have placed a high premium on theological and metaphysical grounds [75] Nigeria is not excused, which makes establishing the scientific mentality essential for technological growth that makes smart cities incredibly difficult, if not impossible. As [76] noted, the basics underpinning the process of developing effective smart cities have not yet resulted in the development of tools to assist the players. As a consequence, from the planning process, smart city concepts should be identified and stated. On the other hand, owing to the absence

of a framework, the planning process in smart city activities is not well defined [77; 33]. [78]and[79] saw technology as cultural knowledge regarding the optimal use of environmental material resources to satisfy human desires and ambitions. Thus, the use of ICTs to enhance people's lives in cities reveals that technology is important to the development of a smart city [80; 52, 2020; 43], and its human-centered design raises important problems concerning culture. [12]and[73] questioned how Nigeria has handled its ethnic and cultural diversity to attain all-inclusive unity.

Nigeria's contemporary civilisation like other affluent cultures worldwide is being rapidly eroded by the great wind and rush of sociocultural globalisation. This is essentially the purpose of ICTs: to improve the quality of life of urban residents and to promote smart competitiveness in urban infrastructure. Human actions, environmental forces, biological and chemical agents, as well as information and communication technologies (ICTs) all risk the preservation of Nigeria's cultural heritage inherently[81; 82]. Notably, [3] says that the world is undergoing a historic shift away from traditional modes of service delivery toward an information and communication technology-driven paradigm in which governments are compelled to use technology to establish policies and provide public services.

IV. FINDINGS

It has been shown that information and communication technologies (ICTs) have a twofold end product on the Nigerian people and culture. There is a downside to indigenous cultures being overwhelmed by western civilisation's dominant cultures, which may result in the loss of some traditional values in Nigeria[71; 12; 73]. By contrast, it profits every sector of the city, including history and culture as tourist attractions. Ethno-religious hostilities have continued uninterrupted in Nigeria, owing to the country's elites being divided along religious and ethnic lines. Individual and community characteristics are significant because they have consequences on aspects of smart cities [21; 22; 23]. As [12] and [13] described, national integration in the Nigerian context has been a process of "unity in diversity," in which socio-cultural inequalities are wished away and homogeneity is imposed despite elusive cultural diversity. This choice has heightened tensions and created impediments to unity, peaceful coexistence, and sustained progress.

Thus, using ICT to power urban sectors and turn municipal areas into smart cities would reduce the physical contact and interaction that exacerbates existing challenges caused by culture, which hinder ICT projects in Nigerian cities. Making a city "smart" is gaining traction as a means of alleviating the problems brought by rapid urbanisation and population growth. According to peer-reviewed research, ICTs enable even the "smallest" organisation to be heard on a worldwide scale. The impact of ICT on the Nigerian people is complicated, having both positive and negative consequences. While these technologies have the potential to obliterate indigenous traditions, they also provide a platform for global groups and cultures to interact.

V. RECOMMENDATION AND CONCLUSION

Recommendations based on the findings would be instructive and open up new lines of inquiry and research for social, economic, technological, and environmental specialists as well as policymakers concerned with smart city development.

Nigeria should forsake outmoded and ineffective approaches to culture in favour of building new institutions and methods for peacefully resolving poverty, income distribution, and other national challenges using ICTs.

Reconciliation with subjectivity by adjusting foreign cultural values to contemporary realities and requirements to grow smart cities should be paramount in the national discourse.

Nigeria should reject traditional conventions and practices that might weaken her authority and cage her in the past, and instead, within the context of a new model draw strength from the backgrounds of her forefathers.

[21,[22] and [23] factors earlier identified should be utilised as a framework for assessing smart cities and their initiatives in terms of their range of influence.

African nations, notably Nigeria, a melting pot of heterogeneous cultures, should resist becoming too protective of indigenous cultural values that have made them lagged behind global trends in ICT-enabled smart development. There should be careful planning, design, and management of an ICT-oriented developmental strategy that pervades inter-relationships and knowledge interaction between culture and modern ways in a creative, productive, and skilful agenda. That couldpromote technological innovations, social and scientific integrationas well as associated benefits, realisablethrough the development and implementation of ICT-driven strategies.

The European Commission's EIP-SCC [37]; China's CSASCITI [38; 40; 41]; the United States' FSCCT program; and the Australian government's SCP created in 2016 [42] are all recommended for adoption to strengthen smart cities initiative by the Nigerian government.

VI. CONTRIBUTION TO THE ADVANCEMENT OF SCIENTIFIC KNOWLEDGE

i.   The research extracted from the reviewed literature reliable conceptual definition of culture-based ICT-oriented smart city;
ii.   identified the weaknesses and strengths of cultural variety practices for smart city growth; and
iii.   shed light on the capacities and restrictions of ICTs for Nigerian cultural inclinations and activities[47] to propel smart cities.

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