Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria

Abdullateef Iyanda BAKO, Nigeria; Olalekan Tolulope B. ADULOJU, Nigeria; Abdulfatai Olanrewaju ANOFI, Nigeria; Ufedo-Ojo Paul ADIKWU, Nigeria; and Emmanuel Oloruntoba, AINA, Nigeria.

ABSTRACT

The advent of Information and Communications Technology (ICT) has birthed a new normal for urban planners. These are reflected in the dual challenges of changing the concept of space and the technological capacity of cities under siege of global competition to meet the ever-changing technology climate. The study examined the manifest capability of ICT towards effective planning administration in Lagos State, Nigeria. A survey design was adopted with both primary and secondary data employed. Data instrumentation included questionnaires, direct observation as well as a review of literature such as journals, technical reports and monographs. A number of key findings include 66.7% of planning practitioners being well acquainted with the use of ICT in such major tasks as detailed layout design, survey charting and technical report preparation given with the observed adoption of technology in planning operations. Meanwhile, the continual need to upgrade the ICT system; poor budgetary allocation; poor return on investment (ROI) and personal abuse, among others, were major problems being encountered on the use of ICT in planning administration in Lagos State. Notwithstanding, there were reported efficacy perceived in planning operations where ICT were deployed. The study suggests full adoption of ICT in land administration and physical planning practice as we now live through uncertain times; as well as periodic training of practising town planners in addressing the lacuna in technological know-how.

Keywords: e-Governance, e-Planning**,** ICT, Land Administration, Planning Administration

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria

Abdullateef Iyanda BAKO, Nigeria; Olalekan Tolulope B. ADULOJU, Nigeria; Abdulfatai Olanrewaju ANOFI, Nigeria; Ufedo-Ojo Paul ADIKWU, Nigeria; and Emmanuel Oloruntoba, AINA, Nigeria.

1 INTRODUCTION

Technology has improved the everyday life of people around the world. Several businesses and public organisations have shifted to the use of modern technologies for their operations. Technology is believed to be changing the way urban systems and processes work, with the creation of immense opportunities for both effective and condition-sensitive urban management thereby contributing to sustainable development programmes (Brown, 2015). Specifically, the birth of ICT is seen as the turning point in the world's history with the creation of a global village where all activities surrounding both human and material resources are interconnected and utilised optimally for better outcomes (Mohammed *et al.*, 2017). The advent of ICT has immeasurably improved the lives of urban citizens, every day and everywhere and has even raised peoples' income. Hasler *et al.* (2017) asserted that it has also helped to make better-informed decisions. Land as the ultimate resource needs absolute and overarching coordination – both digital and analogue planning, for, without it, life on earth remains unsustainable. People relate to land in one way or the other. These relationships tend to get more organised as they evolve. By description, United Nations Economic Commission for Europe (UNECE) labelled the land administration system (LAS) as "the processes of recording and disseminating information about ownership, value, and use of land when implementing land management policies." According to Agunbiade *et al.* (2012), LAS is the processes and operations governments at all levels run, through both public and private ministries, departments and agencies (MDAs) to administer and manage land tenure, land value, land use and land development'. From the foregoing, it is crystal clear that ICT definitely has a role to play in effective land administration and by extension, land use planning which is synonymous with planning administration.

Many scholars have identified ICTs as a distinctive feature and driving force for improved urban development and planning agendas of the 21st century. These ICT-driven planning agenda bring about a better life and liveable cities. In addressing urban problems, ICT is now generally applicable to an array of urban sectors. These sectors include transportation, housing, waste management, sewage and stormwater management, power/energy, water etc. The imperative of ICT in planning is largely attributed to the fact that handling tasks in urban planning, development and management, sometimes, requires a complex interplay of interdisciplinary fields as well as profound and seamless technical data. However, there exists a twin challenge that is tied to the existence of ICT data and services. These twin challenge for ICT services are either unknown or not readily available to people who need them. Consequently, Lee *et al.* (2008) suggested that to essentially furnish urban administrators and

---

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   2

the citizenry with comprehensive information and services, various ICTs should be adopted in urban planning processes.

Notwithstanding, the introduction of ICT has posed dual challenges to urban planners and policymakers. The challenges, as identified by Huang (2012), are concepts of 'spaces of place' and 'spaces of flows or spaces of relation'. Hoang maintained further that understanding of places as 'spaces of place' considers places as "single, integrated, unitary, material objects". The latter concept (spaces of flow), did not only challenge the concept of 'spaces of place' but has completely replaced it. The second challenge expounded, in thoroughness, the technological capacity of a city intensely under siege of global competition. This has been interpreted as the ability and capability of governments at all levels to address, appraise, analyse and make a choice out of newly available technologies and ultimately, adopt, utilise, improve and develop such technologies to achieve the desirable planning goals.

For instance, the novel COVID-19 presented the global economy with a series of unprecedented challenges, most of which were evident in government administration. The emphatic social distancing protocol has mounted pressure on the administrative workforce, especially in government agencies. This, in turn, tested the technological capacities of different cities as they strove to keep the economy running using ICT resources as a coping mechanism and devising work-from-home policy with the aid of this technology. For instance, in most Nigerian cities, offices were shut down, agendas put on hold and these prompted the government to suggest organisations (public and private) adopt the work-from-home policy, where organisational tasks are carried out remotely with the aid of ICT solutions including teleconferencing. Collaborative work was also possible with electronic document management systems (EDMS); and workforce automation solutions, amongst other ICT solutions, became the order of the day. Debates are on-going on the causes, effects and solutions, with questions being asked whether we would be completely free from the impact of the COVID-19 pandemic or accept the new normal. It is evident that technological capacity in countries, particularly the developing countries, will continually be tested by global competition, or unforeseen events that will compel governments of these countries to develop and deploy ICT.

Coping with the aforementioned dual challenges and recently unanticipated new coronavirus (COVID-19), many cities in developed countries have been compelled to adopt new ICT initiative. Since the mid-1990s, the need to integrate ICT strategies into urban and regional planning operations and processes has been growing. This movement included Televillage (United States); Electronic Village Halls (United Kingdom); Telecities network (European Union); Technology Corridor (Singapore) and 'Kuala Lumpur and the Multimedia Super Corridor' (Malaysia) (Huang, 2012). Lagos, being the economic or commercial capital of Nigeria and the most popular in terms of technological advancement, has not been left out of this trend, as it is currently developing Eko Atlantic City which is a state-of-the-art smart city. Though these are quintessential ICT-driven urban planning strategies, there is an oversight of the endless possibilities of deploying ICT, especially in administration.

It has been duly noted that the world is under the influence of connected revolution and an industrial economy without ICT services would collapse. Technological capacity has become a safety net strategy in third world countries and this has subsequently earned them opportunities to link up with cities, and in turn, compete in the informational and global economy. To this end, the paper focuses on exploring avenue by which planning administration, and to some extent, land administration, can leverage ICT deployment for greater efficiency

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   3

and as a coping strategy driven by the lessons of COVID-19 pandemic with attendant pressure on technological capacity

2   CONCEPTUAL CLARIFICATIONS

2.1   E-governance as a Concept in Planning

The concept of e-Governance connotes more meaning than just deploying and launching the government's resources and information on the website. United Nations Administration Division for Public Economics and Public (2002) informed of a trend since the mid-1990s wherein governments globally embraced innovation which utilised the internet and other advanced computer technologies to improve their governing process. This has prompted a series of research on the extent of applicability of the concept of e-governance intending to understand the concept, its pros and cons. According to Abasilim & Edet (2015), e-Governance deals with the use of ICT by various government agencies to enhance accountability, create awareness and ensure transparency in managing government businesses. By definition, this study views e-Governance in line with that of the World Bank as the process of delivering government services and information to MDAs and the private sector through the use of technology. E-Governance is, therefore, seen as a political strategy through which government activities are showcased to the public (Abasilim & Edet, 2015).

The use of technology in government's operation, particularly web-based internet application, wide area networks and mobile computing, transforms relations with citizens, businesses, and other arms of government that have these technologies and can serve a variety of ends. As observed by Asia-Pacific Tele Community Standardization Program (ASTAP) (2012), these include better delivery of government services to citizens; improved interactions with business and industry; citizen empowerment and participation in democratic institutions through access to information, or more efficient urban governance. The core objectives of e-Governance are to improve government processes (e-Administration), connect citizens (e-citizens and e-services) and build external interactions (e-Society) which yield benefits such as less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions (Walker, 2002).

E-Government and e-Governance are two distinct terms defined differently. E-Governance is a broader concept that is more of a system (made of components) driven primarily by technology and information systems. As a whole spectrum, e-Governance is a system of networks and relationship within government powered by the application of ICTs. Conversely, e-Government is a narrower field and represents an institution that grants service delivery to citizens, businesses and other sectors of government through the use of ICT. For better understanding, e-Government activities are identified as adding 'e' to any particular government service. These services include e-Transport or e-Mobility, e-Health or e-Housing. In the truest sense, e-Governance is a broad and wide discipline that analyses and evaluates the effects of technologies on governments' administration, and the inter-connections that exist between the government workers and the larger society.

In a World Bank postulation modified by Walker (2002), e-Governance has four (4) cardinal delivery principles with delivery tracks such as Government-to-Citizen or

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   4

Government-to-Customer (G2C); Government-to-Business (G2B); Government-to-Government (G2G); and Government-to Employee (G2E). These delivery tracks are also known as the models/concepts of e-Governance, which explain the interactions and networking that exist between and among government, citizens, employees, business and Non-Governmental Organisations (NGOs), respectively (Abasilim & Edet, 2015). Despite the distinctions established between e-governance and e-government, both concepts share some degree of similarities. As their existence, effectiveness, accountability and transparent service delivery (from the government to the general public) is contingent on the application of ICT.

The attempted application of the concept of e-Governance in Nigeria has its root in the Nigerian National Information Technology (NNIT) policy was formulated and adopted in the year 2000 to make Nigeria an ICT-driven country. There were guidelines provided for deploying IT in wealth creation; poverty eradication, job creation; effective governance and agriculture. Individual states have initiated their ICT policies to align with the overall objectives of the NIIT. Lagos State established the Lagos State Government ICT policy in 2010.

The potential of e-Governance to invoke citizen participation is one of its emerging and distinctive properties that city planners and planning-related MDAs have recognised for sustainable deployment essentially during uncertain times (Conroy & Evans-Cowley, 2006). E-Planning, especially participatory e-Planning, is an important instrument of both e-Democracy and e-Governance which foster a sense of belonging on the part of the citizens using electronic gadgets and as the cornerstone. Therefore, e-Governance and digital methodologies need to be integrated for better and far-reaching public participation. Many nations however are taking advantage of the possibilities of e-Planning for more efficient deliverables and accessible information and services.

2.2   E-Planning Concept

Wallin & Horelli (2012 viewed e-Planning as the socio-cultural, ethical and political practice in which people take part online and offline in the overlapping phases of the urban planning and decision-making cycle. The concept is rather a confusing one with a somewhat ambiguous interpretation. An instinctive understanding of the term e-Planning often leads to the conclusion that there exist some morphological digital dimensions hidden in the "e" and that the internet probably has some kind of role to play too. Thus, this instinctive understanding of e-Planning has led to equivocation in definitions, which makes it difficult to communicate to planners about e-planning experiences and ideas. Larsen (2003) however, devised a model that simplifies the concept of e-planning as seen in figure 1.

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   5

Digital Plan - Digital Planning

Plan made through a planning process supported by digital aid, where analysis are carried out in the computer like the GIS and traffic models where debate and dialogue about the plan is supported by the internet eg. chatroom and e-mail, and where the plan is distributed via the internet e.g as an homepage

Analogue Plan - Digital Planning

Plan made through a planning process supported by digital aid, where analysis are carried out in the computer like the GIS and traffic models where debate and dialogue about the plan is supported by the internet eg. chatroom and e-mail, and where the plan is distributed traditionally as a printed document.

Digital   **Plan as a product**   **Plan as a product**   *Analogue*

Digital Plan - Analogue Planning

Plan made through a planning process not supported by digital aid, where analysis are carried out in the head/ manually and communication about the plan is done by traditional mail,meetings and telephone and where the plan is distributed via the internet e'g: as a scanned document (PDF)

Analogue Plan - Analogue Planning

Plan made through a planning process not supported by digital aid, where analysis are carried out in the head/ manually and communication about the plan is done by traditional mail,meetings and telephone and where the plan is distributed via the internet e'g: as a scanned document (PDF)
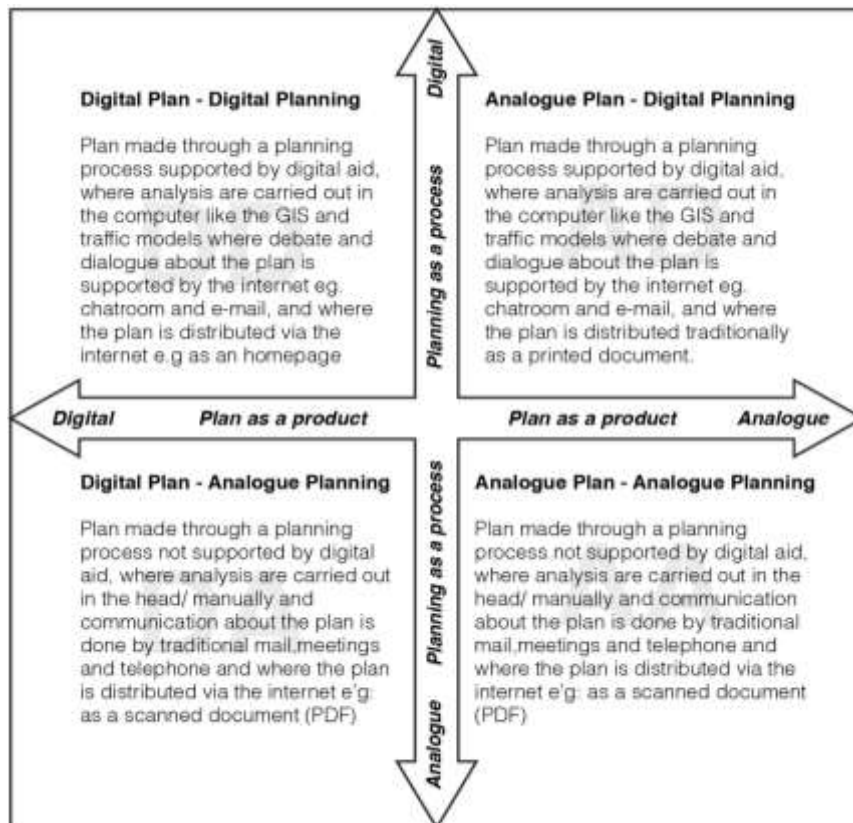
Figure 1: Larsen's E-planning Model (Larsen, 2003)

Relating this model to real-life application, the Lagos State government launched a portal for an e-planning permit. The submission of the required document for the processing of a development permit is done on the portal and approval is granted after a short period of processing. This aligns with the 'Analogue Plan - Digital Planning' as described by Larsen (2003). Although it is an impressive strategy for transparency, however, there exists a lacuna in the application of the e-planning concept. The concept as described by Larsen (2003) is an e-governance strategy that requires the adoption of comprehensive ICT solutions to ensure the improvement of physical planning as a product and a process.

According to The Seoul Institute on Urban Planning Information System, the Republic of Korea however, seems to have a more comprehensive application of the concept. Urban Planning Information System - an urban planning and administrative tool developed and used by city officials in Seoul (Korea Republic). The project was implemented in phases. The first phase of the project was aimed at alleviating the burden of simple but repetitive works of urban planning officials through computerisation. This included civil outreach and routine management that involved notifications, approvals and statistics, among others. All of Seoul's urban planning information, including urban planning decision letters and drawings, were computerised and disseminated across various institutions. The project also established a database using a geographic information system (GIS) maps and a system where urban planners can input information in real-time.

The second phase was implemented at the managerial level. It built a system for collecting information for the database and supporting policy decision-making. The system

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   6

allows abled officials to concentrate on high-quality tasks and spend less time on simple tasks. After establishing the Urban Planning Information System, the city government also created the Seoul Urban Planning Portal, a website that provides both rural and urban citizens with quick and accurate data on urban planning and related projects. From the foregoing, it is evident that there is already a paradigm shift from an analogue plan to a digital plan. This, however, can and must be instituted in Lagos land administration processes and operations, especially and essentially during this COVID-19 era that has repeatedly challenged the old ways of doing things and brought 'new normal'- changes brought about how we live our lives due to COVID-19 - to urban operations and processes. Larsen's concept is a comprehensive model for explaining e-planning, especially to an initiate. A deep understanding and application of this concept will bring about a monumental shift in the performance of planning administrative operations.

2.3   Perceived Recondite Roles of ICT during COVID-19 Emergency

Beyond the aspect of pandemic preparedness and response, the case of COVID-19 and its spread provides fascinating case studies of innovative applications of ICT. Technological tools were developed around the world to cope with the changes brought about by the pandemic not only in the health sector (Allam, 2020). The adoption of different technology solutions aimed at overcoming the challenges occasioned by the COVID-19 pandemic is promisingly and rapidly emerging. Without a doubt, ICT has played a significant role in the control of the pandemic and mitigation of its adverse impacts on the economy and civilisation.

A COVID-19 diagnostic kit was developed by a Korean biotech company using ICT, such as artificial intelligence (AI) and high-performing computing (The Government of the Republic of Korea, 2020). The use of ICT in flattening the COVID-19 curve became widely available and played an unprecedented role in eliminating uncertainties in the early stage of the viral spread. This was achievable as a result of the capabilities of AI to quickly learn, recognise, and analyse big data based on high-performance computing resources, enabling more accurate analysis and decision-making. Also, South Korea has implemented tools for "aggressive contact tracing, using security camera footage, facial recognition technology, bank card records and global positioning system (GPS) data from vehicles and mobile phones to provide real-time data and detailed timelines of people's travel" (The Government of the Republic of Korea, 2020). Similarly, tools such as migration maps, which use mobile phones, mobile payment applications and social media to collect real-time data on the precise location of people, allowed Chinese authorities to track the movement of people who had visited the areas of the outbreak (Whitelaw *et al*., 2020). ICT played a critical role in contact tracing, spatial distancing, diagnosis and rapid testing of possible carriers of the disease hence curbing the spread. By mustering resources at their disposal and deploying the latest technology A few countries have mitigated the effects of COVID-19 to a certain degree and profiled people at risk (Chaturvedi, 2020). With the advancement in technology, MDAs can now create epidemic situation map, locate and predict the actual and potential areas of infection and can isolate the infected people resulting in the containment of the disease. Based on the foregoing empirical studies, it shows that there is now a paradigm shift in the way emergencies can be dealt with, and ICT remains the cornerstone of this movement.

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   7

COVID-19 has made organisations, both public and private rethink their standard operating procedures (SOP), by harnessing and incorporating a variety of digital tools to continue with their businesses during lockdowns and spatial restrictions by enabling their workforce to adopt the *work-from-home principle*. The availability of a wide range of collaborating tools empowered organisations to establish effective and secure communication protocols within the teams and with their customers and partners. Resultantly, one can no longer discount or underscore the fact that there is a need to change the old ways of planning administration and adopt the 'new normal' wherein ICT becomes the nucleus for promoting collaborative work and workforce automation.

3 BRIEF REVIEW of LAGOS STATE GOVERNMENT (LASG) ICT POLICY

Lagos is fully committed to ICT Development and even tags it as the backbone of service delivery in most organisations. As a Government, Lagos State Government (LASG) puts forward an ICT policy to continuously align the acquisition and use of ICT resources with the State's strategy. The objectives of the policy are to establish guidelines and procedure for the acquisition, deployment, usage and retirement of ICT resources in Lagos State Government MDAs; establish standards for evaluating the effectiveness and efficiency of LASG ICT resource and assure the safety and security of ICT resources within the State government from both internal and external threats.

The policy made provision for MDAs within the state to acquire ICT equipment and knowledge by outlining the procedure for ICT infrastructure deployment, as well as the organisation responsible for the provision of this service - ABAT ICT centre. It also clearly outlines the roles of several units within the organisation and singles out the State's MDA's as very important clients. ABAT ICT centre is responsible for: monitoring and maintaining all MDA's ICT equipment such as LAN and WAN communication devices – Routers, Switches, Modems, etc; attending to all faulty ICT equipment – personal computers, printers, uninterrupted power supply devices – was another identified role of the organisation among others. The policy also made provision for ICT projects from the conception stage to the project execution and monitoring. This section of the policy documents states that ICT projects are temporary endeavours to create a unique ICT service or product to suit a particular working environment. This policy is proof that the framework for ICT development in the State's administrative sector has been established but the need to embrace it the more has also been established.

3.1 Land Use Administration and Planning in Lagos

Enemark (2009) described land administration systems to be concerned with the administration of land as a natural resource to ensure its sustainable use and development including social, legal, economic and technical framework within which land managers and administrators must operate. Best practice in land administration benefits both the present and future generation. It operates on the principle of equitable access to land by stakeholders within the policy framework of a country (Otubu, 2018). More so, it determines the degree to which government can offer the security of tenure, regulate land markets, implement land reform, protect the environment and levy land taxes to enhance the utility and value of the land. Furthermore, Otubu asserted that a good land administration system does not only guarantee ownership and

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   8

security of tenure; support land and property taxation; provide security for credit; develop and monitor land markets; reduce land disputes but also facilitate land reform; improve urban planning and infrastructure development and support environmental management.

Lagos state has set milestones to ensure good practice of land administration as the state embarked on reform in the Bureau of Lands in 2017. The process of land acquisition has been eased by adopting an ICT solution; the Electronic Document Management System (EDMS) which helped improve service delivery by making e-signature possible, allowing electronic submission and issuance of title documents. Since the commencement of this solution, the Governor has signed over 1,000 right of occupancy. However, the concept of land administration does not just end at ownership and registration of land. Land administration is an integral part of planning administration as the former ensures compliance to standards in owning and developing landed properties. Therefore, it is imperative to extend this reform across the entire process of planning administration to achieve transparency among administrative bodies performing inter-related functions.

The administrative structure of physical planning in Lagos State is such that involves input from different professions such as town planning, architecture, civil engineering, law, estate surveying and land surveying. Also, involved in planning administration is the Ministry of Physical Planning and Urban Development (MPP&UD), Ministry of Environment, Ministry of Housing, Ministry of Transportation and Bureau of Lands. Keener to this research is the MPP&UD which comprised of the planning authority in the state – the Lagos State Physical Planning Permit Authority (LASPPPA) which evolved from the old Development Control Department (DCD). This department is saddled with responsibilities related to physical planning in line with established Lagos State Urban and Regional Planning and Development Law 2010 and Lagos State Physical Planning Permit Regulations, 2019.

4 METHODOLOGY

The study adopted the survey research method in which 108 questionnaires were administered amongst the physical planning practitioners in planning institutions. Specifically, LASPPPA, Lagos State Building Control Agency (LASBCA) and planning consultancy firms across the state. Secondary data were obtained from existing research works, technical reports, laws and policy documents that are pertinent to planning administration and ICT in the study area.

The sample unit was selected purposively on the basis that the majority of physical planning activities occurs in the core areas of Lagos. On this note, 10 sample units (administrative district offices) located in Lagos Metropolis and 10 sample units (Private organisations) were considered. A total enumeration method was adopted in the administration of questionnaires. This was necessitated by employee sizes of the town planning firms. The sample size for this study for the private town planning consultancy firms was 58 and for public planning agencies, 60. The total sample is summed up to be (118) which is 100% the sample frame.

5 DISCUSSION Of FINDINGS

5.1 Demography of Respondents

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   9

Data collected from the survey revealed that 77% of the respondents were males while 23% were females. One can infer from the active observation that the majority of Town Planning practitioners are male which also reaffirms an assertion that physical planning organisations maintain a culture of male planners dominating the profession (Olufemi, 2008). Analysis of the age distribution of respondent revealed that 47.6% of the respondents were within the ages of 36-45, 36.9% of the respondents were within the ages of 26-35, 12.6% were within the ages of 45-60, and 1.9% fell within the ages of 18-25years and only 1% of the respondents were above 60 years. According to Fajana (2009), the workforce between the ages of 45 and below are known as "Generation Y". The majority in this group has grown amid sophisticated technologies and has been exposed to them earlier than the previous generation. One can infer, therefore, that majority of the workforce in the town planning organisations have better exposure to technologies.

54.4% of respondents had a first degree from the university, 31.1% had Higher National Diploma (HND) certificates, 9.7% had Master's degrees while 4.9% of the respondents had PhD. This denotes that all of the practitioners have obtained at least a first degree in the profession as prescribed by the Town Planners Registration Council of Nigeria (TOPREC) Act of 1988 (sections 7 and 9). Regarding professional experience, 57.3% of the respondents had 5-15 years of experience, 19.4% of the respondents had less than 5 years experience, 19.4% of the respondents had 16-25 years of experience, 2.9% of the respondents had 26-35 years experience and only 1% had above 35-year work experience. This implies that a larger number of workers in the agencies have a minimum of 5-year work experience and are conversant with the laws, regulations and procedures guiding planning administration processes and operations in Lagos State.

5.2 Level of Awareness and Use of ICT in Administrative Process

The extent of familiarity of respondents with ICT tools is presented as follows. 5.88% of respondents were not familiar with ICT, 27.45% were quite familiar, 42.16% were averagely familiar, 22.55% were well familiar and only 1.96% were very familiar. Table 1 further shows that 29.4% of the respondents had less than a year of training on the use of ICT, 31.37% had acquired training between 1-5 years, 16.67% of the respondents had received acquired training between 5-10 years, 10.78% had acquired training for more than 10 years and 11.77% of the respondents had no training whatsoever on the use of ICT. Explanation of the responses from cross-tabulation reveals that 4 respondents with less than a year of training claimed to be unfamiliar with the use of ICT and only 1 respondent out of the 12 respondents with no training was not familiar with the use of ICT (Table 1). Sixteen (16) respondents are averagely familiar with the use of ICT with acquired training ranging between 1-5 years while 6 of which had no training on the use of ICT. Finally, respondents who claimed to be very familiar with ICT, although small in number- 2 responses have acquired training between the duration of 1-5 years and 5-10 years respectively. As posited by Kennedy *et al.* (2008), *o*ne can infer from the data in table 1 that familiarity with the use of ICT is not determined by the duration of training acquired only.

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   10

Table 1: Cross-tabulation of Familiarity with ICT Tools and Duration of Training (Field Survey, 2019)

Extent of Familiarity	Duration					Total	Percent (%)
	less than 1 year	1 -5 years	5 - 10 years	more than 10 years	no training		
Not familiar	4	1	0	0	1	6	5.88
Quite familiar	14	7	4	1	2	28	27.45
Averagely familiar	7	16	8	6	6	43	42.16
Well familiar	5	7	4	4	3	23	22.55
Very familiar	0	1	1	0	0	2	1.96
Total	**30**	**32**	**17**	**11**	**12**	**102**	**100**
Total (%)	**29.41**	**31.37**	**16.67**	**10.78**	**11.77**	**100.0**	**100**

Source: Authors'Field Work, 2020

Data collected on the 'Level of Usage of ICT for Physical Planning Operations' reveals the different operations done in Town Planning Organisations vis-à-vis the level of use of ICT in executing these operations. Data collected from a frequency table was used to compute a scale to rank the level of use of ICT for the stated tasks. Each Likert scale variable was assigned a value ranging between 1 and 5 for Low (1), Below average (2), Average (3), Above average (4) and High (5). The variables were ranked using the sum of the weighted values (SWV) and summarized as the respondents' index.

Table 2 reveals that 'layout design' is the commonest task ICT is used to accomplish, 'survey charting' ranks second, 'technical report writing' ranks third, 'collaborative work between agencies' ranks fourth, 'spatial analysis' ranks fifth while 'surveillance/ monitoring' is the least task ICT was used for with an index number of 1.2. The role ICT plays in physical planning task accomplishments is, therefore, evident mostly in designing of layout among others and least in surveillance and monitoring of development. The further consolidates the fact that physical planning in Lagos and Nigeria as a whole has a long way to go crime mapping and control, violence prediction etc which are clearly under urban security, surveillance and monitoring.

Table 2: Ranking of Tasks Done with ICT (Field Survey, 2019)

Applications	L	BA	A	AA	H	SWV	Index	Rank
Detailed layout design	4	10	16	25	48	412	4.0	1ST
Survey charting	17	11	25	35	15	329	3.2	2ND
Technical Report writing	23	31	18	17	11	262	2.5	3RD
Collaborative work	47	35	16	4	0	181	1.8	4TH
Spatial Analysis	61	34	5	3	0	161	1.6	5TH
Surveillance/ monitoring	84	13	4	1	0	126	1.2	6TH

Source: Authors'Field Work, 2020

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   11

5.3   ICT Toolbox for Physical Planning Operations

The survey revealed that 36% of the samples used video-conferencing applications only, 22% of Computer-Aided Design (CAD) software, 36% of the Websites only. Furthermore, 10% of the respondents made use of video-conferencing and websites, 72% used CAD software, website and video conferencing while the remaining 18% made use of CAD software, GIS and video-conferencing. Inferences drawn from the data puts CAD software as the most used ICT tool. This also concords with the assertion that CAD software is the most used tools by town planners (Egila and Agbola, 2012).

5.4   Problems Associated with the Use of ICT in Planning Administration

A sum of weighted values was assigned to each variable. The severity of each perceived barrier is ranked from first to last which means the indices that ranked first represents the most severe problem associated with the use of ICT in physical planning practice within the study area. Table 3 shows that the continual need to upgrade computer systems ranked the highest barrier to the use of ICT, inadequate ICT tools for construction-related operations ranked second while the high cost of employing technical staff ranked third. This denotes that the rapidly changing nature of ICT and the development of more sophisticated ICT poses a threat to the use of ICT in physical planning operations. Table 3 also shows that the scarcity of professional software ranked fourth, poor software packages ranked fifth and poor returns on investment ranked sixth. This implies that there is a dearth of software packages for town planning operations and the ones that are available does not support all aspects of physical planning. Also, the cost of acquiring and operating ICT infrastructure supersedes the profit accrued overtime. The least problems associated with the use of ICT in the study area are; personal abuse, poor budgetary allocation and job size not requiring ICT.

Table 3: Ranking Table of Problems Associated with the Use of ICT (Field Survey, 2019)

Problems	SA	A	N	D	SD	SWV	Index	Rank
Continual need to Upgrade System	36	41	14	1	0	388	3.8	1st
Inadequate ICT content in construction	33	34	25	0	1	377	3.7	2nd
The high cost of employing technical staff	32	43	7	3	6	360	3.5	3rd
Poor Software Packages	8	58	21	1	5	342	3.3	5th
The scarcity of professional software	12	47	29	5	0	345	3.3	4th
Poor Return on Investment	14	11	42	23	3	289	2.81	6th
Job size and Inadequate fees for ICT	3	22	47	20	1	284	2.8	7th
Poor Budgetary Allocation	11	12	54	8	0	281	2.7	8th
Personal Abuse	9	10	34	33	5	228	2.2	9th

Source: Authors' Field Work, 2020

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   12

5.5 Efficacy of Physical Planning Service through the Use of ICT

Table 4 shows that reduced stress of working is the most perceived benefit of using ICT in town planning organisations followed by improved networking. Table 4 also shows that increased patronage and increased annual turnover ranked third and fourth respectively while improved public awareness and reduction in operation cost ranked fifth and sixth respectively. The least ranked outputs are better public participation and better office management which was ranked seventh and eighth respectively. This implies that the patent output that follows the application of ICT in planning administration is the reduction in stress of working with an index number of 3.4.

Table 4: Perceived output from using ICT (Field Survey, 2019)

Output	SA	A	N	D	SD	SWV	Index	Rank
Reduced stress of working	13	43	37	0	0	348	3.4	1st
improved networking	12	61	15	2	0	351	3.4	2nd
Increased patronage	16	36	37	4	0	343	3.3	3rd
Increased annual turnover	13	29	43	6	0	322	3.1	4th
Improved public awareness	14	16	54	9	0	314	3	5th
Reduced operation cost	11	12	44	26	0	287	2.8	6th
Better public participation	9	11	55	11	0	276	2.7	7th
Better office management	8	14	31	40	0	269	2.6	8th

Source: Authors' Field Work, 2020

6 CONCLUSION

This study examined the level of adoption of e-governance in planning administration in Lagos State. Results from this research reveal that the importance of ICT in any organisation cannot be overemphasized even if its application vary in sophistication; based on the organisations' goals, resources and policies. Overall, countries around the world, Nigeria inclusive has experienced the benefits of using ICT in planning administration, therefore, seek ways to develop the technology. It is safe to say at this juncture that ICT development is strongly tied to a nation's prosperity and continuous relevance on a global scale. The level of awareness of ICT-geared administrative operation largely supersedes its actual application. Workers/practitioners are very aware of the possibilities that ICT offers, essentially in work automation. Nonetheless, they lack the technical know-how. Furthermore, this study has shown that the advantages of ICT as a leeway to effective land administration far outstrips its shortcomings. This has been proved beyond any iota of doubts as to the recondite role of ICT during COVID-19 – which held almost all nations hostage – has now been fully appreciated especially by the developing countries and the need to adopt it fully in planning operations and processes has been self-justified. This study, however, recommends an intermittent training of town planners in practice to continually be in tune with modern ICT realities and further reduce

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   13

the lacunas in the use of ICT. Findings further show that the adoption of technology in Lagos State planning administration processes has provided opportunities for participatory governance, which hitherto has created new ways of communication between political representatives, citizens, non-governmental organisations and administrations. To that end, local services have now been made available online (e.g. planning applications). However, future research will assess fears of workers in the planning space tied with tensions involved in fully adopting ICT and the concerns that it might in future replace peoples' job.

7   REFERENCES

Abasilim, U. D., & Edet, L. I. (2015). E-Governance and Its Implementation Challenges in the Nigerian Public Service. *AUDA*, *7*(1), 30–42.

Agunbiade, M. E., Rajabifard, A., & Bennett, R. M. (2012). *Land Administration for Housing Production*. The University of Melbourne.

ASTAP. (2012). *E-Government Implementation in Asia-pacific Developing Countries and its Challenges and Obstacles* (Vol. 5).

Brown, A. (2015). *Topic Guide : Planning for Sustainable and Inclusive Cities in the Global South* (Issue March). Crown Publishers. https://doi.org/DOI:
    http://dx.doi.org/10.12774/eod_tg.march2015.browna

Chaturvedi, A. (2020, May 11). The China way: Use of technology to combat Covid-19. *The Sino Approach Use of Technology ton Combat COVID-19*.

Conroy, M. M., & Evans-Cowley, J. (2006). E-participation in Planning: Analysis of Cities Adopting Online Citizen Participation Tools. *Environment and Planning: Government and Policy, 24*(3), 371-384. doi:https://doi.org/10.1068%2Fc1k

Egila, M., & Agbola, B. (2012). *The Relevance and Application of Information and Communication Technology on Physical Planning Practice*. Available at: http://www.academia.edu/download/32807218/SSRN-id2244209.pdf Accessed January 8, 2019

Enemark, S. (2009). Land Administration Systems: - managing rights, restrictions and responsibilities in the land. *Map World Forum, Hyderabad, India*, 1–18.

Hasler, S., Chenal, J., & Soutter, M. (2017). Digital Tools as a Means to Foster Inclusive, Data-informed Urban Planning. *Civil Engineering and Architecture*, *5*(6), 230–239. https://doi.org/10.13189/cea.2017.050605

Huang, W. (2012). ICT-Oriented Urban Planning Strategies: A Case Study of Taipei City, Taiwan. *Journal of Urban Technology, 19*(3).

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   14

Kennedy, G. E., Judd, T. S., Churchward, A., Gray, K. and Krause, K. L (2008). First-Year Students' Experiences with Technology: are They Really Digital Natives? *Australasian Journal of Educational Technology 24*(1):108-122

Lagos State Government (2010), Lagos State Government Information Communication Technology Policy Volume 2 – Model Draft Policy Documents. August 2010

Larsen, T. K. (2003). *ICT in Urban Planning*. Available at: http://www.plan.auc.dk/-torben. Accessed October 19, 2019

Lee, S. H., Han, H., & Yigitcanlar, T. (2008). Towards ubiquitous city : Concept , planning , and experiences in the Republic of Korea. In T. Yigitcanlar, K. Velibeyoglu, & S. Baum (Eds.), *Knowledge-Based Urban Development : Planning and Applications in the Information Era* (pp. 148–169). IGI Global. https://doi.org/10.4018/978-1-59904-720-1.ch009

Mohammed, M, Haroun, H. G., & Sadiq, A. M. (2017). The Role of Information and Communication Technology (ICT) in Providing Job Opportunities for Youth in the Developing World. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *07*(02), 50–55. https://doi.org/10.9790/7388-0702025055

Ojo, P. A., Aworawo, F., & Elizabeth, I. T. (2014). Afe Babalola University: Journal of Sustainable Development Law and Policy. *Journal of Sustainable Development Law and Policy*, *3*(1), 132–148.

Olufemi, O. (2008). 'Experiential and Emotional Encounters of Women Planners in Africa', *Development in Practice* 18 (3): 412-419.

Otubu, A. (2018). The Land Use Act and Land Administration In 21st Century Nigeria: Need for Reforms. *Journal of Sustainable Development Law and Policy*, *9*, 80–108. https://doi.org/https://dx.doi.org/10.4314/jsdlp.v9i1.5 1

The Government of the Republic of Korea. (2020). *Flattening the Curve on COVID-19: The Korean Experiences*.

United Nations Administration Division for Public Economics and Public. (2002). *Benchmarking E-government : A Global Perspective*.

Walker, B. (2002). The Efficient Government Technology Trends and Marketing Strategies in E-government. *Texas Business Review*, 1–6.

Wallin, S., & Horelli, L. (2012). Playing with the Glocal through Participatory e-Planning. *Ci-journal*.

Whitelaw, S., Mamas, M. A., Topol, E., & Van Spall, H. G. (2020). Applications of Digital Technology in COVID-19 Pandemic Planning Response. *The Lancet Digital Health, 2*(8), 435 - 440. doi:https://doi.org/10.1016/S2589-7500(20)30142-4

8   ABOUT THE AUTHORS

Dr BAKO, Abdullateef Iyanda is an Associate Professor and the current Dean of the Faculty of Environmental Sciences, University of Ilorin, Ilorin, Nigeria. Also, he was at one time past Head of Department of Urban and Regional Planning and former Sub-Dean, Faculty of Environmental Sciences, University of Ilorin, Nigeria. He is a member of the Nigerian Institute of Town Planners (NITP) and a Registered Town Planner (RTP).

Email: alibbako@yahoo.com

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   15

ADULOJU, Olalekan Tolulope is a lecturer in the Department of Urban and Regional Planning, University of Ilorin, Ilorin, Nigeria. He holds a B.Tech and M.Tech degrees in Urban and Regional Planning and an aspiring PhD student. He is a Full Member of the Nigerian Institute of Town Planners (NITP), Member, Emergency Management Vanguard under (NEMA) and a Registered Town Planner (RTP).
Email: aduloju.otb@unilorin.edu.ng

ANOFI, Abdulfatai Olanrewaju is a lecturer in the Department of Urban and Regional Planning, University of Ilorin. He holds Bachelor's and Master's Degrees in Urban and Regional Planning from the University of Lagos. He is a full member of the Nigerian Institute of Town Planners (NITP) and a Registered Town Planner.
Email: hanophy2002@gmail.com

ADIKWU, Ufedo-Ojo Paul is a research assistant in the Department of Urban and Regional Planning, University of Ilorin. He holds Bachelor's Degree in Urban and Regional Planning from the University of Ilorin. He is a graduate member of the Nigerian Institute of Town Planners (NITP).
Email: ufelove@gmail.com

AINA, Emmanuel Oloruntoba is a lecturer in the Department of Architecture, University of Ilorin. He holds Bachelor's and Master's Degrees in Architecture from the Federal University of Technology, Akure. He is a full member of the Nigerian Institute of Architects (NIA) and Architect Registration Council of Nigeria (ARCON).
Email: aina.eo@unilorin.edu.ng

Leveraging Information and Communications Technology (ICT) for Effective Planning Administration in Lagos, Nigeria (11012)
Abdullateef Bako, Olalekan Aduloju, Abdulfatai Anofi, Ufedo-ojo Adikwu and Emmanuel Aina (Nigeria)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021   16