LUND UNIVERSITY

School of Economics and Management

Department of Informatics

The Causes of Digital Divide in Nigeria:

The Context of the Nigerian Law Reform Commission

Master thesis 15 HEC, course INFM10 in Information Systems

Authors:	Omolara Francisca Oluda
	Chimechefulam Glory Josephs
Supervisor:	Miranda Kajtazi
Grading Teachers:	Odd Steen
	Avijit Chowdhury

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AUTHORS: Omolara Francisca Oluda and Chimechefulam Glory Josephs

PUBLISHER: Department of Informatics, Lund School of Economics and Management, Lund University

PRESENTED: June, 2023

DOCUMENT TYPE: Master Thesis

FORMAL EXAMINER: Osama Mansour, Associate professor

NUMBER OF PAGES: 104

KEY WORDS: digital divide, Nigeria law reform, ICT device usage, digital literacy, digital technology.

ABSTRACT (MAX. 200 WORDS):
Digital divide is the gap between individuals who have access to and can use the internet and ICT devices and those who do not. In this thesis, factors such as income, education, positional categories, electrical power supply, digital literacy etc. are identified as contributors to the cause of digital divide in Nigeria. The quantitative research method was adopted in order to measure those variables identified as factors that contribute to the digital divide in Nigeria, the context of the Nigeria Law Reform Commission(NLRC). Survey questionnaire was used as a technique in collecting the empirical data. Out of two hundred and eight (208) employees that work in NLRC, we received empirical data from a sample population of 112 participants. We used six factors to test the hypotheses we formulated for this thesis: economic factor, human factor, technological factor, government factor, organizational factor supported the tested hypotheses while the geographical factor did not support the tested hypotheses as it opposes what was obtainable in literature.

Our findings reveal that Nigeria is predominantly at the first level of the digital divide and the factors mentioned above are the causes.

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Chapter 1

1.0 Introduction

Information and communication technology (ICT) is seen as a way of fostering development called ICT for development (ICT4D) in developing countries if channeled in the right direction (Avgerou, 2003; Avgerou, 2008; Venkatesh, Sykes, Rai & Setia, 2019; Ojo, 2020). According to Akpan (2003), ICTs encompass all types of technologies and infrastructure which include information processing systems, communication systems (the Internet, E-mail), telephony, fax, satellite communication, videotext, cellular phone, etc. Technological development can only be achieved by avoiding a biased mindset and by putting all the stakeholders involved in the technology development process into consideration (Undp, n.d). In order to achieve this, it is important to ensure that the various ICT artefacts designed (Chipidza & Leidner, 2019), and ICT4D projects carried out in various parts of the developing world are actually achieving the targeted and desired goals (Venkatesh, Sykes, Rai, & Setia, 2019; Masiero, 2022).

According to Heeks (2014), the first works linking ICTs to development were written between the 1960s and the mid-1980s. But in recent years, the term "development" has brought up so many contested issues (Chipidza & Leidner, 2019; Masiero, 2022). Also, the concept of "development" in ICT4D in the context of developing countries has been heavily criticized (Masiero, 2022). The notion that ICT as a force for development among disadvantaged people has been intensely debated (Masiero, 2022). This has resulted from the little impact that ICT4D projects have had on the society of developing countries which is not reducing the digital divide as expected (Chipidza & Leidner, 2019; Masiero, 2022).

The term "digital divide" is used to describe the inequality in access to and utilization of ICT (Fuchs & Horak, 2008; Riggins & Dewan, 2005; Russell & Steele, 2013; Van Dijk, 2017). According to the UN (2020), digital technology plays a major role in contributing to inequality, one of the major challenges facing the world. The Organization for Economic Co-operation and Development (OECD) in the 2001 publication, OECD (2001, p.5) defines digital divide as: "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access ICTs and to their use of the Internet for a wide variety of activities". The OECD goes further to emphasize that having access to basic ICT infrastructure is fundamental to addressing the issue of digital divide because it precedes, and is foremostly important than access to and using the internet (OECD, 2001). The internet and ICTs today have now become the core of our daily life, which includes our public, economic and social functions, and has consequently transformed the way we learn, live, communicate and access information (IRISS, 2020). But while it becomes intertwined with our everyday life, it is unequal and thereby, many persons or areas have become digitally excluded (Selwyn, 2004; Tewathia, Kamath & Ilavarasan, 2020). This exclusion affects their ability to participate effectively in society.

In a broad sense, digital exclusion refers to a scenario where a section of a given population is in a state of continuous lack of access and capacity to utilize ICTs which are essential for their participatory role in society (Schejter, Ben, Orit & Tirosh 2015; Warren, 2007; Kusuma, Muafi, AJI & Pamungkas, 2020). In contrast, digital inclusion talks about reaching out to communities or persons in certain marginalized areas (mostly sub-urban), in order to fix existing problems

with opportunity, access to, and skill with respect to digital technology usage, and internet usage in a meaningful way that improves their lives. Thereby helping them escape the 'shackles' of digital marginalization, a term used to describe the segregation that exists between those who have access to ICTs, and internet access and those who do not (Sin, Franz, Munteanu & Barbosa Neves, 2021). This marginalization could be due to geographical location (Reddick, 2000; OECD, 2020; Gladkova & Ragnedda, 2020). Also, in the design of ICT artefacts, with the aim of making a contribution to bridging the gap, results in designs which are complex and difficult to use, which has largely created digital-design marginalization resulting in digital divide that separates people of the developing world from the developed world (Sin, Franz, Munteanu, & Barbosa Neves, 2021) has also been debated.

Consequently, due to non- inclusive digital designs, many underrepresented users face barriers in accessing essential services that are moving increasingly, sometimes exclusively, online – services such as personal finance, healthcare, social connectivity, and shopping (Sin, Franz, Munteanu, & Barbosa Neves, 2021). Thus this further perpetuates the "digital divide," a technology-based form of social inequality that has offline consequences (Sin, Franz, Munteanu, & Barbosa Neves, 2021). However, the digital divide is one of the early-day ICT4D problems that caused the poorer countries of the world to exhibit relatively low levels of computer diffusion and communication connectivity (Avgerou & Walsham, 2000 cited in Masiero, 2022). Digital divide is still a problem of great concern in most parts of the developing world including the African continent of which Nigeria is one of them due to the fact that the majority of people in these various countries still don't have access to internet connectivity and other ICT tools (ITU, 2021 ; ITU, 2022). This corresponds to what Geach and ITU said that the recent global increase in the use of electronic communications has not included everyone (Geach, 2007; ITU, 2021; ITU, 2022). The vast majority of the world's population is still unable to gain access to digital technology, especially the Internet, as a result of the 'digital divide ' (Geach, 2007; ITU, 2021; ITU, 2022).

This is seen as creating a huge gap between disadvantaged people and the rest of the developed world (ITU, 2021; ITU, 2022). As this is confirmed in the research work of Avgerou and Masiero, the issue of digital divide raised concerns about economic growth and life-improvement opportunities that developing countries would miss out due to inequality in access to ICT tools (Avgerou, 2003; Masiero, 2022). If development is an important goal as claimed by some ICT4D researchers to achieve life improvement in developing countries through ICT, strategies and policies have to be developed in order to bridge the digital divide (Venkatesh, Sykes, Rai, & Setia, 2019 ; Aragba-Akpore, 2022 ; Okocha & Edafewotu, 2022 ; Begazo, Dutz & Blimpo, 2023). That will enable proper diffusion of ICT infrastructure and tools, and as well as ICTs being designed and developed with user friendliness in mind. This will increase the acceptance rate and consequently, reduce or eliminate the digital divide scourge. Unless these are addressed, digital divide will still continue to be a common occurrence for many years to come in the developing countries, especially in Africa, where the digital divide is well pronounced (Okunola, 2021; Okocha, & Edafewotu, 2022; Begazo, Dutz & Blimpo, 2023).

In this thesis, we set out to investigate the factors that cause the digital divide in Nigeria, particularly in the Nigerian workforce, in order to gain insight that will help us proffer recommendations/solutions to reduce or possibly bring digital divide to its bearest minimum in Nigeria.

1.1   Research Problem

Observations and research findings have shown that Digital divide is a major problem preventing the actualization of the ICT4D research agenda in most parts of the developing world (Russell & Steele, 2013; Okocha & Edafewotu, 2022) including Nigeria. Universal access to ICT results in a global community of interaction, commerce, and learning, leading to higher living standards and improved social welfare (Riggins, & Dewan, 2005; Okocha & Edafewotu, 2022). Digital divide has threatened this outcome, prompting many researchers and public policymakers to debate on the best way to bridge the gap (Riggins, & Dewan, 2005).

The gap caused by digital divide has been as a result of many factors, which include lack of access to resources due to inadequate Information Technology infrastructure (Begazo, Dutz & Blimpo, 2023;Okocha & Edafewotu, 2022). Also, lack of financial resources to acquire the hardware or software required to participate in the information age (Russell & Steele, 2013; Kusuma et al., 2020; Begazo, Dutz & Blimpo, 2023; Okocha & Edafewotu, 2022) and Management willingness (Organizational leaders) also contributed to it (Begazo, Dutz & Blimpo, 2023). These factors contribute to division and unequal access to digital technologies which is prevalent in developing countries in Africa (Russell & Steele, 2013; Begazo, Dutz & Blimpo, 2023). Developing countries are plagued with a lot of problems which makes digital divide evident and this affects not only the performance of the workers but a large demography of the population. Also, the issue of poor education among low-income earners and lower caste strata that are marginalized due to the fact that they neither have the skill nor resources to the access and use of ICT (Tewathia, Kamath & Ilavarasan, 2020; Okocha & Edafewotu, 2022) is also among the factor. This further widens the gap caused by the digital divide in developing countries.

Other causes of digital divide are: cost of digital devices, cost of deployment of digital infrastructures, Government policies, corruption, high cost of computers and other gadgets for deployment, level of literacy, level of income, willingness for adoption, cultural practices, political will, Power supply (ITU, 2022; Okunola, 2021; Okocha & Edafewotu, 2022; Begazo, Dutz & Blimpo, 2023) and geographical location (Okocha & Edafewotu, 2022; OECD, 2020; Gladkova & Ragnedda, 2020). These are also mostly common in the developing countries (Wilson, 2004; Kusuma, Muafi, AJI & Pamungkas, 2020; Avgerou, Hayes & La Rovere, 2016; Tewathia, Kamath & Ilavarasan, 2020; Okunola, Rowley and Johnson, 2017).

Even those who due to their financial capability are able to buy and are educated on the use of ICT gadgets still find the use of ICT equipment rather cumbersome (Russell & Steele, 2013; Chipidza & Leidner, 2019). Due to the fact that the user interface design is not user friendly enough, (Chipidza & Leidner, 2019; Sin, Franz, Munteanu, & Barbosa Neves, 2021), they opined that it may still require some further level of expertise (training) in order to engage in the use of ICT (Sin, Franz, Munteanu, & Barbosa Neves, 2021; Chipidza & Leidner, 2019; Russell & Steele, 2013). This further hampers the adoption and use of ICT (Sin, Franz, Munteanu, & Barbosa Neves, 2021; Chipidza & Leidner, 2019; Russell & Steele, 2013). Many research works on the digital divide have focused on the developing countries, and African continent in particular.

This research therefore will be focused on the Nigeria context, in order to identify the factors that cause digital divide in Nigeria.

1.2 Research Purpose

Many people are being disenfranchised from harnessing the benefits in the use and adoption of ICTs (Newell, 2011). This is due to the identifiable but solvable problems expressed in the statement of problems. It is important to acquire more understanding and insights on what contributes to the causes of these problems in order to make proper solutions that can reduce or possibly put an end to the digital divide in Nigeria.

This research work therefore sets out to perform an extensive investigation on the root causes of digital divide and identify probable solutions, improve and correct where necessary. The research seeks to situate the adoption and use of technology in the proper perspective, encourage the use of technology, proffer policy direction in infrastructures location and distribution, policy on technology early and safe adoption among the population, advocate for reduced cost in infrastructure and gadget sales, improvement in alternative energy and power sources and much more.

1.3 Research Question(s)

What factors cause digital divide in the context of Nigeria?

1.4 Research Delimitation

This research is limited only to the workforce at the Nigerian Law Reform Commission. We the researchers are not physically present to advocate for the response of the sample population, only those that respond in the time frame of this research are analyzed. Also, due to the time constraints, our research doesn't cover any other agency or geographical demographics in Nigeria.

Chapter 2

2.0 Related Work: The early to current perspectives

The earliest writings relating ICTs to development, according to Heeks (2014), were produced between the 1960s and the mid-1980s. Since the middle of the 1990s, there has been a considerable increase in research into the effects and adoption of technology in resource-poor communities and regions (Lahiri & Pal, 2009; Riggins & Dewan, 2005; Masiero, 2022). The beginning of ICT4D is connected to the diffusion of computers across countries (Avgerou, 2017) and to the early conferences in the field, such as the first International Federation for Information Processing (IFIP) Working Group 9.4 conference in New Delhi in 1988 (Walsham, 2017). During that time the research was focused on the social implication of computers in developing countries (Masiero, 2022). Thanks to the past researchers who have contributed immensely to the research on ICT4D and who have laid a solid foundation of knowledge from which we have captured in writing this thesis.

To mention a few among them, the research work of Walsham (2017) focuses on the review of other researchers who had contributed greatly to the ICT for development research. The author assessed the state of the ICT4D research community for over the period of thirty years that it has been in existence (Walsham, 2017). He stated that the ICTs are becoming more widespread and numerous academic disciplines are conducting research in the field (Walsham, 2017). Hence, he offered some reflections on the field's history, from the middle of the 1980s to 2017 (Walsham, 2017). Walsham and Sahay (2006) on their research work, assessed various research articles released from 2000 onward that dealt with the developing countries. In this research work, they reveal how other researchers like Avgerou (2003), Madon (2000) etcetera viewed and argued the position of ICTs in socio-economic development. Avgerou (2003) investigated the relation between ICT and socio-economic development in her research work and she challenged the idea of development.

Masiero (2022) eliminated the doubt about whether it still makes sense to carry out ICT4D research as she ascertained that ICT4D research can produce good support practices. In her research work, she investigated some research work between 1995 to 2017 to discover what was discussed about the early assumption of the ICT4D field in which ICTs were seen as a catalyst for development in developing countries (Masiero, 2022). She then compared with the arguments of recent researchers about their view on the ICT4D where it was perceived that development makes other developing countries dependent (Masiero, 2022). ICTs were seen as dangerous and deceitful and the word developing countries were seen as disenfranchising the poor people (Masiero, 2022). She emphasized the importance of renewed ICT4D research based on three reasons she drawn from the recent interdisciplinary research arguments, which include; ongoing reformulating of "development" in terms of justice, the potential of multitheoretical research approaches, and the turn to indigenous understandings of ICTs across disciplines (Masiero, 2022).

The word development, especially ICT for development would not have been so pronounced today, thanks to Harry Truman's speech in 1949 when the American president pleaded that they should commence a strong new programme for making the benefits of their scientific advances and industrial progress obtainable for the development and growth of underdeveloped regions (Esteva, 2018). Okocha and Edafewotu (2022) stated that whatever the reason may be, it is

undeniable that some countries are more developed than others in terms of their involvement in the international political system. Okocha and Edafewotu (2022) stated that development is often described as a process rather than a finished product. As a result of this, no country can currently assert that it has reached the apex of its growth process (Okocha & Edafewotu, 2022). Every country constantly strives to reach a higher, better, and more sustainable level of development at any given time (Angalapu, 2019 cited in Okocha & Edafewotu, 2022). Therefore, this is the reason why there are many researches coming up every time to investigatehow a nation or continent could be further developed than the current development position where it found itself.

As the knowledge from these different researches will help in proffering solutions to any problem that can prevent further development in a nation, continent or the world at large which most of it has been achieved through the help of digital technology. The knowledge acquired from these researchers stated above and many others have enlightened us to know how important ICT is to the growth and development of society and the importance of carrying all the stakeholder involved along in the process (Walsham, 2017; Undp, n.d). Many ICT for development research works have been on the developing countries and the emphasis has been frequently put on the less materially privileged elements of those societies (Walsham, 2017; Masiero, 2022). ICT for development can also be viewed as a component of a larger concern for global development (Walsham, 2017; Masiero, 2022). The constant organizational and ICT innovation occurring in the world's advanced economies, particularly in North America and Europe, as well as the growing socio-economic interconnectivity of all nations and regions resulting in a phenomenon called globalization have all influenced ICTD study (Avgerou, 2008).

As a result, it is a widely held belief in ICTD research that developing nations are at a disadvantage when it comes to ICT innovation in the context of where new technologies are developed (Avgerou, 2008). The idea of a "digital divide" emerged as a result, denoting a new kind of inequality (Avgerou, 2008; Okocha, & Edafewotu, 2022). ICTs are often seen as solutions for alleviating poverty, enhancing economic development as well as enfranchising the marginalized parts of the populace (Greenberg, 2005; Walsham & Sahay, 2006 ; Venkatesh et al., 2019 ; Venkatesh, Sykes & Zhang, 2020). It provides a great deal of potential value in all industries in the world at large in both public and private firms, and at many different levels, from urban software businesses to rural village health delivery (Walsham & Sahay, 2006 ; Avgerou, Hayes, & La Rovere, 2016). The fact that technologies have the potential to increase access to health and education services while also generating employment opportunities for underprivileged populations groups, among other things, has led governments and international aid organizations to view them as crucial tools for national development (Okocha, & Edafewotu, 2022).

There are several failures or partial failures in the deployment of ICTs to date and it is still a challenge to address these issues and find solutions (Walsham & Sahay, 2006 ; Venkatesh et al., 2019). Though, there is remarkable global adoption of mobile phones and the internet, and ICTs have also reached every corner of the world (Avgerou, Hayes, & La Rovere, 2016 ; Walsham, 2017). Additionally, ICTs like the Internet and mobile phone use have increased dramatically on the African continent during the past ten years (Ojo, 2020). But the assumption that ICT diffusion affects socio-economic conditions in developing countries has been questioned by some scholars of ICT and development (Avgerou, Hayes, & La Rovere, 2016 ; Masiero, 2022). The Global Connectivity Report 2022 emphasizes that the Internet's potential for social and economic progress is still largely unrealized because one-third of the world's

population still remain offline, and many users only have access to basic connectivity (ITU, 2022).

Thus, there has been fierce opposition to the idea that ICT is a force for development, in which disadvantaged people are not adversely affected (Masiero, 2022). This is because, in the majority of the time, development is either too slow, stalled, or going backwards (ITU, 2022). That is why ITU advised that it is important to intensify the efforts of making sure the internet covers every part of the world even though it is known that connectivity is not a miracle cure, it is a key enabler to achieve the SDGs targeted between the year 2020–2030 (ITU, 2022).

Avgerou, Hayes, and La Rovere (2016) emphasized that the fact that ICT diffusion is not always associated with socio-economic development in the developing countries, does not negate the truth that ICTs have potential to improve living conditions in those countries. Although, there are questions that have not been satisfactorily answered (Walsham, 2017; Masiero, 2022). One of such questions is to what extent has ICTs promoted growth, especially that of the comparatively underprivileged elements of society? And, how can the positive advantages of ICTs be spread throughout societies and lessen the negative effects of the rich-poor divide? (Walsham, 2017).

The reason for the above question is due to the fact that ICT equal accessibility for all people is still a major concern especially in developing nations (Avgerou, Hayes, & La Rovere, 2016). Therefore, answering these above questions correctly will be a plus to the ICT for development research community. As time goes on, with the increase in the number of researches in information systems that relate to ICT and its impact on the society, the above questions will receive positive answers.

In addition, there is no doubt that great, is what ICTs "will do" and "can do" for developing countries including Africa and its people, if they are implemented within national development planning agendas (Ojo, 2020). This is due to hype surrounding the leapfrogging power of ICTs in the national and international development agenda (Ojo, 2020). In order to make ICT have positive effects on the society, that is the reason why many initiative projects like telecenters or information kiosks are introduced to make people have access to information through the internet (Loh, 2015 cited in Ojo, 2020 ; Venkatesh et al., 2019 ; Venkatesh, Sykes & Zhang, 2020). These are seen as the solutions to the development and are becoming more globalized and stimulating the local economy" by development actors like civil society organizations, corporate entities, UN agencies, and a cross section of nation-states (Loh, 2015 cited in Ojo, 2020 ; Venkatesh et al., 2019 ; Venkatesh, Sykes & Zhang, 2020). Also, there are several studies with developing countries' focus that look at the digital divide and the function of international organizations in the development of ICT policies (Ojo, 2020). In spite of all these project initiatives, their effects have not really been showing in Africa due to the fact that Africa is plagued with the problem of digital divide (Russell & Steele, 2013).

Meanwhile, huge investments have been spent in all these initiatives so as to use ICT to achieve development particularly in developing nations (Avgerou, 2003; Venkatesh et al., 2019). But the initiative attempts have had a low success rate because they have not been usually addressed in a proper manner (Avgerou, 2003; Venkatesh et al., 2019) and it makes digital divide persist. According to Walsham and Sahay (2006), ITU (2022) and Papadopoulos and Cleveland (2023), addressing the "digital divide" between those who have access to the technologies and the capacity to use them effectively and those who do not is a serious concern in regard to ICTs.

The researchers and the policy makers have a great work to do to ensure there is a permanent solution to this problem.

The discussion above emphasised on the ICT4D research works that have been carried out which focused on how ICTs can be used to achieve development. It also revealed initiatives that had been introduced by the international organisation to ensure that the disadvantaged people of the world are involved and enjoy the benefit of ICTs so as to reduce the digital divide. There is still a huge digital divide in the African continent. There are many factors that contribute to this, many of which are stated in the research problem of this thesis work. In the next session, we'll be elaborating on what the digital divide is, and its effect on various countries of the world, in the African continent and especially, in Nigeria.

2.1   What is Digital Divide?

The term "digital divide" was first used in 1995 in newspapers in the United States. If we first examine the phrase "digital divide", the term "digital" already points to the fact that it is a technical issue, but actually it is more of a social problem. The technical attributes of ICTs are very vital for access and usage, and sometimes, they can be very complicated and at other times, they can be simple, but the causes and effects with regards to inequality are social (Van Djik, 2020). Primarily, the concept of digital divide is built on inequality. It now becomes a question of what kind of inequality - "inequality of what?" Does inequality refer to inequality of resources, capital, skills, opportunities, position, capabilities? The issue with digital divide is that it affects all aspects of life and human endeavor. The digital divide is a very complex phenomenon that is constantly changing. In the perspective of Van Dijk (2020), gaining access to ICT tools like computers, the internet, etc, begins with a motivation to use and right mental attitude towards using these tools. Afterwards, we talk about getting a certain type of computer and then internet access. Now this is not enough, as we need to know how to use these tools, therefore, people need to acquire digital skills in order to know how to use several kinds of applications that are relevant to them.

Up until 2010, having a computer and internet access, which refers to physical access, was the most important for everyone, and an objective of interest to both researchers and policy makers (Van Dijk, 2020). This was referred to as the first-level divide in academic research and by policy makers (Van Dijk, 2020). As time went on, policy makers and researchers developed the conviction that the need for gaining digital skills or literacy and usage was becoming a necessity in the discourse concerning digital inequality. This is called the second level digital divide (Van Dijk, 2020). Since 2015, out of the proceeds or benefits of the usage of computers and the internet, came the third level digital divide, of which the proceeds were both positive or negative, as in the case of cybercrimes, illegal hacking, hate speech, etc. (Van Dijk, 2020). A major perspective of the digital divide is the aspect of inequality in skills, which points to literacy (Van Dijk, 2020). But in terms of literacy, under the concept of digital divide, we are looking at digital literacy as against traditional literacy of reading and writing (Van Dijk & Van Deursen 2014; Van Deursen & Van Dijk, 2016 cited in Van Dijk, 2020).

But on the other hand, ICTs make information discovery simplified for instance, simply going to google search to get information, rather than going to a physical library to check through a catalogue. But ICT tools require new and special skills in order to know how to use a search

engine (Van Dijk, 2020). Research on the subject of digital divide has gained a lot of attention and benefits from theories that have been postulated to explain the unevenness or inequality that exists between individuals, households and regions or geographical locations, with regards to access to and usage of ICTs. One of several theories is Van Dijk's theory of digital technology access and Societal impacts. This theory was particularly developed to solve the digital divide. The main statement of this theory is that "particular personal and positional categories of individuals have more or less resources in following this four phases process and its outcomes or benefits, a process called appropriation of a technology" (Van Dijk, 2020). (See Figure 2.1).
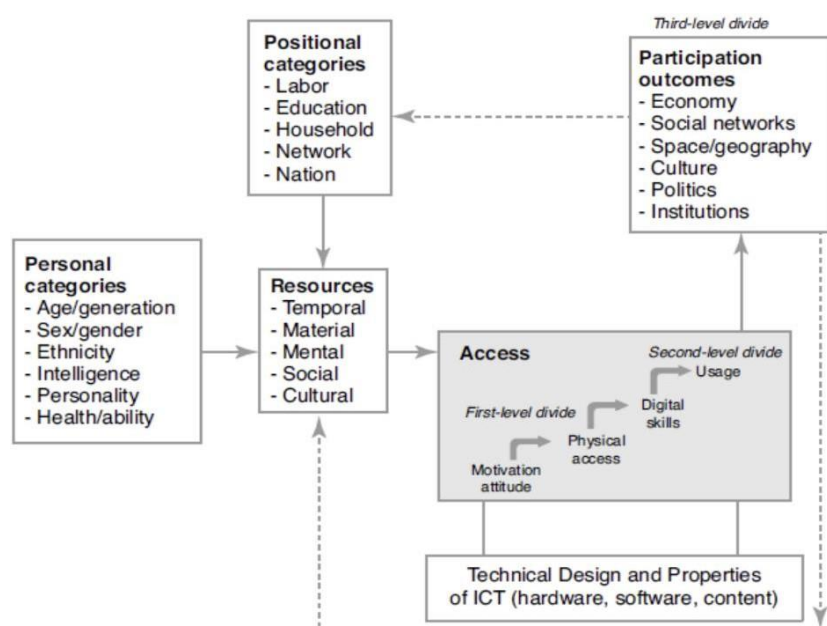
Figure 2. 1: A casual model of Resource and Appropriation model of the digital divide (Van Dijk, 2020).

This theory at its core, postulates that inequalities, with regards to personal position and background result in inequalities in resources for the individual, which in turn lead to inequalities of access and finally to disparities in participation by the individual in society. The individual (personal) participation then connects (modifies) to his positional characteristics again, forming a full feedback loop (James Pick & Avijit Sarkar, 2016). This feedback process goes on over a period of time and sometimes, the process is stepwise iteration, and at the same time, the individual experiences improvements at each cycle of iteration. In this theory, as shown in the diagram above, the steps of access rotate in a circular pattern of motivation for access, access to material hardware and software, gaining digital skills and having access to usage of ICT tools.

On a final note, once total access is achieved, with a high level of certainty with inequalities, this access leads invariably to social impacts, which translates to economic impact, cultural impact, political impact, impacts in institutions and via social networks and also geographical locations, (Van Dijk, Peters & Ebbers, 2008). Today, from figure 2.1, important factors used for explaining digital inequalities can be traced or checked using categories such as age, gender, labor, region, education, etc. These categories can be used to check unequal resources

connected to them such as material (income), mental (knowledge), social (position) and cultural capital (VanDijk, 2020). Twenty-five years ago, the digital divide, was said to have a "right side" (referring to those that have access, which are usually mostly young people, who are highly educated and are in the working class, largely males) and a "left side" (referring to those without access, who are of lower education levels, menial jobs or possibly unemployed, the elderly). Presently, some gaps are closing up (with regards to motivation and physical access), while the divide widens the more in the gaps of digital skills, usage and benefits. The gender gap in many countries has disappeared.

2.1.1 A Global perspective on Digital Divide

Our daily lives have been interwoven with the internet and ICT usage today, which includes our public, economic and social functions, and has consequently transformed the way we learn, live, communicate and access information (IRISS, 2020). But it comes with inequalities and as a result, many persons and areas have become digitally excluded (OIS, 2013). The international Telecommunications Union (ITU, 2021) points to the fact that an estimated 2.9 billion people globally still lie offline, which constitutes about 37 percent of the world's population. As much as global progress has been made towards expanding the use of ICTs, the digital divide that exists between the developed and underdeveloped countries remains wide (UN Press release, 2019). According to the ITU (2021), as of 2021, in Africa, only 33 percent of the population has access to the internet. This translates to 871 million people excluded from the benefits of the use of ICTs.

According to OECD (2020), there has been a significant increase in internet usage over the last decade by various countries. In 2019, among OECD countries, the proportion of adults that are able to access the internet ranges from 97% to less than 75%. (OECD, 2020). Those countries with higher connection rates, had made the internet a basic necessity for social inclusion, which is also affected by digital divide, hence cannot be ignored in the discourse of digital divide. This is because the quite recent ongoing discourse about the digital divide and its effects on people (Aissaoui, 2022) pointed to the existing premise that there are benefits to be gained from the use of internet access and also the negative consequences that follow when internet access is not present. In 2001, the OECD defined digital divide as "the gap between individuals, households, businesses, and geographic areas at different socioeconomic levels with regards to both their opportunities to access ICTs and to their use of the internet for a wide variety of activities'. This is why from the early definitions of "digital divide", there is no separation of concerns regarding ICTs and the internet. They are intertwined because of the shared effects they create in order to enhance human livelihood (OECD, 2020). The OECD further points out that the digital divide exposes differences that exists in different countries (OECD, 2020). They also pointed out that among the OECD countries and non-member countries, the ability of individuals and businesses to access and make use of the internet varied greatly among countries (OECD, 2020). According to (Aissaoui, 2022), the OECD definition of digital divide reveals the fact that digital divide has many facets to it (access, use and performance) and also, it has many dimensions to it also (global, regional and social). The OECD stressed that "Access to basic telecommunications infrastructures is fundamental to any consideration of the issue, as it precedes and is more widely available, than access to and use of the internet" (OECD, 2001).

In contemporary literature, several dimensions to the digital divide exist. We have existing divides between the developed and the developing countries; divided between regions and also divides between urban and rural areas. Recent literature has made a clear distinction between

three types of splits in the digital divide. They include access divide, use divide and performance or result divide (Gladkova & Ragnedda, 2020). In spite of the fact that the initial concept of the digital divide was related to access, the concept has since been improved upon and expanded to encapsulate more issues such as usage of technology, ICT/digital skills and individuals' engagement within the "digital realm" or digital economy (Bilozubenko, Yatchuk, Wolanin, Serediuk & Korneyev, 2020). This expanded concept also connects to the social dimension such as the stratification of people, resulting from their engagement and skills learnt from the usage of ICTs (Otioma, Madureira & Martinez, 2019).

With the backdrop of the rapid technological advancement, we see today, laid against the existing digital divide challenges experienced in certain parts of the world, one would naturally expect a diminishing growth in the divide or gap as new developments emerge. But the opposite is the case due to the high purchasing power that is associated with new and emerging technologies (Rodicio-García, Ríos-de-Deus, Mosquera-González & Abilleira, 2020). Also, technological adoption, and the resulting digital transformations are also unequal across countries and regions (Kupriyanova, Dronov & Gordova, 2019). Having gotten a good understanding of the social impacts of digital divide and also the rapid advancement of ICTs, the digital divide has been classified into three levels: 1.) the first-level digital divide or access divide, 2.) the second-level digital divide or skills divide, and 3.) the third-level digital divide or benefits divide (Ma, Chan, & Teh, 2020). Each of these digital divide levels is focused on the individual's role in interacting with technology in a certain way, which in turn determines what steps and strategy can be employed bridging the gap of concern (Hoyos Muñoz & Cardona Valencia, 2023).

In 2006, a very important theorist, Jan Van Dijk of the network society defined digital divide as "the gap between those who do and who do not have access to computers and internet" (Van Dijk, 2006, p. 178). Van Dijk and Hacker (2003) made an argument that in order to identifying what kind of digital divide exist in a certain scenario or sociocultural setting, there are types of barriers to access; namely:

- The lack of "mental access" refers to lack of elementary digital experience.
- The lack of "material access" refers to lack of possession of computers and network connections.
- The Lack of "skill access" which is the lack of digital skills.
- The Lack of "usage access" means the lack of meaningful usage opportunities.

The first level digital divide is further broken down into two types of access: physical access and material access. The physical access talks about the capability to access ICTs, especially the internet, via the required infrastructure, while the material access refers to various devices that enable people to access ICT services such as the smartphone, tablet, computers and subscriptions that are paramount to accessing ICT services (Van Deursen & Van Dijk, 2019). In the Netherlands, researchers try to study material access by first grinding an understanding of who is using specific materials. Typical devices that allow users to go online include, the desktop computers, laptops, smartphones, and tablets. Van Deursen and Van Dijk (2019) further mentioned other commonly used equipment that help to enhance the online experiences include the printer, scanner, hard drives, etc. Van Deursen and Van Dijk (2019), pointed out three aspects to focus on when studying material access, which include 1.) difference in device opportunities or use replacement of devices by other devices with different technical capabilities, 2.) differences in device diversity, and peripherals, 3.) differences in maintenance cost of services and peripherals.

In their research, Papadopoulos and Cleveland (2023), discovered that households in North America and Western Europe are forecast to own 13.4 percent and 9.4 percent respectively of all kinds of digital devices, as against their counterparts in Eastern and central Europe, Latin America and the Middle east and Africa, whose numbers fell into 4.0, 3.1 and 1.5 respectively (Cisco Annual report, 2020). But the case is different with developed regions, where almost everyone has internet access and one-half of the population are computer owners. Now, in developing countries, there is unlevelness in the availability of internet access; in some cases, access availability can be high, an example is Indonesia (79 percent) and computer ownership is at (30 percent). In African countries, computer ownership and internet access is less than 10 percent (Cisco Annual report, 2020).

Papadopoulos and Cleveland (2023), noted that regarding digital device ownership, the metrics relating to access and usage rates are so readily available, but much less attention is given to the device type, the type of internet access and how these devices are used. This makes this information difficult to measure, and this information is what actually forms the core of what "digital divide" is all about, especially in relation to culture (Papadopoulos & Cleveland, 2023). Van Deursen and Van Dijk (2019) further emphasizes that using ownership of mobile phones as a case point alone, which is quite high in most countries, is not enough to present the full picture of the digital divide. With this understanding, the metrics components are broken further down into more precise categories of type of devices used for access. Papadopoulos and Cleveland (2023) pointed out the distinction made so vividly by Taylor and Silver (2019) in their 2019 report, talking about the rapid growth of the smartphone.

Elaborating on the metrics which will make measurement of the digital divide possible, as noted by Papadopoulos and Cleveland (2023), the question is asked: "What is a mobile phone?", with the purpose of attending to what type of device is being used to access the internet and on to how it is used. In the world, by smartphone ownership, for advanced/developed regions or economies, South Korea ranked first at 95 percent and persons with "plain" mobile phones were about 5 percent. This also means that apparently, there's no one without a mobile device of some sort. The second in rank goes to the United States (U.S), with 81 percent, 13 percent and 6 percent respectively. Sweden, also in the top four, has the following numbers respectively: 86 percent, 12 percent and 2 percent. But in the developing countries/economies, like in Nigeria, some proportions are 39 percent, 44 percent and 17 percent respectively; for India, the figures are 24 percent, 40 percent and 35 percent respectively. This means that a third of the population has no mobile phone at all; it also indicates that only a quarter of the population have smartphones (Taylor & Silver, 2019). The recent report in Pew Research Center according to Wike, Silver, Fetterolf, Huang, Austin, Clancy and Gubbala (2022), shows that Smartphone ownership has increased considerably; as South Korean figures increased from 95 percent to 98 percent (1 percent plain mobile phones), the U.S grew from 81 percent to 85 percent (11 percent plain mobile phones), and in Sweden, from 86 percent to 90 percent (7 percent plain mobile phones).

Furthermore, the first-level divide is also observed from the perspective of technology acceptance. Van Deursen and Van Dijk (2019) in their definition, said that access to ICTs was an appropriation process that comprised four stages, namely: 1.) favorable attitude, 2.) Physical access, 3.) material access, and 4.) skills. In addition, the authors placed emphasis on the expediency of people's attitude towards technology because the perception of people affects their motivation to use ICTs. Other researchers have observed that negative attitudes like computer anxiety decrease the possibility that a person might access the internet (Dutton & Reisdorf, 2019; Reisdorf & Groselj, 2017). It is recognized that attitudes can affect or influence the internet usage using skills, activities and individual experience with technology (Van

Deursen, Van der Zeeuw, de Boer, Jansen, & Van Rompay, 2021). In a further study that explored the concept of internet attitude or usage, revealing greater insight into the usage of the internet for a specific purpose, for example, the internet of things (Hurwitz & Schmitt, 2020). In Sweden, according to a 2018 survey on ICT usage in households and by individuals, there are more online purchases for goods and services made by residents than previously recorded. For instance, online purchases of medicines have grown appreciably from 5 percent in 2014 to 20 percent in 2018 (Statistics Sweden, 2018). In addition, it is not uncommon for men to make online purchases for computer gadgets and other equipment than women, and also for the women to purchase clothes, articles and other feminine items than men (Statistics Sweden, 2018). A recent survey indicates a significant improvement in online engagement, even amongst the elderly (Statistica Sweden, 2022).

Van Dijk has also been able to prove successfully that the digital divide is closing in developed countries, but is still on the increase in the developing countries (Van Dijk, 2006). He says that with regards to skills access and usage access (from the third and the fourth mentioned in his earlier research (Van Dijk & Hacker, 2003), the digital divide is deepening and widening. He further argued that information skills (skills that enable someone to purposefully search, select, and process information from the computer and internet) and strategic skills (the ability to use these information sources to solve specific goals and for the general improvement of one's position) as forms of skill access are "extremely unevenly divided among the developed and developing countries (Van Dijk, 2006, p. 181). Van Dijk also found out, with regards to access to usage, persons with higher income and educational levels tend to utilize more technical software such as databases, spreadsheets and applications more than those with lower income and educational levels. (Van Dijk, 2006, p. 182; Van Deursen & Van Dijk, 2019).

Now, going beyond the inequalities in accessing the internet, there are inequalities in digital skills, that is skills to use ICTs to enable and enhance people's participation in the information society. This lack of adequate digital or ICT skills can also contribute to the existence of digital exclusion. Pearson, Ronda, Steven and Grainne (2018) arrived at a consensus with regards to the major barriers to increasing digital inclusion, namely: lack of infrastructure, low incomes and affordability, user capabilities (lack of basic and digital literacy) and incentives (such as lack of cultural and social acceptance of internet use, awareness and understanding of the internet, and available and attractive local content). Not having or low basic literacy and digital literacy requirements with access to the internet can pose a serious barrier to usage (Pearson, Ronda, Steven & Grainne, 2018). As the digital age continues to increase and expand, people who are not effectively making use of the internet will be left behind (ONS, 2019).

Technological change simply means that digital skills are an ever-increasing important component in the digital age if one must connect with fellow people, access information and services. It will help to meet the continuously changing and emerging demands of society and workplace. This points to say that even those who have access to the internet can also suffer digital exclusion because of the lack of the requisite digital skills with which to confidently and safely surf the digital ecosystem. According to the ONS (2019), in a UK survey, the number of adults who have never accessed the internet at all, or in the last three months (internet non-users) has been on the decline. From 2011 to 2018 there has been a steady decline, but as at 2018, there were still 10.0 percent of the adult population, that's 5.3 million with this state in the digital economy.

In Africa, the impact of digital divide is more pronounced due to many factors that have been discovered as contributing to its existence which are well elaborated in the next sections: 2.1.2 and 2.1.3 of this thesis.

2.1.2 Digital Divide in Africa

Technology is as ever changing as life is impactful. ITU Secretary-General Houlin Zhao stated that digital networks and technologies continue to empower and enrich the lives of billions of people worldwide (Aragba-Akpore, 2022). It is always expanding and transforming into new paradigms, daily creating new facts. As it is common with all innovations, exploiting the internet effectively, by itself, can be a form of innovation (Pradhan, Arvin, Nair, Hall & Bennett, 2021; Begazo, Dutz & Blimpo, 2023) depending on factors that affect innovation absorption (Banji & Adeya, 2004; Cariolle, 2021). Technology has really shaped the world positively and its effects can be seen in every aspect of lives all over the world. But the benefits derived from this technology varies depending on which continent part of the world an individual lives. As the evidence of this can be seen in the African continent that have gained less benefits from this technology due to many factors. As these have been revealed by many researchers.

According to Okunola (2021) and Nnamani (2022), the issue of poor infrastructures for connectivity is evident in the lack of affordable access to computers, Internet devices, and an internet connection. Although the world is connected in many ways, there is still much work to be done to include the remaining third of the world's population (Aragba-Akpore, 2022). That is why more studies have shown that there's a wide disparity in internet connection between countries, especially the African countries (ITU, 2021; ITU, 2022). There are many challenges facing the African continent which caused the countries to experience backwardness in terms of development, these led to many researches that have been carried out from the past till this present time. Due to unprecedented global challenges that are facing humanity all over the world, including the African countries, digital divide is one of these challenges (ITU, 2022). That is why the Sustainable Development Goals (SDGs), which form the basis of the 2030 Agenda for Sustainable Development, were adopted by the United Nations in 2015 (ITU, 2022) in order to put an end to all the challenges, especially in the poor countries like Africa.

Many African countries do not possess the basic infrastructure that can allow them to be connected, particularly ICT infrastructure, consisting of basic telephones, power supply and the personal computers (PCs) (ITU, 2022). In order to ensure that everyone in the African countries are connected to the internet, the five connectivity enablers have to be provided which include: Infrastructure, digital device, affordability, skills, and safety and security (ITU, 2022).There are a lot of efforts being made to put digital development at the top of the agenda of policymakers and the global development community (ITU, 2021). Policymakers had long held the belief that the digital divide issue will be resolved once a nation's Internet connection rate reaches saturation (Van Deursen & Van Dijk, 2019). Yet, researchers who have studied the second-level digital divide have found that even once physical access becomes universal, the gaps in Internet knowledge and usage still widen (Van Deursen & Van Dijk, 2019 ; ITU, 2021 ; ITU, 2021). This second level of digital divide is the inequality in digital skill or ability to use digital technology and the internet among those who do have access(Riggins, & Dewan, 2005 ; Ma, Chan & Teh, 2020 ; Sin et al., 2021). This digital divide has seriously affected countries, regions, groups, individuals especially in the African continent (Van Dijk, 2020 cited in Heeks, 2022, ITU, 2022). This makes them to be completely or largely excluded from the advantages of digital equality, hence, this has been the dominance lens for

understanding the relationship between digital and inequality (Van Dijk, 2020 cited in Heeks, 2022 ; ITU, 2022).

The fact that the spread of the Internet and other ICTs tools have improved globally can not be denied but more efforts still need to be made to ensure that all the people especially those from the low-income countries like Africa are totally included (ITU, 2022). In order to achieve this, the question we need to answer is whether the diffusion of the internet and ICT devices have really circulated in the African continent. Also if the people that have access to these devices have the knowledge and the skill required to use them effectively? The fact still remains that since the start of Covid-19 till now the cost of digital exclusion has significantly increased (ITU, 2022). Without doubt, ICTs, particularly mobile and Internet technologies, have the potential to serve as general-purpose technology in Africa's growth and development (Cardona et al., 2013; Cariolle, 2018 cited in Cariolle, 2021). This is due to the fact that the population of the African continent is increasing yearly. Sub-Saharan African nations are anticipated to continue expanding through the 21st century and make up more than half of the projected increase in the world's population through 2050 (Cariolle, 2018; ADBG, n.d; UN, 2022; Begazo, Dutz & Blimpo, 2023).

However, Nigeria is estimated to be among the countries in Sub-Saharan African countries that will experience a very large increase in population (UN, 2022). In addition, according to the report from African Development Bank Group (ADBG), Africa with a rapidly expanding population, rising urbanization, and what will soon be the largest labor force in the world, has the potential to develop into a major force in the world economy. The reason being that Africa's population is just over 1 billion people, with half of them under the age of 20 years and the continent is expanding quickly (ADBG). In a continent like Africa where the demographic profile is skewed towards youth, this means that the higher uptake among young people will be encouraging for connectivity (ITU, 2021). It also implies that as more members of the younger generation join the workforce, it will become more technologically advanced and connected later in life (ITU, 2021). Thus, this might enhance these African continent's chances for future development (ITU, 2021). Therefore, there is a huge expectation that the greatest economic and social transformations brought about by the adoption of digital technology may be found in this continent (Cariolle, 2018; Begazo, Dutz & Blimpo, 2023). This will happen if the internet and other ICT tools are widely diffused and can be accessed and used effectively by the individual irrespective of their financial and social status.

Poverty rate in the African continent is high (Begazo, Dutz & Blimpo, 2023). For the African countries to reduce poverty and promote shared prosperity, more and better jobs must be created for young people as the population grows (Begazo, Dutz & Blimpo, 2023). In order to achieve this, it is important to place digital technologies at the heart of a good-jobs strategy for the continent (Begazo, Dutz& Blimpo, 2023). The benefit of digital technologies to the development of society is growing and it will continue till ages. According to Kusuma et al., (2020), ICT is a crucial tool for addressing the digital phenomenon of today, where information flows and multiplies. Hence, ICTs and the Internet have played a crucial role in preserving continuity in business activity, employment, education (Kusuma et al., 2020; ITU, 2021), the provision of basic citizen services, entertainment, and socializing (ITU, 2021). Numerous innovations made possible by digital platforms and services have reduced the health, social, and economic costs of the tragedy and increased preparedness for future crises (ITU, 2021).

Also, it is evidenced that access to simple and more complex telecommunications functions is made easier for economic actors through mobile, internet and other ICT tools (Cariolle, 2021). Examples include receiving health follow-up or agricultural extension programs through text

messaging, exchanging digital content remotely over the internet, or facilitating various types of transfers with the government, citizens, or businesses through mobile money (Cariolle, 2021). These and many more benefits are what the African countries will enjoy if digital technologies are prioritized. With all these benefits, many users still face so many barriers that prevent them from having access to those services which sometimes can be as a result of the complexity of the design of digital systems through where services are being offered (Sin et al., 2021) among many other factors.

Notwithstanding, as stated earlier that the increase in African populations will bring a lot of advantage, this cannot be denied but it will also put more strain on resources (UN, 2022). This makes it more difficult to achieve the Sustainable Development Goals (SDGs) of which digital inclusion is one of them (UN, 2022) if efforts are not being made to provide for more resources. In sub-Saharan Africa, mobile phones have seriously spread and it is today representing the principal communication engine and the main platform for accessing the Internet (Cariolle, 2021). Also, the availability of mobile internet in Africa has increased recently, its internet infrastructure and the quality of its services still lag behind that of other continents (Begazo, Dutz & Blimpo, 2023). Additionally, inequalities in access to high-quality digital services continue to be a problem, particularly in remote areas of Africa causing digital divide (Begazo, Dutz & Blimpo, 2023). Because only the wealthy, urban, and highly educated have access to broadband in Sub-Saharan Africa (SSA) (World Bank, 2016, ITU, 2021).

According to the data from the ITU (2021), 96 percent of 2.9 people who are offline from the use of the internet are from the developing nations which include the Africa countries. In actuality, as at 2015, Internet penetration rates in African nations had not surpassed 55 percent of the population, with penetration rates as low as 5 percent in some nations like Niger, Sierra Leone, and Guinea-Bissau (ITU, 2019 cited in Cariolle, 2021). Also, around 30 percent of rural Africans are still without access to mobile broadband (ITU, 2021). For effective performance and involvement in online activities, mobile broadband (3G or above) is typically the only way and the primary way for people to access the internet in the majority of developing nations including the African continent (ITU, 2021). Although it is a condition for connectivity but this is not enough, there are still a number of other obstacles that potential users must overcome (ITU, 2021). Most people rely on mobile broadband to enable them to have the internet connection because fixed broadband is extremely expensive in the African continent (ITU, 2022).

Despite the rise in this use of mobile broadband, there a 21 percent increase in 4G coverage since 2020(ITU, 2021). Globally, there is still a sizable coverage gap in Africa, where 18 percent of the population lacks access to a mobile broadband network with 11 percent of the rural populationin only has 2G coverage, and 18 percent of the rural population has no mobile network coverage at all (ITU, 2021). As at the end of 2021, only 22 percent of Sub-Saharan Africans actually used 3G or 4G mobile internet services despite the fact that 84 percent of the population there lives in areas with access to these services, the lowest usage rate ever recorded (Begazo, Dutz & Blimpo, 2023). This shows that there are a lot of hidden factors causing a larger percentage of the population from using the internet, this needs to be investigated. As a result of these hidden problems, the anticipated benefits of digitization in the continent, particularly the diffusion of Internet technologies, take longer to manifest and reach the entire population (WorldBank, 2016 cited in Cariolle, 2021; ITU, 2022). To make digital technologies a lever for growth, productivity, and job creation in the continent, it is crucial to identify key factors influencing ICTs and Internet adoption (Cariolle, 2021).

Getting everyone online won't be enough to close the digital divide (ITU, 2021, ITU, 2022). Even if someone has access to the internet, their capacity to use it depends on their independence in using it, their technological proficiency, and their access to social support (Sin et al., 2021). However, the digital divide is increasingly being defined by people's capacity to utilize connectivity meaningfully as digital platforms and services become more advanced (Van Deursen & Van Dijk, 2019; ITU, 2021; Papadopoulos & Cleveland, 2023). This capacity in turn is influenced by a variety of elements, one of which is affordability (ITU, 2021; ITU, 2022). In order to combat this problem, the Broadband Commission for Sustainable Development of the United Nations set a goal for 2025 to ensure that the cost of entry broadband services is less than 2 percent of monthly gross national income per person (ITU, 2021; Nnamani, 2022; Aragba-Akpore, 2022). This goal has not been reached in almost half of the countries' economies including the African continent (ITU, 2021). This is due to the fact that a lot of people cannot still afford internet broadband in the African continent due to the low income (ITU, 2021). 40 percent of people live in extreme poverty in Africa, and even the most basic mobile data plans are costly (ITU, 2022), as high as up to one-third of their monthly income (Begazo, Dutz & Blimpo, 2023).

The reflection of this fact is shown in the low broadband subscription rate of 6.7 per 100 inhabitants in the African continent in the year 2021 which drastically went down after three years the continent experienced high growth in subscription (ITU, 2021). Imagine, one GB (1 GigaByte) of internet can cost as much as 8 dollars in Gabon and 2.78 dollars in Nigeria, compared to 0.26 dollars in India and 0.51 dollars in Ukraine (Nnamani, 2022). The problem of high internet prices seems to be a trend in Africa (Nnamani, 2022). It cannot be denied that the cost of the internet has increased globally, but Africans seem to be suffering more because they must wait longer for internet connections due to bad quality, which by international standards, are typically poor (ITU, 2022; Nnamani, 2022). For the cheapest fixed broadband internet package, people must work an average of two weeks in some nations in Africa, including Cote d'Ivoire and Uganda (Nnamani, 2022). Given that internet use is a secondary need for the majority of Africans, this trend may help explain why the continent has a low internet penetration rate and the digital divide persists (Nnamani, 2022).

Other crucial factors are socio-economic status, gender, age, and education (Avgerou, Hayes, & La Rovere, 2016; ITU, 2021; ITU, 2022) as well as digital literacy. They prevent many people from using the internet and impairs their ability to make the most of their digital devices and services (ITU, 2021). People with low levels of digital literacy are also more vulnerable to risks associated with the "dark side" of connectivity, such as scams, fake news, and harmful content (ITU, 2021). Then, gender parity is another problem associated with ICT devices internet access (ITU, 2021). The percentage of men who used the Internet worldwide in 2020 was 62 percent, compared to 57 percent for women (ITU, 2021). Thus, the gender parity score is calculated as the female percentage divided by the male percentage, and is between 0.98 and 1.02. Gender parity is considered to have been achieved in the developed world but in Africa it has not been achieved because the parity score is still between 24 percent versus 35 percent (ITU, 2021). This shows that women continue to remain digitally marginalized in many of the world's poorest nations especially in Africa (ITU, 2021).

Also, a generational divide in other words Age divide contributes as well to digital exclusion; 71 percent of people in the world between the ages of 15 and 24 use the Internet, compared to 57 percent of people in all other age groups in the year 2020 (ITU, 2022). Thus, young people were 1.24 times more likely to connect than the general population on a global scale (ITU,

2022). In the African continent, young people are 1.47 times more likely to be connected to the internet (ITU, 2022).

As it has been said earlier in this thesis that digital technologies (DTs) have become a crucial component of a strategy for African nations, for creating good jobs (Begazo, Dutz & Blimpo, 2023). This will definitely reduce the poverty rate (UN, 2020; ITU, 2022; Begazo, Dutz & Blimpo, 2023) and also improve socio economic development. But there is no way this can be achieved if ICT tools and the internet connectivity is not made, available, accessible and usable to individuals in every nook and cranny of the continents. The main challenge facing Africa is its inefficient and effective use of digital technologies. Businesses and households must both need education (Kusuma, Muafi, AJI & Pamungkas, 2020) financial resources (Kusuma et al., 2020; Begazo, Dutz & Blimpo, 2023) and the infrastructures and the willingness to use these technologies effectively (Begazo, Dutz & Blimpo, 2023).

2.1.3 Digital Divide in Nigeria

Nigeria, being one of the countries in the African continent, still has a long way to go in making the country experience full development through ICT by mitigating against the digital divide as many people still don't have access to the internet and other ICT tools in this present time, as this are being caused by earlier stated factors in this thesis. The country has three regions, namely the eastern region, the northern region, and the western region and there are other ethnic groups within each of them, but the major are: the Igbo, Hausa-Fulani, and Yoruba (Ota, Ecoma & Wambu, 2020). Over 200 different ethnic groups, each with its own language and culture, make up Nigeria. Although this diversity is a crucial aspect of the nation, it also makes closing the digital divide difficult (Ridwanullah, 2023). For instance in some cultures in Nigeria, there's a belief in early marriage for the girl child, and this has put many girls' education into a stop. It therefore leads to increased lack of education for the female child, which further contributes to the digital divide in Nigeria.

According to the World Population Review (2023), the population of Nigeria is 222,266,136. Nigeria is Africa's most populous country, it is predicted according to the United Nation that Nigeria will be around 401.31 million by the end of 2050 (World Population Review, 2023). Nigeria is not only well-known for being the most populous country in Africa with a sizable landmass; it is also a classic example of underdevelopment brought on by, among other things, a lack of leadership, and bloody wars (Onyishi & Ezechi, 2019; Abegen & Nambeh, 2019; Eteng, 2016 cited in Okocha & Edafewotu, 2022). The United States Census Bureau, predicted that the Nigerian population will surpass that of the United States in 2047 when it reaches 379.25 million, it will overtake China as the third-most populous nation in the world (Population Review, 2023). There is a huge opportunity attached to the Nigeria population if ICT devices and the internet can be made accessible and usable by everyone. As this will promote economic growth and development.

The role played by the existence of digital technology was revealed to every part of the world especially during the Covid-19 occurrence between 2020 to 2022 even till this present time. As this was also confirmed in the research work of Schauffel, Schmidt, Peiffer and Ellwart (2021) where they cited (Richter & Mohr, 2020; Rizun & Strzelecki, 2020), that since the COVID-19 pandemic lockdown, the use of ICT has increased dramatically and permeated all aspects of daily life. It has also contributed to the growth of many businesses, to the extent that

ICT is now a crucial tool to help business organizations of all sizes be able to adapt to the different aspects of the technological revolution, such as the digitalization of modern business practices (Kusuma et al., 2020). With the COVID-19 pandemic, it has become an essential tool for completing tasks like working, studying, using basic services, and communicating (ITU, 2021). Thanks to digital technology, if not all the world activities and operations would have been in total look down and there would have been more casualties to the world economy that surpass the one brought by the covid-19.

During that time many countries in Africa especially Nigeria where ICT devices and internet was not available to every individual particularly people living in the rural areas really experienced dark times. The pandemic caused disruption to education, learning had also been disrupted for over 39 million students in primary and secondary school across Nigeria (including those in camps for internally displaced people (Okunola, 2021). During that time leaders quickly shifted to online and remote learning options to lessen the impact of the disruptions on students in Europe, the US, China, and many other parts of the world, with notable success (Okunola, 2021). To fight these challenges, government representatives and other stakeholders in Nigeria have responded to this educational emergency by taking a variety of technological, web-based, and traditional media interventions (Okunola, 2021). However, the majority of these interventions were out of reach for millions of Nigerian learners because more than half of the country's population lacks access to the internet (Okunola, 2021 ; Okocha, & Edafewotu, 2022).

This is primarily because technology and internet access are relatively expensive for those who live in poverty (Okunola, 2021). This created a significant digital divide, or disparities in access to and use of new digital technologies (Okunola, 2021 ; Begazo, Dutz & Blimpo, 2023). Because children from rural areas and vulnerable communities in urban centers are unable to continue learning, while those from more affluent backgrounds or whose parents can afford remote learning leave them behind (Begazo, Dutz & Blimpo, 2023). The evidence can be seen according to the Education Partnership (TEP) Centre (Okunola, 2021). It was said that up to 28 percent of teachers reported that their students weren't actively learning during the pandemic as a result of the lack of accessibility to digital learning tools (Okunola, 2021). In addition, even most people that had money to get access to the internet as well surfer and were unable to access information due to poor internet quality.

According to Okocha and Edafewotu (2022), regardless of people's financial situation, many people might not have adequate Internet connectivity. Adequate internet connectivity is sometimes determined by the geographical location (Okocha, & Edafewotu, 2022). In Nigeria, geographical challenges also negatively affect access to the internet, such as in mountainous areas especially in rural areas. This makes people living in such areas experience bad internet quality due to high degree of interference. It makes life difficult for people as they find it hard to access information on the internet. Also, in contrast to densely populated cities, receiving broadband internet in rural areas is slower and more challenging. As unpopulated areas are less likely to have access to the internet in Nigeria because internet service providers set up their infrastructure mostly in areas of high demand, which leaves the rural areas out of the loop, due to low access demand. Even when provided, the internet signal strength is usually very weak and this makes livelihood very unpleasant in such areas. Because of these issues those who have financial resources have now joined those who do not have financial resources in the group of the informationally disadvantaged causing digital divide as a result of local Internet issues (Okocha, & Edafewotu, 2022).

More so, among the factors that are responsible for this digital divide in Nigeria are; high costs and a general lack of infrastructure, including a poor supply of electricity and few ICT facilities (Okunola, 2021; Okocha, & Edafewotu, 2022). Also, other factors that contribute to the digital divide in Nigeria are largely a result of factors like low levels of literacy and income, government policies, a lack of physical access to technology, and digital illiteracy, (Okunola, 2021) and culture (Okocha, & Edafewotu, 2022). All these factors make poor communities and even low-income people in urban regions of Nigeria have limited access to digital technologies (Okunola, 2021). In addition, having the technological infrastructure doesn't guarantee usage. This is because having access to information on the internet is also connected with income and socio-economic status (Okunola, 2021; Okocha, & Edafewotu, 2022); Nnamani, 2022; Begazo, Dutz & Blimpo, 2023). So basically, people in the low-income bracket of society are less likely to have access to the internet and ICT devices for this reason, the dividends of ICT diffusion and therefore, the digital divide remains sustained due to unequal utilization of ICTs (Okunola, 2021). It is not shocking that Nigeria scored so poorly on the affordability of internet access (Nnamani, 2022), the reason behind this is the high poverty rate in Nigeria (Okocha, & Edafewotu, 2022).

The largest country in West Africa was said to have the most expensive internet in the entire world in the year 2021 (Nnamani, 2022). The Alliance for Affordable Internet (A4AI) states that the cost of 1GB should not exceed 2 percent of a person's monthly income, but this is not the case in Nigeria, where the average cost of 1GB is 1,000 naira and the minimum wage is 30,000 naira (Nnamani, 2022). According to Surfshark, a cybersecurity company report, Nigerians must work 183 times more than Israel, who have the highest digital quality of life in the world, and twice as much as Kenyans to afford mobile internet, at a monthly rate of 15 minutes of work (Nnamani, 2022). Meanwhile, fixed broadband currently costs Nigerians an average of 36 hours and 13 minutes of work time each month, despite the poor internet quality in the nation (Nnamani, 2022). To top it off, Nigeria's inflation has been on the rise, making it even harder for Nigerians to afford internet services and widening the digital divide (Nnamani, 2022). In the year 2022, Nigerians have to put in an additional 13 minutes, 16 seconds of work per day to pay for the same mobile internet service as they did in the year 2021 (Nnamani, 2022).

Life could be tough especially, for people with low income, people who are poor, and are unable to meet their basic needs for food, clothing, and shelter coupled with the lacking skills (Okocha, & Edafewotu, 2022) and the knowledge needed to participate and involve in the digital world. Access to ICTs and the internet can bring a lot of relief and help them acquire the knowledge they need to participate in the digital world as well as improving their life. But in Nigeria, these poor people have been marginalized when it comes to ICTs, which includes mobile phones, personal computers, and Internet connections (Okocha, & Edafewotu, 2022). This is because, it is difficult for many people in Nigeria irrespective of their education background to afford daily needs, this further makes it difficult for them to be able to afford the cost of ICT devices and the internet. It is important for Nigeria as a nation to realize the importance of the internet and ICT devices to socio economic development. Because it will help in reducing the poverty level in the country, also, it will help in closing the digital divide (Momodu, 2023).

2.1.4   The Context of Nigerian Law Reform Commission

The Nigerian Law Reform Commission (NLRC) is one of the parastatals under the Federal Ministry of Justice (nlrc, n.d; Okeke, 2020). The Nigerian Law Reform Commission Act Chapter N118 Laws of the Federation of Nigeria 2004 (hereinafter referred to as "the Act"), which was passed in July 1979, created the Nigerian Law Reform Commission (hence referred to as "the Commission") (nlrc, n.d ; Okeke, 2020).

Subject to the provisions of this Act, "the Commission shall generally research, take and keep under review all Federal laws with a view to their systematic and progressive development and reform in consonance with the prevailing norms of Nigerian society including, in particular, the codification of such laws, the elimination of anomalies, the repeal of obsolete, spent and unnecessary enactments, the reduction in number of separate enactments, the reform of procedural laws in consonance with changes in the machinery of the administration of justice and generally the simplification and modernization of the law" (NLRC Act, 2022, p.193 ; Ochojila, 2022). Its primary goal is to regularly evaluate all federal laws in order to improve and reform them in a way that is consistent with the standards of Nigerian society (nlrc, n.d ; Okeke, 2020). The Commission is led by the Honorable Chairman. According to information obtained from the NLRC, the Human Resource (HR) department, the nominal roll consists of two hundred and eight (208) employees.

In the age of technological innovation, the mechanism for legislative reform is desperately needed (Ochojila, 2022). As it is well known that technology is essential to the growth and advancement of society (Cariolle, 2021). The law is a dynamic force in society and it grows and matures alongside the development of society (Ochojila, 2022). One of the fundamental reasons for the need for new laws and legal reforms at the national, regional, and international levels is globalization (Ochojila, 2022). This is because the world has become a global village (Ochojila, 2022). For NLRC to meet up with the international standard like other countries of the world, it has to fully incorporate the use of digitalization into its operations and practices. Experts and researchers have recently suggested consistent and ongoing legal reforms as a means of addressing some of the social and political issues that the Nigeria nation is currently facing (Ochojila, 2022). They contend that advancing freedom through law reform is essential for overall national development (Ochojila, 2022). These researchers emphasized that legal reforms are important to the advancement of the country's economy and development (Ochojila, 2022). To address the larger issue of economic predicament, unfair laws, policies, and practices that may be the cause of some economic regress in Nigeria must be changed (Ochojila, 2022).

Laws needed to be updated to reflect societal changes (Ochojila, 2022). It helps democracies adapt to changing political and legal environments (Ochojila, 2022), as well as helping in ensuring that the nation is in the same level of socio economics development like the other countries of the world which majorly have been achieved with the help of technological innovation.

This reflects how important a parastatal like NLRC is and its roles which can put Nigeria in a high level of socio-economic development if they can utilize the power they have correctly. Because a nation's laws must evolve along with its political, legal, economic, and social developments in order to remain effective (Ochojila, 2022). There are factors that are preventing parastatals like NLRC from effectively and correctly utilizing its power, these include; lack of funding, inefficiency (Ochojila, 2022). NLRC is poorly funded,that is why it is weakened and under-utilized to give its professional input in bills made by the local government councils, state houses of Assembly and the National Assembly (Ochojila,

2022). It is unimaginable in the 21st century, it sounds so odd, for lawyers and other stakeholders to have to travel for miles to bookshops and libraries in other states of the countries to get a law or an act (Ochojila, 2022). Ochojila (2022) stressed that they are the things that are supposed to be available and accessible on the NLRC website, on an Apple Store or Google play Store.

But NLRC does not have an App, even the website they have does not permit such a function. The layers are not happy with this kind of development. This reflected in their complaint as they pointed out that most of the laws in Nigeria law books are outdated and irrelevant to modern society because they do not take into account norms, technological advancements and scientific advancement (Ochojila, 2022). The instance can be seen in the case of the 2011 amendment to the Nigeria Evidence Act that included the admissibility of computer-generated evidence that still does not reflect the realities of today (Ochojila, 2022). The physical presence of witnesses still ties evidence to admissibility in the open courtroom (Ochojila, 2022). Improvements should be made so that some cases can be handled over the phone, as such instances can be seen in some advanced countries' jurisdictions (Ochojila, 2022). They further stressed that it is very important for the NLRC to take additional steps to phase out the outdated laws and update their provisions to reflect modern circumstances and realities (Ochojila, 2022).

According to Ochojila (2022), he referenced what a lawyer, Douglas Ogbankwa, and said that, NLRC is the main component in Nigeria's law development. He stated that the Commission should be able to regularly get feedback and appraisals of Nigeria's laws in order to suggest amendments that will keep up with the rapidly changing global environment (Ochojila, 2022). However, the lawyer advised that NLRC should have an app on the Google Play Store, where Nigerians can access Nigerian laws online in a real time for 24 hours all through the year after downloading the app (Ochojila, 2022).

Chapter 3

3.0 Conceptual Development

3.1 A literature review

In Appendix A, Table 1 shows the summary of the articles we read for this research work, digital divide. It presents the author names, the title of the research, the focus of the study, the theories, the concepts responsible for digital divide, Methodology, Findings, Category, Limitations and the Implication of the research.

Based on the literature we worked with in Chapter 2, we then developed a table to comprehensively present our views from the literature (Appendix A, Table 1). In reference to the table in Appendix A, we developed another table view (Table 3.1), in a compact format, which contains 4 columns, the serial number, the author(s), categories and the survey questions. The reason why we created this (Table 3.1) is to let the reader know what prompted us to derive the questions we raised for the survey. The parameters in each category in (Table 3.1) correspond to the concepts responsible for digital divide in Africa that is shown in (Appendix A, Table 1) and this helped us in raising the questionnaire for this thesis work. Furthermore, this table 3.1 also becomes our guide for the results in Chapter 5 based on the findings from each category in the questionnaire.

Table 3. 1: Table reflecting the concept/categories of the digital divide in Africa.

S/N	Author(s)	Categories	(Survey) New questions
1	(ITU, 2021; ITU, 2022), (Sin et al., 2021), Van Deursen, A.J. & Van Dijk, J.A. (2019)	Age	• What is your age • At what age did you start using computer and other ICT devices (0-10 years, 10-20 years, 20-30 years, 30-50 years, 50-65+ years, • What do you use computer and other ICT devices for (to make and receive call, To send text message, to send and receive email only, online learning and information gathering, official duty at work, general digital activities • How often do you use ICT devices (Every day, four times, three times, two time, once a week, not at all, Rarely, Not at all) • Which of the ICT devices do you use most (phone, desktop, laptop, tablet etc) What service or operation do you use that above specified ICT for?
2	(ITU, 2021; ITU, 2022), (Okocha, & Edafewotu, 2022), Aragba-Akpore,	Gender: Culture	• What is your gender (Male, Female) • How many are you in your department?

	(2022), Van Deursen, A.J. & Van Dijk, J.A. (2019)		• Which ICT devices do you use most? • What do you use the ICT device(s) for?
3	(OECD, 2001; ITU, 2021; Okunola, 2021 ; Nnamani, 2022 ; Begazo, Dutz & Blimpo, 2023), ITU, 2022, (Okocha, & Edafewotu, 2022), (Kusuma et al., 2020)	Economy Factor: Income, wealthy, affordability, income, Poverty, broadband subscription, mobile data plans can cost up to one-third of their monthly income, Costly connectivity, Financial resources • Affordability of technologies (e.g. smartphones, Willingness to use technology	• What is your monthly salary range in (Naira) (10k-20k, 20k-30k, 30k-40k, 40k-50k, 60-70k, 70-80k, 80-90, 90-100k, 100-200k, 200k-500k, above 500k) • How often do you subscribe for mobile broadband (when I ran out of data, when my broadband subscription expire, when I have money) • Are you discouraged by the quality of internet service you have? If yes, select your reasons; (too expensive, too slow, not available all the time (OFF and ON)
4	Van Deursen, A.J. & Van Dijk, J.A. (2019), ITU, 2021,(Okocha, & Edafewotu, 2022), ITU, 2022, (Okunola, 2021 ; (Okocha, & Edafewotu, 2022), ITU, 2022, OECD, 2020, Begazo, Dutz & Blimpo, 2023), (ITU, 2022), (Okocha, & Edafewotu, 2022)	Technological Factor Phone, personal computer, Material access Fixed broadband (e.g Wireless LAN,fibre network, satellite broadband internet etc), Broadband speed, Internet infrastructures and the Internet quality, connectivity is too slow, bad quality of connection, poor connection	• What type of internet connection do you have in your office(cable, wireless, None) • Do you have access to mobile broadband network (Yes, No, I don't know) • What type of network broadband subscription are you using(2G, 3G, 4G, 5G) • Do you have personal computer • Do have access to broadband internet connection (Yes, No, I don't know) • How fast is the internet connection(Fast, very fast, slow, very slow, Not working) • What do you use the internet for? Which of these devices are you familiar with? (Printer, scanner, external hard drives, etc.)
5	ITU, 2021 (Tewathia, Kamath & Ilavarasan, 2020), (ITU, 2022), Sin et al. (2021), (Okocha, & Edafewotu, 2022) Kusuma, Muafi, AJI, & Pamungkas, 2020), OECD, 2020, Van Deursen, A.J. & Van Dijk, J.A. (2019) IRISS, 2020, Van Deursen, A.J. & Van Dijk, J.A. (2019)	(Human Factor) Education, Digital literacy, Digital skill. Poor Education, Lack of digital skills, Education level (Digital Skills, Digital Inclusion, Digital Capability, Digital Literacy, Digital engagement, Employment status, Educational Qualification,	• What application do you use most when connected to the internet (Google search, Google doc, Google Slide etc, None) • What Social media platform do you use often? (Education platform, Facebook, Twitter, WhatsApp, Instagram, LinkedIn, others) • Which of the devices can you operate very well (mobile phone, computer, Scanner, Printer, Projector, • Which of the software applications do you use in your office? (Microsoft word, Google doc, Power point, Miro, Padlets, others)

		Device diversity, Internet skills, skills usage	• What do you use the internet for? • What's your highest educational achievement? (primary/secondary/Tertiary/Higher)
6	Cariolle, J. (2021) Okocha & Edafewotu, (2022) Begazo, Dutz & Blimpo, (2023), (Taylor, 2019 ; (Begazo, Dutz & Blimpo, 2023) Begazo, Dutz & Blimpo, 2023), (ITU, 2022), (Okocha, & Edafewotu, 2022),	Government Factor: -Poor infrastructural deployment - High internet tariffs -High tax burden incurred by telecom operators. Corruption, lack of leadership.. Management willingness or Organization leadership, Poor supply of electricity,	• Do government make provision for ICT devices in your office (Yes, No, Not sure) • Do you have your own ICT device given to you by your office(Yes, No) • how often do they changed the ICT device (2-4 years, 4-6 years, Until the ICT device stop working) • Is there 24 hours power supply in your office(Yes, No)
7	Okocha & Edafewotu, (2022), Van Deursen, A.J. & Van Dijk, J.A. (2019)	Organizational factor: lack of good leadership, job position, Positional Categorical Inequality	• Does your position require a computer/ICT device at work? What position do you hold in the office?
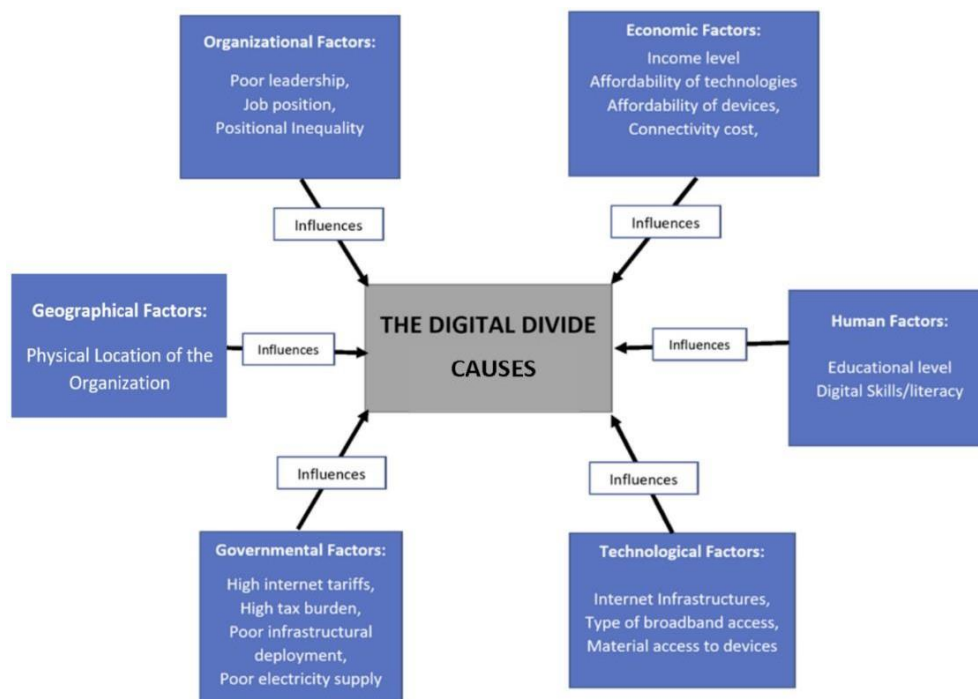
Figure 3.1: Conceptual Model

3.2 Hypothesis Development

We aimed to provide an answer to the research question for this thesis. As a result of this, we realized the need for us to formulate an hypothesis, testing the hypothesis using the empirical data collected (Recker, 2013).

A hypothesis is a proposition that can be tested empirically and is defined as a relationship between two or more variables (Recker, 2013). In other words, A hypothesis is a claim or explanation that is inferred from experience or observation but has not yet been established as true or false(Macleod Clark, & Hockey, 1981 cited in Prasad, Rao, & Rehani, 2001). Additionally, A hypothesis is a speculative explanation of the research problem, a potential finding from the study, or an educated guess as to how the study will turn out (Sarantakos, 1993; 1991 cited in Prasad, Rao, & Rehani, 2001).

It is important to formulate hypotheses in a way that allows for precise reasoning about the underlying statement they represent as well as direct empirical testability (Recker, 2013). Based on the factors in figure 3.1 that we have been able to extract from literature, we then formulate the following clearly stated hypotheses shown in the table 3.2 below.

Table 3. 2: Hypotheses derived from Concepts

HYPOTHESES	Tag	FACTORS
1) a) The Higher the Educational level, the lower the digital divide experience andvice versa. b) The Higher the Digital literacy level, the lowerthe digital divide experience and vice versa.	H1	Human Factors
2) The weaker the organizational leadership,the higher the digital divide experience	H2	Organizational factors
3) a.) The easier the material access to ICTdevices, the lower the digital divide experience. b.) The higher the availability of internet infrastructure the lower the digital divide experiences.	H3	Technological Factors
4) 4. The lower the income level, the higherthe digital divide experience	H4	Economic Factor
5) a.) The lower the power supply coverage over a region, the higher the digital divide experiences b.) The Higher the internet tariff, the greater the digital divide experience	H5	Governmental Factors
6) Rural areas experience a higher digitaldivide than Urban areas	H6	Geographical factors

We used 'H' to represent Hypothesis in the table 3.2 above. As H1 through H6 represent the number of the hypothesis.

Under the human factors, we hypothesize that:
H1 a.) The Higher the Educational level, the lower the digital divide experience and vice versa.
H1 b.) The Higher the Digital literacy level, the lower the digital divide experience and vice versa.

With regards to physical access, factors that influence the resource distribution are usually positional categories, and they usually come under the work and education, that is with respect to human and organizational factors. This is because according to Van Dijk (2006) and Van Deursen and Van Dijk (2019) physical access is anchored on the level of individual education and employment. Therefore, those who have a higher education, and also a higher position at the workplace, are more digitally exposed and consequently, enjoy the benefits of technology in their daily endeavors, than those of a lower educational level (Van Dijk, 2006; Van Deursen & Van Dijk, 2019). On digital literacy level, those with higher income and educational levels tend to make use of more advanced applications like databases, spreadsheets and applications for presentation, such as Microsoft PowerPoint, more than those with lower income and educational levels, who are more inclined to entertainment and simple consultations (Van Dijk, 2006, p. 182; Van Deursen & Van Dijk, J.A. 2019).

Under Organizational factors, we also hypothesis, that:

H2: The weaker the organizational leadership the higher the digital divide experienced.

Leadership at any level, whether at the state or federal government level, or at the organizational or business level, plays an important role in determining if citizens can reap the potential benefits of information and knowledge resources. This is because good leadership that is technologically and ICT inclined will ensure that ICT infrastructure and devices or tools are acquired, deployed and implemented within the areas where it is needed the most. Those areas include places with persons who are digitally literate enough, to enhance their performance, or in certain areas or sectors of the economy, which are digitally excluded, thereby helping to bridge the gap that exists in that area (Venkatesh et al., 2019).

For technological factors, and Economic Factors, we hypothesis that:

H3 a:) The easier the material access to ICT devices, the lower the digital divide experience.
H3 b.) The higher the availability of internet infrastructure the lower the digital divide experiences.

H4: The lower the income level, the higher the digital divide experience.

H3a.) and **H4** are based on the understanding that economic resources play a very important role in determining the ease of material access, which in turn influences the degree of digital divide experienced. People who are low-income earners are not enabled enough financially in order to get access to purchase relevant ICT tools, and even if they make a purchase, it is usually a device of low quality or a second-hand quality. This is against their counterpart, which are the high-income earners, who experience the reverse case. They are able to afford access to ICT

tools or devices, and of course, higher quality devices like brand new desktops and laptops, smartphones, etc. (Van Deursen, Van der Zeeuw, de Boer, Jansen & Van Rompay, 2021). So a lower income means a higher digital divide experience, than for a higher income person.

H3 b.) This hypothesis spins out from the already established understanding that one of the basic keys to overcoming the issue of digital divide is basic access to ICT infrastructure and devices. According to OECD, 2001, it is top priority, above access to and using the internet (OECD, 2001). If an improved living standard must be experienced, then the availability and sustained presence of internet infrastructure cannot be overemphasized. This is because the absence of internet infrastructure spells a strong signal for a real emergence and possible persistence of the digital divide (ITU, 2021; ITU, 2022). This is because in today's information age, an absence or poor availability of internet infrastructure would automatically create inequality across a region or regions, and therefore sentencing many persons to digital exclusion (Selwyn, 2004; Tewathia, Kamath & Ilavarasan, 2020; ITU, 2021; ITU, 2022)). Their ability to engage in effective participation in society is hindered by digital exclusion. Also contributing to a higher digital divide experience is the issue of poor internet access, which discourages or prevents access to information. (Nnamdi, 2022).

Under Governmental Factors, we hypothesized that:

H5 a. The lower the power supply coverage over a region, the higher the digital divide experiences.

Poor electricity supply infrastructure was mentioned among the factors that contribute to the existence of digital divide in Africa because this has prevented large numbers of the population from being connected (ITU, 2022; Okocha & Edafewotu, 2022; Okunola, 2021). The importance of electricity power supply can't be underemphasized, as all the nations' economy is totally tied to the availability of power supply. This shows that the application of digital technology and the use of the internet will surfer and will not be able to stay in any country where there is an epilepsy electricity supply. As electricity supply is always needed to power the ICT tools and the internet. In addition, when it is not available, the use of the ICT tools and the internet to access information by the citizens becomes meaningless and useless and this further creates a huge digital divide.

H5 b. The Higher the internet tariff, the greater the digital divide experience

Higher internet tariffs many a times are a result of the high tax burden incurred by telecom operators and in bid to recover expenses, increase the tariffs on subscriptions. Therefore the higher the internet tariffs (Nnamani, 2022), the greater the digital divide experienced by the individuals or region (Okocha & Edafewotu, 2022).
.
We hypothesis under Geographical Factor that;

H6: Rural areas experience a higher digital divide than Urban areas

Inequality in access to the internet and high quality digital services is connected to the geographical location where individuals live (ITU, 2021). According to ITU (2021), around 30

percent of rural Africans are still without access to mobile broadband, this causes these people to experience digital divide. People who live in the rural areas tend to have suffered access to information because of the disconnection they experience from the unavailability of internet access which is caused as a result of lack of internet infrastructure (Begazo, Dutz & Blimpo, 2023; World Bank, 2016; ITU, 2021). Even Though, the use of mobile broadband has increased with a 21 percent higher 4G coverage across the world in 2020. The African continent is still lagging behind as the mobile broadband coverage does not still affect the large number of population. Thus, only 11 percent of the rural population can access 2G, meanwhile, 18 percent of the rural population do not have mobile network coverage at all (ITU, 2021). This implies that people living in the rural areas of this continent suffer the effect of digital divide.

However, people that live in the urban areas tend to have access to the internet and high quality digital services, this enables them to acquire more information and experience a better social life (Begazo, Dutz & Blimpo, 2023; World Bank, 2016; ITU, 2021).

Chapter 4

4.0   Research Design

In this chapter, we present the methodological choices that we have taken in order to conduct this thesis. This section includes a description of how we conducted the literature, the research approach adopted, targeted population, sampling, ethical considerations, the reliability and the validity.

4.1   Conducting the Literature Review

We carefully selected the materials for this thesis that are related to information systems literature and conferences, with the aim to answer the research questions for this thesis work. We agreed that the literature we will use for the research work will be peer reviewed literature that are information systems journals (IS), those articles that were published on google scholar, Lund University library, conferences, international organization website and recognized blogs. We used different keywords to search for articles such as:

- What is digital divide
- Digital divide in Nigeria
- Digital divide research work in Africa
- Digital divide recent research work in Africa
- The international organization articles on digital divide
- Blogs on digital divide
- Causes of digital divide

We selected several literature materials and streamlined them to different categories; like those that focused on the ICT4D, those literature that talked about the digital divide in the global context, those literature materials that the research was related to the digital divide in the developing countries and the African continent as well as those literature materials that focused on the Nigerian context. We discussed and decided to create a literature review table in (Appendix A, Table 1) so as to narrow them to those literature that discussed digital divide in Africa in order to make it easy for us to highlight those findings from this literature that are related to both general findings of digital divide research and digital divide that was carried out in the African context. We found different variables such as income, power supply, education, digital literacy etc. which are the factors contributing to the digital divide. This led us to create another column on table in (Appendix A, Table 1) so as to put those variables under the concepts with the authors that discovered these variable factors in their research works. We streamlined it to eighteen literature that discussed the digital divide in Africa as this is shown on (Appendix A, Table 1).

We realized the need to categorize these concepts into different factors as these were what we investigated in order to answer the research question through our findings from the empirical data. As a result of this we created table 3.1 where we highlighted eight categories. We imputed age and gender factors as controlled variables. We then set to consider six factors on table 3.1 which we imputed on the conceptual model in figure 3.1 for testing our hypothesis in order to answer the research question.

4.2   A Quantitative Study in Perspective

Appropriate research approach has to be chosen in order to answer a research question correctly (Recker, 2013). This research aims to answer the research question of what factors cause digital divide in Nigeria. Therefore, the quantitative research method is the appropriate method for this research question, as it will enable us to measure those variables we identified in the literature as causing digital divide (Recker, 2013). Also, it is an appropriate method to test the hypotheses we formulated in this research in table 3.2 using the empirical data to prove whether those contributing factors to digital divide identified in the literature are true or not. This research was carried out in Nigeria: Nigerian Law Reform Commission where we used a survey questionnaire to collect the empirical data from the sample population. The data collected are quantitative data, this makes quantitative research method the best approach for this research. Our research is more of deductive reasoning rather than inductive reason since we are using the empirical data to investigate the concepts of digital divide in figure 3.1, this makes the quantitative research method the best approach that fits this research (Recker, 2013).

4.2.1   Choice of Method

From the literature review presented in Chapter 3, we came up with concepts that require us to measure the factors that cause digital divide in Nigeria. We then discovered that the best research method for our research is quantitative as it is best fitting to measure the factors to be investigated (Lucia & Quek, 1997) as well as testing the hypothesis (Recker, 2013). Unlike the qualitative that tends to focus on processes and meanings that are not examined or measured in terms of quantity but rather by adopting interpretive approach when investigating the subject under study (Lucia & Quek, 1997). In addition, from the concepts in the literature review in (Appendix A, Table 1), there are objective realities embedded in the factors that cause digital divide in the organization or society which we set to reveal in this research (Lucia & Quek, 1997). We applied a quantitative research method as this allows us to measure those variables under the categories in Table 3.1 as well as testing the hypothesis in Table 3.2 (Recker, 2013).

4.3   Survey Development and Data Collection

For the survey development, we chose a questionnaire/survey as it is the best technique for collecting empirical data from a large number of the participants (Regmi, Waithaka, Paudyal, Simkhada & van Teijlingen, 2016; Roopa & Rani, 2012). Also, it is the best tool we can use to collect information within a limited period of time because the time frame allocated for this research is short (Regmi, Waithaka, Paudyal, Simkhada & van Teijlingen, 2016; Jenn, 2006). During the questionnaire development, expert's opinions were obtained and the necessary corrections and adjustments were made to the questionnaire in order to ensure that it is reliable and valid (Taherdoost, 2016; Jenn, 2006). We reviewed the items in the questionnaire many times to ensure that there was no complexity in the question thereby making it clear and easy for the participants to understand (Watson, 2015; Roopa & Rani, 2012; Jenn, 2006). This helps to prevent the biased picture of the true state of this research (Watson, 2015; Roopa & Rani, 2012; Jenn, 2006).

We used a highly structured questionnaire as we specified all questions and optional answers and limited the amount of comments made by respondents in their own words in the questionnaire (Roopa & Rani, 2012).

However, this structured questionnaire enabled us to gather targeted and relevant information about the research problem (Aithal & Aithal, 2020). We applied closed-ended questions in our questionnaire as we ensured that the participants responded to a fixed set of questions or multiple-choice questions with multiple answers options (Aithal & Aithal, 2020; Roopa & Rani, 2012). The online questionnaire design consisted of radio buttons likert scale-style items (Joshi, Kale, Chandel & Pal, 2015). Short-answered items are complete using a text-box on the form. On completion of the questionnaire, the respondent is asked to submit via a "SUBMIT" button at the end of the form. If there are any uncompleted "required" areas in the form, the respondent is notified to complete before attempting to submit again; this is to avoid uncompleted rows and columns that could create unnecessary dirt on the google sheet, as this enabled us to minimize the errors that can affect the data analysis accuracy. The questionnaire was designed in such a way that only properly completed forms can be submitted. Once submission is completed, the respondent is notified of a successful submission.

Having concluded development of the survey questions, we set out to create the questionnaire using Google Forms. This is because our physical presence with the target population at the NLRC would not be possible. This expedited the need for us to make our questionnaire online, to allow for easy access (Bainbridge & Carbonaro, 2000). This was also aided by sending the survey link to them. In order to avoid capturing unwanted participants, we also request for their email addresses or WhatsApp numbers so that it would be sent to them personally. All data is secure and is only accessible by the researchers. The website for the questionnaire is secure through Google's built-in security from outside interference (Google for Education, inc), so that only those with which it was shared with (via the link) are able to access it. Finally, we had to make sure that the data was stored in a format that would be ready for data analysis on excel.

Some demographic information about the sample population included parameters like gender, marital status, age range, and the age they were when they first had access to the technological device (ICT devices). From figure 5.1 we observed that 49.12% of the respondents were male, and 42.857.1% were female while others had other orientations. This survey result shows a fairly evenly distributed demography as gender is a concern. From figure 5.2, we observed that 66.07142857% of the respondents were married, 26.78571429% were single(unmarried), 4.464285714% divorced and 2.678571429% were widows or widowers. We can infer that a larger percentage of the respondents are married, which may have accounted for the less number of hours they have to work on ICT devices. They would have to attend to their children and other sundry issues. The age distribution of the employee is also an interesting find: 18-30 years makes up of 10.71428571%, 31-40 years' make up about 44.6428571%, 40-50 years makes up 40.17857143%, and 4.464285714% accounts for the age range of 50-60 years. Adding up the age range of 18-30 and 30-40 makes up almost 55% of the young population of workers. This may account for the high rate of those who could access the questionnaire online and had a fairly good knowledge of ICT devices. The survey went further to enquire about the earliest time of the respondents' contact with ICT, the age range of 10-30 years accounted for 87% of those who had access to technological devices early enough. figure 5.2, 5.3, and 5.4 show these findings.

4.4 Study Area

In this research, the study area is within the federal civil service workforce, specifically the Nigerian Law Reform Commission (NLRC), located in Garki, in the Abuja Municipal Area Council, the Federal Capital Territory (F.C.T) of Nigeria.
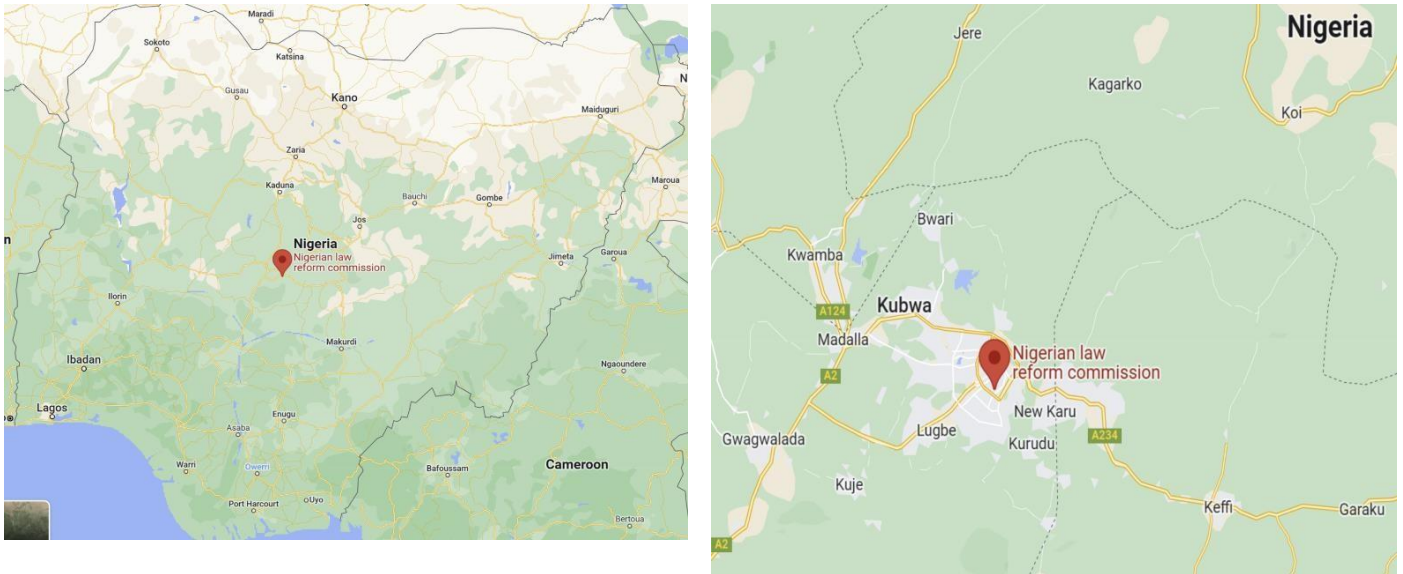

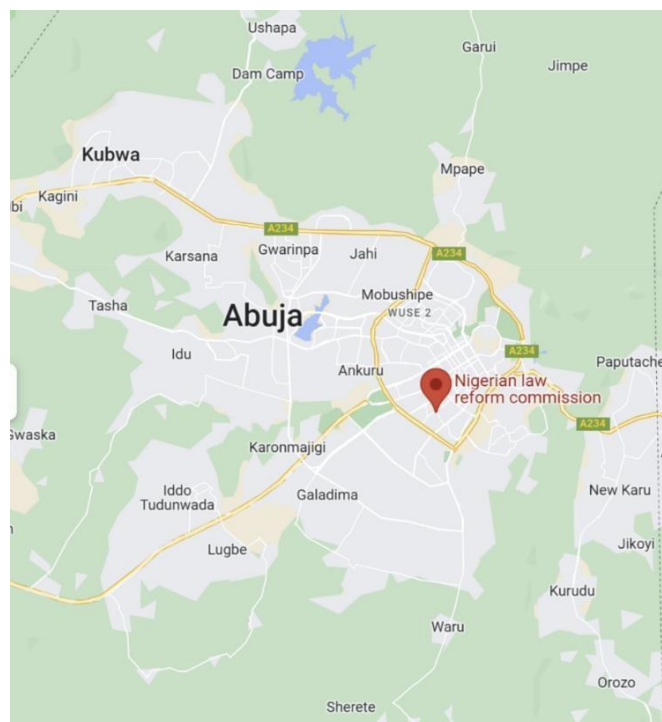**Figure 4.1a: The Nigeria Law Reform Commission (NLRC) location. (Source: Google Maps).**

Figure 4.1b: The Nigeria Law Reform Commission (NLRC) location. (Source: Google Maps).

4.5   Target population

The target population includes all relevant staff working at the NLRC, out of a total of 208 staff members. The Staff was contacted by phone initially via our contact person in Nigeria. After consent was given, participants were then selected to participate in the survey. The sample population was made up of the sample size which is composed of all actual functional staff whose daily tasks are very vital to the successful operation of the NLRC, with the exception of those who are exempted from the survey and anyone who for any reason, refused to participate in the survey. Their response to the survey questions were voluntary. Those who were able to have access to the internet and ICT devices, are able to respond to the survey online. For those who did not have access to a computer system and internet access for the online survey, a printable version of the survey was sent to them for printing, so they can fill or register their survey responses manually. The filled questionnaire was scanned and sent to us.

4.6   Sampling

Since it was not possible for us to cover the whole population as we the researchers were not present at the same location with the organization where we collected the empirical data, we ensured that we selected every member of the population sample, to make this happen, therefore we adopted simple random sampling as it gives equal opportunity to every individual to participate (Lowhorn, 2007). In deciding the number of samples, basically anybody who was 18 years of age and above was qualified to participate in the survey. So, we used the simple random sampling technique. This is due to the fact that everybody in the target population is given an equal chance of being selected (Australian Bureau of Statistics, 2023). Out of the 208 staff, we received 112 completed survey questionnaires with the exception of those who were not interested in partaking in the survey. The data was analyzed using Excel.

4.7   Ethical Consideration

According to Recker (2013), ethics is defined as the principles of right and wrong conduct in a community or profession and can be used by anyone to make choices, guiding their behavior. The definition of ethical behavior is defined as following the laws of responsibility, accountability, liability, and due process (Recker, 2013). Information systems research as a profession requires ethical standards regarding what conduct is acceptable and unacceptable when conducting and publishing research (Recker, 2013). As a result of this we ensured we put ethical rules into consideration when carrying out our thesis. We sought the consent of the participants involved by writing a consent letter to the Director HR of the organization before conducting the survey (Recker, 2013). We sought the consent and interests of every participant involved in the study by letting them know the purpose of the research and that the empirical data collected will be used for research purpose only (Recker, 2013). This is to ensure that there's no false picture of what the research is all about to the respondent (Recker, 2013).

We did not include the participant names on the questionnaire so as to protect their privacy (Roopa & Rani, 2012). The identities of the respondents are not known to us, the researchers, thereby ensuring their anonymity. Also, to encourage the participants to respond to the questionnaire truthfully, we upheld their confidentiality (Roopa & Rani, 2012). The respondents participated voluntarily and those that were not interested in answering the survey were not involved (Recker, 2013). We upheld the participants' rights, as well as their sensitivity and privacy as we conducted the survey (Recker, 2013). We made sure that the empirical data collected using the survey questionnaire were properly kept and not exposed to the outsider (Recker, 2013). In analyzing our empirical data, we ensured we truthfully reveal all the findings we discovered (Recker, 2013).

4.8 Validity

The extent to which the data actually covers the subject of the investigation is referred to as validity (Ghauri and Gronhaug, 2005 cited in Taherdoost, 2016). To measure what is intended to be measured is the essence of validity (Field, 2005 cited in Taherdoost, 2016). To achieve this, we ensured that the empirical data collected using the questionnaire measures the actual variables in figure 3.1 as factors that cause digital divide (Recker, 2013). Questionnaire survey helped us to collect relevant information that best answers our research question in the most accurate and valid way possible (Taherdoost, 2016). The statistical analysis we used in this research enabled us to achieve validity as it helped in answering the research question by revealing the truthful findings about the empirical data collected using charts (Aithal & Aithal, 2020).

4.9 Reliability

According to Carmines and Zeller (1979) cited in Taherdoost (2016), reliability is the degree to which a measurement of a phenomenon yields a steady and consistent result. The consistency of a variable or set of variables with respect to the thing they are meant to measure is referred to as reliability (Recker, 2013). We achieved reliability in this thesis as we ensured that questions in our questionnaire survey were consistent, correctly asked, scaled correctly and measured the variables (factors that cause digital divide) that we targeted at measuring.

Chapter 5

5.1   Findings, Interpretation and Data Analysis

We collected a large amount of data from the survey. We used descriptive statistical analysis to interpret the empirical data. Descriptive analysis is the process of describing, aggregating, and presenting the constructs of interest or the relationships between the constructs to describe, for instance, the population from which the data were collected, the range of response levels attained, and so forth (Recker, 2013).

The use of descriptive statistical analysis to interpret the data enables us to analyze and interpret the data using tables and charts. We also use techniques such as total number, and the percentage to calculate and analyze the total number of responses and the percentage of the responses for each question raised on each chart formulated for our findings from the empirical data collected. The descriptive statistical analysis helped us to explain and visualize the data objectively.

Statistical analysis enables us to use the empirical data we collected from the sample population to confirm whether our findings support or doesn't support what we discovered in the literature (Recker, 2013). The nature of the data being quantitative allows us to be more objective and prevent biased mindset thereby helping us in achieving truthful findings for this research work (Recker, 2013; Pyo et al., 2023). Unlike qualitative research where the findings could be biased as the researchers are subjective in analyzing the data by interpreting the data base on the researcher's feelings and experiences (Recker, 2013).

A total of 208 workers are in the employment of the Nigerian Law Reform commission. 72 respondents filled the online google form questionnaire, while the rest (40) filled-in the printed hard copy questionnaires. The filled hard copy was scanned and sent to us for analysis. A total of 112 respondents were received. The questions in the questionnaire were grouped under the following thematic areas:

1. Biodata Demographics
2. Organization settings
3. Digital Attitude / Education level
4. Economic concerns
5. Technological Concerns
6. Geographical location concerns and
7. Government concerns.

These thematic areas were used to test the hypothesis developed in chapter three and conclusions were arrived at based on the patterns found in the survey response. The following section provides the results and is represented on tables and charts for ease of interpretation.

5.2   Result presentation

The first sets of questions were coded under the Biodata demographics and the following results were obtained from the respondents.

5.2.1   *Question 1: What is your Gender?*

The following response was obtained from the data supplied by respondents. From Figure 5.1, it can be observed that, 49.1% of the total respondent are male, 42.857.1% are female, while 6.5% prefer not to say and about 1.8% of the respondent chose other genders.
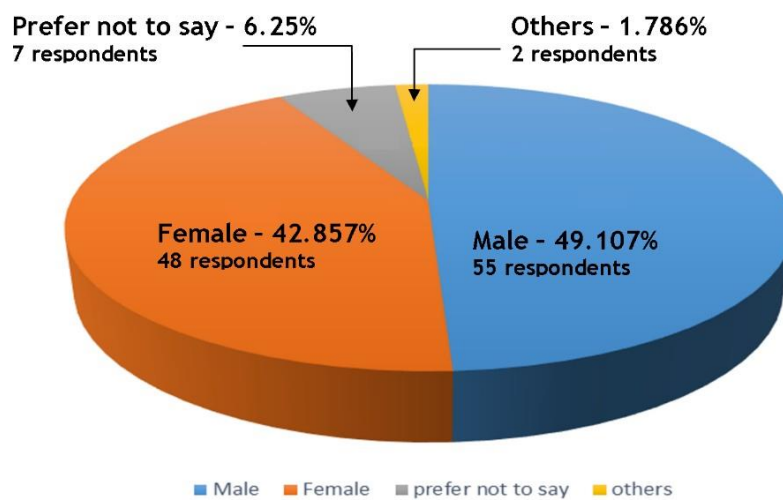
Figure 5. 1: Chart showing the responses from Gender

5.2.2   Question 2: Marital Status?

The following response was obtained from the data supplied by respondents. From table 5.2, it can be observed that 66.07% of the total respondents are married, 26.785% are single, 4.464% are divorced, while 2.679% of the respondents are widow/widower. A pictorial representation of the data is shown in figure 4.2.
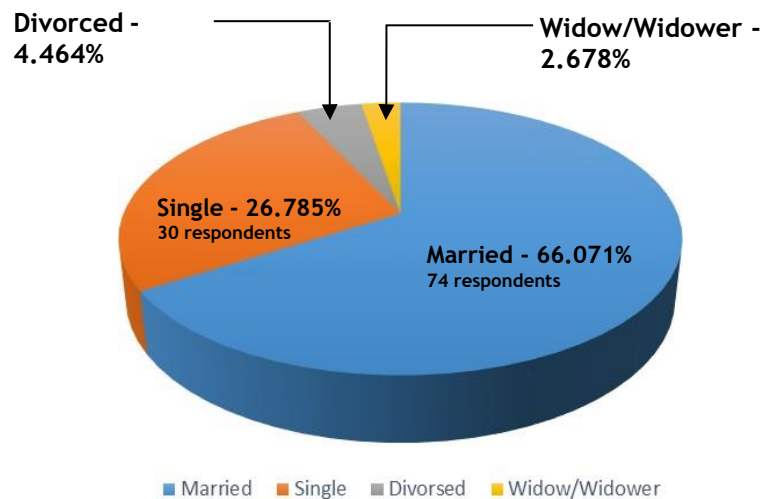
Figure 5.2: Chart showing the responses from Marital status

5.2.3   Question 3: What is your age range?

The following response was obtained from the data supplied by respondents. From Figure 5.3, it can be observed that 10.71% of the total respondents are of the age range 18-30, 44.64% are of the age range 31-40, the respondents with age range 41-50 are 40.179%, the respondents with age range 51-60 are 4.46% and the age range 61-65 is 0%.
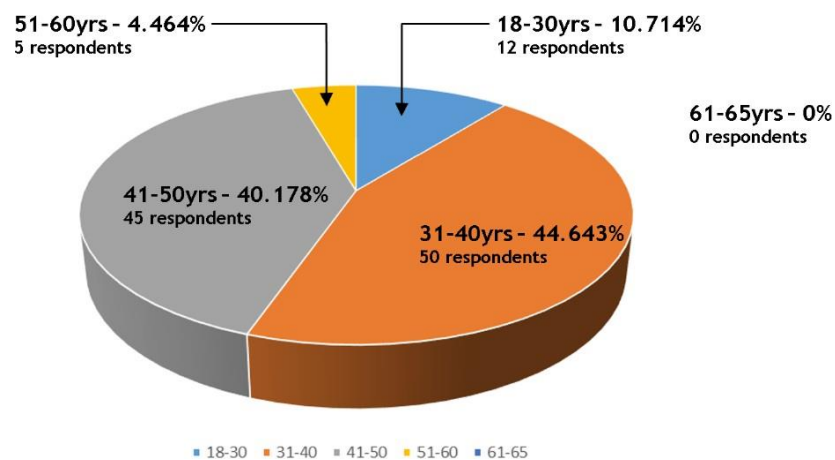
Figure 5.3: Chart showing the responses from Age range

5.2.4   Question 4: At what age did you start using computers and other ICT devices?

The following response was obtained from the data supplied by respondents. From Figure 5.4, it can be observed that 12.5% of the total respondents who started using computers and other ICT devices are of the age range 0-10 years, 27.68% started at the age range of 10-20 years, 50%, started at the age range of 20-30 years, 9.82% at the age range of 30-50 years while 0% at the age range 50-65+.
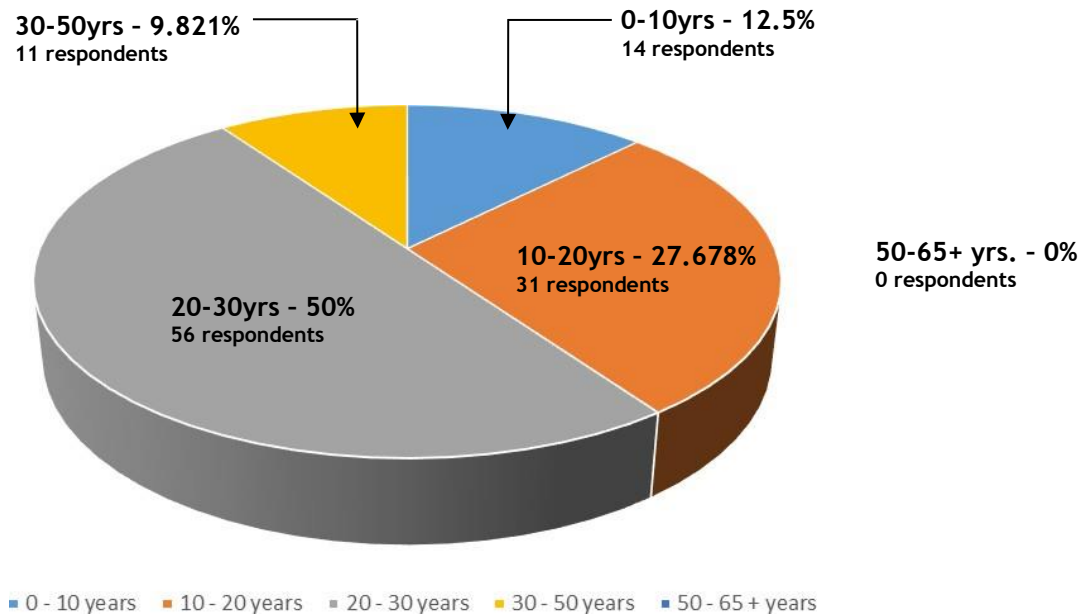
Figure 5.4: Chart showing the responses from age range to start using ICT

5.2.5   Question 5: What department are you working in?

From Figure 5.5, is can be observed that the majority of the respondents working in the HR & Admin departments makes up 42.857%, 16.964% in the Finance & Account department, 14.286% at the Library department, 8.928% at Legal drafting, 7.143% in private law, 4.464% in the department of Public law, 2.678% in Business law department, 0.893% in the procurement department and 1.786% work in the I.T. department.
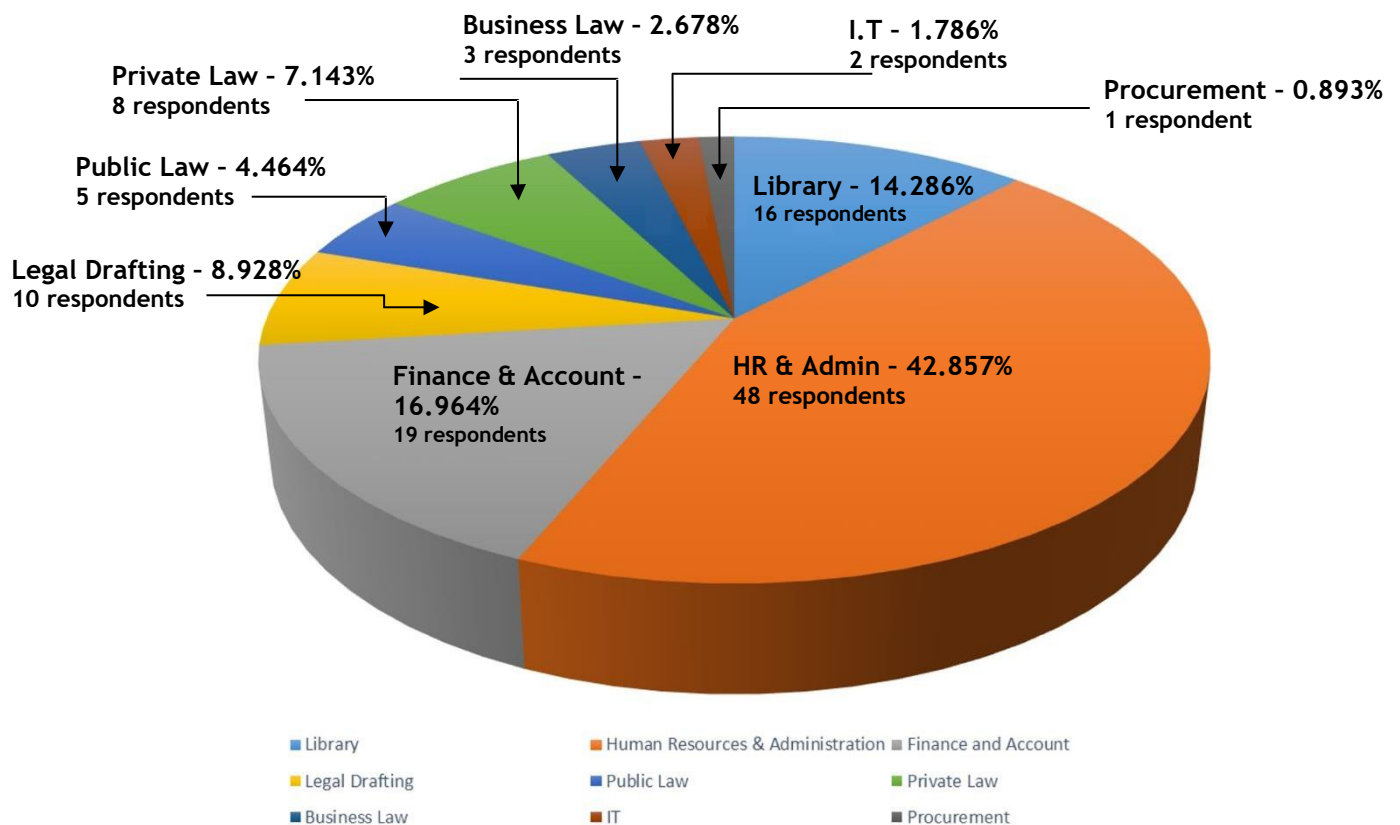
Figure 5.5: Chart showing the responses from departments where respondents work

5.2.6   Question 6: How many people are in your department?

The following response was obtained from the data supplied by respondents. From Figure 5.6, it can be observed that out of the total number of people that work in the organization, 12.01% work in the library, 44.23% are in the Human Resource & Administration, 16.826% are in Finance and Account department, 7.211% are in legal drafting, 4.807 are working in the public law, private law is 7.211%, business law is 3.846%, IT is 2.403% and procurement is 1.442%.
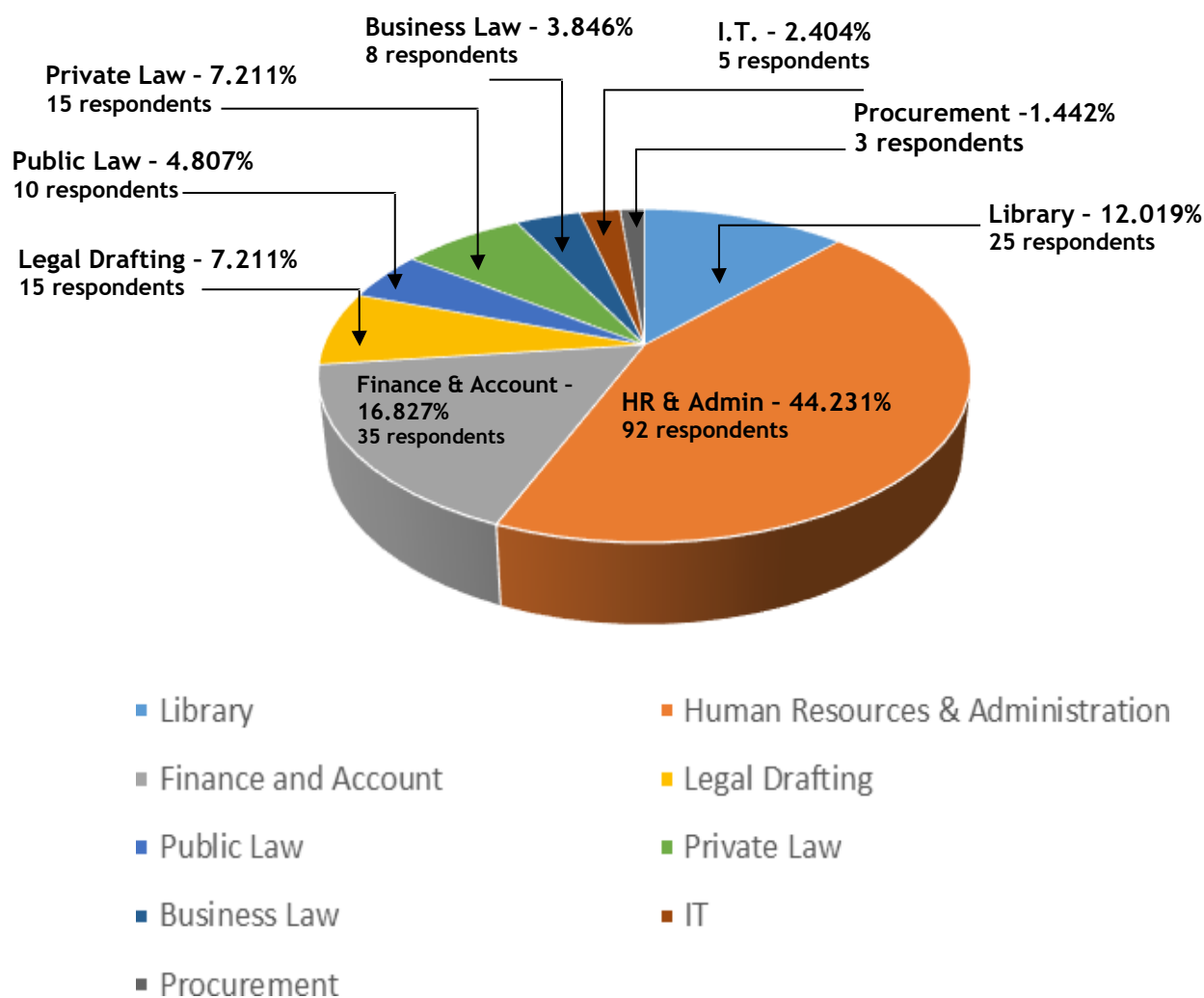
Figure 5.6: Chart showing the responses from total number of staffs in each department

5.2.7   *Question 7: What Position do you hold in the office?*

The following response was obtained from the data supplied by respondents. From table 5.1a, it can be observed that in the Human Resource & Administration department, there were 28 respondents for Admin Officer position, there were 9 respondents for Senior Admin Officer, 5 respondents for principal Admin Officer, 3 respondents for Principal Executive Officer Admin, 1 respondent for Higher Executive Officer Admin, 1 respondent for Assistant Executive Officer Admin and 1 respondent for Office Assistant Admin.

In the Account and Finance Account department on table 5.1b, there were 9 respondents for the Executive Officer Account position, 4 respondents for Assistant Executive Officer Account, 2 respondents for Account Officer, 2 respondents for Senior Account Officer position, 1 respondent for Principal Accountant and 1 respondent for Director of Account.

In the library department on table 5.1c, there were 2 respondents for Principal Library Officer position, 2 respondents for Senior Library Officer, 7 respondents for Library Officer, 3 respondents for Executive Officer Library, 1 respondent for Assistant Director Library and 1 respondent for Director Library.

In the Legal Drafting Department on table 5.1d, 1 respondent for Director Legal, 5 respondents for senior Legal Officer position, 3 respondents for Principal Legal Officer and 1 respondent for Chief Legal Officer.

In the Public Law department on table 5.1e, there were 2 respondents for the Senior Law Research Officer position, 1 respondent for Principal Law Research Officer, 1 respondent for Chief Law Research Officer and 1 respondent for Assistant Chief Law Research Officer.

In the private Law department on table 5.1f, there were 3 respondents for Senior Law Research Officer position, 3 respondents for Assistant Chief Law Research Officer, 1 respondent for Chief Law Research Officer and 1 respondent for Director Private Law.

In the Business Law department on table 5.1g, there was 1 respondent for Assistant Chief Law Research Officer, 1 respondent for Law Research Officer and 1 respondent for Director Business Law position. There were 2 respondents for the IT Officer position on table 5.1h and I responded for Procurement Officer on table 5.1i.

Human Resource & Administration

Table 5. 1a: Shows the spread of positions held in the Human Resource & Administration

S/No	Position Held	No of Respondents
1	Admin Officer	28
2	Senior Admin Officer	9
3	Principal Admin Officer	5
4	Principal Executive Officer Admin	3
5	Higher Executive Officer Admin	1
6	Assistant Executive Officer Admin	1
7	Office Assistant Admin	1

Finance and Account Department

Table 5.1b: Shows the spread of positions held in the Finance and Account Department

S/No	Position Held	No of Respondents
1	Executive Officer Account	9
2	Assistant Executive Officer Account	4
3	Account Officer	2
4	Senior Account Officer	2
5	Principal Accountant	1
6	Director of Account	1

Library Department

Table 5.1c: Shows the spread of positions held in the Library Department

S/No	Position Held	No of Respondents
1	principal Library Officer	2
2	Senior Library Officer	2
3	Library Officer	7
4	Executive Officer Library	3
5	Assistant Director Library	1
6	Director Library	1

Legal Drafting Department

Table 5.1d: Shows the spread of positions held in the Legal Drafting Department

S/No	Position Held	No of Respondents
1	Director Legal	1
2	Senior Legal Officer	5
3	Principal Legal Officer	3
4	Chief Legal Officer	1

Public Law Department

Table 5.1e: Shows the spread of positions held in the Public Law Department

S/No	Position Held	No of Respondent
1	Senior Law Research Officer	2
2	Principal Law Research Officer	1
3	Chief Law Research Officer	1
4	Assistant Chief Law Research Officer	1

Private Law Department

Table 5.1f: Shows the spread of positions held in the Private Law Department

S/No	Position Held	No of Respondents
1	Senior Law Research Officer	3
2	Assistant Chief Law Research Officer	3
3	Chief Law Research Officer	1
4	Director Private Law	1

Business Law Department

Table 5.1g: Shows the spread of positions held in the Business Law Department

S/No	Position Held	No of Respondents
1	Assistant Chief Law Research Officer	1
2	Law Research Officer	1
3	Director Business Law	1

IT Department

Table 5.1h: Shows the spread of positions held in the IT Department

S/No	Position Held	No of Respondents
1	IT Officer	2

Procurement Department

Table 5.1i: Shows the spread of positions held in the Procurement Department

S/No	Position Held	No of Respondents
1	Procurement Officer	1

5.2.8   Question 8: How important is an ICT device for your daily task at the office?

The following response was obtained from the data supplied by respondents. From Figure 5.7, it can be observed that 75.89% of the total respondents say that ICT devices are very important for their daily office work; another 8.03% say it's fairly important for their daily work; another 10.71% respondents said it is importance to their daily office activities while 4.46% respondent said that ICT device is not important for their daily activities, 0.89% say ICT devices are not needed at all for their office activities and there was 0% respondents said not sure.
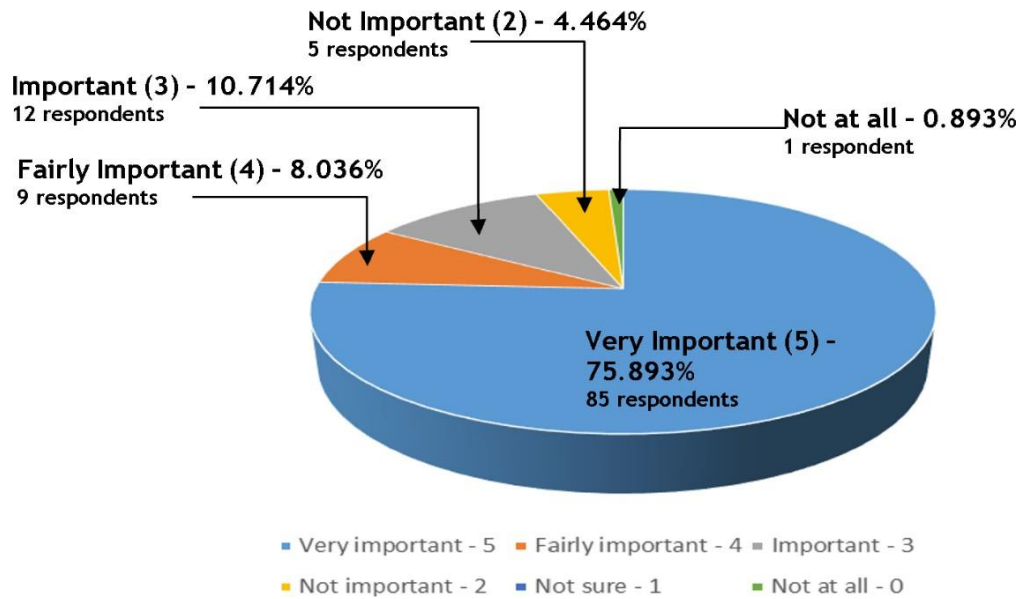
Figure 5.7: Showing the responses from how important is an ICT device for your daily task at the office?

5.2.9   Question 9:   Would you prefer to work without the use of ICT devices in your office work?

According to the respondents, from Figure 5.8, it can be observed that 0.89% (as confirmed from table 5.8) of the total respondents say that they prefer to work without ICT devices, while the majority who say they need ICT devices for work makes up 97.32% of the total respondents. 1.79% say that they are not sure if they need ICT devices.
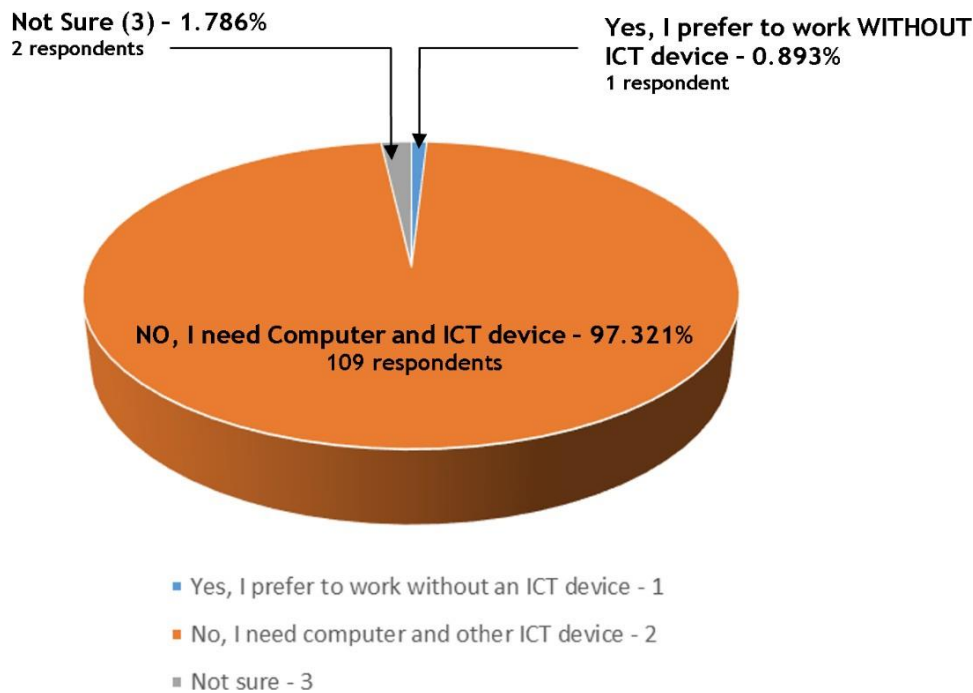
Figure 5.8: Chart showing the responses from preference to work without the use of ICT

5.2.10   Question 10: Time spent on the Computer/ICT devices at work?

From table 5.9, we see that the majority of those who need ICT devices from the previous table, actually spend some quality time with ICT devices on office work. 21.43% spend 8 hours with the devices; another 21.43% spend more than 8 Hours using ICT devices; those that spend less than 8 hours on ICT devices make up about 50.89%, while those that do not use it at all make up 6.25% of total respondents.
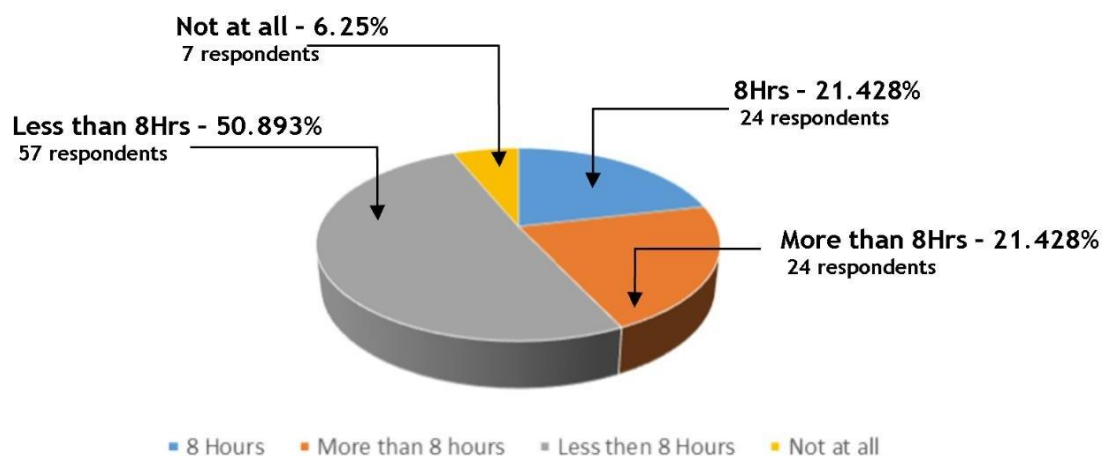
Figure 5.9: Chart showing the responses from time spend on the ICT devices at work

5.2.11 Question 11: What's your highest educational achievement? (primary/secondary/Tertiary)

From Figure 5.10, it can be observed that none of the respondents have a primary level as their highest educational achievement. 0.892% have secondary level education as the highest educational achievement, while most of the respondents have tertiary level education as their highest educational achievement, which is indicated as 99.11%.
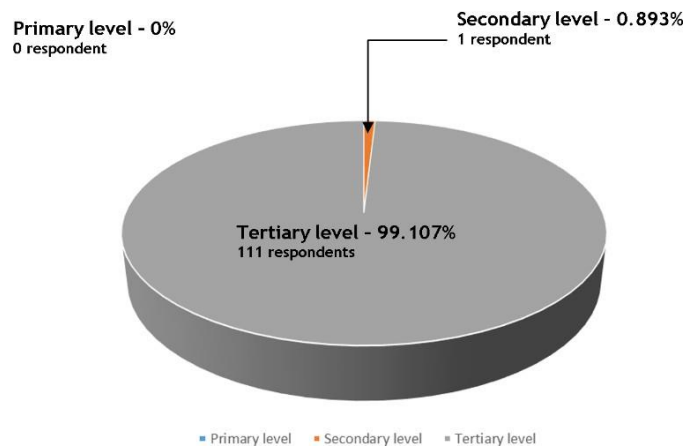
Figure 5.10: Chart showing the responses from highest educational achievement

5.2.12 Question 12: For tertiary level, please indicate level.

From Figure 5.11, it can be observed that amongst the respondents, we were also able to ascertain the level of their tertiary education in order to understand how much education the respondents possess that could either aggravate or diminish their digital divide experience. We can observe that 4.50% of the respondents have NCE; 7.21% possess an OND (Ordinary level diploma) and 18.91% have a HND (Higher National Diploma). These are degrees below a Basic graduate degree. For the graduate degrees, 41.44% have a BSc degree, 1.80% hold a B.Tech degree and the remaining 26.12% hold a Masters degree, which is the Highest degree attained among the respondents. No one holds a Ph.D. degree.
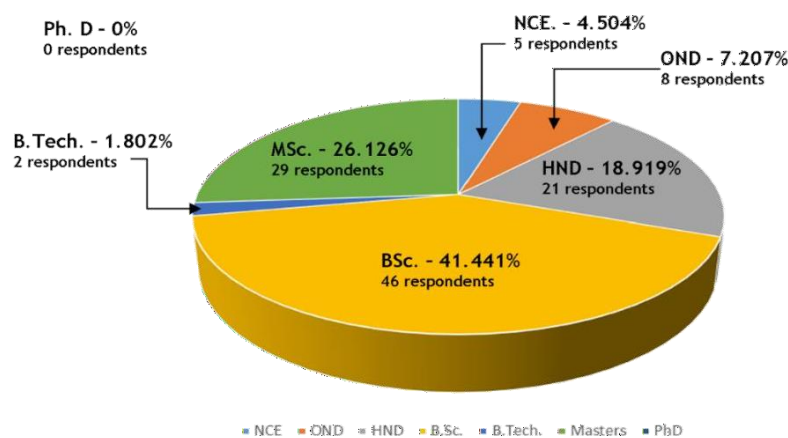
Figure 5.11: Chart showing the responses from tertiary level educational achievement

5.2.13 Question 13: Which of the ICT devices do you use most (phone, desktop, laptop, tablet etc.)

This analysis tells us how apt towards ICT devices the respondents are. It gives insight into the level or extent of material access to ICT devices/tools that exist across the respondents. From the chart in Figure 5.12, it can be observed that virtually everyone has and mostly uses their smartphones at 88.4%; following that is the use of laptops at 74.1%; the desktop is the next highly used ICT device. Other ICT tools used according to common use are the printer, the photocopier, the tablet, desktop and the scanner at 37.5%, 30.4%, 25.9%, 45.5% and 23.2% respectively.
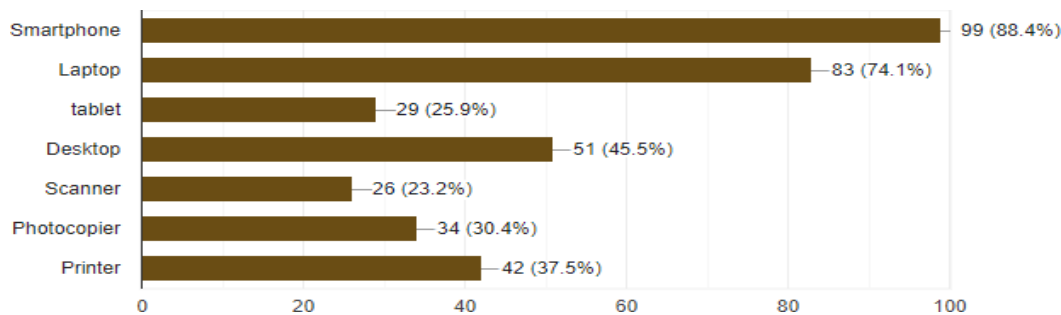
Figure 5.12: Chart showing the responses from most used devices.

5.2.14 Question 14: What do you use the above ICT device(s) for at the office? (Please tick as many as apply to you.

From Figure 5.13, it can be observed that from all activities listed, most of the respondents say that the ICT devices are used mainly for official duty (about 77.7% of them), before other regular activities, which include checking and sending of emails messages at 76.8%, make and receive calls at 74.1%, and make and send SMS messages at 73.2%. Also, there's the usage of the devices for online learning and Information gathering at 59.8%. 36.6% of the respondents make use of the ICT devices for general digital activities.
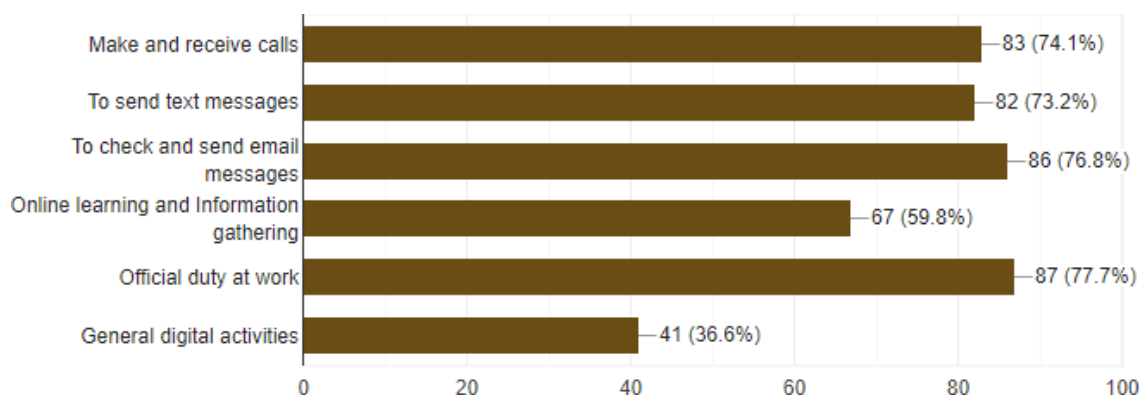
Figure 5.13: Chart showing the responses from use of ICT devices

5.2.15 Question 15: What application do you use most when connected to the internet (Google search, Google doc, Google Slide etc., None)

From Figure 5.14, it's worthy of note that again, their level of digital skills with regards to usage of the internet. Majority of them, about 83.9% and 80.4% of them know how to get onto the internet using chrome browser and get information from the internet using google search, respectively. 43.8%, 23.2% and 3.6% use internet explorer, Microsoft Edge and Safari browsers to access the internet. 0.9% use the opera browser and any other app. 44.6% are familiar with the Gmail, and Hotmail apps for accessing their email boxes. Other apps are accessed once the respondent is online irrespective of whatever browser that's being used. Google docs (17%) and google slide (3.6%) signify an additional digital skill that a few (17%) of the total respondents have.
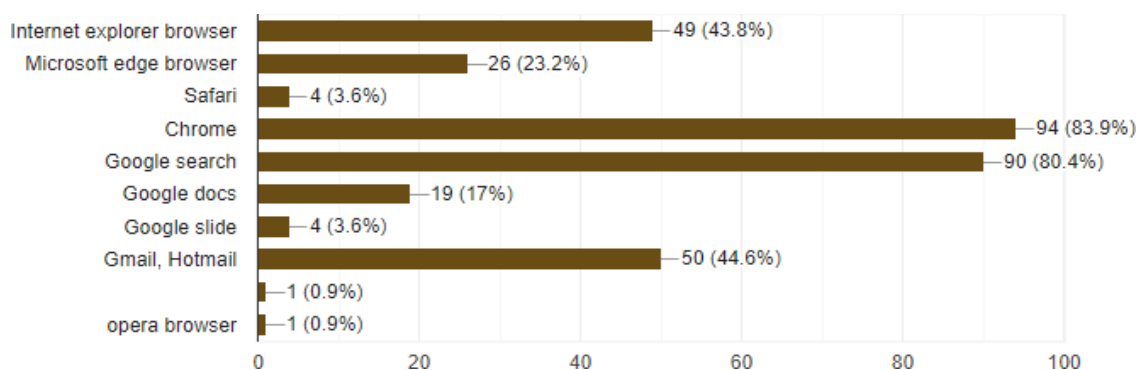
Figure 5.14: Chart showing the responses from application used most when connected to the internet

5.2.16 Question 16: What Online platform do you use often?

The chart in Figure 5.15, tells us that most of the respondents are familiar with several online platforms, the most popular being WhatsApp and Facebook at 83% and 69.9% respectively, followed by Twitter and Instagram at 52.7% and 51.8% respectively; Linkedin's usage falls into 33.9% of the respondents. 40.2% of all respondents use Educational learning platforms.
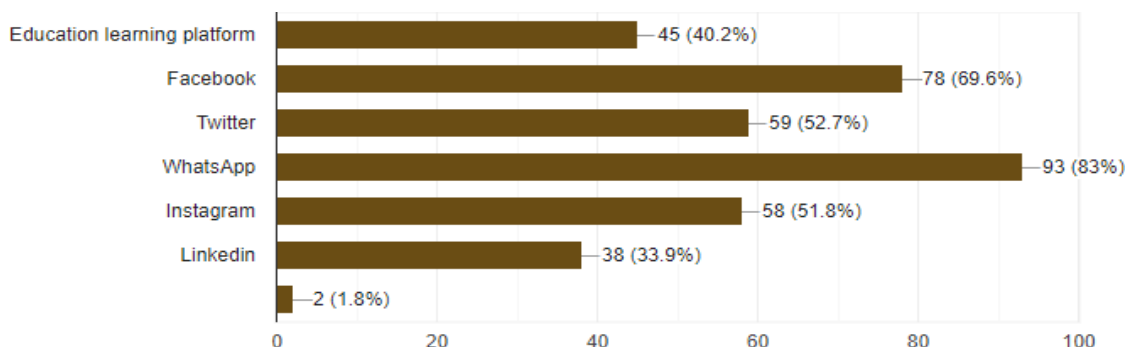
Figure 5.15: Chart showing the responses from most used online platform

5.2.17   Question 17: Do you have an ICT/Technical maintenance section in your office?

From Figure 5.16 below, 95.53% of the respondents confirm "Yes" that there is an ICT maintenance section at the workplace, while 3.57% said "No", while 0.89% said not sure.
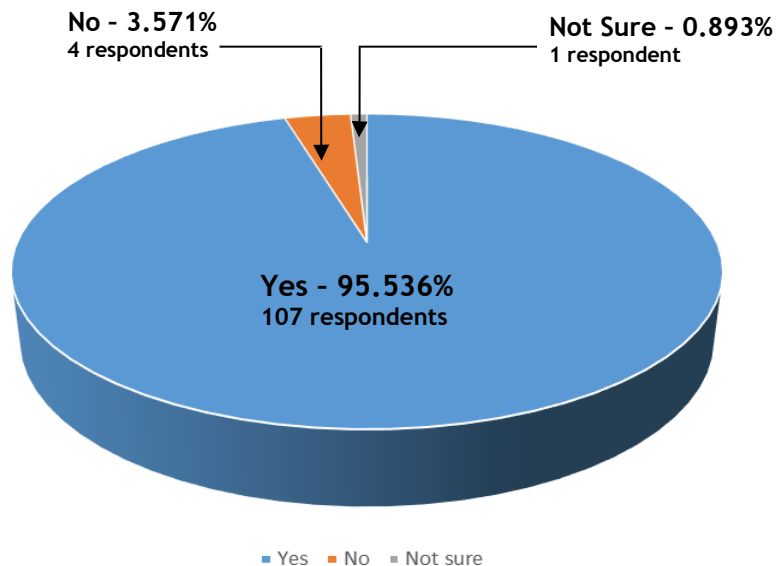
Figure 5.16: Chart showing the responses from if there is a ICT/Technical maintenance section

5.2.18   Question 18: Do you require any further training to operate any ICT devices?

Since from previous data, we understand that most of the respondents possess a higher education level, it also tells how keen they are on learning. That points to their attitude towards the ICT devices. The Figure 5.17 below shows that 86.607% agree that they need further training to operate any ICT device they think they are not familiar with. 6.25% say they don't need any further training, and 7.142% are not sure.
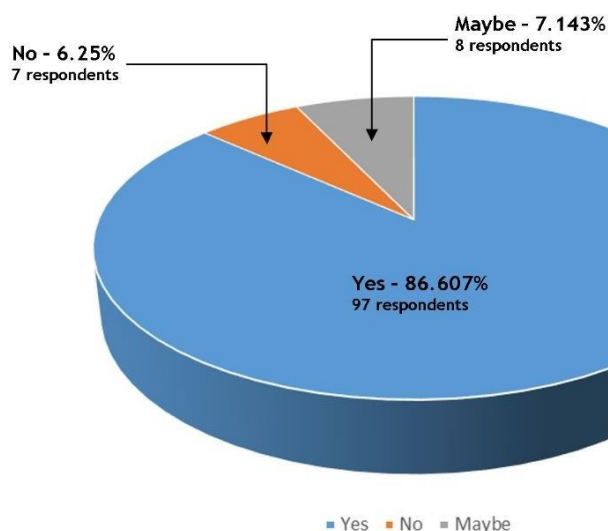
Figure 5.17: Chart showing the responses from respondent require any further training

5.2.19 Question 19: Which of these ICT devices can you operate effectively WITHOUT Training after your formal education? Tick as many as apply to you.

From Figure 5.18, it can be observed that most of the respondents do not require any form of training for using some of these ICT devices. About 93%, 79.5% and 67% use their mobile phones, laptops and desktop computers without any training; 2.7% can use fax without training; the other devices not requiring training include 37.5% of respondents on printers; 33% on Tablets; 37.5% on photocopier;35.7% on scanner; 25% on Modem and 9.8% on Routers.
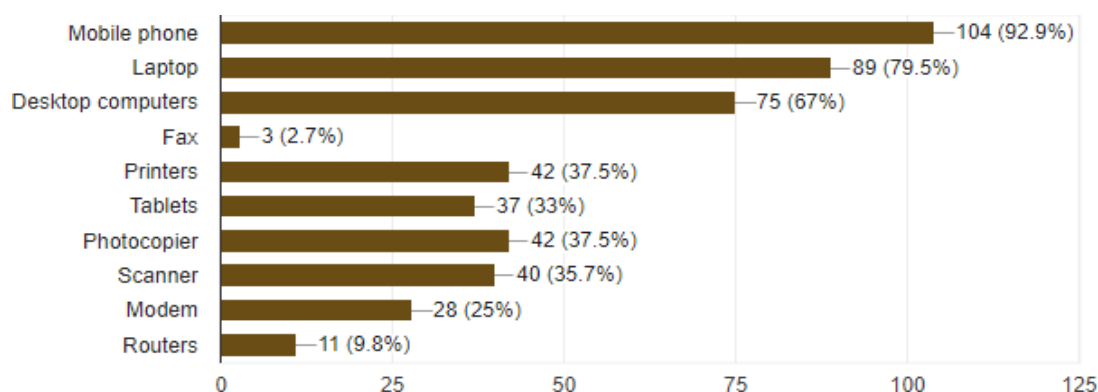
Figure 5.18: Shows the responses from devices respondent can operate effectively without training

5.2.20 Question 20: What computer software can you use effectively?

From data shown here in Figure 5.19, most of the respondents are familiar with Microsoft Word, Excel, Power point and Google Docs, being that the effective usage of these software programs among the total respondents ranks at 94.6%, 62.5%, 44.6% and 19.6% respectively. 14.3%, 12.5% and 8% of the respondents rank their effective usage level of Coreldraw, photoshop, and workflow management system respectively. Nobody knows how to use Miro and Padlet (0% each).
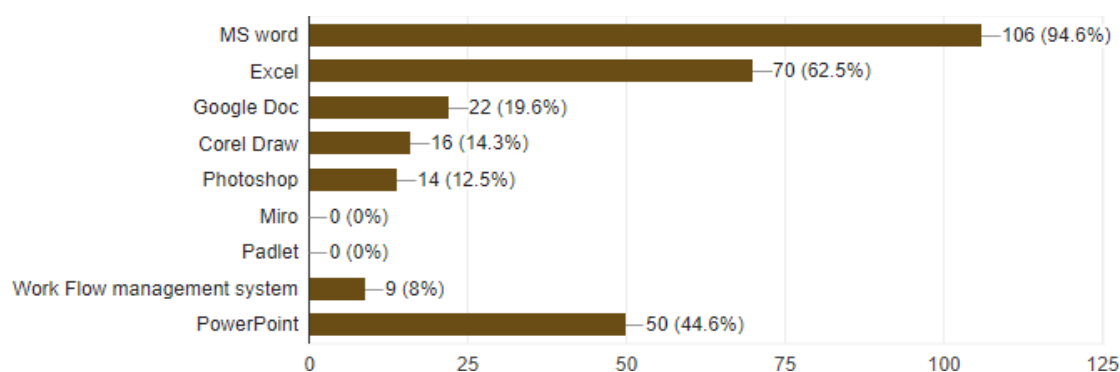
Figure 5.19: Chart showing the responses from computer software respondent can you use effectively

5.2.21 Question 21: What is your Monthly Salary range (in Naira). (Note: K = 1000. e.g., 10k = 10,000)

From Figure 5.20, it can be observed that the monthly salary range of the total respondents, is as follows: 0.89% of respondents fall into the 10k-20k and 20k -30k respectively; 10.71% fall into the 40k-50k range; 11.60% of the respondents fall into the 30k-40k and 60k-70k respectively; 5.36% of them fall into the 70k-80k range and only 6.25% fall into the 80k-90k range; those in the 90k-100k bracket makeup 8.03%; 40.18% of the respondents fall into the 100k-200k range while 4.46% of the respondents receive 200k-500k monthly. No one exceeds 500k monthly.

(**It is worthy of note that NGN 500,000** is equivalent to **$1,082 USD monthly as highest paid**)
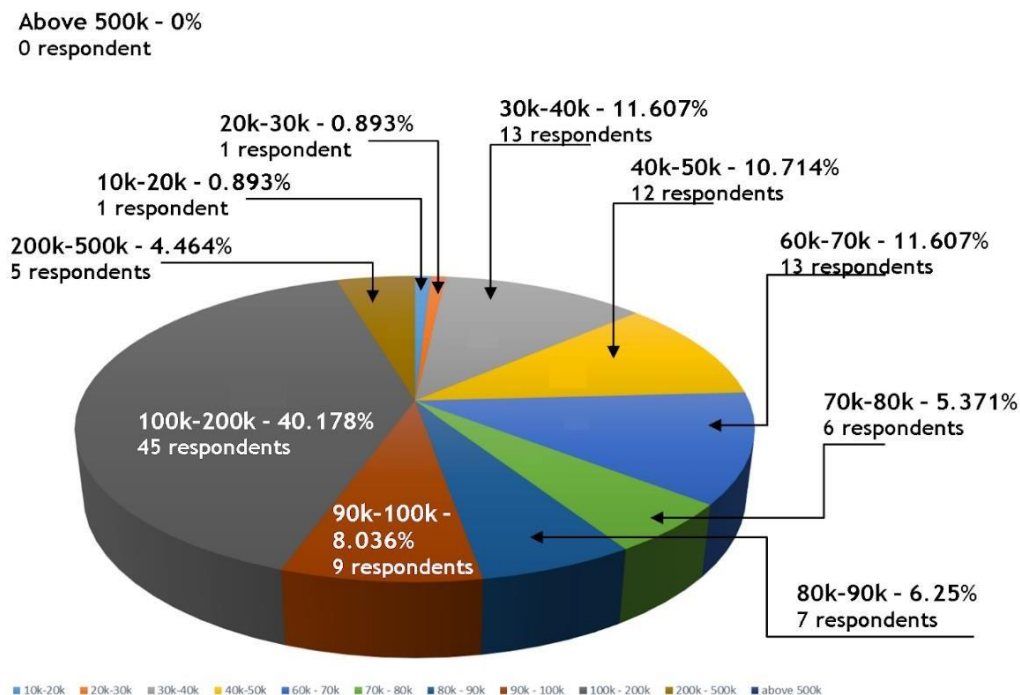
Figure 5.20: Chart showing the responses from monthly salary range

5.2.22 Question 22: How comfortably can you buy an ICT device from your Monthly salary?

In the purchase of ICT devices from monthly salary, the figure 5.21 shows that 1.79% say they are very comfortable; 16.07 say they are comfortable; 64.28% say that they are NOT-comfortable while 17.86% say not at all.
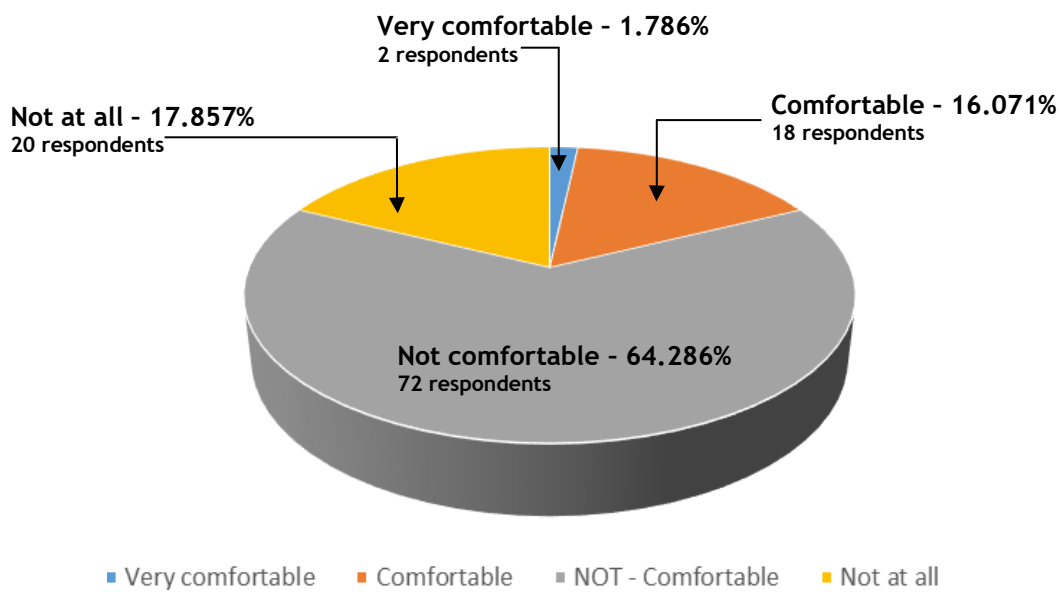
Figure 5.21: Chart showing the responses from if respondent can comfortably to buy an ICT device

5.2.23   Question 23: Which of these devices could you afford from your Monthly salary?

From figure 5.22, of the total respondents, from their monthly salary, 2.7% say they can afford a computer system; 61.6% can afford a smartphone, 3.6% can afford tablets, 37.5% can afford a Modem, 5.4% can get routers and 1.8% they are unable to buy any device; also for the small phone, small androd phone and simple android phones, only 0.9% respectively are able to make a purchase.
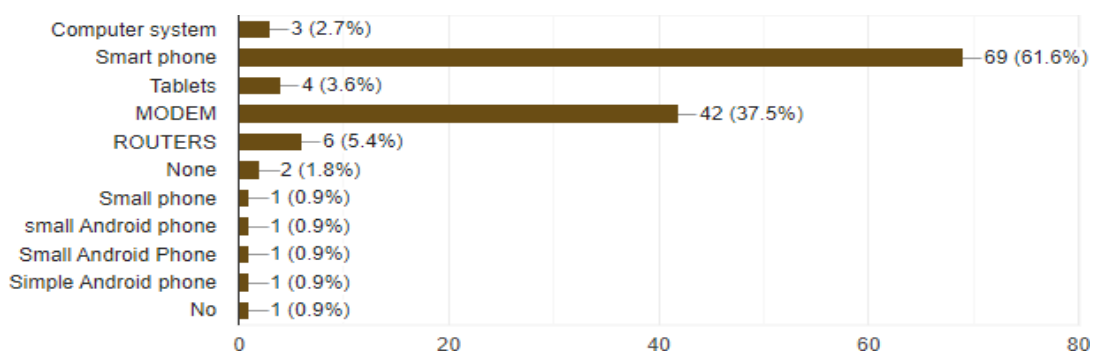
Figure 5.22: Shows the responses from which devices could the respondent afford from Monthly salary

5.2.24   Question 24: How often do you Pay for or subscribe for mobile broadband?

From the Figure 5.23 below, with regards to the regularity of payment for subscription for mobile broadband, 57.14% of the total respondents say that they subscribe "when they run out of data"; 16.07% subscribe "when their broadband subscription expires"; 24.11% make subscription payments "as long as there's money to buy data" while 2.68% do not subscribe at all.
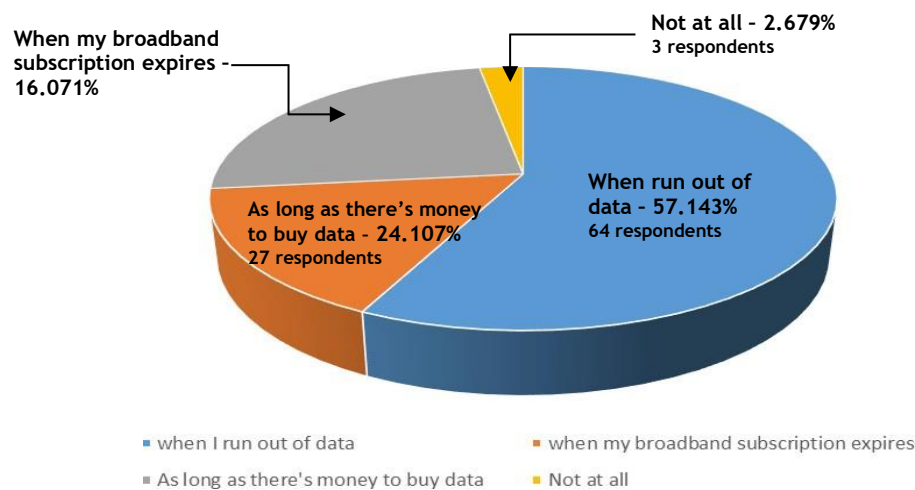
Figure 5.23: Chart Shows the responses from how often do respondents subscribe to mobile broadband?

5.2.25   Question 25: Are you discouraged by the quality of internet service you have? If yes, select your reasons.

Figure 5.24 shows the level of discouragement from the respondents regarding the quality of internet service. 28.57% say "Yes, it's too expensive"; 41.96% say "Yes, it's too slow"; 16.96% say "yes, Not available all the time (OFF and ON) while 12.5% say "No, I'm not discouraged".
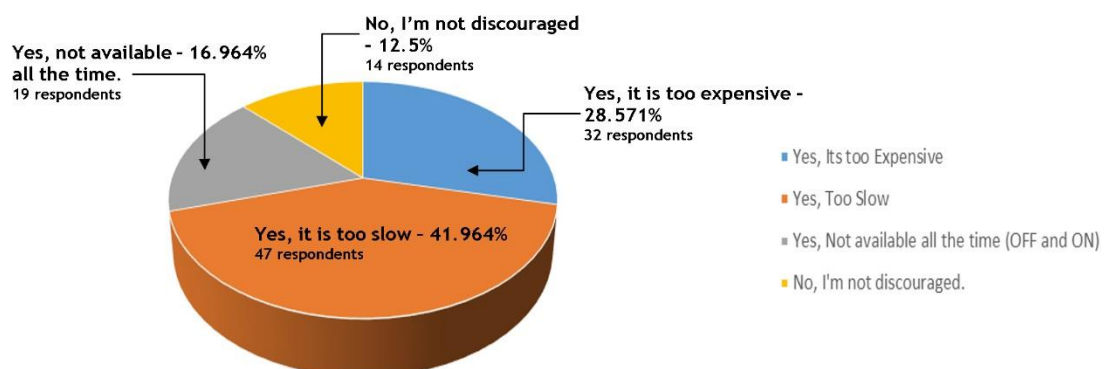
Figure 5.24: Chart shows the responses of respondents are discouraged by the quality of internet service

5.2.26   Question 26: What type of internet connection do you have in your office?

From Figure 5.25, 49.10% say they have a "cable" type of internet connection; 50.89% say they have "wireless" while no one agrees there is no form of internet connection.
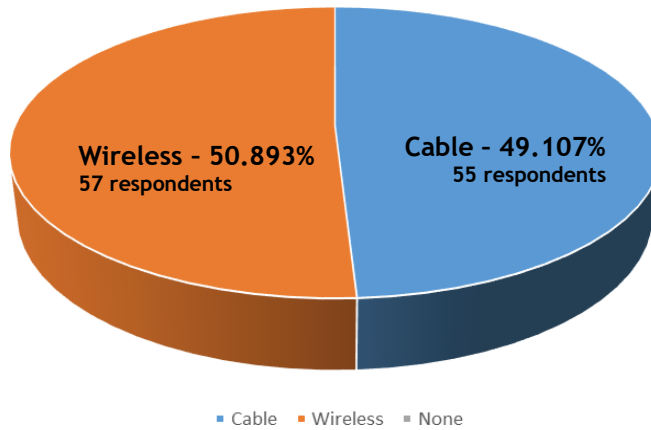
Figure 5.25: Chart showing the responses from type of internet connection

5.2.27   Question 27: What type of network broadband subscription are you using in the office?

From Figure 5.26, it is observed that there's 0% respondent for 2G broadband subscription. 16.96% confirm they have 3G subscription; 76.785% confirm that they have 4G subscription, while 1.785% say they have 5G subscription. The remaining 4.46% say that there is no broadband subscription.
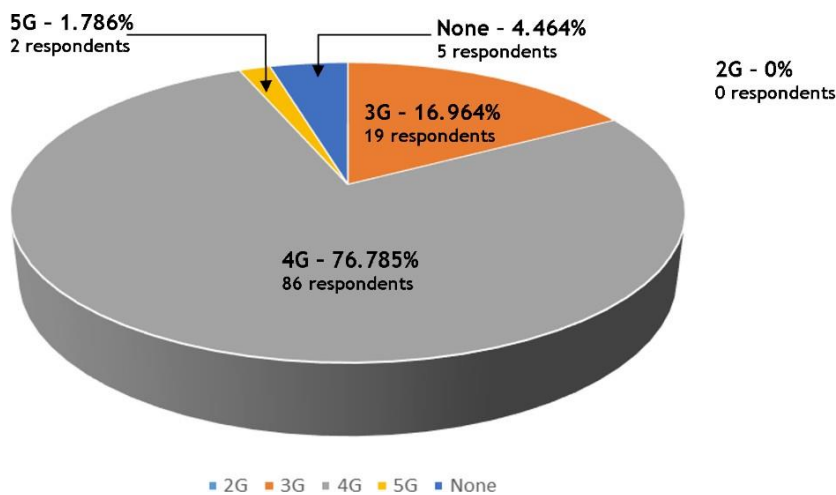
Figure 5.26: Chart showing the responses from type of network broadband

5.2.28   Question 28: Is there 24/7 power supply at your office?

From figure 5.27, it is observed that 20.535% of the respondents say "yes" while 79.464% say "No" regarding the state of power supply in the workplace.
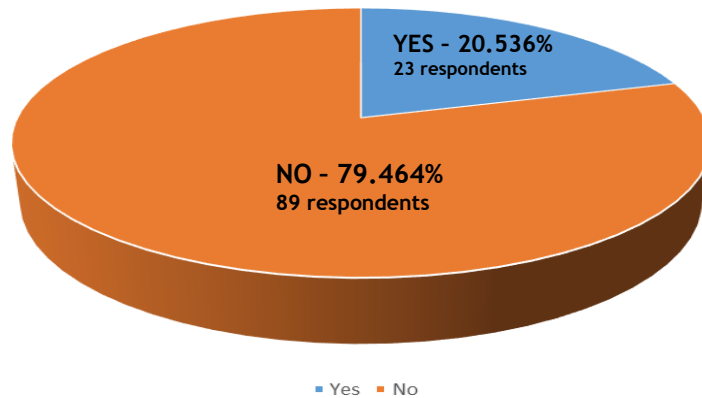
Figure 5.27: Chart showing the responses for if there is 24/7 power supply at the office

5.2.29   Question 29: Which of the following describes the location of your office? Where is your office located?

From the Figure 5.28 below, it is observed that 100% respondents agreed that their workplace is located in the "Urban area (City). No one has a different opinion.
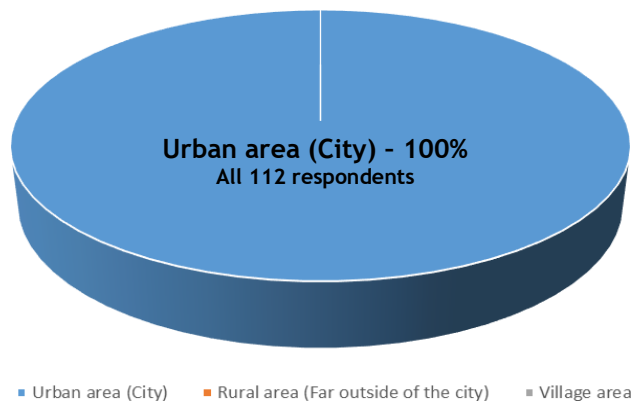
Figure 5.28: Chart showing the responses for location of your office

5.2.30   Question 30: How is the Network Quality in your office location?

From the Figure 5.29, it is observed that from the total respondents, 3.57% say the network is "very fast"; 39.28% say that it is "fast"; 53.57% say that it is "slow" while 3.57% rate it as being "very slow".
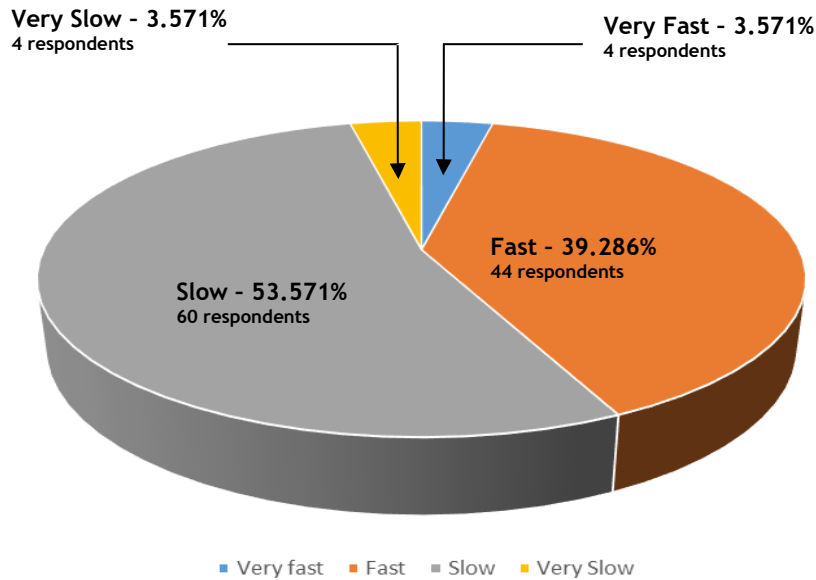
Figure 5.29: Chart showing the responses from Network Quality

5.2.31   Question 31: Does the government make provision for ICT devices in your office?

From Figure 5.30, it is observed that 88.39% confirm a "Yes", that the government makes provision for ICT devices in the office while 11.61% say "No".
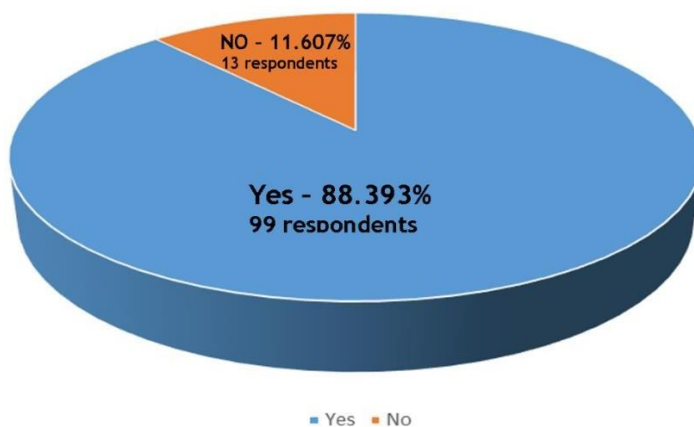
Figure 5.30: Chart showing the responses from Government provision for ICT

5.2.32 Question 32: Do you have your own ICT device given to you by your office?

From table 5.31, we observe that 39.28% confirm "Yes" to being given their own ICT device by the office while 60.71% say "No", they are not given any ICT device.
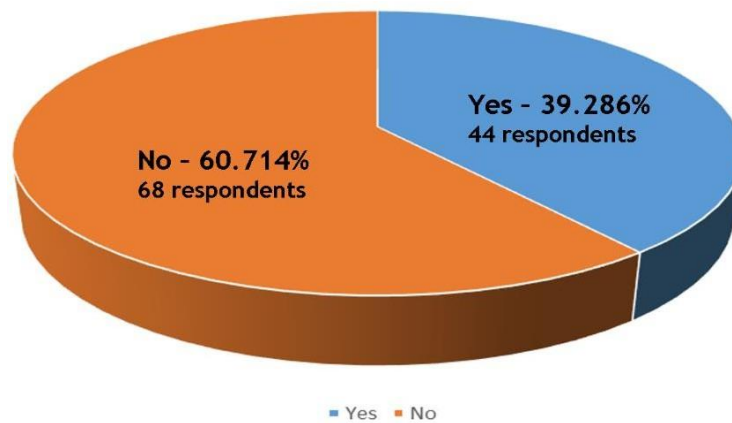
Figure 5.31: Chart showing the responses for the "ICT device given to you by the respondents office"

5.2.33 Question 33: How often do they change the ICT device?

In table 5.32, it is shown that from the total respondents, 3.57% of them say that the ICT device(s) is(are) changed between 2-4 years; 0.89% say they are changed between 4-6 years; 86.60% say the ICT devices are not changed "until device breaks down", while 8.93% say "Not at all", meaning that the devices are not changed at all.
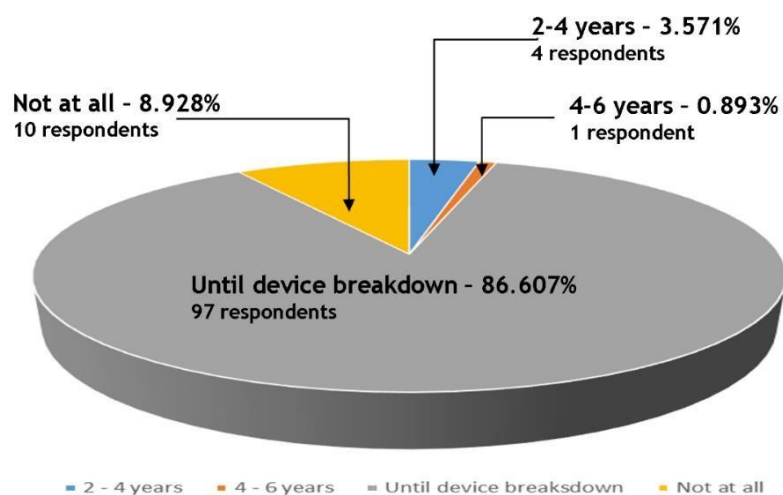
Figure 5.32: Chart showing the responses from how often do they change the ICT device?

5.3 *Result Interpretation and Analysis*

The data (results) obtained from the survey show some interesting facts and discoveries. The data shows peculiar twists to existing findings from research works of literature. For the purpose of analysis, the data obtained will be interpreted under the following thematic areas namely:

- Organization

- Digital Attitude / Education level

- Economic concerns

- Technological Concerns

- Geographical location concerns and

- Government concerns.

The total number of employees in the Law reform commission was obtained from the addition of the total number of members of staff as indicated by the respondents. A total number of 208 employees were accounted for in the survey as seen in figure 5.6. Therefore, we conclude that this research work was able to obtain more than half of the total sample population having gathered 112 respondents on the questionnaire. Some of the employees were away on leave for different purposes, some had no technological devices to access the questionnaires, while others were averse to filling in questionnaires. The obtained data are presented in section 5.1. The analysis and interpretation of the results are as follows.

5.3.1 *Organization settings*

The research sought to know the settings of the Nigerian Law reform commission as a small part of a Nigeria country. The respondents were asked to state their department, the number of employees in their department and the position respondents hold in the organization. A total of nine departments were observed to make up the commission, with varying numbers of employees in each department as seen in figure 5.5. and figure 5.6. Positions such as Director, Assistant Director, Principal Officer, Senior Officer, Officer, Executive Officer were observed in all of the departments as reported in Tables 5.1a-i. It was observed that the higher the position of an employee, the higher the salary, hence, the greater the purchasing power of the individuals. We observed also from the survey, that the employee positional hierarchy has a direct correlation with the purchasing power of the employee.

5.3.2 Digital Attitude / Education level

The survey attempted to know the educational level of the respondents and their attitude to ICT/technological equipment. The result shows that 99% of the respondents were educated up to tertiary education level with varying stages. Some had postgraduate degrees as seen in figures 5.10 and 5.11. On the attitude to digital/ technological devices, about 93% of the respondents agreed that ICT devices were important for use in their daily work with varying degrees of importance ranging from Very, fairly and just important. It was a surprise to observe that some respondents don't find the use of ICT devices important at all in their daily work in this present age and time. 97% of the respondents agreed that they prefer to work with the use of ICT devices. We also observed that a respondent prefers not to work with ICT devices. On the duration of time used on ICT devices, we observed that 42.8% of respondents work 8 hours and more while 50.9% work less than 8 hours with the use of ICT devices. 6.25% of the respondents don't even use ICT devices at all as seen in figures 5.7, 5.8 and 5.9 respectively. The number of hours used on ICT devices may be a combination of several factors: Power supply, cost of access to ICT devices, Cost of internet connectivity and others.

We observed that smartphones are the most used ICT devices with almost 88.4% rating followed closely by Laptops at 74.1% as seen in Figure 5.12. We attempted to know what these technological devices were used for; it was discovered that 77.7% of the respondents used these devices for official duties, 76.8% use these devices to read and send mails and other uses as shown in Figure 5.13. It was observed that the respondents use more search engines whenever they are connected to the internet. This is depicted in figure 5.14. It may be for searching for information or other productive activities. WhatsApp and Facebook tops the most visited online platforms by the respondents at about 83% and 69.9% respectively as seen in figure 5.15. We went further to find out if the respondents needed any further training to use any ICT devices; 86.6 % needed further training while a very small percentage of 6.25% did not need further training to use ICT devices. This shows a sign of a high level of digital divide. We asked which device respondents could use effectively, mobile phones topped the chart with 92.9%, followed by laptop and desktop computers at 79.5% and 67% respectively. This is shown in Figure 5.18. The software the respondents can use effectively are the MS word and Excel at 94.6% and 62.5% respectively. 86.8% know there is a technical ICT unit in the commission. From this survey we can conclude that the respondents of the Nigerian Law Reform Commission are well educated, and can interact with both hardware and software components of ICT devices but they require further training to be able to add to the number of ICT devices they can operate effectively. It can be inferred that the higher the educational achievement and the higher the digital literacy the better the use of ICT devices. Also, the higher the capability of the individual interaction with the advanced ICT tools.

5.3.3 Economic concerns

Individuals need to be economically stable before they can afford to purchase ICT devices or subscribe to the internet services. We attempted to know the opinions of the respondent of their salary range. About 52% of the respondents earn between 90 thousand to 500 thousand naira (90, 000 naira is equivalent to $194.76 USD). It means Just about half of the respondents will be able to afford some basic devices. However, we asked for their purchasing powers of some

ICT devices from their monthly salary, about 81% of the total population of workers were not comfortable enough to purchase ICT devices. Note that mortgage and loans are not available for most government workers in Nigeria. About 61.6% of the respondents could however attempt to buy a smartphone but this was not still comfortable for most respondents. About 37% could afford to buy modems which is about five thousand naira which is equivalent to $10.82 USD. We investigated further to know how often they subscribed to mobile internet services, 57.1% when they run out of data, 16.1% when the internet bundle expires, 24.1% said as long as they had money, which means that if they don't have money there will be no subscription. We wanted to know if respondents are discouraged by the quality of internet service available. From the survey, a total of about 86% has varying degrees of negative remarks from being too slow, to being too expensive to being epileptic. This shows a very poor availability of internet service. This contributes to the digital divide.

5.3.4 Technological Concerns

The survey attempted to know the type of internetwork connection available in their offices. 49.1% had cable connection while 50.9% had wireless connection. This type of network distribution is due to the position held by an employee in the commission. A senior employee gets a dedicated wireless device, while the junior employee gets to share the cable ports connected to several offices. The type of broadband in the office shows that 4G was the highest choice from respondents at 76.79%. But because it will be shared by a number of employees, we observed that the respondent said the connectivity was slow.

5.3.5 Geographical location concerns

We attempted to know the location of the Nigerian Law reform commission. We observed from the survey report that all the respondents agreed that the commission is located in an urban center. 100% of the respondents confirmed that the office is located in the center of the city. We were surprised to note that the facilities that should be part of the urban life were absent or available minimally. We observed from the response of the respondents that power was not available for 24 hours and internet facilities were slow.

5.3.6 Government concerns

We attempted to know if the government made budgetary provisions for the commission; it was observed that about 88.4% of the respondents agreed that the government provided for ICT devices and the others said the government did not make any provision for ICT devices for the commission. Since the government made provision for ICT devices, we attempted to know if the employees had personal ICT devices given to them in the offices, 60.7% of the respondents had no ICT devices given to them in the office to carry out their official tasks. This situation looks so worrisome, if the government provided for the purchase of technological devices, why was it not given to employees to improve their performance? We can infer that there may be inconsistency in the procurement of the ICT devices provided by the government. We attempted to know the replacement plans of ICT devices. We observed that a high percentage of the

respondents said their devices were only changed whenever they finally break down. 86.6% of the respondents said their ICT devices will only be changed if they break down. It can be inferred that obsolete ICT devices could still be in use as long as they are still working. The use of obsolete devices cannot be said to be altogether positive access to technological devices. We sought to know the situation of power supply to the commission. We observed from the response that 79.5% of the respondents said there was no 24-hour supply of power to the commission's offices. The lack of power supply, which is the backbone of all ICT devices is a major contributing factor of digital divide as most devices cannot be used efficiently and effectively.

5.4 Hypothesis Testing/validation

Table 5.4.1: This table shows the validation of the hypotheses

Hypotheses	Tag	Factors	Supported/ Not Supported
1 a) The Higher the Educational level, the lower the digital divide experience and vice versa. b) The Higher the Digital literacy level, the lower the digital divide experience and vice versa.	H1	Human Factors	1. a) Not Supported 1. b) Supported
2 The weaker the organizational leadership, the higher the digital divide experience	H2	Organizational factors	Supported
3 a.) The easier the material access to ICT devices, the lower the digital divide experience. b.) The higher the availability of internet infrastructure the lower the digital divide experiences.	H3	Technological Factors	3. a) Supported b) Supported
4. The lower the income level, the higher the digital divide experience	H4	Economic Factor	Supported
5 a.) The lower the power supply coverage over a region, the higher the digital divide experiences b.) The Higher the internet tariff, the greater the digital divide experience	H5	Governmental Factors	5. a) Supported b) Supported
6. Urban areas experience a lower digital divide than Rural areas	H6	Geographical factors	Not Supported

Chapter 6

6.1 Discussion

In this section we discussed what we discovered from our findings. Also, we related them to what we observed in the literature so as to answer the research question for this thesis.

This research has been able to establish most of the facts that we discovered in the literature and also discover new facts. After our result interpretation, we observed some findings. The gender divide is gradually closing in Nigeria from our finding as the percentage of males to females was about 42 to 49. If we compare this to the African statistic of gender parity that was between 24 percent versus 35 percent for female and male as at 2021 (ITU, 2021), it shows that there is a reduction in the parity regarding females to males in Nigeria. This means that more women are having access to ICTs and the internet as well as using the internet and the ICT devices than before. In terms of age, it was discovered in the ITU (2022) that 71% of the people between the age of 15 to 24 use the internet than 57% of the other age. But in this research, our findings reveal something different as we discovered that only about 11 % of the respondents between the age range 18 to 30 used the internet and the ICTs less than 89% of the older age. The reason for this may be that this age range is less likely to be employed in NLRC. This however cannot be ascertained at the time of writing this thesis as the empirical data collected did not reveal findings as to why the percentage for young people between the age range 18-30 was less than the older age.

Perhaps such reasons could be confirmed or refuted in future research which may be much wider in scope, covering a much larger environment or interstate-wide population sample, thereby allowing for thorough and rigorous research engagements. Also, we observed in our finding that 66.07142857% of the respondents were married, 26.78571429% were single (unmarried), 4.464285714% divorced and 2.678571429% were widows or widowers. More so, we discovered from our findings in this research that the NLRC workers' positional status directly affects the economic and purchasing power of the employees. The higher the position of an employee in the organization, the more income and preference to access technological devices provided by the government. This finding supported what was discovered in the research work of Van Dijk (2020) that the positional category of an individual determines the resource available to him/her, and this further determines his/her access to ICT devices as well as the usage of ICT devices. The economic status of an individual is correlated to the quality of life he/she can experience. As we discovered from our result, a little more than 52% of respondents make between 90,000 and 500,000 Naira per month (NGN 90,000 (Naira) is equal to $194.76 USD and NGN 500,000 (Naira) is equivalent to $1,082 USD). It cannot be imagined how life will be so difficult for people receiving this range of salary monthly, considering the fact that a large percentage of the people in NLRC are married. They will need to take care of their family as well as pay bills from this income.

That is the reason why 81% of the sample population said that they could not afford to purchase ICT devices. This is one of the reasons why the poverty rate is so high in Nigeria. This supported the evidence in the research work of Nnamani (2022) as Nigeria was rated so low on the affordability of internet access. Nigeria was said to have the most expensive internet in the entire world in the year 2021 (Nnamani, 2022). Therefore, our findings support the research work of Begazo, Dutz and Blimpo (2023), that the high price of the internet increases the digital

divide experienced by the people. This is a very tough situation; it cannot be imagined the number of months many workers would save and endure in order to be able to pay bills and attend to important things in life. As a result of this difficult situation where many Nigerian civil servants find themselves, a lot of them see the internet and the usage of ICT devices as not being important when they prioritize their needs, therefore it is seen as a luxury. The kind of income the workers in NLRC receive will make digital divide continue to exist in Nigeria as many workers cannot afford to pay the cost of internet tariff from their salary. Our findings supported what was discovered in the research work of Okocha and Edafewotu (2022) and Okunola (2021) that people in the low-income bracket have less access to the internet and ICT devices, thus increasing the digital divide due to the high cost of the internet (Nnamani, 2022).

We observed from our finding that though the level of education was high among the employees of the commission with 99% of them having tertiary education, their interaction with ICT devices was barely 50%. Up to 80% of the employees still need further training to operate some technological devices. We can therefore discover that only a high level of education does not mean that an individual can use digital technology effectively. Our finding therefore does not support that only a higher education level can lower the digital divide as observed by (Okocha & Edafewotu, 2022). For an individual to be able to access and to use ICTs, that means a high level of education coupled with other factors such as income has to be enough for such individuals to be able to afford other technology courses that can enable him/her to acquire digital skills. This supports the research work of Van Deursen and Van Dijk (2019) and Van Dijk (2006) where it was discovered that people with high income and higher levels of education tend to have higher digital skill to use databases, spreadsheets, and presentation-related applications more than people with lower income and lower levels of education.

Furthermore, we observed from our finding that the leadership of the NLRC is not carrying out sufficient allocation of ICT devices to their staff, despite the fact that provisions are being made by the government. 88% confirmed that the federal government made provision for ICT devices while 66% said that the commission did not give them the ICT devices to carry out their office work. If a high percentage of workers are not given ICT devices to work, that means their performance level to the success of the commission will be very low due to the digital divide. Coupled with the fact that the ICT devices are not being changed on time for those that are given until it breaks down, this shows that many workers will not be able to work effectively due to the obsolete ICT devices which may malfunction at times and this will definitely reduce their performance to the success of this organization. In that case, such a workplace will continue to experience retardation in terms of development. NLRC being one of the federal government agencies, its operation is crucial to the development of the Nigeria country as they are involved in the reforming of all the federal laws including those laws that will make the country experience a high level of technological advancement. But it is observed from our findings that NLRC experiences weak leadership. This finding supported what said in the research work of Begazo, Dutz and Blimpo (2023) and Okocha and Edafewotu, (2022) where they cited (Onyishi & Ezechi, 2019; Abegen & Nambeh, 2019; Eteng, 2016) that poor leadership is one of the problems facing Nigeria as a nation. As it can be observed in our findings that weak leadership contributes to the digital divide in Nigeria.

In addition, we observed from our finding that despite the fact that the Nigerian law reform commission was in an urban area, it did not enjoy the advantages of being in the urban center. There was no constant power supply as about 80% respondents confirmed this and the internet service quality was slow. We found out that technological factors such as internet infrastructure, and type of broadband material access by the employees were still very slow because a large number of employees shared the broadband available despite the fact that about 77% confirmed

that 4G was used in the workplace. This led to the poor quality of internet service the employer experienced according to the findings we observed. This finding did not support what was said in the research work of Begazo, Dutz & Blimpo (2023), ITU (2021) and World Bank (2016) that people in the urban areas enjoy higher quality of internet than the rural area. Our finding shows that the urban city of Nigeria suffers poor internet service quality, same as the rural areas. There is no nation in the world that can reach a high level of development without a good electricity supply. No one can imagine how the epileptic level of the electricity power supply in the rural areas of Nigeria would be if the urban center can suffer poor power supply according to what was discovered in this research finding.

Before we can talk about access to ICT devices and the usage of it, poor electricity power supply is the number one problem that has to be solved because without power supply there is no way an individual can use ICT devices even if he/she has one, this will make digital divide continue in Nigeria. The Nigerian government needs to wake up to its responsibility by ensuring that twenty-four-hour electricity power supply is made available for its citizens. This finding supported what was said in (Okunola (2021), ITU (2021), ITU (2022), Okocha and Edafewotu (2022) that poor power supply contributes to digital divide.

6.2 Implications from Findings

This research work has brought to the fore some findings that had previously been held as acceptable in the literature but proved not to conform when tested with our hypothesis. For example, it was observed by Okocha and Edafewotu (2022) that the level of education has a direct and positive correlation to a reduced digital divide; however, our result does not hold true for this fact. The percentage that had higher education was higher but the digital divide experience was observed to still be very high.

Opinion from literature holds as observed by Begazo, Dutz and Blimpo (2023), ITU (2021) and World Bank (2016), that location contributes to digital divide, the closer you are to the urban centers, the lower the digital divide experience. However, the finding from this research shows that: though the sample space was in the urban center, the level of digital divide experience was so high. Therefore, it is important to research digital divide holistically where factors are not considered or interpreted in isolation. Multiple factors should be evaluated before a factor is concluded to have reduced digital divide or contributed to it. The context of the sample space should also be put into consideration as generalization and assumption on what is known may be misleading and detrimental to the research process and findings. Periodic study should be conducted to see if there are improving conditions on the sample space or if there are worsening conditions. Just like the study of weather where periodic studies are being carried out to determine average weather over a period of time.

Although our research was situated in the context of Nigeria, some of our findings agreed with some prepositions from literature; agreeing with theories and testing positive to some hypotheses. For example, low purchasing power contributes to and affects digital divide, as this was also observed in the research work (Van Deursen & Van Dijk, 2019; Van Dijk, 2006). Also, new findings from our research show that the earlier individuals are exposed to ICT devices, the easier it is for them to overcome the fear of interacting with ICT devices hence helping to reduce digital divide. Government policy in providing infrastructure was seen as a major impediment to improving digital divide.

Chapter 7

7.1 Conclusion

This research focuses on investigating the factors that cause the digital divide in Nigeria. It enables us to answer the research question "What factors cause digital divide in the context of Nigeria?" The results of the hypotheses tested and validated in table 5.4.1 answered the research question by showing the factors that cause the digital divide in Nigeria. These factors include:

- Human factors: lack of digital literacy
- Organizational factors: weak leadership
- Technological factors: lack of material access to ICT devices, and lack of internet infrastructure.
- Economic factors: low income
- Government factors: poor power supply, high cost of internet tariff or subscription
- Geographical location; people who live in the urban areas experience a high level of digital divide as well rural areas of Nigeria.

For Nigeria, the first challenge to be tackled before any other factor is the issue of power supply; because it is epileptic. This is because without adequate power supply, the discussion of bridging the digital divide gap cannot be initiated, let alone tackled. Therefore, to reduce the level of digital divide in Nigeria, we recommend that the Nigeria government look for alternative means of generating electricity from renewable energy sources so as to counter the epileptic electricity power supply. Also, we recommend that the government should create digital technology education centers across every community in the country. We advise the Nigerian government to reduce taxes for all ICTs investors as this will improve digital devices and the internet affordability rate in the country. Lastly, the government should create an independent agency that would be responsible for monitoring and checking ICT devices distributed across the government agencies in the country.

Looking at the findings of our research, we discovered that despite the higher education level of the workers, the larger percentage of the workers said they could not afford the internet and the ICT devices from their monthly income. This financial incapability prevents a large percentage of the population from acquiring the digital skills necessary to get information. To solve this problem in the developing countries and Africa at large where low income and affordability problems contribute to digital divide, the policy makers across the developing countries should look beyond ICT initiatives and initiate a policy of removing taxes for all digital technology investors in those regions as this will encourage many investors into the regions which will eventually reduce the cost of the digital devices and the internet. This will reduce the digital divide experienced by people to a minimum.

7.2 Future Work

We propose that future researchers should investigate the factors that cause digital divide in Nigeria using a mixed research method as this will let out new discoveries which we have not been able to elucidate in this thesis. We also propose that future researchers should investigate the effect of marital status (in African context) on digital divide.

Appendix A: Literature Review table

Table 1.0

(S/N)	Author Name(s)/ year of Study	Title of the Research	Focus (Aim and Focus) of Study	Theory (ies)	Concepts responsible for digital divide	Methodology	Results/Findings related to our Research	General Findings of digital divide in Nigeria	Limitations	Implications of the Research
1	OECD, 2001	Understanding the digital divide	Understanding the digital divide and how to tackle /overcome it		-Income level -level of education -PC availability -Communications Infrastructure.	survey	Indicators such as income, education, availability of PCs and IT infrastructure determine The digital divide among households appears to depend primarily on two variables, income and education. As at 2001, Majority of internet hosts are in South Africa.	Low income and low education affects access and availability of PCs, and internet access in both individual and household level.		The research has helped broaden our perspective on the extent to which the digital divide has eaten into the fabric of the African economy. Certain policies proffered such as development and improvement of Network infrastructures, internet and device diffusion to school and other public institutions, should be implemented to help enhance the gap closure of the digital divide.

2	Cardona, Kretschmer & Strobel (2013)	ICT and productivity	Focuses on how IT/ICT can enhance or contribute to productivity			survey	IT investments provide value and positive impact, but the impact depends on the levels of complementary resources and competitive climate			
3	Cariolle, J. (2021)	International connectivity and the digital divide in Sub-Saharan Africa	The impact of Submarine Cable(SMC) deployment on the digital divide in a sample of 45 SSA countries.		Poor infrastructural deployment High internet tariffs High tax burden incurred by telecom operators		The laying of SMCs made some appreciable improvement in interconnectivity, and therefore improved internet penetration. Disparities still exist among the population subgroups - between richer and poorer, urban and rural, men and women, educated and less educated persons.	International connectivity and the digital divide in Sub-Saharan Africa	The impact of Submarine Cable (SMC) deployment on the digital divide in a sample of 45 SSA countries.	
4	Tewathia, N., Kamath, A. & Ilavarasan, P.V. (2020)	Social inequalities, fundamental inequities, and recurring of the digital divide: Insights from India.	The research offers a novel viewpoint on the connections between India's social inequalities and the digital divide using a large-scale national		Gender, age, social status, education, income, professional skill, digital skill	Survey	Data analysis findings show that lower caste, lower income, and less educated strata are further marginalized because they lack both ICT assets and skill sets.		Although caste, occupatio n, and education were the main factors in this research work, the	The process of inclusion that focuses only on providing people with access to ICT devices and connections or that simply digitizes different economic sectors is myopic and may even widen the digital divide. Therefore, in order to extend the benefits of technology to the groups who were and still are excluded from ICTs, much more needs

			quantitative dataset.						research was unable to include location and religion. Meanwhile both of these elements might have provided the research with insightful information and advanced the conversation.	to be done than simply addressing supply-side problems with ICTs
5	Kusuma, H., Muafi, M., AJI, H.M. & Pamungkas, S. (2020)	Information and communication technology adoption in small-and medium-sized enterprises: Demographic characteristics.	the goal of this research is to examine the relationship between the demographic traits (gender, educational qualifications, age, managerial status, and years of	agency , human capital, and upper echelon theory.	Education, age, gender	survey	significant disparities were found to exist among the age compositions, education, managerial status, and years in business experience	age compositions, education	The research did not cover the leadership style used by SMEs in relation to ICT adoption	By choosing the best technology and taking into account the most crucial acceptance factors, primary benefits, and appropriate strategies for addressing the potential constraints of ICT, owners and managers of SMEs can take proactive steps to support the adoption of ICT in their organizations.

			business experience) of SMEs and the underlying causes of their adoption of ICT.							
6	Fuchs, C. and Horak, E., 2008.	Africa and the digital divide	How the digital divide affects Africa and What solutions can be employed.		Material access ICT skills Internet usage		Lack of Material internet Access Lack or poor digital skills poverty	Lack of internet Access Lack or poor digital skills, Poverty Low economic and development status	-	Research has shown that the digital divide is a problem for Africa that is due to structural inequalities of the global network society which is a society characterized by global social and digital apartheid.
7	Van Dijk, J.A., 2020.	The network society	Issues that lead to digital divide and how	Technology appropriation theory.	Device diversity, Device opportunity, differences in internet skills, Material Access, Education level, Income status		Low digital literacy level Poor internet skills No internet access No device access Low education level	The same is observed/exists in Nigeria: Low device access Low digital literacy level Poor internet skills No internet access low device access Low education level	The research did not account for quality of devices during the investigation, such as processor speed, ram, difference between using a phone and a PC or table, in order to know if there's an impact on	This research reveals the inequalities in material access are present also in Africa and Nigeria. Also pointing out that income levels can affect device diversity and opportunity and consequently, intent access.

									the attitude of hte users towards accessing ICTs and the internet.	
8	Okunola (2021)	Millions of Kids in Nigeria Can't Learn Because They Don't Have Internet. How Do We Close The 'Digital Divide'?	Learning losses caused by the inequalities in access to ICTs and the internet		Low income, digital literacy, Lack of access ICTs		- Low digital literacy - Income levels -government policies -geographical restrictions	Low literacy and income levels Government policies Geographical restrictions Poor electricity		
9	Nnamani (2022)	Nigeria ranks 86th in a world survey assessing digital quality of life: A PC review of Surfshack's website and the DQL report.	An expose on the surfshark survey to evaluate the digital quality of lfe (DQL) of several countries worldover		Digital well-bing pillars: e-government, e-infrastructure, internet access affordability, and e-security	Survey	internet Quality data subscription is too expensive Low internet penetration rate	Rankings are very poor for Nigeria: e-security-66th, E-infrastructure - 86th, e-government - 95th, and internet quality - 99th.	-	The research shows how NIgeria fairs in the global scale of the digital economy, also pointing out what Nigeria stands to loose if drastic measures are not taken to improve the quality if her digital wellbeing.
10	ITU (2021)	Measuring digital development Facts and figures 2021	The aim is to get facts and figures of the digital technology so as to prioritize		Affordability, income, digital skill, poor digital literacy	modeli ng tools, forecas ting techniq	Gender divide, Generational divide (Age divide), Location divide			

			digital development in the minds of decision-makers and the international development community.		ues, Survey					
11	ITU, (2022)	Global connectivity report, 2022	Takes stock of the progress in digital connectivity over the past three decades. It provides a detailed assessment of the current state of connectivity and how close the world is to achieving universal and meaningful connectivity,		affordability	Survey	-Affordability as a major barrier to connectivity. - However, for others, the pandemic exacerbated the cost of digital exclusion. - Five strategies are at hand for policy-makers and regulators to navigate the digital transformation and connect the unconnected.	-The COVID-19 pandemic has led to a sharp uptake in usage of the Internet. -Affordability as a major barrier to connectivity. -the pandemic exacerbated the cost of digital exclusion.	-	The research has made vivid exposure to the fact that African countries, particular Nigeria, wasn't ready to operate a truly digital economy as its por status on many fronts has been exposed. It also points out the need for African countries to raise the urgency alert in order to make decisions that will build and improve on the digital infrastructure for the society to enjoy an improved digital wellbeing.
12	Van Deursen, A.J. & Van Dijk, J.A. (2019)	The first-level digital divide shifts from inequalities in physical access to inequalities in material access	investigates various factors related to material access in a large-scale representative sample of the Dutch population	Resources and appropriation theory	-income level,	Survey	-Age, gender, majority status, employment, education level, and household composition, as well as material resources (income), social resources (quantity and		They did not account for the quality of the devices under investigation.	

			How diversity in access and device related opportunities and attendant expenses for maintenance affects existing inequalities related to internet skills, uses, and outcomes.				quality of support), and Internet attitudes are all related to unequal ownership of devices and peripherals. -Males, majorities, and the employed, well-educated, and married people benefit most in terms of material access.		
13	Begazo, T., Dutz, M.A. & Blimpo, M. (2023)	Digital Africa: Technological Transformation for Jobs.	How that broader use of productivity-enhancing, digital technologies by enterprises and households is imperative to generate such jobs, including for lower-skilled people.		Low income, poor electricity supply	Survey	-internet availability increases jobs and reduce poverty in African countries -The average African business lags in the use of smartphones and computers as well as more sophisticated digital technologies that catalyze further productivity gains. -40 percent of Africans are below extreme poverty	-low income persons are not able to afford ICTs and internet access.	

						line,income can barely afford mobile data plans				
14	Okocha, D.O. & Edafewotu, E. (2022)	Bridging the Digital Divide in Nigeria	The concept of digital divide and how it can be bridged in Nigeria.	Diffu sion of Inno vatio n (DoI)	- Lack of infrastructure - Lack of financial resources - low or poor education levels	survey	- Poverty and infrastructural inequalities between rural and urban areas	Education lack of electrical i nfrastructure low income poor communicatio n Infrastructure High cost of PCs and smartphones geographical location		The research enables us to understand key issues that plague the Nigerian Digital Economy, preventing it from proper growth and development in order to bridge the gap created by the digital divide.
15	Bilozubenko, Yatchuk, Wolanin, Serediuk, & Korneyev (2020)	Comparison of the digital economy development parameters in the EU countries in the context of bridging the digital divide.	Focus is on the indicators related to the spread and use of the Internet (first level of digital divide), the level of digital skills (second level of digital divide), and digital services used by citizens in East EU countries to improve their quality of life (third level of digital divide).		First level digital divide (Access to ICTs and the internet) Second level digital divide (digital skills and usage of ICTs and the internet) Third-level digital divide (eGovernment and public services, eHealth, and eCommerce)	survey	Africa still shares in this digital divide sage, as does many european countries, the likes of Romania, Bulgaria. These factors still exists in Africa - Low internet penetration, poor digital and usage skills, and consequently, keeping the third-level from been actualised - that's gaining meaningful benefits from the digital realm. There is still a sizable coverage gap in Africa, where 18 percent of the population	As it is with Africa, so it is a reflection of whats happening across individual African countries. Nigeria is also affected by the Fundamental issues at the first-level digital divide:: High percentage of No Material access to ICTs and the internet. The second-level digital divide also follows suit with a high percentage of persons without basic digital skills in order to make good use of ICTs and the internet. This consequently leads to not being able to enjoy	-	This research sheds more light on what the three types of digital divde offers. Access to ICTs is the first and most obvious criterion used to investigate digital inequalities between and within countries. The research has revealed, differences in access, usage and benefits exist across Europe, and specifically in East EU countries. We have also seen that not necessarily increasing the growth of Internet penetration implies an automatic and proportional increase in digital skills or tangible benefits

							lacks access to a mobile broadband network with 11 percent of the rural population in Africa only has 2G coverage, and 18 percent of the rural population has no mobile network coverage at all	benefits of the digital economy (The third-level digital divide).		
16	Aragba-Akpore, (2022)	Nigeria: Bridging Digital Divide and Internet for All	This focus on revealing information about the digital divide and how ITU is making effort to bridge the gap.		Affordability, No material access to ICTs and the internet. This is still a major challenge.	Survey	Africa, has a lot to do with regards to catching up with been effectively connected to the digital economy, in order to avoid being lot out of the digital realm. The progress is still very slow across African countries.	Nigeria has broadband coverage of 44% and its target is 70% by 2025 (according to the national broadband plan(2020-2025). Nigeria is currently lacking behind, alongside other developing countries. Nigeria has keyed into the ITU initiative to connect the 2.7billion people by 2025 in other to hopefully catch up.	-	This research does well to inform us about Some 2.7 billion people will be connected by 2025 according to ITU. This proffers the opportunity for countries to seize the opportunity to improve their odds with regards to joining the digital economy and gaining from it.
17	Sin, Franz, Munteanu, & Barbosa Neves, (2021)	Digital Design Marginalizatio n: New Perspectives on Designing	The focus of the research is on the impact of marginalizing designs on	Digit al Desi gn Mar ginal isati	Digital skill, age	mixed metho ds		Adoption of frameworks like inclusive design, universal design, accessibility, and	The framework s do not fully reflect, capture, or address	

		Inclusive Interfaces	older adults. The goal is to give designers, service providers, and policymakers a conceptual lens they can use to intentionally lessen or avoid digitally marginalizing different user groups.	on (DDM) framework				ability-based design	the digital designs or design processes that may have an adverse effect on users beyond the immediate use of the design, including factors like the users' social well-being or economic status	
18	Ma, Chan & Tech 2020)	Bridging the digital divide for older adults via observational training: Effects of model identity from a generational perspective	Focus is on investigating how the use of training programs for older adults can enhance their acceptance and use of technology.	Social cognition theory.	-Congnitive skills. -digital literacy - Older adults -	Survey	Digital divide still exists in Africa, especially among the elderly. Their inability to Low digital literacy Disengaged form the digital world	In Nigeria, the same inequality exists, which affects the elderly, coupled with poverty Lack of digital literacy. - Lack of Education (formal training)			The research enlightens us concerning the plight of the elderly in society today, with regards to their participation in the digital economy. The elderly are still left out of the digital economy due to their inability to handle modern devices. Training platforms should be created in order to increase their intention and improve their attitude towards new technologies, and therefore, bridge the gap among older adults.

Appendix B: Survey Questionnaire

Figure B: Snapshot of Survey Questionnaire

Survey Questionnaire

The Factors that Cause Digital Divide in Nigeria

Good day sir/ma, I am Omolara Francisca Oluda and my partner Chimechefulam Glory Josephs, Master Students in Information Systems, from Lund University, Sweden, School of Economics and Management, Department of Informatics. We are conducting research on the causes of digital divide in Nigeria.

The aim of the research work is to investigate the factors causing digital divide in Nigeria: Nigerian Law Reform Commission as our target population. We will be glad if you could spare 2 to 5 minutes of your time to respond to these questions to the best of your ability. Information gathered through this survey will be used for research purposes only and will be treated with strict confidentiality.

For any inquiry, please contact the researchers through the details below.
oludafrancisca@gmail.com.

Thank you.

"*" Indicates required question

Biodata demographics - Tick where Appropriate

- What is your gender? * ○ Male ○ Female ○ Prefer not to say ○ Others ....

- Marital Status: * ○ Single ○ Married ○ Divorsed ○ Widow/Widower

- What is your age range? * ○ 18-30 ○ 31-40 ○ 41-50 ○ 51-60 ○ 61-65

- At what age did you start using computer and other ICT devices? *
  ○ 0-10 yrs ○ 10-20 yrs ○ 20-30 yrs ○ 30-50 yrs ○ 50-65+ yrs

Organization settings - Tick where Appropriate

- What Department are you working in? * _____

- How many persons are in your department? * _____

- What position do you hold in the office? * (Example - Director, Manager, Admin. Officer, etc.)
  _____

- How important is an ICT device for your daily task at the office? *
  ○ Very important ○ Fairly important ○ Important ○ Not Important ○ Not sure ○ Not at all

- Would you prefer to work without the use of ICT device in your office work? *
  ○ Yes, I would prefer to work without ICT device -1 ○ No, I need computer/ICT device -2 ○ Not sure - 3

- How long do you spend on the Computer/ICT devices at work? * ○ 8 hours ○ More than 8 hours
  ○ Less than 8 hours ○ Not at all

<u>**Digital Attitude / Education level**</u> - <u>Tick where Appropriate</u>

➢ What's your highest educational achievement? *
   ○ Primary level   ○ Secondary level   ○ Tertiary level

➢ For tertiary level, please indicate level *☐ NCE ☐ OND ☐ HND ☐ B.Sc ☐ B.Tech   ☐ Masters ☐ Ph.d
                                                                    ☐ Other: ————————————

➢ Which of the ICT devices do you use most? Tick as many as apply *.
   ☐ Smartphone ☐ Laptop ☐ Desktop ☐ Tablet ☐ Scanner ☐ Photocopier ☐ Printer ☐ Other:——————

➢ What do you use the above ICT device(s) for at the office? Tick as many as apply to you *.
   ☐ Make and receive calls ☐ To send text messages ☐ check and send email messages   ☐ official duty at work
   ☐ online learning and information gathering ☐ General digital activities

➢ What application do you use most when connected to the internet (Google search, Google doc, Google
   Slide etc., None) *.
   ☐ Internet explorer ☐ Microsoft edge browser ☐ Safari ☐ Chrome ☐ Google search ☐ Google docs
   ☐ Google slide ☐ Gmail, hotmail ☐ Others: ——————————

➢ What Online platforms do you use often? *☐ Educational Learning platform ☐ Facebook ☐ Twitter
            (Pick as many that apply) ☐ WhatApp ☐ Instagram ☐ Linkedin ☐ Others:——————

➢ Do you have an ICT/Technical maintenance section in your office? *
   ○ Yes ○ No ○ Not sure

➢ Do you require any further training to operate any ICT devices? *
   ○ Yes ○ No ○ Maybe

➢ Which of these ICT devices can you operate effectively <u>WITHOUT</u> training after your formal education?
   Tick as many as apply to you. *
   ☐ Mobile phone ☐ Laptop ☐ Desktop computer ☐ Fax ☐ Printer ☐ Tablet ☐ Photocopier ☐ Scanner
   ☐ Modem ☐ Routers

➢ What computer software can you use effectively? Tick as it applies to you. *
   ☐ MS Word ☐ MS Excel ☐ Google Docs ☐ Corel Draw ☐ Photoshop ☐ Miro ☐ Padlet ☐ Powerpoint
   ☐ Workflow Management System ☐ Others: ——————————

Economic Concerns - Tick where Appropriate

➢ **What is your Monthly Salary range (in Naira)?** (Note: K = 1000. e.g., 10k = 10,000) *

☐ 10k-20k ☐ 20k-30k ☐ 30k-40k ☐ 40k-50k ☐ 60k-70k ☐ 70k-80k ☐ 80k-90k ☐ 90k-100k

☐ 100k-200k ☐ 200k-500k ☐ Above 500k

➢ **How comfortably can you buy an ICT device from your Monthly salary?** *

○ Very comfortable ○ Comfortable ○ NOT - Comfortable ○ Not at all

➢ **Which of these devices could you afford from your Monthly salary?** *

☐ Computer System ☐ Smartphone ☐ Tablets ☐ MODEM ☐ ROUTER ☐ Others: _____

➢ **How often do you Pay for or subscribe for mobile broadband?** *

☐ When I run out of data ☐ When my broadband subscription expires ☐ As long as ther's money to buy data

☐ Not at all

➢ **Are you discouraged by the quality of internet service you have? If yes, select your reasons** *

☐ Yes, It's too expensive ☐ Yes, too slow ☐ Yes, NOT available all the time (OFF and ON) ☐ NO, I'm not discouraged

Technological Concerns - Tick where Appropriate

This section describes your network infrastructure.

➢ **What type of internet connection do you have in your office?** *

○ Cable ○ Wireless ○ None

➢ **What type of network broadband subscription are you using in the office?** *

○ 2G ○ 3G ○ 4G ○ 5G ○ None

➢ **Is there 24/7 power supply at your office?** *

○ Yes ○ No

Geographical Location Concerns - Tick where Appropriate

➢ **Which of the following describes the location of your office? Where is your office located?** *

○ Urban area (CIty) ○ Rural area (Far outside of the city ○ Village area

➢ **How is the Network Quality in your office location?** *

○ Very Fast ○ Fast ○ Slow ○ Very Slow

Government Concerns – Tick where Appropriate

➢ **Do government make provision for ICT devices in your office?** *

○ Yes ○ No

➢ **Do you have your own ICT device given to you by your office?** *

○ Yes ○ No

➢ **How often do they change the ICT device?** *

○ 2 - 4 years ○ 4 - 6 years ○ Until device breaksdown ○ Not at all

Appreciation

Thank you for your time in filling out this questionnaire. It means a lot to us as researchers in moving forward. To frontier on our research output.

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