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Evaluating the Adoption of Mobile Governance: Case of Nigeria

Master's thesis

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Tallinn 2022

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Infotehnoloogia teaduskond

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Hinnang M-Valitsemise rakendumisele: Nigeeria näitel

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Tallinn 2022

Author's declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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09.05.2022

Abstract

The continuous rise of mobile phone usage in developing countries unveils a new path of electronic governance known as mobile governance. As the governments of developing countries continuously scrutinise effective means of providing services to the citizens, mobile governance provides the government with the answers to implementing the strategy with real-time citizens' feedback and performance.

This thesis's main objective is to evaluate the adoption of mobile governance in developing countries using the case of Nigeria. The study used a quantitative and qualitative method, gathered 102 sample data from Nigeria's citizens and collected four (4) structured interviews from the public sector personnel. The results were evaluated using the Pearson correlation two-tailed method in the SPSS tool for the quantitative data, and thematic analysis was conducted using the NVivo tool for the qualitative data. Based on the citizen response, the study findings reveal that perceived usefulness, ease of use, and trust are critical factors for adopting mobile governance. In contrast, the public sector response correlates with the citizens' outcome; the public sector personnel also highlighted other potential benefits such as accountability, enhanced productivity, and access to service and information. However, other factors that could mitigate the success of mobile governance, such as poverty, infrastructure, and compatibility, were also spotlighted. The author believes that this case study research would provide a foundation for similar research on mobile governance.

Keywords: mobile phone, developing countries, mobile governance, real-time, services, citizens, perceived usefulness, ease of use, and trust, Nigeria

This thesis is written in English and is 59 pages long, including 7 chapters, 6 figures and 11 tables.

List of abbreviations and terms

AoS	Awareness of Service
CBN	Central Bank of Nigeria
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IT	Information Technology
MX	Mobile Experience
NCC	National Communication Commission
NITDA	National Information and Technology Development Agency
NGO	Non-Governmental Organisation
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
TAM	Technology Acceptance Models
GSM	The Global System for Mobile communications
UTAUT	The Unified Theory of Acceptance and Use of Technology
TPB	Theory of Planned Behaviour
TR	Trust

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1 Introduction

The history of mobile phones can be traced back to early 1900, when a U.S. patent was issued in Kentucky for a wireless telephone (Hoffer, 1971) The initial idea was to introduce mobile phones that enable communication between government agencies. However, the innovation of mobile phones, which was not mobile during their invention, has evolved over the years; mobile phones have gone from two-way radio communication between two parties to the stage of broadband smartphones. In addition, the functions of mobile phones go beyond basic voice communication but encompass other sophisticated features (Uswitch, 2021).

The current stage of mobile phones is often regarded as smartphones with extended battery life, several operating systems which are usually limited to a computer, accommodating processor capacity, random access memory (RAM), an adaptive screen, expandable storage capacity, file transfer functionality, embedded sensors, real-time information and service accessibility, internet connections, mobile and wireless connections and a large market of choice of desired features and functionality.

The evolution of mobile phones creates a new era of service delivery for both the private and public sectors. Today, mobile phones have gone beyond a tool to instantly communicate or send and get text and voice messages (Krishnpriya, 2016). For example, the joy of sending the first SMS "Merry Christmas" by Neil Papworth, an employee of Vodafone United Kingdom, in 1992 has expanded to sending Christmas photos, ordering Christmas gifts for family and friends, and even joining a live Christmas party on mobile phones (History Phone, 2021). The tool has emerged as one of the most vital technologies to bridge the digital divide experienced a few decades ago; mobile phones enable the world to become a global village bridging the urban haves and rural have-nots (Krishnpriya, 2016).

The swift growth of mobile phones and their penetration has shifted many government bodies to leverage this layer of information technology (I.T.) to provide solutions and

offer their end-users, "the citizens," adequate and on-time services. Mobile phones have been one of the key channels for government-citizen communication. Many government parastatals are well informed of all happenings. The preeminent bureaucratic style is diminishing in various countries as the penetration of mobile phones enables immediate criticism of actions before they prevail, even though the benefits of mobile phones still depend on the willingness of all parties to adopt the tool. Mobile phones have continuously penetrated every part of developing countries in less than three decades, especially in Africa. Despite difficulties like income, poor connectivity, electricity, and a high illiteracy rate faced in some parts of developing countries like Nigeria, mobile phones still make it to remote rural areas. Also, mobile phones have opened room for innovations for people in the suburbs of Nigeria, directly or indirectly. There were over 195 million active mobile GSM subscribers according to the Nigerian Communication Commission Statistics of subscribers and teledensity for mobile as of December 2021 (NCC, 2022). And over a 104million active internet users as of January 2021, with an average yearly increase of 4.8million (2.28%) users since 2015 (Kemp, 2021).

Mobile phones have emerged as a delivery channel for different services and are now used as a transaction platform in most private sectors across Nigeria (Nava & Dávila, 2005). For example, OPay, Paga, Paystack and Carbon offer mobile services that give users the ability to pay for utilities, make peer to peer (P2P) transfers, invest, and make life savings (Fintechnews, 2021). However, on the other hand, the public sector in Nigeria is still lagging in leveraging mobile platforms as a rich tool for service delivery. Even though various government bodies in Nigeria have an online presence, this does not offer the same service satisfaction as in other developed countries where mobile phones are the first tool of choice in service delivery (Nzimakwe, 2018).

With the solid potential and penetration of the internet and mobile phones in Nigeria, this master thesis will evaluate mobile technologies as a tool for increasing government service delivery and citizen-centric service development. The research will summarise the findings of evaluating the adoption of this subdomain of electronic governance known as mobile governance by using a quantitative and qualitative analysis method that will involve analysing primary data collected using a structured questionnaire and open-ended questions.

1.1 Motivation and Relevance of the Topic

Based on the author's functional understanding as a resident of Finland and Estonia, also two of the top e-governance countries according to the United Nations E-Government index 2020 and the author's experience living in Nigeria for over 25years; the author can cultivate the most suitable approach for a developing country like Nigeria (UN E-GOV Index, 2020). Furthermore, the author's study program elucidates the essential requirements to evaluate, design and implement a working e-governance system. Nigeria has a few functioning public electronic services; as a master's student in E-Governance Technologies and Services, the author explored the history that shaped the current digital transformation in Finland and Estonia. The author understood how these two countries leveraged the existing architecture and infrastructure to implement the current e-governance system. With the high mobile penetration, developing countries like Nigeria should leverage mobile infrastructure to develop a working e-governance system rather than introducing and building a new system. This research benefits Nigeria's public sector and other developing countries with high mobile penetration aiming to have a working e-governance system.

In a brief context, Estonia's e-government state can be traced back to establishment of the institute of cybernetics in the 1960s (Velmet, 2020, pp. 166-169). This establishment aimed to elevate the technology strength of the soviet system in chemistry, physics, automated control systems, artificial intelligence, mathematical methods, speech synthesis, architecture modelling, economic cybernetics, and sociology (Kutser, 2000). Furthermore, the drive of the information society spurred post-socialist development in the 1980s by establishing the informatics development fund. Finally, the tiger leap project of the mid-1990s played a massive role in the current Estonia e-governance system (Velmet, 2020, pp. 175-178), In addition, Estonian success is also related to digitalisation of the documents and records by adopting paperless management both in state and local level (Pappel, Tsap, & Draheim, 2021), (Gelashvili & Pappel, 2021).

The Finland case is no different to Estonia. In the 1980s, Finland developed a statistical centralised national census database that the government uses for strategic planning. The success of this statistical system triggered the Finland 1990s public management reforms. The reform led to significant changes such as accountability and flexibility at the agency

level, greater responsibility, and decreased oversight and coordination responsibilities at the ministry level (OECD, 2003, pp. 11-69).

Most leading e-governance states have a history of information technology architecture and infrastructure that can be traced to decades ago. This technology architecture and infrastructure are a layer to which these countries build or advance the latest e-government system. Nigeria's history is no different from those of pioneers of e-government, even though the initiative has not made significant progress since its establishment. Nigeria's e-governance initiative could be traced back to the early 2000s after the democratic system of government succeeded the military government. The aim at that time was to eradicate bureaucracy and improve the deteriorating public service system with accountability and effectiveness. This initiative spurs the creation of the National Information and Technology Development Agency (NITDA) task to actualise the e-governance aim (NITDA, 2001).

With the creation of NITDA, there has not been any significant progress made in developing the e-governance initiative; instead, the bridge between the government and the citizens of Nigeria is getting wider. Nigerians' adoption of the latest technology, especially mobile phones, has grown exponentially in the last 15years (Adeoye & Alenoghena, 2019, p. 3). As the world is becoming a global village with mobile phones, which have served as the bridging tool from the previous decades, the author strongly believes the mobile phone is the best interface where the Nigerian government could actualise the dream of functioning e-governance. Many private sectors like banks are already using this tool to reach their customers; most private sectors are bringing services to their end-users in different locations, eliminating the principle of urban haves and rural have-nots.

The author envisions this master's thesis as an eye-opener to the public sector innovation in eliminating bureaucracy, bringing the government and the citizen closer, helping the public sector better understand their customer - the citizen, generating additional revenue and improving public service delivery.

1.2 Research Objectives and Questions

This thesis aims to understand the barrier and progress of e-governance in Nigeria and understand the relationship between the Nigerian government and its citizens. Furthermore, this thesis will understand the concept, process, and citizen-government perspective of having functioning mobile governance for a developing nation like Nigeria, the author's home country. Lastly, discover those obstacles that could hinder the adoption of this new facet of government from enhancing service delivery.

The research aims to provide further insight by collecting additional data through a survey and interview with participants, evaluating the concept of mobile governance from the phenomenon, and consulting some previous literature related to this field. The result of these data collected would help to understand the bottleneck of adopting working mobile governance and how to enable the functionality of this system.

This Master's Thesis will seek to answer the main research question (RQ):

- **How can the government of a developing country leverage mobile technology for effective service delivery?**

To answer the main research question, empirical research of interviews and survey questionnaires will be conducted to collect data from Nigerian citizens and the public sector. This diverse data would help have an accurate real-life understanding of the various stakeholders.

While focusing on the main research question, the following sub-questions require research for a complete evaluation:

- **How well do citizens differentiate physical and online services in Nigeria?**

To better understand citizens' awareness and differentiation of physical and online services in Nigeria, a questionnaire will be used to gather users' experience of online services. The perspective and technology literacy of the users is one of the base principles of any technology implementation. Understanding the user's interest and use of technology and technologies that will be embraced and stay for a long time is essential, not the ones that will become obsolete or not integrated into the everyday life of people.

- **How regularly do Nigerians seek to use the online government platform, and how would mobile governance increase this use?**

Deriving the outcome of the level of citizens' understanding of physical and online services would trigger the following question of how often people use the existing government online platform. This would help understand how mobile phones could help fill some spaces and push towards a human-centric approach to moving beyond the technocentric and universalist dimension that governs most technology initiatives.

- **How to ensure that many people (those in the suburbs, illiterates, older people and the disabled) benefit from implementing the mobile governance system?**

Trist 1978, Socio-technical design (hybridisation) in organisational theory highlighted how the social and technological spheres are strongly interconnected in any societal environment. Focusing on change and innovation only from the technical side can lead to solutions that do not meet the desired expectations (technocentric) (Trist, 1978). This aspect of the research question would seek answers from the public sector personnel to fill the gap from the government perspective on ensuring the technology would include all.

1.3 Overview of M-Governance

Pierre and Peters (2020), divided governance into three categories: **governance as a structure** where governance provides direction to society and the economy. The structure includes upholding and imposition of laws and regulations with the presence of networks and hierarchies. The second category is **governance as a process** where the entire governance is perceived as a moving picture rather than a snapshot. Governance as a process perceives governance as a constant dynamic steering and coordinating process. Lastly, **governance as an analytic framework** - focuses on the philosophical terms, events, developments, the characteristics of the occurrence and how to illustrate them. This analytic aspect of governance shifted from the physical output-oriented to the intellectual part (Pierre & Peters, 2020, pp. 3-17).

In a broader sense, **E-Governance** is a more general discipline that applies modern information and communications technology to reengineer and redesign governance processes for strengthening the relationships between public administration and governing society while maintaining a transparent, citizen-centric and cost-effective aim (Hossain et al., 2015). On the other hand, **M-Governance** is a new tier of e-governance that integrates wireless and mobile technology, communication services, devices, and corresponding applications to ensure citizens access government services (Kushchu & Kuscu, 2003), (Krishnpriya, 2016). As a result, mobile governance shifted citizens', private and public institutions' perceptions of service delivery.

Despite the evolution of information communication technology, various developing nations are still struggling to have functioning electronic services; and some are still encountering difficulty in satisfying their end-user - the citizens' needs. The challenges of e-governance in developing nations are connected to several factors. One of the most prominent challenges is reachability; getting services to the citizens' doorstep is a big concern as most people live in rural areas.

1.4 Thesis Outline

This chapter outline the structure this thesis follows accordingly; the first chapter presents the motivation and relevance of the topic, followed by the research objectives and the research questions to be answered, and finally gives an overview of mobile governance. The second chapter explains the research methodology, elaborates on the case studies, illustrates the acceptance factors considered for the research, the data collection process, the process of designing the survey, and presents the data analysis process and procedure. At the same time, the third chapter discussed the general understanding of mobile governance from a theoretical standpoint and elaborated on the related work of mobile governance. The fourth chapter discusses the state of the art, and the fifth focus on the case of Nigeria. Chapter six presents the result and analysis of the research with the discussion and limitations in the same chapter. Finally, the last chapter, chapter seven, concludes the research and proposes the areas for further research for mobile governance adoption.

2 Research Methodology

To further achieve the aim and objective of this thesis, this section dive into the most suitable approach, adoption model and method to evaluate the research questions identified for this thesis. For a full accomplishment, quantitative method, qualitative method, and analysis of related work alongside technology acceptance models (TAM) with an extended variable of "Trust", "Mobile experience", "Awareness of service" will be used to attain discernment into the gathered data (Davis, 1989), (Venkatesh, Morris, Davis, & Davis, 2003).

2.1 Case Studies

The author employs a single case study as the concept of mobile governance is new and less researched from a case study stance. Also, the author believes this research is among the first conducted in the case of Nigeria; most research focuses on the broader electronic governance, while this research explicitly concentrates on evaluating the adoption of mobile governance and understanding the sociological characteristics from the case of Nigeria.

The case study has proven to be helpful in observing, explaining and exploring real-life events of a phenomenon; a case study is not only evaluating development methods but gives room to gain and make in-depth analysis and examination of different cases (Verner & Abdullah, 2012). Its effects on different curves of life such as countries, ministries, researchers, private and public institutions have made case studies remarkable in understanding, creating the best solutions, analysing a scenario or targeting a remediation action for an event or implementing new development (Thomas, 2021).

A case study, according to Thomas (2021), "is an in-depth exploration from multiple perspectives of complexity and uniqueness of a particular case in a real-life context. It is research-based, inclusive of different methods, and evidence-led" (Thomas, 2021, p. 10). Furthermore, Thomas (2021) clarifies that "a case study provides the most vivid, inspirational analysis that an inquiry can offer. A case study provides a form of investigation that elevates a view of life in its complexity. The contrasting view breaks life into digestible, study-sized chunks" (Thomas, 2021, p. 3). Abdullah and Verner

(2012) depicted a case study as a methodology that presents a systematic way of visualising an event, collecting data, analysing and showing the result of the outcome. Although orthodoxically, a case study seems to focus on qualitative evidence; however, some research nowadays may present quantitative proof while using a case study (Verner & Abdullah, 2012). Also, the norm of single case evidence could be expanded by viewing similar cases, which helps gather robust data, focusing on the single case itself and expanding into a small number of cases (Hafiz, 2008).

2.2 Case Study Planning

Choosing a case study is to gain deep insight into different phenomena in the country using an empirical research method to collect information from various parties, mainly citizens, profit and nonprofit organization and public sector workers. The empirical method allows the author to understand and plan the most suitable acceptance approach that fits the case study country and fully answers the research questions and target objectives.

2.3 Case Study Design

In understanding the diversity of case study classification and purposes, this research would utilise multiple case studies and find similar cases within the scope of research and related studies. A qualitative and quantitative method will be used to test and analyse the applied acceptance model based on the collected data, make an imperative prediction, and provide more contrast to this research (Yin, 2003). Multiple case study permits the usage of existing studies to form a hypothesis or research question (Yin, 2003).

2.4 Case Selection

It is evident that many countries are already utilising mobile governance in government service delivery though it is still in the maturity stage; such countries serve as a steppingstone or a phenomenon for other developing countries. Therefore, the case of this research (Nigeria) is selected considering that the country is most suitable for implementing mobile governance as a developing country with high mobile penetration.

2.5 Acceptance Factors

The adoption of new technology may vary depending on the adopter; a positive technology enthusiast would be highly motivated to try out new technology, while a job stressor would counter adopting new technology (Stahl, et al., 2005). Mobile governance's fundamental aim is to increase citizen access to government services while eliminating the digital divide (Krishnpriya, 2016). Therefore, the user adoption of such innovation should be measured and analysed extensively to accomplish mobile governance solutions. The technology acceptance model has proven to help analyse and anticipate consumers' adoption of technology changes or innovations (Shankar & Kumari, 2019).

Several researchers utilised the technology acceptance model (TAM), the unified theory of acceptance and use of technology (UTAUT) and the theory of planned behaviour (TPB) in determining the factors that influence the adoption of mobile governance (Wirtz, Balzer, & Schmitt, 2021). However, after examining several documents and models, the author selected TAM for this research over UTAUT and TPB because TAM utilises a precise structure; also, it is the most used by most researchers on mobile governance and its adoption (Wirtz, Balzer, & Schmitt, 2021). TAM attributed the motivation for adopting technology to Perceived usefulness and Perceived ease of use (Davis, 1989). Perceived usefulness is how adopters believe adopting a technology would augment their productivity, performance, accessibility, usage and end goal (Davis, 1989). Perceived ease of use is the simplicity of utilising new technology and the effort and time required to complete a particular task (Davis, 1989). These two variables of TAM have helped shape the intention to use and the attitude of users to new technology (Shankar & Kumari, 2019).

To further justify the acceptance of this new solution (mobile governance), the author employs additional variables (Trust, Mobile experience, Awareness of service) to test the intention and acceptance of use as utilised by (Wang, 2014; Ahmad & Khalid, 2017; Amer & Abdelhafez, 2017; Saxena, 2017; Alkhaldi, 2018; Sharma, Al-Badi, Rana, & Al-Azizi, 2018; Shankar & Kumari, 2019). Trust is the degree to which the user believes the service provider is free of exploitation (Shankar & Kumari, 2019). Mobile experience as users' experiences using the service delivery tool, the mobile phone (Alkhaldi, 2018) —

Awareness of service, measuring users' understanding of the purpose of the provider's services (Alkhaldi, 2018).

2.6 Data Collection

This research employs the concept of data triangulation to increase credibility by using multiple data sources to gather insight into the phenomenon (Nigeria). Jentof and Olsen (2019) summarised triangulation as using multiple data points in locating positions and verifying a controversial data by elaborating and deepening into the understanding of the subject matter while aiming toward realisation; While Patton (1980) pinpointed that triangulation does not provide the answer to the problem but provides a more prosperous and more transparent picture into a complex social phenomenon (Patton, 1980), (Jentoft & Olsen, 2019).

As triangulation focuses on collecting data from multiple data points but not solving the problem, the author expands on the data source by cultivating extensive insights from different perspectives on the research using the mixed method of data collection in connection with data triangulation. Zhang and Creswell (2013) refer to a mixed method as the interlinking of quantitative and qualitative elements to produce a compound result (Zhang & Creswell, 2013). Halcomb and Hickman (2015) validated that using a mixed method creates better opportunities to gain a deep insight into complex issues (Halcomb & Hickman, 2015).

The author implemented the primary and secondary data collection procedure in answering the research question and sub-questions. The primary data collection consists of two structured interviews (open-ended and closed-ended) with two main actors involved in implementing mobile governance (the citizen and the government). The open question was directed to the public sector personnel, while the closed was to gather quantitative insight from the end-user, the citizen. The secondary source completes the data triangulation, where the author reviewed multiple pieces of literature related to the research and collected data about the existing knowledge structure surrounding mobile governance.

2.6.1 Document review

Document review serves as the secondary source of collecting data for this research. In addition, document reviews serve as a background framework for advancing this research as it provides evidence of the significance of the research, previous work, phenomenon studies and guide in developing the research questions (Kabir, 2016).

In this thesis, the document review used data from different sources such as government websites, reports on budget and GDP, peer-reviewed journals, government budgets on mobile phones penetration and impact on the GDP, blogs, websites, reports, online academic articles and other helpful literature related to mobile governance of countries already developed or currently developing mobile governance to gain a robust insight into the topic of research. Furthermore, the document review aspect of this research further explores the models used by previous researchers to validate the adoption and use of mobile governance.

2.6.2 Structured Interviews

Interviews in research are categorised into structured, semi-structured, and unstructured. This research adopted the structured interview format; the interviewer uses an open-ended and closed-ended interview structure. A structured interview asks participants the same set of questions in the same order while maintaining time efficiency, eliminating bias and subjectivity, and giving the interviewer a holistic structure for comparison and analysis (Doody & Noonan, 2013).

Open-ended questions directed to the public sector personnel give the interviewee room for thoughtful answers and space to elaborate on points, perspectives, and concerns (Bhasin, 2019). The respondents are expected to have at least basic knowledge of electronic governance to make their responses viable for this research. Therefore, the first set of questions was about their understanding of electronic governance to test their knowledge.

Closed-ended questionnaires are used to collect data from the general public; due to the expected large quantity of responses, the interviewee is obliged to stick to the specified information requested and defined answers by the interviewer without further elaboration (Bhasin, 2019). This set of defined questions does not require respondents to have prior

knowledge of electronic or mobile governance but is instead used to understand citizen stance on electronic governance and mobile phone usage while the interviewer provides a short context and prospect of mobile governance.

2.7 Questions and Survey Design

The sample size for the open-ended questions for the public sector personnel is four (4) respondents, selecting only responses from public sector workers with at least four years' work experience and knowledge of electronic governance. Respondents can either identify themselves or maintain anonymity to ensure a fortified response, but the data about their role, year of service and ministry is mandatory. The sample size for the closed-ended question is 102 respondents with a strict anonymity no personal or any identifiable information was requested or collected about the respondents. The author used Google form to collect closed-ended answers from respondents, enabling the functionality of opting out and not collecting respondent email addresses and limiting response to one per respondent to eliminate biases.

2.8 Data Analysis and Procedure

As this study is based on an empirical and analytical scientific approach, qualitative and quantitative data analysis methods will be used to analyse the collected data from the interview and questionnaire.

The quantitative analysis method will be used for closed-ended questions focusing on statistical approaches that eliminate the bias of the sample using a 5-point Likert scale and correlation ranks using the IBM SPSS tool (Korzilius, 2010), (Verner & Abdullah, 2012). Other questions that do not fit into the statistical method from the questionnaire are grouped by their categories. Ten out of the seventeen questions of the questionnaire were designed using the five Likert scale. Example of using the Likert approach in the survey is: "I will use government services more if they are available on mobile" with options ranging from 1 to 5 and an explanation of what each number signifies; where 1 is "Totally Disagree" 2 "Disagree" 3 "Neutral" 4 "Agree" 5 "Totally Agree", the derived numbers are then used in the data analysis.

A qualitative analysis method will be used for the open-ended question directed to public sector personnel. A thematic method will be implied to analyse the qualitative data; a thematic analysis method allows researchers with less or high analysis experience to identify, analyse, and report patterns within a set of collected data. The five steps framework of "compiling", "disassembling", "interpreting", "reassembling", and "concluding" outlined by Castleberry and Nolen (2018) will be followed in this study for qualitative data analysis (Castleberry & Nolen, 2018).

The first step of the framework is the compiling phase which involves finding and organising the valuable answers to the questions. Since the interview format employed by this study is an English written structured open-ended question, it requires no effort in transcribing the text, which would have been the case of a verbal interview. The second step is to disassemble; at this phase, the researcher creates a group of correlations according to the context (Castleberry & Nolen, 2018). The researcher assembles all the text into a usable theme with the help of the coding tool - NVivo. Coding in this research identifies patterns such as similarities and differences within a set of text (data) and groups them according to the respective patterns. Twenty-three codes were generated in this analysis.

The reassembling phase unites codes with the same patterns; this phase captures the relationship among codes showing the bigger picture where the researcher could expand by breaking some codes into themes, sub-themes and creating a hierarchy where codes are clustered (Castleberry & Nolen, 2018). The interpreting phase is when the researcher makes an analytical conclusion about the data. The conclusion derived at this stage should be complete, fair, accurate, valuable and credible to the research and future research (Castleberry & Nolen, 2018). Whereas the concluding phase demonstrates the connection of the themes with the research questions and purpose. This step indicates the value the research is adding to the research study and how this value could be replicated beyond the current research (Castleberry & Nolen, 2018).

2.9 Reliability, Validity and Correlations

For the quantitative analysis, the reliability construct was measured to check the internal consistency of the defined variables; perceived usefulness - PU, Perceived ease of use -

PEOU, Trust - TR, Mobile experience - MX, Awareness of service - AoS. Cronbach alpha is used in computing the internal items and consistency for correlations and measurement of the five constructs. The acceptable internal consistency of Cronbach alpha is set at 0.70 and above. Hierarchical regression analysis software tool SPSS was used for computing the reliability coefficient, validity and correlations for each construct.

The author uses the internal and external validity tests for the qualitative analysis. The internal validity test measures the validity between two variables using the mapped themes in the NVivo tool. As Jiménez-Buedoand and Russo (2021) illustrated, internal validity infers that the causal relationship between variables and the lack of a relationship signifies a lack of cause (Jiménez-Buedo & Russo, 2021). The external validity test considers the generalisation strength of the research. Jiménez-Buedoand and Russo (2021) refers to external validity as "the approximate validity with which we can assume that the inferred causal relationship can be generalised to and across alternate measurements of the rationale and result in different types of a phenomenon" (Jiménez-Buedo & Russo, 2021). This aspect relies on the analytical generalisation strategy, where every variable inferred to answer the research question is assumed to apply to a similar phenomenon.

The reliability test focuses on minimising the margin of error and eliminating biases to ensure the same or close output, findings and conclusions would be derived from conducting the research by another researcher. The case study guideline developed by Thomas (2021) was adopted to achieve the reliability aim (Thomas, 2021).

3 Related Work and State of the Art

As mobile governance is a growing tier of e-governance, this chapter of the master's thesis explores several pieces of literature, academic framework, research and articles related to mobile governance. The review of previous work helps examine, evaluate and understand the current stance of mobile governance from the theoretical aspect, also provides more context into the most applied model and approach, and finally helps select the most suitable model and method for evaluating the adoption of mobile governance for a developing country, a case of Nigeria.

3.1 General Understanding of Mobile Governance by Scholars

Most reviewed scholars regarded m-governance as a subset of or an extension of electronic governance. All reviewed scholars conceptualised m-government as mobile and wireless devices for providing services to the end-user. Kushchu and Kuscu (2003), one of the most referred definitions, considered m-government as a strategy of implementation and utilisation of all peripherals of wireless and mobile technology for improving benefits to the parties involved in e-government (Kushchu and Kuscu, 2003), Wang (2014), Saxena (2017). Kim, Yoon, Park and Han (2004), simplify m-governance as the use of wireless and mobile communication technology by the government body to deliver services and information to its end users and stakeholders (Kim, Yoon, Park, & Han, 2004). However, Al-Hadidi and Rezgui (2010) believe any government-citizen transaction via the mobile phone is categorised as mobile governance (Al-Hadidi and Rezgui, 2010). Nica and Potcovaru (2015), m-government is the citizen shift towards considering and embracing mobile technology and its peripherals in attaining the government objective (Nica & Potcovaru, 2015). Wirtz and Birkmeyer (2018) expanded Kushchu and Kuscu's (2003) definition, adding the utilisation of the unique features of mobile phones in providing location-based information and services to the end-user and stakeholder anytime and at any place (Wirtz & Birkmeyer, 2018). Ishengoma, Mselle, & Mongi (2019), ascribed that the continuous advancement, ubiquitous nature and the increasing subscriber rate accelerated the call for the government to consider the use of mobile service in service delivery (Ishengoma, Mselle, & Mongi, 2019). Wirtz, Balzer, and Schmitt (2021) conclude that mobile governance is a tool for improving service and information provision for citizens. Furthermore, m-government serves as a facilitator for

strengthening the connection between the government, its stakeholders and clients (Wirtz, Balzer, & Schmitt, 2021).

3.1.1 Continuance use of M-Government in China - Contextualizing TAM into Perceived Values

Wang (2014) conducted a confirmatory research design with a questionnaire of 326 respondents using a structural equation modelling to test the hypothesis of the perceived value of the technology acceptance model (TAM) developed by Venkatesh (2000) and Davis (1989), (Davis, 1989), (Venkatesh, 2000). The study examined the antecedents and behaviours that motivate individuals to accept a new information system and measured how they do and continue to do it (Wang, 2014, p. 143). The study mainly focuses on understanding the initial and continuous adoption of m-government in the Henan province of China, concentrating on the mobile tax message platform (MTMP) used in providing tax notice, tax news, tax alerts, tax investigation and other tax information (Wang, 2014, p. 141).

The study also aims to understand the factors that influence people to fully adopt m-government, emphasising that first-time use and acceptance of technology are crucial to determining the success of information technology (Wang, 2014, p. 141). However, the technology's continued usage is more significant than the initial use. Perceived value was used as the primary quantifier of other numerating attributes such as perceived usefulness, ease of use, mobility, perceived security, satisfaction and trust (Wang, 2014).

As Wang (2014) defined, perceived value refers to measuring consumer perspicacity of a product's efficacy based on what is given and received (Wang, 2014). Perceived usefulness and ease of use of m-government, according to the article, is providing personalised and convenient services in a satisfying and timely manner to the consumers while maintaining efficiency, availability and spontaneity (Yuan, Archer, Connelly, & Zheng, 2010). Mobility is the key feature of mobile governance that increases derived user values and eliminates the need for a wired network connection using wireless portable devices anytime and anywhere in handling digital information (Clarke III, 2001). The extent to which the consumer believes a system is impregnable and the provider's concession of privacy and reliability refers to Perceived security. Satisfaction is the

consumer's psychological, cognitive, and emotional state of derived fulfilment after using a service or purchasing a product (Bhattacherjee, 2001).

Trust was classified into three main categories which are first, trust in government which plays a massive role in the adoption of E-Governance in general; secondly, trust in technology which drives the adoption of consumers of the reliability and usefulness of the technology; lastly, trust in agent which is believed to be one of the critical players in the adoption of mobile-tax in China (Wang, 2014, p. 144).

The research outcome indicated that perceived usefulness, satisfaction, security, and trust have a more significant impact on consumers than perceived ease of use and mobility. Most users are familiar with the information system due to its existence for a while (Wang, 2014). Perceived ease of use becomes obsolete after the initial use; users tend to become familiar with an information system functionality after some use compared to the growing need for the perceived value of re-consumption, where consumers have an increasing demand for satisfaction, and usefulness, growing security and trust (Wang, 2014, p. 144).

3.1.2 Intention for the Adoption of Mobile Government in UAE - TAM with Trust, Social influence, Cost, and Variety of services

The United Arab Emirates (UAE) adopted mobile government in mid-2013 after the announcement by the Vice-President and Prime Minister, Sheikh Mohammad Bin Rashid Al Maktoum, on providing services around the clock while shifting customer service centres into customers' devices (Ahmad & Khalid, 2017). This introduction of mobile government in the UAE aims to have a proactive service available anytime and does not wait for people but instead approaches them. With the swift adoption of this m-government in UAE, Ahmad and Khalid (2017) conducted empirical research to examine and understand the factors that affect the adoption of mobile government by the citizens of developing countries using an extended technology acceptance model with additional attributes to test the hypothesis (Davis, 1989).

Trust, social influence, cost, and variety of services added to Davis (1989), two fundamental principles of the technology acceptance model of perceived usefulness and ease of use (Ahmad and Khalid, 2017). A questionnaire of 120 UAE respondents (60

male and 60 female) was used with advanced statistical methods in testing the existing technology acceptance model and the additional attributes.

Ahmad and Khalid (2017) tested perceived usefulness and ease of use form-government as it is a new system for people to adopt; determining if people perceived m-government as helpful, easy to learn and not challenging to use led to the adoption of the system. In addition, the variable "Trust" was tested to understand how people's confidence in the government, level of trust in security, potential information loss and lack of physical interaction affects the adoption of them-government (Radomir & Nistor, 2013), (van Velsen, van der Geest, van de Wijngaert, van den Berg, & Steehouder, 2015). Furthermore, understand how cost affects the adoption of mobile government; as the mobile government is an end-user service environment, where all users of the service would need a suitable device, subscription and stable network coverage to access the government services (Gitau & Nzuki, 2014). Also, to understand the influence of social influences such as reference groups, family, friends, colleagues, experts and other connections on the adoption of m-government. Lastly, it understands if having various services plays a significant role in people adopting mobile government (Ahmad & Khalid, 2017).

The outcome of the research analysis indicated that trust, regarded as people's confidence in the government and social influences, are the top criteria that impacted people's intention in adopting mobile government, with trust coming before social influences. In addition, the study outcome indicated that people already understood the know-how and benefits of mobile phones and their cost. However, respondents of the research noted that the trust in the government in terms of security and privacy and protection of personal and sensitive data plays a significant role when using this device to access government services (Ahmad & Khalid, 2017).

3.1.3 Reason for the Use of Mobile Government Services in Egypt – TAM with Trust, Social factors, and Image

With Egypt as one of the leading countries in mobile phone and mobile governance penetration in Africa, Amer and Abdelhafez (2017) conducted empirical research on mobile government adoption in Egypt to understand the trigger for user adoption of m-government in the country (Amer & Abdelhafez, 2017). In testing the validity of the

defined hypothesis, a questionnaire of 436 respondents from different age groups was analysed to confirm the adoption of m-governance. The research implied the technology acceptance model (TAM) of perceived usefulness and ease of use with three additional variables (trust, social factors and image) to identify the most crucial attributes influencing people's attitude toward using the mobile government (Amer & Abdelhafez, 2017). Social influence as a variable was included to understand the effect the environment plays in people's adoption of m-government (Davis, Davis, Morris, & Venkatesh, 2003), while trust measures the impact of citizen trust in the government affects the adoption (Carter & Bélanger, 2005). At the same time, the image represents how the adoption of the technology fulfils the social esteem needs of the user's status (Liu, et al., 2014).

The outcome of the research analysis carried out by Amer and Hafez (2017) indicated that perceived usefulness, face to face interaction, awareness of the service, compatibility with lifestyle, age of the user and social influence are essential tools influencing citizens' intention to adopt mobile government and its services (Amer & Abdelhafez, 2017). On the contrary, perceived ease of use, gender, trust, and internet experience does not significantly trigger the intention to adopt mobile government. But internet experience could be a significant variable in an environment of high aged citizens (Amer & Abdelhafez, 2017).

3.1.4 Empirical research on Usage of Mobile Government services in South Africa – UTAUT

The unified theory of acceptance and use of technology (UTAUT) model developed by Venkatesh, Morris, Davis and Davis (2003) was used to measure factors that led to increased citizen participation in Buffalo City, a local government in South Africa using mobile phones (Hobololo & Mawela, 2017). The study believes the UTAUT over other models provides more context into the determinant factors that drive the intention to use new or existing technology (Davis, Davis, Morris, & Venkatesh, 2003). The research excluded the Use Behaviour (UB) and Experience, with the belief that usage of mobile phones for government service delivery in the local government before the introduction of mobile governance did not exist. In addition, the research also examines the impact of gender and age as a factor to measure the adoption process. A semi-structured interview

and a questionnaire survey of 156 respondents were used to verify the adoption model (Hobololo & Mawela, 2017).

The first outcome of the research indicated that effort expectancy was not a significant factor as the existence of mobile technology expedites the possibility of mobile service adoption; however, designing a mobile governance solution that enhances citizen performance or benefits would trigger the adoption of mobile governance (Park, Roman, Lee, & Chung, 2009). Citizens want to understand the value or gain the new technology would produce (Hobololo & Mawela, 2017). The second outcome stated that social influence is a determinant in driving the adoption of mobile governance; family and friends play a huge role in the intention to use a mobile solution (Hobololo & Mawela, 2017). Age as the third outcome plays a significant role among youngsters. They always look for a quick way to accomplish their aim or reach the government; older people would utilise the less complicated means of accessing government services, which could be possible via mobile phones with high-quality mobile services and straightforward deliverability (Chan, et al., 2010). Gender as the fourth option plays less or no significant role in adopting this technology, as the adoption is triggered by the design, convenience, functionality and how technology inclined the user, not the gender of the user (Hobololo & Mawela, 2017).

3.1.5 User Willingness to Use Mobile Governance Applications (mG-Apps) in Oman – UTAUT with Trust and Information quality

Continuous development of mobile governance applications has pushed Oman to be one of the leading countries using mobile phones to transact between the government and the end-user daily (Sharma, Al-Badi, Rana, & Al-Azizi, 2018). Several tiers of government use mobile governance applications (mG-Apps) to provide services to their consumers; for example, the ministry of education has a mobile application that allows parents to access student results upon query easily. This application allows for immediate student results and provides access to track students' daily activities and retrieve previous results. The Royal Oman police also have an operational application providing services to citizens in case of vehicle registration, license renewal and application, location of the closest service centre and police station with GPS enablement, enquiry and payment of charges, provision of news and announcement (Al-Busaidi, 2012). In addition, the ministry of manpower has its mobile application for job seekers, job announcements, enquiries about

a worker using a personal identification code and visualisation of personal details in the ministry database (Sharma, Al-Badi, Rana, & Al-Azizi, 2018).

The research utilised the unified theory of acceptance and use of technology (UTAUT) due to its ability to comprehend users' behaviour and preference to employ technology, new or existing, concentrating on performance expectancy, social influence facilitating conditions, and effort expectancy (Sharma, Al-Badi, Rana, & Al-Azizi, 2018). The research applied two additional variables, "trust" and "information quality", to better have a robust output for the intention to use. Trust is the level of users' belief in the government system and how trustworthy the mobile application is to provide the expected outcome (Venkatesh, Thong, Chan, Hu, & Brown, 2011). Information quality is the measurement of relevancy, completeness, timeliness and accuracy of the provided service through the mobile application compared to other means of service delivery (DeLone & McLean, 2003). Performance expectancy is a user's expectation that technology would help fulfil personal aim or improve performance (Venkatesh, Morris, Davis, & Davis, 2003). Effort expectancy significantly declines the physical and mental effort required to use a technology or complete an action (Venkatesh, Morris, Davis, & Davis, 2003). Social influence as users closes one's opinion into the adoption of technology (Venkatesh, Thong, & Xu, 2012). Facilitating conditions as the belief that the existence of technology is to improve and support the user in achieving an aim (Venkatesh, Morris, Davis, & Davis, 2003).

The research used a questionnaire to gather from 513 mobile application users to test the hypothesis identified from the defined model variables. Analysed the result with a structural equation modelling (SEM) and validated SEM with an artificial neural network approach. The analysis indicated that trust and information quality are the top drivers for adopting and using mobile governance applications, followed by performance expectancy, effort expectancy, and facilitating conditions (Sharma, Al-Badi, Rana, & Al-Azizi, 2018). Social influence, however, does not contribute to the intention to use as citizens of Oman focus on trustworthiness and service quality followed by good service performance, minimal required effort and benchmark conditions for the introduction to driving their behavioural intention. Trust and quality are vital players in users' behaviour and intention to use a service; these two key attributes would be the determinant factor in continuous usage of a particular service (Sharma, Al-Badi, Rana, & Al-Azizi, 2018).

3.1.6 Factor Influencing the Use of Mobile Government Services in India – UTAUT, TPB, TAM

Hierarchical retrogression analysis and a composite of three models, unified theory of acceptance and use of technology (UTAUT), technology acceptance model (TAM), and theory of planned behaviour (TPB), was used to test the objective for the adoption of mobile governance service in India by 311 interviewees. Influence, self- effectiveness and facilitating provisions were pulled from the unified theory of acceptance and use of technology (UTAUT), while perceived usefulness and perceived ease of use were drawn from the technology acceptance model (TAM), with compatibility, trust, attitude and behavioural intention from the theory of planned behaviour (TPB), (Davis, 1989; Ajzen, 1991; Venkatesh, Morris, Davis, & Davis, 2003; Saxena, 2017).

The variable "Influence" was implied to check how users take other people's beliefs and perspectives of a solution into consideration in using a solution (Venkatesh, Morris, Davis, & Davis, 2003)—facilitating conditions and self-efficacy as personal feelings of how complex it is to complete an action using mobile governance (Ajzen, 1991), (Ajzen, 2001). Perceived usefulness is the enhanced value expectancy from a mobile governance solution, and perceived ease of use is how demanding it is to complete a mobile governance service. With compatibility - to test how users perceive the solution to be consistently connected with the values, needs and experience of the user (Rogers, 1995), trust - is an expectation that the service provider is responsible for all aspects of the service (Warkentin, Gefen, Pavlou, & Rose, 2002), attitude - as a personal reaction about performing an individual action and behavioural intention. Lastly, behavioural intention determines the probability a user would perform some activity related to a service (Davis, 1989).

The research outcome indicated that demographic attributes such as professional background, age of users, marital status, literacy level and usage rate were not an enormous contributor to the adoption of mobile governance. However, users tend to focus on the perceived usefulness, ease of use, and attitude linked to the user in completing an action, followed by trust - safety, privacy, and security to impact the adoption of mobile governance significantly (Saxena, 2017). The outcome further elucidated that to adopt mobile governance successfully; the provider should consider how the service user would find the solution helpful, hassle-free, and secure. Furthermore, the provider's credibility

will be considered when using mobile governance services as the platform may require users to make transactions and share personal information; privacy and confidentiality are crucial to users (Saxena, 2017).

3.1.7 Factors Affecting Users' Intention to Use Mobile Government Services in Saudi Arabia - TAM

Alkhaldi (2018) conducted quantitative research to investigate the factors influencing people's adoption of mobile governance in Saudi Arabia. Alkhaldi (2018) utilised an online-based survey questionnaire to gather data to analyse the effect of the existence of mobile phones on the adoption of mobile government using the technology acceptance model (TAM) variables of perceived usefulness, perceived ease of use with additional variables; awareness, mobile experience, perceived cost, perceived trust, and perceived risk (Davis, 1989; Alkhaldi, 2018).

Awareness of the public service and mobile phones was included by Alkhaldi (2018), based on Al-Hujran's (2012) point that public awareness plays a significant role in the achievement of mobile services in developing countries, prior experience of use, cost, benefits and legal aspects would initiate the usage of new solutions (Al-Hujran, 2012). Perceived usefulness is the envisioned return on usage by the user (Almarashdeh & Alsmadi, 2017). Perceived ease of use is the amount of help and support required by the service user to complete an action. The perceived cost of services is the monetary cost incurred by the user when using a mobile governance service compared to physical or other means of attaining a service (Almarashdeh & Alsmadi, 2017). Almarashdeh and Alsmadi (2017) emphasised that service charges should be realistic not to discourage users. Trust is related to how comfortable people feel with using personal phones to access government services, how much will the government know about them, and how vibrant is the government in ensuring privacy and protection of personal data (Alkhaldi, 2018). Finally, perceived risk is any mayhem that may arise from the tool's usage, such as financial threat, security breach or loss of possession of belongings (Alkhaldi, 2018).

The research found out that the awareness and usage of mobile phones had a significant impact on perceived ease of use and perceived usefulness, however, not on perceived risk and perceived cost. Nevertheless, perceived risk and perceived cost are crucial in those with less acquaintance with mobile phones, which the percentage is relatively low; the

cost of acquiring a standard mobile phone poses a risk to the adoption for such a category (Alkhaldi, 2018). Out of all the tested variables, perceived usefulness and ease of use were the most prominent driving forces in mobile governance adoption (Alkhaldi, 2018). Alkhaldi (2018) further illustrated that users are willing to forgo other variables if they find the solution useful, enhancing, and easy to use (Alkhaldi, 2018).

3.2 Comparison of Related Work, Aim, Methodology and Models

Country	Research aim	Methodology	Model	Input Variable	Output Variable	References
China	Reason for continuance Use of M-Government in China	Confirmatory research design Respondent = 326 Questionnaire Structural equation modeling	TAM	Satisfaction Trust in technology Trust in agent Trust in government Perceived usefulness Perceived ease of use Mobility Perceived security	Perceived usefulness Perceived security Satisfaction Trust in technology Trust in agent Trust in government	Wang, 2014
United Arab Emirates	Intention for the Adoption of Mobile Government in UAE	Confirmatory research design Respondent = 120 Questionnaire Structural equation modeling	TAM	Perceived usefulness Perceived ease of use Trust Cost Social influence Variety of services	Trust Social influence	Ahmad & Khalid, 2017
Egypt	Reason for the Use of Mobile Government Services in Egypt	Confirmatory research design Respondent = 436 Questionnaire Multiple regression analysis	TAM	Perceived usefulness Perceived ease of use Image Trust Social factors (gender, internet experience, awareness, interaction, age, lifestyle compatibility, social influence)	Perceived usefulness Image Social factors (awareness, interaction, age, lifestyle compatibility, social influence)	Amer & Abdelhafez, 2017
South Africa	Empirical research on Usage of Mobile Government services in South Africa	Confirmatory research design Respondent = 156 Questionnaire Multiple regression analysis	UTAUT	Performance expectancy Effort expectancy Social influence Facilitating conditions	Performance expectancy Social influence Facilitating conditions	Hobololo & Mawela, 2017
India	Factor influencing the Use of Mobile Government	Confirmatory research design Respondent = 311 Questionnaire Multiple regression analysis	TPB, TAM, UTAUT	Perceived usefulness Perceived ease of use Compatibility Trust Social influence	Perceived usefulness Perceived ease of use Attitude Trust	Saxena, 2017

	Services in India users			Self-efficacy Facilitating conditions Attitude		
Saudi Arabia	Factors affecting Users' intention to Use Mobile Government services in Saudi Arabia	Confirmatory research design Respondent = 426 Questionnaire Multiple regression analysis	TAM	Perceived usefulness Perceived ease of use Perceived costs Perceived trust Perceived risk Awareness of service Mobile experience	Perceived usefulness Perceived ease of use Awareness of service Mobile experience	Alkhaldi, 2018
Oman	User willingness to use Mobile Governance Applications (mG-Apps) in Oman	Confirmatory research design Respondent = 513 Questionnaire Structural equation modeling	UTAUT	Performance expectancy Effort expectancy Facilitating conditions Trust Information quality	Performance expectancy Effort expectancy Social influence Facilitating conditions Trust Information quality	Sharma, Al-Badi, Rana, & Al-Azizi, 2018

Table 1. Comparison of related work on M-Gov. Source: Author and Wirtz, Balzer, & Schmitt (2021)

3.3 State of the Art

This section of this research briefly elucidates on the connection between mobile phone usage and mobile services. The section describes the main topics such as mobile services, the current state of mobile service in Nigeria.

3.3.1 Mobile Phone Usage

According to a buildfire.com (2022) research on mobile app download and usage statistics, over 81%, approximately 6.3 billion of 7.9 billion of the world population uses mobile phones, which are continuously growing yearly (Buildfire, 2022), (Worldometer, 2022). Trevor Wheelwright of reviews.org surveyed phone usage statistics on 1000 Americans between 18 and above in 2021. The survey requested all respondents to report their average daily phone screen time to aggregate the counts of times participants check and the total time spent on phones daily. The survey outcome shows that 53% of the respondents indicated they had not gone longer than 24hours without their mobile phone, while 47% consider themselves phone addicts. This survey indicated that the average American spend almost 3 hours daily on their mobile phone with constant checking of

about 344 times a day, averaging every 4 minutes (24*60/344). Over 50% of the respondents spend the most time on social media, while about 40% play games or use other applications. Phone calls and texting, which is the root aim of introducing mobile phones, are barely used at less than 10% daily (Wheelwright, 2022).

For a developing country like Nigeria, mobile phones are used as a tool to connect with the outside world. Every Nigerian has a relative living outside the country, and the best means of connecting with these close ones is via mobile phone. Nigeria is one of the biggest economies in Africa, with over 90% of its population between the age of 0-55 and 187.9million of 208.8million of the total population using mobile phones (Kemp, 2021). (Statista, 2021). As of early 2021, there were over a 104.4million internet users, a 22.1% increase compared to 2020, with an estimated 11% increase by the year ending 2021. According to the analysis by Kemp (2021), additional 6million users joined the social media users totalling over 33million social media users at the beginning of the year 2021, 15.8% of the country's total population (Kemp, 2021). Furthermore, it was estimated that an average mobile internet user in Nigeria is between the age of 16-64 and spend approximately 4hours 55 minutes online (Kemp, 2021).

3.3.2 Mobile services

Services, on the one hand, as it sounds, are means of offering or performing a duty to an individual or set of individuals with an expectation of tangible or intangible satisfaction from all parties. Axelsson and Wynstra (2002), defined services as input-oriented involving supplier's resources and capabilities, process-oriented, which defines how the service is produced, a function-oriented process towards engineering service functionality and output, and outcome-oriented that facilitate economic value in monetary terms (Axelsson & Wynstra, 2002). Nowadays, the paradigm of services has shifted from the orthodox way of rendering services. Shankar and Kumari (2019), noted that the availability of various information and communication technology (ICT) platforms has shifted the way providers provide services to their consumers online, offline and via mobile platforms (Shankar & Kumari, 2019).

On the other hand, mobile service is a digital extension of service provision via mobile phone. The ubiquity of nature, mobility, and high localisation render mobile service more effective (Shankar & Kumari, 2019). Jun and Palacios (2016) examined the quality of

mobile services by collecting comments from 900 participants. The key features identified by respondents to mobile services are content, accuracy, ease of use, speed, aesthetics, security, responsiveness, competence, courtesy, credibility, access, communication, understanding of the customer, and continuous improvement (Jun & Palacios, 2016). These personalised features fine-tune how the service provider renders service to their consumers. In 2018, CPC Strategy surveyed 1505 respondents on Amazon shopper behaviour. 24% of these respondents prefer using a mobile phone to order goods on Amazon. Most other respondents would browse some goods on their mobile phones before ordering on their desktop or laptop computer (CPC Strategy, 2019).

4 Case of Nigeria

4.1 Mobile penetration in Nigeria

The NCC subsidisation of the communication network shifted the old privileged and wealthy access to a telephone to equal distribution of no privilege (Bakare, Ekanem, & Allen, 2017). Nowadays, a new smartphone can be purchased for as low as 20,000-naira, equivalent to 48.04 dollars as of 30.03.2022 (JUMIA, 2022).

Mobile phones have become a tool that people feel incomplete when they do not have one. The impact had overshadowed those days when people lived without a mobile phone, making it difficult to comprehend how life would be or look like if these devices did not exist. The global system for mobile communication (GSM) is like a television that every home is expected to have for those born before the 2000s (Lotz, 2016). It is obvious to see the positive impact of the GSM network in Nigeria as it has impacted life directly and laterally, augmenting communication, trades, ways of life, views, and the economy.

The idea of adopting the web in Nigeria started in mid-1996 but was fully adopted in 1998. However, despite the adoption of this new initiative, it took another three years to have over 100 internet service providers (ISPs) licensed by the national communication commission (NCC) all over the country and internet services were restricted to industrial, medical, educational, and scientific use. Furthermore, the commercialisation of the internet was highly restricted and only allowed on a 3.5ghz wireless fidelity hotspot through a very small aperture terminal (VSAT), (Adomi E. E., 2005).

The advancement and usage of the internet in Nigeria grew after the internet business centre, also known as a cyber cafe for accessing the world wide web (www), was introduced later in 2002. These business ventures offered internet service access to the public using a dial-up system or the VSAT (Adomi E. E., 2005). By the year ending 2003, there were more than 2000 cyber cafes in Lagos state, the most populous city in the country. This cybercafe's substantial penetration and value influence the NCC permitting these business centres to offer voice over internet protocol (VOIP) services (Adomi, Okiy, & Ruteyan, 2003). By early 2004, Nigeria had over 700,000 internet users, an equivalent of less than 0.5 per cent of the total population. The number of personal computers was

approximately 900,000, while telephone penetration is growing, but it is remarkably slow compared to other developing countries. The citizen's adoption of the individual internet subscription is relatively slow due to the high usage cost and slow connectivity. People prefer to opt-in for cybercafes where they could pay less or hourly for medium speed internet.

According to Adomi (2005), The significant turnaround and today's mobile phone penetration in Nigeria started in 2003. The unavailability of dial-up lines prompted the NCC to grant four effective operators (Globacom, Mobile telephone network, Econet Wireless, NITEL) the licence of the GSM. These mobile operators were entwined to offer a wide range of telecommunication across the country and provide viable internet connectivity in rural and urban areas, and this development triggered the NCC to engage the Internet service providers association of Nigeria (ISPAN), created in the late 1990s with objectives to continuously determine the needs of the end-users, retain and provide relevant information to partners and the public, influence and uphold the industry regulations, structures, tariff, maintain national and international competition and policies. The responsibilities involved but were not limited to promoting service provision in the industry, training and developing the knowledge base of internal and external clients, members and partners, finally, improving internet access to urban haves and extending access to rural have not in Nigeria.

Almost two decades later, the introduction of the global system for mobile telecommunication (GSM) and other technology introduced within this period has positively impacted the lives of ordinary people, influencing businesses and individuals to innovate using this tool. The banking sector is one of the major industries with significant value in mobile technology. The industry quickly adopted the mobile banking initiative in developed nations, allowing banking customers to conduct self-service banking in their comfort zone. The services include Unstructured Supplementary Service Data (USSD) enquiries for account balance, interest rate, transfer of funds and other banking alerts. Internet banking is also available for smartphones and personal computer users (Agwu & Carter, 2014). The benefit of mobile phone technology is not limited to the banking sector; it has also significantly impacted the country's gross domestic product year over year.
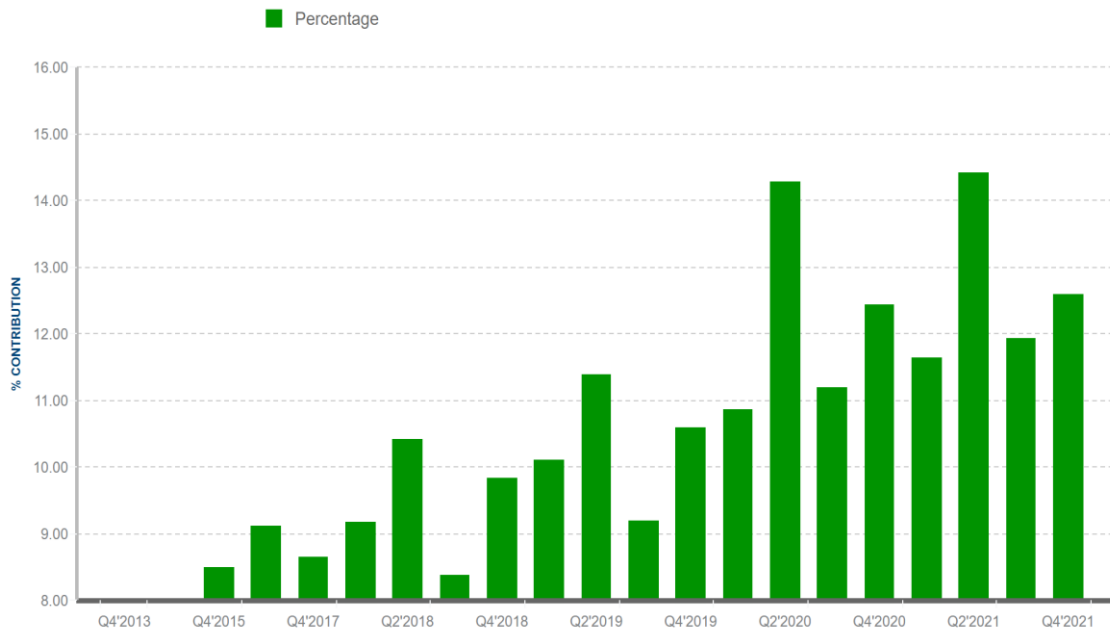
Figure 1. Percentage Contributed to Nigeria GDP by the telecom industry. Source: *(NCC, 2022)*

Despite the Nigerian Communication Commission in the second quarter of 2020 reporting that the telecommunication industry single-handedly contributed 14.30% to Nigeria's Gross Domestic Product (GDP), (NCC, 2022), the Nigerian government is yet to adopt the usage of this system for service delivery. Most government services up to date depend on physical or partner offices for accessibility. The Nigeria National Information Technology policy was formulated in 2000 to make Nigeria a full flair information technology country and drive working e-governance (Olatokun, 2006, p. 10); however, this body has not significantly impacted the nation.

Nowadays, e-governance is beyond investing a tremendous amount of money in creating satisfaction for the citizen; instead, it is an era where the citizens are willing to support the government to ensure their satisfaction, a process where the end-user is a stakeholder.

Within 20 years of penetration, information communication technology has become financially commensurate with the vast majority of people, especially the low-income class; people can quickly provide for their daily bread and make plans in securing the future. Many low-income earners have upgraded to medium or even high earners using these ICT tools, especially mobile phones, which serve as a tool for good, political and social relations among people of all curves of life, classes and status. Regardless of the business scale, all entrepreneurs in the country bank on mobile phones to better their

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business capacity; it is an essential means of communication demanded to be suitable for their jobs (Bakare, Ekanem, & Allen, 2017). Apart from the monetary value of mobile phone penetration in Nigeria, it is noted by Baro & Endouware (2013), that two-thirds of Nigerian lives in the suburbs; the value of access to real-time information has been critical in ensuring the security of these people with the high insurgency rate in the country (Baro & Endouware, 2013).

Bakare, Ekanem, & Allen (2017), expanded that as many people use this tool to communicate with business clients, customers, friends, and families; a large amount of the low-income community creates jobs by investing in mobile call centres where people drop by to make phone calls with a token amount of money charged by the duration of calls. In addition, battery and prepaid card recharge centres are also available where people drop by anytime to fill their call credit balance and load their phone power. This business centre is one of the quickest jobs to set up, and it is easy to move around as all required to start the business is a big umbrella, two chairs, a mobile phone and a source of electricity.

4.2 Electronic Services in Nigeria

Mobile penetration in Nigeria is not limited to enabling peer to peer communication, sponsorship of business, job, and employment creation. There are other crucial benefits this tool has brought to the country. Before introducing electronic services, also known as e-services in Nigeria, private and public institutions relied on an employee's good faith in dealing with and using funds (Gberevbie, Ayo, Oni, & Folarin, 2014). Gberevbie, Ayo, Oni, & Folarin (2014), further elucidated those employees, before the introduction of e-services, are expected to accurately account for public funds and revenues usage and collection (Gberevbie, Ayo, Oni, & Folarin, 2014). The philosophy and practice of good faith in all institutions did not only wreck the country's economy but also encouraged corruption in different tiers of all organisations, according to Ayoola 2013. Lack of accountability encourages junior and senior staff to manipulate records due to the dependency on a paper-based system (Ayoola, 2013). The high rate of corruption, theft, inefficiencies and high cost of banking services triggered the central bank of Nigeria in 2012 to introduce the cashless policy corresponding with the Nigeria vision 2020 of economic transformation (CBN, 2012).

Since the CBN's introduction of the cashless policy, the growth of online services continues to grow as people are becoming more comfortable every day using the internet and various online platforms to perform different local and international transactions (Onodugo, 2015). One of the prominent of them all is mobile banking, where banks leverage technology to enable clients and customers to have complete and around the clock access to their bank account through a mobile phone. As a result, Internet banking in Nigeria is growing exponentially after its introduction by the central bank of Nigeria; internet banking has grown to over 40% of banking customers in the country (Oni & Ayo, 2010).

Nigeria's electronic service industry is one of the most competitive in terms of innovations and one of the fastest growing in terms of rate of penetration in Africa since the introduction of the GSM in 2001 (NCC, 2012). Electronic services still find their way due to the suburbs despite the poor infrastructure and lack of mobile telecommunication in some areas. Electronic services have continued to grow due to their ability to reach the unreachable irrespective of their location and help build a deep consumer base structure.

4.3 Electronic Governance in Nigeria

Electronic governance is not a new concept in Nigeria; in short, there is no public sector in Nigeria that has not experienced any touch of electronic governance, also known as e-governance (Obiageli et al., 2020). Businesses nowadays that refuse to incorporate ICT into their daily running are liable to failure or stagnancy. Nigeria's public sector nowadays has gone through various upgrades such as process transformations, modernisation, privatisation and liberalisation to increase effectiveness and efficiency. However, with all these touches and improvements of ICT, the public sector still serves a small portion of Nigeria's population through e-governance technologies (Oseni & Dingley, 2015). As mentioned above and defined by Hossain, Samakovitis, Bacon, & Kinnon (2015), adopting e‑governance applies modern information and communications technology in reengineering and redesigning governance processes to strengthen the relationships between public administration and governing society with good service delivery and accountability (Hossain, Samakovitis, Bacon, & MacKinnon, 2015).

Nigeria's initiative of e-governance, like many countries adopting e-governance, is to enable good governance, eradicate poverty, promote democracy, connect rural and urban areas, provide education, job and wealth creation, provide world-class computer-centric education, and other e-governance add-ons. This initiative led to creation of the National Information Technology (NNIT) policy in 2000 as the key driver in achieving this aim (Olatokun, 2006).

Since creating the NNIT policy in 2000 and seeing the significance of ICT in governance, several developments have been made to facilitate the smooth running and adoption of ICT in Nigeria's public sector, such as the announcement of ICT as national importance and the creation of information technology policy in 2001 (Obiageli et al., 2020). The National Assembly passed the National Information Technology Development Enabling Act in 2007 to promote and develop ICT use in Nigeria and the public-private sector collaboration (Obiageli, Anthony, & Junior, 2020, p. 51). The creation of the Ministry of Communications Technology in 2011 was charged with facilitating the national plan of attaining e-governance (Omeire & Omeire, 2014). In 2012, the ministerial committee presentation of a National ICT draft policy on ICT policy harmonisation included several policy recommendations and reports and other actualisation acts (NICTP Draft, 2012).

The Federal Executive Council (FEC) created the National Information Technology Development Agency (NITDA) to facilitate private-public sector collaboration in promoting the development of the information and communication technology sector growth (Adah, 2015). The National Information Technology Development Agency (NITDA) 2008 founded a new information and communication technology for Development plan (ICT4D) (NITDA N. I., 2019). The plan aimed at employing ICT in the governing proceeding to achieve the government's vision 2020 development scheme (NITDA N. I., 2019). The Nigerian e-Government Interoperability Framework (Ne-GIF) version 1.2 was released by NITDA in August 2019, with the primary purpose being to set a baseline framework for e-government and IT systems interoperability across ministries and departments and agencies (NITDA N. I., 2019). In addition, to provide a set of standard specifications and best practices for deploying e-government and IT systems by ministries, departments and agencies, ensure seamless information exchange, and encourage deployment of e-government and IT systems that promote cross-portfolio service provision by ministries, departments and agencies. Furthermore, to use ICT tools

for seamless service delivery and interactions between government, businesses and citizens (NITDA N. I., 2019).

The expected outcome is improving synergy between government organisations by promoting effortless communication and data exchange, also providing efficient cross-portfolio services with fully integrated public sector e-government and IT systems.

4.3.1   Impact of Electronic Governance in Nigeria

However, it is impossible to rule that ICT has not impacted Nigeria's public sector as many public sectors use ICT functions to serve their customers even though the bureaucratic habit of public sector personnel negates the swift growth of digitalization (Obiageli, Anthony, & Junior, 2020, p. 51). The use of ICTs has enabled and continues to enable public services efficiency and reduced cost to the ministries and the citizens. Significant changes in electronic data handling compared to the manual process of cost, allowances, expenses, and risk is evident (Obiageli, Anthony, & Junior, 2020, p. 55). Thus, one can imagine the logistic challenge and cost of service provided by the Federal Civil Service manually with a population rounding over 200 million people spread across 900 thousand square kilometres (Obiageli, Anthony, & Junior, 2020).

Table 2 shows that government has continuously invested in rendering services to citizens and other stakeholders via the web and mobile interfaces, the table also present the huge differences between manual and electronic processing time (Abdulkareem A. K., 2021). Furthermore, people can actively suggest, contribute and criticise ideas and implementation via designated online forums or websites (Abdulkareem A. K., 2021). For example, electronic feedback allows the service provider to make a swift adjustment after the public provider renders a service (Abdulkareem A. K., 2021).

Government Service	Manual Processing Time	Electronic Processing Time
International Passport Application	Expected minimum of 90 days, max 9 months	Minimum 1 day and maximum of 3 days
Trade Clearance	Requires 7 working days to clear	1 day to clear
National Exam Registration	Expected minimum of 7 days, maximum not guaranteed	Minimum of 1 hour

Recruitment	Two (2) months	1 hour of online form completion and instance acknowledgement
Land Allocation	3 to 4 months	1 day at the GIS
Tax Remittance	7 working days	Minimum of 20 minutes
Voters Registration	Six (6) days to register and get voters' card	Six (6) minutes and instant voters' card
National Identity Registration	Minimum of 14 months or more	Minimum of 90 days

Table 2. Comparison of Manual vs. Electronic Service Delivery. Source: (Abdulkareem & Ishola, 2016)

The education sector is one of the notables of the implementation where the business-as-usual long waiting time has been reduced with digital systems (Oghogho, 2013, p. 62). Several examinations conducted annually for millions of candidates, such as the Senior School Certificate Examination and Joint Admissions and Matriculation Board (JAMB), have implemented online accessibility where candidates register, take examinations, and view their scores online (Obiageli, Anthony, & Junior, 2020, p. 52). Some states' geographical information systems (GIS), electronic custom data, electronic immigration passports, voter registration, identity registration, and visa application also provide digital service delivery to citizens (Abdulkareem & Ishola, 2016). According to Sikiru, Bello, & Oyekunle (2019), most states in Nigeria have websites and mobile hotlines. They consecutively communicate with stakeholders locally and internationally using different ICT tools implemented as an act of the e-governance development initiatives (Sikiru, Bello, & Oyekunle, 2019).

5 Result and analysis

This thesis section presents the gathered data from the closed and open-ended structured interviews, followed by the interpretation and analysis of the derived data. The section is divided into three parts; the first part presents and analyses the closed-ended interview questions derived through a questionnaire, the second part would also present, interpret, and analyse the open-ended interview questions while the third section would use the gathered data to answer the research questions.

5.1 Quantitative Analysis of Closed-ended Questions

The first section of the data analysis is divided into subsections where the author presents:

- The demographic characteristics of respondents
- The categorisation of results based on the defined variable of the acceptance model
- The reliability of individual variables, validity, correlations coefficients that signifies the substantial variables and their impact on the acceptance of mobile governance.

5.1.1 Demographic Characteristics of Respondents

The sample size consists of 102 responses from the 17 questions of the questionnaire survey. The first question of the survey gathers the age distribution of all respondents. Age data would help eliminate the digital divide among technology inclined youth and the aged citizens. From the answers, 52 of the respondents (53.9%) fall in the age range of 31 and 40, followed by 37 respondents (32.4%) between 21 and 30, 6 respondents (7.8%) within 41 and 50, 51 and above with 4 respondents (3.9%), and 3 respondents (2.0%) from 20 and below. The figure 2 pie chart visualises respondents' age distribution and categorisation. The result signifies that most respondents fall between 21 and 40 years old, constituting 87.5% (89) of the survey population. The age result corresponds with statista.com analysis of Nigeria's age distribution which indicated that over 90% of its population is between 0 and 55 (Statista, 2021).

Age Distribution of Respondents
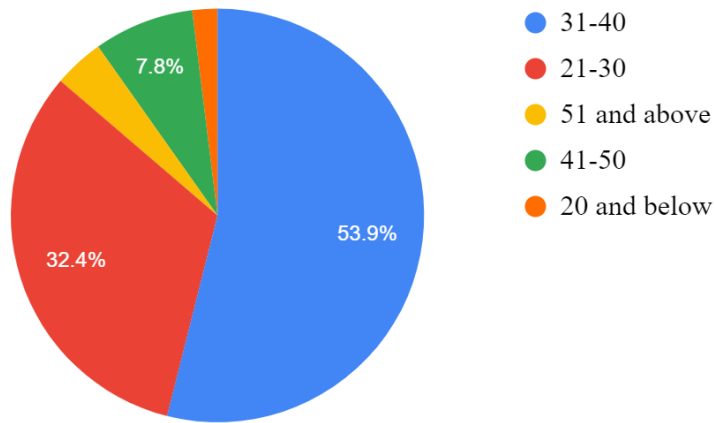
Figure 2. Age Distributions of Respondents

The occupation of respondents is crucial to this research as the solution does not aim to provide a segregated solution but instead considers the inclusiveness of different occupation paradigms, gathering data from different occupational levels starting from unemployed to retired (pensioner). The outcome of the result signifies those 42 (41.2%) respondents are working in the private sector, followed by 22 (21.6%) students, 19 (18.6%) entrepreneurs, 10 (9.8%) public sector workers, 4 (3.9%) unemployed respondents, 2 (2%) nonprofit organisation workers, 2 (2%) NGO workers, and 1 (1%) retired (pensioner) respondent as indicated in figure 3 pie chart below.

Occupational Distribution of Respondents
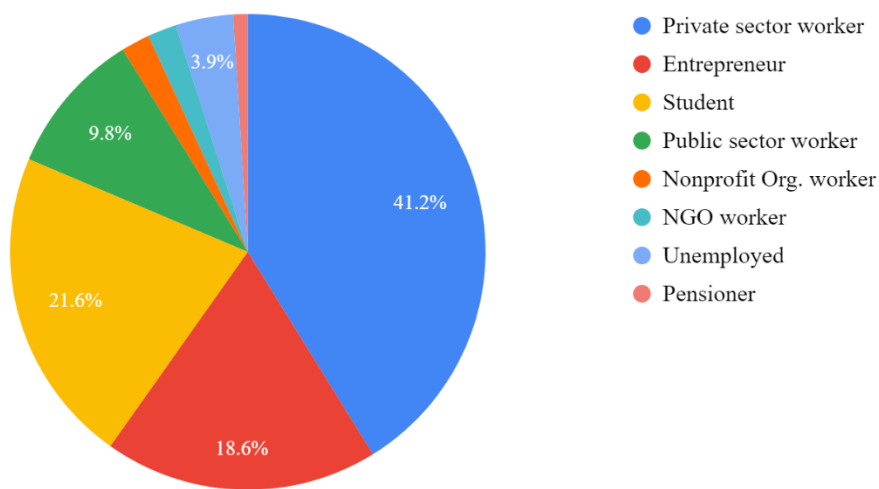
Figure 3. Occupational Distribution of Respondents

To better understand respondents' usage and awareness of online services, the questionnaire requested respondents to select their use of online services with the option of selecting more than one answer from the provided list as shown in the figure 4 bar chart below, also offering respondents the flexibility to choose "none" if not applicable.

Kindly describe your uses of online services (One or more)
102 responses
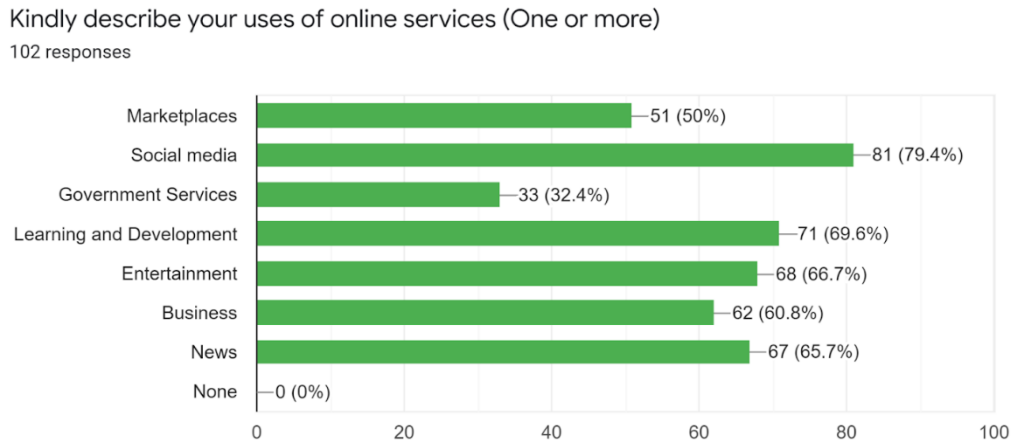
Figure 4. Respondents Usage of Online Services

For a diverse representation, the author performed a basic calculation to understand the use of other online services compared to the government services by summing up the total count of used services as the denominator and dividing individual online services as the numerator in deriving the usage percentage of each service. As shown in the table 3, all respondents are familiar with online services; however, the online government service has the lowest with 7.62%, while social media has the highest with 18.71%.

Online Service	Count Per Usage	Percentage of Usage
Marketplace	51	11.78%
Social media	81	18.71%
Government services	33	7.62%
Learning and development	71	16.40%
Entertainment	68	15.70%
Business	62	14.32%
News	67	15.47%
None	0	0.00%
Total	**433**	**100%**

Table 3. Round Percentage Distribution of the Use of Online Services

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The pie chart in figure 5 reveals the respective devices used in accessing the above listed online services. This data helps collect information for testing the "mobile experience" variable of the acceptance model. Respondents have the options of "Both Computer and Mobile phones", "Computer" and "Mobile phone". 52% of respondents chose "both"; however, the percentage of those using mobile phones alone is 43.1%, while only 4.9% use only computers to access the online services, which signifies that most of the respondents use mobile phones for online services.
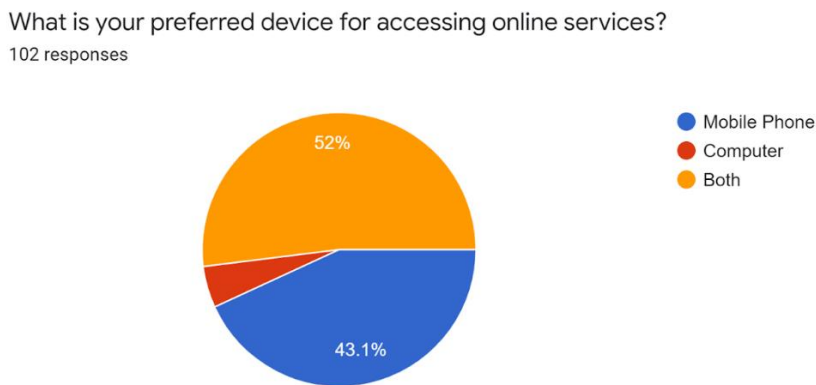
Figure 5. Respondents Preferred Device for Online Services

5.1.2 Categorization of Results Based on TAM Variables

The remaining questions of the survey focus on the citizen-government interaction, usage of services and mobile governance. The author grouped the remaining ten questions into the respectively defined variables "Perceived usefulness" as PU, "Perceived ease of use" as PEOU, "Trust" as TR, "Mobile experience" as Mx and "Awareness of service" as AoS. The tables below indicate each question classification, the assigned variable, and the percentage of responses according to the Likert scale numerical format utilised in collecting responses.

	Perceived Usefulness	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PU1	I will interact more with the government if accessible on mobile phone	6.90%	2.90%	15.70%	36.30%	38.20%

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PU2	I will use the government mobile application if available	5.90%	3.90%	11.80%	41.20%	37.30%

Two questions were used to test citizens' perceived usefulness of mobile governance; the questions focus on citizen interaction with the government if accessible on mobile phones and test the use of mobile government applications if available. These questions would help understand how citizens would embrace and find the introduction of mobile governance beneficial.

The table 4 shows that over 74% of the respondents fall within the range of agreeing and strongly agree with both questions, which signifies that most respondents find it useful and are comfortable using or interacting with the government and its services, while the remaining 25% of the respondents either stay neutral, disagree, or strongly disagree.

	Perceived Ease of Use	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
PEOU1	I believe mobile phones for government service delivery are easy to use	10.80%	7.80%	12.70%	33.30%	35.30%
PEOU2	I would prefer mobile phones to PC for accessing government services	8.80%	8.80%	18.60%	27.50%	36.30%

Table 5. Perceived Ease of Use of M-Governance

Mobility and simplicity are critical components of mobile phones, which led to mobile governance adopting this feature for providing borderless and seamless service delivery. In this research, respondents were asked about their perception of the ease of use of mobile phones and their preference for mobile phones over personal computers for accessing government services. The two questions also took respondents' existing experience of using mobile phones to access online services as a determinant factor for testing the ease of use of mobile governance if existing. As signified in table 5, over 63% of the respondents lean toward using mobile phones for accessing government services,

with over 18% neither disagree nor agree and 8% disagree; also, over 68% believe mobile phones would make government services accessible, while 12% neither disagree nor agree and 10% disagree with mobile phones enhancing service delivery.

	Trust	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
TR1	I will trust government services more if they are available on mobile phones	5.90%	2.00%	13.70%	39.20%	39.20%
TR2	I trust mobile governance would help me feel included in the government	7.80%	7.80%	18.60%	26.50%	39.30%

Table 6. Trust of M-Governance

The comfortability of using personal devices to access government services is crucial to mobile governance. However, trust is one of the hindrances to the success of e-governance in most developing countries. Historically, the non-transparency of the government prevents citizens from using most online services. In addition, issues like fraud, lack of monitoring systems and guardrails drove the preference for physical service where there is a person to hold in an account rather than an online presence where every activity is based on trust from both parties involved.

Regardless of the conceptual issue of trust, two questions were used to measure the trust in the use of mobile governance if available as shown in table 6. The first question is to test the trust of government services if accessible on mobile; almost 78.40% of respondents believe government services being accessible easily with good infrastructure on mobile phones would increase transparency and trust, eliminating the usual bureaucracy and intermediaries, while 13.70% rather stay neutral, 5.90% disagree and 2% strongly disagree. While 65.80% believe mobile governance would increase inclusiveness in the government with access to up-to-date information and proactive contributions, 18.60% of the respondents instead stay neutral, 7.80% disagree, and 7.80% strongly disagree.

	Mobile Experience and Awareness and Service	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
MX	Mobile Experience for online service	0.00%	0.00%	4.90%	52.00%	43.10%
AoS1	Interacts with the government	55.90%	0.00%	33.30%	0.00%	10.80%
AoS2	Use of online government services	15.70%	0.00%	57.80%	0.00%	26.50%
AoS3	Current use of mobile phone for online government services	17.65%	25.49%	31.37%	1.96%	23.53%

Table 7. Mobile Experience and Awareness of Service

According to Andreani et al., 2019, Designing or implementing a new technology should not attempt to control. Instead, it should connect with the natural human flows people might witness from the nearest city square or riverbank (Andreani, Kalchschmidt, Pinto, & Sayegh, 2019). Therefore, it is crucial to test the users' ability to use mobile phones; measuring respondents' mobile experience is crucial in understanding the level of acquaintance with mobile phones since the mobile governance's primary medium of accessibility is via the tool. Furthermore, one of the critical aims of mobile governance is to eliminate the digital divide, eliminate the urban haves and the rural have not and facilitate a social-technical environment where the technology is not created to dominate. In the survey outcome in table 7, it is evident that 95.10% of the total respondents are experienced in using the mobile phone for online services, while barely less than 5% rather stay neutral, with 0% of respondents disagree and strongly disagree.

Awareness of service focuses mainly on understanding the extent to which respondents are familiar with the government service; the first question measures how often the respondents interact with the government. The response to this question would help inform the cordiality between both parties. A high percentage of respondents as shown in table 7 strongly disagree with 55.90%, while only 10.80% of the respondents agree with interacting with the government, with 33.30% preferring to stay neutral—the second question shifts toward using online government services. As e-government already exists in the country, the need to understand user awareness of the current system is vital to the

study; mobile government is a tier of e-governance, which makes mobile governance reliant on the existing infrastructure of e-governance. The current strongly agree response is at 26.50%, while 57.80% prefer to stay neutral and 15.70% strongly disagree with using the government's online services. The third question measures the use of mobile phones in accessing the current electronic services. This data would provide a deep insight into the existing use of mobile phones for governance. Responses to this question would serve as a starting point for the development of mobile governance. With 25.49% of respondents already using mobile phones for accessing government services, this data would help understand what services are most accessed and how to make it user friendly to attract more users in the group of neutral, disagree and strongly disagree, which constitute about 74.51% of the total respondents.

5.1.3 Reliability and Correlations Coefficient

Table 8 shows the consistency of individual variables and the reliability. The acceptable range was calculated using the Cronbach alpha (α) rule of thumb that any variable above .70 is good. At the same time, .80 is very good, and any variable at .90 and above is excellent. Perceived usefulness (PU) tested at .927, which signifies a very high internal consistency for the sample scale, followed by Trust (TR) at .860, slightly below the .90 excellent level but still at the level of good internal consistency. In contrast, Perceived ease of use (PEOU) tested at .813, maintaining a good internal consistency level; however, Awareness of service (AoS) and Mobile experience (MX) are below the good range of internal consistency, with AoS at .661, slightly below .70 and MX at .052. The mobile experience was tested against all variables as there was only one question focusing on respondents' mobile experience.

Construct	No. of items	α
Perceived Usefulness	2	.927
Perceived ease of use	2	.813
Trust	2	.860
Awareness of service	3	.661
Mobile experience	1	0.52

Table 8. Reliability of Constructs

As table 8 shows the internal consistency of individual construct and the reliability, table 9 checked the internal consistency of individual sample questions and the impact on the acceptance of mobile governance. The reliability of the Cronbach alpha was tested at .828 for the ten questions. The table also signifies the Cronbach alpha if an item is deleted, which would increase the acceptance significance; however, the result indicates that all the items used in measuring each construct are significant for the analysis ranging above .70 of a good acceptable range.

Cronbach's alpha for each item	Cronbach's alpha if item is deleted
PU1	.787
PU2	.795
PEOU1	.798
PEOU1	.791
TR1	.789
TR2	.785
MX	.836
AoS1	.848
AoS1	.821
AoS	.853

Table 9. Cronbach's alpha for each item

	PU1	PU2	PEOU1	PEOU2	TR1	TR2	MX	AoS1	AoS2	AoS3
PU1	1									
PU2	.865**	1								
PEOU1	.647**	.603**	1							
PEOU2	.713**	.686**	.685**	1						
TR1	.874**	.831**	.643**	.741**	1					
TR2	.801**	.716**	.602**	.699**	.763**	1				
MX	0.023	-0.031	.257**	0.155	0.135	0.139	1			
AoS1	0.043	-0.043	-0.038	0.002	-0.031	0.147	-0.033	1		
AoS2	.264**	.212*	.215*	0.15	.267**	.295**	0.1	.575**	1	
AoS3	-0.028	-0.013	0.088	0.098	-0.01	0.033	0.167	.253*	.369**	1
**. Correlation is significant at the 0.01 level (2-tailed). N=102										
*. Correlation is significant at the 0.05 level (2-tailed). N=102										

Table 10. Correlations of Items

The correlation of each construct items is shown in Table 10, measuring the degree to which different construct items are related to each other. A Pearson correlation was tested with two-tail significance levels less than 0.01 for high correlations and 0.05 for average correlations using a linear association between two variables from -1 to +1. Any negative value signifies no correlations between contrast, while a value higher than 0.05 shows less impact on both constructs.

As presented in table 10, every sample item PU1, PU2, PEOU1, PEOU2, TR1, AoS2 and AoS3 significantly correlated at above 0.369** (low positive); however, MX and AoS1 have no significant correlation with other sample items. The correlation of mobile experience is dependent on the factor of respondents' mobile experience of online service and its correlation with the adoption of mobile governance; the minimum correlation is -0.031 (negative) on PU2 while the maximum is 0.257** (negligible correlation) on perceived ease of use. AoS1 has the poorest significance, with four out of the seven outputs at negative correlations between -0.031 to -0.043, remaining at a negligible range of correlation lower than .30 or low positive.

5.2 Qualitative Analysis of Open-ended Questions

This second section of the data analysis presents and analyses the collected information acquired from the open-ended interview. The structured open-ended questions consist of questions that require respondents to give an extensive response to individual questions. This type of interview question gives room for thorough and concrete elaboration and permits the usage of any words for robust output.

The second section of the data analysis is divided into subsections where the author presents:
- Information about respondents.
- Respondents' understanding of E-Governance and M-Governance
- Analysis of the adoption of Mobile governance
- Lastly, the significance of Mobile governance

5.2.1 Respondents Profile

The first part of the open-ended interview collected general information about the interviewee. Table 11 shows the interviewee's profile, name was made optional; however, two out of the respondents stated their names. The sector they currently work in requires collecting the sector information to help have a distributed perspective from various sectors. The position held and the years of experience were required for this interview. Henceforth, the interviewee's position will be used throughout this analysis.

Name	Sector	Position	Years of Experience
Mrs. Adesanya	Ministry Information and Strategic Communication, Lagos State	Director of Public Affairs	4 years
Not applicable	Ministry of Transport, Osun state	Senior Transport Engineer	9 years
Oluwaseun E. Taiwo	Ministry of Information Technology, Ondo State	I.T. Support Manager and Web Analyst	7 years
Not applicable	Ministry of Education, Lagos State	Registrar	30 years

Table 11. Public Sector Respondents Profile

5.2.2 Respondents' Understanding of E-Governance and M-Governance

This first section of the interview investigated the interviewee's understanding and purpose of electronic governance to collect a robust response and to eliminate ambiguity. Furthermore, the interviewee's perspective on mobile governance was derived; however, it was optional as the interviewer believes the concept is relatively new, and responses would not be used to determine the interviewee's knowledge base.

The Registrar at Lagos State Ministry of Education conceptualises electronic governance as the government's use of an electronic device interface to connect with the citizens to enhance governing and communication. However, the Registrar portrayed no prior knowledge of mobile governance. The I.T Support Manager at the Ondo State Ministry of Information Technology described electronic governance as the application of information and communication technology (ICT) in the government system to improve and encourage the citizen participation in the decision-making process, increase

government accountability and transparency, facilitate digital communication, reduce corruption and increase effectiveness. The I.T Support Manager illustrated mobile governance as utilising mobile or wireless devices to seamlessly harness governance services and information. Director of Public Affairs at the Lagos State Ministry of Information and Strategic communication articulated electronic governance as the use of technology to provide information, policies and developmental awareness to the public through mobile phones and other electronic means to enable fast and easy outreach to the citizens. While from a Senior Transport Engineer at the Osun State Ministry of Transport perspective, electronic governance is the application of information technology to government services to promote transparency, make citizens feel inclusive and connected to the government while simplifying governmental processes, and making them easily accessible.

From the collected definition of electronic governance from all the interviewees, it is evident that all interviewees are accustomed to the meaning and purpose of e-governance. The related keywords identified from all the interviewee definitions are "electronic and information technology devices", "connect with citizens", "enhancing governing", "citizen participation", "transparency", "fast communication", and "increase effectiveness".

5.2.3   Analysis of the Interview Result

In this section, the author presented the result and discussed the data analysis using NVivo. The twenty-three (23) codes identified from the interview document were clustered into themes according to their relatedness. A thematic map on the most notable themes "Significance of Mobile Governance", "Potential Opportunity", "Potential Barrier", and "Potential Benefit" discussed by the interviewee is illustrated in figure 6, where every code connects to a respective theme. The below-highlighted themes and their respective children will be discussed accordingly in the following sections.
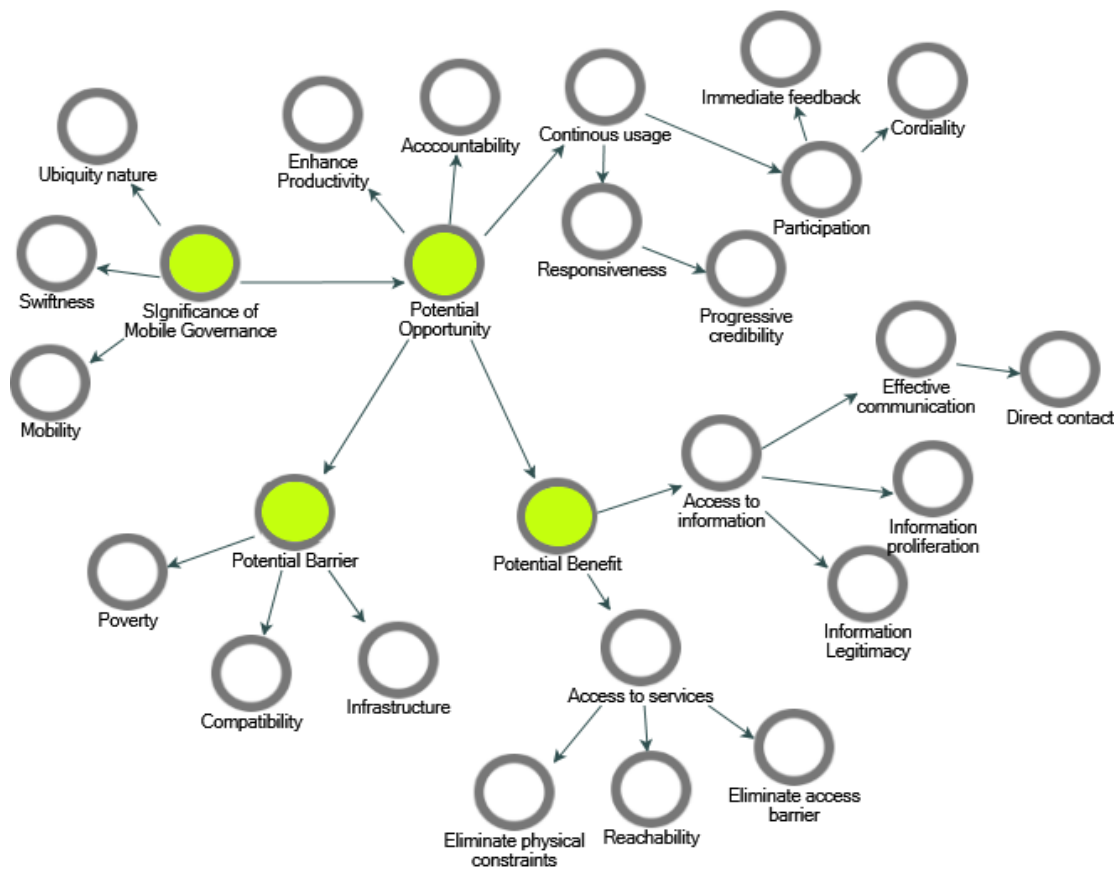
Figure 6. Thematic Map

Significance of Mobile Governance

The features and significance of mobile governance were initially discussed in this thesis, where the key attributes of mobile phones and their impact on governance were explored theoretically. However, the most crucial features identified by scholars cannot be generally applicable until tested on an individual case to know which feature has a high impact and which has less. The significance of mobile governance and the associated codes drawn from respondents' responses help validate the essential feature from the public sector perspective.

The outcome of the result validated the theoretical concept of the features of mobile phones for governance, where all respondents highlighted mobility, swiftness in reachability and ubiquity as the ultimate reason for the adoption of mobile governance. Most of the respondents pointed out some aspects mobile phones had impacted decisions and helped foster actions in a critical moment. I.T Support Manager at the Ministry of Information Technology highlighted the impact of the ubiquity nature of mobile phones,

stating: "m*obile phones are being used to address some of the most pressing challenges in Nigeria through SMS, MMS, WhatsApp and other phone services; for example (COVID-19, Kidnapping, Robbery and other criminal cases)*". At the same time, the Director of Public Affairs at the Lagos State Ministry Information and Strategic communication stressed the swiftness feature, mentioning: "*Citizens will have access to credible information on time which would increase the productivity of Public Servants.*" The mobility and availability feature of mobile phones for governance was accentuated by the Registrar at the Ministry of Education, stating: "*Its mobile and availability nature would facilitate effectiveness and efficiency*".

With the fundamental feature of mobile phones identified by all the respondents, it is evident that there is a prospect for the significance of mobile governance. However, it is arguably impossible to focus only on the general features of the tool without exploring the streamlined potential opportunity it would have for the citizen and the government.

Potential Opportunity

The respondents identified several opportunities, including benefits and barriers to mobile phones for governance. The author categorised the potential opportunities into a general and specific theme. The general opportunities consist of accountability, enhanced productivity, and continuous usage, which respondents believe would increase responsiveness, progress credibility, increase participation, facilitate immediate feedback, and build cordiality. At the same time, the specific theme of the potential opportunity consists of potential benefits and potential barriers. Potential benefits focus on the return, expected impact, and outcome of mobile governance for citizens and government. According to the respondents, the potential barriers highlight the mitigating factors or risks associated with the successful implementation of mobile governance.

Potential Benefits

The respondents' main potential benefits of the adoption of mobile governance are divided into two key categories, access to information and access to services. Access to services spotlighted the impact highlighted by respondents on the government service delivery. In contrast, access to information showed how mobile governance would affect communication between the Nigerian government and its citizens.

Access to services

Service delivery is a critical area where mobile phones have played a significant role. The interviewee also concurs with this belief that the adoption of mobile governance would significantly enhance the current process of service delivery. Mobile governance is expected to fill the main gaps of physical constraints, reachability, and access barriers. The author asked the interviewee specifically to discuss how mobile governance would help improve service delivery to marginalised people; this question ensures that mobile governance aims to include all citizens, regardless of their physical condition. The Registrar at the Ministry of Education believes *"virtually everyone has access to mobile phones which would enable easy participation regardless of physical constraints".* At the same time, the Senior Transport Engineer at the Osun State Ministry of Transport further clarifies that *"with mobile phones, there are no physical barriers to accessing governmental services other than making sure that the electronic components are functioning appropriately".* All respondents believe mobility and ubiquity features enhance reachability and eliminate the access barrier to services. The I.T Support Manager at the Information Technology Ministry articulated that mobile governance would *"enhance service delivery anytime, anywhere and better citizen-government connection."*

Access to information

Withholding supportive, reliable, and sustainable communication has been a prominent aspect of mobile phones' effectiveness over the year. Government-citizen access to information would enable a smooth running of the governmental system. Many interviewees of this research believe access to information is the primary area where mobile governance would have an outstanding outcome not only on the country but also on democracy. The interviewees emphasised information legitimacy, information proliferation, and effective communication with direct mobile contact as the central gaps mobile governance would bridge. According to the Registrar at the Ministry of Education, *"With more people having information; participating and benefiting from government programmes via the mobile phone, this would increase the growth of democracy".* Furthermore, the Registrar noted that *"the power of social media, citizen-journalists and other means of accessing information via the mobile phone would affect transparency",* also believes that citizen participation in government decisions could be increased *"through direct and effective contacts using the mobile platform for effective*

communication". The Director of Public Affairs at the Lagos State Ministry of Information and Strategic communication concluded that with mobile governance, *"citizens will have access to credible information on time, and it will increase the productivity of Public Servants". "It will be an avenue by which citizens can hear and be heard. This means that they can air their views on government programs, policies and projects."* also *", Citizens will be well informed about government activities, and through this platform, the government can be held accountable to the citizens".*

Potential Barrier

This research would be incomplete without looking into the potential barrier to adopting mobile governance in Nigeria. Over the year, it has become evident that the physical means of service delivery has not been effective enough with limited reachability. Contemporarily, electronic and mobile governance has proven to reach the unreached and make service provision unlimited. Nonetheless, this research scrutinised the significant barrier that could impede the growth, actualisation or progress of mobile governance in Nigeria.

The prime barriers highlighted by the respondents are poverty, compatibility and infrastructure. Despite the high usage of mobile phones in the country, three respondents believe mass poverty would hinder the user adoption of mobile governance. Moreover, some citizens cannot afford a mobile phone, or it is not on their priority list. In comparison, those with a mobile phone might face compatibility issues, like technical limitations such as screen size, a small processor, outdated software version, and memory size on old phones, common among senior or aged citizens.

Another prominent barrier highlighted is the weak or lack of infrastructure. The Registrar at the Ministry of Education and the Director of Public Affairs at the Lagos State Ministry of Information spotted that *"weak infrastructure, network issues would be the first barrier that would hinder the adoption of mobile governance".* The two interviewees believe that the Nigerian mobile service infrastructure is proliferating; however, the reach and strength of this infrastructure are limited to those living in the city or the developed area. Furthermore, some regions or suburbs might suffer no network coverage due to no establishment of mobile infrastructure, while some regions would have the best coverage as in developed countries.

5.3 Discussion

This aspect of the thesis discusses how the quantitative and qualitative data presented in the result and analysis chapter helps answer the main research question of "*How the government of a developing country leverages mobile technology for effective service delivery?*" However, the main research question has sub-questions developed to have an extensive result for the research. Finally, this section presents the author's limitations from the theoretical aspect, interview, and questionnaire.

The first sub-question is *"How well do citizens differentiate physical and online services in Nigeria."* The findings showed that citizens could differentiate between online and physical services; nonetheless, the primary use of online services is mainly for personal needs. In accessing the magnitude of using online services, the extent of mobile experience to access online services was measured and how this would influence the adoption of mobile governance. The findings show that most people are experienced using mobile phones to access several online platforms like social media, marketplace, entertainment platforms and other platforms, as indicated in Table 2 of the result and analysis chapter. However, the relationship between the mobile experience and other constructs used to test mobile governance adoption is very low. With ten-question of all constructs, mobile experience only correlates with one perceived ease of use item (.257**). The lesser relationship of this item signifies that people's experience of mobile phones would not affect the adoption of mobile governance as it already integrates into their daily life. Theoretically, this outcome correlates with Amer & Abdelhafez's (2017) findings on evaluating internet experience as one construct for testing the reason to use mobile government in Egypt. Amer and Abdelhafez (2017) believe internet experience could be significant among high aged citizens, not in an environment with high young or middle-aged people. However, Alkhaldi (2018) believes mobile experience plays a massive role in adopting mobile government in Saudi Arabia as prior experience of use helped support the perceived ease of use among the citizens of Saudi Arabia.

The second sub-question of the leading research question understands, *"How regularly do Nigerians seek to use the online government platform, and how would mobile governance increase this use?"* The result showed that people are aware of the government's online services; nonetheless, most prefer the physical medium to the online

medium. The findings further indicated that despite the high use of online services, online government services are quite low, with 7.62% (N-33) out of 100% (N-102). Most people prefer to visit the government office physically to expedite requests or ensure certainty of outcome. Table 7 of the result and analysis further shows the citizen percentage of interaction and awareness of online government services. The result indicated a shallow interaction and awareness of the use of the current government online services, which could negatively affect the adoption of mobile governance. However, the relationship between perceived ease of use, perceived usefulness, and trust tells a different story showing that citizens are willing to adopt mobile governance despite their low interest and awareness of the current government's online services.

Awareness of service has played a significant role in some phenomena, such as Egypt and Saudi Arabia, as Amer & Abdelhafez (2017) and Alkhaldi (2018) stated that citizen awareness spur more effective use of mobile government service in these two countries. The high relationship and correlations of perceived ease of use, perceived usefulness and trust from this research result confirm Amer & Abdelhafez's (2017) and Alkhaldi's (2018) assertion of the adoption of mobile governance as the correlation of these three items ranges high, between (.602**) and (.874**) among all items. Furthermore, citizens are willing to use and interact more with the government if accessible on mobile phones and also welcome the idea of having a government mobile application. The author assumes that there is a possibility of gaining more percentage to use mobile governance from the 26% of neutral, disagree and strongly disagree respondents after the full implementation, as the need and comfortability would be perspicuous. The perceived ease of use also shows that 63% to 68% of citizens prefer to use mobile phones to access government services and believe that mobile phones for government service delivery will be hassle-free. The ease of use of mobile governance could be improved over time as the interface of this service would encounter a continuous improvement which would earn more percentages for the perceived ease of use. The trust of use is also vital for adopting and using mobile governance.

In contrast, trust will always be a key player in adopting new technology and e-governance, as Wang (2014) highlighted. Wang (2014) separated trust into three main tiers: trust in government, technology, and agents. As indicated in Table 6 of this research, the outcome of trust shows that 65% to 78% of the citizens agree to trust government

service more and feel included in the government if it is available on mobile phones. Therefore, trust in technology, government and agents would grow over time if nurtured and prioritised.

This research's qualitative result and analysis helped solve the last sub-question: "*How to ensure that many people (those in the suburbs, illiterates, older people and the disabled) benefit from implementing the mobile governance system?*" Specifically, one of the interview questions asked respondents, "How would mobile phone usage help improve service delivery to marginalised groups of citizens (elderly, people with disabilities, less privileges)". All the respondents in this category believe mobile phones' mobility, swiftness, and ubiquity would help ensure that no citizen is excluded from the great benefit of mobile governance. Also, respondents stated unrestricted access to information and services, accountability, increased productivity and continuous usage as potential benefits of mobile governance. However, with all the potential benefits and opportunities of adopting mobile governance, respondents identified barriers that could slow down this adoption, such as poverty, compatibility, and infrastructure. Respondents from the public sector believe that not focusing on these barriers upfront could hinder the smooth adoption of mobile governance.

5.4 Limitations

The author used a single case study of a developing nation; the generalisation and external validity of the case poses a limitation. While it is possible to apply the same model and use the same method for different cases, it is impossible to expect the same outcome as generated from this research.

The other limitation of this research is the theoretical aspect framework of mobile governance. Although mobile governance is still developing, finding a considerable theoretical background is rigorous; most concrete research related to mobile phones focuses on mobile banking, mobile commerce or other business-related mobile adoption. Also, there is a limitation in finding a multi-case study to evaluate the stages of adoption from a phenomenon perspective because quite a few countries have implemented mobile governance.

Getting a verbal interview from the public sector personnel is impossible as all the personnel are wary of their reputation and prove less trust in the interviewer. However, they offered a written open-ended question. Although written answers still provide good context for the research, a verbal interview would have allowed the author to expand on asking more questions due to the interviewee's response. The final limitation is the questionnaire, where the author only gathered 102 responses. With a country of over 200millions, it is tricky to generalise the adoption of mobile governance with this number of respondents.

6 Conclusion

In answering the primary research question of how the government of a developing country could leverage mobile technology for effective service delivery, this thesis evaluated the adoption of mobile governance from a theoretical standpoint, likewise citizen and public sector perspective.

The author adopted the technology acceptance model (TAM) to help illuminate the key determinant factors for validating the adoption of this new tier of government from the citizen standpoint. With a total of 102 answers collected via a web-based survey, the author was able to test the correlation among the TAM variables using the Pearson two-tailed correlation method. Also, the adoption of the mixed method using both quantitative and qualitative methods give room for collecting adequate information from the public sector view of mobile government. The author translated the response from the four public sector personnel into codes; the codes formed into themes where each theme signifies the paramount driver of the bucket of codes. Expanding further in having reliable data, the author presented related work of mobile governance from a phenomena perspective. The related work reveals seven countries that have already adopted mobile governance, three countries from the Middle East (Saudi Arabia, United Arab Emirates and Oman), two from Asia (China and India) and two from Africa (South Africa and Egypt). The author also reveals that researchers testing the reason for the use and adoption of mobile governance in the above countries mostly adopted the technology acceptance model (TAM), the theory of planned behaviour (TPB) and the unified theory of adoption and use of technology (UTAUT).

The result confirms that mobile governance is the go-to area for developing countries to achieve the long-awaited yawning of e-governance. The high usage of mobile phones for communication and online services among the citizens has already set a foundation for the government to leverage. Furthermore, the outcome of the correlation of mobile experience on the adoption of mobile governance reveals that the citizen mobile experience is not a hindrance to the adoption likewise awareness of service; however, the usefulness, ease of use and trust are the most significant constructs valued by the citizens. The outcome also reveals that the public sector agrees with the citizens' viewpoints confirming that the usefulness, trust and ease of use of mobile governance would help

eliminate access and information barriers and enhance the productivity of the public sector worker. Also, enable accountability and facilitate an environment for continuous rapport between the government and the citizen, also increasing trust and collaboration in the long term.

However, despite all the identified blanks mobile governance would help fill, some hindrance was identified from the collected data which could mitigate the success of full adoption of this new system of government. Hindrances such as poverty have been prominent issues affecting growth in most developing countries, where people would prioritise daily bread over adopting technology. Compatibility is also an issue where devices used by people in these countries could be obsolete to withstand the processing capacity of new technology. Lastly, the best infrastructure in developing countries lives in the city, town or capital areas, whereas most people live in the suburbs due to the high cost of living in the developed area. Therefore, infrastructure in the suburb is relatively poor. Focusing on all these hindrances upfront would facilitate a smooth adoption and high success of mobile governance.

6.1 Future work

Mobile governance is at an infant stage; this study evaluates the adoption of this system in only one country of all the developing countries in the universe. Further research is required to evaluate the adoption of mobile governance using a multiple case method to validate the adoption of the same system across developing countries.

This study limits the evaluation to a few variables of the TAM model; other researchers should evaluate the adoption using other models or additional variables such as privacy, security, cost of service, ethnicity, transparency, social influences, attitude, performance, and risk. The research also leaves out the implementation stage. Therefore, further research should investigate mobile governance's design and technical aspects and test its success and failure after implementation. Finally, corruption is a parasite eating the progress of ICT development in public sectors of most developing countries. Therefore, the impact of corruption on the adoption of mobile governance should be carefully evaluated in further research.

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Appendix 2 – Closed-ended Interview Questions for the Citizens

General questions

What is your age?

- 20 and below
- 21-30
- 31-40
- 41-50
- 51 and above

What is your occupation?

- Student
- Private sector worker
- Public sector worker
- NGO worker
- Nonprofit worker
- Pensioner
- Entrepreneur
- Unemployed

Kindly describe your use of online services (One or more)

- Marketplaces
- Social media
- Government Services
- Learning and Development
- Payment systems
- Entertainment
- News
- Finding jobs
- None
- Other (Please specify)

What is your prefered device for accessing online services?

- Mobile Phone
- Personal Computer
- Both

- None
- Others

Understanding the citizen-government interaction

How often do you interact with the government?

- Often
- Not often
- Never

How often do you use the government services?

- Often
- Not often
- Never

What medium do you use in getting government services? (One or more)

- Physically (going to offices)
- Online via computers
- Online via mobile phones
- Other
- Never

What government services have you accessed online?

- Jobs
- Justice, law and grievance
- Travel and Tourism
- Business and self-employed
- Education and Learning
- Health and Wellness
- Electricity, Water and Local services
- Money and Taxes
- Birth, Death, Marriage and Childcare
- Pension and Benefits
- Transport and Infrastructure
- Citizenship, Visa and Passports
- Agriculture, Rural and Environment
- Science, IT and Communication
- Youth, Sport and Culture

- Security and Military services
- None
- Other (Please specify)

Mobile phone knowledge base

How will you like to access government services?

- Physically
- Online via PC
- Online via Mobile phones
- Never
- Other

How often will you use the government platform if accessible on mobile phones?

- Often
- Not often
- Never

Mobile Governance knowledge base

Using a scale of 1 to 5 where 1 is "Totally Disagree" and 5 is "Totally Agree"?

- I believe mobile phones for government service delivery is easy to use
- I will trust government services more if they are available on mobile
- I will prefer mobile phones to PC for accessing government services
- I would prefer PC to mobile phones for accessing government services
- I will interact more with the government if accessible on mobile
- I will use the government mobile application if available
- I trust mobile governance would help me feel included in the government

Appendix 3 – Open-ended Interview Questions for the Citizens

General question

- Name of the interviewee (optional)
- Name of the sector
- Position
- Years of experience

Understanding of E-Governance

- In your perspective, what is electronic governance?
- What is the primary purpose of introducing electronic governance?
- What is your understanding of mobile governance? (Optional)

Reason for mobile governance

- How would mobile phones increase the effectiveness and efficiency of government service delivery?
- How would mobile phone usage help increase citizen participation in government decisions?
- How would mobile phone usage help improve service delivery to marginalized groups of citizens (elderly, people with disabilities, less privileges)
- How would mobile phone usage contribute to the growth of democracy?
- How would mobile phone usage for service delivery help increase government transparency?
- How do you think citizen trust in the government would affect the adoption of mobile government service delivery?
- What are the benefits, barriers, or challenges that you think may arise from mobile phones for government service delivery from the government and citizen perspective?

Appendix 4 – Open and Closed ended Interview Responses

M-Gov - Closed ended responses - Google Sheets

M-Gov - Registrar, Ministry of Edu. Response - Google Docs

M-Gov - I.T. Support Manager, MIT, Response - Google Docs

M-Gov - Director of Public Affair, Response - Google Docs

M-Gov - Senior Transport Eng. Response - Google Docs