A FRAMEWORK OF CHALLENGES OF THE TRANSITION FROM E-GOVERNMENT TO M-GOVERNMENT INTHE UNITED ARAB EMIRATES

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UNIVERSITI PENDIDIKAN SULTAN IDRIS

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ABSTRACT

This study aimed to investigate (a) the challenges due to lack of IT infrastructure, (b) the challenges of security and privacy, (c) the challenges associated with IT skills, (d) the knowledge of operating standards and protocols, and (e) the existing operational framework. This study employed a systematic review of previous literature by focusing on the challenges in and opportunities for a successful transition from e-government to m-government. A survey questionnaire was used to gather the data relating to the study constructs from 250 respondents and the proposed framework was validated by the Fuzzy Delphi method. The survey data were analyzed using Chi-square test that showed the constructs of the study - IT infrastructure, security and privacy, IT skills, knowledge of operating standards and protocols, and operational frameworks - had significant effects on the transition from e-government to m-government based on the calculated χ^2 values not exceeding the threshold value of 9.488 at the level of significance of .05. Therefore, the Fuzzy Delphi method showed there was a strong consensus of opinions among experts regarding the significance of the five constructs and their components, as evidenced by the high percentages of expert agreement ranging from 93% to 100%. These findings will have several implications that the stakeholders need to be aware of the inherent challenges in and opportunities for a successful transition of services from e- government to m-government, which can be better understood with the use of the framework developed in this study that highlights the critical parameters involved in such a transition and will enable governments to accomplish efficiency in service delivery to citizens and corporate entities through wireless information and communication as well as integrating various government department and personnel through mobile platforms.

RANGKA KERJA CABARAN PERALIHAN DARIPADA E-KERAJAAN KEPADA M-KERAJAAN DI EMIRIYAH ARAB BERSATU

ABSTRAK

Kajian ini bertujuan untuk mengenal pasti (a) cabaran kekurangan infrastruktur IT, (b) cabaran keselamatan dan privasi, (c) cabaran yang berkaitan dengan kemahiran IT, (d) pengetahuan tentang piawaian dan protokol operasi, dan (e) rangka kerja operasi sedia ada. Kajian ini menggunakan semakan literatur sistematik untuk mengenal pasti cabaran dalam dan peluang untuk peralihan dari e-kerajaan ke m-kerajaan. Borang soal selidik digunakan bagi mengumpul data yang berkaitan dengan konstruk kajian daripada 250 orang responden dan rangka kerja yang telah dibina disahkan dengan kaedah Fuzzy Delphi. Data tinjaun dianalisis dengan ujian Chi- squared yang menunjukkan konstruk-konstruk kajian - infrastruktur IT, keselamatan dan privasi, kemahiran IT, pengetahuan mengenai standard operasi dan protokol, dan rangka kerja operasi - mempunyai kesan yang signifikan terhadap peralihan dari e-kerajaan ke m-kerajaan berdasarkan nilai-nilai χ^2 yang tidak melebihi nilai ambang 9.488 pada paras signifikan .05. Oleh itu, kaedah Fuzzy Delphi menunjukkan terdapatnya konsensus yang tinggi dalam kalangan pakar mengenai kepentingan kelima-lima konstruk dan komponen-komponen yang terlibat dan ini dibuktikan oleh peratusan persetujuaan yang tinggi dari 93% ke 100%. Dapatan kajian ini mempunyai beberapa implikasi di mana mereka yang berkepentingan perlu sedar mengenai cabaran dalam dan peluang untuk peralihan perkhidmatan dari e-kerajaan ke m- kerajaan yang dapat difahami dengan lebih berkesan dengan menggunakan rangka kerja yang dibina dalam kajian ini yang memperlihatkan parameter-parameter yang kritikal yang terlibat dalam peralihan berkenaan dan akan membolehkan kerajaan mencapai kecekapan dalam penyampaian perkhidmatan kepada rakyat dan entiti korporat melalui maklumat dan komunikasi tanpa wayar serta mengintegrasikan pelbagai jabatan dan kakitangan kerajaan melalui platform mudah alih.

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LIST OF ABBREVIATIONS

E-government	Electronics Government
M-government	Mobile Government
NECCC	National Electronic Commerce Coordinating Council
UAE	United Arab Emirates
ICT	Information and Communication Technology
PDA	Personal Digital Assistant
UNDP	United Nations Developmental Program
OECD	Organization for Economic Cooperation and Development
TRA	Telecommunications Regulatory Authority

CHAPTER 1

INTRODUCTION

1.1 Introduction

In recent years, the efficiency of business transactions has been given a strong emphasis in many developing nations around the globe. In particular, the advent of electronic government, popularly known as e-government, has drastically altered the business realm by employing information and communication technology (ICT) to improve the efficacy of government services of many nations to serve their citizens, employees, businesses, and agencies through web-based internet applications (OECD, 2018). Around the world, various federal, state, and local governments have applied various e-government initiatives to enable the purchase of goods and services, the delivery of information and forms, and submission of bids and proposals (Gefen et al., 2018; Pavlou, 2018; Van Slyke et al., 2019).

These online services bring in many benefits to both citizens and governments of many nations. From the public perspective, e-government is an efficient strategy of modernizing information acquisition, thereby reducing the cost of a business transaction. It is also an effective strategy of providing an array of information to citizens and private business ventures through the Internet. From the governmental standpoint, e-government plays a major role in information dissemination for the public, thereby facilitating the implementation of government services, transactions, policies, and resource distributions across agencies which results in agencies experiencing significant cost reductions and improved efficiency, with citizens receiving faster, more convenient services (Wirtz, 2017) & (Trinkle, 2017). In recent years, the public, including government employees working in various organizations, have witnessed the proliferation of mobile devices that expedited the transition from e-government to m-government, also known as (Mobile government), as more people are becoming more aware of the importance of m-government, which they can gain access to anytime, anywhere using their mobile devices (Song, 2018).

Essentially, M-Government is an extension or evolution of e-government through the utilization of mobile technologies for public service delivery (Mensah & Zeng, 2020). Thus, an efficient transition of e-government to m-government services is vital for fostering improvements in management services and the utilization of governments' information technology resources. As emphasized by Magdy (2018), the success of e-government adoption and implementation largely depends on various factors which include, but not limited to, a sound and efficient leadership, a proper cross-coordination of activities as well as better knowledge of an ICT strategy. As

such, these factors are the determinants of the success of m-government adoption and implementation.

1.2 Background of the Study

Today's government programs and transactions must be dynamic, user-focused, conveniently available, and compatible with the most recent innovative technology as well as citizens' rapid modern lifestyles (Alsaadi et al., 2018). Consumers may use current state taxation programs to download and upload forms and obtain information (Alsaadi et al., 2018). Governments must deliver high-quality services via smart apps to achieve universal acceptance of smart-government services. The apps are designed to meet consumers' evolving requirements while also offering a high level of service and efficiency (Mahmood, 2020). Smart-government apps appear to benefit both individuals and governments (Sunassee et al., 2017). They are more convenient for customers since they may use a smart device to obtain services at any time and from any location (Mahmood, 2020).

Compared to previous systems, governments may change and distribute new material and information to consumers with relative ease, reaching a far bigger audience, particularly those in rural regions and those who are not computer literate (Alsaadi et al., 2018). Smart-government services help people save money, time, and effort by allowing them to access services and information from anywhere and at any time (Alsaadi et al., 2018). The amount of people who use any system, including the smart-government system, determines its efficacy (Sarantis, 2019).

Smart-government service acceptance is key to their success (Mahmood, 2020). Previous research on smart-government service adoption has concentrated on the static, interaction, and transaction stages but has not given special attention to the particular aspects that drive smart-government service adoption. According to Jain and Ranawat (2017), this dilemma arises since neither existing researchers nor competent service providers thoroughly understand customers' demands at each level of smart-government services.

Many studies have explored and determined the essential variables that impact the adoption of smart-government services using current technology acceptance theories and models such as the TAM, UTAUT, TRA, and TPB. Alsaadi et al. (2018) experimentally evaluated the TAM model in the UAE by considering four external forces: perceived usefulness, social influence, trust, and cost. They observed that social influence and trust influenced behavioral intention to use smart-government services. Alsaadi et al. (2018) investigated the motivators for adopting smart-government services by combining the TAM and UTAUT models. According to the research, perceived trust, affordability, simplicity of use, social conditioning, and performance anticipation all had a major influence on people's continuous usage of smart-government services.

The UAE Government publicized the creation of the "Best m-Government Service Award" in February 2014, with the first edition in March 2014. It is being implemented in keeping with the administration's smart government tacit of making government transparent and available to the general public around the clock annually. The Award is planned to urge government associations to foster new cell phone

applications, versatile web SMS, and smart wearable advances (Nazneen &Jagtiani, 2021). It will be presented annually. It pays tribute to the governments of the United Arab Emirates, both federal and local, and organizations the whole way across the Arab world and the world. Also, a special reward will be given to students enrolled in academic institutions in the United Arab Emirates to encourage innovation and creativity and engage in the provision of public service solutions. Furthermore, it was discovered that 71 percent of respondents had registered fewer than ten applications, which is an indication that there is a problem with the acceptance of services provided by mobile-government. (Mansoori& colleagues, 2018). These facts indicate an urgent need for a study to determine the primary elements influencing end-user behavior regarding mobile government services usage or adoption. This research should be conducted as soon as possible.

The Government of the UAE and the Ruler of Dubai is visionary leader who believes that technology is necessary for achieving exceptional personal satisfaction. In a joint effort with its Smart Dubai partners, DSG is progressing toward achieving long-term citizen, resident, and tourist happiness. Many tasks are assigned to SDG as part of its mandate, including a) proposing the general system for the keen government project; b) directing savvy rebuilding at the degree of government substances; c) investigating plans and spending plans for keen change at the degree of government elements as far as data innovation, keen services, and framework; d) proposing legislation that are critical to facilitating the transformation cycle.

In 2021, SDG was established under the name "Dubai e-government" to provide smart city customized solutions to the residents of Dubai (Nazneen &Jagtiani,

2021). In June 2013, the government renamed e-government to Dubai Smart Administration to reflect its vision of a more competent government. Another statute, passed in November 2015, established SDG as an institution; a subsequent rebranding exercise, completed in March 2016, brought about an alternate personality and symbol. As the CEO of SDG, H.E. Al-Abbas serves as the organization's leader (Nazneen &Jagtiani, 2021). SDG has assembled a whole team of people to work towards that goal to realize King Mohammed VI's ambition of making Dubai the world's most innovative and most happy city.

According to Karunasena and Deng (2012) transition program from e-government to m-government provides several benefits, such as movement and ubiquity, the availability of site-based governmental services, on-time service delivery, ease of use, and improved emergency management services. These benefits offers alternative solutions to overcome most of the administrative inconveniences and inefficiency of e-government service delivery. Inevitably, similar with any other technologies, such a transition will face many challenges and barriers, especially during a transition process.

For private organizations, the public enterprise must endeavor to establish an IT infrastructure that supports a newly introduced and compatible information system and applications, encompassing the provision of hardware and software that can provide protected electronic services to the business community as well as to ordinary citizens. Information technology infrastructure (IT Infrastructure) dimension includes a shortage of reliable network and communication, inadequate network capacity or bandwidth (Nurulhusna Ghazali; Rozilawati Razali (2014), a lack of resource

standards, common architecture policies, and definitions (Chen et al. 2015), incompatible systems, and complex internal systems that restrict integrating capabilities (Sivarajah, et al. 2014). Additionally, there has been a lack of integration across government systems and the integration technologies of heterogeneous databases, a lack of knowledge regarding e-government interoperability, complexity in understanding the processes and systems involved in their redesign and integration, a lack of availability of enterprise architecture and compatibility of software, systems and applications, as well as a lack of documentation, especially in custom systems (Ayyash, Ahmad, & Singh, 2013; Khayun et al. 2012).

Generally, IT infrastructure consist of wireless infrastructure such as fiber optic channels, Wi-Fi networks, wireless hotspots, kiosks, and service-oriented information systems (Al-Hader &Rodzi, 2009). Anthopoulos and Fitsilis (2010) emphasized the importance of organizational IT infrastructure flexibility which is a major strategy to successful m-government implementation. The concept of IT infrastructure flexibility has been characterized into different dimension by different researchers. In the exploratory study conducted by Duncan (1995), the author characterized IT infrastructure flexibility into compatibility, connectivity, and modularity. In the study of Byrd and Turner (2021), IT infrastructure flexibility was characterized into two components (Technical and human components). The technical component consists of IT connectivity and IT compatibility, and modularity) and the human components consist of technology management, business knowledge, management knowledge, and technical skills.

Chung, Rainer, and Lewis (2018) reported compatibility, modularity, connectivity, and IT personnel to characterize IT infrastructure flexibility. The report further shows that there is significant relationship between connectivity, modularity, and IT on strategic IT-business alignment. Ness (2018) investigated the relationship between IT infrastructure flexibility, strategic alignment, and IT effectiveness. Findings indicated a positive relationship between the variables. Masrek and Jusoff (2009) utilized four components of IT infrastructure flexibility (compatibility, connectivity, modularity, and skilled IT personnel) to gauge intranet effectiveness under three dimension such as operation, culture, and facilitation. Findings indicated a significant relationship between IT infrastructure flexibility components and intranet effectiveness.

According to Germanakos, Samaras, and Christodoulou (2016), IT infrastructure for an efficient e-government to m-government platform should be designed to comply with a general legal and procedural framework as well as with principles, rules, and regulations capable of giving around the clock service seven days a week. IT infrastructure architectural design either for wired and wireless mechanisms and procedures should satisfy all the e-government and m-government goals. Main part and component of an IT infrastructure is composed of:

(1) User interface (front-end): This provides a single point of access to informational, interactive, and transactional public and business services.

(2) Integration middleware: This component provides service and user request that facilitates the assemble/dispatch data from across

governments and supports related transactions to be conducted and usually based on XML messaging and Web related services.

(3) Back-end layer: This component provides the storage of the actual internal and external services and related requested information (Greunz, Schopp&Haes, 2015).

Coaker and Deans (2016) emphasized that the wireless technology infrastructure utilized for e-government infrastructure and service can be extended to be used for m-government services. Hence, m-government infrastructure platform incorporates requirements which includes broadband, interoperability, scalability, transparency, personalization, privacy, and security as shown in Table 1.1.

Table 1.1

Requirements of M-Government Infrastructure

M-Government Requirement	Description
Broadband	Considered a new initiative that will have a unique impact on the further development of the m-gov channels and infrastructure.
Interoperability	A multi-faceted requirement that is necessary at various levels such as device-to-network; device-to-device; network-to-network; and between content and/or applications. Without appropriate interoperability between different infrastructure and terminal solutions, the 3G reality could remain fragmented.
Transparency and Scalability	Incorporates design of software applications and systems for the number of concurrent clients that access the application, response times, and transparency issues.
Personalization	Incorporate concerns such as what content to present to the user, how to show the content to the user, how to ensure the user's privacy, or how to create a global personalization scheme.
Privacy and Security	Involves securing an appropriate environment for corporate and individuals' mobile applications of personal and sensitive data.

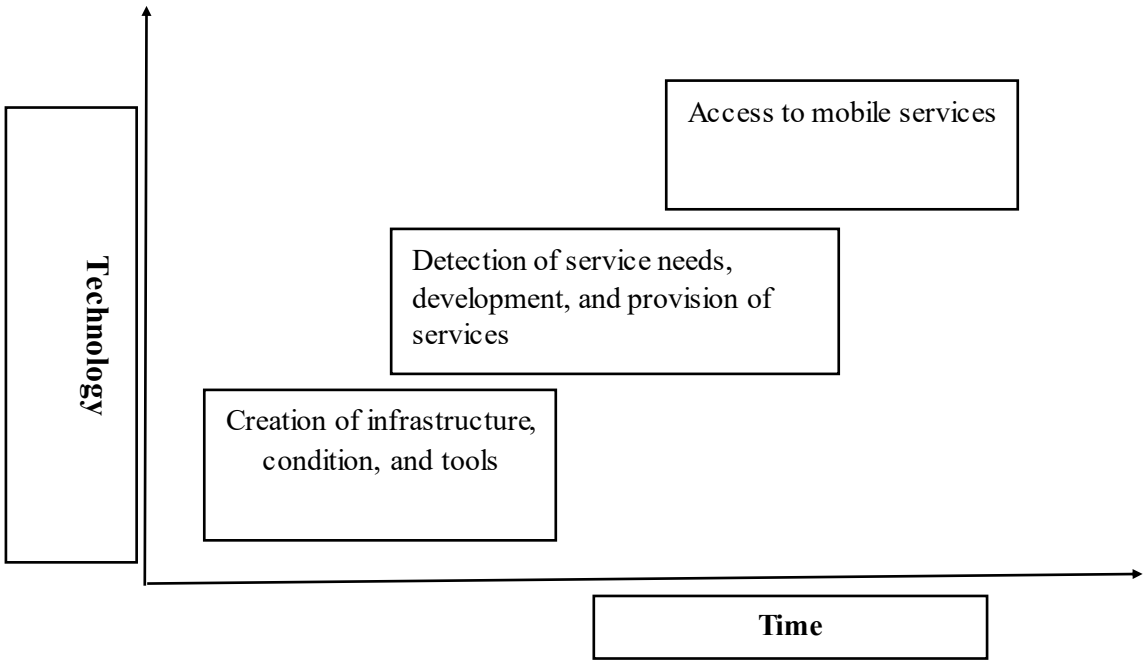
Source: Centeno et al. (2019)

Models of m-Government: In the study of Centeno et al. (2019), the authors designed a model for implementing e-services at M-Government level with three parts which include, creation of infrastructures, conditions and tools required for providing m-services, detection of service needs, and development and provision of services. The focus of the model is on the needs of the citizens as illustrated in figure 1.1

According to Centeno et al. (2019), citizen's readiness to utilize m-government is assessed in the first part of the model and efforts are asserted to improve the usage.

Figure 1.1

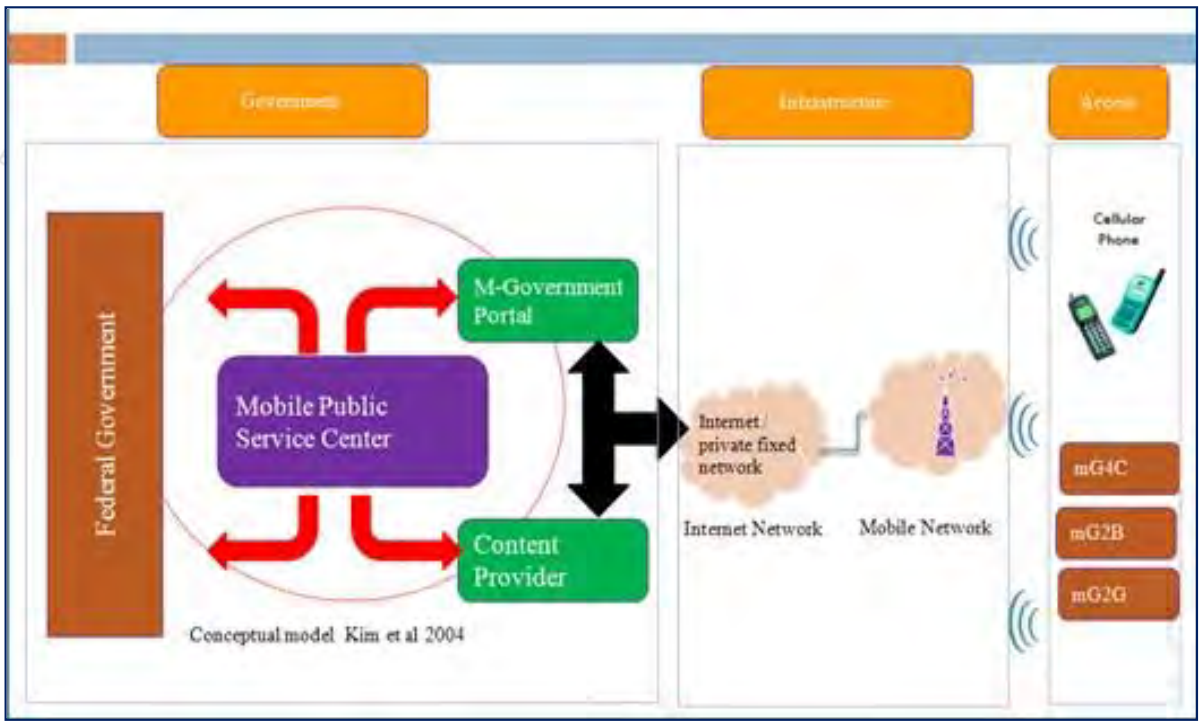
M-Government model Centeno et al. (2019, p. 15)



In the first part of the model, the major responsibility of government includes the development of essential infrastructure for mobile technologies, as well as to organize such technologies in ways that fit with the establish ICT infrastructures which will enable the use of m-services by the citizens. The second part in the model involves the provision of m-services to the citizens which is the most crucial aspect of the model as this will further involve the establishment of users consent for m-government services.

Figure 1.2

M-Government Adoption Model Source: (Kim et al., 2019)



Tomas et al (2019) thought that if opportunities are uncovered by the government regarding the provision of services via mobile phones, they should be assessed to ensure that the citizens will be able to access them and not miss them or face additional challenges. The approach is aimed at enhancing inclusivity by

increasing accessibility of all government services. In this regard, the government should create the essential conditions for citizens to access m-government services easily and quickly. In other words, the relationship between citizens and government is a key pillar of the m-government concept.

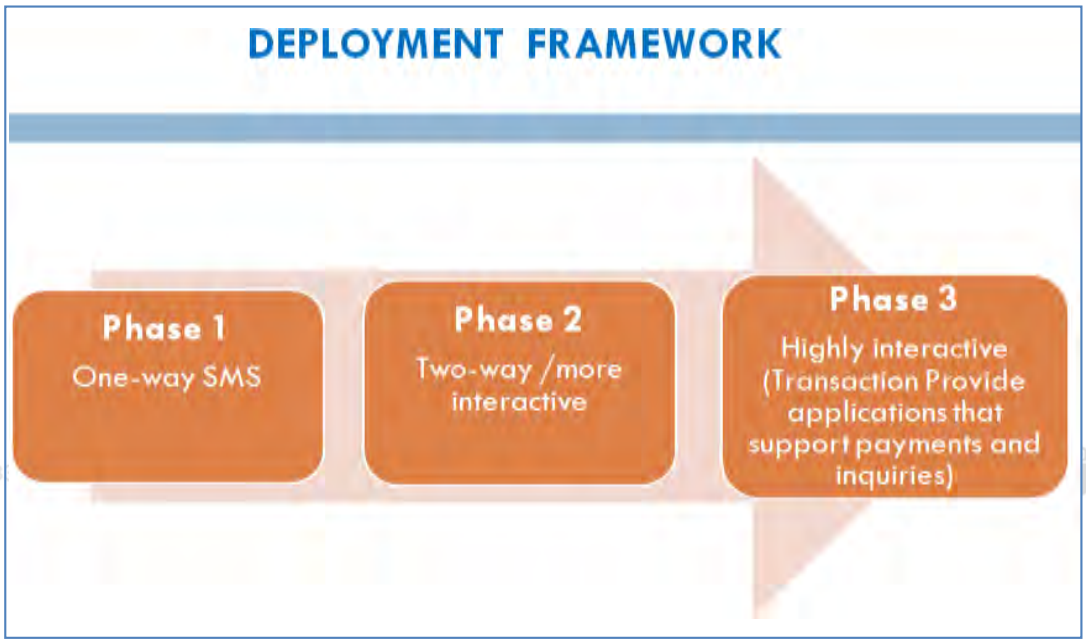
Kim et al. (2019) highlights three approaches that can help to achieve the m-government model. (Figure 1.2). First, the government can launch the m-government services independently and rely on telecommunication companies as the gateways. The second is similar to the first but it involves launching independent portals that will then be used to access various services. Through various services, the telecoms industry has greatly increased the earnings of numerous government bodies throughout the years. The third approach entails using a government gateway specifically developed for m-government services.

The purpose of the mobile service delivery gateway (MSDG) is to create government-wide shared infrastructure and services that will allow for quick development, mainstreaming, and deployment of m-Government services. By providing a common pool of resources aggregating the demand for communication and existing e-Government services, it will improve interoperability across various public services while also lowering the total cost of operation of m-Government services. It will also serve as a platform for various government departments and agencies to test, rapidly deploy, and easily maintain m-Government services across the country. Open standards should be used to build the infrastructure (to ensure interoperability of apps across operating systems and devices).

Kim et al. (2019); FarshidGhyasi (2019) and Farshid and Kuschu (2017), explain that m-government can be deployed effectively and efficiently in three different phases proposed by as shown on (Figure 1.3).

Figure 1.3

M-Government Deployment framework



Phase 1-applications to reach out to people, phase 2-applications to motivate citizens, and phase 3-applications that need basic transactions are all examples of how m-government can be deployed effectively and quickly. Given that the majority of individuals now own mobile devices, which are well-suited to serve as alternate access and delivery channels for government services. It is vital to note that m-governance is currently undergoing development not just in underdeveloped countries but also in affluent countries. The proposed m-government initiative's success will be determined in large part by governments' ability to provide citizens with frequently needed public services, build infrastructure for ubiquitous mobile-

based services, adopt appropriate open standards, develop appropriate technology platforms, keep service costs low, and create jobs.

Beginning with SMS-based m-government would play a crucial role in poor nations (Bremer & Prado, 2017; Susanto et al., 2010). According to reports, providing public services via SMS has significantly reduced time and cost; introduced a cheaper, easier, and faster information-access channel; improved transparency, accountability, communication, and relationship between government and citizens; made services and procedures easier for citizens; improved the district's political image; engaged more people and increased citizen participation.

Figure 1.4

Three-dimensional model of m-services in m-Government (Source: Yu &Kushchu, 2019, p. 887-898)

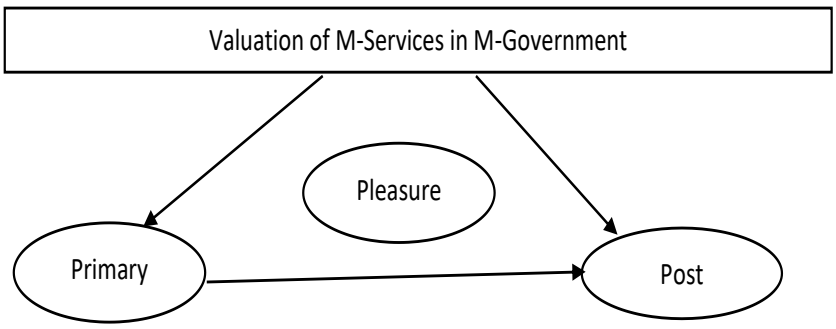


Table 1.2

Three Dimensions Model. Source: (Yu &Kushchu, 2019)

Dimension	Descriptions	Usage
Primary Value	Considering real informational needs of users. This type of value provides primary needs of usersto solve problems	Short message system for deaf people. Quick access to a set of requested information. Locating stolen goods.
Pleasure Value	Presenting better services to citizens in a dynamic and desirable interaction between government and citizens	M-transactions. Rapid informational interactions. Coping with crimes.
Post Value	Citizens' self-service among various options	GPS. M- Vote.

Source: (Yu &Kushchu, 2019)

As stated by Rossel et al. (2017) implementation of the of m-Government programs requires specific conditions and the most important of which is electronic awareness and readiness of citizens for accepting the political/cultural/technical infrastructures. In this regard, the public sector managers should examine andfacilitate the implementation of proper ICT technologies for an efficient transition of e-government to m-Government.

Ghyasi and Kushchu (2019) proposed a model for evaluation of applications of m-Government in which classified ordinary applications (receiving short messages from public sector organizations, receiving information from stock market, meteorology, sending educational information to schools for students), interactional applications (interactions of schoolmasters with families, interactions of public organizations with citizens, creating constructive relationships between internal parts

of organizations) and fully interactional applications (interactions of public sector organizations with each other, interactions of public and private sectors organizations and concurrent interactions of citizens with citizens and government).Sandy and McMillan (2009) proposed a model of success for m-government that has five evaluation dimensions or levels which include(1) Preliminary level, (2) Advance level, (3) Interactional level, (4). Transaction level, (5). Totally interactional level.

According to Sandy and McMillan (2009) each level constitutes a vital evaluation stage that determines how well m-government is achieving the set objectives.

1. Preliminary level- provides evaluation of infrastructures required for wireless access to citizens' information and performing non-interactional activities for instances opinion poll.

(2). Advanced level – Involves updating information and providing related services such as weather prediction, traffic status of cities, electronic payments, and political changes.

(3). Interactional level- involves developing official interactions between citizens and providers of public services. This necessitates facilitating the provision of necessary information about different services of public sector is provided to citizens and information about citizens' needs is provided to public sector organizations. For instance, citizens receive necessary forms and documents from informing websites of these sectors.

(4). Transaction level- involves developing a single interaction opportunity for sharing value between m-citizens and m-government. At this level, mobile transactions are usually performed through specific mediators under the

complete control of government. The manner of providing services is totally made-to-order.

(5). Totally interactional level – involves security of mobile interactions and transactions for payment, ordering and issuance of service bill is considered. This level also involves making sure mobile and wireless technology acts with the aim of creating independence, increasing security, and protecting privacy of individuals. Interactions of this level are developed not only between citizens and government, but also among citizens and among internal divisions of public sector organizations.

According to the authors, recognition of mobile and wireless technologies is only one part of the platform which allows movement from e-government toward m-Government. In this regard Heeks (2019) posit that planning for development and implementation of services at this platform requires careful reflection of factors that bring accomplishment to the strategies of m-Government for providing m-services.

In a study conducted by Jahanshahi et al. (2011), a three section and seven level m-government model (SMS- based) (Figure 1.5). The three section of this model - communication, interaction, and network.

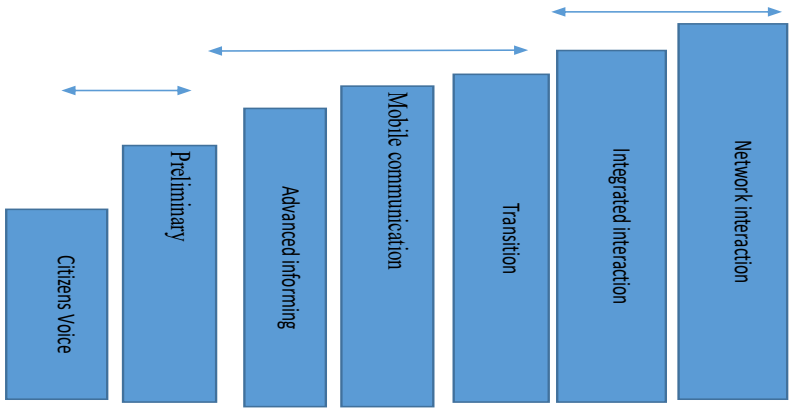
(1)Communication section. This section involves the level of citizens' voice andthe level of preliminary information. This involves making available the plans for m-government available to citizens as well as listening to complaints and receiving oral reports from citizens. Furthermore, preliminary informing level information necessitates that SMS-based applications will be able to develop communication

between government and citizens Sending public notices and internal news by government and sending reports, documents and personal information of citizens are performed at this level. Providing public services at this level is performed through encouraging citizens to use m-services.

(2)Interaction section- This section involves high level mobile technologies and advance information level. This section also provides that avenue through which high level of readiness will increase, since higher-level mobile technologies will be used. The advanced informing level involves forming communications through interaction such as when citizens send short messages to the intended system in public sector to receive services and they will receive the intended service or information about it in the shortest time possible.

Figure 1.5

Three sections in seven-level-model of providing m-services in m-Government (Source: Jahanshahi et al. (2011, p. 1193)



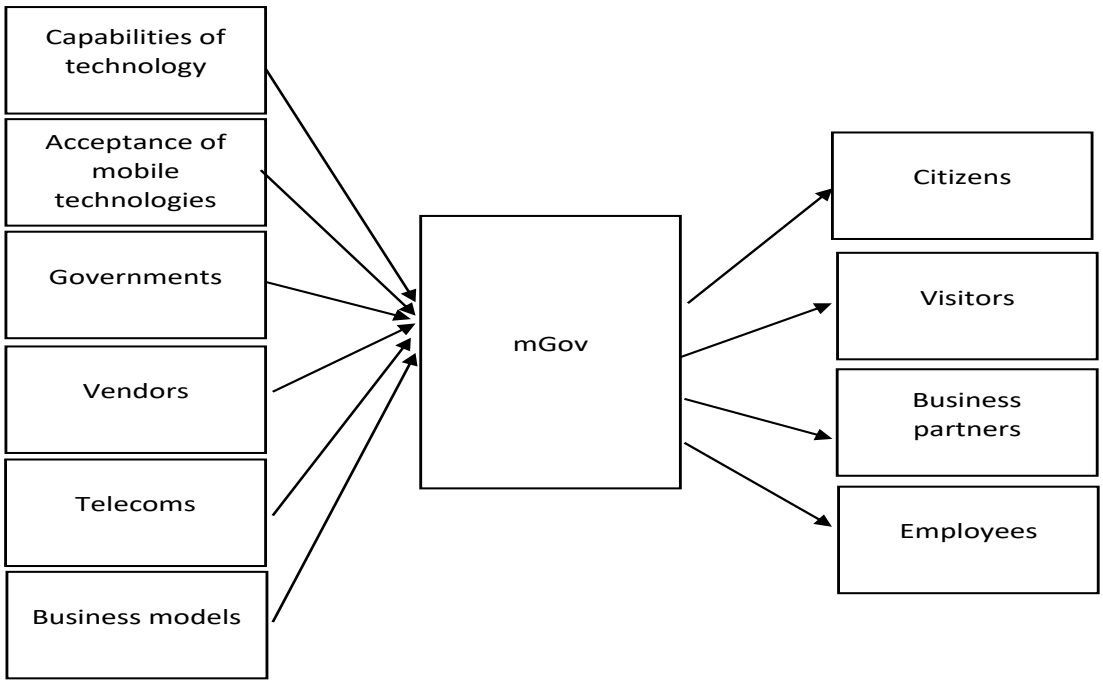
(3)Network section -This section involves government communication with a larger number of citizens with the task of making more infrastructures and tools of

mobile technology ready and available as well as making sure that the readiness of citizens for accepting m-Government services has increased. Hence an integrated interactions level that requires a system that can provide the communication between citizens and government and manage received information simultaneously is implemented.

Furthermore, a network interaction level should also be provided to facilitate relationships between government and citizens, public sector organizations and other organizations. Carroll (2017) proposed six (6) dimensions m-government framework for citizen, visitors, Business partners, and employees based on the concepts of innovation, information systems, e-commerce, and mobility literature that facilitates implementation and uptake of m-government (Figure 1.6).

Figure 1.6

Six-Dimensional m-government Service Framework: Source: (Carroll, 2017)



According to Carroll (2017), the dimensions include capabilities of technology, acceptance of mobile technologies, government involvement, vendor's involvement, telecommunication organizations, and business models. The intended users include citizens, visitors, business partners, and employees. As stated by Carroll (2017), (1).

Germanakos et al. (2018) is of the opinion that availability of multiple channels raises issues of interoperability, data quality and transparency of delivery across paper based, e-government and m-government systems as well as a range of institutional arrangements which may include

(1) Legislation to ensure security, privacy, and recognition of mobile transactions and infrastructures that facilitates implementation.

(2) Acceptance of mobile technologies – involves the acceptability of the general public or citizen of mobile technologies. This this aspect, studies already indicate that there is widespread acceptance of mobile technologies, and their use is common in rural and urban settings, in developed and developing countries, in private and public places by young and old. Hence acceptance as integral tools of everyday life that is encouraging m-government application services.

(3) Government's involvement – Government involvement is a vital aspect of m-government framework. As stated by Borucki et al. (2018), Government is needed in the provision of efficient services at low cost, right format, and on time to citizen.

(4) Vendor's involvement - According to Sandy and McMillan (2018) integration of vendors of systems, hardware and devices, software developers

and consultants that devise and sell generic m-government applications are vital for m-government framework.

(5) Telecoms– Another aspect is the involvement of the telecommunications companies which will facilitate increase in profits through distribution of more content on their networks.

(6) Business model - Elliot (2016) argues that business models capture how innovations can add value to an organisation. Studies indicate that there is a range of business models for e-commerce to m-commerce framework (Timmers,2021) and the public sector is encouraged to implement some of these private sector models although their verification on how to successfully align with public sector services is recommended (Navarra & Cornford 2019).

Despite numerous challenges and barriers, the adoption and implementation of E-government in the United Arab Emirates (UAE) has been carried out successfully, providing a superior flow of information delivery of governmental services. Being the first among Gulf Cooperation Council (GCC) countries to intensify the push for electronic government, its transition to M-government became imminently inevitable as the rate of mobile phone penetration across the Emirates had reached a record high (Al-Khouri, 2019). Equally important, M-government initiative falls in line with the country's ambitious Vision 2021 that aims a high-qualityworld-class government services delivery.

For such a bold initiative, all its governmental entities were given two years, stretching from 2013 to 2015, to complete the implementation of services through mobile phones. In this regard, the Telecommunications Regulatory Authority (TRA),

the sole authorized entity that oversaw the implementation of the M-government Initiative, prepared relevant documents as a road map for such an implementation, the aims of which are as follows:

1. To establish the environment for M-Government in government sector.
2. To assess the capability and capacity of governmental entities.
3. To establish shared resources across governmental entities on the national level.
4. To achieve citizen happiness.

(Source: https://u.ae/en/about-the-uae/digital-uae/uae-mgovernment-initiative)

A full implementation of M-government across all governmental and private organizations is the primary aim of the M-government initiative embedded in the UAE Vision 2021, which is geared toward realizing all the benefits of M-government. Also, while in the implementation, the official portal's primary goal is to serve as a single access point for users to various government and federal E-Services. It does this by acting as a unified platform or single entry-point. It also makes it possible to strengthen communication between consumers and government officials and E-Participation by utilizing forums, blog posts, polls, and social networking sites, among other features. Government.ae is the primary portal for the discussion thread on E-Participation, E-Services, services, and UAE Open Data, all of which are available through the main portal is also the main portal for the discussion thread on E-Participation, E-Services, services, and UAE Open Data (Mreea et al., 2017).

M-governance has taken shape in developed and developing countries due to its efficiency when delivering government services. The shift to mobile operations has

shown significant growth in the social and economic sectors. Mobile technology has advanced in producing services since it is fast and efficient since most citizens have access to mobile technology. The ICT model of the government leverages the internet presence of most citizens since this then creates a platform for operating in a more efficient model. Expanding the communication channels gives mobile technologies access to infrastructure that would promote internet connectivity. Consequently, the government can reach out to many crowds since they offer better technologies. Also, mobile technologies have allowed citizens to explore numerous unimaginable opportunities before introducing modern technology. The United Arab Emirates has seen different versions of technologies, which have improved how they communicate with their citizens.

In 2015, the two-year deadline imposed by the UAE's government for m-government services to be implemented across all governmental organizations had passed, culminating in a remarkable milestone that witnessed the implementation of its m-government peaking at 96.3%, encompassing 337 important governmental services offered by 41 governmental entities. (G-A-R, 2017). Admittedly, an implementation rate at 100% would be extremely difficult to achieve due to various challenges. A report published by Telecommunications Regulatory Authority (TRA, 2019) indicated its governmental entities faced several key challenges in implementing m-government services, such as interoperability, integration efficiency, data privacy, security, user-friendly applications, and accessibility.

As stressed by Hassan (2019), there is a strong connection between e-government and m-government strategies. As further pointed out by Abdel-ghaffar

and Yousra (2017), the transition from e-government to m-government has been spurred by the rapid proliferation of cell phones in the UAE society as well as the appearance of versatile web and portable applications and administrations of mobile phones, which has gathered a strong momentum compared with the conventional wired personal computers. This remarkable development has changed how its citizens acknowledge the usefulness of cell phones as a powerful tool that can be used not only for making calls but also for exchanging data, trading texts, and sending and receiving messages from government portals (Kushchu & Kuscu, 2018).

Nonetheless, legal issues concerning the data ownership of m-government applications have not been fully understood and addressed by governmental and private organizations, and as such appropriate governmental frameworks must be put in place to ascertain appropriate policies can deal with legal issues (CIO Council, 2019). In the same way, mobile service quality, data and service systems, accessibility, privacy and security are still transition challenges Zhao et al., 2019). The inadequate m-government infrastructure (Software frameworks, for example, institutional frameworks and software), lack of hybrid systems hinder transition from e-government to m-government (Kuscu, 2018). Another challenge is the incompatibility of mobile systems with existing electronic government systems (Mreea et al., 2017). There is thus a need to obtain government software (Pocket Rescue, PacketWriter and Portable Blue) (Al-Jenaibi, 2019).

According to OECD (2019), M-governance creates an opportunity for the government to have a streamlined approach towards how they carry out their operations. The transformation of the public sector through improving the

accessibility of the available services. The M-government approach supports entities that seem to have exhausted all their options to reach their audience, such as the education sector. The citizens get empowered through M-governance; therefore, the quality of life gets upgraded. Mobile technologies have offered the citizens easy access to public information, thus improving how they navigate public services. At the same time, they can get aware of the government's assistance, therefore getting an easy time being served by the public servants. Consequently, mobile technologies can improve association with citizens since they get personalized attention from the government.

1.3 Problem Statement

Having been considered as one of the first country in the Middle East region to establish an electronic government, H. H. Sheikh Mohammed bin Rashid Al Maktoum launched the UAE m-Government in 2013 under the banner of “Vision 2021” that aimed at making governmental services available to citizens (Ndou, 2019). The initiative responds to the call of UAE government acceleration in the implementation and adoption of m-Government (Nasser, 2017). Unfortunately, there is a scarcity of research in the UAE context for understanding the adoption factors of m-Government (Almuraqab & Jasimuddin, 2018). Much as DIFC announced plans to update its 2007 data protection law in 2019, the same year Reuters broke the story of Project Raven, a secret program conducted by the UAE government to spy on journalists, activists, and dissidents in the UAE, this indicated the need for data security and privacy in m-government (O’Brien, 2020). Worse still, a good number

of UAE citizens have limited IT skills to enable m-government usage (UN, 2020), this was discovered during the 2019 pandemic survey where some citizen were left out.

Zhao (2019) reports privacy and security, accessibility, data and service systems quality as m-government transition challenges, there are still no frameworks to determine suitable policies (CIO Council, 2019). Similarly, a combination of other challenges like the incompatibility of mobile systems (Mreea et al., 2017), the inadequate m-government infrastructure (Software and institutional frameworks) and lack of a hybrid systems (Kuscu, 2018) equally hinder the transition process from e-government to m-government in UAE.

M-government initiative in developing nations frequently fails because non-customized information technology (IT) packages are taken from developed nations (Ali and Kabbi, 2018). These packages are not in line with the social norms, local culture, and political situations of the developing nation's but, one notable aspect that surfaced from the works on the cross-cultural effects of IT system adoption was the variables connected with the individual citizens. Culture affects individuals who are part of an organisation, and this in turn influences the selection of IT solutions in that respective organisation or nation (Sehli et al., 2016). According to Uğur (2017) aspects that emerge while figuring out factors that hinder IT adaptation are the ones related to the culture of that particular place.

Several works on IT adoption and acceptance conclude that culture plays a major role in the acceptance of IT (Herzallah et al., 2018). Ahmad et al. (2018) also

supported the premise promoted by the TAM. Hofstede's cultural dimensions concept also demonstrates people's intentions regarding using Arabic e-commerce websites.

However, the transition from e-government to m-government has several challenges (Sharma & Gupta 2019; Song 2018), which encompasses both social and technical dimensions, such as people's awareness, the privacy of information, data security, trust, and technology training skills (Kheder, 2019).

In this respect, several researchers have outlined some of the challenges that include cultural, political, structural, legal, social and administrative aspects (Mukherjee & Biswas, 2018; Antovski& Gusev, 2018; Kim et al., 2019). For example, in Jordan, Aloudat et al. (2017) investigated several challenges and barriers, such as trust information security and privacy concern, which were associated with the adoption and acceptance of m-government.

As highlighted in the 2019 TRA Report, in rushing to meet the deadline set by the UAE's government to transform services from websites to mobile applications, many of its government entities had to face several challenges in ensuring the quality of applications, the security of information as well as the effectiveness of the applications in terms of their usability, which were highly challenging to small entities that typically lacked essential infrastructures and technical skills. As such, an implementation rate at 100% was practically impossible to achieve given such challenges.

The above problem evoked considerable interest that motivated the researcher, who was as a government employee with expertise in communication and computer engineering, to investigate the challenges and barriers faced by most of UAE's governmental entities that hindered a complete transition from E-government to M-government within the given time frame.

1.4 Research Objectives

Against the backdrop discussed above, the researcher carried out this study to achieve the following objectives:

1. To study; the challenges due to lack of IT infrastructure; having a significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE
2. To study; the challenges of Security and Privacy; having a significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE
3. To study; the challenges associated with IT skills; having significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE.
4. To study; the knowledge of operating standards and protocols, having significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE.

5. To study; the existing operational framework having significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE.

1.5 Research Questions

Considering the problem statement and objectives highlighted above, this study focused on the following research questions:

in governmental and private organizations in the UAE?

1. What are the challenges due to lack of IT infrastructure; having a significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE?
2. What are the challenges of Security and Privacy; having a significant relation with the transition from e-government to m-government
3. What are the challenges associated with IT skills; having significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE?
4. What are the knowledge of operating standards and protocols, having significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE?
5. What are the existing operational framework having significant relation with the transition from e-government to m-government in governmental and private organizations in the UAE?

1.6 Operational Definitions

M-Government:

Mobile government or m-Government refers to collection of services as the strategic use of government services and applications which are only possible using cellular/mobile telephones, laptop computers, personal digital assistants and wireless internet infrastructure.

e- Government:

E-government is the use of technological communications devices, such as computers and the Internet, to provide public services to citizens and other persons in a country or region.

IT Infrastructure

Information technology infrastructure is defined broadly as a set of information technology components that are the foundation of an IT service; typically physical components, but also various software and network components.

Security and Privacy

Security refers to the system that protects that data from getting into the wrong hands, through a breach, leak, or cyber-attack; and Privacy typically refers to the user's

ability to control, access, and regulate their personal information in digital environment.

IT Skills

An information technology skill is the learned ability to perform an action with determined results with good execution often within a given amount of time, energy, or both. Skills can often be divided into domain-general and domain-specific skills.

Operating Protocols and Skills

An original draft, minute, or record from which a document, especially a treaty, is prepared. Definition of standard: something considered by an authority or by general consent as a basis of comparison; an approved model.

Operating Framework

An operating framework is a strategy that a business uses to unify, motivate, orient, and organize its people around a common vision to achieve predefined goals within a set timeframe

Efficient Transition

Utilizing of information and communication technologies for developing and improving the relationship between government, citizens; businesses and other

government entities as a tool for delivering better government services to the citizens, businesses, and employees

1.7 Significance of the Study

Lately, the incorporation of the latest technological innovations in business transactions has become the order of the day in government and private organizations in many developing nations to promote the efficiency and quality of the delivery of services.

Theory wise, the study expanded understanding of the existing theories for instance, the TAM and web trust models, the DOI theory which supported the formation of a comprehensive model whose findings revealed that trustworthiness, perceived ease of use and compatibility were determinants of citizens' intentions to utilize m-government services. In the same way, this study is a baseline for future scholars undertaking research in the field technology adoption/m-government.

Practically, the study picked interest in enhancing organization's performance through effective conflict management, it will also be a baseline for campaigned for the adoption of m-Government by public and private organizations not only in UAE but also the entire globe. This is because M-Government involves the utilization of different mobile devices, such as Personal Digital Assistants (PDAs), handheld operated devices, smartphones, and cellular phones, to access governmental services (Ahmad, 2020). Essentially, M-government has several unique features that can

significantly improve the delivery of governmental services, such as providing non-stop, fast, and reliable services throughout the year, adapting to changes quickly, and devising solutions to challenges, and facilitating people's lives (Fraser, 2021).

The study also informed the implementation of some policies for instance, the privacy and security policies concerning the use of mobile government. Also implementation policies in various aspects of technology adoption have gained insight from this study.

Methodologically, the current research bridged the methodological gap that was presented as a result in limitations of the methods and techniques used by previous researchers research (explains the situation as it is, avoids bias, positivism, etc. Omondi, (2018). It therefore gives a foundation to the upcoming scholars.

Lastly, the UAE's government's focus on several core visions of electronics services delivery as follows: (a) To become a top world-class e-government, (b) To create a knowledge-based society, and (c) To integrate the policy of the UAE's government. Clearly, transforming existing e-government services technology to a wider service technology, such as m-government, can help the UAE's government to reach a wider population of its citizenry. As with any technologies, implementing such a transition may encounter many challenges that may be attributed to implementation strategies, technological hardware interfaces, culture, social stigma, and many others. Nonetheless, such a technological transition may provide many opportunities, which need to be properly articulated. This study, therefore, focused on understudying the challenges and opportunities in the implementation of an m-

government by the UAE's government, which can surely help its governmental and private organizations improve the dissemination of information to its citizens.

1.8 Scope of the Study

The study involved 250 employees who were randomly selected from 10 governmental organizations and 10 private business organizations in the emirate of Dubai in the United Arab Emirates (UAE). The sample of population for each organization was determined based on the number of employees in each target organization. Such governmental and private organizations were selected in this study because of their active participation in the transition from e-government to m-government in the UAE.

Amidst the many promises of the Information Communication Technologies (ICT) revolution is its potential to modernise government organisations, strengthen their operations and make them more responsive to the needs of their citizens. However, the experiences of many countries around the world is that in order to truly reap the benefits of e-government and cope with its growth, governments are required to develop and setup a robust ICT infrastructure.

The future e-Government strategy of the UAE's government includes the objective of raising the standing of the United Arab Emirates as a provider of fully connected citizen to government services by providing the enabling infrastructure to facilitate full interaction between government entities, the private sector and citizens.

Practices related to e-governance are rapidly becoming a key national priority for all countries and a global phenomenon. However, our observation of e-Government projects in public sector organisations all over the world is that they still lack fundamental infrastructure to make considerable progress. Existing assessment studies of e-Government readiness shows that governments need to adopt more effective approaches to promote in principle, the authentication of online identities.

Key to achieving this requirement is to develop a national infrastructure to enable online authentication of users. This need to be developed to address the overall requirements of trust, identity management and privacy and in the context of electronic governance. The UAE government has always been noted as the region's leader in innovations especially in public sector management. Its adopted mixed-approach of both citizen and governance-centric vision for its e-governance initiatives, resulted in many reformations of traditional public sector governance models; and not merely the computerization of government operations.

1.9 Chapter summary and the dissertation Structure

Chapter one is majorly an introductory chapter of the thesis, it explores the process of E-Government transition to M-Government alongside the surrounding challenges and opportunities. The chapter gave the research background and problem statement where the research gap is identified, it further presents the research objectives, research questions, research hypotheses, and conceptual framework where variables are articulated. Therefore, this chapter is a discussion of the fundamental issues

highlighted in the current literature that provided the researcher the motivation to pursue this study. In particular, the discussion delved into the transition from e-government services to m-government services in the UAE's government and private organizations has been quite a success. However, not all organizations were able to do so, as they were several challenges and barriers associated with various aspects of technology that might have impeded such a bold initiative.

On the other hand, the Dissertation Structure involves the Organization of the Remaining chapters summarized as follows:

Chapter 1: This chapter has included Background, introduction, and problem statement; also Research objective, questions and hypothesis.

Chapter 2: Literature review.

Chapter 3: Methodology.

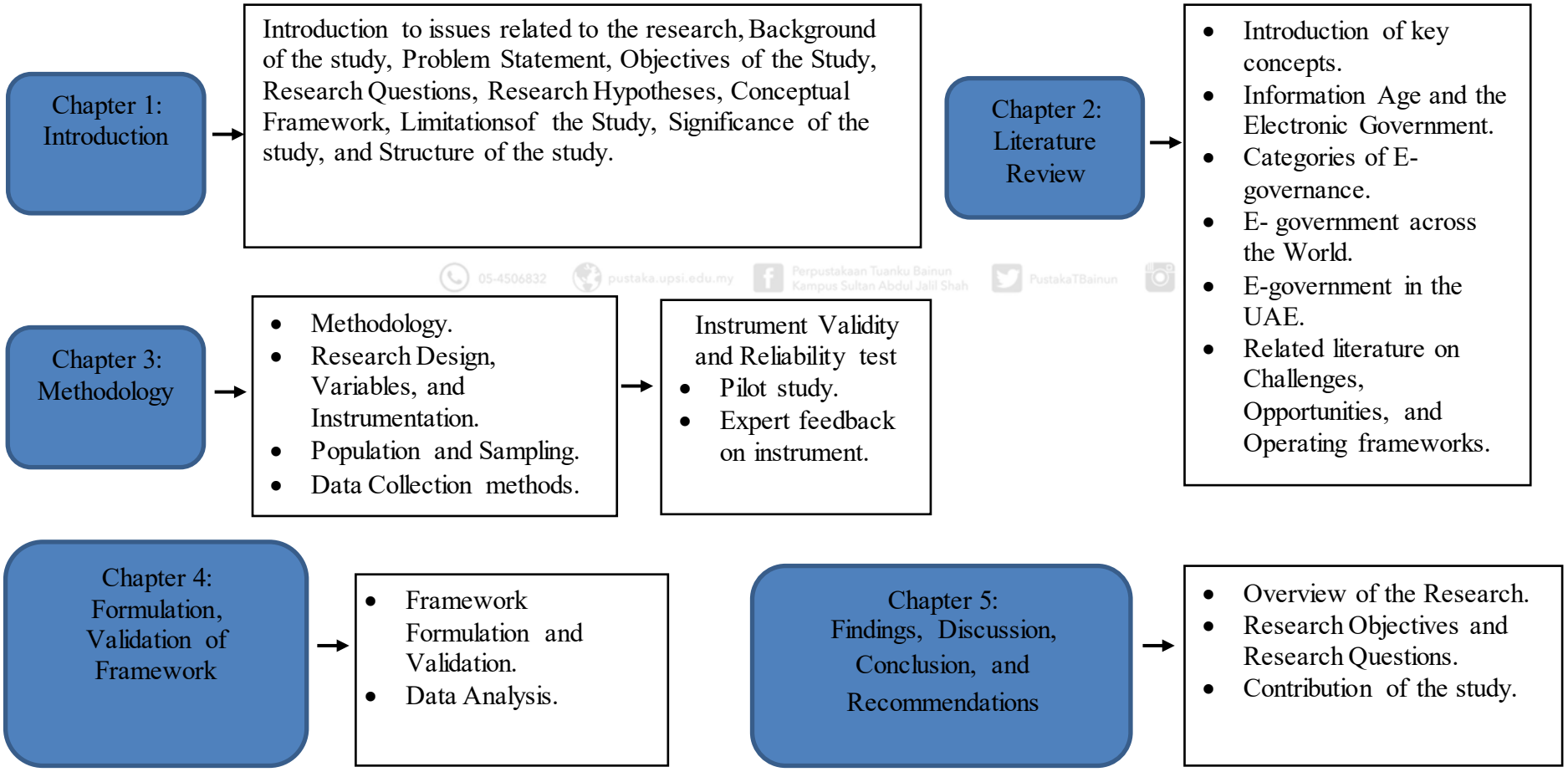
Chapter 4: Formulation and validation of framework.

Chapter 5: Findings, Discussion, conclusion, and recommendations.

The discussion of this dissertation is organized and structured into several chapters as shown in Figure 1.7

Figure 1.7

The Structure of the Dissertation



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