Investigating public sector online communication channel adoption and usage amongst older adults: A UK local government perspective

A thesis submitted to the University of Hertfordshire in partial fulfilment of the requirements for the degree of Doctor of Philosophy

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Abstract

Since governments around the world are moving away from conventional ways of face to face communication to a more digital approach when delivering services to their citizens. Advancements in using novel information and internet technology e.g. Online Social Networks (OSN) for communications has become a fast-developing strategy in the public sector of the economy. However, research has found that not all the citizens use these online tools; thereby, causing a digital divide. A societal demographic group causing immense concern for governments, organizations and society is the ageing population. It is also this group that is not extensively investigated in e-government research. Recognising the role of older adults in the society and for e-government research, the aim of this research is to ***identify, explore and understand the factors that encourage older adults of 50 years old and above to continue using a particular online communication channel (Facebook versus Email) when interacting with the government.*** For this purpose, a conceptual framework was developed which was the Model of Online Communication Channel (MOCC) based on the Expectation Confirmation Theory (ECT), Unified Theory of Acceptance and Use of Technology (UTAUT) and Channel Expansion Theory (CET) along with service quality and trust factors. To achieve this aim, a quantitative research approach was employed for the data collection process to test the MOCC model. The data collection process was carried out in three phases namely; the content validity, pilot phase and final phase. The data was collated using an online survey tool (SurveyMonkey) which resulted in 222 completed response for the pilot and 1014 completed response for the final data collection. Findings revealed that older adults will continue using a particular online communication channel to interact with the government if they have good knowledge and previous experience of using an online communication medium for interaction. Equally, having a strong satisfactory experience with a medium will encourage them to trust and use that particular online communication medium when interacting with the government. Most significantly, the consequences of ailments being suffered by older adults impacted on their continuance intention to use an online communication channel for interaction.

Additionally, to validate and verify the results obtained from the quantitative data collated, an evaluation study was carried out using a qualitative research approach in form of telephone interview. In summary, this research study contributed to the growing research body of Information Systems (IS) knowledge on adoption and continuance usage of technology. Moreover, this research would benefit industry by informing providers of online communication channels to the government to be aware of the factors that influence older adults' choices when interacting with the government. In so doing, the public sector providers of ICT can learn whether the provided services and products are indeed being accepted by citizens, more than it is recognised as one that is disadvantaged. The major implication of this study is that it provides information with regards to the generational difference within this age segment i.e. 50 years and above. This would help the government determine the best strategy to employ while tackling this issue. Finally, due to the limitations of time, finance and manpower research findings could not be nationally representative of the UK. They are only representative of a single group of society residing in an affluent area of the UK which is Hertfordshire.

Keywords: Public sector, Older adult, Adoption, Usage, United Kingdom

Dedication

I DEDICATE THIS THESIS TO MY WONDERFUL PARENTS, SIR NELSON OBIANO AND LADY OGECHUKWU OBIANO.

Thank you.

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Table of content

List of Figures

List of tables

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List of Abbreviations

ICT	Information and Communication Technologies
IS	Information Systems
IT	Information Technologies
ONS	Office for National Statistics
OFCOM	Office for Communications
UK	United Kingdom
TPB	Theory of Planned Behaviour
UTAUT	Unified Theory of Adoption and Use of Technology
WHO	World Health Organization
KBE	Knowledge building experience
SATEXP	Satisfactory experience
CITN	Continuance Intention to Use
TRA	Theory of Reasoned Action
TAM	Technology Acceptance Model
SEM	Structural Equation Modelling
CB-SEM	Covariance-Based Structural Equation Modelling
PLS-SEM	Partial Least Squares Structural Equation Modelling
OCC	Online Communication Channel

Publications

- Nwanekezie, U. & Choudrie, J., (2014) How Do Older Adults communicate with the UK public sector? Comparing online communication channels. In *ECIS* (pp. Research-in).
- Nwanekezie, U., Choudrie, J. & Spencer, N. (2016) Public Sector Online Communication Channel Adoption and Usage amongst older adults: a UK Local Government Perspective. In *ECIS* (pp. Research-in).
- Nwanekezie, U., Choudrie, J. & Ojiako, U. (2019) (Accepted) Investigating the Digital Divide in Hertfordshire's Local Government: A Quantitative Adoption and Use Perspective Study. *Hawaii International Conference of Systems Sciences: HICSS 52.*
- Choudrie, J., Nwanekezie, U., & Ojiako, U., (2019) (Peer reviewed) Understanding online communication continuance intention: A Quantitative, E-government, Local Government service delivery perspective. *European Journal of Information Systems*.

Chapter 1: Introduction

1.1 Introduction to chapter

This chapter will start by introducing the research study and identifying the background to the research problem. This is then followed by section 1.3 which defines the research aims and objectives of this study. Section 1.4 will outline the scope of this research while Section 1.5. briefly explains the research contributions. Section 1.6 outlines a brief description of the research approach that was undertaken to achieve the aims and objectives of this research. Section 1.7. shows the dissertation outline in a tabular form while Section 1.8 then provides the structure of the thesis in a diagrammatical way. Section 1.9 provides a summary of all the aspects covered within chapter 1.

1.2 Background to Research Problem

Information and Communication Technologies (ICT) such as the internet have changed the ways of communication, information seeking behaviour, and lifestyle of individuals (Lean et al, 2009). By accessing the internet, individuals can make informed decisions regarding daily life, shopping, or work activities. This technological revolution has transformed the world and its connectivity and due to these advances, online services are quicker, more convenient and cheaper to use (Sharit et al, 2008). Due to the ever-growing technological evolution and daily access to public services by members of the public, governments all over the world face an enduring challenge of transformation and reinvention in order to deliver services in an efficient, useful and cost-effective way (Lissitsa & Chachashvili-Bolotin, 2015). The developments in the internet offers a new, effective and efficient means by which citizens can contact government departments to express their views or concerns. An increasing number of developed countries are using ICT to modernize and increase internal efficiency as well as, to improve service delivery by providing services between the Government to Citizens(G2C), Government to Business(G2B), Government to Government(G2G) and Government to Employee(G2E) (Santhanamery & Ramayah, 2013).

The United Kingdom (UK) has been facing these transformations, which has led to a shift from face to face to a more digital mode of communication via the internet (Choudrie et al, 2013). Presently, local governments in UK provide over six hundred public services to the local vicinities, which will all have to be provided using digital/online channels, thus the emergence of Electronic Government (E-government). E-government is a crucial e-service that touches citizens' lives and influences their future interactions with their governments. According to OECD, E-government refers to the use of information and communication technologies, and particularly the internet, as a tool to achieve better government (OECD,2003). This includes using the internet as both a communication tool and an information source to improve efficiency in their services. Modern network technologies particularly electronic mail and the World Wide Web offer the potential for significantly enhancing communication between government agencies and their citizen clients (Sivarajah et al, 2015). It has also been learnt that not all the citizens are making use of these changes in the public sector, which includes the older adults (Choudrie et al, 2013; Ofcom, 2013). Before continuing further, for the purpose of this research, older adults are the demographic group of interest to this research and are identified as individuals who are aged 50 years old and above adults (Pan & Jordan-Marsh, 2010).

In the United Kingdom (UK), a national survey in 2012 found that 16.4% of the UK population are older than 65years old, with around 40% of the population being older than 45 years old and this trend is set to continue and not to reduce (Office for National Statistics, 2012). Due to medical advances and an improving quality of life, some older adults are still in employment or becoming entrepreneurs; thereby owning and managing enterprises (Meyer, 2013). As ICT, especially the internet becomes increasingly important in the current day society, governments cannot ignore the fact that some of the citizens; for example, older adults, are excluded from the benefits related to internet usage, thus, the existence of digital divide (Niehaves & Plattfaut, 2010). This poses to be a problem as the internet is the communication channel of the future and also, the governments are making substantial investments in it due to the benefits it can

bring to the economy. As a result, if non-adoption occurs, then there is a low return to investment or value, which is not beneficial to governments, citizens and taxpayers alike.

Given that non-adoption is occurring, and older adults are increasing, and the role of internet-based products and services is growing, for this research study, comparisons in terms of the online communication channels used to communicate with the government are made. One communication channel to be considered in this research study is Facebook, an Online Social Network (OSN) that is viewed to be a novel communication channel. Online social networks such as, Twitter, Facebook, LinkedIn, blogs are becoming increasingly important tools for communication, but, people aged 50 years and over tend to use these tools at lower rates than those in younger age groups (Vosner et al, 2016). Comparatively, E-mail also is the communication channel is considered to be the classic communication channel in this research study. According to the Office of National Statistics (ONS, 2018), sending and receiving Emails remained the most common internet activity being carried out especially by adults in the UK as at 2017 which showed an increase of three percent compared to the previous year. By forming this distinction, this research draws comparisons of the citizens adoption and uses of these online communication channels (Facebook versus E-mail) when interacting with the local government.

These online communication channels were selected because Facebook is an OSN that is becoming increasingly popular, particularly given that its usage and adoption rate are intensifying. According to statistics (Facebook newsroom, 2018), Facebook has daily active average users of about 1.45 billion and 2.20 billion monthly active users across the globe as at 2018. Equally, it has been found that the UK has witnessed a high increase in the number of their Facebook usage (Gadsby, 2010). These growing numbers have led to forward thinking governments to implement and utilise this application in establishing relationships and maintaining conversations with community members. Conversely, E-mail has been in use as an online communication tool since the internet proliferated society and organizations; hence, providing motivation to examine this topic (Aamoth, 2011).

Another motivating factor for pursuing this study also emerged due to the reasoning that communication between governments and citizens is important for any country socially, economically and politically (Wang & Lim, 2011). As new ICTs are introduced in the public sector, the need to focus on whether and if these new services appeal to customers, especially the older adults and on the willingness of customers to continue to use the services arises (Zhao et al, 2013). Instant messaging, social networking, and blogging have become important as communications tools, but E-mail remains the most popular online activity particularly amongst older internet users, a trend noted in the United States of America (USA) (Jones and Fox, 2009). Some research studies carried out on online social network continuous use for instance, Facebook within younger and older adults revealed that the older adults' user numbers are lagging behind the younger age groups (Zajicek, 2007). As a result, it is of paramount importance to examine how the older adults are using these online communication channel in interacting with the government.

1.3 Research Aim, Objectives and Research Questions

Having considered the aforementioned and determining that older adults are not readily adopting and using new online communication channels like Facebook for communication purposes, it was recognised that a research gap existed which needs to be addressed and this had led to the aim of this research being formed:

To understand and identify the factors that encourage older adults to continue using a particular online communication channel when interacting with the government.

To fulfil the stated aim, the following objectives were formed as follows;

1. A comprehensive and detailed literature review of e-governments services in the public sector, older adults, online communication channels, technology adoption and usage were completed to gain an understanding of these areas. The knowledge also led to confirming the existence of the research gap.

2. A research approach using a theoretical and conceptual framework was developed based on the knowledge gained from the literatures studied. Theoretical factors that have been previously used in Information Systems (IS) studies were identified.
3. In order to validate the conceptual and theoretical framework, the hypotheses were tested using a real-life situation which involved the use of expert panels and pilot phase within a small sample population.
4. The results obtained from the data collection was assessed in terms of validity and reliability using statistical tools to help determine the accuracy of the theorised research hypotheses.
5. Furthermore, an evaluation using primary data through interviews amongst a few older adults within the sampled area was undertaken to provide verification and validation of the final findings.
6. Drawing conclusions based on the outcomes of the final research phase. Hence, implications and contributions were provided, followed by limitations, recommendations and future directions.

Research Questions

To further address the research aim and objectives, a set of research questions were formed and are as follows;

- *What factors motivate older adults' choice towards a particular online communication channel when dealing with the government?*
- *What purposes are the online communications channels used for by the older adults when interacting with the government?*

1.4 Research Scope

Although the introduction to this research study has been made, the background problem has been provided, the boundaries or scope of this research have not been declared, which is provided in this section.

The scope of a research simply defines the areas that will be under study. This will aid in determining the extent of generalisation that can be construed from the results gathered from the study (Bryman & Bell, 2015). This study aims to identify and understand the factors that encourage older adults (50 years and above) to continue using a particular online communication channel when interacting with the government. For this purpose, a socio-technical approach that involves investigating both the social and technical factors that affect the continuance intention of online communication tool usages within the older adults' population is used. For this purpose, datasets using online survey questionnaires is being employed, but this study will not be developing any product of technical nature. A further note made at this point is that, since the older population is of immense interest, much emphasis is placed on the theoretical aspects surrounding age related digital divide.

Furthermore, it must be stated that online communication channels encompass a group of technologies including Email, blogs, content communities, forums, OSNs like Facebook, Twitter, Snapchat, YouTube etc. However, this research study will be restricted to Email and Facebook only. This is because Email has been in use for a long time as major source of online communication which will be classified as classic in this research study. On the other hand, Facebook is one of the modern online communication technologies that has been adapted within the UK public sector (Local Government) because of its popularity and wide usage, thus, it is of great interest to this study.

This research study gathered primary data from the East of England in the United Kingdom but limited it to Hertfordshire County. This is due to resource constraints and familiarity of the researcher with the area to help in accessibility of data for this study. Another reason to utilise

Hertfordshire is because it is the second largest county in the East of England and one of the Counties in England that operates a two-tier structure i.e. a county and a district council which makes it unique. Census carried out in 2011 showed that the population of Hertfordshire is 1.16 million and 33% represents older adult. The Office of National Statistics has projected that the older adult population in Hertfordshire will increase to 41% by 2037 which is a problem that is causing immense concern (HertLIS, 2014). Further, life expectancy in Hertfordshire has been found to be above the national average and people continue to live longer because of the high standards of living and good quality of life the residents enjoy. As Hertfordshire citizens live longer, it means both the number and proportion of older people is set to increase over the coming years. (Hertfordshire 2021: A Brighter Future). Therefore, for the previous reasons and the fact that having access to this population area means that there is easier access to the population, all within a suitable time frame and cost; Hertfordshire was selected. This research will identify the online communication channels that promote interaction with citizens at a local government level.

1.5 Research Contributions

By completing this research study, the following contributions to academia, policy makers and industry are anticipated.

1.5.1 Academia

The benefit of this research study to academia is the development of an extended framework that will be empirically tested and validated in order to form an understanding of continuance intention of using online communication tools when older adults communicate with the local government. Prior research has focused upon whether older adults are accepting diverse types of e-government services or the impacts of the existence of the internet on older adults' lives. This research has proceeded to a higher level and shows that government services deserve and merit attention which if not focused on, could impact the adoption of novel or classic forms of communication. The implication of conducting such research is that factors such as trust,

service quality and continuance intentions are combined to determine whether older adults are accepting and using the new or older technologies.

1.5.2 Policy makers

Government policymakers are also pursuing the development and implementation of communication channels for governmental purposes including G2C, G2B, G2G and G2E. This research will help identify the online communication channels that promotes interaction with citizens at a local government level. This study provides a conceptual framework that will be proven in practice. This verification could assist the policymakers in determining whether the industrial strategies and policies being pursued at the local government level are increasing access to innovative technologies especially within this demographic.

1.5.3 Industry

Equally, the framework that this study would provide will benefit industry by informing providers of communication channels to the government to be aware of the factors that influence older adults' choices when interacting with the government. By considering such research, public sector and private sector providers of ICT can learn whether the provided services and products are indeed being accepted by citizens, more than it is recognised as one that is disadvantaged. If the novel forms of ICT are not being accepted, then the exposure provided by the conceptual framework application in practice could identify means that the adoption and use of novel products and services could be increased.

1.6 Research Approach

When determining the appropriate research approach for this research, ICT and continuance intentions research approaches were reviewed (Al-Debei et al, 2013; Limayem & Cheung, 2008; Zhou,2013; Sun & Jeyraraj,2013; Ku et al, 2013; Hong et al, 2006; Zhao, 2012, Atchariyachanvanich et al, 2006). From the review, it was evident that quantitative survey questionnaires have yielded productive and important research findings. Quantitative research is a systematic investigation in which the investigator uses scientific inquiry to examine a

social phenomenon (Bryman, 2006). It usually starts with a theory, which in this context can be described as a broadly deductive approach whereby hypotheses are deduced from the theory and then tested. This research initially gained an understanding of ICT adoption and usage phenomenon using literature review and then created a conceptual framework which will be tested. As this research study involves developing a hypothesis from existing IS theories, it is deemed that a deductive research methodology will be undertaken within this study.

With regards to the quantitative element that will be used in this study, a survey questionnaire method of data gathering will be employed using the online method. A survey approach was deemed most suitable for this research study due to research on use of modern online communication channels like Facebook still in its infancy. Justifications for the selection of the survey method include issues such as convenience, cost, time and accessibility (Gilbert, 2001). Furthermore, the data collected through the survey questionnaire will be statistically validated using statistical tools SPSS version 23 and Partial Least Squares based on Structural Equation Modelling (PLS-SEM) which is the SmartPLS 3.0 to help test the framework. PLS-SEM is appropriate for relatively complex structural models that include several constructs and several items, which is applicable to this study (Hair et al, 2016).

1.7 Dissertation Outline

This section provides the overview of the research study in a tabular form. This will comprise of seven chapters and a brief description of the chapters have been provided in the table 1.1;

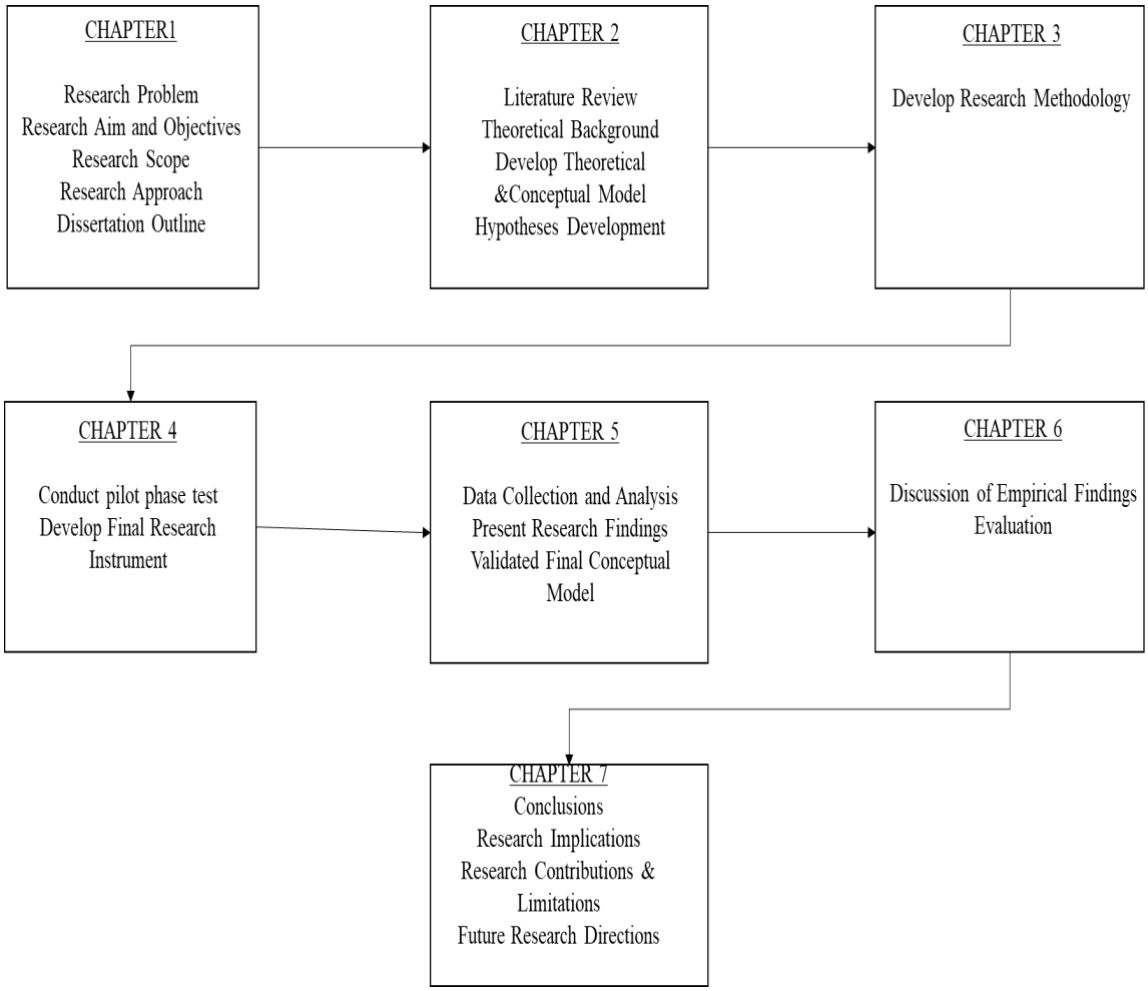
Table 1.1 Dissertation Outline Descriptions	
Chapter 1	This chapter provides the overview of this research. The research problem of this study is also introduced followed by the aims and objectives of this study. The research scope is also detailed showing the research boundaries. A description of the research approach is provided to inform the readers of how the research study will be achieved. The research contributions and benefits are also provided and finally, the dissertation outline and thesis structure will be provided.
Chapter 2	Chapter two provides a comprehensive literature review that includes reviews of previous studies on older adults and digital divide, E-government and ICT adoption and usage which are appropriate to this study. Also, part of the reviews includes the assessments of previous technology adoption models, theories and constructs that have been investigated e.g. Unified Theory of Acceptance and Use of Technology (UTAUT). Finally, the conceptual framework of this study is developed and explained using selected theories.
Chapter 3	This chapter describes the relevant aspect of the research models in details. Reasoning behind the selection of the research approach, technique and strategy will be provided as well. Equally, the selection of data analysis and validations techniques employed in this research will be described.
Chapter 4	This chapter provides details on the instrument development and pilot phase. Equally, the analysis and findings of the quantitative pilot phase would be described. Based on the findings from the pilot phase, the final questionnaire will be improved and prepared for the final data collection.
Chapter 5	This chapter presents the analysis and findings of the main research findings which is final data collection from a large scale of survey questionnaire. This will be distributed within the Hertfordshire County of England and the results in terms of the theories of adoption and usage will be discussed. The final empirically validated conceptual model in terms of this larges study will be presented. The research hypotheses are also tested and discussed followed by the key research findings in this chapter.
Chapter 6	This chapter will provide an evaluation and discussion of the research findings. This will be done by using primary data collection through interviews amongst a few older adults within the sampled area undertaken for this study to provide verification and validation of the final result findings.
Chapter 7	Summarises the research findings and provides research contributions and implications of this research in terms of the theory, policy and practice. This chapter also discusses research limitations, recommendations and presents future directions in the area of older adults' technology adoption and usage within the public sector.

[Compiled by researcher]

1.8 Thesis Structure Flow Diagram

The structure of this dissertation is also illustrated diagrammatically in flow diagram in Figure 1.1;

Figure 1.1 Thesis Structure Flow Diagram



[Compiled by the researcher]

1.9 Chapter Summary

To summarise, this chapter provided an introduction to this research with a clear explanation to the background of the research problem. This is followed by the aims, objectives, scope and benefits of the of this research study. These steps were essential to identify the gap that existed in the research field which this study intends to proffer solution. This deals with adoption and usage of online communication within UK's older population (UK residents over the age of

50 years old). The research approach that would be used to achieve the aim of this study was briefly discussed. Finally, a brief description and outline of the entire dissertation is offered to help readers understand the structure of this doctoral dissertation.

Having introduced the main concepts and ideas associated with this research study, the next chapter will review literatures that are anticipated to be useful and appropriate for undertaking this research study.

Chapter 2: Literature Review

2.0 Introduction

Having provided the introduction and defined the aims, objectives and scope of this research in the previous chapter, chapter 2 provides definitions, origin and background for the key elements combined in this thesis. To provide a valid contribution to academia, industry and policy makers, a literature review was conducted in this chapter. Equally, this chapter provides previous literatures regarding approaches, theories and models that have been successfully applied to research and this is discussed in full. This information guides the selection of technology adoption and use theories that was used to formulate and design a conceptual and theoretical framework in this research. Furthermore, the research hypotheses presented is also tested and discussed in this chapter. Lastly, the overall summary of the chapter is provided.

2.1 E-Government: The Nature and Classifications

In the world today, governments are faced with the challenge of transformation and the need to reinvent government systems in order to deliver efficient and cost-effective services, information and knowledge through ICTs (Choudrie et al, 2018). This development of ICTs in the public sector triggered the emergence of E-government. E-government is also known by different terms such as Electronic Government, Digital Government, Online Government, e-Gov etc. In fact, there are many definitions for the term E-Government and differences reflect the priorities in the government strategies.

E-government is a term that will be frequented within this research study. There are diverse definitions of E-government used within research, each used according to the needs of the research studies. For example, Löfstedt (2012) defined E-government as the use of ICT in public administration to transform the structures and processes of government organization. A non-government organization, the Organisation for Economic Co-operation and Development (OECD) defined E-government as the use of ICT, particularly the internet, as a tool to achieve

better government (OECD, 2003). There are also some other disparities that exist when defining the concept of E-government, which is illustrated by Silcock (2001) who defined E-Government as the use of ICT to improve the access to and delivery of government services to benefit its citizens. This shows that the government to citizen relationship is no longer a one-way process, but E-government is building a partnership between governments and its citizens. For the purpose of this study, the definition by Carter & Belanger (2005) was used. In Carter & Belanger (2005: p.5) E-government is defined as the "use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, businesses and government agencies". Hence, E-government has enabled governments to communicate and provide a range of services to citizens, businesses and other government organisation through the online communication channels. Therefore, as E-government continues to lead to great organisational transformation, government agencies begin implementing E-government initiatives, performances in organisations will be improved and service delivery will be better equipped to interact with citizens and provide services over the internet (Lee, 2010).

Furthermore, E-government offers services to those within its authority to transact electronically with the government. These services differ according to users' needs, and this diversity has given rise to the development of different types of E-government. E-government functions can be classified into four main categories and are discussed as follows (Choudrie et al, 2016);

- **Government-to-citizen(G2C)**

  The primary goal of e-government is to serve the citizen and facilitate citizen interaction with government by making public information more accessible through the use of websites, as well as reducing the time and cost to conduct a transaction. Majority of government services come under this category, towards providing citizens and others with comprehensive electronic resources to respond to individuals' routine concerns and government transactions.

- **Government-to-business(G2B)**

  G2B is the second major type of e-government category. G2B include various services exchanged between government and the business sectors, including distribution of policies, memos, rules and regulations.

- **Government-to-government(G2G)**

  The G2G could be referred to as the relationship between government and its employees. This refers to the online communications between government organizations, departments and agencies based on a great government database. The efficiency of these processes is enhanced by the use of online communication and co-operation which allows for the sharing of databases and resources and the combination of skills and capabilities.

- **Government-to-employee(G2E)**

  G2E could be seen as the least sector of e-government in considerable e-government research. The purpose of this relationship is to serve employees and offer some online services.

2.2 E-government at the Local level

In the 21st century, the internet is one communication that has the potential to drastically change the face of government especially in its service delivery (Hermana & Silfianti, 2011). The UK government like many other countries around the globe has moved from a classic way of delivering services (face-to-face, or the telephone) to a more digital approach using the internet (Hazlett & Hill, 2003 & Welch et al, 2005). When considering the link between government and citizens, internet use allows citizens to proffer knowledgeable decisions, provide opinions, access government information and interact with government departments (Klischewski & Abubakr, 2010). Hypothetically, with a simple personal computer and internet connection, citizens can contact government anytime and anyplace, without going through the hassle of face-to -face communication with government officials.

To keep citizens well informed of the latest government decisions, policies, and service, several government websites such as, the UK Central government group provide their content via RSS feed (Really Simple Syndication) which is a form web-based communication. This can be described as the use of internet technologies to facilitate greater interaction between a government and its citizens (Nasir, 2014). It characterizes an interactive communication channel that allows citizens to send their comments and feedback to government services (Hermana & Silfianti, 2011). The central government are more clearly taking advantage of the potential benefits these new and emergent ICTs has to offer. Whilst such changes are occurring at the central government level, local government authorities are also pursuing such technological changes as this assists them to deliver their services to local communities in more efficient ways. The use of this medium allows, the voices of the citizens to be heard (Cochrane, 2015). Examples of services impacted by the technological changes are local transport, communications relating to health, welfare support to the community, or retirement benefits. Scholars and practitioners researching the relationship of G2C suggest that the most important interaction between citizens and government occur at the local level and these relationships could become closer with more frequent use of the ICTs (Sandoval-Almazan & GilGarcia, 2012). However, there are relatively few studies about local E-government.

A study carried out by Bonson et al (2012) which consist of seventy-five European Union local government suggested that most local governments are using the Web 2.0 and social media tools to enhance transparency. However, the use of these online tools with regards to e-participation amongst the citizens in general is still at its infancy at the local level. In the last few years, the UK government especially at the local government level has begun to employ online communication mediums such as, blogs, Facebook, Twitter and YouTube as online communications channels to change the way that governments engage and interact with their citizens (Sivarajah et al, 2015). These tools could provide new electronic channels for these interactions through their inclusion in local government portals as could be seen in the Hertfordshire Local County Website which is the research site of this study.

Figure 2.1: A Screen shot of the Hertfordshire County Council Website

Source: Hertfordshire county council (2018)

By doing so, governments are moving citizens' interaction from just Email to more modern online communication medium which is the online social networking environment. Most local government councils in the United Kingdom (UK) like the Hertfordshire County Council provide online social networks (OSN) platforms to seek citizen's opinions and to reach out to the general public (Oliveira & Welch, 2013; HertLIS, 2014). The use of these modern communication channels also enhances the classic mediums of communication when delivering services to the citizens; thus, promoting the role of E-government.

2.3 Communication channels used within the UK public sector

Communication has greatly altered and revolutionised in the last two decades. At the start of the last decade, the introduction of the internet has led to changes in communication and relationship building (Gato & Tak, 2008). An online communication channel is viewed to be an online tool or application used by organisations to communicate with its customers or the public (Wang & Lim, 2001). These online communication channels enable information to be shared instantaneously and effectively. Online communication channels enable government to

communicate important government information, extend government services and receive feedback on government operations with its citizens (Graham et al, 2015). Communication channels that are employed within the public sector are in the form of three categories. The classic forms of communication as identified by Rogers (1983) are: phone communication, face-to-face communication (i.e. a conversation that an individual have while facing another individual) and online based communication i.e. internet-based-communication that takes place while utilising a global connection of networks (Lee, 2010). Research studies have been undertaken to identify the reasons for government's adoption of online communication channels, particularly OSNs. Some of the reasons includes; reaching out to citizens and other public; disseminating information to the public and sharing information across government agencies (Chang &Kanan,2008); enhancing and promoting community participation; and achieving transparency (Xie et al,2017). The UK government for example has stated that all citizen interaction with central and local government should be capable of taking place online by 2008 (Selwyn et al, 2005). Over the years, this has been achieved through government harnessing its products and services to be delivered online by rebuilding most of its major services especially at the local level to make them 'digital by default (Gov.uk, 2017). In so doing, this has increased reach to the citizens and accessibility at low cost. As a result, the United Nations has recognised the UK as the world leader in online governance.

Furthermore, research has been conducted on online communication channels due to innovative ICT in the information systems arena. For instance, Al-Debei et al (2013) examined the continuance participation intentions and behaviour on Facebook as an online communication channel and found that factors such as, attitude, subjective norms and perceived value have significant effect on the continuance participation intention of post adopters. An exploration of factors affecting users continued use of online social networking sites concluded that factors such as; gratification and privacy can influence continuance intention (Ku et al, 2013). A study of the continuous use of e-learning services suggested that ease of use, playfulness and usefulness are considered important issues in information

technology usage (Chiu & Wang, 2008). These shows that there are diverse factors to be considered when looking into the decision to continue using information technology tools as a communication tool which in this study is being investigated under the public sector.

2.3.1 Older adults, OSN and Email

Citizens use different communication channels for different purposes when making contacts with the government. For instance, Reddick & Turner (2012) in their study on communication channel choice suggested that citizen's use of communication channels depends upon the gratification and utility that they receive. Also, a European based study of Germany and Australia explored individual differences on service channels for E-government services and found diverse preferences on the choice of communication channel in each of the countries studied (Plattfaut et al, 2013). In terms of the online communication channels used by older adults, studies have shown that older adults are more interested in using Email as a form of communication especially with friends and families (Madden, 2010; ONS, 2012). This is because Email is viewed to be effective at increasing social interaction within the elderly (Charness et al, 2001). What has also been learnt is that a gap exists in the way that older adults adopt and use ICT. Although this gap is known of, current ICT and IS research studies of online communication channels emphasise more on the behaviour and usage patterns within the younger age groups (Al-Debei et al, 2013; Limayem & cheung, 2008, Hill et al, 2015). For specific channels like OSN and Email, younger people are rapidly adopting the former while decreasing their use of the latter even as older adults begin to use the Email more regularly. Although, older adults have started using OSN more frequently as a communication channel, but this cannot be compared to the younger generation (Braun, 2013). There are fewer research studies determining the factors that promote the continued use of certain communication channels, particularly within older adults and their interaction with the public sector.

2.4 Ageing population and internet usage

When considering E-government, the outreach should be to all the citizens of the country, including older adults. Currently, the largely developed countries and societies are facing two common trends; an ageing population and the growing importance of ICT. This means that older individuals are increasing in number and make up a growing share of the population in almost every country with implications for nearly all sectors of society. According to the World Health Organization (WHO) (2015), the number of individuals aged 65 years or older is projected to grow from an estimated 524 million in 2010 to 1.5 billion in 2050 due to the recent improvements in the quality of life and advances in health care treatment.

In the UK, it is evident that life expectancy over the last few decades has steadily increased. People are living longer than ever before which could be associated to a major achievement of modern science and healthcare (Gov.uk, 2016). In mid-2014, the median age of the UK population exceeded 40 for the first time, up from 33.9 years in 1974. This gradual increase in life expectancy and average age seen during the 20th century is projected to continue. And over 70% of UK population growth between 2014 and 2039 will be in the over 60 age group, an increase from 14.9 to 21.9 million people (ONS, 2018). While it is growing, improvements in healthcare and lifestyles mean the population is getting older.

As there is an increase in the average age, a similar trend is being observed in the population of computer and internet users. In many cases, older adults are the fastest growing computer and internet user group in both personal and workplace contexts (Wagner et al, 2010). The groups of older people accepting and using computers and the internet have been labelled as Silver Surfers, a popular description of the confident and competent older ICT user (Cody et al, 1999; Netlingo, 2015). When considering the growing importance of ICT in demographic groups of society, it has been found that older adults are the fastest growing demographic group to use the Internet (Fox, 2001). A survey carried out by Pew Internet on internet use amongst older adult in 2012 found that 53% of American adults aged 65 and older use the internet or Email. Additionally, within adults aged 50-64 years old, almost eight in ten (77%)

use the internet, a proportion that has remained relatively steady over the past three years (Zickhur & Madden, 2012). Equally, a survey in UK on digital inclusion found that the numbers of 55-year olds and above internet users have approached a position where twice the number of this demographic group has overtaken non-users (Green & Rossall, 2013).

In terms of older adults and general internet usage, there are diverse studies that have been undertaken. As an example, studies of the intentions of the older adults with regards to internet use found that the increasing numbers of older adults have different attitudes, beliefs and intentions when it comes to technology usage (Niehaves & Plattfaut ,2013). Comparatively, older adults surfing the internet had more positive attitudes toward ageing, higher levels of perceived social support, and higher levels of connectivity (Cody et al, 1999). In the aforementioned study, the silver surfers spent more time online when computer efficacy was high, computer anxiety low, and attitudes toward ageing were positive. Equally, Sum et al (2008) found that greater use of the internet as a communication tool was associated with a lower level of social loneliness while greater use of the internet to find new people was associated with a higher level of emotional loneliness. It has also been suggested that computer and internet use seem to contribute to older adults' well-being and sense of empowerment by affecting their interpersonal interactions, promoting their cognitive functioning and contributing to their experience of control and independence (Shapira et al, 2007). Revelations have also shown that older adults found computers to be beneficial in terms of providing a sense of connectedness, satisfaction, utility, and positive learning experiences (Gatto and Tak, 2008).The study also identified the barriers for computer use to be frustration, physical and mental limitations, mistrust, and time issues.

When considering the use of the internet within the population at large, an aspect that is of great importance is the older adults. Previously, older adults were not paid attention to as their significance was not known. However, as times have progressed, it has been learnt that older adults are also of importance to research and society as they are wealth creators and holders (Lusardi & Mitchell, 2007). Research has found that although older adults are the fastest

growing demographic group of society, they are also the ones that are being excluded from it (Selwyn et al, 2003; Olphert et al, 2005). Despite this exclusion, the numbers of older adults becoming experts at using new technology is rising, but despite this a digital divide amongst this demographic group still exist.

2.5 Older adult and digital divide

Presently, the penetration of ICTs and the internet into major parts of the society such as political, economic and personal lives have caused a lot of variation among individuals, social groups and nations. These differences that exists in the way's individuals use and accept their ICT and innovative technologies are associated with characterizations that are widely referred to as the digital divide (Tsatsou, 2011). Despite progress in broadband usage and access, certain divides are evident. Moreover, van Dijk and Hacker (2003) described access in three different ways: those possessing a computer (material access), those interested in technology (mental access) and those that have the knowledge and opportunity to use the technology (skill and usage access). However, in literature, the interpretation of the digital divide is wide-ranging. One of the top-level definitions of the digital divide follows the study carried out by Norris (2001). Norris conceptualized the digital divide as operating at three levels:

- **The Global Divide**; This refers to the divergence of internet access between industrialised and developing countries.

- **The Social Divide** concerns the gap between information rich and information poor in each nation.

- **The Democratic Divide** signifies the difference between those who do, and those who do not, use these digital resources to engage, mobilise, and participate in public life.

Norris summarised the definition of digital divide as any and every inequality associated with and existing in the internet community.

In a more recent study, Szeles (2018) in her studies classified the digital divide into three different levels especially at the individual level and they are as follows;

- First-order digital; The lack of Internet access determined by inequalities in terms of infrastructure and services.
- The second-level digital divide which explains differences in ICT or Internet usage thorough social differences.
- The third-order digital divide which refers to the inequalities caused by the consequences of the Internet usage.

Furthermore, Curwen & Whalley (2010:210) defined digital divide as the divide between "those who have access to a particular technology and those who do not". When considering "the digital divide" it was also found that this means internet access, but the term has been broadened to include other ICTs (Anheire & Toepler, 2010). The digital divide often referred to as the "information gap" or "information inequality" has promoted immense debates that have resulted in the digital divide being considered in a variety of contexts, including socio-economic status, gender, age, racial, region or geography (Tsatsou, 2011). One significant component of the digital divide is age (Selwyn et al., 2003). In particular, the digital divide is said to be predominant among the older group of the society. Having lived many years in the world without the internet, older adults tend to perceive the internet as a 'non-essential'. Ferro & Sorrentino (2010) in their study which aimed at investigating the relationship between age and technology diffusion in the older adult concept found that age factor and demographics shows a significant effect on the length of a technological diffusion process.

Several research studies have attempted to study this issue and identify the factors leading to the age-related digital divide. These factors are viewed to be in theoretical terms for instance, perceived lack of benefits (Melenhorst et al., 2006), lack of interest or motivation and cost (Carpenter & Buday, 2007; Selwyn et al., 2003), lack of knowledge and access (Peacock & Künemund, 2007) and physical limitation (Saunders, 2004; Carpenter & Buday, 2007).

Additionally, it is generally acknowledged that older adults often face more difficulties and barriers than younger people in learning and using new technologies (Choudrie et al, 2016). This could be due to age related problems such as declining eyesight and arthritis which can pose to be major challenges to overcome when viewing computer monitors and co-ordinating mouse interaction (Greengard, 2009, Lissitsa & Chachashvili-Bolotin, 2015). This has resulted in a significant age-based divide between young and old with internet use declining in every advancing age group. Also, from a psychological perspective several empirical investigations have shown that older adults are more anxious and less confident in internet use and such negative factor can affect their decisions with regards to internet adoption (Pan et al, 2010).

In the last decade, older adults' applications of and benefits of novel technologies have been examined by many researchers. When considering this issue, several aspects have emerged. These have included the digital divide where the gap between older individuals who have used ICT and those who have not used ICTs has been examined. This aspect has been characterised by Morris (2007) as the 'grey divide' i.e. the low use of internet by older adults. According to his study, this is hardly surprising because age is associated with no-use and older people are often regarded as being socially excluded because they tend to have lower incomes and participate less in social and economic activities.

On the other hand, older adults can benefit from internet use in variety of ways for instance, having ready access to a wealth of information, opportunities such as playing games and listening to music, and facilitates communication among family and friends via email, instant messaging, OSN etc (Neves et al, 2013). For older adults, mobility and activity limitations may increase importance of the internet for interpersonal communication, maintain family bonds and expanding social network (Choudrie et al, 2015).

With all these interpretations of digital divides, it can be deduced that digital divide is a complex and dynamic phenomenon which is difficult to clarify the pattern and strategies for dealing with its social drawback. A basic strategy for overcoming the digital divide has been to provide physical access to computers; but, as Warschauer (2004) clarifies, there are

additionally three further aspects with regard to resources: Digital resources (material made available online); Human resources (in particular literacy and education) and Social resources (the community, institutional and societal structures that support access to IT). The aspects that Warschauer (2004) identified as important formed the basis of this research when evaluating and identifying the non-technical and technical factors that lead to the adoption and usage of technology by older adults.

In e-government, Belanger & Carter (2006) viewed the digital divide as a distinction between those that have both the access and skills needed to take advantage of these new ICTs and those who do not. As a result, one important aspect of the local government policy is to bridge this so-called digital divide. Therefore, from these results it can be learnt that older adults' internet use is of immense importance to society not only for general purposes, but for personal matters that the public sector can help with.

2.6 Theoretical foundation

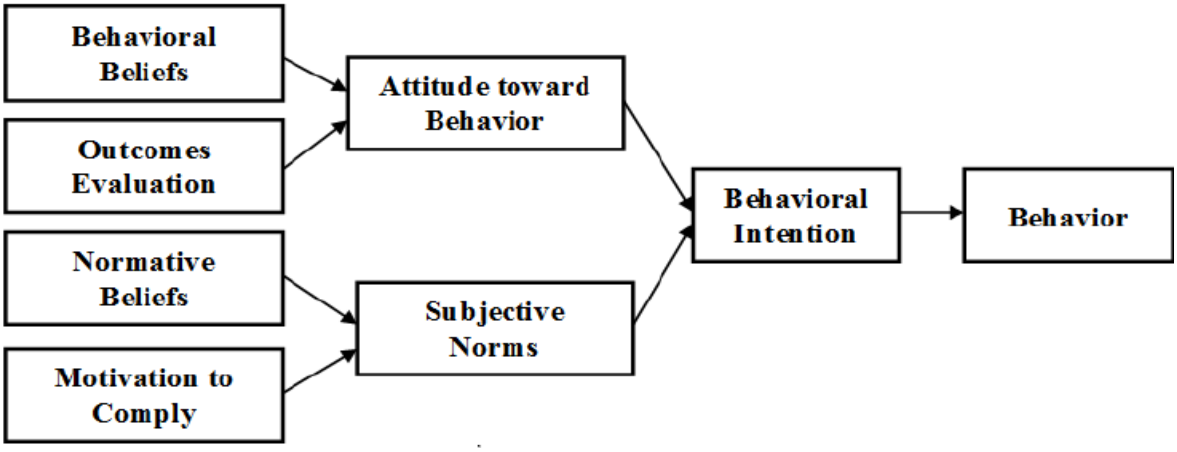
In IS research, diverse studies conducted have been on adoption, acceptance and continuance usage of various information technology theories both in the private and the public sectors. Of which some of them are as follows: Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) Technology Acceptance Model (TAM), Unified Theory of Acceptance, Use of Technology (UTAUT) and Expectation Confirmation Theory (ECT). Furthermore, all these studies have identified factors that influence an individual's behaviour towards adopting and using ICT. Moreover, some of these theories have been extended by researchers by incorporating different factors for more effective use of prediction using factors from other models or theories in different disciplines. Since this study is focused on investigating factors leading to post- adoption of ICT use from older people's perspective, the following sections provide an extensive review of these technology acceptance and continuance usage theories.

2.6.1 Theory of Reasoned Action

The theory of Reasoned Action (TRA) which is one of the most influential theories used in IS by researchers for individual users was established by Ajzen & Fishbein (1980). TRA posits that one's attitude toward a behaviour and subjective norms of the behaviour influence behavioural intentions, which in turn influence behaviour (Ajzen, 1985). The theory suggests that the attitude towards behaviour and subjective norms will determine intention to perform behaviour hence, making it to be behavioural intention rather than attitudes which determines actual behaviour. Equally, the role of TRA is to investigate the relationship between attitudes and behaviour based on compatibility and behavioural intention. This theory was used to study users' acceptance behaviour and to identify critical factors in deriving the full benefits of information technology (Yousafzai et al., 2010). Initially, TRA was intended to predict the behaviour in situations where an individual control his own behaviour and he is thoughtful about it.

One of the criticisms of TRA is that it does not specify the beliefs that are operative for a particular behaviour unlike some of the IS theories. As a result, a researcher using the TRA must first identify the beliefs that are relevant for participants regarding the behaviour under study. This gives the researcher the opportunity to really dig deep into the research field for potential factors influencing users' behavioural attitude in the area which makes this model not suitable for this research study (Montano & Kasprzyk, 2015). Equally, the TRA deals with the prediction, rather than outcome of behaviours. This implies behaviour is determined by behavioural intentions, therefore, limiting the predictability of the model to situations in which intention and behaviour are highly interrelated (Mishra et al, 2014). Based on these inessential factors which affects a person's intention, this makes this theory liable to subjectivity. Figure 2.2 shows the path model of the variables of the theory of reasoned action.

Figure 2.2: Theory of Reasoned Action (Adapted from Legris et al, 2003)



Source: Legris et al (2003)

2.6.2 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) which was developed by Ajzen (1991) is a modification of the theory of reasoned action. The theory of planned behaviour was derived from the TRA which assumed that most human social behaviour is under volitional control and, hence, can be predicted from intentions alone (Ajzen, 2014). The TPB is an extension of the TRA made necessary by the original model's limitations in dealing with behaviours over which people have incomplete choice of control. In effect, TPB was developed by adding Perceived Behavioural Control (PBC) to the original TRA considering situations where there are significant barriers to performing a given behaviour (Madden et al,1992). The TPB depicts behaviour as a function of behavioural intentions and PBC. PBC is the individual's perception of the extent to which performance of the behaviour is easy or difficult. According to the theory (Sniehotta et al, 2013), human behaviour is guided by three kinds of considerations:

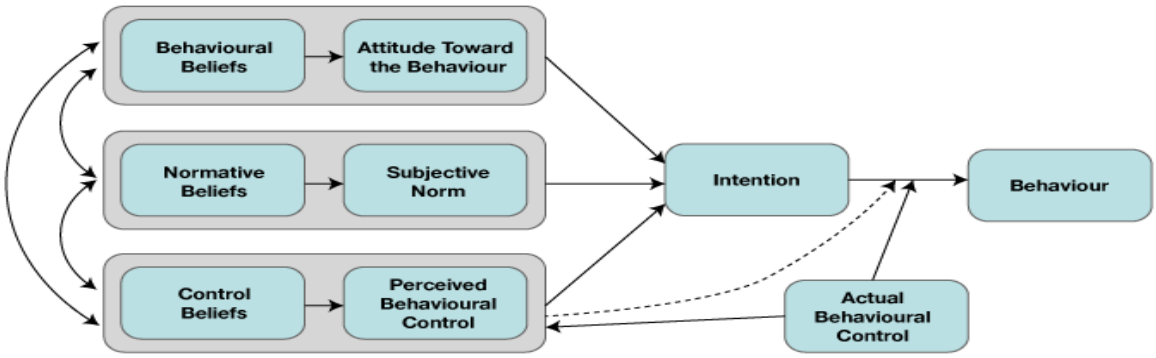
- **The Behavioural beliefs** i.e. beliefs about the likely outcomes of the behaviour and the evaluations of these outcomes
- **The Normative Beliefs** which is beliefs about the normative expectations of others and motivation to comply with these expectations

- **The Control Beliefs** i.e. beliefs about the presence of factors that may facilitate or hinder performance of the behaviour and the perceived power of these factors

In other words, user's actions are determined by their intentions and perceptions of control while their intentions are influenced by their attitudes toward behaviour, subjective norms, and perceptions of behavioural control. This imply that individuals make behavioural decisions based on careful consideration of available information. The link between intentions and behaviour reflects the fact that people tend to engage in behaviours they intend to perform. However, the link between PBC and behaviour is more complex (Montano & Kasprzyk, 2015). This relationship suggests that we are more likely to engage in behaviours we have control over and suggests that we are prevented from carrying out behaviours over which we have no control (O'Connor & Armitage, 2017).

The main focus of criticism for TPB has been the limited predictive validity of this theory. Reviews show clearly that most of variability in observed behaviour is not accounted for by measures of the TPB (Sniehotta et al, 2015). Furthermore, expectations that performing a behaviour will lead to experiencing emotions e.g. pain, pleasure, regret, fear are simply behavioural beliefs, i.e. beliefs about the likely consequences of the behaviour which could be negative or positive. It has been argued, however, that these kinds of behavioural beliefs are not sufficiently represented in applications of the theory due to the way in which relevant beliefs are caused (Armitage & Conner, 2001). By not indicating a clear picture of factors that might predict behaviour, this makes the model open to further expansion which in turn may lead to the creation of biases. Figure 3 shows the path model of the theory of planned behaviour.

Figure 2.3: Theory of Planned Behaviour (Adapted from Ajzen, 2006)



Source: Ajzen (2006)

2.6.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) was originally proposed by Davis (1989) as a means of predicting technology usage i.e. addressing why users accept or reject information technology. This theory is an adaptation of the TRA proposed by Fishbein and Ajzen to explain and predict the behaviours of people in a specific situation. A key purpose of TAM is to provide a basis for tracing the impact of external variables on internal beliefs, attitudes, and intentions (Al-Gahtani, 2016). TAM theorizes that an individual's behavioural intention to use a system is determined by two beliefs which are the two most important factors in explaining technology/system use.:

- Perceived Usefulness (PU), defined as the extent to which a person believes that using the system will enhance his or her job performance
- Perceived Ease Of Use (PEOU), defined as the extent to which a person believes that using the system will be free of effort

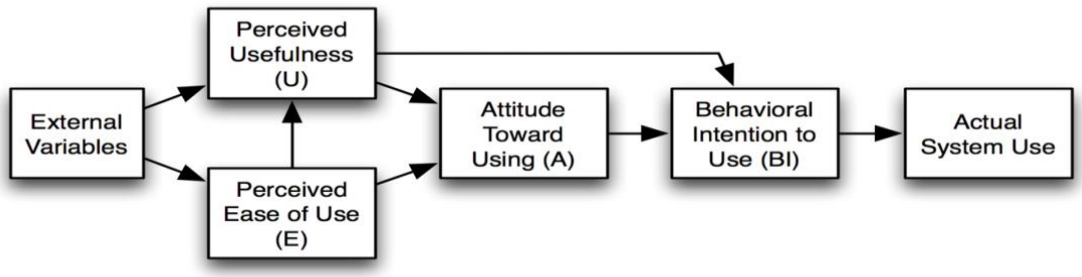
According to TAM, perceived usefulness is also influenced by perceived ease of use because, other things being equal, the easier the system is to use the more useful it can be. Thus, TAM hypothesizes that the effects of external variables on intention to use are mediated by perceived usefulness and perceived ease of use. TAM is a theory that has gone through several changes for instance, an update called TAM2. TAM2 removed the attitude component from the model,

which originally mediated some of the influence of PU and PEOU (Venketash & Davis, 2000). The theory TAM2 reflects the impacts of interrelated social forces impinging on an individual facing the opportunity to adopt or reject a new system: Experience, voluntariness, and image. TAM2 also added a variable meant to capture the social influence that compels end users to positively evaluate and accept IT, called subjective norm (Lee et al, 2015).

Furthermore, the most recent and comprehensive developments of TAM are manifested in TAM3 which was proposed by Venkatesh & Bala (2008). They combined TAM2 and the model of the determinants of PEOU to integrate this model of technology acceptance. In TAM3, three constructs (subjective norms, image and voluntariness) captured the social influence processes on perceived usefulness (Al-Gahtani, 2016).

Indeed, TAM has been widely used as the theoretical basis for many empirical studies of user technology acceptance and has partially contributed to understanding users' acceptance of IS. While being very powerful in helping to predict users' acceptance, one of the limitations of TAM is that it does not help understand and explain acceptance in ways that guide development beyond suggesting that system characteristics impact ease of use (Venketash & Davis, 2000). Equally, TAM is predictive, but its generality does not provide sufficient understanding from the standpoint of providing system designers with the information necessary to create user acceptance for new systems. Specifically, it is important to emphasize that although perceived ease of use has been employed extensively in user acceptance research in general and TAM research in particular, very little has been done to understand the determinants of perceived ease of use.

Figure 2. 4: Original Technology Acceptance Model (Adapted from Legris et al, 2003)



Source: Legris et al (2003)

2.6.4 Unified Theory of Acceptance And Use Of Technology

When considering the acceptance and usage of ICT, the Unified Theory of Acceptance and Use of Technology has served as a baseline theory of the study of various technologies in organizational settings (Tan, 2013). Venkatesh et al (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model to consolidate previous TAM related studies. UTAUT provides a model to assess the likelihood of adoption for a new technology where the reasoning for formulating this theory involves integrating some IS theories and research on individual acceptance of ICT into a unified theoretical model (Venkatesh et al, 2003)..By combining the explanatory power of selected theories and models, UTAUT provides a strong foundation to inform future research in the technology adoption area. In the UTAUT model, performance expectancy and effort expectancy were used to integrate the constructs of perceived usefulness and ease of use in the original TAM study. Moreover, the UTAUT model attempts to explain how individual differences influence technology use (Magsamen-Conrad et al, 2015). Most especially, the relationship between perceived usefulness, ease of use, and intention to use can be moderated by age, gender, and experience. Although UTAUT provides great promise to enhance our understanding for technology acceptance, the initial UTUAT study focused on large organizations. In addition, the scales used in UTAUT model were new

as they are in combination of several prior scales and hence, the suitability of these scales needs to be further tested.

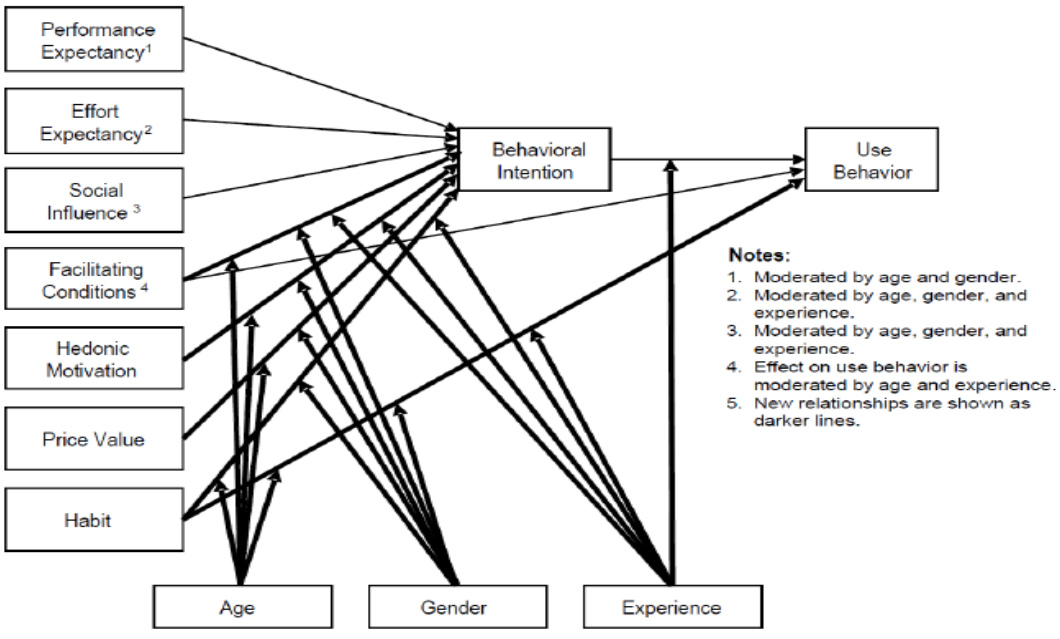
After the introduction of this theory, the UTAUT model has also been tested and widely applied by different scholars in several technological aspect of research. For instance, Yu (2012) applied this model in his study on what impacts people to adopt mobile banking. In the study, it was found that individual intention to adopt mobile banking was significantly influenced by social influence, performance expectancy and perceived credibility. Also, age considerably moderated the effects of performance expectancy and perceived financial cost on behavioural intention. Additionally, Lian & Yen (2014) applied UTAUT model in their study to determine the key factor influencing elderly users' intention to adopt and use the mHealth services. Their findings show that performance expectancy, effort expectancy, social influence, technology anxiety, and resistance to change were significant in impacting on the users' behavioural intention to adopt mHealth services. Furthermore, Magsamen-Conrad et al (2015) applied the model in their study in predicting behavioural intention to use tablets. They found that effort expectancy and facilitating conditions were the only determinants that positively predicted tablet use intentions after controlling for age, gender, and tablet use in older adults. This shows that UTAUT model has is a more comprehensive model for evaluating the possibility of technology success and understanding the determinants of acceptance in technology users especially in the older demography. Therefore, constructs like the performance expectancy served as the foundation for the conceptual framework of this study.

On the other hand, critics of this model argued that this model was improved by integrating only three factors (hedonic motivation, price value, and habit) in order to fit it into the consumer technology use context. This resulted in a more improved model which is the UTAUT 2. However, studies have been carried out using UTAUT2 to show how relevant these factors are in IS studies. For instance, Macedo (2017) applied UTAUT2 in his study to explain older adults' intention behaviour and usage of ICT among the Portuguese older adults. Findings of this study confirms that most UTAUT2 predictors, some of them directly and others

indirectly were found to be relevant for this demographic group. Likewise, Baptista & Oliveira (2015) in their study on mobile banking acceptance in an African country applied UTAUT2. Findings from their study suggested that factors like performance expectancy, hedonic motivation, and habit affect behavioural intention significantly.

As UTAUT 2 is an improvement to UTAUT and the flaw which was stated above that existed in UTAUT has been overcome in UTAUT 2, UTAUT 2 was employed in the formulation of the research model for this research. Again, pre-usage beliefs may serve as anchors for post-usage beliefs as people tend to rely on their initial beliefs and early impressions in the formation of future beliefs. It is possible for these pre-usage beliefs to be disconfirmed, with such disconfirmation ultimately influencing future behaviour and vice versa (Zhou et al, 2010). Considering that this research study is focused on identifying factors that encourage older adults use online communication channel when interacting with the government, this study adopted some of the pre-usage beliefs from the UTAUT2. Specifically, the factors performance expectancy and habit as they have been used in older people's studies to form the conceptual framework of this study.

Figure 2.5: Unified Theory of Acceptance and Use of Technology 2



Source: Venkatesh et al (2012)

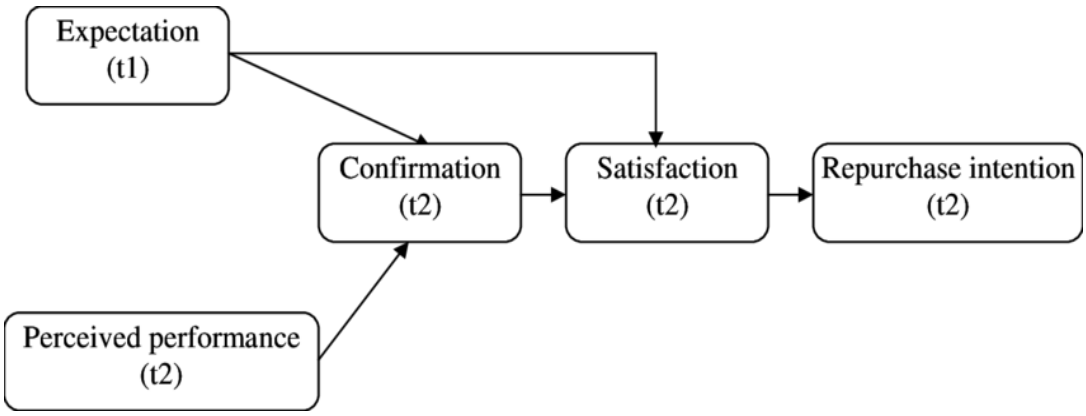
2.6.5 Expectation Confirmation Theory

Recently, IS research has had increasing research on technology adoption and acceptance; however, the success of these technologies does not depend on its initial use, but its continuous usage (Hossain & Quaddus, 2012). The Expectation Confirmation Theory (ECT) is a cognitive theory that is widely used to study consumer behaviour in an IS post-adoption studies. The ECT holds that consumers' intention to continue service use is primarily determined by their satisfaction with prior use of that service (Oliver, 1980). This suggests that user satisfaction with IS usage is a critical source in shaping IS continuance intention. In the ECT, users develop initial expectations about a technology/ system before using it (Kim & Garrison, 2010). After the users actually use this technology, they update their expectations of the technology's performance based on their direct experiences. When technology outperforms relative to their initial expectations, their post-adoption expectations are confirmed; otherwise, their post-adoption expectations are disconfirmed. ECT also posits that user satisfaction is determined by two constructs: expectation of the IS and confirmation of expectation following actual use. The ECT was modified and tested in the IS research area by Bhattacharjee (2001b) which he named the post-acceptance model.

The ECT model has been used in some studies to address post-adoption issues when using a service or product (Bhattacherjee, 2001b; Bhattacherjee, 2001a; Thong et al., 2006). Some of these studies found that customer satisfaction with a service or product is a leading construct for measuring continuance intention (Thong et al., 2006; Roca et al, 2006). Likewise, Kim (2010) developed a model using ECT and TPB to predict a user's continuance behaviour toward mobile data service and found that user satisfaction is an integral part of continuance intention. Lee (2010) equally carried out a study to explain and predict users' intention to continue using E-learning and found that satisfaction has the most significant effect on user's continuance intention. Furthermore, it has been argued that ECT should be used to examine the continuance intention of IS users rather than just to explain satisfaction (Hossain & Quaddus, 2012). Based on these evidences provided by empirical studies, it can be concluded

that for post adoption to take place in technology continuous usage, an individual would have been satisfied with the pre-usage beliefs. Having considered that this study is focused on the drivers of continuance intention to use a particular online communication tool by older adults for interaction, the ECT model was identified suitable for this study. This is because the constructs of ECT are related to the motivational factors that determine post -adoption or continuance intention to use a technology. As a result, ECT served as the foundation for the conceptual framework for this research study. Furthermore, in using ECT as a foundation for the research model, the aim is to offer a more comprehensive as well as high predictive validity in terms of older adults and continuance intention to use a particular online communication channel for interaction. The figure 2.6 shows the path model of the ECT.

Figure 2.6: Expectation Confirmation Theory



Source: Bhattacharjee (2001)

2.6.6 Channel Expansion Theory (CET)

While IS as a distinct area of research has the potential to be a reference for other research areas, it is rational to argue that information systems theorizing can benefit from fresh new insights from other fields of inquiry. This will in turn enhance even more, the reference potential of IS (Kock, 2004). As a result of this, a new novel theoretical factor was developed through a media perception theory called the Channel Expansion Theory (Carlson & Zmud, 1994). This theory posits that an individual's relevant experiences are central factors that influence perceptions of a channel's richness. In other words, an individual's experience with

using a channel will increase one's understanding of how to use a channel competently; hence, an individual's perceptions of its richness. Equally, Carlson and Zmud (1999) noted that because richness perceptions are socially constructed, they are subject to social influence which is also an important factor when considering continuance intention to use a technology.

The notion that experience may be associated with perceptions of a medium is consistent with research on relational development in computer-mediated communication (Slovacek, & Tidwell, 2001). By gaining relevant experiences, individuals can effectively encode and decode computer-mediated messages. D'Urso (2008) explored the use of communication media by organisational members using the channel expansion theory. The main finding shows that richness of a communication medium is not fixed and may be shaped by interpersonal factors including one's relevant experiences. Likewise, Hew & Kadir (2016) in their study on predicting the acceptance of cloud based virtual learning environment found that CET significantly affects intention to use virtual learning environment from teacher's perspective. Ogara et al (2014) in their study on the factors that influence social presence and user satisfaction with mobile instant messaging found that user experience and perceived richness of a communication mediums are important drivers of social presence and user satisfaction in mobile instant messaging.

Carlson and Zmud (1999) identified four knowledge-building experiences that influence one's perception of a channel's richness: experiences with communication partners, the message topic, organisational context and the communication channel utilized. However, this study is going to adopt one of the four knowledge building experiences which is the communication media utilized for the conceptual framework (Hew & Kadir, 2016). This is because the experience with communication channel would allow individuals to learn the selections, attributes, applications and restrictions of the channel. This would allow more efficient use of communication channel by adapting its application to the attributes of the required function that would eventually lead to increase in perceived media richness by the individual.

2.6.7 Trust

Trust has always been an important factor in online communication and usage and is something that is experienced on a daily basis. Despite its high rate of frequency, trust is a concept that is quite challenging to define. For example, trust is a strong belief in the capability of a thing to act consistently, securely and dependably within a definite context (Grandison & Sloman, 2000). Research has also found that trust represents a real obstacle for the uptake of online services with the lack of trust being described as sand in the social machinery (Josang et al, 2005). However, this research study adopts the definition of trust as used by Carter & Belanger (2005). They defined trust as the extent to which one party is willing to depend on somebody or something in a given situation with a feeling of relative security even though negative consequences are possible at end.

Furthermore, an aspect of trust that has been of paramount importance to IS study is trusting beliefs and trusting intentions. Some researchers have found a strong relationship between trusting beliefs and trusting intentions. According to Kim et al (2009), trusting belief is the belief that the trustee has characteristics that would benefit the trustor. These beliefs lead to trusting intention which is the willingness or intention of the trustor to rely on the trustee. Finally, trusting intention leads to trusting behaviour which is the act of the trustor becoming vulnerable to the trustee in a situation of uncertainty. Moreover, Chakraborty et al (2016) in their study regarding post breach online shopping in both older and younger adults found that trusting beliefs in online shopping services and attitude toward e-commerce are significant for the older generation for post breach online shopping intentions.

Moreover, Li et al (2008) has described trust as a primary predictor of technology usage and a fundamental construct for understanding user perceptions of technology. This is because introducing a new technology can offer both benefits as well as uncertainties to the user. As such, users may want to weigh the uncertainties and benefits of using such innovation prior to deciding whether to adopt or not adopt it (Carter and Belanger, 2005). Looking at this from the older adult perspective, one of the major reasons attributed to the low rate of ICT purchase,

adoption and usage among the older adults, is the issue of trust (Choudrie & Alfalah, 2016). This is evidenced in the study carried out by Vroman et al. (2015) which found that majority of older adults who did not use ICT attributed this to feeling anxious with technology.

Further, perceptions of trustworthiness could also impact citizens' intention to use e-government services. Within E-government research, trust has been investigated using concepts drawn from e-commerce, where trust was considered to exist in two forms: Trust of the Internet and trust of the government (Carter and Belanger, 2005, Choudrie & Alfalah, 2016). The decision to engage in E-government transactions requires citizen trust in the government providing the service and citizen trust in the technology through which electronic transactions are executed, the internet (Carter and Belanger, 2005). Thus, citizens must have confidence in both the government and the enabling technologies. Further, the trust that users have in the privacy and security of E-government services seriously affects their implementation. Equally, citizens who have higher levels of trust in using E-government services are more likely to find the E-government services useful for them (Warkentin et al 2018)

Since this research is focused on older adults and it is anticipated that trust is going to be a matter to contend with, this study will use two classes of trust that are decision and reliability trust which was used in the context of online service provision (Josang et al, 2007). Due to these two forms of trust being based on a positive belief about the object that the trustor depends for welfare, they are included in the conceptual framework as constructs.

2.6.8 Service Quality

Based on marketing terms, service quality can be seen to be a measure of how well the service level delivered by a product or service matches customer expectations (Lewis & Booms, 1983). In essence, delivering a quality service means conforming to customer expectations on a constant basis. According to Seth et al (2005), service quality models have been adopted to understand users' perception in various industries and countries by customizing original

SERVQUAL dimensions as per the need of the study. Parasuraman et al. (1985) proposed the SERVQUAL model as a foundation for understanding and enhancing quality of services in various fields which most of the research on service quality has focused on. Research carried out by Roca et al (2006) suggests that of the determinant of user's continuance intention is service quality. Also, Service quality tends to reflect reliability, responsiveness, assurance and personalisation (Parasuraman et al, 1985). Pitt et al (1995) suggested that IS researchers should also include a measure of service quality in the assessment of information system effectiveness. Of which, users' perception toward information systems quality has been discussed in commonly used models like E-S-QUAL, SITE-QUAL, e-GovQual etc (Lien et al, 2017). Although, this model has been commonly cited in the literatures, several authors have expressed some critiques on the instrument as it only focuses on the service delivery process but omits the service encounter outcomes (De Keyser &Lariviere, 2014).

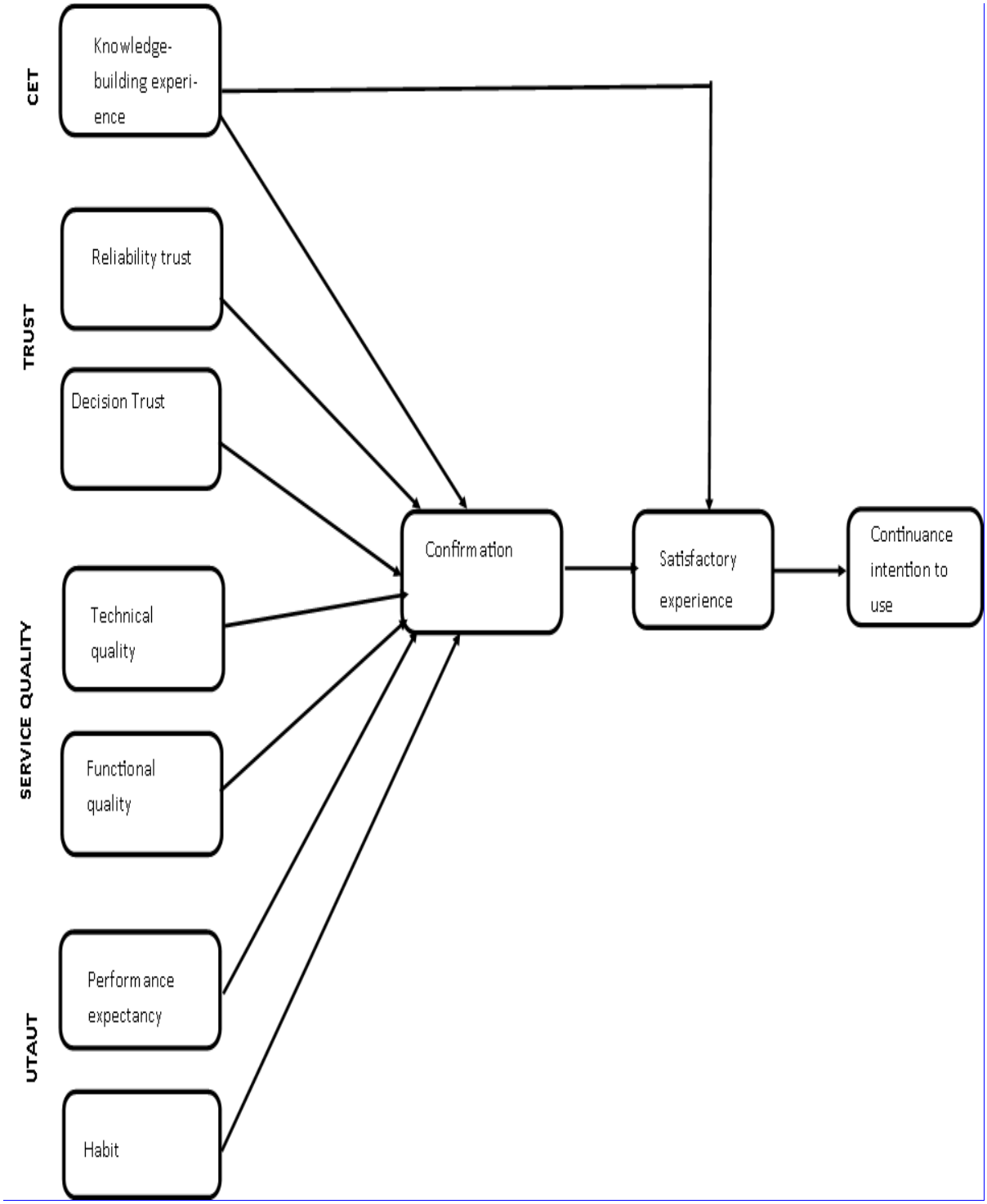
Furthermore, service quality has been directly/indirectly linked to a number of customer outcomes, including customer satisfaction (Lien et al, 2017). A firm in order to compete successfully must have an understanding of consumer perception of the quality and the way service quality is influenced. Managing perceived service quality means that the firm has to match the expected service and perceived service to each other so that consumer satisfaction is achieved. Gronroos (1984) is a pioneer of research on service quality and in his study proposed two distinct service dimensions including technical and functional quality. These distinct dimensions of service quality have been applied in research studies to show its link with customer satisfaction. For instance, Ali & Raza (2017) on proposing antecedents towards perceived service quality and customer service found significant relationship between functional quality, technical quality, overall perceived service quality and guest satisfaction. Likewise, Oghuma & Libaque-Saenz (2016) in their study on continuance intention to use mobile instant messaging found that perceived service quality and perceived usability significantly affect user satisfaction and continuance intention. Based on these evidences from empirical researches showing perceived service quality significantly having effect on users'

continuance intention, the technical and functional quality was included as constructs in this research conceptual framework.

2.7 Development of research conceptual framework and hypotheses

Having identified and selected the constructs suitable for this research study, a conceptual framework was developed. This guided the study towards understanding the factors that affect the choice of online communication channels being used by older adults when communicating with the government. In this, the main features of the research model were drawn from the theories of UTAUT, CET, Trust and Service qualities which are used to extend the ECT. This model was termed the Model for Online Communication Channels (MOCC) and it is presented in figure 8.

Figure 2.7: Model for Online Communication Channels (MOCC)



[Compiled by the researcher]

Additionally, each of the constructs selected for the study along with the relevant hypothesis associated with it is discussed in the section below. The hypotheses will be based on the classic

(E-mail), novel (Facebook) and both online communication channels being identified within this study to give the readers better understanding of the comparison being made between these two technologies.

Knowledge building experience (KBE)

According to Carlson & Zmud (1999), KBE is defined as relevant experiences that are central factors influencing the perceptions of a channel's richness. CET identifies certain experiences as important in shaping how an individual develops richness perception for a given channel (Carlson & Zmud, 2009). This was identified as knowledge building experience and this study will concentrate on the experience with channel use. However, a medium need to be confirmed before its richness can be perceived. As an individual develops and confirms an experience with communicating with others using a specific channel such as e-mail or Facebook, they may develop a knowledge base for that particular channel. As a result, they will be more competent to apply the communication channel in various situational context. E.g. communicating with the government. Carlson & Zmud (2009) carried a study to prove this but with the use of the classic online communication which is Email. In a more recent study, these knowledge building experiences described in CET was tested empirically to prove its richness in newer technologies like the instant messaging interaction (D'Urso & Rains, 2008). Based on these explanations and consistent with the rationale, this research study posits the following,

H1: Knowledge building experience has a positive effect on older users' satisfaction of an online communication channel

H1a: Knowledge building experience has a positive effect on older users' satisfaction of Email

H1b: Knowledge building experience has a positive effect on older users' satisfaction of Facebook

H2: Knowledge building experience has a positive effect on older users' confirmation of an online communication channel.

H2a: Knowledge building experience has a positive effect on older users' confirmation of Email.

H2b: Knowledge building experience has a positive effect on older users' confirmation of Facebook.

Trust

Unlike initial acceptance decision, continuance intention depends on various factors that affect the individual's decision to continue using a particular system, with trust being one of the most important factors (Santhanamery & Ramayah, 2013). Trust is a mental state comprising the intention to accept liability based upon positive exception of intention and behaviour of another (Kim et al, 2009). When considering trust, credibility is usually associated with it and is an expectation that an online communication channel user wants to see in a new innovation before continuing to use it (Josan et al, 2003). Trust requires trust in the human designers, users of the technology and/or a trust in the technology (Kris & Bagchi, 2012). For this study, Trust was divided in two: Reliability trust (RT) that is the subjective probability by which one individual expects another individual to perform a given action on which his/her welfare depends on (Josang et al, 2007). While, Decision trust (DT) is the extent to which a given individual is willing to depend on something or somebody in a given situation with a feeling of relative security, even though negative consequences are possible (Josang et al, 2007). This is because both reliability trust and decision trust are based on the positive belief that a trustor depends on for his welfare. Therefore, this construct was selected to understand whether the older adults' choice to continue using a particular communication channel to deal with the government depends on the trust quality of the channel. Thus, this study posits:

H3: Reliability trust positively affects older users' confirmation of an online communication channel

H3a: Reliability trust positively affects older users' confirmation of Email

H3b: Reliability trust positively affects older users' confirmation of Facebook

H4: Decision trust positively affects older users' confirmation of an online communication channel

H4a: Decision trust positively affects older users' confirmation of Email

H4b: Decision trust positively affects older users' confirmation of Facebook

Service quality

One of the major determinants of IS success is service quality (Delone & Mclean, 2004). Service quality is the consumer's perception of what a standard service should deliver and the measure against what is delivered and is viewed to have the potential to influence users' expectation and the perceived performance of choice of online communication channel (Zhao et al, 2013). Therefore, if an older adult is not actually receiving the actual quality, he/she expects from a particular online communication channel, it could make them discontinue a service. It has been suggested that users' expressions of what they want are revealed by their expectations and their perception of what they think they are getting (Conrath and Mignen, 1990). There are two types of service quality have been recognised in this study: technical and functional quality (Gronroos, 1982). **Technical quality (TQ)** is the value that a customer is actually receiving from a service. **Functional quality (FQ)** is the manner in which the service itself is delivered. Having examined various literatures on service quality, this study has integrated the two types of service quality recommended by Gronroos (1982) within this conceptual framework. Therefore, this study posits:

H5: Technical quality has a positive effect on older users' confirmation of an online communication channel.

H5a: Technical quality has a positive effect on older users' confirmation of Email

H5b: Technical quality has a positive effect on older users' confirmation of Facebook

H6: Functional quality has a positive effect on older users' confirmation of an online communication channel

H6a: Functional quality has a positive effect on older users' confirmation of Email

H6b: Functional quality has a positive effect on older users' confirmation of Facebook

Performance Expectancy

Performance expectancy is one of the main factors that influence user adoption and usage in information technology. Performance expectancy is the degree to which using a technology will provide benefits to consumers in performing certain activities (Venkatesh et al, 2012). In this study, performance expectancy is defined as the extent to which an older adult believes that using a particular online communication channel will help him or her to attain gains in the performance of government-related information access/processing. It has been found in the past studies on acceptance that performance expectancy strongly predicts intention to utilize information technology (Wang & Shih, 2099; Tan, 2013; Zhou et al, 2010). In terms of research studies carried out on older adults, performance expectancy has been found as one of defining factors for older adults use behaviour in technology acceptance and usage. Likewise, Lian & Yen (2014) in their study on the drivers and barriers affecting the older consumers intention to shop online found that performance expectancy is one of the major factors that drive older adults towards online shopping. Based on the above discussion, this study drew the performance expectancy from the UTAUT2 as one the constructs for its conceptual framework. Therefore, this study proposes:

H7: Performance expectancy has a positive effect on older users' confirmation of an online communication channel

H7a: Performance expectancy has a positive effect on older users' confirmation of Email

H7b: Performance expectancy has a positive effect on older users' confirmation of Facebook

Habit

Habits are commonly understood as a cultured series of acts that become automatic responses to specific situations which may be functional in obtaining certain goals. In other words, once a habit has been established, the performance requires little conscious attention and only minimal mental effort. Limayem et al (2007) defined habit as the extent to which people tend to perform behaviours automatically because of learning. In recent time, the habit construct

has been used in several studies as a predictor of technology use and most especially, it has been used beyond prior use to post- use. A study carried out by Tam et al (2018) to uncover the factors that underlie the continuous intention to use mobile apps using ECT and UTAUT2 shows that habit, performance expectancy and satisfaction as the most drivers of continuance intention of mobile apps. Furthermore, Escobar-Rodrguez et al (2014) in their study on factors that influence the perceived advantages and relevance of Facebook as a learning tool found habit to be one of the relevant factors when analysing student's intention to use Facebook. In this current study, habit is used as a determinant of the continuance intention to use a particular online communication. Therefore, this study proposes the following:

H8: Habit has a positive effect on older users' confirmation of an online communication channel

H8a: Habit has a positive effect on older users' confirmation of Email

H8b: Habit has a positive effect on older users' confirmation of Facebook

Confirmation

Confirmation is a rational process a user goes through prior to setting up an effect and subsequent intention (Bhattacherjee 2001b). Atchariyachanvanich et al (2006) also described confirmation as the evaluation of a customers' perceived performance against their original expectation and determines the level to which the expectation is confirmed. Based on the ECT, for a customer to reach their repurchase decision, it involves several stages (Santhanamery & Ramayah, 2013). Initially, there is an initial expectation for the product or services that leads to forming a perception of the performance of the product or services. Then, a confirmation is formed based on the expectation and performance of products or services. Nonetheless, as an older adult uses an online communication channel, he or she confirms his/ her initial expectation about the value and benefits of the used channel. Research carried out by studies have shown this factor to be strong determinant of user's continuance intention to use information technology. For instance, Hsu & Lin (2015) in their study on mobile app usage

found that confirmation was positively related to satisfaction. Based on these explanations, this research study posits the following:

H9: Confirmation has significant impact on older users' continuance intention to use a particular online communication channel

H9a: Confirmation has significant impact on older users' continuance intention to use Email

H9b: Confirmation has significant impact on older users' continuance intention to use Facebook

Satisfactory Experience (SE)

Satisfactory experience is the extent to which consumers perceive their initial expectations of a service to be confirmed or disconfirmed during actual use, thus, users' IS continuance intention is determined primarily by their satisfaction with prior use (Bhattacherjee, 2001a). Most literature on technology usage have found that a user's continued usage intention of information technology is determined by the user's satisfaction which is influenced by confirmation (Roca et al, 2006; Lee, 2010; Lee & Kwon, 2011). Likewise, Alzarhrani et al (2017) described citizens satisfaction as the extent to which an E-government service helps a citizen to achieve his/her needs. Thus, citizens' satisfaction is influenced by their intention to use E-government. This study will also build on the users' satisfaction to explain older adults' continuance intention to use a particular online communication channel to communicate with the government. Therefore, this study posits:

H10: Satisfactory experience has significant impact on older users' continuance intention to use a particular online communication channel.

H10a: Satisfactory experience has significant impact on older users' continuance intention to use a particular online communication channel (Email).

H10b: Satisfactory experience has significant impact on older users' continuance intention to use a particular online communication channel (Facebook).

2.8 Demographic Variables

When considering social investigation, factors such as age, gender, education, occupation and health status are found to be main socio-demographic variables when examining IT adoption and continuous use (Vyas, 2013). These factors are viewed as important to provide information regarding the characteristics of the populations of interest considering that this study is focused on older adult's continuance usage of online communication channels. Research studies have also been carried out in IS field to show how significant these factors aid in adoption and use of new technologies. For instance, Bélanger & Carter (2009) and Niehaves et al (2014) addressed the education variable in their studies. Likewise, Van Deursen et al (2015), also studied all the named factors except for health status in their cross-sectional analysis of internet activities among the Dutch population. Equally, as older adults are the demographic group of interest to this study, and as ageing occurs, disabilities, ailments and health issues emerge, which is likely to affect technology use; hence, the health variable was included in this study. In addition, age, gender and education were also included based on the above findings from the research field. Recognising that including the demographic variable within research analysis allows for a broader and more insightful understanding of demographics, this will be tested within the path analysis in the final phase of this study.

Furthermore, in the UTAUT 2 study, Venkatesh et al. (2003) identified four key moderators believed to affect the relationship between key determinants and intention: gender, age, voluntariness, and experience. Research has also been carried out to examine these key moderating factors in diverse studies specially on adoption and continuous use of technology (Pan and Jordan-Marsh , 2010; Lin &yen, 2014). In all, this study intends to adopt the use of age and gender as moderating variables based on UTAUT 2.

2.9 Summary of Chapter

This chapter began with a clear definition and backgrounds into E-government. Then, it went down to discuss E-government at the local level and the services being rendered to the local

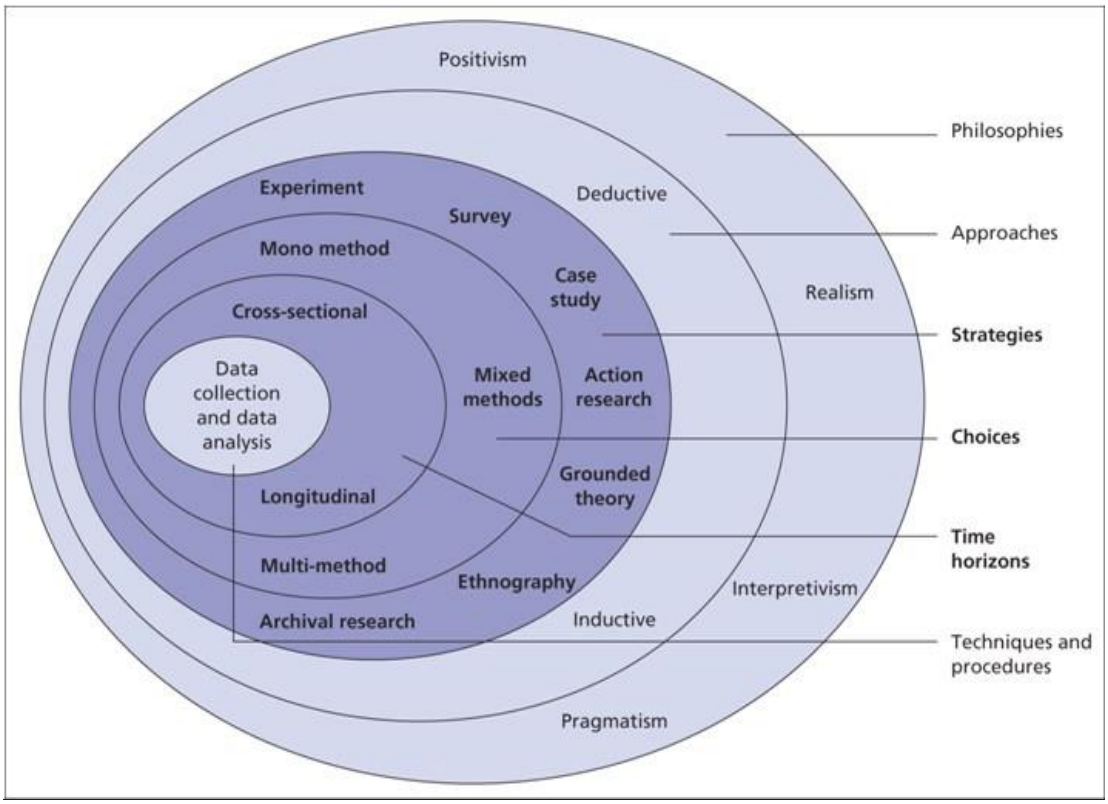
communities by the local council. A review of literatures relating to different online communication channels and how they have been adopted by the government especially for E-government service delivery were carried out. This chapter went further to look into the population of interest to this study which is the older adult. A range of literature reviews relating to older adults, internet usage and digital divide were discussed in detail. Furthermore, theories and models relevant to acceptance and continuance use of ICTs were identified and discussed in this chapter. This was to enable this study select suitable constructs and the development of the conceptual framework as well as hypotheses that guided the research study.

Chapter 3: Research Methodology

3.0 Introduction to chapter

Having provided the literature review for this research study that included forming the conceptual framework for this study, this chapter presents the research methodology applied to this research. In addition, this chapter will discuss the different methods employed in research projects for data collection and will identify the one suitable for this study. For this, the operations and structures of this study are influenced by the research process onion which was developed by Saunders et al (2009). Figure 3.1 shows a diagram of the research onion and its components.

Figure 3.1 Research Process 'Onion'



Source: Saunders et al (2009)

From 3.1, it is evident that there are six main stages which needs to be considered when trying to answer research questions in a research study. These stages are as follows: philosophies,

approaches, strategies, choices, time horizons and techniques and procedures. Saunders et al (2009) suggests that it is important for researchers to consider the outer layers as well as the core of the onion to help them understand the central point of the research onion. This research study adapted the research onion because it creates a series of stages under which the different methods of data collection can be understood. Equally, it illustrates the steps by step guide on which a methodological study can be described. It will also discuss existing paradigms, linking how these paradigms link to epistemology, ontology and methodology and subsequently, the paradigm that applies to this study will be determined. Additionally, the technique used for the analysis of the research data will be discussed followed by a summary of the chapter.

3.1 Research and methodology

Research is a systematic and scientific search towards purposeful investigation on a specific topic (Kothari, 2013). In other words, research is an original contribution to the existing stock of knowledge making for its advancement or further enrichment. A different description of the definition to research by Achari (2014) is that research is the quest for truth with the help of study, observation, comparison and experiment. Bearing the current research study in mind, the main aim of research is to find out the truth, which is hidden, and which has not been discovered and yet this gap can be overcome using a research methodology. Furthermore, the term research is sometimes confused with research methodology. Research methodology is a way of systematically solving a research problem (Pruzan, 2016). It may be understood as the overall principles of producing new knowledge.

3.2 Paradigms /philosophy

Research philosophy refers to a system of beliefs and assumptions about the development of knowledge (Saunders et al, 2015). Most research studies are commonly based on certain philosophical assumptions about the nature of society and science. There are four common research philosophies that researchers can apply: Positivism, Critical realism, Interpretivism and Pragmatism (Saunders et al, 2015), which are briefly described hereafter.

- **Positivism:** It relates to the philosophical stance of the natural scientist and entails working with an observable social reality to produce law-like generalisation.
- **Critical realism:** This focuses on explaining what can be seen and experienced in terms of the underlying structures of reality that shape the observable events. Critical realists see reality as external and independent, but not directly accessible through observation and knowledge of it.
- **Interpretivism:** It emphasises that humans are different from physical phenomena because they create meanings. As a result, human beings and their social worlds cannot be studied in the same way as physical phenomena.
- **Pragmatism:** This suggests that concepts are only relevant when they support action. For a pragmatist, research starts with a problem and aims to contribute practical solutions that inform future practice.

The above-mentioned paradigms contain three elements, which are epistemology, ontology and methodology. Epistemology is closely interrelated with ontology and methodology (Punch, 2013). Comparatively, ontology is the philosophy of reality. Epistemology is the link between the reality and the researcher while methodology is the process used to acquire knowledge of the reality. Based on the arguments above, the positivist approach was identified as suitable and as a result, it was adopted for the purpose of this research. Considering this, positivism is discussed in more details below.

3.2.1 Positivism

The label positivism refers to the importance of what is theorised. This emphasises the positivist focus on strictly scientific empiricist method designed to yield pure data and facts uninfluenced by human interpretation or bias (McGregor and Murnane, 2010). In some cases, positivism involves using existing theory to develop hypotheses. These hypotheses are tested and confirmed, in whole, partly or disproven, leading to the further development of theory that then, may be tested by further research. Positivist researchers are likely to use a highly structured methodology to facilitate replication (Gill and Johnson 2010). Furthermore, the

emphasis will be on quantifiable observations that lend themselves to statistical analysis. Bearing this in mind, this current research applied a positivist approach in the sense that it involved the use of surveys and theory verification to determine the factors that influence older adult's adoption and continuance usage of an online communication channel when interacting with the government.

3. 3 Research Approach: Inductive and Deductive

Research approach is the second layer of Saunders et al.'s (2009) research onion which is divided into a deductive and inductive approach. The deductive approach concentrates on using literatures to identify theories and ideas that the researcher will test using data (Saunders et al, 2009). Deductive research is more generally associated with positivist and quantitative research. It is often developed from reading of the academic literatures and then, designing a research strategy to testing the theory (Pheeraphuttharangkoon, 2015). In contrast, the inductive approach involves collecting data and developing a theory based on the results of data analysis (Bryman, 2016). It begins with specific data, which are then used to develop a general explanation (a theory) to account for the data (Trochim et al, 2015). This study shows a focus on theory testing that involves developing hypothesis from existing IS theories, development of a conceptual framework and testing hypotheses in a specific research context. Therefore, this shows that the present study has a deductive research approach.

3.4 Research Strategy

The third layer of Saunders et al's (2009) research onion is research strategy. It that offers an overall direction to the research, including a process of how research should be conducted and enabled such that researchers can systematically perform the study (Remenyi, 1998). Strategies can be considered as a general plan for researchers to perform their research study with, and to answer their research question (Saunders et al., 2009). The factors helping researchers to select an appropriate research strategy are research objectives, research questions, existing information, time and other resources as well as the selected research

philosophy (Pheeraphuttharangkoon, 2015). The strategy layer of the research onion consists of an Experiment, Survey, Case study, Action research, Ground theory, Ethnography and Archival research. This study employed the survey strategy, and this is usually associated with the deductive approach. Survey research is defined as the collection of information from a sample of individuals through their responses to questions (Ponto, 2015). This type of research allows for a variety of methods to get participants, collect data, and utilize various methods of instrumentation. It is also a popular and common strategy in business and management research and is most frequently used to answer who, what, where, how much and how many (Pheeraphuttharangkoon, 2015). Vroman et al. (2015) also suggested that surveys are useful for examining trends within a population as well as identifying features and frequency of attitude and practices in order to determine the relationship between involved constructs. Survey research may use a variety of data collection methods with the most common being questionnaires and interviews (Kothari, 2013). For this study, the survey research was developed using Surveymonkey.com to create the questionnaire. The questionnaire contained mainly close-ended questions and was divided into seven sections. Additionally, the measurement items of each construct were adapted from previous studies with some modification to suit the context of this research.

3.5. Research choices/ method

Peeling away the approach and strategy layers of the research onions leads to the next layer of the onion, which is the research choices/methods. Research methods are the specific tools and techniques being employed in a study within a specific research methodology (Bryman & Bell, 2015). Research choices include selecting between, or with both, the quantitative and qualitative approach and these exist in several options including the mono method, mixed methods and multi-method (Punch, 2013). The single (mono) method can be qualitative or quantitative whereas multi or mixed method could be qualitative, quantitative or a combination of both. Each of these methods has its own uniqueness and is fundamental for achieving a

successful research study (Kothari, 2013). The following provides further detailed discussion regarding the quantitative and qualitative approach.

3.5.1 Quantitative Research Approach

Quantitative research is based on the measurement of quantity or amount which is applicable to phenomena that can be expressed in terms of quantity. Bryman (2016) described quantitative research as collecting numerical data, where there is a deductive view of the relationship between theory and research, with a preference for a natural science approach (O'Dwyer et al, 2013). It focuses on gathering numerical data and generalizing them across groups of people or to explain a particular phenomenon. The data are usually gathered using a structured research instruments and are based on larger sample sizes that are representative of the population (Kothari, 2013). Furthermore, quantitative methods examine the effects of specified circumstances (independent variable) on an outcome of interest (dependent variable). In this instance, causal inferences are drawn either from direct observation as in true experiments or from associations established through statistical analysis tools such as SPSS and SmartPLS (Creswell and Clark, 2007). Moreover, quantitative research provides results that can be generalized to a specific population as it is based on statistical sampling of the target population (Bryman, 2016).

3.5.2 Qualitative Research Method

Qualitative research is concerned with the qualitative phenomena i.e. phenomena relating or involving quality or kind. According to Jupp (2006), qualitative research aims to explore the subjective meanings through which people interpret the world. Moreover, qualitative research is often based on interpretivism, constructivism, and inductivism (Vyas, 2013). Qualitative method usually involves the use of a small sample size, because the main focus is on information gathering, seeking patterns and also putting experiences into words and narratives (McGregor and Murnane, 2010). It is sometimes dismissed as it is viewed to be lacking the rigor of quantitative research (O'Dwyer et al, 2013). However, it is also a method commonly

used for generating theory, in other words, qualitative research seeks to discover new knowledge by retaining complexities as they exist in natural settings (Punch ,2013).

Considering the above reasoning, the main method employed in this study is the quantitative method. However, an aspect of qualitative method was introduced for evaluating the result of the quantitative findings. This was utilised in this research study so as to use the findings from one type of study to check against the findings derived from the other type of approach i.e. the result of the quantitative study can be checked against the qualitative investigation. The aim is generally to enhance the validity of findings of this research study.

3.6 Time horizons

Before reaching the core of the research onion, the next layer depicts the time horizon over which a researcher undertakes a research study. From the research process onion, time horizons can be seen from two studies: cross-sectional studies and longitudinal studies (Saunder et al ,2009). A cross-sectional research is undertaken to answer a question or solve the problem in one or more variable for a single period of time or in one short period and social change over time can be analysed (Menard, 2007). In such cases, strategies such as experiment, survey, case study or grounded theory is used. This time horizon is suitable for studies where a particular phenomenon is considered at a specific time (Saunders et al., 2009). On the other hand, where the question or the problem is such that it necessitates data to be collected in one or more variable for one or more time periods, the longitudinal study is being applied (Menard, 2007). This type of time horizon is suitable for testing and developing theories on human development and answers (Saunders et al., 2009).

Based on the research aim and objectives of this study, there was an attempt to explore use of online communication channel phenomenon within a particular time and limited timed period. This resulted in the application of the cross-sectional time horizon being most appropriate for this study. Equally, the cross-sectional time horizon was compatible with this research philosophy and selected survey strategy.

3.7 Techniques and Procedures

When considering the technique and procedures in the research onion, the data collection and analysis involved in a research study are dependent on the methodological approach being used in a study (Bryman, 2013). This represents the key point of any research project which helps in gathering data from the sample so that the research questions can be answered. It is important to be able to distinguish between different kinds of data because their nature has important implications for their reliability and for the sort of analysis to which they can be subjected (Kothari, 2013). Nonetheless of the approach used in a research study, the type of data collected can be separated into two types: primary and secondary data. The next section details the type of data used for this study.

3.7.1 Primary and Secondary Data

Primary data is data that is derived from first hand sources that can be historical, or data derived from the respondents in survey or interviews (Saunders et al, 2009). There are many ways of collecting and recording primary data including observations, surveys and experiments (Bryman & Bell, 2015). There are several reasons why people do not collect primary data and the main ones being time, cost and access. However, organising a huge survey undertaken by large teams would overcome this limitation. As earlier stated, this research study is a quantitative research using a primary data in the form of a survey.

Secondary data:

Generally, researchers use data originally collected for other purposes all the time. When data originally collected for one purpose are used for other research, the data are often referred to as **secondary data**. According to Kotler & Armstrong (2010), secondary data provides a good starting point for research and often help to define research problems and objectives. Although, all data needed in carrying out a research or project can rarely be obtained from secondary sources (Cooper & Schindler, 2013). Even when data can be found, the information might not

be very usable. Therefore, Kothari (2013) suggested that researchers must evaluate secondary information carefully to make sure of its relevance and accuracy before using it on a project. Based on the aim and research questions of this study, this research study needed to acquire primary data. However, secondary data was also required; e.g. for literature reviews when forming the initial understanding and conceptual framework. In this research, secondary data such as journal articles and conference publications are used for problem definition, literature review, conceptual development, method development, and discussion phases. Statistical documents and secondary quantitative data sets also helped in developing the problem definition and evaluation phases. Further, research books were also used for the research method development phase.

3.7.2 Sampling in Research

Sampling is widely used in academic researches as a means of gathering useful information about a population (Cochran, 2007). A population is can be defined as any group of people that share a common set of characteristics (Kothari, 2004) The process of sampling involves using a small number of items or parts of the population to make conclusions about the whole population (Bryman, 2016). A such, a sample can be characterised as a subset of a particular population. To identify the most suitable sampling method to match the requirements of this research study, a number of leading sampling methods were consulted. There are two main sampling techniques used in academic research namely: random sampling techniques and non-random sampling techniques.

Random sampling techniques can be referred to as probability-based sampling. In this type of sampling technique, every element in the population has a known chance of being selected into the sample (Cochran, 2007). This technique is most preferable to researchers as random selections are more likely to result in samples which are more accurate and less biased (Cooper & Schindler, 2006). In other words, random sampling helps to keep sampling error to a minimum. This sampling method is the most utilised method for making generalisable

inference about the target population from the outcome of a study. There are different types of random sampling techniques and they are as follows: (Bryman, 2016; Lim & Ting, 2013);

- **Simple random sampling:** This type of sampling is also known as chance sampling or probability sampling where each item in the population has an equal chance of inclusion. Here, a sampling frame is needed, and the researcher is required to have minimal knowledge of the target population.
- **Systematic sampling:** It involves selecting a participant randomly from the target population and the other participants are then selected periodically. In such a design, the selection process starts by picking some random point in the list and then every nth element is selected until the desired number is secured.
- **Stratified sampling:** This type of random sampling technique involves splitting the target population into sub-groups with the same characteristics such as age, gender, ethnicity and other characteristics. In this technique, the population is stratified into several subpopulations or strata and sample items are selected from each stratum. This helps to ensures a representation of all groups of the population and then, estimation and comparison can be made.
- **Cluster sampling:** Cluster sampling involves grouping the population and then selecting the groups or the clusters rather than individual elements for inclusion in the sample. Then, clusters to be used for the study are then randomly or systematically selected.

Further, **Non-random sampling techniques** suggest that the probability of any member of the population being chosen into the sample is unknown (Campbell & Stanley, 2016). This implies that the selection of a sampling unit in this type of technique is quite subjective as the sample selection relies heavily on the researcher's personal judgement (Bryman & Bell, 2015; Saunders et al, 2009). This method is less expensive, less time consuming and easier to implement as compared to random sampling. However, sampling error in this type of sampling cannot be estimated and the element of bias is always there (Lim & Ting, 2013). As such, this

sampling design is rarely used in conducting large inquires of importance. Moreover, in small inquiries and researches by individuals, this design may be adopted because of the relative advantage of time and money inherent in this method of sampling (Campbell et al, 2016). There are different types of non-random sampling and they are as follows (Lim & Ting, 2013; Bryman, 2016);

- **Quota sampling:** It is a form of non-random sampling technique that involves selecting specific characteristics of a population to the extent of a set quota in order to ensure representativeness. This type of sampling technique is particularly useful when a researcher is unable to obtain a probability sample but is still trying to create a sample that is as representative as possible of the population being studied.
- **Purposive sampling:** the primary consideration in this sampling design is judgment of the researcher as to who can provide the best information to achieve the objectives of the study bearing in mind the purpose of the study. With purposive sampling, the researcher hardly knows whether the cases selected do represent the population or not.
- **Convenience Sampling:** In this type of sampling, researchers prefer participants as per their own convenience such that participants are chosen based on accessibility and willingness. The rationale behind using this technique is that the researcher is dealing with an almost limited population and cannot include every subject of the population.
- **Snowball sampling**: In this method, the sample is actually collected in various stages because its more on a referral basis. Specifically, the researcher begins by identifying someone who meets the criteria for inclusion in the study and then, ask them to recommend others who they may know who also meet the criteria. This process goes on till the purpose of the researcher is achieved.

Based on the above description, this research study employed a mix of the random and non-random sampling technique. Initially, a self- selection method was used for the pre-test and content validation by employing experts to check the viability of the questionnaire before administering them to the target population. Then, the snowball method was used for the pilot

study. This is because the study required participants who are 50 years and over in UK specifically Hertfordshire County. This approach was employed with already established contacts to recruit more participants from retirement homes, local churches and the general community. Households in some part of Hertfordshire County were visited and 510 questionnaires were distributed to potential participants that led to 233 responses (both hard & soft copies). Of these, 222 were valid and complete. The 222 completed responses consisted of 169 soft and 53 hard copies respectively.

Finally, a stratified random sampling method was employed for the final phase of the data collection. This is because undertaking random sampling methods will give this research the highest chances of obtaining data to an acceptable extent; i.e. a representation of the over 50s population in Hertfordshire. This was achieved by dividing the sampling population into the 10 Boroughs and Districts in Hertfordshire County as "Strata". A list of the towns/areas in Hertfordshire was identified using the Google search engine. However, due to the resources available to this research study (time, money & manpower), it is not possible to sample every household in each town/area. Subsequently, a method to randomly select households in each town/area was designed which was a simple random sampling method. This was done using the Microsoft Excel 2013 software package which is embedded with the RAND function to randomly assign numbers to the list before selecting the towns/areas to be sampled.

With regards to the number of households to be sampled, the expected response rate offers a logical standpoint on which to base a decision. As only non-probability sampling methods have been employed in the pilot phase of this research, an estimated response rate cannot be calculated. As a result, guidelines were sought from previous research studies. Response rates are principally affected by factors such as nature of respondents, social climate and subject of research (Denscombe, 2009). As a rough guide, any researcher will be fortunate to get a response rate of 20% (Denscombe, 2009; p.9). With these principles considered to achieve a sample size of 1000 at a response of 20%, at least, 5000 survey flyers must be distributed across the towns/areas selected. However, a 20% response rate is viewed to be too optimistic

based on attitudes towards participation that were observed within the pilot stage undertaken within Hertfordshire. Also, as the survey participants are limited to 50 years and above, not all households selected will contain individuals eligible to participate. Thus, a response rate of 10% - 15% was estimated, which resulted in 6,590 households being sampled. Table 3.1 shows the selected sampling methods, sample sizes and sampling frame for each phase of this research study which involves collecting data.

Table 3.1 Selected Sample Methods & Sizes

	Sampling Technique	**Target Sample Size**	**Actual Sample Size**	**Sampling Frame**
Content Validity	Expert Sampling	20	15	Hertfordshire
Pre-Test	Self-Selection	20	15	Hertfordshire
Pilot Test	Snowball Sampling	250	233	Hertfordshire
Final Survey	Stratified Random Sampling	1000	1049	Hertfordshire

3.8 Research Site

As previously stated, the findings of this research will be provided using a UK perspective, which means that findings are those drawn from analysis of data collected from participants who are only UK residents. In the UK, the population count for the mid-year estimate 2017 was 66,040,200 compared to the last census which was 63,182,000. England amongst all the four countries in the UK comprised of over 80% of the population (55,619,400); thereby accounting for over three quarter of the UK population (ONS, 2018). The population of the UK is ageing in terms of both the increase in the average (median) age of the population and the increase in the number and proportion of older people in the population (ONS, 2018). Of which, this is one of the major issues being faced in UK Local communities today. Population ageing is as a result of past improvements in mortality rates at all ages and continuing improvements in mortality rates at the oldest ages combined with overall past declines in fertility rates (ONS, 2018).

However, for viability purposes, the sample site for this study is the East of England but was limited to the Hertfordshire County of UK. The reason being that Hertfordshire is the second largest county in the East of England and one of the counties in England that operates a two-tier structure i.e. a county and district councils which makes it unique (Hertfordshire: 2021). In 2016, the county was rated as the second most densely populated county in England with an estimated population of over 1.18million people as at 2017 (Herts Insight, 2018). Census surveys carried out in 2011 showed that the population of Hertfordshire is 1.16 million and 33% represents are older adults. Likewise, figures obtained from the office of the national statistics in 2017 showed that older adults living in Hertfordshire i.e. 50 years and above were approximately 420, 472 adults which was above the national average older adult age structures (ONS, 2107). These data gathered was one of the major factors that helped to form the basis of site selection for this research study.

Furthermore, the Office of National Statistics has projected that the older adult population in Hertfordshire will increase to 41% by 2037. Hertfordshire's population of over 65s is expected to increase by 22% between 2011 and 2021 and this will have a significant impact on the demand for services which is a problem that is causing immense concern (ONS, 2018). Further, life expectancy in Hertfordshire has been found to be above the national average and people continue to live longer because of the high standards of living and good quality of life the residents enjoy (Hertfordshire; 2021). Considering this, evidence of this increment in the population of older adults in Hertfordshire has begun to manifest based on statistics (ONS, 2107). As Hertfordshire citizens live longer, it means both the number and proportion of older adults is set to increase over the coming years. Moreover, Hertfordshire is often viewed as a prosperous county (Hertfordshire; 2021). The growing workforce in Hertfordshire is highly skilled of which most of them are age 50 and above which makes them wealth-creators and contributors (Hertfordshire Foundation Community, 2016). According to Hertfordshire Economic Outlook (2016), it was estimated that Hertfordshire's economic output as at 2011 was about £26.7billion.

Therefore, bearing in mind the above-mentioned information as well as the proximity and, accessibility of this site to the researcher all formed the basis for the selection of Hertfordshire County as the study sample site. A map of Hertfordshire County is provided in figure 3.2 showing the list of all the boroughs and district in Hertfordshire. This map confirms the figures on the table above by showing that all the boroughs and district are of different sizes comprising different population sizes within.

Figure 3.2: A map of Hertfordshire County

Source: YC Hertfordshire (2019)

3.9 Statistical Data Analysis

Having considered the research site of this study, this section is going to discuss the data analysis used in this study. By doing so, an understanding of how a suitable conclusion was achieved from the data obtained for the study can be offered. In data analysis, the purpose of a rating scale is to allow respondents to express both the direction and strength of their opinion about a topic (Kothari, 2013). **T**here are four most widely used classification of measurement

scales used in research projects namely: nominal scale, ordinal scale, interval scale and ratio scale.

Nominal scale: This is simply a system of assigning number symbols to events in order to label them into categories. This method is used to represent variables that are non-numeric or where the numbers have no value (Bryman, 2016). This type of scale is very useful in keeping track of people, objects and events and also, are widely used in surveys research when data are being classified by major sub-groups of the population.

Ordinal scale; This type of scale places events in order based on some levels of magnitude either in terms of quantity or value (Kothari, 2013). Ordinal scales only permit the ranking of items from highest to lowest but there is no attempt to make the intervals of the scale equal.

Ratio scale: This type of scale measures in terms of equal intervals and has an absolute zero point of origin. (Trochim & Donnelly, 2008). Examples of ratio scales are measures of physical dimensions such as weight, height, distance, etc. Generally, all statistical techniques are usable with ratio scales.

Interval scale: A scale that measures in terms of equal intervals or degrees of difference, but whose zero point, or point of beginning is arbitrarily established (Trochim & Donnelly, 2008). Interval scales provide more powerful measurement than ordinal scales.

Allen & Seaman (2007) identified another type of scaling technique used in research studies especially surveys for measuring attitude which is called the Likert scale. The Likert Scale is a five- or seven-point scale that offers a range of answer options from one extreme attitude to another, like “extremely likely” to “not at all likely.” Ideally, this type of scale includes a moderate or neutral midpoint (Boone & Boone, 2012). Likert scales are quite popular because they are one of the most reliable ways to measure opinions, perceptions and behaviours. For instance, customer satisfaction and employee engagement. The scaling technique employed in this study research was the Likert-type scaling method. Specifically, a seven-point Likert-type

scale was employed in measuring the continuance intention aspects of the study by scaling the opinions of the participants.

Furthermore, there are several techniques used for analysing statistical data. Presently, social and behavioural sciences are in a process of evolution involving in the shift away from the fragmented methods of inquiry towards more and theory-based models (Milton, 2009). This can be described as first-generation data analysis technique. This shift is so profound that a second generation of multivariate techniques has emerged. Gefen et al. (2000) defined these classification of data techniques as follows;

- First-generation data analysis technique is a term used to refer to correlation based analytic methods such as multi variance analysis, hypothesis testing, Analysis of Variance (ANOVA) and analysis of covariance (Milton, 2009). This method of data analysis only analyses one level of relationship between dependent and independent variable at a time.
- The second-generation data analysis methods are often used to test for the validity of a statistical conclusion. It also allows the simultaneous analysis of linkage among multiple independent and dependent constructs (Recker, 2011). In addition, it is a more suitable method for modelling complex and multivariate data acquired based on both theory and practice.

In recent times, these procedures were conducted using electronic programme, software packages. Some of the most common program packages currently available for the analysis of quantitative data includes Microsoft Excel, SAS, R, SmartPLS and SPSS (Bryman & Cramer, 2005). These packages offer time saving and easier methods for analysing quantitative data. It also provides an avenue for selecting the most appropriate statistical technique for the data being analysed.

Based on the above argument as well as the usefulness of SEM in the study of behavioural and social science as suggested by Milton (2009), SEM was identified as suitable for this study.

3.10 Structural Equation Modelling

Structural equation modelling (SEM) techniques such as partial least squares belong to the second-generation data analysis method (Milton, 2009). The term SEM has been used interchangeably with path analysis, causal modelling and covariance structure analysis in literature. SEM is a statistical modelling technique employed to examine the relationship between latent variables or factors (Hair et al, 2016). SEM consists of a set of multivariate techniques that are confirmatory rather than exploratory in testing whether models fit data (Byrne, 2013). SEM usually requires one or more hypotheses which it represents as a model, operationalises by means of measurement items and then, tests statistically. In SEM, models are first evaluated for fit and upon satisfying fit, individual paths may be evaluated (Recker, 2011). In contrast to the first-generation data analysis technique, SEM allows the researcher to examine reliability and validity of the measurements together with the examination of the hypotheses contained in the proposed theoretical model (Ringle et al, 2015).

Moreover, there are two types of SEM namely: covariance-based structural equation modelling (CB-SEM) and partial least squares structural equation modelling (PLS-SEM) (Gefen et al., 2000). The SEM is widely acknowledged to be very good for high quality statistical analysis in survey research (Hair et al, 2017). It has been widely used in social science research for the casual modelling of complex multivariate data sets in which the researcher gathers multiple measures of proposed constructs. In recent years, SEM has become increasingly popular amongst researchers for purposes such as instrument validation and testing of linkages between constructs. Moreover, Urbach, & Ahlemann (2010) stated that empirical studies that use SEM are widespread in IS research. In agreement to that, research carried out by Hair et al (2017) demonstrated the continued use and acceptance of SEM as an accepted research method within IS especially the Partial Least Square Structural Equation Modelling (PLS-SEM) .Based on the usefulness of SEM discussed above, this study used SEM to carry out its data analysis.

Further, there are various software packages used to perform SEM statistical analysis. Some of these software packages include SmartPLS, AMOS, LISREL, EQS and (Hair et al., 2012). However, the software package used in this study is the SmartPLS 3.0 by Ringle et al. (2015).

3.11 Reliability and Validity Testing

When conducting a research project, it is important to consider the measure of validity and reliability of the data collection tools or instruments (Litwin & Fink, 1995). This is because when completing a research project, assessment instruments must be both reliable and valid for the study results to be credible (Monette et al, 2013). These measures are quality enhancers mostly used in quantitative research as a psychometric measure which can be embedded in the positivist approach of research (Dune et al, 2014). Bearing this in mind, the following provides a detailed discussion on reliability and validity.

3.11.1 Reliability

Reliability is the extent to which a research instrument consistently has the same results if it is used in the same situation on repeated occasions i.e. it refers to the consistency of a measure (Heale & Twycross, 2015). Reliability is a part of the assessment of validity. There are three types of consistency used in research namely: stability, internal consistency and equivalence.

Stability: Stability is the ability of an instrument to show that there is a high correlation between measurements from one time to another (Heale & Twycross, 2015). It is tested using test–retest or alternate-form reliability testing. The concepts being tested are the same in both tests of the instrument, but the wording of items is different.

Internal consistency: It is the extent to which all the instruments in a test measure the same constructs to determine the correlations of the instruments in the test (Furr & Bacharach, 2008). The internal consistency can be assessed using item-to-total correlation, split-half reliability, Kuder-Richardson coefficient and Cronbach alpha (Kline, 2013). Of which, Cronbach alpha is the most commonly used test to determine the internal consistency of an instrument (Litwin & Fink, 1995). In using the Cronbach alpha, the average of all correlations in every

combination of split-halves is determined and instruments with questions that have more than two responses can be used in this test (Kline, 2013). The Cronbach alpha result is a number between 0 and 1 and, an acceptable reliability score is 0.7 and higher (Litwin & Fink, 1995). This research study considered using Cronbach alpha alongside other reliability estimators such as composite reliability to check the reliability of the measurement items.

Equivalence: This test includes a process for qualitatively determining the level of agreement between two or more observers (Heale & Twycross, 2015). Equivalence can be assessed through inter-rater reliability.

3.11.2 Validity

It is possible for a measurement item to be reliable but not valid. On the other hand, for a measurement instrument to be valid, it must be reliable. Measurement of validity has to do with whether a measure of a concept or a set of indicators that are devised to gauge a concept really measures the concept in a quantitative study (Bryman & Bell, 2016). There are several ways of establishing that validity is explored in a research study and they are as follows; content validity, content validity, construct validity.

Content validity is a method used to measure how appropriate the items seem to a set of reviewers who have some knowledge of the subject matter (Bryman & bell, 2016). The assessment of content validity typically involves an organised review of the survey's content to ensure that it covers all the content that it should with respect to the variable (Heale & Twycross, 2015). It is a fundamental element of construct validation given that it is sometimes applied in validating and refining the construct. Furthermore, content validity ratio or index proposed by Lawshe (1975) is the most commonly used method for determining content validity.

Criterion validity is a measure of how well one instrument stacks up against another instrument or predictor (Monette et al, 2013). It is a form of construct validity and inter-relatedness of the instruments can be conducted to determine the extent to which the different

instruments measure the same variable (Heale & Twycross, 2015). It provides much more quantitative evidence on the accuracy of a survey instrument. Criterion validity is measured in three ways: convergent validity, divergent validity and predictive validity concurrent and predictive. (Litwin & Fink, 1995).

Construct validity refers to whether you can draw inferences about test scores related to the concept being studied. It is an important measure of a survey instruments accuracy. According to Heale & Twycross (2015), there are three types of evidence that can be used to demonstrate a research instrument has construct validity: homogeneity, convergence and theory evidence. In all, all steps of validation carried out in a study are all important components for achieving construct validation (Vyas, 2013).

3.12 Ethical Consideration

Ethics refers to a branch of philosophy concerned with how people should act, judgements about those actions and developing rules for justifying those actions (Gajjar, 2013). It evaluates behaviour in terms of right or wrong according to principles or guidelines (Bhatttacherjee, 2012). In the context of research, ethics focuses on guidelines for researchers, reviewing and evaluating research and establishing enforcement mechanism to ensure ethical research (Punch, 2013). Before conducting a study, researchers must evaluate their competence to conduct the research, their knowledge of ethical guidelines and ethical acceptability of their study.

There are several reasons why it is important to adhere to ethical norms in research, the most important one being the promotion of the aims of the research, such as knowledge, truth, and avoidance of error (Gajjar, 2013). Moreover, one tenet of ethical behaviour that is widely accepted within the research community is anonymity and confidentiality when dealing with human subjects(punch,2013). This is because the ethical responsibilities inherent in research are partly associated with the researcher ensuring the participants are informed about the study and giving their consent for participation (Punch, 2013). Equally, it is also important to inform

the participants of their right to withdraw at any time (Bryman, 2016). Considering this, ethical considerations were considered before the commencement of this study which led the principal researcher to obtain permission and ethics number from the university to carry out this research study. The ethics form used for this purpose is provided in appendix. Also, the issue of consent, confidentiality and anonymity were addressed in the cover letter or leaflet, which can be viewed in appendix.

3.13 Summary of chapter

Having identified the literature review of this this study and developing the conceptual framework, this chapter discussed the research methodology of this study using the widely used research onion to guide this study. Furthermore, the research site and the rationale for selecting the research site were provided. In terms of analysis of data, the study employed the PLS-SEM technique in analysing the construct section of the questionnaire using SMARTPLS 3.0 software package. Furthermore, the validity and reliability processes carried out in the study to ensure the research achieves consistency was also discussed. Finally, the ethical considerations of this study were also discussed.

Having addressed the above-mentioned areas, the next chapter provides details of the pilot phase consisting of the content validity exercise and the pilot testing exercise.

Chapter 4: Pilot findings and analysis

4.0 Introduction

Having provided reasons and explanations of the research methodology pursued by this research, this chapter described the reasoning and selection of the applied research method, which is a quantitative method. The details of how the survey instrument used for the pilot test was developed and the outcomes of the instrument's applications. Also included in the chapter was a description and reasoning for the selected sampling methods and data validation. The described and explained methods were used for the pilot phase of this research and for the expert panel pre-test. This chapter describes the pilot findings that then led to the final questionnaire development and construct measurement for the final phase of research.

4.1 Pilot Study

A pilot study can be defined as a small study to test research procedures, data collection instruments, and other research techniques in preparation for a larger study (Cargan, 2007). A pilot study is one of the important stages in a research project and is conducted to identify potential problem areas in the research instruments prior to implementation during the full study. The aim of a pilot is to try out the research approach to identify problems that may affect the quality and validity of the results. Therefore, the aims of this research's pilot test are as follows.

1. To examine the designed survey instrument which is the questionnaire.
2. For data collection, analysis and coding.
3. To gain preliminary results regarding the proportion of variation of participants' intention, which can be explained by the MOCC model.
4. To identify the constructs that are statistically significant which can lead to an adjustment of the research framework.
5. The pilot will be evaluated to determine the final phase of this research.

Before conducting the pilot test, a survey questionnaire instrument was needed in order to gather data on which to draw the findings of this study. This will be explained in the following section.

4.2 Pilot Survey Questionnaire Development

When determining the mode for disseminating the survey questionnaire, internet survey method was considered. In recent time, the internet is profoundly changing the way we communicate with one another. One of the most recent new uses of the world wide web is as a survey platform (Dillman & Edwards, 2016). Internet-based surveys, although still in their infancy, are becoming increasingly popular because they are believed to be better, faster, easier and cheaper to conduct (Dillman, 2011). The wide geographical reach of web surveys offers the possibility to quickly and easily create a great sample of people. According to Crano et al (2014), due to the low cost and short time needed in carrying some research studies, web surveys can be a great method to perform large-scale research. Based on the abovementioned reasons, along with computer availability and widespread internet access available to much of the UK and certainly Hertfordshire, the internet survey research method offered a more flexible, cost effective and efficient method of survey-based data collection for this research, this study chooses the internet survey approach.

In order to develop the questionnaire, methodology literatures were consulted. Stone (1993) suggested ten step by step guides for good questionnaire design and this was selected to assist in the survey design of this study. These suggested steps are as follows:

- Decide what data you need
- Select items for inclusion in the survey
- Determine content of individual questions
- Compose wording
- Design layout and presentation
- Think about coding

- Prepare first draft and pre-test
- Pilot and evaluate
- Perform survey
- Start again.

A range of closed ended questions like yes or no, ordinal and category rating scales were used in designing the survey instrument. The questionnaire consisted of close ended questions that gauged the citizens' opinions using a 7 range Likert scale. The questionnaire was divided into 7 sections, which includes;

- Demographics details of the participants
- The use of the internet
- The use of the Local council website
- Choice of communication mediums by the participants
- Usage of Email and reasons for its use
- Usage of Facebook and reasons for its use
- Thank you page

The section addressing the research construct are sections 5 and 6 which was created for examining influencing factors with respect to the use of a particular online communication channel when interacting with the government. This aspect of the survey questionnaire was necessary for testing and validating the MOCC model developed for the study. To do this, measurement items used in this study were adapted from previous studies using theoretical frameworks (UTAUT, ECT, CET, Trust, Service Quality) with some modifications to suit this research purpose. The development of the measurement items was developed to represent all the key components for each of the ten chosen constructs in the study. A copy of this survey questionnaire can be viewed from the appendix area of this thesis. Details of these measurement items and their source are provided in table 4.1.

Table 4. 1 Pilot Study Constructs Measures		
Constructs	**Measure Definition (Survey Item)**	**Source**
Knowledge building experience (KBE)	People who are important in my personal life suggest using the email facility to communicate with the government.	Carlson & Zmud, 2009
	I am very experienced using occ.	
	I am very comfortable using occ.	
	I do find email as medium of communication.	
	The richness and quality of service being delivered by email makes me use without thinking of an alternative communication medium.	
	People who are important to me at work think that that I should use email.	
Reliability trust (RELTRU)	Emails are more secure and allows me to learn of privacy.	Josang et al, 2007
	Email is trustworthy.	
Decision trust (DECTRU)	Emails have proved to be source of evidence for me	Josang et al 2007
	OCC has enough safeguard to make me feel comfortable using it to interact with the government.	
Technical quality (TECSERQ)	OCC helps me to save time while communicating with people.	Gronroos, 1982
	OCC as an online tool has high quality	
	Adaptable to my life style	
Functional quality (FUNSERQ)	Email allows me to have official conversations like interacting with the government.	Gronroos, 1982
	It allowed me to use OSN when interacting with people.	
	OCC allowed me to communicate faster with the local government.	
Performance expectancy (PERFEXP)	I feel OCC is easy to use even when using it for the first time.	Venketash et al, 2012
	Email is simple to use.	
	OCC increases my chances of achieving things that are important to me especially fast feedback.	
	I became confident using OCC when interacting with govt and people.	
	OCC allowed me to become competent in using OSN when interacting	
Habit (HAB)	The use of email as an OCC has become a habit for me. I cannot do without OCC	Venketash et al, 2012
Confirmation (CONF)	Compared to my initial expectation, it is trustworthy	Bhattacharjee, 2001
	Compared to my initial expectation, it is useful	
	Compared to my initial expectation, it saves time	
	Compared to my initial expectation, it is adaptive to my lifestyle	
Satisfactory experience (SATEXP)	I am very satisfied using email to interact with the local council	Bhattacharjee, 2001
	I am very satisfied using OCC as a medium of communication	
Continuance intention (CITN)	I do plan to continue using email while communicating with the government.	Bhattacharjee, 2001
	I do intend to continue using email to communicate with the local council.	

4.3 Content Validation

Having constructed the survey questionnaire, the next stage is validation of this survey instrument as discussed earlier in chapter 3. This will take the form of a pilot study that will occur in two phases. The essence of piloting a survey is to increase the reliability, validity and usability of the survey (Cargan, 2007). As a result, before administering this questionnaire within the selected sample, a number of validation techniques will be used. The first validation process will test the content validity. Content validity is the extent to which a research instrument accurately measures all aspects of a construct (Heale and Twycross, 2015). It also answers the question that to what extent the selected sample in an instrument or instrument items is a comprehensive sample of the content (Zamanzadeh et al, 2015). Zamanzadeh et al (2015) suggested that it provide information on the representativeness and clarity of items. Also, help improve an instrument through achieving recommendations from an expert panel i.e., the content validity of instrument can be determined using the viewpoints of the panel of experts by considering the importance of individual items within an instrument. However, it should be noted that it also has some drawbacks such as the subjective nature of the experts' judgement, which might lead to bias (Heale and Twycross, 2015).

In recent time, diverse methods for quantifying expert's degree of agreement or content validity ratio regarding content validity of an instrument have been proposed. This includes methods like averaging experts' ratings of item relevance and using a pre-established criterion of acceptability, using coefficient alpha to quantify agreement of item relevance by three or more experts, computing a multi crater kappa coefficient etc (Polit et al, 2008). However, one approach recommended years ago has special relevance in the field of research i.e. the approach proposed by Lawshe (1975) which is commonly used in the studies that involves more than 5 experts. This approach is called the Content Validity Index (CVI) which involves having a team of experts indicating whether each item on a scale is consistent with or relevant to the construct, computing the percentage of items deemed to be relevant for each expert, and then taking an average of the percentages across experts (Polit et al, 2008). These experts are expected to rate items into one of three categories using a scoring process of 1 to 3:

- Essential
- Useful, but not essential
- Not necessary

And then, the items deemed "essential" by a critical number of panel members are then included within the final instrument, with items failing to achieve this critical level discarded. In all, to quantify the CVR for each item based on the ratings of the experts, a content validity index needs to be estimated. Lawshe (1975) derived a formula for estimating the CVR for individual items, which is provided below:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

Where ^{n}e is the number of panellists indicating essential and *N* is the total number of panellists. Given that the content validity of this study involved 15 experts, CVI method was identified as suitable and therefore was used in this study.

4.3.1 The content validity exercise for this study

As earlier mentioned that 15 expert panels will be utilised, the content validation for this study will involve pre-testing the questionnaire among the panellist. These experts were identified using a self-selection process. These experts consisted of 7 academic practitioners and 8 industrial specialists of which some of them are age 50 and above. These experts were selected from different disciplines so as to enable this study to receive concrete suggestions and limit the bias that might result from individual expert's ideas. Table 4.2 provides information on the experts used for the study.

Table 4. 2; Content Validation – Experts Panel

Category	Participant	Area of expertise
Academic practitioners	A	Computer science
	B	Engineering
	C	Environmental management
	D	Statistics
	C	Information systems
	E	Engineering
	F	Mechanical engineering
Industrial specialists	G	Information systems
	H	Research analyst
	I	Information technology
	J	Accounting
	K	Accounting
	L	Engineering
	M	Data analyst
	N	Data analyst

Furthermore, the role of the experts was to provide the length of time it took to complete the questionnaire as well as provide some feedbacks on the questionnaire developed. As mentioned earlier, for the validation aspect, the experts were required to rate each item based on its relevance. In terms of the total time it took to complete the questionnaire, this was calculated by averaging the total time it took each expert to complete the questionnaire. As a result, the average time it will take a participant to complete the questionnaire is approximately 12.20 minutes. A sample of the questionnaire providing information required from the experts for the content validity process is provided in appendix. Equally, the experts were required to provide feedbacks with regards to the problems identified in the questionnaire as well as suggestions that will help in improving the questionnaire. These feedbacks are useful for developing a more understandable and clearer questionnaire. With this in mind, the questionnaire was modified before disseminating it for the pilot study. Table 4.3 provides details of the total completion time of each expert.

Table 4. 3: Calculating the average completion time of the questionnaire

Dr E: 10 minutes	Miss L: 11 minutes	Dr S :11minutes	Dr O :11minutes	Dr N: 12 minutes
Mr S :12 minutes	Mr Z :14 minutes	Dr C :11 minutes	Dr A :12 minutes	Miss O: 18 minutes
Mr I :10 minutes	Mrs N: 12 minutes	Barr N: 11minutes	Mr Y: 14 minutes	Dr O: 14 minutes
Average completion time: 12.20 minutes				

Furthermore, as stated earlier, the experts were required to validate the content of the questionnaire based on the relevance of each item. This aspect of the content validity exercise was aimed at examining the viability of the research as well as evaluating how suitable the survey is to the target population. This would be done using the rating criteria that was provided earlier as stated by Lawshe (1975) which will in turn help this study to calculate the CVR. Once replies were received, CVRs were calculated using Microsoft Excel. All the measurements met the accepted CVR value of 0.60.

Further, to quantify the CVR for each item based on the ratings of the experts, a content validity index needs to be estimated which is done by averaging the CVR of the accepted items and the threshold is 0.80 (Prion et al, 2016). Prion et al (2016) suggested that it is more efficient to report the overall content validity index score than each induvial item CVR. Therefore, the CVI value for the overall items is 0.83, which is an acceptable value. Table 4.4 shows the result of the CVR calculation.

Table 4.4: Calculation of the content validity ratio for each individual item

Questions	Essential	Useful but not necessary	Not Necessary	CVR Values	Accept/Reject
1	14	1	0	0.87	Accept
2	12	3	0	0.60	Accept
3	13	1	1	0.73	Accept
4	13	2	0	0.73	Accept
5	15	0	0	1.00	Accept
6	14	0	1	0.87	Accept
7	15	0	0	1.00	Accept
8	14	1	0	0.87	Accept
9	14	1	0	0.87	Accept
10	14	0	1	0.87	Accept
11	12	1	2	0.60	Accept
12	14	1	0	0.87	Accept
13	14	1	0	0.87	Accept
14	15	0	0	1.00	Accept
15	12	0	3	0.60	Accept
16	13	2	0	0.73	Accept
17	13	1	1	0.73	Accept
18	15	0	0	1.00	Accept
19	13	1	1	0.73	Accept
20	13	2	0	0.73	Accept
21	13	2	0	0.73	Accept
22	13	2	0	0.73	Accept
23	12	1	2	0.60	Accept
24	13	2	0	0.73	Accept
25	14	1	0	0.87	Accept
26	15	0	0	1.00	Accept
27	15	0	0	1.00	Accept
28	13	2	0	0.73	Accept
29	14	1	0	0.87	Accept
30	14	1	0	0.87	Accept
31	14	1	0	0.87	Accept
32	15	0	0	1.00	Accept
33	15	0	0	1.00	Accept

4.4 Sampling and sample population

To ensure successful participants recruitment, a self-selection approach with already established contacts was initiated, which was followed by seeking contacts to recruit more participants from retirement homes, local churches and the general community which resulted in a snowball sampling. Furthermore, the data collection period was between the periods of 3rd April 2016 and 22nd June, 2016. The questionnaires were distributed both online(internet) and in paper form to help boost the response rate and reduce bias. For the paper form, 80 hard

copy questionnaires were distributed in the churches and retirement homes which was picked up by the researcher at an arranged date. Finally, the SurveyMonkey online survey tool was viewed to be suitable for the online distribution of the questionnaire as it provides important features needed for this pilot, which are Page and Question Logic (SurveyMonkey, 2018). These features allow surveys to route respondents to particular questions, specific to the answers that are provided. SurveyMonkey also provides graphs and charts which are useful for illustrating the results. The website allows users to export the findings to a variety of formats including, Microsoft excel (Lehman & DuFrene, 2010). The format can also be imported to several analytic programs such as, SPSS and SmartPLS. Further, SurveyMonkey is amongst the oldest and pioneering of the online questionnaire providers, which meant that there is a reliability and trust, in turn, which has led to its popularity.

On the whole, the researcher visited households in Hertfordshire County and distributed 510 questionnaires to potential participants that led to 233 responses (both hard & soft copies). Of these, 222 were valid and complete. Using the reasoning that responses between 100 and 200 are considered to be sufficient for a pilot study intending to undertake a comprehensive item analysis (Johanson & Brooks, 2010), it was felt that 222 replies are suitable for the pilot study.

For the sample population, the country of interest is the UK because it is one of the fastest growing developed countries using the internet. As at 2016, about 82% of adults in the UK use the internet daily or almost daily (ONS, 2017) In addition, the UK is one of the nations experiencing the ageing population. According to the office of the national statistics (ONS, 2018), the population of UK was 65.5 million as at 2016 which was its largest ever. By 2036, over half of local authorities are projected to have 25% or more of their local population aged 65 and over, again with many of the highest authorities being in South East of England. However, it will be quite challenging to investigate the entire UK population. Bearing this in mind, this research study chose the research site to be East of England but was limited to Hertfordshire County. Hertfordshire is the second most densely populated county in England, with a mix of new towns, market towns and rural villages (Hertfordshire 2021). It is a

prosperous place with most of the wealth contributors coming from the age 50 and above. Life expectancy in Hertfordshire is above the national average and people continue to live longer and as people live longer, it means both the number and proportion of older people is set to increase over the coming years. This suggests the need for locally tailored responses to the challenges such changes bring which is one of the things this study is addressing i.e. the online communication perspective. Therefore, it was based on these details as well as resource constraints and familiarity of the principal researcher with the area that helped with accessing data for this study that the Hertfordshire County was selected as a suitable site for the study.

4.5 Analysis of pilot data

Having discussed the construct validity and sampling method, this section is going to analyse the pilot result. The data was analysed using SmartPLS 3.0 and SPSS version 23.

4.5. 1 Demographics

With regards to internet usage, 97.3% of the participants are internet users while 2.7% are non-users of the internet. To assess whether there was a gap in the use of the internet and non-use with respect to age, result showed that majority of the internet users with 41.8% are from the age group 60-69, followed by the 50-59 with 40.1% and the least majority with 3.4% was from the 80-89 age group. On the other hand, the non-users showed the age group 70-79 to have the highest non-users with 1.3%.

In terms of gender, gender-weighting procedures were applied in an attempt to reduce possible bias. This is because before the study began, it was known beforehand that the division between genders in Hertfordshire County were almost evenly distributed. However, after the data collection it was found that over half of the participants were females i.e. (Female) 65.3%: (Male) 34.27%. Bearing that in mind, result indicated that male participants had the highest with 48.7% while the female participants had 48.6% and the non-users resulted to the female having the highest percentage with 1.4% while the male participants had 1.3%. More details concerning these results are presented in table 4. 5.

Table 4.51: Cross-tabulation of age and gender with internet use

Category			Do you access and use the internet?		
			Users	Non-users	Total
Age	50 - 59 years	Count	89	0	89
		Table N %	40.1%	0.0%	40.1%
	60 - 69 years	Count	93	0	93
		Table N %	41.8%	0.0%	41.8%
	70 - 79 years	Count	27	3	30
		Table N %	12.1%	1.3%	13.4%
	80 - 89 years	Count	7	2	10
		Table N %	3.4%	1.0%	4.4%
	90 years and above	Count	0	1	1
		Table N %	0.0%	0.3%	0.3%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**
Gender	Female	Count	108	3	111
		Table N %	48.6%	1.4%	50.0%
	Male	Count	108	3	111
		Table N %	48.7%	1.3%	50.0%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**

Furthermore, education and employment status were cross- tabulated with the internet usage. In terms of education, result indicated that most internet users are were the bachelor's degree holders with 30.0% showing that they use the internet followed by the college diploma/ BTEC holders with 24.6% and then, HND holders with 13.7%. On the other hand, the highest percentage of non-internet users came from the GCSE/O level holders.

With regards to the employment status, the highest percentage of internet users are from those in full time employment with 30.8% followed by pensioners 65+ 18.1% and then, those with part-time employment with 17.4%. however, only the pensioners 65+ had non-internet users with 2.7% which suggests that a lot of the older adults in this group are above the age of 70 years and would not want to use the internet. More details concerning these results are presented in table 4. 6.

Table 4.6: Cross-tabulation of educational qualification and employment status with internet use.

Category			Do you access and use the internet?		
			Users	Non-users	Total
Educational qualification	Higher Degree / Postgraduate Degree (MBA, PhD, MD, MA, MSc)	Count	16	0	16
		Table N %	7.3%	0.0%	7.3%
	1st Degree (BA / BSc)	Count	67	1	67
		Table N %	30.0%	0.3%	30.4%
	HND, HNC, Teaching	Count	30	2	32
		Table N %	13.7%	0.7%	14.3%
	BTEC/College Diploma	Count	55	1	56
		Table N %	24.6%	0.6%	25.2%
	A Level	Count	27	0	27
		Table N %	12.1%	0.0%	12.1%
	GCSE/O Level	Count	21	2	24
		Table N %	9.7%	1.0%	10.7%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**
Employment status	Pensioner 65+	Count	40	6	46
		Table N %	18.1%	2.7%	20.8%
	Retired (under 65 years old)	Count	28	0	28
		Table N %	12.7%	0.0%	12.7%
	Employed full time	Count	68	0	68
		Table N %	30.8%	0.0%	30.8%
	Employed part time	Count	39	0	39
		Table N %	17.4%	0.0%	17.4%
	Entrepreneur	Count	26	0	26
		Table N %	11.6%	0.0%	11.6%
	Unemployed (for less than 6 months)	Count	7	0	7
		Table N %	3.3%	0.0%	3.3%
	Unemployed (for medical reasons)	Count	4	0	4
		Table N %	1.6%	0.0%	1.6%
	Unemployed (for more than 6 months)	Count	2	0	2
		Table N %	0.7%	0.0%	0.7%
	Student (part-time)	Count	2	0	2
		Table N %	1.0%	0.0%	1.0%
	Student (full-time)	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%
	Redundant	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**

In addition, health status, marriage status and ethnicity were compared with internet use. In terms of health status, the participants with good health status had the highest percentage in both internet use (70.2%) and non-use (1.7%) respectively while all the participants in with the excellent health status are internet users with 25.4%. In addition, due to the characteristics of the of the sampled participants, the ailment that might impact on internet usage were assessed. Specifically, 69.4% of the participants indicate that no ailment prevented them from using the internet. On the other hand, out of those who indicated that certain ailment impacted on their use of the internet, 21.2% indicated that visionary impairment such as not being able to see the screen, 2.7% indicated high blood pressure, while arthritis of the hands and ear disorders were 1.4% respectively. This suggests that health status of an older adult can greatly impact on their use of the internet. More details on ailment suffered by older adults can be found on the appendix.

With regards to marital status, majority of the internet users are married with 39.9% followed by the single but cohabiting participants 19.3%. as for non-internet users, the participants that are separated from the partners had the highest percentage with 1.3%.

Furthermore, because Hertfordshire has a multi-cultural community, ethnicity was considered. Results indicated that most of the participants are the white British with 53.8% followed by any other white background with 25.4% and then, any other mixed background with 7.6% while the non- internet users the highest percentage are from the white British and any other white background with 1.3% each. More details concerning these results are presented in table 4. 7.

Table 4.7: Cross-tabulation of health status, marital status and ethnicity with internet use

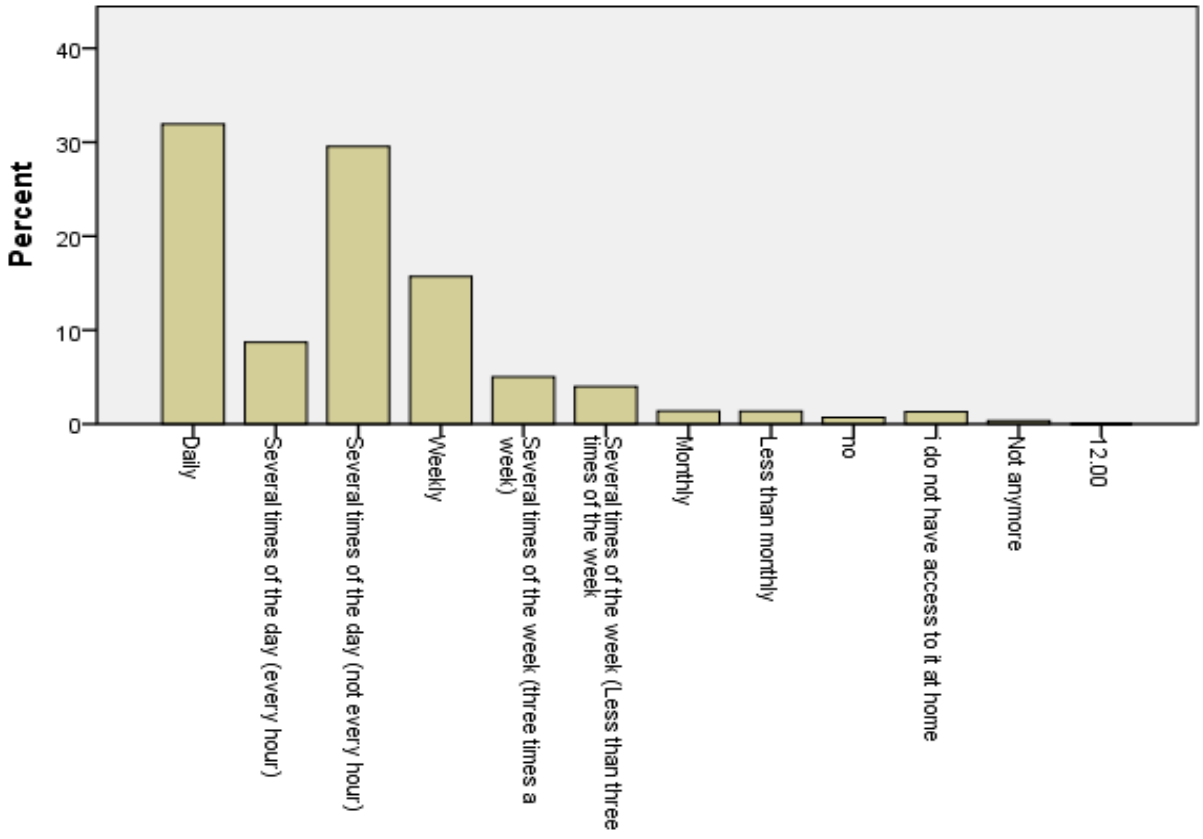
Category			Do you access and use the internet?		
			Users	Non-users	Total
Health status	Excellent	Count	56	0	56
		Table N %	25.4%	0.0%	25.4%
	Good	Count	156	4	159
		Table N %	70.2%	1.7%	71.8%
	Poor	Count	4	2	6
		Table N %	1.7%	1.0%	2.7%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**
Marriage status	Married	Count	89	1	89
		Table N %	39.9%	0.3%	40.3%
	Widowed	Count	15	1	16
		Table N %	6.8%	0.3%	7.2%
	Divorced	Count	20	1	21
		Table N %	9.0%	0.3%	9.3%
	Separated	Count	35	3	38
		Table N %	16.0%	1.3%	17.3%
	In a domestic partnership or civil union	Count	1	1	2
		Table N %	0.3%	0.3%	0.7%
	Single, but cohabiting with a significant other	Count	43	0	43
		Table N %	19.3%	0.0%	19.3%
	Single, never married	Count	13	0	13
		Table N %	6.0%	0.0%	6.0%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**
Ethnicity	White British	Count	119	3	122
		Table N %	53.8%	1.3%	55.2%
	Any other White background	Count	56	3	59
		Table N %	25.4%	1.3%	26.8%
	White and Black Caribbean	Count	7	0	7
		Table N %	3.0%	0.0%	3.0%
	White and Black African	Count	7	0	7
		Table N %	3.1%	0.0%	3.1%
	White and Black Asian	Count	2	0	2
		Table N %	0.7%	0.0%	0.7%
	Any other mixed background	Count	17	0	17
		Table N %	7.6%	0.0%	7.6%
	Asian/Indian	Count	1	0	1
		Table N %	0.6%	0.0%	0.6%
	Asian/Pakistani	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%
	Any other Asian Background	Count	1	0	1
		Table N %	0.3%	0.0%	0.3%
	Black and Black British	Count	5	0	5
		Table N %	2.3%	0.0%	2.3%
	Caribbean	Count	1	0	1
		Table N %	0.3%	0.0%	0.3%
	African	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%

	Other Black groups	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%
	Chinese	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%
	Japanese	Count	0	0	0
		Table N %	0.0%	0.0%	0.0%
	Total	**Count**	**216**	**6**	**222**
		Table N %	**97.3%**	**2.7%**	**100.0%**

4.5.2 Internet adoption among participants and reasons for usage

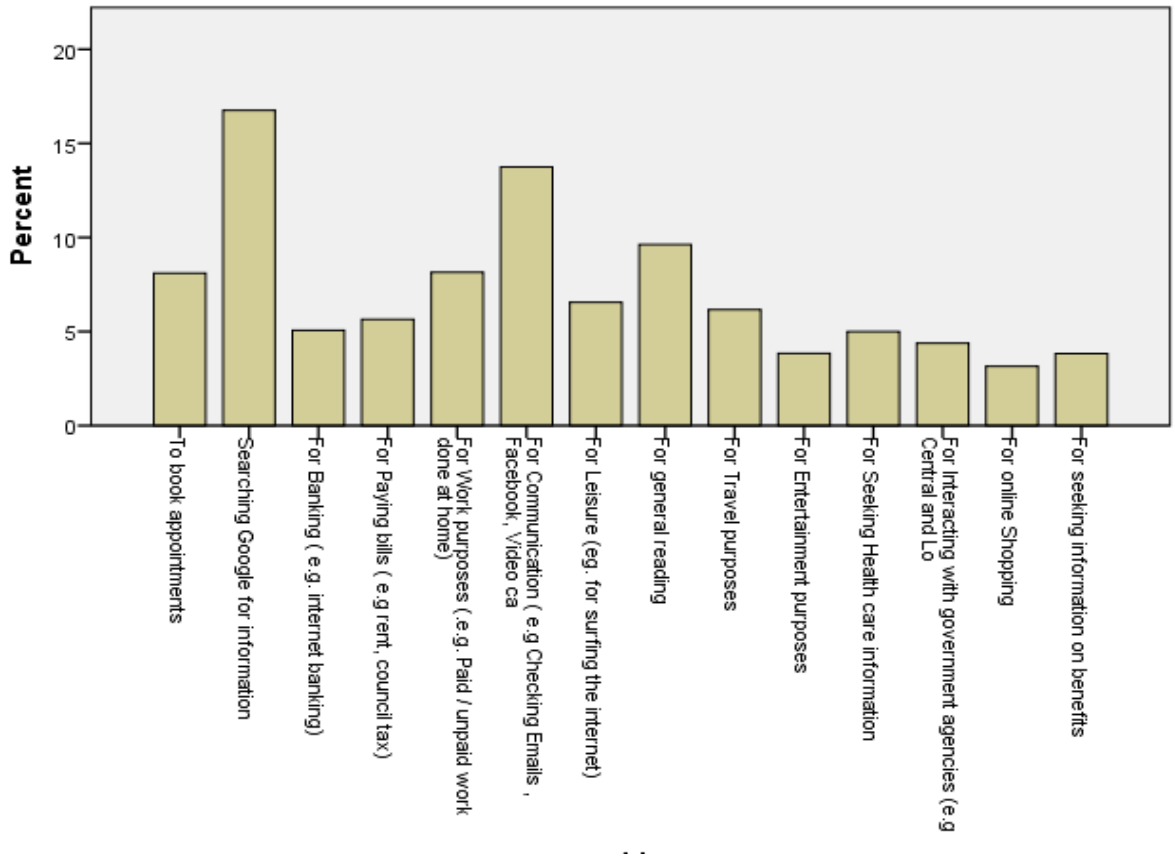
To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. On assessing the internet use among participants, it was observed that 97.3% are internet users while 2.7% are non-users of the internet. Furthermore, out of the number of the participants who currently use the internet, majority indicated that they use the internet daily (31.9%) while 29.6% indicated that they use the internet several times of the day but not every hour. 15.7% also indicated that they use the internet weekly. Figure 4.1 provides a graphical representation of the Internet usage frequency.

Figure 4.1 Internet Usage Frequency



Furthermore, those participants that currently use the internet were asked their reason for using the internet. Majority of the internet users indicate that they use the internet to search for information on Google (96.9%). This result was followed by the participants that indicated they use the internet for communication purposes like checking of Emails, Facebook, video calls with 79.5%. equally, 55.7 % of the participants indicated that they use the internet for general reading while 47.1% of the participants indicated that they use the internet for work purposes both paid and unpaid works. This suggest that older adults use the internet for diverse purposes that can help them improve their lifestyle. Figure 4.2 provides a graphical representation of the reasons for the use Internet.

Figure 4.2: Reasons for the use Internet

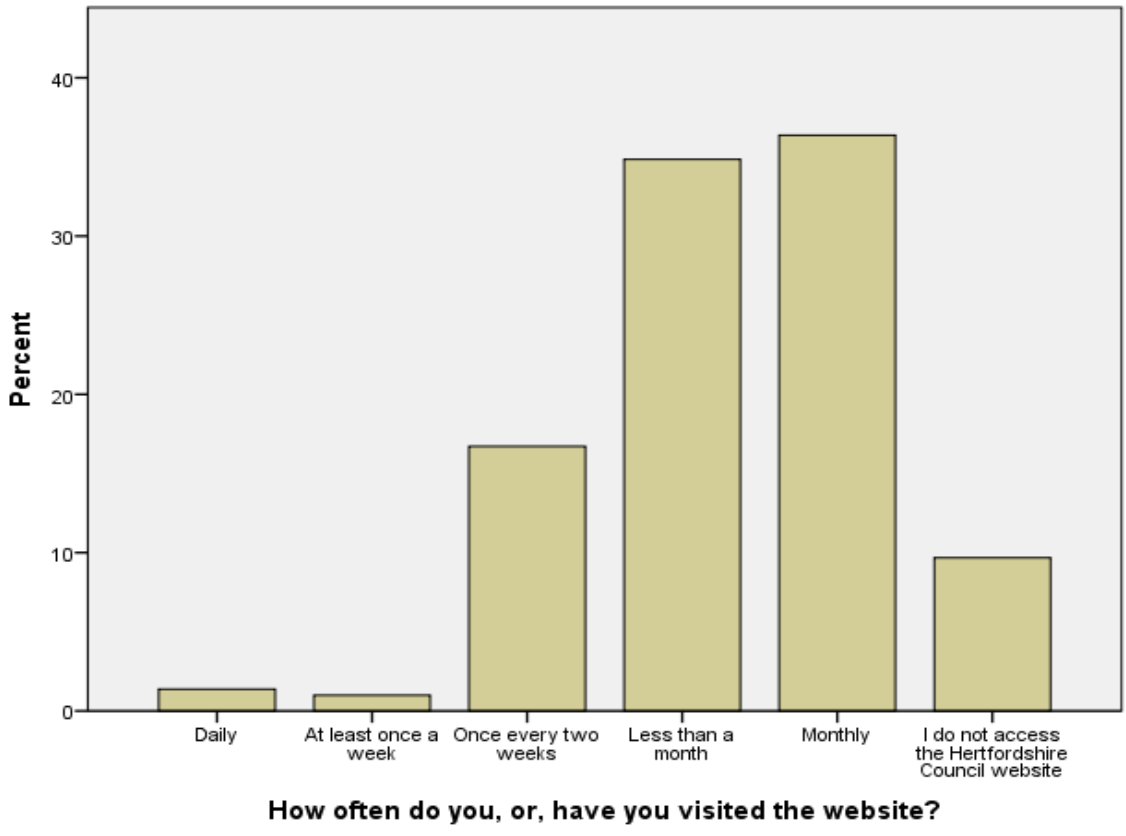


4.5.3 Use of local government website and reasons for using it

Bearing in mind that the focus of this study is on how e-government services are supplied by the local government, this study assessed participants in terms of local government website

use. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. Result showed that 90.0% of the participants have visited the local government website, 6.4% indicated that have never visited the local website while 3.7% of those that have not visited the website have plans of visiting the government website in future. In addition, this study created a section to assess the frequency of visit by the participants. Result showed that majority of the participants with 36.4% only visited the website monthly while 34.9% visited the website in less than a month. Figure 4.3 provides a graphical representation of the frequency of use of the local government website.

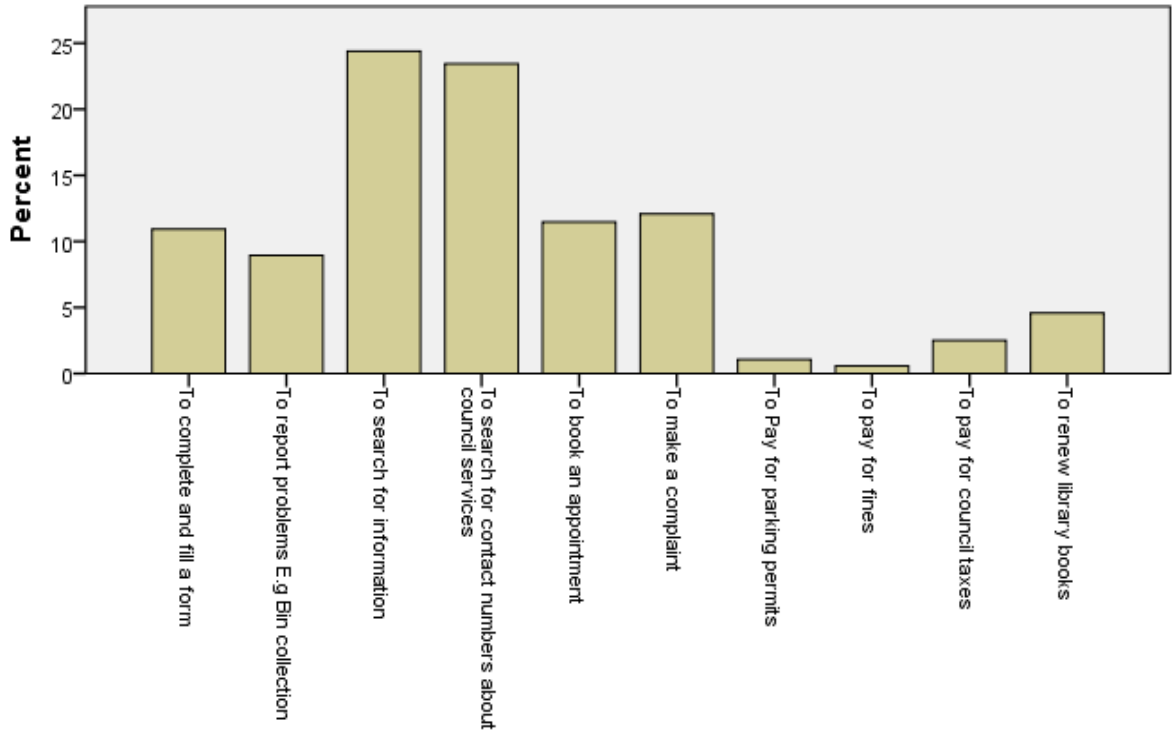
Figure 4.3: Frequency of use of the local government website



Amongst those participants that have visited the local government website, this study assessed their reason for their visit. Results indicated that the highest percentage of participants which is 93.6% visited the website to search for government information, while 90.0% of participants visited the website to search for contact numbers about council services. Other participants

were there to make a complaint (46.4%), to book an appoint (44.0%), to complete and fill form. Figure 4.4 provides a graphical representation of the reasons for visiting the local government website.

Figure 4.4: The reasons for visiting the local government website



4.5.4 Preferred choice of communication

In this study, a section was mapped out to specifically assess the different communication channels being used by older adults when communicating with the council. The aim of this section was to identify the preferred online communication channel amongst all other channels of communication used by the older adults when communicating with the council. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. The following provides details regarding the results gathered from this section.

In terms of the communication channels being used by the local council, this study categorised them into five; face to face contact, use of online social network, Emails, telephone services

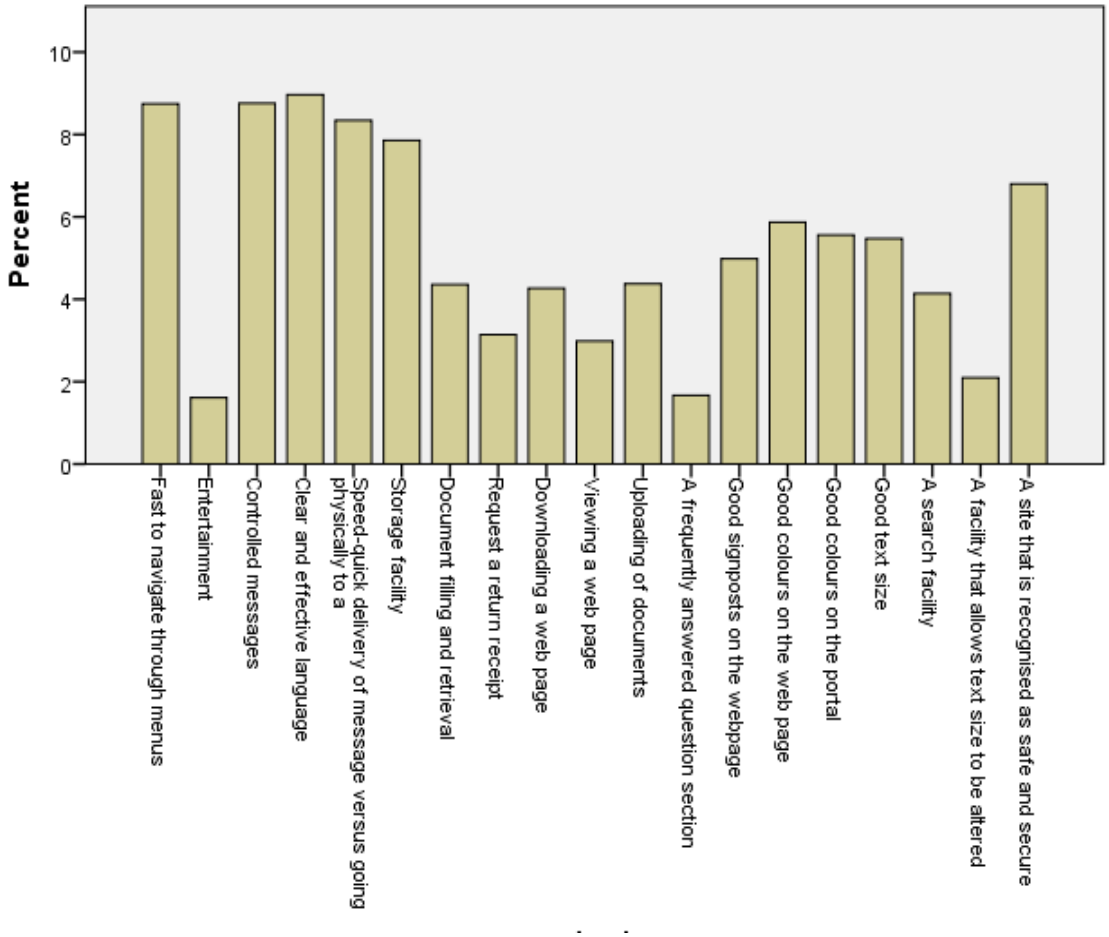
and letter writing. Results showed that Email had the highest percentage with 94.6% followed by telephone services with 82.2% and then, face to face contact with 77.2%. However, this study is focused on online communication and specifically, comparison between Email and Facebook as online communication channels used by local council for e-governments service delivery. The result indicated that participants preferred to use Email (94.6%) than Facebook (36.2%) when communicating with the local council. In all, the age group with the highest percentage in all the communication channel choices except for Email are 50-59 years. The table 4.8 presents the details of these results.

Table 4.8: Preferred choice of online communication channel

Preferred choice of online communication channel		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
Face to face contact with a council staff member	Count	73	69	24	7	0	171
	Table N %	32.7%	30.9%	10.7%	3.0%	0.0%	77.2%
Through the use of an online social network (Facebook)	Count	34	29	11	7	0	80
	Table N %	15.2%	13.3%	4.7%	3.0%	0.0%	36.2%
Email	Count	84	92	27	7	0	210
	Table N %	37.8%	41.4%	12.1%	3.4%	0.0%	94.6%
Telephone services	Count	73	72	28	8	1	183
	Table N %	33.0%	32.5%	12.7%	3.7%	0.3%	82.2%
Letter writing	Count	22	20	8	0	0	50
	Table N %	9.8%	9.1%	3.6%	0.0%	0.0%	22.5%
Total	Count	89	93	30	10	1	222
	Table N %	40.1%	41.8%	13.4%	4.4%	0.3%	100.0%

In addition to the preferred choice of communication channel, participants were assessed on the reason for their choice of a particular online communication channel. Results showed that majority of the participants (89.3%) prefers to use an online communication channel that is has clear and effective language. Also, channels with controlled messages had the 87.3% while, speed-quick delivery of message had 83.1%. Further detailed result can be found in the figure 4.5.

Figure 4.5: Reasons for choice of online communication channel

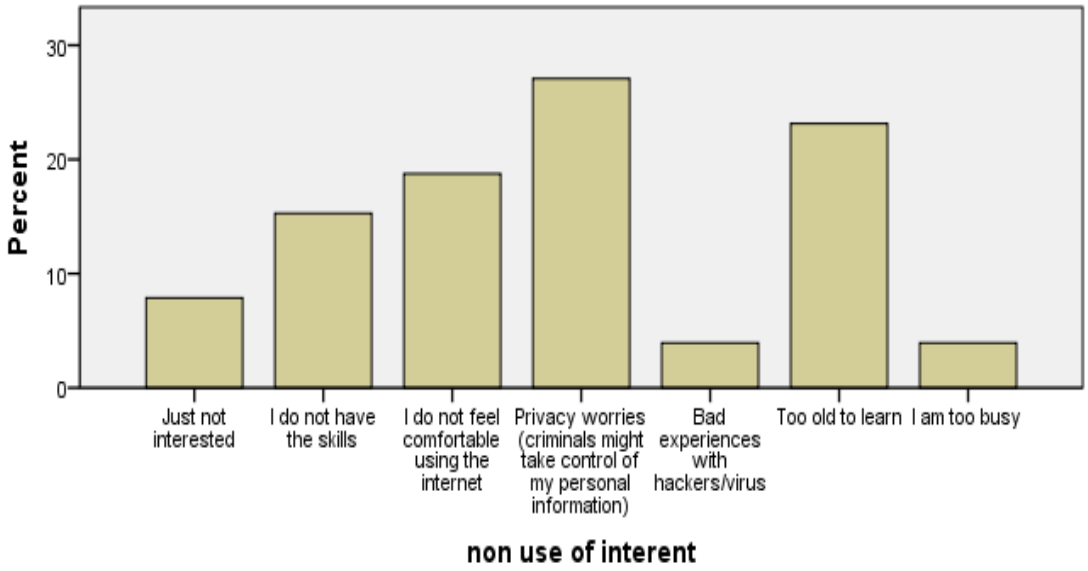


4.5.5 Non-internet adopters

As mention earlier, a section assessing non-adopters of the internet was also created to examine reasons behind non-adoption. It was also intended to identify factors that might possibly encourage the adoption of the internet which will in turn lead to adoption of online communication channels. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. The following therefore provides the results gathered from this section. In analysing the reasons given for non-adoption, result showed that majority of the non-adopters (70.5%) stated that they have privacy worries such criminals taking control of their personal data. Following this, 60.2% indicated that they are too old to learn how to use the internet. Equally, 48.8 % indicated that the reason for not using the internet is because they do

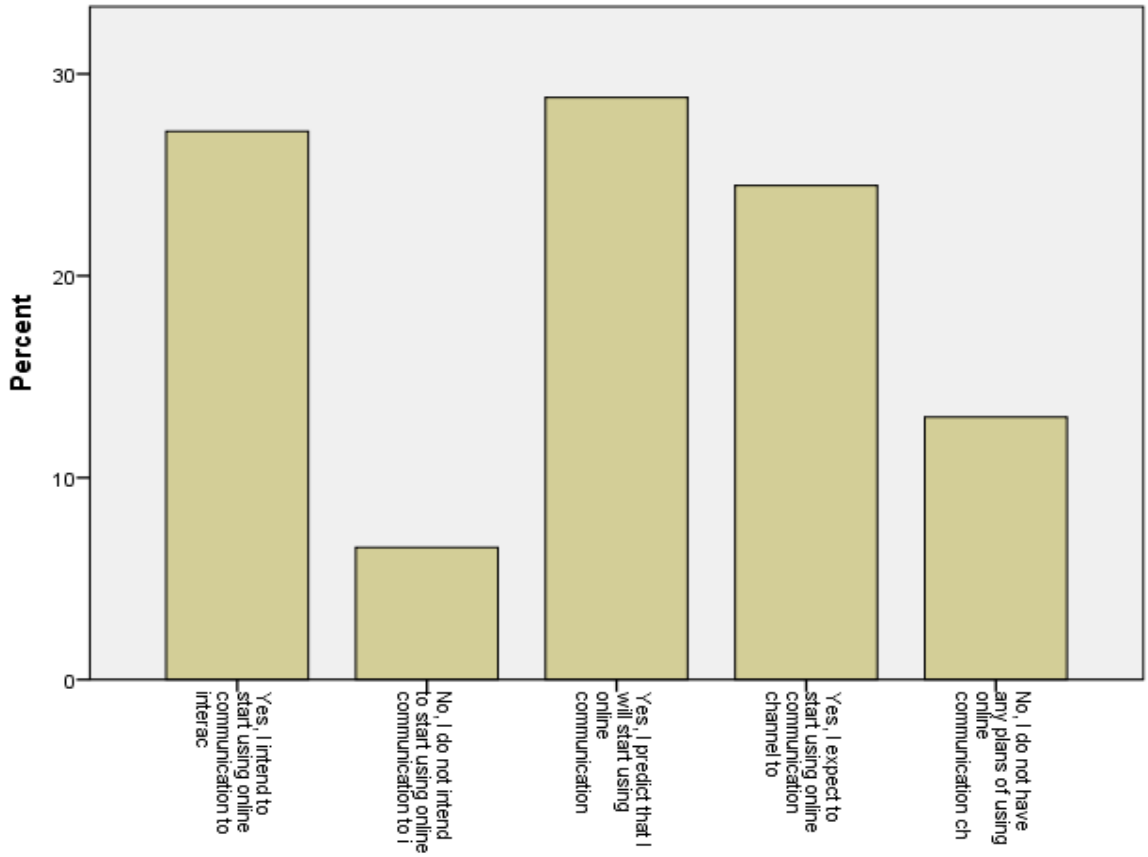
not feel comfortable using the internet. Other reasons given are provided in the figure 4.6.

Figure 4.6: Reasons for not using the internet



In addition to assessing non-use of the internet, this study also assessed those participants that do not currently use the internet however, they intended to use it in the future. This was done so as to help this study to assess their plan to adopt online communication channels like Email and Facebook in future when communicating with the government. Specifically, result showed that 28.8% of those planning to use online communication predict to start using them to communicate with the local council of which 21.3%. Equally, 24.5% indicated that they expect to start using online communication when interacting with the local council. However, 13.0% indicated that they do not have plans of using online communication channel to interact with the local council. Figure 4.7 provides a graphical representation of the plan to use online communication channel in future.

Figure 4.7: Plan to use online communication channel in future



4.5.6 Reliability and validity test

Reliability indicates the extent to which items are consistent with each other. In other words, it measures consistency of the constructs (Leech et al, 2015). It is an important measure of a survey instrument; hence, constructs reliability must be determined. Construct validity is the most valuable way of assessing a survey instrument (Fink & Litwin, 2003). It is a measure of how meaningful the survey instrument is when in practical use. To accomplish reliability, Cronbach's Alpha, Composite Reliability and Average Variance Extracted (AVE) were determined using the SmartPLS 3.0 statistical tool. Vinzi et al (2010) suggested that the values of Cronbach's Alpha, Composite Reliability and AVE should be above or equal to 0.7, 0.7 and 0.5 respectively. The pilot analysis based on online communication channels revealed that all the constructs met the reliability measurement criterion except Satisfactory experience (SATEXP) as shown in Table 4.9. Table 4.9 presents the result of the reliability and validity test.

Table 4.9: Reliability and validity results

	Cronbach's Alpha			Composite Reliability			Average Variance Extracted (AVE)		
	OCC	**Email**	**Facebook**	**OCC**	**Email**	**Facebook**	**OCC**	**Email**	**Facebook**
CITN	0.841	0.910	0.775	0.926	0.957	0.899	0.863	0.955	0.816
CONF	0.845	0.953	0.765	0.928	0.977	0.895	0.866	0.837	0.810
HAB	0.708	0.809	0.706	0.869	0.911	0.869	0.768	0.754	0.769
KBE	0.871	0.890	0.881	0.912	0.924	0.918	0.722	0.841	0.737
PEFEXP	0.886	0.904	0.882	0.930	0.941	0.928	0.816	0.731	0.812
SATEXP	***0.590***	***0.633***	***0.640***	0.830	0.844	0.847	0.709	0.798	0.734
SERQFUN	0.728	0.756	0.833	0.879	0.887	0.923	0.785	0.788	0.857
SERQTEC	0.728	0.737	0.761	0.879	0.882	0.892	0.784	0.864	0.806
TRUEDC	0.829	0.845	0.817	0.920	0.927	0.914	0.852	0.833	0.842
TRURE	0.758	0.804	0.740	0.890	0.909	0.883	0.801	0.917	0.790

4.5.7 Factor analysis

Factor analysis is a statistical tool for analysing scores on large number of variables to determine whether there are any identifiable proportions that can be used to describe many of the variables under study (Munro, 2005; Hair et al, 1998). Factor analysis uses mathematical procedures for the simplification of interrelated measures to discover patterns in a set of variables. During the exploratory phase of factor analysis, it is important to determine if there are sufficient number of significant correlations among the items to justify undertaking a factor analysis (Munro, 2005). There are several tests that can be undertaken to ascertain whether it would be possible to proceed with factor analysis (Rajaretnam, 2015). These tests include Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test. The KMO measure may vary between 0 and 1 with larger numbers indicating greater difference i.e. If a KMO measure in the 0.80s or 0.90s is achieved, this supports the use of factor analysis for the data. Likewise, achieving a *p*-value of less than 0.05 for the Bartlett's test indicates significance (Rajaretnam, 2015). Based on this, this pilot's data was assessed for its adequacy for factor analysis using the KMO measure of sampling adequacy and the Bartlett test of sphericity. These results in the Table 4.10 shows that the tests meet and supports the use of factor analysis for this sampling data. Table 4.10 presents the results derived for the KMO and Bartlett's test.

Table 4.10; The KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		***.942***
Bartlett's Test of Sphericity	Approx. Chi-Square	5474.371
	df	253
	Sig.	***.000***

4.5.7.1 Convergent and discriminant validity

Further, to establish validity of the constructs, factor loadings were generated where the loads indicated the correlation between each item and its construct. This was done using the convergent and discriminant validity. Convergent validity is the assessment to measure the level of correlation of multiple indicators of the same construct that are in agreement i.e. it shows that an instrument is highly correlated with instruments measuring similar variables (Hamid et al, 2017). Hair et al (1998) recommended that for convergent validity to be established, the loadings of the items of each construct should be above 0.7.

On the other hand, discriminant validity refers to the extent in which the construct is actually differing from one another empirically (Hamid et al, 2017). It also measures the degree of differences between the overlapping construct and this can be evaluated by using cross-loading of the items for each construct. For instance, there should be a low correlation between an instrument that measures habit and one that measures performance expectancy. To satisfy this requirement, each construct's Average Variance Extracted (AVE) must be compared with its squared correlations with other constructs in the model (Hair et al, 2015).

Therefore, the following provides information regarding the convergent and divergent validity result of the pilot study. As earlier stated, ten constructs were assessed in this study and measurement items were generated for each construct. In order to establish the correlation between the subscales and their respective construct, cross loadings using SmartPLS 3.0 were generated. In this pilot study, all the correlation coefficients showed a strong load of above 0.7. Additionally, all the factors demonstrated divergent validity. Table 4.11 shows the cross

loading of items with the shaded region indicating the cross-loading values of the measurement items and its corresponding construct.

Table 4.11; Cross-loadings of items

Items	CITN	CONF	HAB	KBE	PEFEXP	SATEXP	SERQFUN	SERQTEC	TRUEDC	TRURE
CONINTE1	0.926	0.634	0.606	0.724	0.656	0.636	0.649	0.631	0.722	0.679
CONINTE2	0.932	0.622	0.628	0.740	0.722	0.659	0.654	0.690	0.707	0.743
CONF	0.634	0.934	0.726	-0.799	0.755	0.602	0.770	0.774	0.852	0.810
CONF1	0.424	0.927	0.790	-0.202	0.791	0.585	0.767	0.781	0.787	0.727
HAB	0.617	0.881	0.923	-0.126	0.846	0.604	0.750	0.779	0.864	0.790
HAB1	0.545	0.603	0.827	-0.412	0.590	0.778	0.599	0.658	0.616	0.591
KNWM	0.608	0.687	0.430	0.869	0.546	0.595	0.772	0.804	0.832	0.779
KNWM1	0.539	0.596	0.742	0.784	0.589	0.787	0.617	0.643	0.645	0.582
KNWSO	0.591	0.725	0.734	0.881	0.310	0.730	0.788	0.801	0.834	0.773
KNWSO1	0.341	0.704	0.684	0.862	0.411	0.655	0.745	0.809	0.814	0.847
PEFEXP	-0.169	0.840	0.614	0.829	0.941	0.615	0.791	0.440	0.844	0.874
PEREXP1	-0.387	0.878	0.623	0.840	0.953	0.646	0.807	0.442	0.873	0.921
PEREXP2	-0.165	0.661	0.619	0.779	0.809	0.621	0.802	0.281	0.764	0.730
SAT	0.588	0.534	0.564	0.684	0.599	0.842	0.623	0.662	0.652	0.629
SAT1	0.586	0.539	0.722	0.685	0.565	0.842	0.570	0.603	0.588	0.585
FUNSERQ1	0.673	0.656	0.610	0.761	0.775	0.646	0.862	0.768	0.718	0.740
FUNSERQ	0.581	0.797	0.759	0.768	0.787	0.614	0.909	0.743	0.784	0.737
TECSERQ	0.629	0.822	0.800	0.624	0.561	0.667	0.770	0.915	0.822	0.825
TECSERQ1	0.636	0.641	0.649	0.771	0.735	0.669	0.735	0.855	0.708	0.665
DETRU	0.660	0.404	0.873	0.663	0.690	0.661	0.820	0.541	0.943	0.839
DETRU1	0.777	0.302	0.704	0.539	0.792	0.708	0.743	0.755	0.903	0.800
RETRU1	0.700	0.609	0.617	0.744	0.731	0.646	0.661	0.691	0.691	0.860
RETRU	0.682	0.542	0.798	0.623	0.725	0.651	0.813	0.419	0.878	0.929

4.5.8 Path Analysis

Path analysis is the statistical technique that employs bivariate correlations used to examine casual relationships between two or more variables (Hair et al, 2014). Path analysis seeks to determine the strength of the paths shown in the path diagram. Using the SmartPLS 3.0, path analysis was conducted in order to determine the path coefficients (β). Furthermore,

bootstrapping was applied to the PLS analysis using 0.05 level of significance and this generated *t*-values and corresponding *p*-values.

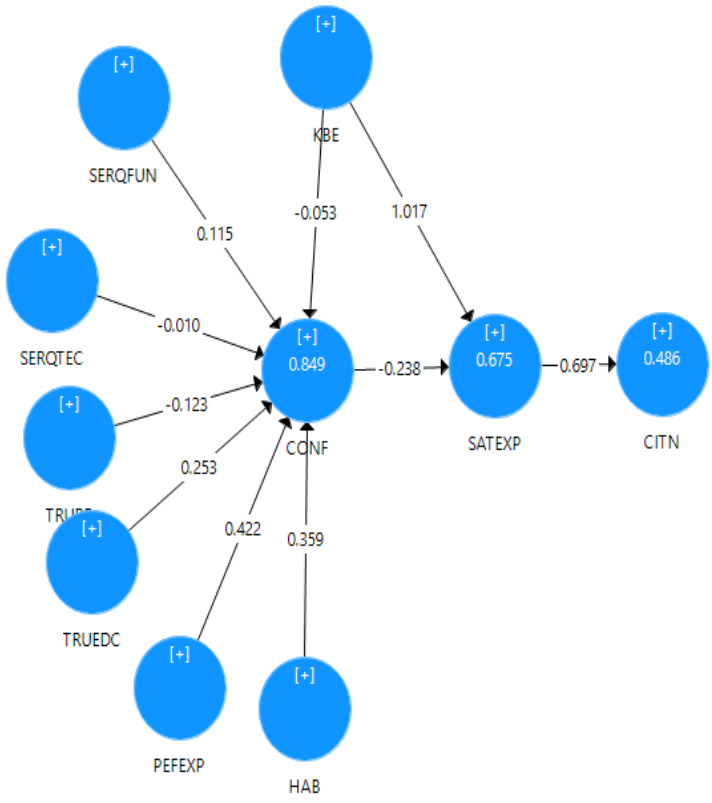
4.5.8.1 Structural equation modelling of the Online Communication Channel (OCC)

From this analysis, an overall six significant relationships were observed within the MOCC model with regards to online communication channel out of the ten constructs. It was observed that knowledge building experience to satisfactory experience (H2 supported with co-efficient=1.017) had the strongest influence towards continuance intention to use online communication channel. This was followed by the satisfactory experience (H10 supported with co-efficient=0.697) towards continuance intention and then, habit (H8 supported with co-efficient=0.359). On the other hand, four of the theoretical constructs had no significant influences on the key dependent variable Confirmation i.e. knowledge building experience(H1 supported with co-efficient=-0.053), functional service quality(H6 supported with co-efficient=0.115)., technical service quality(H5 supported with co-efficient=-0.010) and reliability trust(H3 supported with co-efficient=-0.123). These results are now interpreted in the table 4.12. The hypothesis result and the structural model of all participants can be viewed in table 4.12 and figure 4.8 respectively.

Table 4.12: Result of the hypothesised online communication channel constructs

Path	Coefficient	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	Results
KBE -> CONF =H1	-0.053	0.134	0.397	Not supported
KBE -> SATEXP= H2	1.017	0.095	10.749	Supported
RELTRU -> CONF=H3	-0.123	0.107	1.144	Not supported
DECTRU -> CONF=H4	0.253	0.141	1.797	supported
TECSEQ -> CONF=H5	-0.010	0.113	0.085	Not supported
FUNSEQ -> CONF=H6	0.115	0.095	1.209	Not supported
PEFEXP -> CONF=H7	0.422	0.170	2.478	Supported
HAB -> CONF=H8	0.359	0.090	3.974	Supported
CONF -> SATEXP=H9	-0.238	0.100	2.370	Supported
SATEXP -> CITN=H10	0.697	0.072	9.641	Supported

Figure 4.8: The pilot structural model for all participants



The reason for including data gathered from all the participants using online communication channels to derive the result shown in figure 4.8 in order to have a general overview of how each construct affects the adoption and continuance use of both online communication channels (Email and Facebook) among the older population. Considering this, it can be observed that figure 4.8 shows the path coefficient result derived for the hypothesised constructs.

4.5.8.2 Structural equation modelling of Email

One of the chosen online communication channels being studied in this research work is Email. It was chosen as a classic channel in comparison to Facebook and the results obtained are as follows; the PLS-SEM result showed that five out of the ten major hypotheses were supported. Knowledge building experience to satisfactory experience (H2a supported with co-

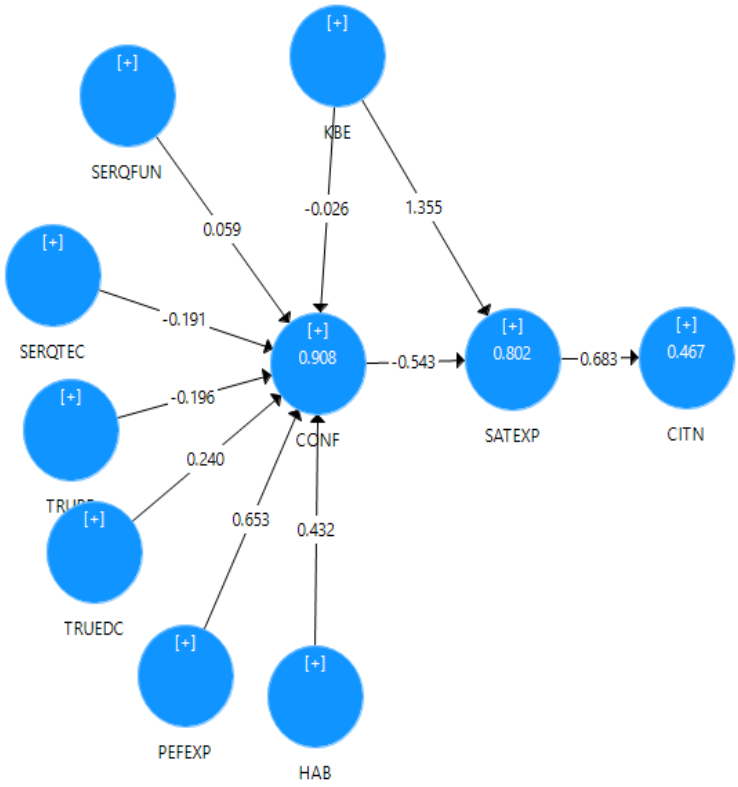
efficient=1.355) had the strongest level of significance towards continuance intention to use followed by satisfactory experience to continuance intention (H10a supported with co-efficient=0.683) with p<0.005 respectively. Habit (H8a supported with co-efficient=0.432), performance expectancy (H7a supported with co-efficient=0.653) and confirmation (H9a supported with co-efficient=--0.543) were also found significant. On the other hand, all the elements of trust (H3a supported with co-efficient=-0.196 and H4a supported with co-efficient=-0.240)) and service quality (H4a supported with co-efficient=-0.191 and (H5a supported with co-efficient=0.059) were not found to be significant in terms of older adults use of Email in communicating with the local government. Table 4.12 shows the details of the path analysis of Email and all participants and the result of their hypothesised constructs.

Table 4.13: Summary of the hypothesis testing for Email

Path	Coefficient	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	Result
KBE -> CONF =H1a	-0.026	0.270	0.095	Not supported
KBE -> SATEXP= H2a	1.355	0.153	8.868	Supported
RELTRU -> CONF=H3a	-0.196	0.231	0.850	Not supported
DECTRU -> CONF=H4a	0.240	0.275	0.873	Not supported
TECSEQ -> CONF=H5a	-0.191	0.201	0.954	Not supported
FUNSEQ -> CONF=H6a	0.059	0.208	0.285	Not supported
PEFEXP -> CONF=H7a	0.653	0.350	1.865	Supported
HAB -> CONF=H8a	0.432	0.170	2.547	Supported
CONF -> SATEXP=H9a	-0.543	0.183	2.970	Supported
SATEXP -> CITN=H10a	0.683	0.138	4.956	Supported

Furthermore, a structural model for all participants using the Email was developed in the structural equation model analysis conducted. Thus, figure 4.9 presents the structural model for all the participants.

Figure 4.9: Structural model for Email with all participants



The reason for including data gathered from all the participants using Email to derive the result shown in figure 4.9 is in order to have a general overview of how each construct affects the adoption and continuance use of Email as an online communication channels among the older population. Considering this, it can be observed that figure 4.9 shows the path coefficient result derived for the hypothesised constructs.

4.5.8.3 Structural equation modelling of Facebook

Unlike the Email and online communication in general, the PLS-SEM result showed that three out of the ten major hypotheses were supported. The elements of trust i.e. decision trust (H4b supported with co-efficient=0.209) and reliability trust (H3b supported with co-efficient=0.099) were not found to be significant with $p<0.005$ respectively. This shows that older adults do not have much level of trust in the use of Facebook when using it to

communicate with the government. Likewise, all elements of service quality i.e. functional service quality (H6b supported with co-efficient=0.278) and technical service quality (H5b supported with co-efficient=0.013) were found to be not significant.

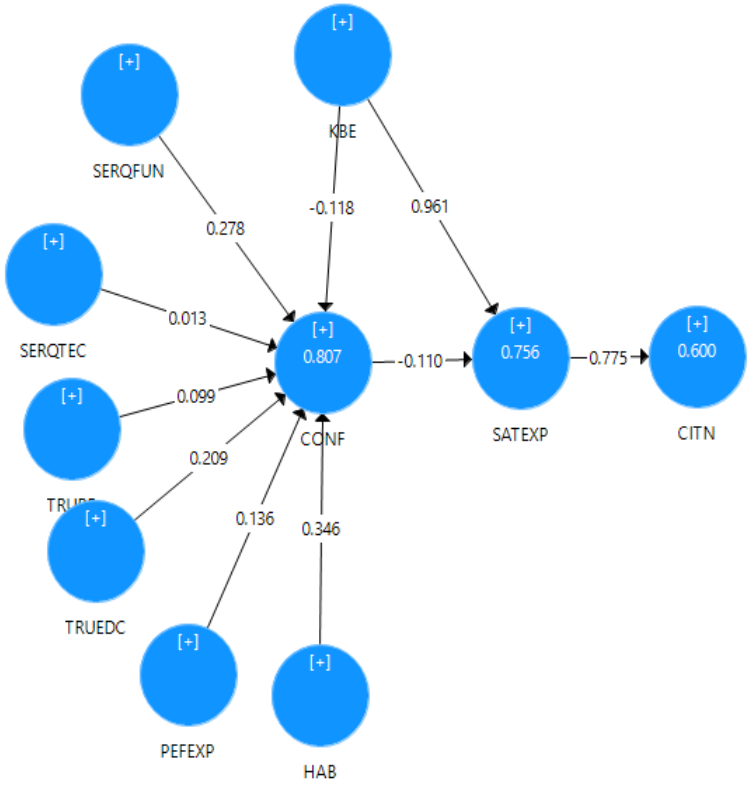
Knowledge building experience (H2b supported with co-efficient=0.961) was found to be highly significant in its relationship with satisfactory experience with $p<0.005$ but found to be not significant with confirmation (H2b supported with co-efficient=-0.118). This implies that the knowledge an older adult has built over the years using Facebook to communicate with the government has given them a level of satisfaction in using this particular online communication channel. Interestingly, habit (H8b supported with co-efficient=0.346) was found to be significant with the use of Facebook while interacting with the government. This implies that as older adults get so used to modern online communication channel like Facebook when interacting with the government, it gets easier and they make it habitual. Table 4.13 shows the details of the path analysis of Facebook and all participants and the result of their hypothesised constructs.

Table 4.14: Summary of the hypothesis testing for Facebook

Path	Coefficient	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	Result
KBE -> CONF =H1b	-0.118	0.205	0.574	Not supported
KBE -> SATEXP= H2b	0.961	0.106	9.097	Supported
RELTRU -> CONF=H3b	0.099	0.154	0.643	Not supported
DECTRU -> CONF=H4b	0.209	0.177	1.184	Not supported
TECSEQ -> CONF=H5b	0.013	0.225	0.058	Not supported
FUNSEQ -> CONF=H6b	0.278	0.183	1.517	Not supported
PEFEXP -> CONF=H7b	0.136	0.210	0.647	Not Supported
HAB -> CONF=H8b	0.346	0.135	2.557	Supported
CONF -> SATEXP=H9b	-0.110	0.124	0.890	Not Supported
SATEXP -> CITN=H10b	0.775	0.042	18.651	Supported

Furthermore, a structural model for all participants using Facebook was developed in the structural equation model analysis conducted. Thus, figure 4.10 presents the structural model for all the participants**.**

Figure 4.10: Structural model for Facebook with all participants



The reason for including data gathered from all the participants using Facebook to derive the result shown in figure 4.10 is in order to have a general overview of how each construct affects the adoption and continuance use of Facebook as an online communication channels among the older population. Considering this, it can be observed that figure 4.10 shows the path coefficient result derived for the hypothesised constructs.

4.5.8.4 Email versus Facebook

In comparing the two online communication channels being studied in this research, a multi-group analysis in SEM was used to test for difference in the two online communication

channels. The parametric test result indicated that between Email and Facebook, there was significant difference in the way knowledge building experience and confirmation impacted on continuance intention to use online communication when interacting with the government with $p<0.05$. On the other hand, all other constructs had no significant difference between Email and Facebook for all the hypothesised constructs with all the derived *p*-values greater than 0.05. This implies that these other factors or constructs are likely not to have similar impact on both the Email and Facebook use. The result of this comparison is presented in table 4.14.

Table 4.15; Parametric test between Email and Facebook

Path	Coefficients-diff (Email - Facebook)	t-value (Email vs Facebook)	p-Value (Email vs Facebook)	Result
KBE -> CONF =H1	0.092	0.269	0.788	Not supported
KBE -> SATEXP= H2	0.394	2.221	0.027	Supported
RELTRU -> CONF=H3	0.296	1.084	0.280	Not supported
DECTRU -> CONF=H4	0.031	0.097	0.923	Not supported
TECSEQ -> CONF=H5	0.219	0.764	0.446	Not supported
FUNSEQ -> CONF=H6	0.204	0.606	0.545	Not supported
PEFEXP -> CONF=H7	0.517	1.302	0.194	Not Supported
HAB -> CONF=H8	0.086	0.374	0.709	Not Supported
CONF -> SATEXP=H9	0.432	2.085	0.038	Supported
SATEXP -> CITN=H10	0.092	0.768	0.443	Not Supported

4.5.9 Coefficient of determination

Coefficient of determination (R^2) is a measure of the proportion of the variance in one variable that is accounted for by another variable (Osborn et al, 2008). This describes the proportion of variation in the dependent variable that is associated with the variation or changes in the independent variable. Kohler (2012) suggested that r^2 values of 0.75, 0.50, or 0.25 results in a structural model are labelled as significant, moderate, or poor, respectively. This shows that the closer R^2 is to 1.0, the more completely the model describes the relationship between the test method results and the basis for evaluation. Keller (2015) on the other hand suggested that the coefficient of determination could be much lower and still be important depending on the

research area. He also stated that it is up to the researcher to interpret the coefficient of determination accordingly.

For the online communication channel, the central dependent variable CONF observed an r^2 0.849, which demonstrated that 84.9% of the variability within the older adult's intention to use a particular online communication channel to communicate with government can be explained by the MOCC model. Satisfactory experience observed that 67.5% of the variability within the satisfaction an older adult gets in using a particular online communication was accounted for by the measures of Satisfaction and KBE. Continuance intention to use explained 48.6% of the variance in continued and intended long term use of a particular online communication channel by older adults when communicating with the government. Overall from the analysis of the entire sample, the r2 value of 67.5% and 48.6% can be interpreted as moderate and the r2 value of 84.9% is significant which could have explained by the direct dependency of CONF on all the constructs. Hence, this implies that the achieved values demonstrated a sufficient explanatory power for the purpose the formed MOCC model.

Furthermore, the structural model for email was developed and this also produced r^2 values. In terms of r^2 values, the key dependent variable CONF observed an r^2 0.908, which demonstrated that 90.8% of the variability within the older adult's intention to use Email when communicating with government can be explained by the MOCC model. Also, Satisfactory experience observed that 80.2% of the variability within the satisfaction an older adult gets in using Email to communicate with the government was accounted for by the measures of a Satisfaction and KBE while, continuance intention to use explained 46.7% of the variance in continued and intended long term use. From the analysis of the sample, the r^2 value of 80.2% and 46.7% can be interpreted as between moderate and poor and the r^2 value of 90.8% is significant which could be explained by the direct dependency of CONF on all the constructs. Therefore, this result indicates that the MOCC model is adequate for determining the intention to use Email by older adults when communicating with the government.

Finally, the structural model for Facebook was developed and this also produced r^2 values. In terms of r^2 values, the key dependent variable CONF observed an r^2 0.807, which demonstrated that 80.7% of the variability within the older adult's intention to use Facebook when communicating with government can be explained by the MOCC model. Also, Satisfactory experience observed that 75.6% of the variability within the satisfaction an older adult gets in using Facebook to communicate with the government was accounted for by the measures of a Satisfaction and KBE while, continuance intention to use explained 60% of the variance in continued and intended long term use. From the analysis of the sample, the r^2 value of 54.6% and 51.9% can be interpreted as moderate and the r^2 value of 90.1% is significant which could be explained by the direct dependency of CONF on all the constructs. Therefore, this result indicates that the MOCC model is adequate for determining the intention to use Facebook by older adults when communicating with the government. Table 4.14 shows the R^2 comparison of the pilot test.

Table 4.16: Pilot Test R-Squared Comparisons

	OCC	Email	Facebook
CITN	$R^2 = 0.486$	$R^2 = 0.467$	$R^2 = 0.600$
CONF	$R^2 = 0.849$	$R^2 = 0.908$	$R^2 = 0.807$
SATEXP	$R^2 = 0.675$	$R^2 = 0.802$	$R^2 = 0.756$

4.6 Pilot discussion

Having conducted the analysis of the pilot study, this section is going to discuss the findings of the pilot study. The pilot study was conducted with the intention of testing the validity and reliability of the MOCC model developed for this research study. This technique also required the testing of the study's hypotheses. Furthermore, the pilot study was also used to pre-test the technique employed for the data collection and analysis as well as identify errors in order to ensure a successful final study. As discussed in chapter 2, ten major hypotheses were developed for the study. From the pilot result, six of these hypotheses were supported **(H9, H8, H2, H7, H10 and H4)**. However, four of the hypotheses were not supported (**H1, H6, H5 and H3**) of which all elements of service quality were insignificant. Studies carried out by De

Keyser & Lariviere (2014) on impact of service quality on consumer happiness in a multi-channel environment and, Zhao et al (2012) on the effect of service quality on customer satisfaction which in turn, affects continuance intention on mobile services found service quality to be significant respectively. Though these constructs were found to be insignificant, they were still used to in the final study to help verify if the findings from the pilot also applied to the main study since the pilot study was on a small scale.

As mentioned earlier, there is currently an ongoing issue termed the digital divide which is a resultant effect of the presence of ICT in society (van Dijk and Hacker, 2003). Age has been identified as one of the factors associated with this digital divide which could be one of the deciding factors for older adult's continuance usage of a particular technology (Choudrie et al., 2013). From the pilot, the 50-year-old and above adults could have different reasons for using a particular online communication channel when interacting with the government. This can be attributed to the different lifestyles, time management and the ability to learn, with training also being important for the older adult use of the internet. Therefore, this study compared the use of two main online communication which the Hertfordshire local government has adopted for E-government service delivery from the older adult's perspective. Results of the hypotheses on these two online communications channels can be found on the table 4.17.

Table 4.17: Summary of the hypothesised constructs for the pilot study

Hypotheses	All participants (OCC)	Email	Facebook
KBE-> CONF= H1			
KBE-> SATEXP=H2	Supported	Supported	Supported
RELTRU -> CONF=H3			
DECTRU-> CONF=H4	Supported		
TECSEQ-> CONF=H5			
FUNSEQ-> CONF=H6			
PEFEXP-> CONF=H7	Supported	Supported	
HAB-> CONF= H8	Supported	supported	Supported
CONF-> SATEXP=H9	Supported	Supported	
SATEXP-> CITN=H10	Supported	Supported	Supported

Note: the empty cells depict not supported

In terms of the reliability and validity of constructs, all the tested constructs were verified to be reliable and valid thus, supporting the use of the measurement items for the final study. Likewise, the MOCC model was confirmed fit for continuance intention in terms of online communication channel use by older adults. This is because the R^2 values derived were found to be significant (Kholer, 2012). This result established the sufficiency of the MOCC model for use in the final study.

4.7 Final survey development

Having discussed the pilot study results, the next stage was the final phase that will involve disseminating an online survey instrument. To develop the final survey instrument, final modifications were made to develop the final quantitative research instrument. The undertaken changes are detailed below.

- The survey welcome page was updated
- The Hertfordshire council website address was added to question 15 to help the participants understand the aim of this research better
- The logic option was also added to help non-online communication channel users jump or skip to necessary question which was on their future plan

- The satisfactory experience questions were changed to be in Likert scale like other constructs
- The answer options regarding residential area were replaced with the towns/areas randomly selected within the stratified random sampling method
- The font of the flyers to be distributed for the final data collection was changed and the University logo removed because of the school policy

As with the pilot study, the questionnaire used for this final phase was split into seven sections. The first section was aimed at collecting the demographic profile of all participants. This section also included questions addressing the state of health and ailments preventing adoption. The second section addressed the use of the Internet generally, the third section addressed the use of the local government website by participants. Furthermore, the fourth section addressed the choice of communication channel being used by the participants while the section five and six addressed were employed to assess the selected construct and test the research hypothesis. This includes the use of Email and Facebook which has all the items of the constructs. Similar to the pilot study, using a Likert-type scale, the measurement items for each construct were adopted from previous studies with some modification to suit the research context. And finally, the seventh section was the thank you page. In all, there were no new wordings, change of construct questions or any additional question being added in the questionnaire. Therefore, the pilot measurements tables being presented in section 4.3 of this chapter was used for the final data collection.

4. 8 Summary of chapter

Having discussed in detail, the research methodology that will help in the data collection of this study from the previous chapter, this chapter presented the pre-testing stage of this study which is the pilot phase of this research. Initially, an online survey questionnaire was developed and after the development, a content validity exercise was performed. This phase was conducted with the intention of verifying whether the content of the survey questionnaire was fit for purpose.

The survey questionnaire was then pilot tested using a snowball sample. It was revealed that KBE, DECTRU, PEFEXP, HAB, CONF and SATEXP were significant explanatory variables in the continuance intention to use a particular online communication channel by older adults when interacting with the local government.

Having provided these details, the next chapter discusses the details of the final phase including findings and analyses.

Chapter 5: Final Phase Findings and Analysis

5.0 Introduction to chapter

Having conducted the content validation and a pilot study which helped in pretesting the study procedures before the final study, and also, modifying and improving the survey questionnaire for the final phase, this chapter will reveal the findings that were drawn from the analysis of the final data collection. This chapter offers details such as, sampling sizes, response rates, non-response bias and path analysis of the MOCC framework that was tested in terms of all the participants, Email users and Facebook users. Further, analysis within these sections addresses the age behavioural differences that emerged between participants aged 50-59, 60-69, 70-79 and the remaining participants aged 80 and over. All significant findings drawn from the individual models are then compared to demonstrate the diversity that occurs between the sub-groups when analysed in the context of the conceptual framework, MOCC. The significant findings are then used to test all the hypotheses devised in chapter 2.

5.1 Sampling and Sample size

Before going into the discussion, some introduction needs to be made. Sampling may be defined as the selection of a subset of a population for inclusion in a study (Daniel, 2011). In Chapter 3 of this study, detailed explanation was given on how the probability random sampling method was viewed to be appropriate for the final phase of this research study. Furthermore, data was collected using quantitative method in the form of survey questionnaires.

To determine an adequate sample size for this study, studies were consulted. The size of a sample is an important element in determining the statistical precision with which population values can be estimated (Ryan, 2013). There is no consensus on the size of sample to be included in any study. However, Khine (2013) suggested that for path models in SEM, a ratio of 20:1 can be more realistic. That is, a path model with 20 parameters should have a sample size of 200. Comrey and Lee (2013) offered a rough rating scale for adequate sample sizes in

factor analysis: 100 = poor, 200 = fair, 300 = good, 500 = very good, 1,000 or more = excellent. They urged researchers to obtain samples of 500 or more observations whenever possible. Based on Comrey and Lee's recommendation, this study used a target sample size of 1,000 cases.

For the data collection, an allocated period was between the periods of 1st April, 2017 and 30th July, 2017. This was done within this time period to ensure that the working population families would respond to the survey before they travel for summer holidays. To inform and obtain participants, survey flyers were disseminated to 6,590 randomly sampled households in the initial three months from 1st of April to help achieve up to 1,000 completed responses. The remaining period was allocated to allow sufficient time for all potential respondents to participate of which, reminders were not sent to any households. At the end of the whole data collection period, 1,049 responses were obtained from respondents. The responses were inspected and cleansed which led to 1,014 complete responses. Compared to estimated responses to be obtained for this study, it was found that the results received 1.4% more than the anticipated target. The data collection was achieved by the researcher and three extra people who are conversant with the area making it a total of four individuals.

5.2 Response rate for this study

In conducting this research, careful predictions and accuracy of the required response rates was required and several sources were consulted. The level of response rate is an important, sometimes crucial, factor in assessing the value of research findings. Denscombe (2004) defined response rate as a representation of the proportion of complete interviews with responding units divided by the number of the eligible units in the sample i.e. it is the basic parameter for evaluating a data collection effort. Although, Baruch & Holtom (2008) stated that it is important to clarify that in the standard research process which uses questionnaires, no one should expect a 100% response rate. As 6,590 flyers were distributed in the households of the 11 Boroughs and districts of Hertfordshire and the number of responses was 1,049 of which 1,014 were completed, the calculated response rate for the final survey test is **15.39%.**

Descombe (2014) went further to state that there is no benchmark figure for judging what is an acceptable response rate and what is not and that it all depends on the circumstances. As a result, a few considerations must be mentioned before interpreting the response rate. The units of analysis for this survey were individuals aged 50 and above. The sampling unit was not individuals, but households. Also participating households were not limited to only one response per household; therefore, it cannot be suggested that the results are a representation of the 1,014 sampled households in Hertfordshire. It can only be stated that the sample is representative of completed responses from the individuals i.e. 1,014, from the total number of sampled households which is 6,590. Further, due to the application of the random sampling method in this study, it was assumed that not every sampled household would have residents aged 50 or above, which eliminated them from participating. Hence, with these points being considered, acquiring the exact number of households that were eligible to participate with any degree of accuracy was not possible. Eligibility of households was determined by dividing the number of households by the number of responses, which offers an approximation of the response rate, which is calculated to be**15.39%** using the following formula from Saunders et al (2007);

$$\textit{Response rate in \%} = \frac{\textit{Total number of responses}}{\textit{(Total number in sample – ineligible)}} \textit{ X 100}$$

5.3 Survey Error

Survey data are susceptible to error and thereby increase the risk of drawing wrong conclusions. This term refers to factors that reduce the accuracy of the survey estimates and results (Dillman, 2011). There are four generally accepted factors of survey error that are defined and discussed below;

1. **Sampling error**; This is the result of surveying only some and not all, randomly selected elements of the survey population (Engel et al, 2014). Sampling was considered for this phase as efforts were made to reduce the sampling error by

distributing an equal number of surveys within randomly selected towns and areas of Hertfordshire. Although, a degree of sampling error may have been present as the entire population of Hertfordshire was not surveyed.

2. **Measurement error;** This type of error results from poor question wording and questionnaire construction (Dillman, 2011). Measurement error occurs when a respondent's answer to a survey question is inaccurate, imprecise or cannot be compared in any useful way to other respondents' answers. To reduce measurement error pertaining to the questions within the final questionnaire, a pre-test was conducted using an expert panel where enquiries were made regarding the error that could arise in the structuring or wording of the questionnaire. Following the feedback received from pre-test, these were resolved accordingly.
3. **Non-response error**: This occurs when a significant number of people in the survey sample do not respond to the questionnaire and have different characteristics from those who do respond (Engel, 2015). Non-response error did occur as only 15.39% of the selected households participated in this research. This can be partly accounted for, by those households that contained individuals that were not of the age of 50 years old or above and also, individuals that were too busy or ill to respond.
4. **Coverage error:** This occurs when the list from which the sample is drawn does not include all elements of the population. As a result, making it impossible to give all elements of the population an equal or known chance of being included in the sample survey (Dillman, 2011). This error was partly eliminated within this phase by utilizing a stratified random sampling method, which has been explained in the earlier chapter 3. This sampling method allowed for an equal chance of selection of all towns within the 10 Boroughs and Districts that comprise the geographic area of Hertfordshire.

5.4 Analysis of data

According to Johnson (2014), there are many potential sources of bias in survey samples. This can be caused by sampling techniques and non-response which is a critical concern in a research study. A standard approach in survey research to account for differential non-response is to adjust sample weights. Weights are commonly assigned to respondent records in a survey data file in order to make the weighted records represent the population of inference as closely as possible (Kalton & Flores-Cervantes, 2003). The main reason for the use of weights is to compensate for unequal selection probabilities and nonresponse bias.

When this study began it was known beforehand that the division between genders in Hertfordshire County were almost evenly distributed (Herts Insights, 2018). However, after the data collection it was found that that over half of the participants were females i.e. Female, 59.47% (603) and Male, 40.53% (411). In an attempt to reduce possible bias, gender-weighting procedures were applied using the data analysis software package SPSS version 23.

5.4.1 Demographics

Before conducting regression analysis for the MOCC conceptual framework, the following sections describe the range and diversity of key socio-economic characteristics which was obtained in the total sample of the final phase.

Table 5.1 Socio-demographic Summary of final participants *(n -1014)*

		Count	Table N %
Age	50 - 59 years	371	36.6%
	60 - 69 years	365	36.0%
	70 - 79 years	180	17.7%
	80 - 89 years	91	8.9%
	90 years and above	8	0.8%
	Total	**1014**	**100.0%**
Gender	Female	507	50.0%
	Male	507	50.0%
	Total	**1014**	**100.0%**
Educational Qualification	Higher Degree / Postgraduate Degree (MBA, PhD, MD, MA, MSc)	78	7.7%
	1st Degree (BA / BSc)	341	33.7%
	HND, HNC, Teaching	93	9.2%
	BTEC/College Diploma	243	24.0%
	A Level	73	7.2%
	GCSE/O Level	185	18.2%
	Total	**1014**	**100.0%**
Employment status	Pensioner 65+	231	22.8%
	Retired (under 65 years old)	147	14.5%
	Employed full time	411	40.5%
	Employed part time	152	15.0%
	Entrepreneur	47	4.6%
	Unemployed (for less than 6 months)	2	0.2%
	Unemployed (for medical reasons)	14	1.4%
	Unemployed (for more than 6 months)	3	0.3%
	Student (part-time)	1	0.1%
	Student (full-time)	0	0.0%
	Redundant	7	0.7%
	Total	**1014**	**100.0%**

From Table 5.1, it can be seen that the age ranges were almost equally distributed in the age bands ranging between 50 and 69, with few results in the participants aged between 70-79 and

then it starts slowing down in age band 80-89. In the age groups of 90 and above, only 8 replies were received.

In terms of gender, due to the gender-weighting, the gender split was Female (50%) and Male (50%) which shows an even distribution. Education was diverse in the qualification levels starting from the secondary school qualification which represents the GCSE at 18.2%, while further education at A Level qualification within the college institution had the lowest results of 7.2%. Equally, BTech from the college institution had send to the highest result at 24.0%. Participants with a University bachelor's degree had the majority of results with 33.7%; 7.7% at a University degree, postgraduate levels of Master or doctoral level and finally, HND qualification had 9.2% within the educational qualification.

With regards to employment status, 40.5 % of the respondents were on full time employment, 22.8 % were Pensioner at 65 years and above, 15 % were in part time employment, 14.5% were retired under age 65, 4.6 % were Entrepreneurs, 1.4% were Unemployed (for medical reasons), 0.3 % were Unemployed (for more than 6 months), 0.7% were Redundant, 0.2% were Unemployed (for less than 6 months), and 0.1% were part time students.

Table 5.2 Socio-demographic Summary of final participants *(n-1014)*

		Count	Table N %
Health status	Excellent	544	53.6%
	Good	458	45.2%
	Poor	12	1.2%
	Total	**1014**	**100.0%**
Marriage status	Married	520	51.3%
	Widowed	120	11.8%
	Divorced	131	12.9%
	Separated	161	15.8%
	In a domestic partnership or civil union	12	1.1%
	Single, but cohabiting with a significant other	37	3.7%
	Single, never married	33	3.3%
	Total	**1014**	**100.0%**
Ethnicity	White British	443	43.7%
	Any other white background	414	40.9%
	White and Black Caribbean	27	2.6%
	White and Black African	17	1.6%
	White and Black Asian	5	0.5%
	Any other mixed background	92	9.1%
	Asian/Indian	2	0.2%
	Asian/Pakistani	0	0.0%
	Any other Asian Background	2	0.2%
	Black and Black British	10	1.0%
	Caribbean	2	0.2%
	African	0	0.0%
	Other Black groups	0	0.0%
	Chinese	0	0.0%
	Japanese	0	0.0%
	Other ethnic groups	0	0.0%
	Total	**1014**	**100.0%**

As the ageing process involves health related issues, a question seeking participants self-assessment of their health was also included. The majority at 53.6% of the respondents

believed that their health was Excellent, 45.2% identified their health as good. However,1.2% of the respondents assessed their health as poor. Equally, a question on different ailment being suffered by older adults were included and this was cross tabulated with Age.

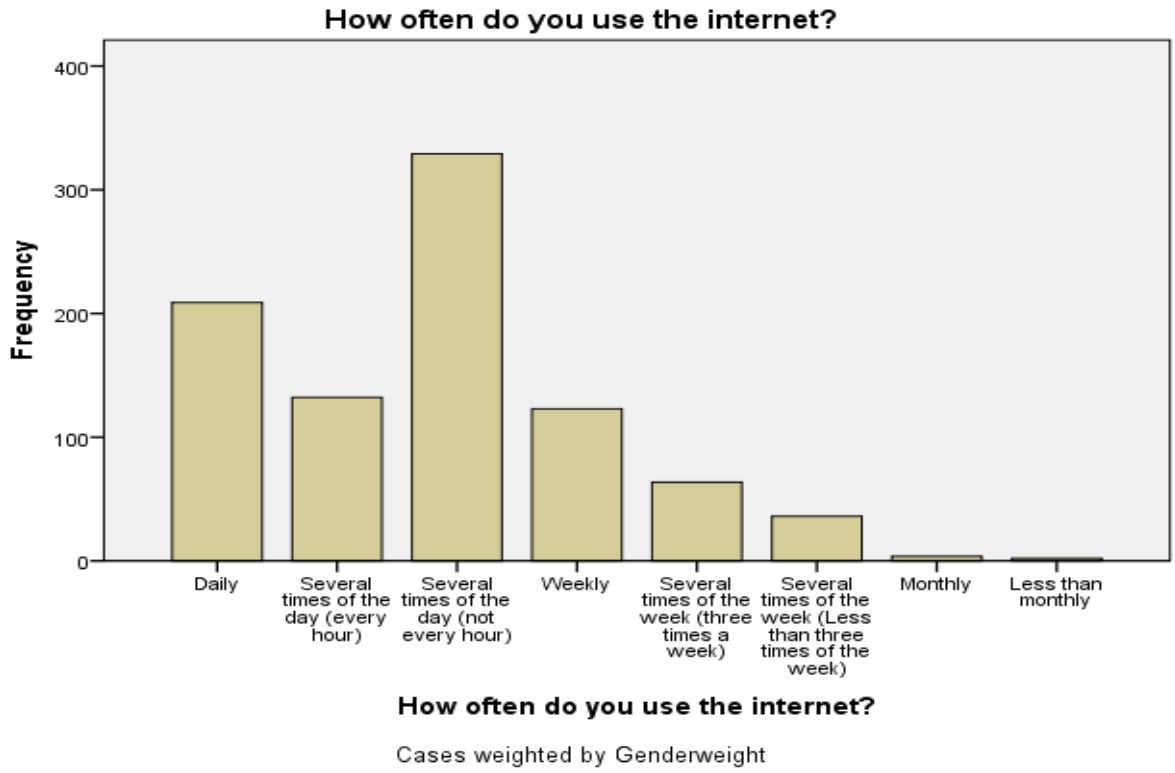
Furthermore, in terms of Marital status, 51.3% were Married, 11.8% were Widowed, 12.9% were Divorced, 15.8% were Separated, 1.1% were in a domestic partnership or civil union, 3.7% were Single, but cohabiting with a significant other and 3.3% were Single, never married.

Finally, as the UK is a multi-cultural and diverse country, ethnicity was also considered by this research study where majority of the respondents were White British (43.7%), followed by other White background which is 40.9% of the respondents. Other ethnicities with replies are Other mixed background (9.1%), White and Black Caribbean (2.6%), White and Black African (1.6%), White and Black Asia (0.5%), Asian/Indian (0.2%), Any other Asian Background (0.2%), Black and Black British (1.0%) and Caribbean (0.2%).

5.4.2 Internet adoption

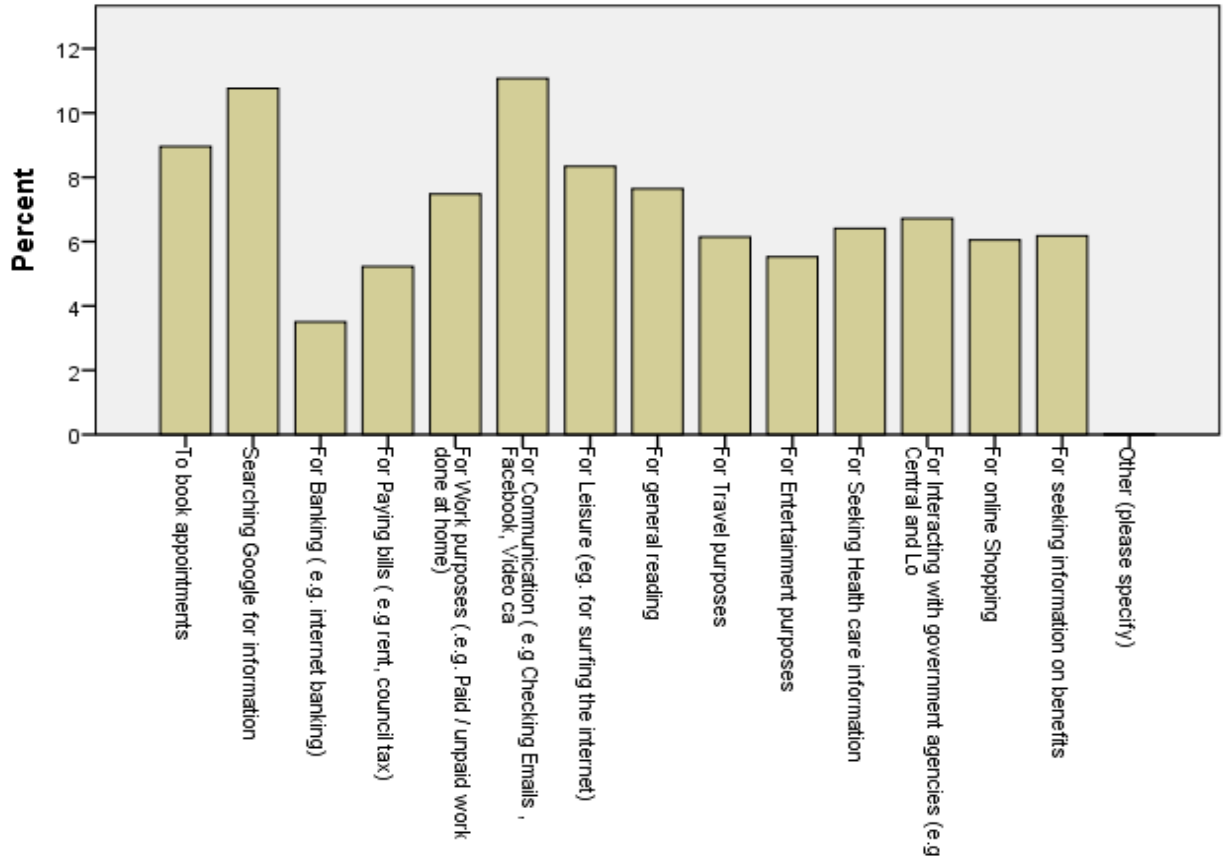
On assessing Internet usage, it was observed that 88.6% of the participants currently use the Internet while 11.4% do not use the Internet. Additionally, out of the number of the participants who currently use the Internet, majority (36.6%) indicated that they use it several times of the day (not every hour). While, 23.2% of the participants indicated that they use the Internet daily and 14.7% of the participants stated that they use it several times of the day (every hour). Figure 5.1 provides a graphical representation of the Internet usage frequency.

Figure 5.1 Frequency of Internet Usage



Additionally, the study assessed how the Internet was being used among the participants. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. Results showed that 92.0% of the internet users use it for communication purposes for instance, sending and checking emails, Facebook and video messaging. Meanwhile, 89.4% of the internet users use it to search for information on google. Additionally, 74.4% use the internet to book appointments and 62.1% use for work purposes e.g. paid/unpaid work done at home. Figure 5.2 shows the graphical representation of the reasons for Internet use.

Figure 5.2 Reasons for Using the Internet



5.4.2.1 Age and internet adoption

In researching the older age groups, an adaptation of the sub-categories of the older adult population that were coined by Lee et al, 2011; Lee and Bowes, 2016 was used. Based on their suggestion, the world has gone beyond viewing old age as a single stage of life hence, viewing old age in different categories. This led this study to the following sub-categories for older adult. To achieve this, the participants were split into four age groups namely: 50-59 (pre-seniors), 60-69 years old (young- old), 70-79 years old (old-old) and 80+ years (very-old). These groups were cross-tabulated with internet use which was measured by users and none users of internet. Interestingly, the result showed that the highest percentage of internet users were those aged 50-59 years old with 35% and the least percentage of internet users where the 80+years with 5.3%. Also, in the group of the none internet users, 80+ years has the highest percentage with 4.4% while the least percentage group was the 50-59 years with 1.1%. This shows that as age increases, the number of older adults using the internet decreases and vice versa.

Table 5.3: Comparative analysis of age with internet use

Category			Do you access and use the internet?		
			Yes	No	Total
Age	50 - 59 years	Count	359	12	371
		Table N %	35.4%	1.1%	36.6%
	60 - 69 years	Count	333	32	365
		Table N %	32.8%	3.1%	36.0%
	70 - 79 years	Count	153	27	180
		Table N %	15.1%	2.7%	17.7%
	80 - 89 years	Count	54	37	91
		Table N %	5.3%	3.6%	8.9%
	90 years and above	Count	0	8	8
		Table N %	0.0%	0.8%	0.8%
	Total	Count	899	115	1014
		Table N %	88.6%	11.4%	100.0%

5.4.2.1 Gender and internet adoption

As previously mentioned, the participants of this study consisted of Female, 59.47% (603) and Male, 40.53% before gender weighting. On assessing whether there was a difference in internet users in terms of gender, result showed that within the internet users, 44.1% were female while 44.5% were males. For non-users, the female participants dominated this group with 5.9% while, 5.5% were male. However, in assessing the relationship between gender and internet use, the Chi-square test result indicated a lack of significance with $p=0.693$ at 1 degree of freedom. This implies that internet use is not dependent on gender. Table 5.4 below provides an overview of the cross-tabulation of gender with internet use.

Table 5.4; Cross-tabulation of gender and internet use

Category			Do you access and use the internet?		
			Yes	No	Total
Gender	Female	Count	447	60	507
		Table N %	44.1%	5.9%	50.0%
	Male	Count	451	56	507
		Table N %	44.5%	5.5%	50.0%
	Total	Count	899	115	1014
		Table N %	88.6%	11.4%	100.0%

5.4.2.3 Education and internet adoption

In terms of cross tabulation between education and internet use, results showed that among the internet users, 1st degree holders dominated the group with 31.7% followed by those with the college diploma /BTEC (21.8%). However, among the non-users of the internet, participants with GCSE/O level had the highest result (4.4%) followed by college diploma/BTEC. Furthermore, in assessing the relationship between gender and internet use, the Pearson's Chi-square test for independence was used and it was observed that χ^2 = 53.648 with 5 degrees of freedom and indicated significance with p=0.000. This implies that internet use and non-use is dependent on educational level of older adults. Table 5.5 below provides an overview of the cross-tabulation of education with internet use.

Table 5.5: Comparative analysis between education and internet use

Educational Qualification		Do you access and use the internet?		
		Yes	No	Total
Higher Degree / Postgraduate Degree (MBA, PhD, MD, MA, MSc)	Count	77	1	78
	Table N %	7.6%	0.1%	7.7%
1st Degree (BA / BSc)	Count	321	20	341
	Table N %	31.7%	2.0%	33.7%
HND, HNC, Teaching	Count	77	16	93
	Table N %	7.6%	1.6%	9.2%
BTEC/College Diploma	Count	221	23	243
	Table N %	21.8%	2.2%	24.0%
A Level	Count	63	11	73
	Table N %	6.2%	1.1%	7.2%
GCSE/O Level	Count	140	45	185
	Table N %	13.8%	4.4%	18.2%
Total	Count	899	115	1014
	Table N %	88.6%	11.4%	100.0%

5.4.2.4 Health status and internet adoption

Equally, the demographic variable 'health status' was also compared with internet use in this research study. This is because previous research studies on older adults have identified that certain health decline impact on ICT adoption and use, it was relevant to analyse this aspect in this study (Lissitsa & Chachashvili-Bolotin, 2015). Therefore, in the result gotten from the participants, it was noted that majority (51.8%) of the internet users indicated they were in excellent health while 36.6% indicates that their health status is good. Contrastingly, the majority of the non-internet users indicated that their health status was good.

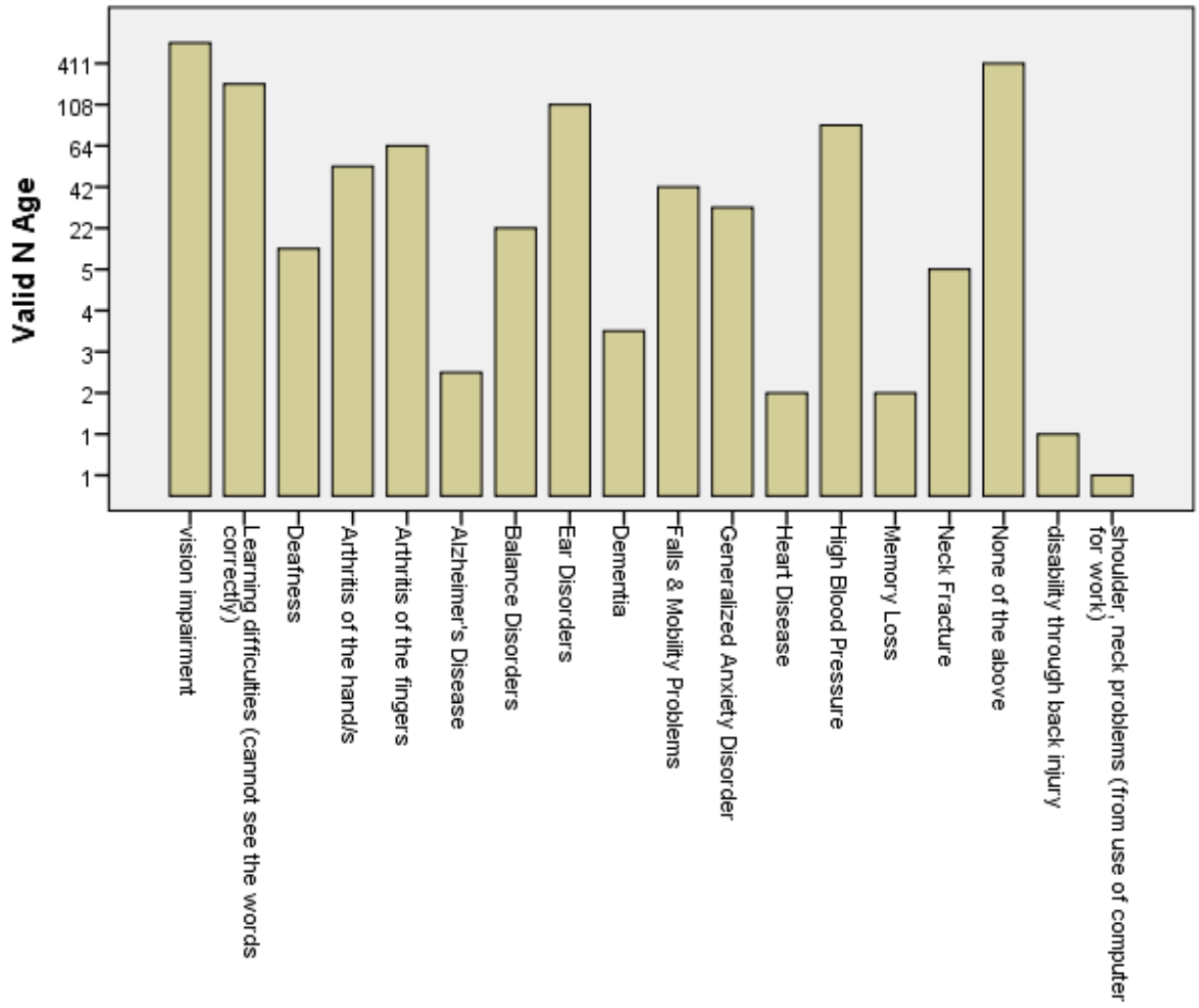
Moreover, Chi-square test was also conducted to test for relationship between the health status of the participants and internet use/non-use. The result from this test showed significance with χ^2 = 117.302, 2 degrees of freedom and p=0.000. This implies that the use and non-use of the internet is also dependent on the health status of the older adult. Further details of the result in terms of health status and internet adoption are presented in table 5.6 below.

Table 5.6: Comparative analysis between health status and internet adoption

Category			Do you access and use the internet?		
			Yes	No	Total
Health status	Excellent	Count	526	18	544
		Table N %	51.8%	1.8%	53.6%
	Good	Count	371	87	458
		Table N %	36.6%	8.6%	45.2%
	Poor	Count	3	10	12
		Table N %	0.2%	0.9%	1.2%
	Total	Count	899	115	1014
		Table N %	88.6%	11.4%	100.0%

In addition to the health status, a cross-tabulation of the ailments with age was carried out in order to examine the impact of health issues on age which in turn could impact on older adult's choice of online communication channel when interacting with the government. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. From the result, ailments identified to be impacting on continuance intention to use includes, vision impairment, ear disorders, arthritis of the fingers, learning difficulties and high blood pressure. The result showed that majority of these ailments were suffered by older adults within the age group 60-69 and above the exception of vision impairment which had about 13.1% of participants within the age group of 50-59. This result suggests that there might be a relationship between the ailments and age which in turn impacts on continuance intention. A more detailed result of this can be found on the appendix. Further details of the result in terms of ailments and age are presented in figure 5.3.

Figure 5.3: Comparative analysis of ailment and age



5.4.3 Age, gender and website use

As previously mentioned on how the public sector has gone digital in delivering e-government services, this study assessed older adults in terms of the local government website visit. On assessing whether there was a difference in local government website visit and age, result showed that of all the participants, 888(87.6%) older adults have visited the website of which majority of them are within the age range of 50-59 and 90 and above had the least number of people to have visited the website. Also, a total of 11(1.1%) participants said they have not visited the website while 114(11.3%) said they have not visited the website but plan to visit the website. Furthermore, Pearson's Chi-square test for independence was used to test whether there was a relationship between use and non-use of local government website and the age

group of the respondents. From the result of this test, it was observed that χ^2 = 163.125 with 8 degrees of freedom indicated significance with *p*=0.000. This implies that the use and non-use of local government website is dependent on the age group of the individual.

On assessing whether there was a difference in website visit in terms of gender, result showed that 443(43.7%) of those that have visited the website where female while 445 (43.9%) where males. For those that have not visited the website, result showed that 5(0.5%) where female and 6(0.6%) where male. On the other hand, 59(5.8%) of the have not visited the website but plan to do so while 56(5.5%) of the male also plan to do so in future. However, in assessing the relationship between gender and the local government website visit, the Chi-square test result indicated a lack of significance with χ^2 = 0.174, 2 degrees of freedom and p=0.917. This implies that the local government website is not dependent on gender. Table 5.7 below provides an overview of the cross-tabulation of age and gender with website visit.

Table 5.7: Cross-tabulation of age and gender with council website visit

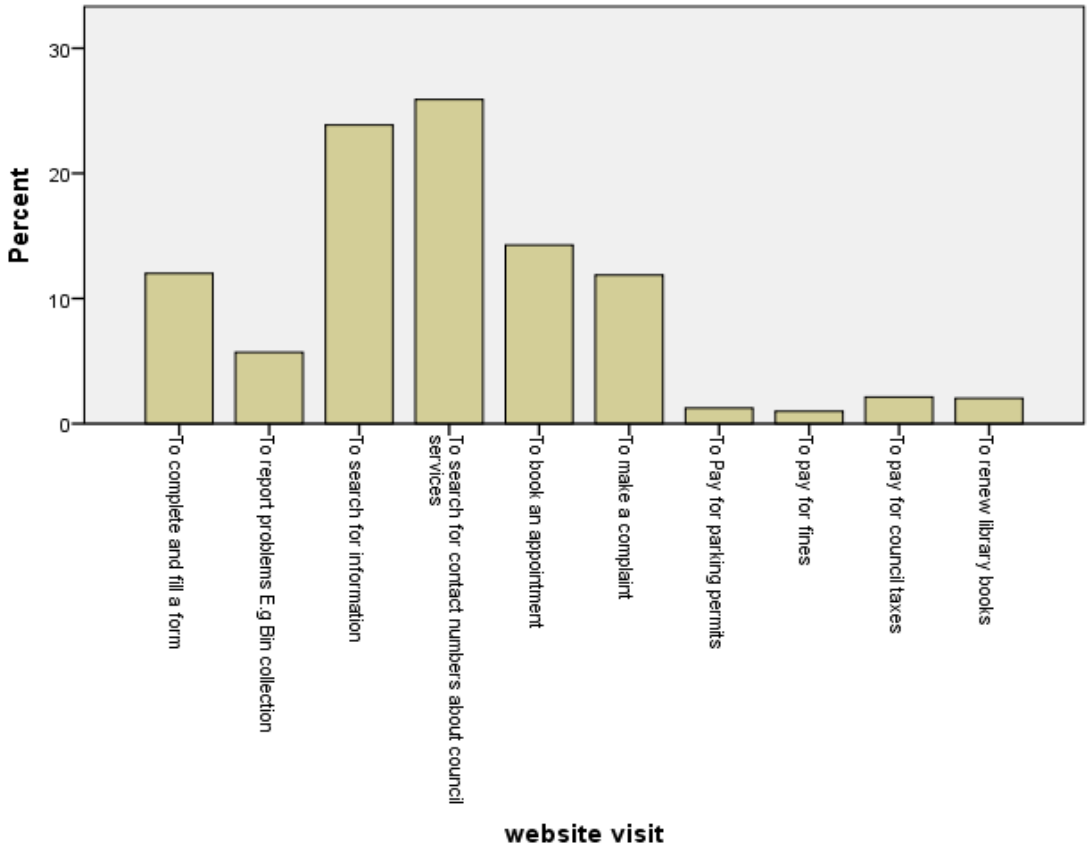
Category			Have you ever visited the Hertfordshire council website (http://www.hertsdirect.org)?			
			No	Yes	No but plan to use	Total
Age	50 - 59 years	Count	5	354	12	371
		Table N %	0.4%	35.0%	1.1%	36.6%
	60 - 69 years	Count	2	331	32	365
		Table N %	0.2%	32.6%	3.1%	36.0%
	70 - 79 years	Count	3	150	27	180
		Table N %	0.3%	14.8%	2.7%	17.7%
	80 - 89 years	Count	2	52	37	91
		Table N %	0.2%	5.2%	3.6%	8.9%
	90 years and above	Count	0	1	8	8
		Table N %	0.0%	0.1%	0.7%	0.8%
	Total	Count	11	888	114	1014
		Table N %	1.1%	87.6%	11.3%	100.0%
Gender	Female	Count	5	443	59	507
		Table N %	0.5%	43.7%	5.8%	50.0%
	Male	Count	6	445	56	507
		Table N %	0.6%	43.9%	5.5%	50.0%
	Total	Count	11	888	114	1014
		Table N %	1.1%	87.6%	11.3%	100.0%

5.4.3.1 Reasons for visiting the local government website

Additionally, a section was created for reasons why people visit the local government website. This was to help identify factors that might possibly encourage older adult's choice of online communication when interacting the with the government. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. In analysing the reasons given, results showed that majority of the participants that have visited the Hertfordshire website were there to search for contact numbers about council services (90.7%) and also, search for information (83.6%). Likewise, respondents who visited the website to complete and fill a form a form online (42.1%) and also, to make a compliant (41.6%) were quite high. Other

reasons for visiting the council website are provided in the figure below and a more detailed result can be found in the appendix.

Figure 5.4: Reasons for visiting the council website



5.5 Preferred choice of communication

As previously mentioned, a section was mapped out to specifically assess the different communication channels being used by older adults when communicating with the council. The aim of this section was to identify the preferred online communication channel amongst all other channels of communication used by the older adults when communicating with the council. To familiarise readers with the result of this part of the analysis, this aspect of the questionnaire was a multiple-choice question and as such, each answer was calculated to a 100%. The following provides details regarding the results gathered from this section.

In terms of the communication channels being used by the local council, this study categorised them into five; face to face contact, use of online social network, Emails, telephone services

and letter writing. Results showed that Email had the highest percentage with 97.2% followed by telephone services with 93.7% and then, face to face contact with 85.5%. However, this study is focused on online communication and specifically, comparison between Email and Facebook as online communication channels used by local council for e-governments service delivery. The result indicated that participants preferred to use Email (97.2%) than Facebook (69.4%) when communicating with the local council. In all, the age group with the highest percentage in all the communication channel choices are 50-59 years. From the results, it can be deduced that as age increases, older adults tend to reduce the use of the communication channels when interacting with the local council. The table 5.8 presents the details of these results.

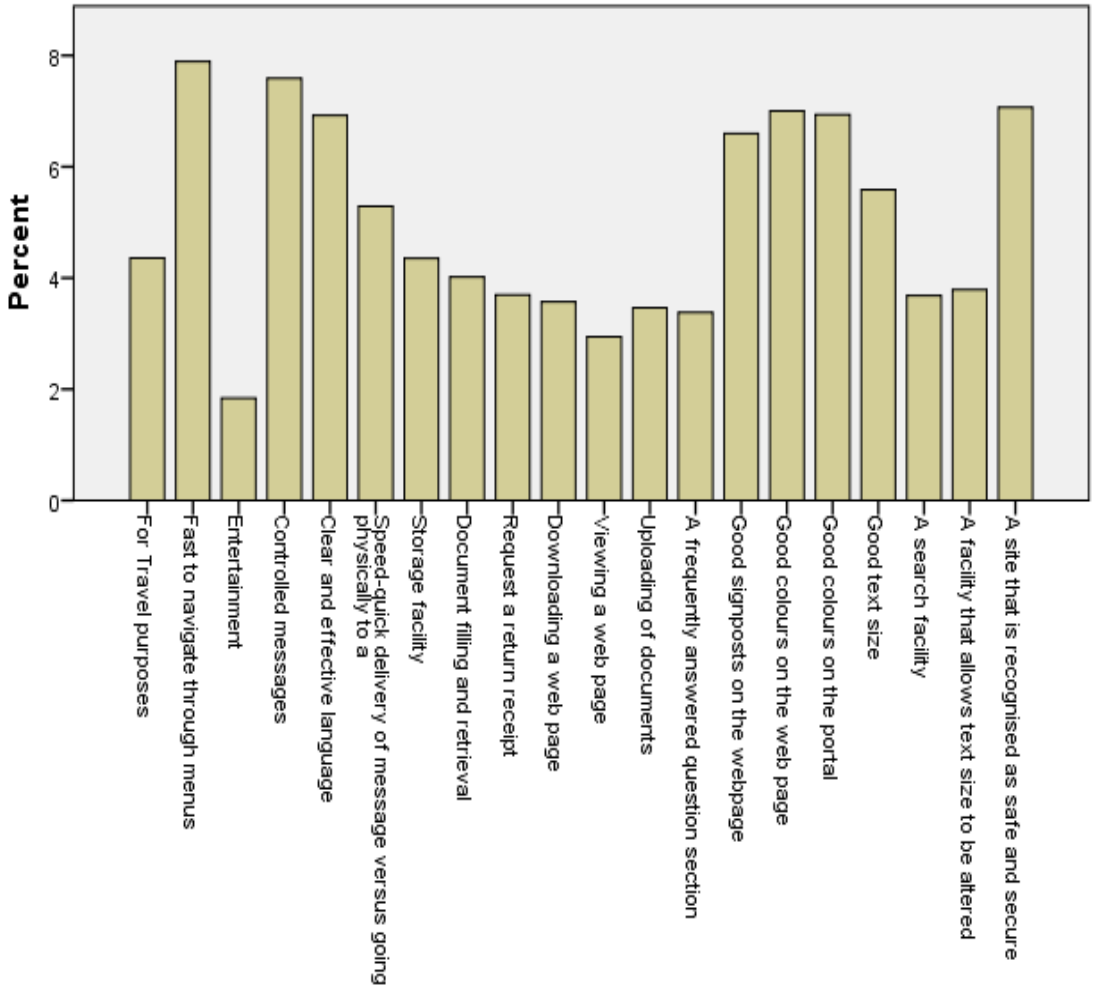
Table 5.8; Comparative analysis age and preferred communication channels

Preferred choice of communication channels		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
Face to face contact with a council staff member	**Count**	314	291	127	38	0	771
	Table N %	34.7%	32.1%	14.1%	4.2%	0.0%	85.1%
Through the use of an online social network (Facebook)	**Count**	257	238	99	34	0	629
	Table N %	28.4%	26.3%	10.9%	3.8%	0.0%	69.4%
Email	**Count**	352	325	149	54	1	881
	Table N %	38.9%	35.9%	16.4%	6.0%	0.1%	97.2%
Telephone services	**Count**	334	318	146	51	0	850
	Table N %	36.9%	35.1%	16.1%	5.6%	0.0%	93.7%
Letter writing	**Count**	247	224	96	37	0	605
	Table N %	27.3%	24.7%	10.6%	4.1%	0.0%	66.7%
Total	**Count**	360	333	155	58	1	907
	Table N %	39.7%	36.7%	17.1%	6.4%	0.1%	100.0%

In addition to the preferred choice of communication channel, participants were assessed on the reason for their choice of a particular online communication channel. Results showed that majority of the participants (92.2%) prefers to use an online communication channel that is

fast to navigate through menus. Also, channels with controlled messages had the 88.6% while, a site that is recognised as safe and secure had 82.6%. equally, good colours on the web page and good colours on the portal were of great importance to the participants with 81.8% and 81.1% respectively. Further detailed result can be found in the figure 5.5.

Figurer 5.5; Reason for their choice of a particular online communication channel



5.6 Non-adopters of the internet

As mention earlier, a section assessing non-adopters of the internet was also created to examine reasons behind non-adoption. It was also intended to identify factors that might possibly encourage the adoption of the internet which will in turn lead to adoption of online communication channels. The following therefore provides the results gathered from this section.

In analysing the reasons given for non-adoption, result showed that majority of the non-adopters (53.7%) stated that they do not have the skills to use the internet and the age group with the highest percentage here is the 80-89 years with 20.5%. Following this, 53.7% indicated that they did not feel comfortable using the internet of which the age group 80-89 years had the highest percentage with 20.5%. equally, 32.1 % indicated that the reason for not using the internet is because privacy worries i.e. criminals might take control of their personal information. Other reasons given are provided in table 5.9 below.

Table 5.9; Cross-tabulation of age and reasons for non-use of the internet

Reasons for not using the internet		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
Just not interested	Count	2	14	8	11	3	39
	Table N %	1.8%	12.3%	7.2%	9.7%	2.5%	33.5%
I do not have the skills	Count	5	16	13	24	5	62
	Table N %	3.9%	13.7%	11.2%	20.5%	4.3%	53.7%
I do not feel comfortable using the internet	Count	4	13	13	24	5	58
	Table N %	3.3%	10.9%	11.6%	20.5%	4.3%	50.6%
Privacy worries (criminals might take control of my personal information)	Count	2	12	11	9	3	37
	Table N %	1.8%	10.5%	9.7%	7.5%	2.5%	32.1%
Bad experiences with hackers/virus	Count	4	16	9	8	0	37
	Table N %	3.3%	13.8%	7.5%	7.2%	0.0%	31.8%
Too old to learn	Count	1	8	4	14	7	34
	Table N %	1.1%	7.2%	3.6%	11.9%	5.8%	29.5%
I am too busy	Count	1	1	0	0	0	2
	Table N %	1.1%	1.1%	0.0%	0.0%	0.0%	2.1%
Other (please specify)	Count	1	0	2	3	0	6
	Table N %	0.7%	0.0%	1.8%	2.5%	0.0%	5.1%
Total	Count	12	32	27	37	8	115
	Table N %	10.1%	27.5%	23.5%	31.7%	7.3%	100.0%

In addition to assessing non-use of the internet, this study also assessed those participants that do not currently use the internet however, they intended to use it in the future. This was done

so as to help this study to assess their plan to adopt online communication channels like Email and Facebook in future when communicating with the government. Specifically, result showed that 50.4% of those planning to use online communication intend to start using them to communicate with the local council of which 21.3% is from the age group 50-59 years. Equally, 19.1% indicated that they predict to start using online communication when interacting with the local council of which age group 60-69 showed the highest percentage with 8.9%. However, 11.1% indicated that they do not have plans of using online communication channel to interact with the local council. The result of this comparison is presented in the table 5.10 below.

Table 5.10; Comparative analysis of age and future plan to adopt online communication

Do you plan to use an online communication channel in future while interacting with the Local council?		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
Yes, I intend to start using online communication to interact with the Local council	Count	214	177	85	29	1	506
	Table N %	21.3%	17.6%	8.5%	2.9%	0.1%	50.4%
No, I do not intend to start using online communication to interact with the government	Count	27	28	21	10	1	87
	Table N %	2.6%	2.8%	2.1%	1.0%	0.1%	8.6%
Yes, I predict that I will start using online communication to interact with the Local council	Count	60	89	27	15	0	191
	Table N %	6.0%	8.9%	2.7%	1.5%	0.0%	19.0%
Yes, I expect to start using online communication channel to interact with the Local council	Count	49	36	16	6	1	109
	Table N %	4.9%	3.6%	1.6%	0.6%	0.1%	10.8%
No, I do not have any plans of using online communication channel to interact with the Local council	Count	17	30	28	30	5	112
	Table N %	1.7%	3.0%	2.8%	3.0%	0.5%	11.1%
Total	Count	367	361	177	91	8	1004
	Table N %	36.5%	36.0%	17.7%	9.0%	0.8%	100.0%

5.5 Instrument Validation

Having explained the demographics and its relationships, the next step was to conduct the validation test before commencing path analysis of MOCC. This was necessary to demonstrate that the construct measures employed to operate MOCC were appropriate and correct. Equally, that the data collected are valid and meets the required statistical standards. The first instrument validation test was constructs validation. In order to provide support for the validity of constructs that were used in the final test a factor analysis was used. Factor analysis is a multivariate statistical technique that can summarise the information from a large number of variables into a much smaller number of variables or factors. Factor analysis is a statistical technique that develops linear combination of variables that summarizes the original variables based on their underlying patterns (Hair et al, 2015). Factor analysis is employed in relation to multiple indicator measures to determine whether groups of indicators tend to bunch together to form distinct clusters referred to as factors. (Bryman & Bell,2015). The aim of using factor analysis is to summarise the interrelationships among the variables in a concise but accurate manner as an aid in conceptualisation. However, the collected sample must be proven to be adequate enough before determining that a factor analysis is appropriate which brings this study to sampling adequacy of the measures.

5.5.1 Sampling Adequacy

In addition to the statistical basis for the correlations, data matrix is necessary so that a researcher can ensure that the data has sufficient correlations to justify the application of a factor analysis (Hair et al, 2014). This can be accomplished using the Kaiser-Meyer–Olkin (KMO) measure of sampling of adequacy, discussed below.

5.5.2 KMO measure of sampling adequacy

The KMO is considered to be the measure of sampling adequacy. It is based on the principle that if variables share common factors, then partial correlations between pairs of variables should be small when the effects of other variables are controlled (Munro, 2005). The KMO

measure may vary between 0 and 1 with larger numbers indicating a greater difference between the zero order correlations and the partial correlations. As a general guideline, it is considered that a value greater than 0.60 shows acceptable sampling adequacy, greater than 0.70 shows good, greater than 0.80 shows very good and greater than 0.90 shows excellent. This is to say that if KMO measure in the .08s or .90s is achieved, this supports the use of factor analysis for the data. In this analysis, the SPSS tool was used to carry out this test on the entire sample (n-1014) using all the construct measurements. The result of the test is shown in table 5.11. For this research study, the resulting KMO measure value was 0.972 which shows that the value is excellent, and these calculations provide support for proceeding with the analysis.

Table 5.11: The KMO and Bartlett's test result

Sampling Adequacy Test Results.		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		***.972***
Bartlett's Test of Sphericity	Approx. Chi-Square	68627.907
	df	628
	Sig.	*.000*

5.5.3 Bartlett's Test of Sphericity

The Bartlett's test of sphericity is an additional test to justify the appropriateness of a factor analysis. It tests the null hypothesis that the correlation matrix is an identity matrix and follows Chi-Square distribution (Hair et al, 2014). It indicates that the larger the value of Bartlett's test indicates, the greater likelihood that the correlation matrix is not an identity matrix. As a general rule, a *p*-value of <0.05 indicates that it is appropriate to conduct a factor analysis (Hair et al, 2016). From the table above, it is evident that the Bartlett's test of sphericity in this study, was tested through chi-square value which was found to be significant at 0% level of significance indicating that the inter-item correlation matrix was not an identity matrix. Hence, will conclude that the variables are correlated highly enough to provide a reasonable basis for factor analysis.

5.5.4 Construct Validity

Following the sampling adequacy test indicating the suitability of factor analysis, factor analysis of the measurement variables was conducted. From the completed factor analysis, factor loadings were assessed for construct validation. In research, construct validity and reliability must be determined in order to confirm dimensionality. Construct validity refers to how well a measure actually measures the construct it is intended to measure (Civelek, 2018). This could be referred to as convergence of observed variables that are connected to the same latent variables (convergent validity) and dissociation of observed variables from other observed variables that are connected to other latent variables (discriminant validity). Hence, the results are detailed below in the following sections. Further details of the validation procedures using this cross-loading result are also presented.

Table 5.12; Factor Loadings results (Cross Loadings) (*n*- 1014)

ITEMS	CITN	CONF	DECTRU	FUNSERQ	HAB	KBE	PEFEXP	RELTRU	SATEXP	TECSEQ
CITN1	**0.963**	0.595	0.675	0.608	0.649	0.667	0.480	0.445	0.658	0.465
CITN2	**0.962**	0.664	0.723	0.654	0.626	0.702	0.536	0.496	0.653	0.514
CONF1	0.540	**0.967**	0.792	0.880	0.499	0.551	0.931	0.890	0.469	0.922
CONF2	0.770	***0.641**	0.679	0.581	0.578	0.718	0.429	0.370	0.646	0.399
CONF3	0.545	**0.969**	0.792	0.877	0.485	0.559	0.922	0.884	0.474	0.915
CONF4	0.529	**0.964**	0.782	0.876	0.488	0.545	0.923	0.889	0.463	0.913
DECTRU1	0.602	0.545	**0.891**	0.588	0.585	0.714	0.442	0.407	0.626	0.429
DECTRU2	0.676	0.594	**0.833**	0.636	0.675	0.772	0.466	0.424	0.727	0.453
DECTRU3	0.552	0.537	**0.888**	0.644	0.552	0.719	0.424	0.375	0.633	0.389
DECTRU4	0.518	0.906	**0.898**	0.895	0.471	0.514	-0.966	0.929	0.430	0.972
FUNSEQ1	-0.479	0.824	0.710	**0.954**	0.450	0.479	-0.924	0.969	0.403	0.916
FUNSEQ2	-0.451	0.823	0.687	**0.856**	0.432	0.451	-0.923	0.978	0.385	0.922
FUNSEQ3	-0.459	0.833	0.692	**0.864**	0.433	0.457	-0.930	0.980	0.386	0.929
FUNSEQ4	-0.472	0.834	0.710	**0.862**	0.443	0.475	0.938	0.974	0.391	0.935
FUNSEQ5	0.499	0.889	0.756	**0.868**	0.459	0.487	0.962	0.936	0.421	0.972
HAB1	0.460	0.409	0.448	0.449	**0.782**	0.430	0.376	0.379	0.417	0.371
HAB2	0.623	0.522	0.690	0.570	**0.873**	0.649	0.426	0.384	0.793	0.411

KNOWB1	0.531	0.531	0.641	0.568	0.511	**0.810**	0.437	0.411	-0.525	0.432
KNOWB2	0.621	0.540	0.654	0.576	0.527	**0.862**	0.439	0.422	0.583	0.418
KNOWB3	0.627	0.571	0.727	0.641	0.558	**0.904**	0.470	0.439	-0.656	0.450
KNOWB4	0.552	0.568	0.696	0.606	0.518	**0.860**	0.452	0.405	-0.569	0.430
KNWB5	0.650	0.542	0.745	0.589	0.668	**0.777**	0.428	0.372	-0.697	0.405
PEREXP1	0.520	0.868	0.753	0.876	0.471	0.525	**0.957**	0.940	-0.430	0.924
PEREXP2	0.528	0.868	0.756	0.881	0.475	0.536	**0.952**	0.938	0.433	0.923
PEREXP3	0.500	0.896	0.768	0.882	0.460	0.494	**0.966**	0.926	0.428	0.971
PEREXP4	0.499	0.897	0.762	0.879	0.466	0.501	**0.979**	0.937	0.423	0.968
PEREXP5	0.502	0.898	0.762	0.879	0.473	0.500	**0.978**	0.934	0.426	0.966
RELTRU1	0.611	0.552	0.715	0.720	0.579	0.700	0.438	**0.727**	0.614	0.420
RELTRU2	0.601	0.540	0.746	0.705	0.596	0.737	0.423	**0.703**	0.667	0.397
RELTRU3	0.491	0.859	0.732	0.899	0.461	0.496	0.945	**0.905**	0.419	-0.938
RELTRU4	0.516	0.903	0.777	0.901	0.474	0.514	0.962	**0.908**	0.432	-0.967
SAT1	0.609	0.504	0.660	0.561	0.731	0.650	0.402	0.384	**0.958**	-0.395
SAT2	0.696	0.576	0.741	0.616	0.722	0.738	0.448	0.407	**0.968**	0.425
TECSEQ1	0.467	0.827	0.707	0.858	0.456	0.470	-0.928	0.962	0.386	**0.943**
TECSEQ2	0.518	0.897	0.774	0.885	0.471	0.518	-0.958	0.926	0.439	**0.975**
TECSEQ3	0.490	0.879	0.754	0.864	0.453	0.489	-0.957	0.920	0.414	**0.973**
TECSEQ4	0.493	0.886	0.755	0.874	0.450	0.484	-0.965	0.940	0.413	**0.980**

5.5.5 Convergent validity

Convergent validity is established by showing a strong relationship between the scale under review and another validated scale thought to measure the same construct. It is the extent to which different assessment methods concur in their measurement of the same attribute, ideally these values should be moderately high (Civelek, 2018). Hair et al (2015) stated three criteria used in establishing convergent validity;(a) The composite reliability of each construct should be greater than or equal to 0.7. (b.)All the item loadings should be significant and have values greater than or equal to 0.7. (c) The AVE of the constructs should also exceed 0.5. These should be adhered to otherwise; the fit indices of the general model will be adversely affected.

Following the above stated criteria, it can be observed from table 5.12 that all the items except CONF2 demonstrated convergent validity.

5.5.6 Discriminant validity

Discriminant validity entails ensuring that when a measure is used for one construct, it is different in terms of its content from a measure used to measure another construct. In other words, it is the measure of the level at which a structure in a measurement model differs from other structures (Warner, 2012). It is an indicator of low correlation between the questions that form a construct and other questions that form another construct. To assess this, item loading of a construct should be greater than its other cross-loadings. In addition, the square root of the AVE of the construct should be greater than the correlation between the construct and other constructs. Using the cross-loading criteria, it can be observed from table 5.13 that all of the items indicated discriminant validity. From the table, it can be observed that all the diagonal values are greater than the correlation values between any pair of constructs, which establishes that the constructs have sufficient discriminant validity. Overall, majority of the constructs displayed sufficient construct validity because these constructs satisfied the criteria for both convergent and divergent validity.

Table 5.13: Discriminant validity using AVE

	AVE	CITN	CONF	DECTRU	FUNSERQ	RELTRU	HAB	KBE	PEFEXP	SATEXP	TECSEQ
CITN	0.927	**0.963**									
CONF	0.801	0.654	**0.895**								
DECTRU	0.638	0.726	0.454	**0.799**							
FUNSERQ	0.659	0.655	0.610	0.600	**0.812**						
RELTRU	0.937	0.488	0.670	0.336	0.490	**0.968**					
HAB	0.686	0.662	0.567	0.401	0.620	0.459	**0.828**				
KBE	0.711	0.711	0.653	0.425	0.409	0.486	0.664	**0.843**			
PEFEXP	0.934	0.527	0.416	0.387	0.510	0.567	0.485	0.529	**0.966**		
SATEXP	0.927	0.680	0.563	0.530	0.613	0.411	0.754	0.723	0.443	**0.963**	
TECSEQ	0.937	0.509	0.502	0.673	0.399	0.667	0.472	0.507	0.584	0.427	**0.968**

5.5.7 Construct measurement reliability

Following the construct validity, reliability needed to be determined. In this research study reliability was essential in order to demonstrate the integrity of the measures developed uniquely for this research study. With the advent of structural equation modelling, other test of internal consistency or internal stability has been made available and they are as follows; Composite reliability, Cronbach's Alpha and Average Variance Extracted. This will be discussed below:

Cronbach's Alpha

Cronbach's alpha is a commonly used test of internal reliability. Cronbach's alpha is the average correlation between the indicators of a given construct. When considering internal consistency, it's been found that a Cronbach's alpha index of 0.70 and higher is evidence in support of homogeneity of the indicators (Hair et al, 2014). As seen in the table 14. below, all the constructs demonstrated high levels of reliability in the Cronbach's alpha. However, Habit did not meet the acceptable threshold.

Composite Reliability

Composite reliability can be used to measure how well a construct is measured by its assigned indicators. However, compared to Cronbach alpha, composite reliability is considered a better measure of internal consistency because it employs the standardized loadings of the manifest variables (Hair et al, 2014). When considering the output result, an acceptable threshold for composite reliability is 0.70. In this research study, all the constructs demonstrated accepted levels of composite reliability.

Average Variance Extracted

Average variance extracted measures the overall amount of variance that is attributed to the construct in relation to the amount of variance attributable to measurement error (Hair et al, 2014). An Average variance extracted of 0.5 or higher is therefore regarded as acceptable (Henseler et al, 2016). This indicates that the construct explains at least half of the variance of

its observed variables. In this research study, all the constructs demonstrated accepted level the Average Variance Extracted.

Table 5.14: Cronbach's Alpha, Composite Reliability & Average Variance Extracted (n-1014)

	Cronbach's Alpha			Composite Reliability			AVE		
	OCC	**EMAIL**	**FACE-BOOK**	**OCC**	**EMAIL**	**FACE-BOOK**	**OCC**	**EMAIL**	**FACE-BOOK**
CITN	0.922	0.921	0.815	0.962	0.962	0.913	0.927	0.926	0.840
CONF	0.907	0.908	0.895	0.940	0.941	0.934	0.801	0.803	0.785
DECTRU	0.818	0.820	0.718	0.876	0.876	0.807	0.638	0.639	0.515
RELTRU	0.983	0.985	0.975	0.987	0.988	0.981	0.937	0.943	0.910
FUNSERQ	0.831	0.836	0.776	0.884	0.887	0.849	0.659	0.666	0.597
TECSEQ	0.977	0.981	0.971	0.983	0.986	0.979	0.937	0.945	0.920
HAB	***0.548**	***0.553**	***0.562**	0.814	0.816	0.815	0.686	0.690	0.689
KBE	0.898	0.898	0.786	0.925	0.925	0.855	0.711	0.711	0.543
PEFEXP	0.982	0.985	0.976	0.986	0.988	0.981	0.934	0.943	0.911
SATEXP	0.922	0.923	0.841	0.962	0.963	0.926	0.927	0.929	0.862

5. 6 Model Validation Result

Considering that the main focus of this research study is on online communication channel, it was necessary to evaluate the relationship between the chosen channels (Email and Facebook) and the factors that impact older adults use of these particular channels when interacting with the government. Afterwards, a parametric test using the multigroup analysis will be used to assess if there was any level of significance in the difference between the two online communication channels.

5.6.1 Coefficient of Determination

The coefficient of determination (R^2) measures the amount of variation in the dependent variable that is explained by the variation in the independent variable which are the constructs in this research study (Keller, 2016). In other words, it describes how well the model fits the data. An r^2 close to 1 implies an almost perfect relationship between the model and the data, whereas an r^2 close to 0 implies that just fitting the mean is equivalent to the model fitted (Jackson, 2009). Kohler (2012) suggested that r^2 values of 0.75, 0.50, or 0.25 resulted in the structural model that are labelled as significant, moderate, or poor, respectively.

5.6.2 Structural equation modelling of the Online Communication Channel (OCC)

For this study the central dependent variable CONF observed an r^2 0.892, which demonstrated that 89.2% of the variability within the older adult's intention to use a particular online communication channel to communicate with government can be explained by the MOCC model. Satisfactory experience observed that 53.8% of the variability within the satisfaction an older adult gets in using a particular online communication was accounted for by the measures of Satisfaction and KBE. Continuance intention to use explained 46.3% of the variance in continued and intended long term use of a particular online communication channel by older adults when communicating with the government. Overall from the analysis of the entire sample, the r2 value of 53.8% and 46.3% can be interpreted as moderate and the r2 value of 89.2% is significant which could have explained by the direct dependency of CONF on all the constructs. Hence, this implies that the achieved values demonstrated a sufficient explanatory power for the purpose the formed MOCC model.

From this analysis, an overall eight significant relationships were observed within the final MOCC model with regards to online communication channel. Five theoretical constructs had significant influences on the key dependent variable Confirmation. These constructs are decision trust (H4 supported with co-efficient=0.166), performance expectancy (H7 supported with co-efficient= 0.673), knowledge building experience (H1 supported with co-

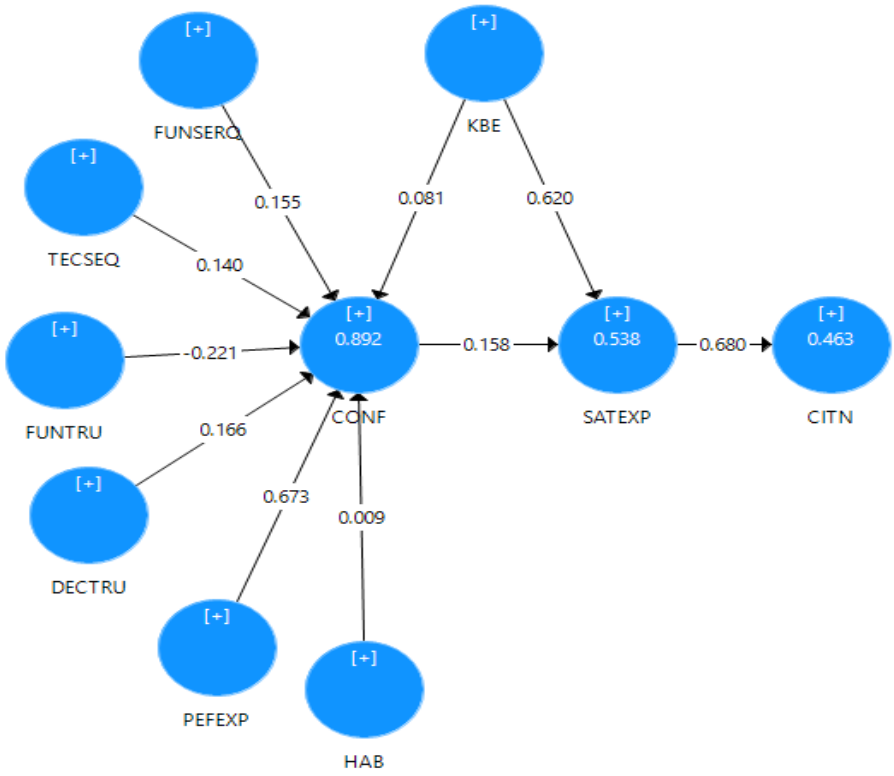
efficient=0.081), reliability trust (H3 supported with co-efficient=-0.221) and functional service quality (H6 supported with co-efficient=0.155), all at *p*-values <.05. The three other remaining significant constructs held extremely strong significant paths (*p*-values <.001) i.e. knowledge building experience (H2 supported with co-efficient=0.620), confirmation (H9 supported with co-efficient=0.158) and satisfactory experience (H10 supported with co-efficient=0.680). These results are now interpreted in the table 5.15.

Table 5.15: Result of the hypothesised online communication channel constructs

Path	Coefficient	STDEV	t-Value	p-Value	Result
KBE -> CONF =H1	0.081	0.038	2.130	0.033	Supported
KBE -> SATEXP= H2	0.620	0.061	10.084	0.000	Supported
RELTRU -> CONF=H3	-0.221	0.083	2.673	0.008	Supported
DECTRU -> CONF=H4	0.166	0.055	2.985	0.003	Supported
TECSEQ -> CONF=H5	0.140	0.144	0.968	0.333	Not supported
FUNSEQ -> CONF=H6	0.155	0.068	2.298	0.022	Supported
PEFEXP -> CONF=H7	0.673	0.159	4.244	0.000	Supported
HAB -> CONF=H8	0.009	0.024	0.392	0.695	Not Supported
CONF -> SATEXP=H9	0.158	0.045	3.506	0.000	Supported
SATEXP -> CITN=H10	0.680	0.066	10.268	0.000	Supported

Furthermore, a structural model for all participants for the online communication channel developed in the structural equation model analysis was conducted. Thus, figure 5.6 presents the structural model for all the participants.

Figure 5.6: Structural model for all participants



The reason for including data gathered from all the participants to derive the result shown in figure 5.6 is in order to have a general overview of how each construct affects the adoption and continuance use of both online communication channels (Email and Facebook) among the older population. Considering this, it can be observed that figure 5.6 shows the path coefficient result derived for the hypothesised constructs.

5.6.3 Structural equation modelling of Email

Email is one of the chosen online communication channels i.e. the classic one for this research study and the results obtained are as follows; the PLS-SEM result showed that eight of the ten major hypotheses were supported. Both elements of trust i.e. decision trust (H4a supported with co-efficient= -0.246), and reliability trust (H3a supported with co-efficient=0.617), were found to be significant with $p<0.005$ respectively which shows that older adults have strong

level of trust in Email when using it to communicate with the government. Knowledge building experience (H2a supported with co-efficient=0.074), was also found to be highly significant in its relationship with and satisfactory experience with p<0.005. This shows that the knowledge that an older adult has built over the years using Email to communicate with the government has given him/her a level of satisfaction in using this particular online communication channel. Also, habit (H8a supported with co-efficient=0.155), and technical service quality (H5a supported with co-efficient=0.127), were found to be significant. However, confirmation (H9a supported with co-efficient=0.167), continuance intention to use functional service quality (H6a supported with co-efficient=0.064), were found to be insignificant in determining older adult's choice and continuance use of Email when interaction with the government. Table 5.16 shows the details of the path analysis of Email and all participants and the result of their hypothesised constructs.

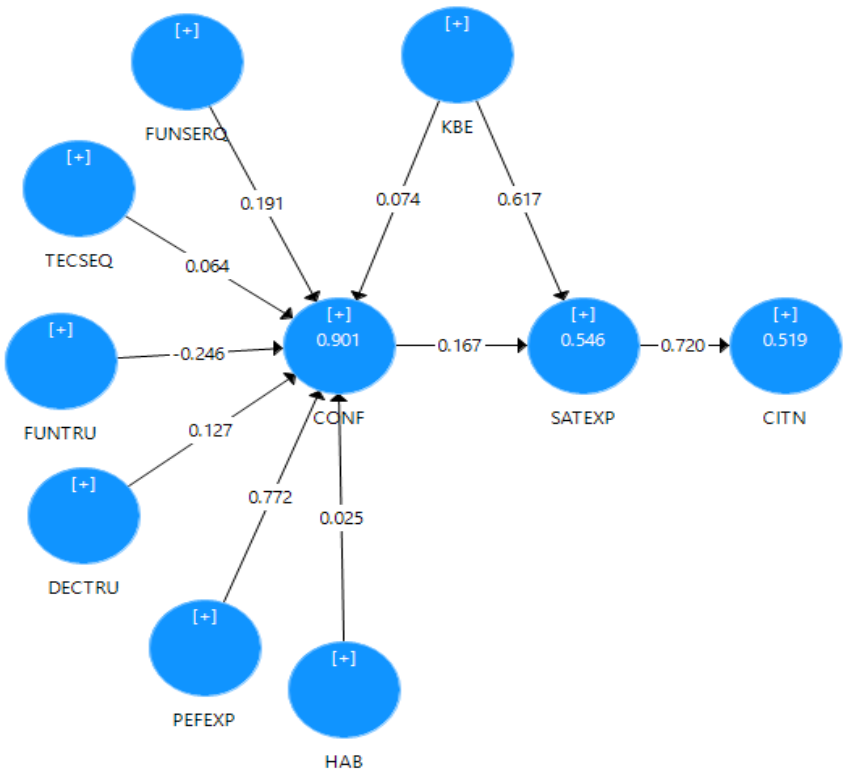
Table 5.16: Summary of the hypothesis testing for Email

Path	Coefficient	STDEV	t-Values	p-Value	Result
KBE -> CONF =H1a	0.025	0.027	0.935	0.350	Not Supported
KBE -> SATEXP= H2a	0.074	0.035	2.127	0.034	Supported
RELTRU -> CONF=H3a	0.617	0.079	7.847	0.000	Supported
DECTRU -> CONF=H4a	-0.246	0.094	2.608	0.009	Supported
TECSEQ -> CONF=H5a	0.127	0.052	2.446	0.015	Supported
FUNSEQ -> CONF=H6a	0.064	0.166	0.387	0.699	Not supported
PEFEXP -> CONF=H7a	0.191	0.069	2.763	0.006	Supported
HAB -> CONF=H8a	0.772	0.191	4.038	0.000	Supported
CONF -> SATEXP=H9a	0.167	0.054	3.076	0.002	Supported
SATEXP -> CITN=H10a	0.720	0.068	10.616	0.000	Supported

Furthermore, the structural model for email was developed and this also produced r^2 values. In terms of r^2 values, the key dependent variable CONF observed an r^2 0.901, which demonstrated that 90.1% of the variability within the older adult's intention to use Email when communicating with government can be explained by the MOCC model. Also, Satisfactory experience observed that 54.6% of the variability within the satisfaction an older adult gets in using Email to communicate with the government was accounted for by the measures of a

Satisfaction and KBE while, continuance intention to use explained 51.9% of the variance in continued and intended long term use. From the analysis of the sample, the r^2 value of 54.6% and 51.9% can be interpreted as moderate and the r^2 value of 90.1% is significant which could be explained by the direct dependency of CONF on all the constructs. Therefore, this result indicates that the MOCC model is adequate for determining the intention to use Email by older adults when communicating with the government.

Figure 5.7: Structural model for with r-squared values for Email with all participants



The reason for including data gathered from all the participants that use only Email to derive the result shown in figure 5.7 is in order to have a general overview of how each construct affects the adoption and continuance use of Email as an online communication channels among the older population. Considering this, it can be observed that figure 5.7 shows result derived for the hypothesised constructs with the inclusion of the path co-efficient.

5.6.4 Structural equation modelling of Facebook

Unlike the Email and online communication in general, the PLS-SEM result showed that seven of the ten major hypotheses were supported. The elements of trust decision trust (H4b supported with co-efficient=0.077) and reliability trust (H3b supported with co-efficient=0.051) were not found to be significant with $p<0.005$ respectively which shows that older adult do not have much level of trust in the use of Facebook when using it to communicate with the government.

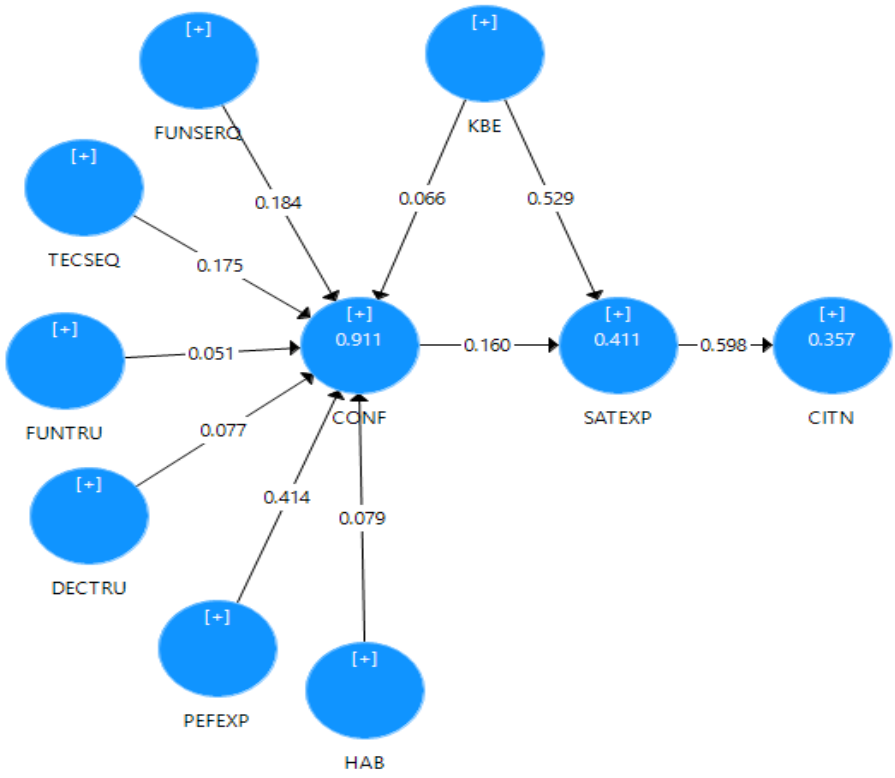
Knowledge building experience were found to be highly significant both in its relationship with confirmation (H1b supported with co-efficient=0.066) and satisfactory experience (H2b supported with co-efficient=0.529) at $p<0.005$. This implies that the knowledge that an older adult has built over the years using Facebook to communicate with the government has given them a level of satisfaction in using this particular online communication channel. Interestingly, habit (H8b supported with co-efficient=0.079) was found to be significant with the use of Facebook while interacting with the government. This implies that as older adults get so used to modern online communication channel like Facebook when interacting with the government, it gets easier and they make it habitual. Also, confirmation (H9b supported with co-efficient=0.160), satisfactory experience (H10b supported with co-efficient=0.598), functional service quality (H6b supported with co-efficient=0.184) and performance expectancy (H7b supported with co-efficient=0.414) were also found to be significant in determining older adult's choice and continuance use of Email when interaction with the government. However, technical service quality (H5b supported with co-efficient=0.175) was not found to be significant also. Table 5.17 shows the details of the path analysis of Facebook and all participants and the result of their hypothesised constructs.

Table 2: Summary of the hypothesis testing for Facebook

Path	Coefficient	STDEV	t-Values	p-Value	Result
KBE -> CONF =H1b	0.066	0.027	2.460	0.014	Supported
KBE -> SATEXP= H2b	0.529	0.067	7.908	0.000	Supported
RELTRU -> CONF=H3b	0.051	0.117	0.435	0.663	Not supported
DECTRU -> CONF=H4b	0.077	0.048	1.601	0.110	Not Supported
TECSEQ -> CONF=H5b	0.175	0.135	1.292	0.197	Not supported
FUNSEQ -> CONF=H6b	0.184	0.069	2.667	0.008	Supported
PEFEXP -> CONF=H7b	0.414	0.157	2.635	0.008	Supported
HAB -> CONF=H8b	0.079	0.034	2.347	0.019	Supported
CONF -> SATEXP=H9b	0.160	0.073	2.171	0.030	Supported
SATEXP -> CITN=H10b	0.598	0.067	8.921	0.000	Supported

Furthermore, the structural model for email was developed and this also produced r^2 values. In terms of r^2 values, the key dependent variable CONF observed an r^2 0.911, which demonstrated that 91.1% of the variability within the older adult's intention to use Facebook when communicating with government can be explained by the MOCC model. Also, Satisfactory experience observed that 41.1% of the variability within the satisfaction an older adult gets in using Email to communicate with the government was accounted for by the measures of a Satisfaction and KBE while, continuance intention to use explained 35.7% of the variance in continued and intended long term use. From the analysis of the sample, the r^2 value of 41.1% and 35.7% can be interpreted as between moderate and poor and the r^2 value of 91.1% is significant which could be explained by the direct dependency of CONF on all the constructs. Therefore, this result indicates that the MOCC model is adequate for determining the intention to use Facebook by older adults when communicating with the government.

Figure 5.8: Structural model for with r-squared values for Facebook with all participants



The reason for including data gathered from all the participants using Facebook to derive the result shown in figure 5.8 is in order to have a general overview of how each construct affects the adoption and continuance use of Facebook as an online communication channels among the older population. Considering this, it can be observed that figure 5.8 shows the path coefficient result derived for the hypothesised constructs.

5.6.5 Email versus Facebook

Using multi- group analysis in SEM, Email was compared with Facebook to test for difference in the two online communication channels. The parametric test result indicated that between Email and Facebook, there was significant difference in the way reliability trust impacted in the continuance intention to use online communication when interacting with the government with $p<0.05$. This means that the continuance intention to use a particular online

communication channel differs between Email and Facebook based on how reliable the online communication is when communicating with the government. On the other hand, all other constructs had no significant difference between Email and Facebook for all the hypothesised constructs with all the derived *p*-values greater than 0.05. This implies that these other factors or constructs are likely not to have similar impact on both the Email and Facebook use. The result of this comparison is presented in table 5.18.

Table 3: Test for difference between Email and Facebook

Path	Coefficients-diff	t-Values (Email - Facebook)	p-Values (Email - Facebook)	Results (Yes/No)
KBE -> CONF =H1	0.007	0.152	0.879	NO
KBE -> SATEXP= H2	0.088	0.809	0.419	NO
RELTRU -> CONF=H3	0.297	2.030	0.043	YES
DECTRU -> CONF=H4	0.050	0.671	0.502	NO
TECSEQ -> CONF=H5	0.111	0.477	0.633	NO
FUNSEQ -> CONF=H6	0.007	0.072	0.943	NO
PEFEXP -> CONF=H7	0.358	1.355	0.175	NO
HAB -> CONF=H8	0.054	1.256	0.209	NO
CONF -> SATEXP=H9	0.007	0.082	0.934	NO
SATEXP -> CITN=H10	0.123	1.222	0.222	NO

5.6.6 Age difference

As stated earlier in this chapter, the participants were split into four age groups namely: 50-59 (pre-seniors), 60-69 years old (young- old), 70-79 years old (old-old) and 80+ years (very-old). PLS-SEM result showed that confirmation was significant in young old and old-old groups with (p=) respectively. However, the result from pre-seniors and Very-old are not significant.

In addition, decision trust was found to be significant with young adults and very- old but not with the pre-seniors and old- old age group. Reliability trust was only found significant within the old-old compared to all other group categories.

Equally, functional service quality was found to be significant amongst the pre-seniors and where not supported by other group categories. On other hand, no significant result was found for the technical service quality.

Furthermore, knowledge building experience and satisfactory experience were found to be significant in all age groups. Performance expectancy was found significant within three age groups namely; pre-seniors, young old and old-old. Habit was only found to be significant amongst the very-old age group. Table 5.19 shows the details of the path analysis of all age categories and the result of their hypothesised constructs.

Table 5.19; Summary of hypothesis testing all age groups

Path	Pre-seniors	Young old	Old -old	Very - old
KBE -> CONF =H1				**Supported**
KBE -> SATEXP= H2				
RELTRU -> CONF=H3	**Supported**	**Supported**	**Supported**	**Supported**
DECTRU -> CONF=H4			Supported	
TECSEQ -> CONF=H5		Supported		Supported
FUNSEQ -> CONF=H6				
PEFEXP -> CONF=H7	Supported			
HAB -> CONF=H8	**Supported**	**Supported**	**Supported**	
CONF -> SATEXP=H9		Supported	Supported	
SATEXP -> CITN=H10	**Supported**	**Supported**	**Supported**	**Supported**

Note: Empty cells denotes not supported

In addition, a parametric test was conducted using the multi-group analysis in SmartPLS 3 to check for significant difference within the groups. Furthermore, the structural model for each segment was developed and this also produced the r^2 values. The detailed result of these can be found on the appendix section of this thesis.

5.6.3 Moderating effect of the demographic variables

According to Venkatesh et al. (2012), the moderating variables such as gender, age, experience and voluntariness of use sometimes affect the relationship between the independent variables and the dependent variable. Bearing this in mind, the demographic variables age, gender,

education and health status were selected in this study as moderators for confirmation and satisfactory experience in determining the dependent variable continuous intention to use which is consistent with the UTAUT 2 model. These moderating variables were selected based on the aim of this research as well as the suggestion of previous studies (Venkatesh et al., 2012; Pheeraphuttharangkoon, 2015). The following provides the details of the test for moderating effect.

Based on the findings, result showed that age had negative moderated relationship with confirmation and satisfactory experience which in turn affects continuance intention to use. This implies that age does not strengthen the effect of confirmation to continuance intention to use and also, satisfactory experience to intention to use. Moreover, gender and education were also used but were found to be negatively moderating the effect confirmation and satisfactory experience just like age.

However, health status was also selected as a moderator for the relationships between satisfactory experience and continuance intention which was found to be significant moderator for the relationship. Result also found health status to have a positive significance between confirmation and satisfactory experience. This implies that health status strengthens the effect of confirmation on satisfactory experience which in turn will affect continuance intention positively. The table 5.20 presents the result of the test for the moderating effect of age.

Table 5.20: Testing the moderating effect of age, gender, education and health status

Paths	Coefficients	(STDEV)	t-values	p- Values	Result
Age* sat -> CITN	**-0.009**	**0.146**	**0.220**	**0.826**	**Not supported**
Age*conf -> SATEXP	**-0.009**	**0.020**	**0.499**	**0.618**	**Not supported**
Edu * satexp -> CITN	**-0.071**	**0.088**	**0.826**	**0.409**	**Not supported**
Edu * conf -> SATEXP	**-0.012**	**0.022**	**0.558**	**0.577**	**Not supported**
Gender * satexp -> CITN	**0.174**	**0.223**	**0.991**	**0.322**	**Not supported**
Gender * conf -> SATEXP	**0.060**	**0.044**	**1.444**	**0.149**	**Not supported**
Health * satexp -> CITN	**0.154**	**0.069**	**2.265**	**0.024**	**Supported**
Health * conf -> SATEXP	**-0.089**	**0.047**	**1.965**	**0.050**	**Supported**

5.7 Hypotheses Testing

As stated earlier in chapter 2, ten hypotheses were devised to guide the construction of the proposed MOCC model. The table below illustrates the hypotheses supported by the final data collected for this research with the empty cells denoting not supported. Conclusively, hypotheses will be tested using the results from the entire sample, this allows reflection of results in consideration of all participating individuals including viewpoints of both internet users and non-users. The following sections interpret and discuss the findings of the hypotheses.

Table 5.21; Hypotheses Testing: Results

Hypotheses	All participants (OCC)	Email	Facebook	Pre-seniors	Young-old	Old -old	Very - old
KBE-> CONF= H1	Supported	Supported	Supported				
KBE-> SATEXP=H2	Supported	Supported	Supported	Supported	Supported	Supported	Supported
RELTRU -> CONF=H3	Supported	Supported				Supported	
DECTRU-> CONF=H4	Supported	Supported			Supported		Supported
TECSEQ-> CONF=H5							
FUNSEQ-> CONF=H6	Supported	Supported	Supported	Supported			
PEFEXP-> CONF=H7	Supported	Supported	Supported	Supported	Supported	Supported	
HAB-> CONF= H8			Supported				Supported
CONF-> SATEXP=H9	Supported	Supported	Supported		Supported	Supported	
SATEXP-> CITN=H10	Supported	Supported	Supported	Supported	Supported	Supported	Supported

Hypothesis1- Supported

Hypothesis 1 predicted that the experience an older adult has with an online communication channel use when interacting with the local government will have significant positive effects on their satisfactory experience which will lead to continuance intention to use. This hypothesis was supported by the data collected even with Email and Facebook as two different online communication channels. Therefore, this shows that the theoretical construct

Knowledge Building Experience (KBE) is a motivational factor for older adults when choosing an online communication channel for communication purposes.

Hypothesis 2 – Supported

Hypothesis 2 predicted that the experience an older adult has gathered in using an online communication channel when interacting with the local government will lead to a positive confirmation of the initial use which in turn positively affect their continuance intention to use. This theoretical construct was found to have a significant on all categories in the table above. As a result, this confirms that the theoretical construct Knowledge Building Experience (KBE) is a motivational factor for older adults when choosing an online communication channel for communication purposes.

Hypothesis 3 – Supported

Hypothesis 3 anticipated that reliability trust in the form of reliability and/trustworthiness an older adult has in an online communication channel being used to communicate with government will be confirm and in turn lead to continuance intention to use. This hypothesis was supported by all the participants, Email and also, participants within the Old-old category i.e. age 70-79 but not with the Facebook users.

Hypothesis 4 – Supported

Hypothesis 4 theorized that decision trust in the form of the extent to which an older adult can depend on using a particular online communication channel when interacting with the local government and still feel relatively secured will positively affect confirmation. This hypothesis was found to be significant by all participants and Email but not Facebook. Equally, it was supported by the young-old (60-69) and the very-old (80+) age category. This shows that trust is also a valuable factor when considering continuance intention to use amongst older adults.

Hypothesis 5 – Not Supported

Hypothesis 5 expected that aspects of technical quality i.e. the value that an older adult is actually receiving from using a particular online communication channel when interacting with the local government will positively impact their continuance intention. This hypothesis was the only one not to be supported by the entire population and in all sub-samples.

Hypothesis 6 – Supported

Hypothesis 6 predicted that functional quality i.e. the manner in which the conversation which the older adult intends to have with the council is being delivered using the online communication channel to the local government will positively influence their continuance intention to use. This hypothesis was supported by the all the participants, Email and Facebook users and also, the pre-seniors (50-59) age category. This result suggest that functional service quality is a motivating factor in post-adoption of online communication channel by older adults.

Hypothesis 7 – Supported

Hypothesis 7 predicts the performance expectancy in the form of how easy and important an online communication channel is to an older adult when communicating the government will positively influence continuance intention to use. This hypothesis was found to be significant within the entire population and sub-samples with the exception of the very old age category. This result suggests that the ease of use of an online communication channel has strong influence in older adults' decision to continually use a communication medium.

Hypothesis 8 – Not Supported

Hypothesis 8 expected that having a habit of using a particular online communication channel to interact with the local government will positively influence continuance intention to use. This theoretical construct was found not to have any significant effect on continuance intention to use. However, when this hypothesis was tested with face book users and sample of

participants in the very-old category, the hypothesis was supported. This result reveals that for Facebook users and very-old older adults, having the habit of using a particular online communication channel to interact with the government increases their continuance use behaviour.

Hypothesis 9 – Supported

Hypothesis 9 anticipated that confirmation in form of evaluating older adults' initial performance expected from an online communication against the actual performance will positively affect continuance intention to use. This hypothesis was found to be significant within the entire final sample, Email and Facebook users. Also, it was found significant within the age category young-old and old-old groups.

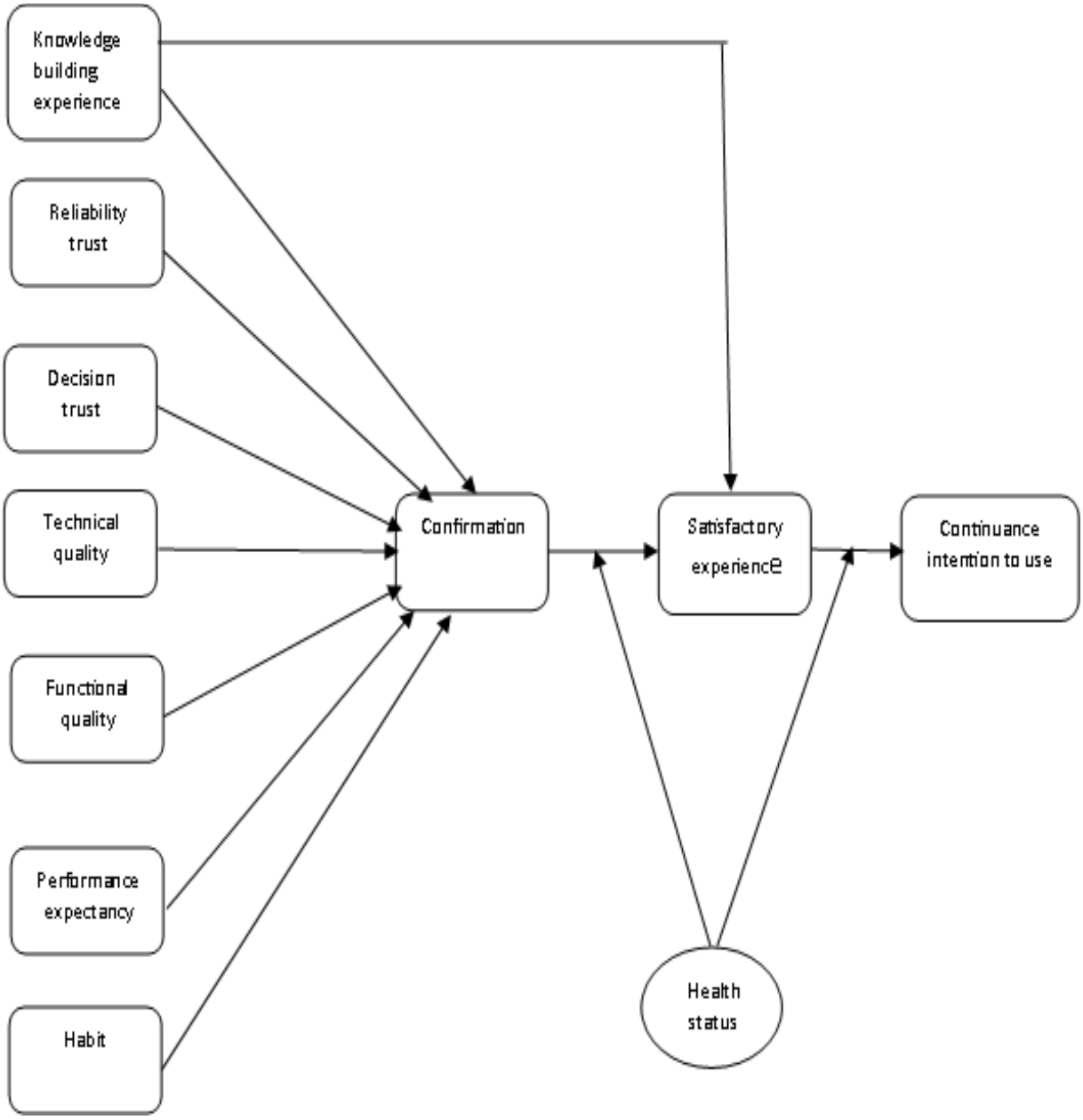
Hypothesis 10 – Supported

Based on the available literatures that examined the relationship between technology adoption and continued use of technology, hypothesis 10 expects a significant positive effect between actual use and continued long term use of an online communication channel by older adults which is predicted by satisfactory experience. Overall, this hypothesis was supported within the entire sample, Email and Facebook users and age divided categories. This result demonstrated that there was a significant relationship with those participating older adults' individuals who used online communication channels to communicate with the local government and their intention to continue using it.

5. 8 Revised Empirical Model

Having discussed the details of the entire results, the moderating effect analysis and identifying the significant moderators, a model indicating these moderating effects was developed and is presented in figure 5.9.

Figure 5.9: Revised model with moderating factors



5.16 Summary of chapter

This chapter presented the findings extracted from an analysis of data collected from the final phase sample of 1014 participating older adults. The chapter began by determining the sampling size and overall response rate, discussed possible sources of survey error that could lead to biased results, and then an analysis of the demographic data to ascertain the societal groups that participated in this research. Also provided was a summary of the sampling method

that was conducted for the data collection phase. The reliability and validity of the result gathered in this phase was also presented in this chapter.

Furthermore, the results derived from the hypothesis testing were also provided in this chapter. From the result, eight out of the ten hypothesised constructs were supported. In addition, the MOCC model was confirmed to be significant and sufficient for determining continuance intention to use. Furthermore, the moderating effect of some selected demographic variable on the constructs was also discussed and findings revealed that health status had a moderating effect on the relationship between confirmation and satisfactory experience with continuance intention to use.

Having analysed and discussed the final findings, the next chapter evaluates and discusses these findings gathered.

Chapter 6: Evaluation and Discussion

6.0 Introduction to Chapter

Having analysed the results of the main study for this research study, this chapter is going to validate the results of the findings from chapter 5 through evaluation. The evaluation process that will be used is a qualitative method through the use of telephone interviews. Further, the discussion of the main findings of the research studies will be discussed in detail. Finally, the reflection of the researcher on the doctoral programme will be presented followed by the chapter summary section.

6.1 Evaluation

In any research study where findings are derived using modelling models or algorithms, validation of the results that are based on theoretical aspects becomes a question requiring answers. From the previous chapter, the results of the primary data from the Hertfordshire area in England were obtained that achieved a conceptual model. It is essential that before this study applies the research results generated or before its being accepted as reasonable, there is need to be able to know whether or not they are worthwhile. Therefore, this research needs to evaluate the research results and the methods used to produce them critically. For this, initially a definition and selection of an evaluation method and its variations is provided. Second, a description of the methods available to conduct an evaluation and the reasoning for the choice undertaken is proffered, which is then followed by the empirical analysis that is analysed using a qualitative data collection in the form of interview will be provided.

6.1.1 Evaluation definitions

Mathison (2005) defined evaluation as the process of making judgements about the value, merit or worth of a programme for the purpose of reducing uncertainty in decision making about the programme. Looking at the definition of evaluation from a social science research perspective, Evaluation is presented as a form of applied social research, the primary purpose

of which is not to discover new knowledge, as is the case with basic research, but to study the effectiveness with which existing knowledge is used to inform and guide practical action (Clarke & Dawson, 1999). Based on this definition, the aim of the evaluation is to assess the success of the results of this research study and to obtain the information needed for further development in order to improve the credibility and validity of the findings gathered in this research.

6.1.2 Evaluation methods

From the concept of user evaluation method in Human-Computer Interaction, Fernandez et al. (2011), described an evaluation method as a set of activities that help to examine programme in order to ascertain its degree of usability. In this research study, the programme in question is the research process, which was assessed through quantitative means. As a result, the aim of the evaluation procedure in this study is to assess the results derived from this quantitative method with regards to the MOCC model. Fernandez et al. (2011) in their study classified the methods of evaluation into two; **Empirical method** and the **inspection method**. The empirical methods are based on capturing and analysing usage data from participants while the Inspection methods are performed by expert evaluators or designers and are based on reviewing the usability aspects of a programme with regards to their conformance with the set guidelines.

Furthermore, other classifications for evaluation methods include the **formative and summative methods** (Bennett, 2005; Patton, 2014). Formative evaluation is evaluation done to provide feedback to people who are trying to improve something (Bennett, 2005). In a formative study, the emphasis is on identifying the strengths and weaknesses of a programme or intervention. It tends to seek answers to questions about the process of implementation and how this relates to the achieved curriculum. In particular, the emphasis is on the perceptions and experiences of programme planners, practitioners and participants. However, in a summative evaluation, the principal aim of the exercise is to determine the overall effectiveness or impact of a programme or project with a view to recommending whether or

not it should continue to run (Patton, 2014). It tends to seek answers to questions about what relationships exist between the goals of the programme and its outcome.

Finally, evaluation can also be conducted using either quantitative or qualitative procedures (Rubin and Babbie, 2016).

- **Quantitative method:** This method is used to collect numerical data that will help assess certain hypothesis of the design through user participation. Quantitative data can be collected by surveys or questionnaires, pre-tests, observation, or review of existing documents.
- **Qualitative method:** This method involves using descriptive measurements to provide detailed insights regarding the design from the perspective of the users. Qualitative data are collected through direct or participant observation, interviews, focus groups, and case studies and from written documents.

From the above descriptions, this study employed the inspection, formative and quantitative methods in the early stage of this research study. For example, the formative method was used in the gathering and discussion of relevant literatures used for this study in the chapter two and also, the MOCC was developed after this literature were reviewed. Additionally, the formative method was also present in chapter three where the research methodology was discussed. The inspection method was applied in chapter three and four of this study.

Having considered the above, the empirical, summative and qualitative evaluation method will be conducted at this point of the research study. This is because the research study has already determined some outcomes based upon theory, but using an alternative practice based on empirical data, verification and validation of the main aim of this research and aspects of this research can be considered. This method was also selected because the aim of the evaluation is to gather detailed information that will help to determine the practicality and effectiveness of the quantitative findings from the older adults' perspective (Trochim et al, 2015). Thus, qualitative method was used to collect data in order to validate the earlier reported quantitative

results as well as discover new insights for further understanding of the hypothesised constructs.

6.1.3 Qualitative data for evaluation

In gathering qualitative data, Saunders et al (2009) suggested two methods which are interviews for gathering primary and document revision for gathering secondary data. **Qualitative interviews** give a new insight into a social phenomenon as they allow the respondents to reflect and reason on a variety of subjects in a different way. It is the most widely used data collection method for qualitative research. Braun et al (2017) also suggested that all other methods of collecting qualitative data including observation and document reviews are often dependent on the data from interviews. To achieve richness and depth of understanding, those engaged in qualitative interviewing listen for and explore key words, ideas and themes and use follow-up questions to encourage the interviewee to expand on what he or she has said that the researchers feels is important. On the other hand, **document revision** involves the use of previously existing and reliable documents and other sources of information as a source of data to be used in a new research or investigation (Miles et al, 2013). These documents include national official reports, written excerpts from open-ended surveys, organisational records personal diaries.

Having defined these two methods of gathering qualitative data, this research study identified the qualitative interview method to be suitable for achieving the aim of this study. This is because, considering that there is limited documentation specifically addressing the research context in terms of online communication channel continuance use with regards to the local government and older adults in UK, thus, the documents review method could not be utilised. Equally, as stated earlier, the aim of this evaluation process is to gain an insight on the practicality and effectiveness of the hypothesised constructs from the older adults' perspective.

Furthermore, the technique used to collect data for the evaluation process is the telephone interview technique. A telephone interview is a strategy for obtaining data which allows

interpersonal communication without face-to-face meeting (Carr & Worth, 2001). The telephone interview was selected because it usually cheaper and quicker to conduct as they remove geographical limitations and also, increases the participants' perception of anonymity (Silverman, 2013). This method of data collection can be used on its own or in combination with face-to-face interviews, and questionnaire surveys and interview schedules can be structured or semi-structured. Although one of the drawbacks of the telephone interview technique is the assumption that everyone owns a telephone, which results in bias and subsequent exclusion of those who do not have a phone (Saunders, et al., 2009). However, it is a more effective method for ensuring the inclusion of those participants who cannot be accessed face-to-face due to location, time or are reluctant to be involved in face-to-face interviews (Kothari, 2004). Furthermore, selecting the sample for telephone interview can vary accordingly for instance, some studies contact subjects purposefully, as follow-up interviews of subjects previously recruited which is the case in this research study. Given that the research site consists of several towns, telephone interview was identified as suitable for gaining maximum access to the target population.

Subsequently, to make meaning out of the qualitative data collected, analysis of the data is required. A common way of analysing qualitative data in research is the formation of themes also known as thematic analysis (Punch, 2013). The goal of a thematic analysis is to identify themes, i.e. patterns in the data that are important or interesting and use these themes to address the research or say something about an issue (Punch, 2013). It is much more than simply summarising the data; a good thematic analysis interprets and makes sense of it. Generally, thematic analysis is the most widely used qualitative approach to analysing interviews. In particular, the development of themes and codes is an important aspect of analysing the textual data derived from qualitative methods.

As Braun and Clarke (2006) suggested, themes or patterns within data can be identified either using an inductive or deductive thematic analysis. The main purpose of the inductive approach is to allow research findings to emerge from the frequent, dominant or significant themes

inherent in raw data, without the restraints imposed by structured methodologies. However, the deductive approach is a theory-driven method of analysis whereby codes are generated from existing concepts or ideas. In view of this, considering that the main focus of this evaluation process is to confirm the findings from the quantitative method, therefore, the theory-driven or deductive coding method was selected for assessing the qualitative data.

6. 2 Evaluating the quantitative findings using qualitative data

During the final data collection phase of this research studies, participants where requested to provide their contact details in case of further research was necessary. This section in the questionnaire was created to for the recruitment of participants for the evaluation aspect of this study which is in the qualitative form. On the whole 36 of the respondents indicated interest in being involved in future research work. 21 of these participants were selected based on their age and gender to ensure a balanced representation of different age and gender classes. These participants were emailed and telephoned to

confirm their agreement to participate in the telephone interview phase. However, only 11 of the participants confirmed their willingness to be interviewed through telephone.

6.3 Data collection method

As stated earlier in the chapter, the data collection took a qualitative approach in the form of a semi- structured telephone interview. On the whole, twelve semi- structured telephone were conducted with selected older adult's resident in the Hertfordshire County. These interviews were designed with an open-ended question to examine certain aspects of the continuance use of online communication channel from the narration of the older adults. Moreover, these telephone interviews were recorded and transcribed. The questions asked include: what the older adults liked or disliked about the internet, what they used the internet for, what online communication channels they use to interact with the local government, their main reason for deciding on the particular online communication channel they chose to interact with the government, whether they required assistance to use the internet while communicating, what

they feel about using the chosen online communication channel and whether they intended using it again. These questions were intended to provide validation mainly for the supported hypothesised constructs. The constructs in question include, knowledge building experience, reliability and decision trust, functional service quality, performance expectancy, satisfactory experience and continuance intention.

6. 4 Content analysis of the qualitative data

A qualitative content analysis involves using a set of techniques for the systematic analysis of texts of many kinds, addressing not only manifest content but also the themes and main ideas found in texts as primary content (Krippendorff, 2013). It can be used for evaluation, comparative designs and even in explanatory research designs. In this study, a qualitative content analysis of data was conducted which involved developing a coding scheme or using thematic analysis (Nowell,2017). The coding scheme was generated by putting the contents of the data into common themes based on the constructs of interest. At first, two judges who were unaware of the details of the research or the results gathered from the quantitative study were selected to code the transcript independently. This was done to help improve the consistency and trustworthiness of the analysis whilst reducing the bias that might result from each judge's ideas (Stemler, 2004). Furthermore, details of the construct being investigated i.e. construct definition, coding systems and examples were provided to the judges to help guide them. To reach a consensus on their judgment, the two judges compared their coding and negotiated their disagreements (Stemler, 2004). Moreover, one way of gauging the agreement between the two judges is to calculate the overall percentage of agreement or effective percentage of agreement. As a result, 76% of the percentage of consensus was finally agreed. However, to measure the reliability of the agreement between the two judges, Kappa statistics was used (McHugh, 2012). It indicates the proportion of agreement beyond that expected by chance. The Kappa coefficient (*K*) was derived using the formula below:

$$K = \frac{P\ (A) - \ P\ (E)}{1 - P\ (E)}$$

where *P (A)* is the proportion of observed agreements by the judges and *P (E)* is the proportion of agreements expected by chance. To interpret Kappa statistics, the value or coefficient of Kappa often ranges from -1 to 1, where 1 represents perfect agreement and -1 represents perfect disagreement while 0 represents agreement that can be expected by chance (McHugh, 2012). Bearing this in mind, the Kappa coefficient derived is 0.63 (63%). To validate the data classifications, acceptable value for consensus agreement should be 0.70 or greater while, the acceptable value for Kappa coefficient should be .60 or greater (Stemler, 2004). Based on this, the reliability and validity of the data classification was sufficient. Table 48 presents a sample of the responses and their classifications.

Table 4: Sample of responses and classifications

Responses	**Judge 1**	**Judge 2**	**Consensus agreement**
I am very satisfied using online communication channel to interact with the government that's why I use Facebook and Email	SATEXP (+) -> CITN (+), O -> CITN (+)	SATEXP (+) -> CITN (+)	SATEXP (+) -> CITN (+)
I am not new to the internet. So, this has helped me a lot communicating online, and I am very satisfied with that	KBE (+) -> CONF (+), CITN (+) -> SATEXP (+)	KBE (+) -> CONF (+)	SATEXP (+) -> CITN (+)
I was encouraged by my children to be sending Emails to the council instead of walking down to the office due to my age	KBE (+), SATEXP (+) -> CITN (+)	KBE (+), SATEXP (+) -> CITN(?)	KBE (+), SATEXP (+) -> CITN (+)
I use the internet but do not trust it enough to rely on it as a way of interacting with the government	RELTRU (+) -> CONF, DECTRU (+/-) -> CONF (+)	RELTRU (+) -> CONF, DECTRU (+) -> CONF (+)	RELTRU (+) -> CONF, DECTRU (+) -> CONF (+)
I find it more comfortable to use the Email to communicate with the government rather than Facebook because of its features and for my privacy	FUNSEQ (+) -> CONF (+), RELTRU (+), DECTRU (+)	FUNSEQ (+) -> CONF (+), RELTRU (+), DECTRU (+)	FUNSEQ (+) -> CONF (+), RELTRU (+), DECTRU (+)
I find it very easy to use Email and Facebook instead of going to the council office	PEREXP (+), CONF (?)	PEREXP (+) -> CONF (+)	PEREXP (+) -> CONF (+)
I am always busy at work and I find easier communicating with council through Emails	O -> CITN (+), SATEXP (?) -> CITN (+), PEREXP (+),	SATEXP (+/-) -> CITN (+), PEREXP (+), CONF (+)	SATEXP (+/-) -> CITN, PEREXP (+), CONF (+)

	CONF (+)		
My experience with Email over the years made me to stick to using when communicating with the council	KBE (+), CONF (+)	KBE (+)	KBE (+)
I have been using the internet over the years to communicate and I think it is good enough for me	CONF (+)	CONF (+)	CONF (+)
I am wary of using Facebook because of it features and how it can make your details public	FUNSEQ (+), CONF (+)	FUNSEQ (+) -> CONF (-),	FUNSEQ (+) -> CONF (-),
I use emails because it is compatible with my phone	O -> CITN (+)	O -> CITN (+)	O -> CITN (+)

Note: KBE= knowledge building experience, CITN = continuance intention to use, HAB = Habit, O = other factor, SATEXP = satisfactory experience, RELTRU = reliability trust, PEREXP = performance expectancy, DECTRU= decision trust, CONF = confirmation, -> denotes the relationship, + denotes positive and – denotes negative.

6.5 Profile of The Respondents

The age of participants used for the qualitative study ranged from 57 to 84 years old with mean age of 65 years old. The participants also consisted of seven female and four males. These participants either uses Email(*n*=10), Facebook(*n*=5) and both users(*n*=5). The participants were all selected from different towns in Hertfordshire including Old Knebworth (*n*=2), Hertford (*n*=2), Hatfield (*n=1*), Welwyn Garden City (*n=3*), Ickleford (*n*=1) and Hemel Hampstead (*n*=2). The respondents were assigned fictious names help protect the privacy of these respondents, which are utilised throughout the report.

6.7 Analysing Evaluation Results

The following sections analyses the result gathered from the qualitative study and uses it to validate the result of the quantitative study. Generally, there was a mix of opinions in terms of the intention to continue to use a particular online communication when communicating with the government by the older adults.

- **H1: Knowledge building experience has a positive effect on older users' satisfaction of an online communication channel(supported).**

Here, all of the participants agreed with the above statement. They showed that their level of experience with the internet has helped to shape their choice of online communication medium used in communicating with the government at a given time. Furthermore, two participants pointed out the importance these knowledge experience to them and how satisfied they are with their choice of online communication. One participant, Claire 59 who is a Data Analyst, commented,

"I have worked all my life in the industrial sector were most of my job requires the use of computer and also, carrying out some searches online. Most of the time, we communicate using the Email within the company and presently, my company just created a Facebook page for the customers. So, I also apply these experiences in my choice of communication with the Local government".

This confirms the result of the final findings of the analysis were the hypothesis was supported and also, has a very strong significance with the use of Email and Facebook as a way of interacting with the government by older adults.

- **H2: Knowledge building experience has a positive effect on older users' confirmation of an online communication channel (Supported).**

Equally, all the participants agreed with the above comment which still centres on knowledge building experience of an older adult in using an online communication channel. The majority of the participants believed that by gaining relevant experiences of the internet, they are able to effectively encode and decode computer-mediated messages which is helping them in their use of a given online communication medium when interacting with the government. For instance, 82-year-old Alice who is a pensioner, commented,

"I am no longer working but the experience I gained before retiring in using the internet has helped me to continue using Email when contacting the Local government because I am too old to walk down to the council office".

Furthermore, knowledge building experience centres on richness of a communication medium, richness perceptions are socially constructed they are subject to social influence. Majority of the participants revealed that family, relatives and friends made a considerable impact on their continuance use of online communication channel when interacting with the local government. Two of the participants pointed out the importance of friend's encouragement to use online communication when interacting with the government. One participant, Andy who is 84 years old commented,

"I usually call the council whenever they don't turn up to pick up my recycle bin. They promise to come around, but they never do. Until my son used their Facebook page to make it public which attracted a lot of comments. They turned up the next day to pick up the bin. I have used this method ever since then to make complaints of such nature".

The other participant, Lesley who is 78 years old commented,

"I started using the Email to contact the council when my friend told me how she uses it to contact the council which she said was quite easy. Since I started using the Email, I get a quick response and it has also saved me some fuel that I could have used to drive down to their office. I was able to get their contact through the local government website".

However, two of the participants said they do not recall ever using online communication to interact with the government due to peer influence or family and friends.

This confirms that is knowledge building experience is a motivational factor for older adults when choosing an online communication channel for communication purposes.

- **H3: Reliability trust positively affects older users' confirmation of an online communication channel (Not supported)**

In the case of reliability trust, seven of the participants disagreed with the above statement whereas four of the participants did agree with the statement. The majority of the participants believes that credibility is usually associated with choice of online communication channel

they use to communicate with the local government. Some of them feel that Facebook is not secured enough for them to use it. One participant, 62-year-old Doris who is a teacher commented,

"I only use Email when I want to send a message to the council. My colleague talks about how she gets recent news on the council's Facebook page, but I am not interested in using Facebook because I do not think it is reliable enough".

Further, two participants pointed out that the issue of someone using their personal information against them that which makes the not to use Facebook as a modern online communication medium especially when interacting with the government.

- **H4: Decision trust positively affects older users' confirmation of an online communication channel (Not supported)**

For decision trust, the same seven of the participants who disagreed with hypothesis also disagreed with the above statement. They believe that cannot willingly depend on online communication channel like Facebook in a given situation with a feeling of relative security. A participant, Emily who is 81 years old commented,

"After so many years of interacting with the government using Email, it will be difficult for me to decide to use a different type of online communication channel like Facebook because am not sure how much I can secure my details".

Another participant Paul who is 68 commented,

"Using the internet to communicate with someone is totally different from speaking to some face-to-face. There a lot of scammers online especially with these modern communication mediums like Facebook and Twitter. I will rather stick to using Email to communicate with the government".

Interestingly, it was also visible that as the age of the participants goes up, the likeability of the online interaction with government drops. Moreover, four out of the participants agreed with the above statement and pointed out the importance of using modern online communication channel like Facebook to communicate with the local government. A participant, Eve who is 57 years commented,

"I have been using Email to communicate with the local government but recently, I found out on the local government website that they now use Facebook and Twitter. So, I decided to check their Facebook page since I already have a Facebook account. I trust its security level".

- **H6: Functional quality has a positive effect on older users' confirmation of an online communication channel (Not supported).**

Eight participants disagreed with the above statement while three participants agreed with the statement. Moreover, three of the participants commented that changing the standard way government communicate with its citizen e.g. telephone and face-to-face is not good for people in their age as they are used to interacting with the government in a certain way because of the quality of the medium. In fact, one of them Jonathan who is 61 years old commented,

"I believe in consistency. I prefer to call the council office to have a discussion with them rather than going on the internet. Sometimes they ask me to send an Email which I am comfortable with but, I am not ready to use Facebook to communicate with them yet".

- **H7: Performance expectancy has a positive effect on older users' confirmation of an online communication channel (supported)**

With regards to performance expectancy, all the participants agreed to the above statement. In this study, performance expectancy is defined as the extent to which an older adult believes that using a particular online communication channel will help him or her to attain gains in the performance of government-related information access/processing. The majority of the participants believed in the benefits they get from a particular online communication channel before using it to interact with the government. For instance, 68 years old Paul commented,

"Most times, I use Email to communicate with the government because I do not want the general public to be aware of my discussion with them. Also, it is very easy for me to send a message to the council without getting notification that people are commenting under my post because that's what happens with Facebook".

Three participants revealed that some online communication channels have clearer features which helps them to interact with the local government quicker and easily. One participant, Eve who is 57 years old commented,

"I use both Email and Facebook to interact with the council. However, I prefer to use Email to send a message across to the council because I get a prompt reply afterwards unlike when I use Facebook. I only use their Facebook page if I want to hear other people's opinion about a compliant or new development around the area".

This analysis supports the final data analysis result on performance expectancy which suggest that the ease of use of an online communication channel has strong influence in older adults' decision to continually use a communication medium.

- **H9: Confirmation has significant impact on older users' continuance intention to use a particular online communication channel(supported)**

Here, nine of the participants agreed with the above statement. They believe that there is an initial expectation for an online communication channel when interacting with the government which helps them to form a perception of the performance of the channel. Afterwards, a confirmation is formed based on the expectation and performance of the channel. One of the participants from this group, Andy who is 84 years old, commented,

"Compared to my initial expectation of Facebook, it is useful, trustworthy and saves time when I used it to contact the council and likewise Email. It really adapts to my lifestyle".

However, the other group (two participants) didn't think that there is a direct connection between one's initial expectation and how the online communication channel performs. A participant from this group who did not agree with the statement commented,

"I don't think it necessarily matters to me, I just use what is available to me to contact the council as long as its online. All that I care about is a reply to my message from them".

- **H10: Satisfactory experience has significant impact on older users' continuance intention to use a particular online communication channel (Supported).**

All the participants agreed to the above statement. Some pointed out the importance of satisfaction when using a particular online communication channel when interacting with the local government. IS continuance intention is determined primarily by their user's satisfaction with prior use of a product which applies in here. One of the participants, Andy who is 84 commented,

"*I use Email because I have tried it over the years and its trustworthy. After my son contacted the council about the bin and it worked, I always go to their Facebook page to make a compliant because I believe that it helps them in check".*

Another participant, Claire who is 59 years old also commented,

"I have used online communication channel like Email and Facebook over the years in my day to day activities and I am satisfied to continue using it while interacting with the government".

- **Other identified factors**

It was observed that some of the participants decided to use a particular online communication channel when interacting with the government based on other factors aside from those used in the MOCC. From the response of three participants, compatibility surfaced as a motivating factor for their choice of online communication channel and its continuance usage. For

instance, compatibility was implied in the comment of Lesley who is 78 years old when she said,

"I have access to broadband at home and I might as well use the internet to communicate with the local government instead of using my phone credit. It also saves me the hassle of getting on the bus to the council office".

This comment suggests that her current behaviour towards her choice of communication channel is neither negative nor positive and this can only change depending on her confirmation on how using online communication channel medium to interact with the government is beneficial to her lifestyle or daily activities.

Equally, subjective norm was also noticeable from the comments of 50% of the participants. This was mainly evident in response to the question on why they choose a particular online communication channel for their interaction with the government. One of the participants, Alice who is 82 years old commented,

"I am used to writing to the council through the Email. However, my daughters told her quick they can also respond to queries through Facebook and that's how I started using it which was quite easy for me based on my experience with the internet".

Another participant, Claire who is 59 years old commented,

"Most times, I am busy at work and the council office is not open during the weekend. So, I prefer to download forms from the council website, fill it up and send it to them through Email which makes my life easy".

This comment suggests that Claire was subjected to using the internet to communicate with the local government because she needed to be at work.

In conclusion, many of the participants in the evaluation process had perceptions that were to a large extent similar with the proposed hypotheses test outcomes. All of the participants

revealed that their continuance intention to use a particular online communication channel when interacting with the government are greatly influence by their knowledge and experience with the internet and also, those who are regarded as important e.g. family, friends and colleagues. As for trust, most of the participants disagreed that some online communication channels like Facebook are not trustworthy and reliable and as a result, it is quite difficult for them to use them when communicating with the government, rather they keep to what they trust like the Email. Likewise, the hypothesis on functional service quality was not supported because majority of the participants did not agree with the comment. Some of them revealed that changing the way government communicate with the citizen i.e. going from face-to-face to a more digital way is not good enough for them because of their age. For performance expectancy, majority of the participants agreed to the comment most especially because of ease of use of online communication channel when interacting with the government. Furthermore, confirmation, satisfactory experience and continuance intention work together and majority of the participants agreed with these comments. They believe that their expectation about an online communication channel helps them confirm if that particular online communication channel actually serves them the purpose of its use which will in turn determine if their level of satisfaction with it which leads to them continuously using it in communicating with the government. They revealed that confirmation and satisfactory experience has connection with continuance intention to use.

6.7 Discussion of The Main Study

As mentioned earlier, Information and Communication Technologies (ICTs) such as the internet have changed the ways of communication, information seeking behaviour, and lifestyles of individuals (Lean et al, 2009). This technological change has transformed the world and due to these advances, online services are quicker, more convenient and cheaper to use (Sharit et al, 2008). However, it is suggested that the older adults are less likely to use technology in comparison to the younger adults (Friemal, 2016). In this research study, the ICT selected for assessing this theory is the online communication channel; Email and

Facebook. The pilot and final phases of this study produced several important, interesting and valuable insights. Predominantly, this study aimed to investigate the factors that influence an older individual's continuance use of online communication channel when interacting with the government. However, to achieve this aim, some research questions were also highlighted. This will be addressed in this section with the findings of this research study thus, this section will set the findings of the research within the context of existing literature which was consulted earlier throughout the research to address these questions. By doing so, this research also demonstrates the gaps of research that it is intending to overcome.

6.8.1 E-government online communication channel use by older adult

Presently, governments are faced with the challenge of transformation and the need to reinvent government systems in order to deliver efficient and cost-effective services, information and knowledge through ICTs (Choudrie et al, 2018). In terms of e-government services, online communication channels like Email, Facebook, Facebook, Twitter, MySpace etc are being used by the government (Local government) to facilitate communication between government and its citizens. Online communication channels enable government to communicate important government information, extend government services and receive feedback on government operations with its citizens (Graham et al, 2015). This research study's emphasis was on citizens acceptance and continuance use of the communication channels of OSNs and email choice when interacting with the local government. From a simple analysis, it was found that the most popular form of communication was email, followed by the telephone service, face-to-face contact and then OSNs (refer to table 5.8 in chapter 5). A similar study of e-government and communication channels revealed that citizens used different contact channels depending upon the usefulness and received satisfaction (Reddick & Turner, 2012).

However, in comparison to online communication channel assessed in this research study, the result indicated that participants preferred to use Email (97.2%) compared to Facebook (69.4%) when communicating with the local council. In terms of the various age groups, the

communication channels were mostly adopted and used by the young-old age group of "50-59 years", which reduces as ageing occurs. This can be compared to the Communication Market Research carried out in 2017 where individuals aged 55-75 years and older used more Email communication compared to Facebook, which also reduces as age increases (OFCOM, 2017). This shows that older adults adopt and use different channels for diverse types of communication channels when interacting with the government. This also supports other studies that revealed that Email is still the most pre-dominant online communication service used by older adults (Zickuhr & Madden 2012; Morrison & Barnett 2013).

In this research study, the usefulness of online communication channels was included in the construct of Performance expectancy, Functional service quality and Technical service quality. Technical quality did not display a significant association with continuance intention to use; therefore, citizens were not concerned with the technical issues of the OSN or email, which is correct given that email was the leading communication channel of this study. However, Performance expectancy and Functional quality revealed a strong correlation with older adults' intention to continue using online communications when interacting with the government. This suggests that Hertfordshire's older citizens used an online communication channel depending upon its usefulness (functional quality) or if the channel performed well for them. For instance, if email was easily accessed and available, then they would use that even more than the OSN. However, if the OSN was more accessible and easier to use, then they would use that. This similar to the study carried out by De Keyser & Lariviere (2014) where technical and functional service quality have positive impacts on consumer happiness. Satisfaction also showed a strong significant relationship with continuance intention to use, which is also similar to the previous study. Therefore, only if the older citizens achieved satisfaction from the online communication channel would they accept and use it. This confirms the findings of Yu (2012), in his study on what impacts people to adopt mobile banking found that that individual intention to adopt mobile banking was significantly influenced by performance expectancy and perceived credibility. Equally, Lian & Yen (2014) in their study empirically tested the key

factor influencing elderly users' intention to adopt and use the mHealth services. Their findings show that performance expectancy was one of the major factors that had a significant impact on the users' behavioural intention to adopt mHealth services. With regards to functional service quality, this also confirms the findings of Ali & Raza (2017) on proposing antecedents towards perceived service quality and resulting customer service. They found significant relationship between functional quality, technical quality, overall perceived service quality and guest satisfaction.

A critical factor that may affect older adult's adoption and continuance use of an online communication channel while communicating with the government is Trust. Bélanger and Carter (2008) emphasised the role of trust affecting the adoption and use of e-government services. A high level of government trust with a low level of internet trust indicates a scenario where citizens will try to co-operate with government efforts, but the lack of trust in the technology will inhibit this cooperation (Colesca, 2009; Alzarhrani et al, 2017). Technology trust was considered in the constructs of Reliability and Decision Trust in this study. Interestingly, both Decision Trust and Reliability trust had large impacts on continuance intention to use that was shown by the resulting coefficients of 0.166 and -0.221 respectively which also supports the study carried out by Lankton et al (2015) (refer to table 5.15 in chapter 5).

An additional factor that was studied by researchers and depicted a crucial correlation with continuance intention to use is the Knowledge Building Experience (KBE) of an older adult using a technology (Hew & Kadiri, 2016). In this study, results also showed a strong impact of KBE on older adults' continuance intention to use an online communication channel (refer to table 5.15 in chapter 5). A study conducted to examine the factors that influence social presence and user satisfaction with mobile instant messaging found that users experience is one of the drivers for user's adoption and usage of a technology (Ogara et al, 2014) which confirms the above result. Therefore, if an older adult's experience of using a communication

channel; e.g. Facebook was good, then according to the result of this study, the person would continue to use Facebook.

6.8.2 Older Adult and Digital Divide

The research within this thesis was centred on older adult. A systematic review of literature was made towards understanding the factors that influence older adults' adoption and continuance use of online communication channel in terms of social media platforms in the form of OSNs (Facebook) and Email. Older adults were argued to be an important demographic group to examine due to a significant percentage of adults aged 50 and above in the UK due to advances in medicine and the quality of life (ONS, 2018). These advances have led to an ageing UK population. Furthermore, older adults are important individuals in the society because they are wealth creators and experience holders and need to be socially included (Lusardi & Mitchell, 2007).

Many research studies attempted to study the willingness of older adults to adopt and use modern ICTs and findings revealed a limited adoption of ICT by older adults compared to other groups within societies (Czaja & Schulz, 2006). This has widened the technological gap between the young and the old in the society causing what is widely known as "digital divides" (Tsatsou, 2011). Although, the use of ICT in the older adults' population is growing, it has not increased to a level such that gaps in the diverse age groups is not noticeable; thus, an age-based digital divide still exists (Lissitsa & Chachashvili-Bolotin, 2015; Madden and Zickuhr, 2011; Ma et al, 2015). Age has always been a major and critical limiting factor for the use of technologies, especially the internet to succeed (Selwyn et al., 2003). The importance of the age factor with respect to ICT and internet adoption was also confirmed by this research, which shows that there is a decrease and minimum disparity in the likelihood of internet adoption as age increases. The level of internet adoption for the age groups of 50-59 (pre-seniors), 60-69 (young-old), 70-79(old-old) and 80+(very-old) was 36.6%, 36.0%, 17.7% and 11.7%

respectively (refer to table 5.3). This is was referred to as the 'grey divide' by Morris (2007) i.e. the low use of internet by older adults.

Furthermore, higher education is viewed to be a strong predictor to older adults' adoption and use of internet where education was linked to the interest and computer use of more highly educated older people over less educated people (Berner et al, 2015). A study carried out by Vicente & Lopez (2006) on the diffusion of ICT across the European Union found that people with a university degree are more likely to use the internet compared to those with primary school education. This is similar to the findings of this study where level of education seemed to be playing important role with regards to internet adoption by older adults. For instance, this research found more higher degree and 1st degree educational qualifications holders being internet users (39.3%), compared to other qualifications holders e.g. A Level (6.2 %) who were fewer in number (refer to table 5.5).

Besides these psychological and social factors, aging is often accompanied by various physical problems including deteriorating health and cognitive functioning that affect adoption and usage of internet (Sharit et al, 2008, Hill et al,2015). The findings of this research showed that as age increases, different ailments suffered by older adults' increase. For instance, visual impairment was greatest within the 70-79 years old age group: 50-59 years (23.4%), 60-69(27.7%), 70-79 years (36.2%) and 80-89 years (12.8%). It is important to overcome these difficulties because using the internet for communication can assist in reducing social isolation, loneliness, and depression within older adults (Gell et al, 2013).

Finally, many studies on the digital divide have found that age, education and normal age-related diseases are major causes of digital divides (Hill et al, 2015, Niehaves & Plattfaut, 2014). The findings of this study were in line with the findings of the previous studies where there are clear indications of the existence of these divides. Equally, older adults prefer to use an online communication channel they know and are familiar with when communicating with the government; i.e. Email over Facebook. Therefore, government should invest more in ICT

in terms of physical and social aspects. Promoting and providing computer education programs to people, especially to older adults, is also important in bridging the digital divide. When considering the findings of this research, for governments to promote the use and adoption of its electronic services especially in the communication area, there should be more efforts made to tackle the rising concerns of its older adults' citizens (Khosravi et al, 2016). For instance, the government could launch a national campaign to publicize its online services along with training sessions for the elderly.

6.8 Research contribution

Based on the literature review carried out in this study, it is evident that minimal studies are available examining use of online communication channels specific to the public sector by the older population in the UK. Therefore, this research study contributes a unique perspective by producing findings to the adoption and continuance use from the perspective of a local government in the UK Local community. This means that in terms of older population, modern technology usage research in the UK, particularly at the local level is very vital due to its ageing population and also, being a country leading in internet use and digital governance in Europe. Presently, government is worried about the industrial strategies being used to improve digital skills in this demographic group. The results derived from this study found out how many older adults who have digital skills to use either the novel (Facebook) or classic (Email) and also those who do not have the digital skills. This will help the local government or central government ascertain how badly the policies are doing and proffer solutions to help organisations such as Age UK who try to help the government combat loneliness in older adults through digital skills, to map out industrial strategies that will help older adults to continue using modern technology such as Email and Facebook for interaction. Furthermore, this research study provides significant and valuable theoretical contributions to knowledge in terms of older adults and internet use in the UK. It also offers a rigorous review of literature relevant to older individuals from a standpoint of online communication channels and technology continuance usage. This study also empirically validated novel constructs which

provided a deeper and clearer understanding of the reasons why older adults choose to use a particular online communication channel to interact with government. These novel constructs come together to contribute towards theoretical development in the IS field and integrate to extend the ECT which formed the MOCC. There are studies published within this area of interest, but this study retains novelty due to the investigation on public sector ie the local government and older adult online communication style.

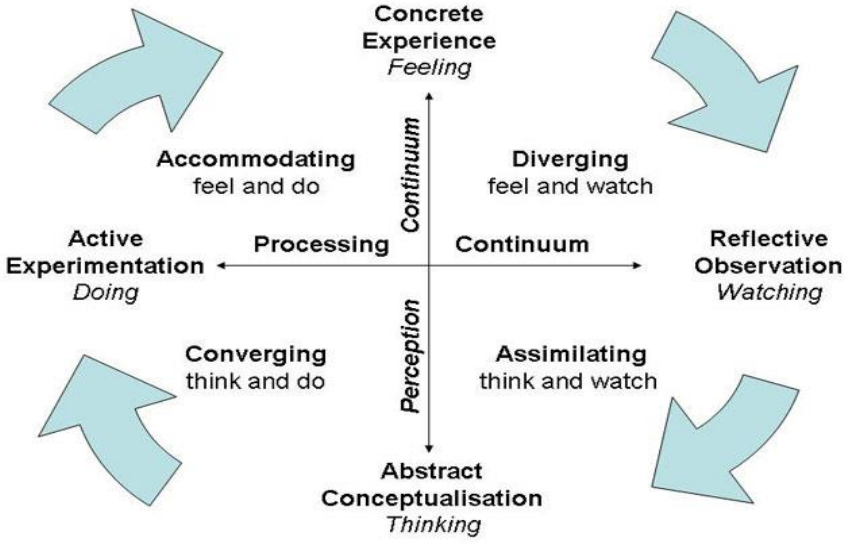
6.9 Reflection Discussion

Having completed all the important aspects of this research study, it will be useful to present a reflective discussion on the PhD journey of the researcher. This section explains the researcher's perspective of the benefits, challenges and drawbacks faced throughout the researcher's study.

According to Heyler (2015), reflection is mainly associated with reflecting on one's action which encourages an exploring of thoughts and feelings and afterwards, looking for insights and maximizing on self-awareness which all tie the process closely to identity formation. Reflection can also provide a structure in which to make sense of learning, so that concepts and theories become embedded in practice and constant thought and innovation are simultaneously fostered (Moon, 2013). Boud et al (2013) defined reflection as one's quest to understand and appreciate their experiences and intellectual activities. In essence, reflection is therefore, connected with looking back and examining the past in order to learn from what happened and perhaps not repeat mistakes. Based on these various definitions of reflection and to ensure that the applied aspect of this study can be associated with theory, the experiential learning theory (ELT) model presented by David Kolb (1984) was used in this discussion. According to Kolb & Kolb (2009), this theory defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984: 41). The grasping experience refers to the process of taking in information and transforming experience is how

individuals interpret and act on that information (Passarelli & Kolb, 2012). Thus, this learning process is presented in four stages namely: Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation. The Concrete Experience and Abstract Conceptualization are related to the grasping experience while Reflective Observation and Active Experimentation are related to the transforming experience. The concrete experiences are the foundation for observations and reflections and, these reflections are integrated and refined into abstract concepts from which inferences for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences (Kayes et al, 2005) With regards to the above discussion, each reflection stage will be further defined and discussed separately in terms of this research. Figure 6.1 shows the Kolb's learning cycle.

Figure 6.1: Kolb's ELT



Source: Kolb (2014)

Concrete Experience

At this initial stage of learning, the learner faces a novel situation surrounding new information and events. Then, the learner then tries to deal with the new situation by integrating it to his/her own feelings, beliefs and values (Blunsdon et al., 2003). In applying this experience to my own personal experience, it seemed more like a surprising news to me when I passed the interview stage and was given an offer letter for my PhD study. It was a mixed feeling for me because I have been rejected before during the application process due to incomplete supervisory team for my work by the University. Equally, I was at the early stage of my first pregnancy which made it more difficult for me to comprehend the news. I was excited and at the same time, scared of the challenges ahead. However, I knew that this was what I have always wanted which is to study a PhD, so I had to be brave.

When I started my doctoral programme, each step that followed was a challenge for me due to the novelty of the experience. My first year was the hardest for me because I had to refine my topic and attend some research development programme which will help build up my research skills. I was required to spend most of my time searching, reading and learning about the subject of my thesis. It was the most difficult year throughout my entire doctoral program where I felt in many occasions disappointed. However, the turning point for this experience was when my first paper was accepted for conference publication. I felt elated and my confidence was restored back.

As for the research aspect of my experience, learning about a new method of research approach (quantitative data collection) was a big hurdle for me to cross because I am more of a qualitative person and equally, working with a large scale of data. Although, I was taught statistics as a module during my master's degree program but that was not enough. I had to study extensively and attend seminars on this to equip myself for the task ahead. My principal supervisor also suggested to me to do some self-learning using YouTube which was really helpful with the actual model and data analysis.

Reflective Observation

At this stage of reflection, the learner tends to logically review and study new information in order to form the most suitable judgments and decisions. This is because learning occurs through observing the various existing perspectives regarding the new experience (Cortez et al., 2009). Applying this stage to my personal experience, I came from Accounting background but had a great opportunity during my bachelor's degree and master's degree to study management information system which was an aspect of accounting. This gave me an insight and helped me to build upon the little knowledge I have about IS. At first, I needed to think about my topic critically because I was going to spend four years of my study investigating the phenomenon. It was not an easy task but eventually, I discovered an area with the help of my principal supervisor which centered on E-government and how older adult choose to communicate with the government through the internet of which, the contribution was going to be beneficial to industry, policy makers and academia. The next logically review of my experience was the choice of area for data collection. It was so much of a challenging issue because I have had a first-hand experience with helping a colleague and my sister in carrying out a data collection among the elderly segment within Hertfordshire which gave me an idea of the area. So, this helped me in my choice of area.

Abstract Conceptualizations

At the abstract conceptualization stage, the learner reasons comprehensively about the new information surrounding the learning process in order to rationally establish concepts and theories based on the new information and experience (Blunsdon et al., 2003). An example of this stage in my research journey was refining and restructuring my topic and area. During my first-year examination, one of my examiners who was my second supervisor pointed out something important about my research work and topic. He said my topic did not look feasible because my report showed that I was talking about the United Kingdom as whole not a section of the country as I stated. Secondly, he said that my report also pointed towards the central

website instead of the local website as I told them in the exam. I took this as a constructive criticism and went back to work on this by visiting the council website and also, in person. Indeed, this actually helped to reshape my research work because I found out that the central government does not use the online communication channel like Facebook, Twitter, YouTube to interact with the citizen but the local government do use these modern communication technologies. Another aspect related to this stage of learning was in fact connected with the process of reviewing the literature pertaining to the topic of my thesis. A literature review of this size was a new task for me that required a great amount of time and effort. I was able to rationally understand the situation and thoroughly plan my research in terms of the theoretical foundation and methodology.

Active Experimentation

This final stage of the learning cycle refers to the actual "doings" after gaining a new knowledge and being through a certain experience (Blunsdon et al., 2003). The learner tends to apply the new knowledge gained into a new situation to solve problems or to test out new ideas. An example of this stage in my research journey was the active experimentation which took place in the final phase of my research journey. The final phase of this study was basically carried out based on lessons learnt from my PhD journey. These lessons were related to many aspects of the research, including analysis, sampling and questionnaire design and, corrective steps were taken in order to enhance the processes of the final data collection and analysis. For instance, the data collection aspect was refined based on the lessons learned from the pilot phase. During the data collection for the pilot phase, I was able to find out that the older adults do not just live everywhere in a town/area rather there are specific signs you watch out for in an area that can tell you whether older adult reside there or not e.g. signs like road signs, bungalows with railings, retirement homes etc. This helped this study during the final phase to identify these areas easily. Another example is the evaluation process which enriched this research study using qualitative approach after conducting this final phase with the quantitative

approach. Based on this experience, I am going to take into account what I have learnt about the various existing approaches and apply them in future research work.

6.10 Summary of Chapter

Having established and analysed the findings of the final data collection in the previous chapter, this chapter validated the quantitative results of this research study through evaluation. This process was achieved using qualitative method that involved conducting telephone interviews with 11 selected individuals. These interviews provided more insights in explaining how the hypothesised constructs were linked. Following this, the discussion of the whole result in this study and how they relate to the reviewed literatures were detailed. Finally, a reflective discussion of the researcher's PhD journey including lessons learnt in the process was discussed using the Kolb learning cycle from the ELT.

Chapter 7: Conclusion

7.0 Introduction to chapter

Having discussed all the phases of this research study in details on each chapter, this chapter begins with an overview of the undertaken study followed by the research conclusion. The implications of the research findings are then discussed in terms of academia, industry and policy makers. Also, the limitations of this research are clearly identified followed by a discussion of future directions. Finally, recommendations of the study and chapter summary will be presented.

7.1 Thesis Overview and Summary

This research report was divided into seven chapters to give appropriate details of each step taken in the study. The following provides a summary of the contents of each chapter;

Chapter one: In this chapter, the research study was introduced and the background to the general study was identified. Furthermore, the research gap was identified which led to the aims, objectives and research questions of this study. Also, the research scope was outlined, and the research contribution briefly discussed. These aspects were included to define the amount of generalisation that can be drawn from this research study. Also, the research approach was briefly introduced to help familiarise readers with how the data will be collected. Finally, the thesis structure was provided in order to inform readers of the step by step guide of this research study.

Chapter two: In this chapter, the origin and background for the key elements combined in the thesis was provided. A critical review of relevant literature was provided to help the readers understand the phenomenon being studied. The studies reviewed include E-government studies, ageing studies, digital divide studies adoption and continuance of ICT generally. Based on this review, the rationale behind assessing the adoption and continuance usage of online communication channel among older adults was discussed. Furthermore, the literature

review also provided a selection of theories that guided the designing of the conceptual and theoretical framework for this study. In addition, the research hypotheses which was tested in this study was developed.

Chapter three: In this chapter, a detailed discussion of the research methodology used for this study was provided. This included the philosophy guiding the researcher as well as the data collection method and analysis techniques employed in this study. This was done using the research onion. Furthermore, the research site of this study which is Hertfordshire County, UK was provided in detail. Further, the ethical measures that were taken in this study was discussed considering that this study involved human participants.

Chapter four: This chapter described the reasoning and selection of the applied research method, which is a quantitative method. The details of how the survey instrument used for the pilot test was developed and the outcomes of the instrument's applications was provided. The first two phases which was proposed in chapter i.e. the pre-testing stage of this study and the pilot phase were provided. This involved the content validity discussion and how this measure helped in this study. Furthermore, the findings of the pilot study which involved 233 respondents age 50 and above was analysed and discussed. The results from the findings showed that MOCC model which was proposed in chapter two was confirmed suitable for this study. This was evident the R^2 derived from the analysis of the pilot.

Chapter five: In this chapter, the findings that were drawn from the analysis of the final data collection were discussed. It presented the findings extracted from an analysis of data collected from the final phase sample of 1014 participating older adults. This chapter was the pivotal point of this study given that it provided the information for drawing conclusions. This chapter offered details such as, sampling sizes, response rates, non-response bias and path analysis of the MOCC framework that was tested in terms of all the participants, Email users and Facebook users. From the results, it was indicated that eight out of the ten main hypotheses proposed were supported. Finally, it was also identified from the chapter that health status was

linked to the continuance intention to use a particular online communication channel when interacting with the government among those aged 50 years and above.

Chapter six: In this chapter, the evaluation process was carried out to validate the findings of the final data results generated using quantitative method. The validation of result was conducted using qualitative method in the form of telephone interview which involved 11 interviewees who are internet users and also use the online communication channel for communication purposes. Furthermore, this validation helped to add value to the findings of this study by giving more insight for explaining the phenomenon being studied. Finally, a detailed discussion of the findings of this study were provided.

Having provided the summary of the thesis chapters, the next section is going to provide a general conclusion drawn from the results gathered in this research study.

7.2 Research Conclusion and Recommendation

In the public sector, the Internet and other advanced technologies are offering new forms of interaction that are changing communication means and increasing people's inclusion in society. However, not all the citizens are making use of these changes; particularly the older adults. Of the various demographic groups in society, the ageing population is one that is presently causing immense concern. This study aimed to identify, explore and understand the factors that encourage older adults of 50 years old and above to continue using a particular online communication channel (Facebook versus Email) when interacting with the government. For this, a Local government perspective in United Kingdom (UK), Hertfordshire was selected where this study used a quantitative study that utilized an online survey questionnaire for data collection. A conceptual framework based on leading information system theories of ECT, UTAUT, CET along with service quality and trust factors was developed to help in addressing the research aim of this study. Prior to forming the framework, a literature review of the main issues surrounding online communication channels, digital divide and older people and e-government were provided.

From the results of this research studies, the following conclusions and recommendations are made. Firstly, the findings of this study demonstrated that the theoretical framework which is the MOCC sufficiently demonstrated appropriateness in predicting continuance intention to use online communication by older adults when interacting with the government. this was evident in the r-squared derived from the analysis both at the pilot stage and the final phase of this research study.

On the whole, the result obtained showed that eight out of the ten main hypotheses formed where supported by this study and they are as follows: knowledge building experience, decision trust, reliability trust, functional service quality, performance expectancy, satisfactory experience and continuance intention to use. Further, satisfactory experience had the strongest effect on continuance intention to use followed by knowledge building experience, which had a very strong impact on satisfactory experience. However, habit and technical service quality did not have significant impact on continuance intention to use. In addition, the impact of satisfactory experience was moderated by age, gender, education and health status. Findings revealed that health status i.e. ailments suffered by older adults had moderating effect on continuance intention to use online communication channel by older adults when interacting with the government.

Furthermore, previous studies have shown how older adults adopt and use modern ICTs and how they vary. For instance, Plattfaut (2014), who studied the intentions of the elderly with regards to internet use concluded that a growing group of the elderly have different attitudes, beliefs and intentions when it comes to technology usage. In terms of internet use, Czaja & Lee (2007) highlighted the existence of the older adult who intentionally do not want to use the internet i.e. older adults who feel quite content without the internet in their lives. This is evident in this study whereby 33.5% of the non-internet adopters are just not interested in using the internet and 2. 1% of the non-internet users are too busy that they do not want to use the internet, 29.5% feel they are told to learn to use the internet. This shows that there is still a technological gap in older adult adoption and use of modern technologies which leads to the term “digital divide”.

Many studies on the digital divide have found that age, education and normal age-related diseases are major causes of digital divides (Selwyn et al, 2003; Hill et al, 2015; Niehaves & Plattfaut, 2014). The findings of this study were in line with the findings of the previous studies where there are clear indications of the existence of these divides. The ailments that were most prevalent in this study are vision impairment, ear disorder, high blood pressure and Arthritis of hands and fingers. In terms of age, this research study confirmed through the results of its finding that age divide does not necessarily lie between the younger generation and older adults but, a generational difference exists within the older population. This was evident in this study, for instance, the importance of the age factor with respect to ICT and internet adoption was also confirmed by this research, which shows that there is a decrease and minimum disparity in the likelihood of internet adoption as age increases. This is similar to the study carried out by Pan & Jordan -Mash (2010) on their study on factors affect Chinese older adults' decisions to adopt the Internet. Their findings showed variation within the older adults i.e. the old seniors and young seniors. Likewise, a study carried out by Pew Research Centre on older adult and technology found evidence of this generational difference toward younger, more highly educated, or more affluent seniors and the less affluent, often with significant challenges with health or disability (Smith, 2014). This could be because they have a relatively low familiarity with information and communication technology (ICT) and also, as individuals' age, the declining physical, sensory and cognitive capabilities lead to significant barriers of ICT use. Moreover, their mobility, which is an essential part of offline social activities, is quite limited because of the effect of ageing.

Finally, in terms of e-government services, online communication channels like Email, Facebook, Twitter, MySpace etc are being used by the government (Local government) to facilitate communication between government and its citizens. This research study's emphasis was on citizens acceptance and continuance use of the communication channels of OSNs and email choice when interacting with the local government. the findings of this study showed that older adults preferred to use Email compared to Facebook when communicating with the local council. This could be that older adult used different contact channels depending upon

the usefulness and received satisfaction. This also supports other studies that revealed that Email is still the most pre-dominant online communication service used by older adults (Zickuhr & Madden 2012; Morrison & Barnett 2013). To increase service use within citizens, government support in the form of raised awareness of internet use is suggested as this can assist in reducing the online risks within citizens.

7.3 Implications of Research

Having detailed the conclusion of this research study, this section is going to provide details on the implication of this research study to academia, industry and policy makers.

7.3.1 Implication to academia

This research study contributes to the theoretically and empirically to the body of knowledge on older adults' adoption and continuance usage technology. Specifically, this research study offers an insight into adoption and continuance use of online communication channel by older adult when interacting with the UK local government. Hence, this study offers insight into the perspective of a significant demographic i.e. the older population. Hypothetically, this study presents a novel model the MOCC model to explain the factors that encourage older adult's continuance use of online communication channel when interacting with the local government integrating the ECT model with constructs from UTAUT, CET, service quality and trust. This can be proven from the empirical analysis conducted within this research study. Moreover, prior research has focused upon whether older adults are accepting diverse types of e-government services or the impacts of the existence of the internet on older adults' lives. From the findings of this research study, it was revealed that there is generation difference within the older adult group in terms of internet adoption and continuance usage. This research has proceeded to a higher level and has shown that government service deserves and merits attention, which if not focused on, could impact the adoption of novel or classic forms of communication. The results of this study will lead to a better understanding of factors that affect older adult decision making when continuing the intention of using online communication tools when communicating with the local government. Furthermore, this study

gathered its data using a quantitative research method and validated the result of this study using a qualitative method. This helped to provide deeper understanding of the study and strengthened the findings of this research.

7.3.2 Implication to industry

For industry, the framework that this study has empirically tested and validated will be beneficial as providers of communication channels to the government will become aware of the factors influencing older adults' choices when interacting with the government. This research also provides an implication of a better understanding of factors affect the choice and continuance use of modern technologies of the older adult group that Internet Service Providers could find useful in promoting products and Internet services in the future. Most importantly, a fundamental outcome of this research is the understanding that the older population are concerned with how secure a communication channel is before they can use it because they do not want their personal information being used by scammers. These findings suggest that Internet service providers and other application providers should invest more resources and strategies in providing assurance and obtaining confidence as this age group is of immense importance.

7.3.3 Implication to policy makers

The result of this study will also be beneficial to policy makers. As earlier mentioned in this study, modern ICTs has penetrated different aspects of economy and UK is one country that is experiencing ageing population which means that in near future, the growth of the economy will depend on this demographic. This suggest that digitally including older adult will be of paramount importance. For policymakers, this research has identified the online communication channels that promote interaction with citizens at a local government level. Therefore, if policymakers are still forming new strategies and budgets for the future, there should be a provision made for overcoming and handling some of the challenges cited in this study. Equally, efforts should be

made to increase e-government functionality within the leading OSNs of Twitter, Facebook and LinkedIn since these were found to be popular for older individuals in the UK.

7.4 Limitations and Future Directions

As with any research study, limitations do exist and must be identified in order to be able to generalise findings appropriate for the research purpose. This research encountered some limitations which will be discussed, and future directions provided.

Before the results of this study can be used, it is important to understand that although this was carried out from a UK perspective, the research findings are not nationally representative of the UK. This study examined a Local government (Hertfordshire) which is a small portion of the country due to its prosperity, ageing population and accessibility. This posed to be a limitation as it would have strengthened the assumptions and deductions made in this research study. A suggested future direction is to seek a larger sample size with the added benefit that a much larger sample population leads to generalisations, which for this are about the digital divide and public sector online communication channels. It is also recommended that a future research study could examine the regional differences that might exist within UK with respect to older adults' choice of online communication when interacting with the public sector and the findings compared to the findings of this research study.

Furthermore, the pilot phase was carried out using a non-probability sample technique which is the snowball sampling technique. Snowball sampling is a non-probability sampling technique where existing study subjects recruit future subjects from among their acquaintances. However, it can be very difficult to identify units to include in the sample due to no obvious list of the population your interest (Bryman, 2016). Also, for this study, a quantitative approach was utilized for the main study. It is recommended that for the future, a qualitative approach involving focus groups and/or observations will lead to a diverse perspective and an in-depth understanding of the older adults' needs and views towards public sector online communication channels continuance usage.

Furthermore, this study used a cross- sectional time horizon due to the limited time frame to carry out this research study. Survey carried out by the Office of National Statistics (2018) showed that over the years, the older population adoption and use of technology has being changing. This could be due to the gradual changes in technology adoption amongst the younger population and it is likely that individuals in the older population will also change in time. As older adults change their attitude towards internet and with regards to the adoption and use of online communication channel when interacting with the government, it could be said that the findings of this study will be subject to change of over time. Therefore, it can be argued that this research is limited in terms of longitudinal research. Based on this reasoning, this study recommends that research calls for other researchers to conduct longitudinal studies in the area online channels adoption and continuance use so as to provide different and equally valuable perspectives on this phenomenon.

7.6 Summary of Chapter

Having discussed the validation process of the findings of this study in the previous study, this chapter discussed the chapter review of this study. Furthermore, the research conclusion and recommendations were discussed in detail followed by the implication of this study to academia, industry and policy makers. And finally, the chapter summary.

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Appendices

Appendix1: Ethics Approval

UNIVERSITY OF HERTFORDSHIRE
SOCIAL SCIENCES, ARTS AND HUMANITIES

ETHICS APPROVAL NOTIFICATION

TO Nwanekezie Ukamaka

CC Prof Jyoti Choudrie

FROM Dr Tim Parke, Social Sciences, Arts and Humanities ECDA Chairman

DATE 13/01/2015

Protocol number: **BUS/PG/UH/00745**

Your application for ethical approval has been accepted and approved by the ECDA for your school.

Appendix 2 : Sample of content validity form

Content Validity - Instructions

A link to the survey questionnaire questions is below.

https://www.surveymonkey.co.uk/r/FLRT76Y

Before completing the online survey please consider the following:

How long (minutes) did it take you to complete the survey?

Can you suggest any changes that can be made to improve this survey in order to make it easier and more straightforward for a participant to follow and complete. This includes spelling or grammar errors.

Are there any questions that you found too intrusive or you thought may discourage people from taking part in this survey?

Also, for each individual question we would like your opinion on whether you believe that question is:

Essential to aims of this research.
Useful, but not essential to the aims of this research.

Please select one box for EACH question according to the statement you think is applicable from the three options given above. Please indicate with a Y for Yes and an N for No

Finally, after checking for accuracy and correctness, please complete the questionnaire and answer the following three questions on the feedback page below.

Once you have done this please save the document, then attach your response to an email back. Thank you.

Please enter your name here (if you want to) >

SURVEY QUESTIONS

Section A – Demographics Information

	Essential	Useful, but not essential	Not necessary
Question 1			
Question 2			
Question 3			
Question 4			
Question 5			
Question 6			
Question 7			
Question 8			
Question 9			

Section B – You and the Internet

	Essential	Useful, but not essential	Not necessary
Question 10			
Question 11			
Question 12			
Question 13			
Question 14			

Section C – You and your Local Council

	Essential	Useful, but not essential	Not necessary
Question 15			
Question 16			
Question 17			
Question 18			

Section D – Choice of communication medium

	Essential	Useful, but not essential	Not necessary
Question 19			
Question 20			

Section E – Usage of Email and reasons for its use

	Essential	Useful, but not essential	Not necessary
Question 21			
Question 22			
Question 23			
Question 24			

Section F – Usage of Facebook and reasons for its use

	Essential	Useful, but not essential	Not necessary
Question 25			
Question 26			
Question 27			
Question 28			
Question 29			
Question 30			
Question 31			

Section K – Thank you page

	Essential	Useful, but not essential	Not necessary

Question 32 ☐ ☐ ☐

FEEDBACK

(1) How long (minutes) did it take you to complete the survey?

(2) Can you please suggest any changes that can be made to improve this survey in order to make it easier and more straightforward for a participant to follow and complete. This includes spelling and grammar errors.

(3) Are there any questions that you found too intrusive or you thought may discourage people from taking part in this survey?

Appendix 3: Sample of leaflet for recruiting participants

A Facebook, Twitter, LinkedIn

(Online Social Networking) Survey

THE UNIVERSITY OF HERTFORDSHIRE KINDLY ASKS YOU

>>>> AGED 50 YEARS AND ABOVE <<<<

TO SPARE 10-15 MINUTES TO TAKE PART IN THIS RESEARCH. YOU DO NOT HAVE TO BE A CURRENT ONLINE SOCIAL NETWORKING USER OR INTERNET USER TO TAKE PART.

This is an important and unique research project being conducted at University of Hertfordshire's Business School. Governments around the globe are moving away from the face-to-face medium of communication to a more digital way of communication using online channels e.g. E-mail and online social networks such as, Facebook, Twitter and LinkedIn to interact with its citizens. However, not everyone is fully making use of these changes, especially the older adults, or silver surfers, adults aged 50 years and above. The older adult population is of interest because the older adult population is increasing and making large contributions to society and economies, so improving their wellbeing and quality is of immense importance.

Therefore, we kindly ask you and your household members aged 50 years or over to PLEASE give 15 minutes of your valuable time for this unique research project. The research team at the University of Hertfordshire would like to take this opportunity to thank you in advance for your time, patience and co-operation. **Please note:** We do not ask for any personal or private household information. Please be assured that any information you provide will be used for academic research purposes only. Your survey responses for this research will be identified using only codes. The online survey can be accessed from all computers, PCs, laptops, iPads and Smartphones at the following website address:

https://www.surveymonkey.co.uk/r/FLRT76Y

The research team at the University of Hertfordshire would like to take this opportunity to thank you in advance for your time, patience and co-operation.

****Please Note****

*****If you are unable to access the internet because you have no access to it, or you do not know how to use a computer, please call (07588691184 or (024)76393391) within two (2) weeks of receiving this leaflet. In the call, please state your age, education, occupation, place that you are calling from e.g. Welwyn garden city and whether you are calling because you cannot access the questionnaire due to not knowing how to use a computer; do not have a computer to complete it, or do not use the internet and do not intend to.***

THANK YOU very much for your help.

Survey participants are welcome to enquire about the outcomes of this research project by emailing one of the researchers: Mrs Ukamaka Nwanekezie, a research student (Email:u.e.nwanekezie2@herts.ac.uk) or Prof. Jyoti Choudrie, Professor, Information Systems (E mail: j.choudrie@herts.ac.uk). This work has been approved by UH Ethics Committee with the Protocol number [illegible]

Appendix 4 : List Of Towns In Hertfordshire

Abbots Langley
Aldbury
Aldenham
Apsley
Ashwell
Ayot St Lawrence
Baldock
Barkway
Barley
Barnet
Bedmond
Berkhamsted
Bishops Stortford
Borehamwood
Bovingdon
Braughing
Brickendon
Bricket Wood
Brookmans Park
Broxbourne
Buntingford
Bushey
Bushey Heath
Cheshunt
Chipperfield
Chorleywood
Codicote
Colney Heath
Cottered
Cuffley
Datchworth
Elstree
Enfield
Epping Green
Essendon
Flaunden
Garston
Gosmore
Graveley
Great Hadham
Great Hallingbury
Great Offley
Harpenden
Hatfield
Hemel Hempstead
Henham
Hertford
Hertford Heath
Hertingfordbury
Hexton
Hinxworth
Hitchin
Hoddesdon
Hunsdon
Ickleford
Ippolyts
Kimpton
Kings Langley
Knebworth
Letchworth Garden City
Little Gaddesden
Little Hadham
Little Hallingbury
Little Wymondley
London Colney
Long Marston
Markyate
Marshalswick
Marsworth
Much Hadham
New Barnet
Old Knebworth
Oxhey
Perry Green
Pirton
Potters Bar
Potters Crouch
Preston
Puckeridge
Radlett
Redbourn
Rickmansworth
Royston
Sandridge
Sawbridgeworth
Sheering
Shillington
South Mimms
St Albans
Standon
Stanstead Abbotts
Stansted
Stansted Airport
Stapleford
Stevenage
Stotfold
Takeley
Tea Green
Tewin
Tring
Turnford
Ugley
Walkern
Waltham Cross
Ware
Watford
Watton At Stone
Wellpond Green
Welwyn
Welwyn Garden City
Westmill
Weston
Wheathampstead
Whitwell
Wigginton
Willian

Appendix 5: Result for the final data collection

Unweighted results for the demographic

Age	50 - 59 years	Count	374
		Table N %	36.9%
	60 - 69 years	Count	364
		Table N %	35.9%
	70 - 79 years	Count	177
		Table N %	17.5%
	80 - 89 years	Count	90
		Table N %	8.9%
	90 years and above	Count	9
		Table N %	0.9%
	Total	**Count**	**1014**
		Table N %	**100.0%**
Gender	Female	Count	603
		Table N %	59.5%
	Male	Count	411
		Table N %	40.5%
	Total	**Count**	**1014**
		Table N %	**100.0%**
Educational Qualification	Higher Degree / Postgraduate Degree (MBA, PhD, MD, MA, MSc)	Count	77
		Table N %	7.6%
	1st Degree (BA / BSc)	Count	348
		Table N %	34.3%
	HND, HNC, Teaching	Count	91
		Table N %	9.0%
	BTEC/College Diploma	Count	241
		Table N %	23.8%
	A Level	Count	72
		Table N %	7.1%
	GCSE/O Level	Count	185
		Table N %	18.2%
	Total	**Count**	**1014**
		Table N %	**100.0%**
Employment status	Pensioner 65+	Count	233
		Table N %	23.0%
	Retired (under 65 years old)	Count	147
		Table N %	14.5%
	Employed full time	Count	410
		Table N %	40.4%
	Employed part time	Count	152
		Table N %	15.0%
	Entrepreneur	Count	45
		Table N %	4.4%
	Unemployed (for less than 6 months)	Count	2
		Table N %	0.2%
	Unemployed (for medical reasons)	Count	15
		Table N %	1.5%
	Unemployed (for more than 6 months)	Count	3
		Table N %	0.3%
	Student (part-time)	Count	1
		Table N %	0.1%

	Student (full-time)	Count	0
		Table N %	0.0%
	Redundant	Count	6
		Table N %	0.6%
	Total	**Count**	**1014**
		Table N %	**100.0%**
Health status	Excellent	Count	546
		Table N %	53.8%
	Good	Count	455
		Table N %	44.9%
	Poor	Count	13
		Table N %	1.3%
	Total	**Count**	**1014**
		Table N %	**100.0%**
Marriage status	Married	Count	519
		Table N %	51.2%
	Widowed	Count	122
		Table N %	12.0%
	Divorced	Count	132
		Table N %	13.0%
	Separated	Count	162
		Table N %	16.0%
	In a domestic partnership or civil union	Count	11
		Table N %	1.1%
	Single, but cohabiting with a significant other	Count	35
		Table N %	3.5%
	Single, never married	Count	33
		Table N %	3.3%
	Total	**Count**	**1014**
		Table N %	**100.0%**
Ethnicity	White British	Count	443
		Table N %	43.7%
	Any other white background	Count	419
		Table N %	41.3%
	White and Black Caribbean	Count	25
		Table N %	2.5%
	White and Black African	Count	17
		Table N %	1.7%
	White and Black Asian	Count	5
		Table N %	0.5%
	Any other mixed background	Count	89
		Table N %	8.8%
	Asian/Indian	Count	2
		Table N %	0.2%
	Asian/Pakistani	Count	0
		Table N %	0.0%
	Any other Asian Background	Count	2
		Table N %	0.2%
	Black and Black British	Count	10
		Table N %	1.0%
	Caribbean	Count	2
		Table N %	0.2%
	African	Count	0

		Table N %	0.0%
	Other Black groups	Count	0
		Table N %	0.0%
	Chinese	Count	0
		Table N %	0.0%
	Japanese	Count	0
		Table N %	0.0%
	Other ethnic groups	Count	0
		Table N %	0.0%
	Total	**Count**	**1014**
		Table N %	**100.0%**

Aliment suffered by the participants

Ailment suffered		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
vision impairment	Count	133	206	120	65	6	530
	Table N %	13.1%	20.4%	11.8%	6.4%	0.6%	52.3 %
Learning difficulties (cannot see the words correctly)	Count	12	30	31	30	7	110
	Table N %	1.2%	3.0%	3.1%	2.9%	0.7%	10.9 %
Deafness	Count	1	5	2	0	0	8
	Table N %	0.1%	0.5%	0.2%	0.0%	0.0%	0.8%
Arthritis of the hand/s	Count	10	23	13	7	0	52
	Table N %	0.9%	2.3%	1.2%	0.7%	0.0%	5.2%
Arthritis of the fingers	Count	9	27	19	7	2	64
	Table N %	0.9%	2.7%	1.8%	0.7%	0.2%	6.4%
Alzheimer's Disease	Count	1	0	1	1	0	3
	Table N %	0.1%	0.0%	0.1%	0.1%	0.0%	0.3%
Balance Disorders	Count	4	7	6	2	2	22
	Table N %	0.4%	0.7%	0.6%	0.2%	0.2%	2.2%
Ear Disorders	Count	15	34	28	28	3	108
	Table N %	1.5%	3.4%	2.7%	2.8%	0.3%	10.7 %
Dementia	Count	1	2	1	0	0	4
	Table N %	0.1%	0.2%	0.1%	0.0%	0.0%	0.4%
Falls & Mobility Problems	Count	7	18	4	10	3	42
	Table N %	0.7%	1.8%	0.4%	1.0%	0.3%	4.1%
Generalized Anxiety Disorder	Count	4	12	8	11	1	36
	Table N %	0.4%	1.2%	0.8%	1.1%	0.1%	3.5%
Heart Disease	Count	0	1	1	0	0	2
	Table N %	0.0%	0.1%	0.1%	0.0%	0.0%	0.2%
High Blood Pressure	Count	15	24	14	18	1	71
	Table N %	1.4%	2.4%	1.4%	1.8%	0.1%	7.0%
Memory Loss	Count	0	1	0	1	0	2
	Table N %	0.0%	0.1%	0.0%	0.1%	0.0%	0.2%
Neck Fracture	Count	3	0	0	3	0	5
	Table N %	0.3%	0.0%	0.0%	0.2%	0.0%	0.5%
None of the above	Count	223	127	43	17	2	411
	Table N %	22.0%	12.5%	4.2%	1.7%	0.2%	40.6 %
disability through back injury	Count	0	0	1	0	0	1
	Table N %	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
shoulder, neck problems (from use of computer for work)	Count	1	0	0	0	0	1
	Table N %	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%
Total	Count	371	364	180	92	8	1014
	Table N %	36.6%	35.9%	17.8%	8.9%	0.8%	100.0 %

How often do you use the internet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	209	20.6	23.2	23.2
	Several times of the day (every hour)	132	13.0	14.7	37.9
	Several times of the day (not every hour)	329	32.4	36.6	74.6
	Weekly	123	12.1	13.7	88.2
	Several times of the week (three times a week)	64	6.3	7.1	95.3
	Several times of the week (Less than three times of the week)	36	3.6	4.0	99.4
	Monthly	4	.4	.4	99.8
	Less than monthly	2	.2	.2	100.0
	Total	898	88.6	100.0	
Missing	-11.00	116	11.4		
Total		1014	100.0		

How would you describe your level of knowledge and experience in the use of computers?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Other (please specify)	4	.4	.5	.5
	I have no knowledge or experience of computers	18	1.8	2.0	2.5
	I am a user with little knowledge and experience	313	30.9	34.8	37.3
	I am a user with a lot of knowledge and experience	564	55.6	62.7	100.0
	Total	900	88.7	100.0	
Missing	-11.00	114	11.3		
Total		1014	100.0		

Benefits of using internet

		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
To book appointments	Count	275	246	113	36	0	669
	Table N %	30.6%	27.3%	12.5%	4.0%	0.0%	74.4%
Searching Google for information	Count	318	293	145	48	1	805
	Table N %	35.4%	32.6%	16.1%	5.3%	0.1%	89.4%
For Banking (e.g. internet banking)	Count	122	103	24	12	0	262
	Table N %	13.5%	11.5%	2.7%	1.3%	0.0%	29.1%
For Paying bills (e.g rent, council tax)	Count	158	152	58	24	0	391
	Table N %	17.5%	16.9%	6.4%	2.6%	0.0%	43.4%
For Work purposes (.e.g. Paid / unpaid work done at home)	Count	268	202	68	20	0	559
	Table N %	29.8%	22.5%	7.6%	2.2%	0.0%	62.1%
For Communication (e.g Checking Emails , Facebook, Video ca	Count	325	310	141	51	1	827
	Table N %	36.2%	34.4%	15.6%	5.6%	0.1%	92.0%
For Leisure (eg. for surfing the internet)	Count	257	234	98	34	0	623
	Table N %	28.6%	26.0%	10.9%	3.8%	0.0%	69.3%
For general reading	Count	229	219	86	36	1	571
	Table N %	25.5%	24.3%	9.6%	4.0%	0.1%	63.5%
For Travel purposes	Count	195	181	65	19	0	459
	Table N %	21.6%	20.1%	7.2%	2.1%	0.0%	51.0%
For Entertainment purposes	Count	175	155	67	16	0	413
	Table N %	19.5%	17.2%	7.4%	1.8%	0.0%	45.9%
For Seeking Health care information	Count	192	186	77	24	0	479
	Table N %	21.3%	20.7%	8.5%	2.7%	0.0%	53.2%
For Interacting with government agencies (e.g Central and Lo	Count	218	184	72	29	0	502
	Table N %	24.2%	20.4%	8.0%	3.2%	0.0%	55.8%
For online Shopping	Count	189	167	74	22	0	452
	Table N %	21.0%	18.5%	8.3%	2.4%	0.0%	50.2%
For seeking information on benefits	Count	183	180	71	27	1	462
	Table N %	20.3%	20.0%	7.9%	3.0%	0.1%	51.3%
Other (please specify)	Count	0	0	0	1	0	1
	Table N %	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
Total	Count	359	333	153	54	1	900
	Table N %	39.9%	37.0%	17.0%	6.0%	0.1%	100.0%

Have you ever visited the Hertfordshire council website(http://www.hertsdirect.org)?

Age		No	Yes	No but plan to use	Total
50 - 59 years	Count	5	354	12	371
	Table N %	0.4%	35.0%	1.1%	36.6%
60 - 69 years	Count	2	331	32	365
	Table N %	0.2%	32.6%	3.1%	36.0%
70 - 79 years	Count	3	150	27	180
	Table N %	0.3%	14.8%	2.7%	17.7%
80 - 89 years	Count	2	52	37	91
	Table N %	0.2%	5.2%	3.6%	8.9%
90 years and above	Count	0	1	8	8
	Table N %	0.0%	0.1%	0.7%	0.8%
Total	Count	11	888	114	1014
	Table N %	1.1%	87.6%	11.3%	100.0%

Reasons for choosing a particular channel of communication.

	Responses	
	N	Percent
Fast to navigate through menus	832	8.3%
Entertainment	194	1.9%
Controlled messages	799	7.9%
Clear and effective language	730	7.2%
Speed-quick delivery of message versus going physically to a	557	5.5%
Storage facility	459	4.6%
Document filling and retrieval	424	4.2%
Request a return receipt	389	3.9%
Downloading a web page	376	3.7%
Viewing a web page	310	3.1%
Uploading of documents	365	3.6%

A frequently answered question section	356	3.5%
Good signposts on the webpage	695	6.9%
Good colours on the web page	738	7.3%
Good colours on the portal	731	7.3%
Good text size	589	5.8%
A search facility	388	3.8%
A facility that allows text size to be altered	399	4.0%
A site that is recognised as safe and secure	749	7.4%
Total	10080	100.0%

Reasons for not using the internet

	Responses		
	N	Percent	Percent of Cases
Just not interested	39	14.1%	33.5%
I do not have the skills	62	22.5%	53.7%
I do not feel comfortable using the internet	58	21.2%	50.6%
Privacy worries (criminals might take control of my personal information)	37	13.4%	32.1%
Bad experiences with hackers/virus	37	13.3%	31.8%
Too old to learn	34	12.4%	29.5%
I am too busy	2	0.9%	2.1%
Other (please specify)	6	2.1%	5.1%
Total	275	100.0%	238.4%

Do you plan to use an online communication channel in future while interacting with the Local council

		Age					
		50 - 59 years	60 - 69 years	70 - 79 years	80 - 89 years	90 years and above	Total
Yes, I intend to start using online communication to interact with the Local council	Count	214	177	85	29	1	506
	Table N %	21.3%	17.6%	8.5%	2.9%	0.1%	50.4%
No, I do not intend to start using online communication to interact with the government	Count	27	28	21	10	1	87
	Table N %	2.6%	2.8%	2.1%	1.0%	0.1%	8.6%
Yes, I predict that I will start using online communication to interact with the Local council	Count	60	89	27	15	0	191
	Table N %	6.0%	8.9%	2.7%	1.5%	0.0%	19.0%
Yes, I expect to start using online communication channel to interact with the Local council	Count	49	36	16	6	1	109
	Table N %	4.9%	3.6%	1.6%	0.6%	0.1%	10.8%
No, I do not have any plans of using online communication channel to interact with the Local council	Count	17	30	28	30	5	112
	Table N %	1.7%	3.0%	2.8%	3.0%	0.5%	11.1%
Total	Count	367	361	177	91	8	1004
	Table N %	36.5%	36.0%	17.7%	9.0%	0.8%	100.0%

Please choose the town that you live in from either of the boxes. - Town of choice (A - Z)

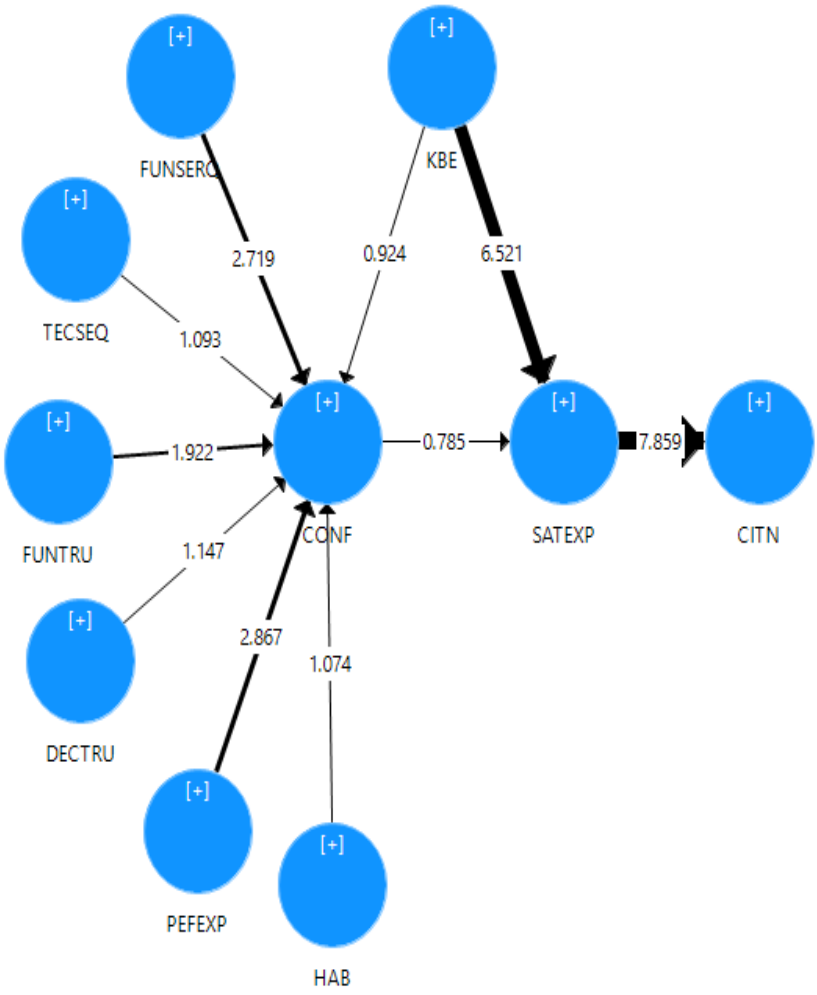
	Frequency	Percent	Valid Percent
Abbots Langley	9	.9	.9
Albury	2	.2	.2
Aldenham	3	.2	.2
Apsley	6	.6	.6
Ashwell	6	.6	.6
Aspenden	1	.1	.1
Aston	3	.3	.3
Aston End	2	.2	.2
Ayot St Lawrence	6	.6	.6
Ayot St Peter	2	.2	.2
Baker's End	2	.2	.2
Baldock	44	4.4	4.4
Barley	1	.1	.1
Bayfordbury	14	1.4	1.4
Bengeo	3	.3	.3

Benington	4	.4	.4
Berkhamsted	31	3.1	3.1
Bishop's Stortford	40	4.0	4.0
Borehamwood	5	.4	.4
Bovingdon	3	.3	.3
Brookmans Park	8	.8	.8
Broxbourne	26	2.5	2.5
Buntingford	17	1.6	1.6
Bury Green	6	.6	.6
Bushey	16	1.6	1.6
Bushey Heath	3	.3	.3
Caldecote	9	.9	.9
Cheshunt	8	.8	.8
Chipperfield	2	.2	.2
Chipping	1	.1	.1
Chorleywood	2	.2	.2
Codicote	23	2.3	2.3
Cole Green	5	.5	.5
Colney Heath	11	1.1	1.1
Croxley Green	1	.1	.1
Cuffley	1	.1	.1
Digswell	3	.2	.2
Elstree	1	.1	.1
Essendon	4	.4	.4
Flamstead	3	.3	.3
Goff's Oak	5	.5	.5
Great Offley	2	.2	.2
Hadham Cross	1	.1	.1
Harpenden	22	2.2	2.2
Hatfield	17	1.6	1.6
Hemel Hempstead	13	1.3	1.3
Heronsgate	1	.1	.1
Hertford	14	1.4	1.4
Hertford Heath	5	.5	.5
Hertingfordbury	3	.2	.2
Hitchin	30	3.0	3.0
Hoddesdon	20	2.0	2.0
Ickleford	13	1.3	1.3
Kimpton	4	.4	.4

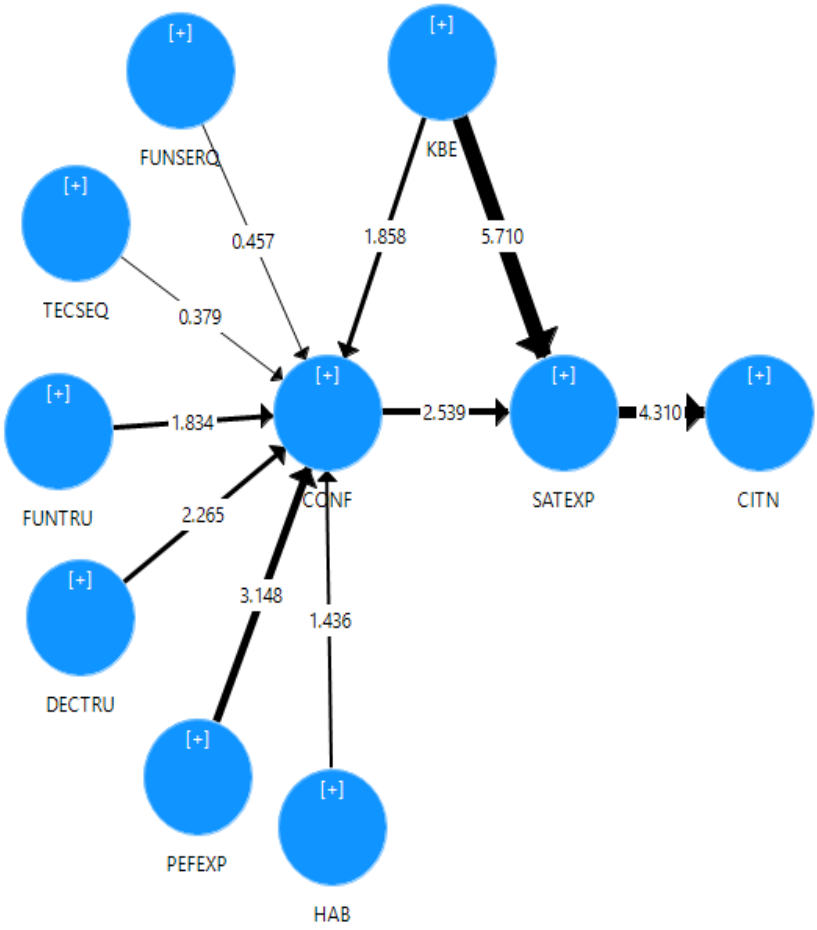
Kings Langley	3	.3	.3
Knebworth	15	1.5	1.5
Lemsford	10	.9	.9
Letchworth	5	.5	.5
Letchworth Garden City	13	1.2	1.2
Letty Green	1	.1	.1
Little Berkhamsted	6	.6	.6
Little Gaddesden	8	.8	.8
Little Hadham	4	.4	.4
Little Hormead	2	.2	.2
Little Wymondley	2	.2	.2
London Colney	3	.3	.3
Long Marston	14	1.4	1.4
Markyate	2	.2	.2
Marshalswick	5	.5	.5
Much Hadham	1	.1	.1
Nasty	4	.4	.4
Northchurch	8	.7	.7
Old Knebworth	14	1.3	1.3
Potten End	5	.5	.5
Potters Bar	4	.4	.4
Preston	5	.5	.5
Puckeridge	2	.2	.2
Puttenham	12	1.1	1.1
Radlett	8	.8	.8
Radwell	6	.6	.6
Redbourn	10	1.0	1.0
Rckimansworth	19	1.9	1.9
Ridge	4	.4	.4
Roe Green	8	.7	.7
Royston	15	1.5	1.5
Sacombe	12	1.2	1.2
Sandon	3	.3	.3
Sandridge	3	.3	.3
Sarratt	1	.1	.1
Sawbridgeworth	5	.5	.5
Shenley	2	.2	.2
Shenleybury	2	.2	.2
South Mimms	11	1.1	1.1

St Albans	43	4.2	4.2
St Ippollitts	4	.4	.4
St Paul's Walden	3	.3	.3
Stanborough	12	1.1	1.1
Standon	2	.2	.2
Stanstead Abbots	6	.6	.6
Stapleford	4	.4	.4
Stevenage	28	2.8	2.8
Thundridge	6	.6	.6
Tonwell	3	.2	.2
Tring	21	2.1	2.1
Turnford	18	1.8	1.8
Wadesmill	5	.4	.4
Ware	13	1.3	1.3
Waterford	6	.6	.6
Watton-at-Stone	11	1.1	1.1
Welham Green	1	.1	.1
Welwyn	1	.1	.1
Welwyn Garden City	33	3.2	3.2
West Hyde	3	.3	.3
Weston	1	.1	.1
Wheathampstead	11	1.1	1.1
Whitwell	3	.3	.3
Wigginton	10	1.0	1.0
Woolmer Green	10	1.0	1.0
Wormley	12	1.2	1.2
Total	1014	100.0	100.0

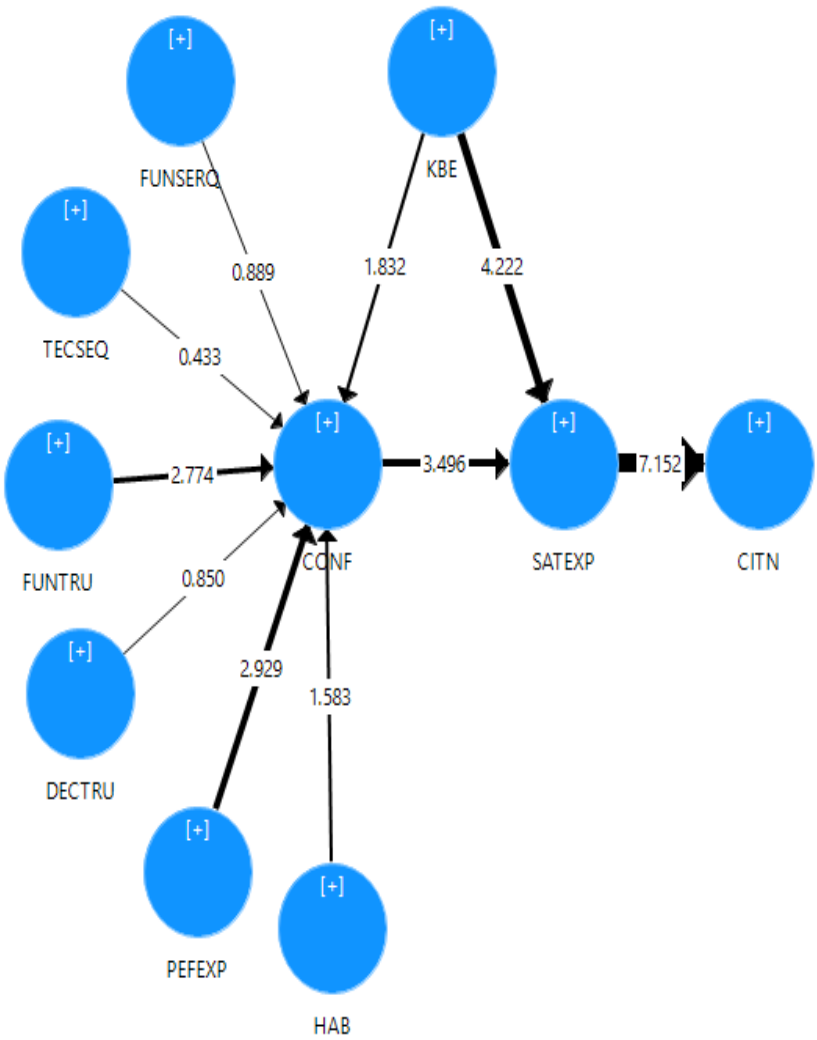
Structural model for Pre-seniors (50-59 years old)



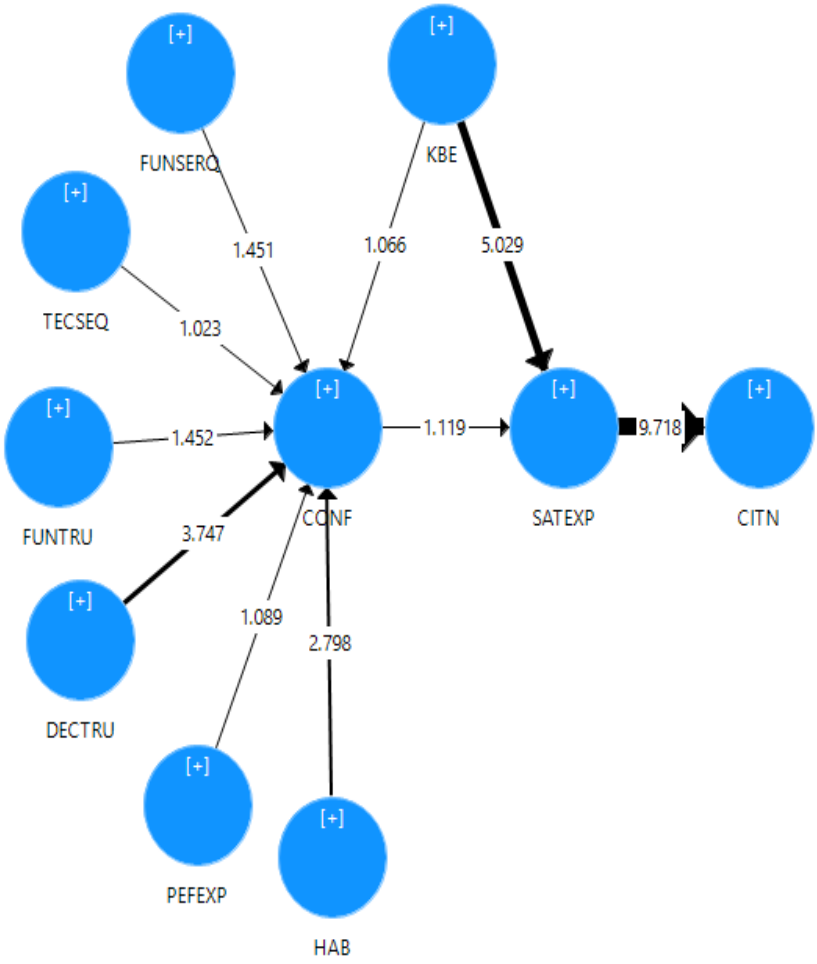
Structural model for Young-old (60--69 years old)



Structural model for Old-old (70-79 years old)



Structural model for Very-old (80+ years)



Appendix 6: Results for the pilot phase

Unweighted result of the demographic variables

Age	50 - 59 years	Count	97
		Table N %	43.7%
	60 - 69 years	Count	84
		Table N %	37.8%
	70 - 79 years	Count	30
		Table N %	13.5%
	80 - 89 years	Count	10
		Table N %	4.5%
	90 years and above	Count	1
		Table N %	0.5%
	Total	Count	222
		Table N %	100.0%
Gender	Female	Count	145
		Table N %	65.3%
	Male	Count	77
		Table N %	34.7%
	Total	Count	222
		Table N %	100.0%
Educational qualification	Higher Degree / Postgraduate Degree (MBA, PhD, MD, MA, MSc)	Count	15
		Table N %	6.8%
	1st Degree (BA / BSc)	Count	66
		Table N %	29.7%
	HND, HNC, Teaching	Count	31
		Table N %	14.0%
	BTEC/College Diploma	Count	59
		Table N %	26.6%
	A Level	Count	28
		Table N %	12.6%
	GCSE/O Level	Count	23
		Table N %	10.4%
	Total	Count	222
		Table N %	100.0%
Employment status	Pensioner 65+	Count	47
		Table N %	21.2%
	Retired (under 65 years old)	Count	29
		Table N %	13.1%
	Employed full time	Count	70
		Table N %	31.5%
	Employed part time	Count	39
		Table N %	17.6%
	Entrepreneur	Count	23
		Table N %	10.4%
	Unemployed (for less than 6 months)	Count	7
		Table N %	3.2%
	Unemployed (for medical reasons)	Count	3
		Table N %	1.4%
	Unemployed (for more than 6 months)	Count	2
		Table N %	0.9%
	Student (part-time)	Count	2
		Table N %	0.9%
	Student (full-time)	Count	0
		Table N %	0.0%
	Redundant	Count	0
		Table N %	0.0%

	Total	Count	222
		Table N %	100.0%
Health status	Excellent	Count	57
		Table N %	25.7%
	Good	Count	158
		Table N %	71.2%
	Poor	Count	7
		Table N %	3.2%
	Total	Count	222
		Table N %	100.0%
Marriage status	Married	Count	92
		Table N %	41.4%
	Widowed	Count	19
		Table N %	8.6%
	Divorced	Count	20
		Table N %	9.0%
	Separated	Count	36
		Table N %	16.2%
	In a domestic partnership or civil union	Count	2
		Table N %	0.9%
	Single, but cohabiting with a significant other	Count	41
		Table N %	18.5%
	Single, never married	Count	12
		Table N %	5.4%
	Total	Count	222
		Table N %	100.0%
Ethnicity	White British	Count	122
		Table N %	55.0%
	Any other White background	Count	60
		Table N %	27.0%
	White and Black Caribbean	Count	6
		Table N %	2.7%
	White and Black African	Count	9
		Table N %	4.1%
	White and Black Asian	Count	2
		Table N %	0.9%
	Any other mixed background	Count	16
		Table N %	7.2%
	Asian/Indian	Count	1
		Table N %	0.5%
	Asian/Pakistani	Count	0
		Table N %	0.0%
	Any other Asian Background	Count	1
		Table N %	0.5%
	Black and Black British	Count	4
		Table N %	1.8%
	Caribbean	Count	1
		Table N %	0.5%
	African	Count	0
		Table N %	0.0%
	Other Black groups	Count	0
		Table N %	0.0%

	Chinese	Count	0
		Table N %	0.0%
	Japanese	Count	0
		Table N %	0.0%
	Total	Count	222
		Table N %	100.0%

Ailment suffered by the participants

		Frequency	Percent	Valid Percent	Cumulative Percent
	Visionary Impairments (seeing the screen, the text on the screen	47	21.2	21.2	21.2
	Learning difficulties (cannot see the words correctly)	4	1.8	1.8	23.0
	Arthritis of the hand/s	3	1.4	1.4	24.3
	Balance Disorders	2	.9	.9	25.2
	Ear Disorders	3	1.4	1.4	26.6
	Falls & Mobility Problems	1	.5	.5	27.0
	Generalized Anxiety Disorder	1	.5	.5	27.5
	High Blood Pressure	6	2.7	2.7	30.2
	None of the above	154	69.4	69.4	99.5
	Diabetes	1	.5	.5	100.0
	Total	222	100.0	100.0	

Please choose the town that you live in from the box. - Town of choice

	Frequency	Percent	Valid Percent	Cumulative Percent

	Barnet	2	.9	.9	.9
	Borehamwood	1	.5	.5	1.4
	Hatfield	25	11.3	11.3	12.6
	Henham	1	.5	.5	13.1
	Hertford	29	13.1	13.1	26.1
	Hoddesdon	5	2.3	2.3	28.4
	Letchworth Garden City	4	1.8	1.8	30.2
	St Albans	46	20.7	20.7	50.9
	Stevenage	47	21.2	21.2	72.1
	Welwyn	10	4.5	4.5	76.6
	Welwyn Garden City	52	23.4	23.4	100.0
	Total	222	100.0	100.0	

Appendix 7: LITERATURE REVIEW – ALL ARTICLES

Technology adoption and usage

Conference	Year	Authors	Vol/issue/page no	Article title	Findings
Decision support system	2006	Hong, S, Thong, J , & Tam, K	Vol 24, Pg 1819 - 1834	Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet	This study examines the utility of three prospective models for understanding the continued IT usage behavior. The three models include: Expectation-Confirmation Model in IT Domain (ECM-IT), Technology Acceptance Model (TAM), and a hybrid model integrating TAM and ECM-IT (extended ECM-IT). It was concluded that TAM is the most parsimonious and generic model that can be used to study both initial and continued IT adoption; the extended ECM-IT explains continued IT usage behaviour as well as TAM; and both the ECM-IT and extended ECM-IT models provide additional information to increase understanding of continued IT usage.
Electronic Government, An International Journal	2010	Choudrie, J., Grey, S. & Tsitsianis, N.	Vol. 7, No. 2, pp.148–167	Evaluating the digital divide: the Silver Surfer's perspective'	The aim of this study is to explore and ascertain using an information systems perspective evaluation framework, the factors that encouraging the adoption and usage of online products and services; namely, in this case, Broadband, within one particular population group – the Silver Surfer. A finding of this study illustrate whether technological or non-technological factors, as well as communication are very pertinent in adopting and using technology
Computers in Human Behavior	2010	Pan, S & Marsh, M	Voulme 26, pp 1111–1119	Internet use intention and adoption among Chinese older adults: From the expanded technology acceptance model perspective	The purpose of this paper is to discuss how various factors intertwine to affect Chinese older adults' decisions to adopt the Internet by applying the expanded technology acceptance model (TAM). Gender and age were included in the proposed model as factors to moderate the effect of two key TAM components (PU and PEU) on adoption behaviors. The results indicate that PU, PEU, and SN were significant predictors of Internet adoption among Chinese older adults, while PU, SN, and FC were significant predictors of Internet use intention.
Geoforum	2012	Hardill, I & Olphert, W	Voulme 43, pp 1306–1312	Staying connected: Exploring mobile phone use amongst older adults in the UK	

European Journal of Information Systems	2014	Niehaves, B., & Plattfaut, R.	Volume 23, no 6, pp 708-726	Internet adoption by the elderly: employing IS technology acceptance theories for understanding the age-related digital divide	This study examined the intentions of the elderly with regard to Internet use and identifies important influencing factors. Four alternative models based on technology acceptance theory are tested in the context of comprehensive survey data. As a result, a model that explains as much as 84% of the variance in technology adoption among the elderly is developed.

Silver surfer/ older adult related studies

Conference	Year	Authors	Vol/issue/page no	Article title	Findings
Educational Gerontology	2002	Chen, Y & Persson, A	Volume 28, pp 731–744	Internet use among young and older adults: relation to psychological well-being	This study examined age differences in psychological well-being, impact of Internet use on psychological well-being of young and older adults, and grouped differences between older Internet users and non- users of psychological well-being and personal characteristics. Young and older adults were found to differ on dimensions of psychological well-being. In addition, older Internet users were more positive than non-users concerning psychological well-being and personal characteristics.
Educational Gerontology	2008	Gatto, S & Tak, S	Volume 34, Issue 9, pp 800 — 811	Computer, Internet, and E-mail Use Among Older Adults: Benefits and Barriers	This study examined the perceived benefits and barriers encountered by 58 older adults. They found that sense of connectedness, satisfaction, utility, and positive learning experiences are some of the benefits of computer use by older adult. Equally, the barriers include frustration, physical and mental limitations, mistrust, and time issues.
Ageing and Society	2003	Selwyn, N, Gorard, S, Furlong, J & Madden, L	Volume 23, pp 561-582	Older adults' use of information and communications technology in everyday life.	This study examined the extent and nature of ICT access and use by older adults in their everyday lives. Their findings suggest that using a computer is not only a minority activity amongst older adults but also highly stratified by gender, age, marital status and educational background. Equally, non-use of computers can be attributed to their low relevance and relative advantage to older people.

Digital divide/ E-government

Conference	Year	Authors	Vol/issue/page no	Article title	Findings
Interacting with Computers	2013	Choudrie, J, Ghinea, G & Songonuga, V	Volume 25, Issue 6, pp 417-442.	Silver Surfers, E-government and the Digital Divide: An Exploratory Study of UK Local Authority Websites and Older Citizens	The aim of this study is to understand the e-government initiatives in the UK, more specifically London. Findings of this study showed that in relation to quality, the local authority websites do contain useful and relevant information for the elderly. However, that this information is difficult to access, mainly due to the lack of knowledge, skills in the use of computers or Internet.
Electronic Government, An International Journal	2010	Choudrie, J., Grey, S. & Tsitsianis, N.	Vol. 7, No. 2, pp.148–167	Evaluating the digital divide: the Silver Surfer's perspective'	The aim of this study is to explore and ascertain using an information systems perspective evaluation framework, the factors that encouraging the adoption and usage of online products and services; namely, in this case, Broadband, within one particular population group – the Silver Surfer. A finding of this study shows that technical factors are not of primary importance. Non-technical factors were considered to be fundamental and clearly need to be taken into consideration when encouraging Silver Surfers to become online interactive.
Electronic Government.	2010	Niehaves, B & Plattfaut, R	Volume 6228, pp 275-288	What is the issue with internet acceptance among elderly citizens? theory development and policy recommendations for inclusive e-government	factors influencing private internet usage. This study examined the factors influencing private internet useage by identifying important influencing factors based on the literature on technology acceptance and digital divide. A model was developed based on these factors and was tested against comprehensive survey data (n=192). The theoretical model was able to explain more than 70% of the variation in private internet usage.
IEEE	2006	Belanger, F & Carter, L	Volume 4, pp 81c	The Effects of the Digital Divide on E-Government: An Emperical Evaluation	This study explored the potential effects of the digital divide on e-government by surveying a diverse group of citizens to identify the demographic characteristics that impact use of e-government services. The results indicate that income, education, age and frequency of Internet use significantly impact the use of e-government services.

Information Systems Frontiers	2008	Carter, L., & Weerakkody, V	Volume 10, no 4, pp 473-482.	E-government adoption: A cultural comparison.	This study compared e-government adoption in the U.K. to adoption in the U.S. In particular, this study seeks to determine if the same factors are salient in both countries. This study proposed a model of e-government adoption in the U.K. based on salient factors in the U.S. A survey is administered to 260 citizens in London to assess the importance of relative advantage, trust and the digital divide on intention to use e-government. The results indicate that of the prevailing adoption constructs, relative advantage and trust are pertinent in both the U.S. and the U.K., while ICT adoption barriers such as access and skill may vary by culture.
International Journal of Public Administration in the Digital Age	2014	Nasri, W	Volume 1, no 2, pp 80-96	Citizens' E-Government Services Adoption: An Extension of Unified Theory of Acceptance and Use of Technology Model."	This study investigated the factors that influence citizens' intention to use e-government services and its causal relationships using the Unified Theory of Acceptance and Use of Technology model (UTAUT). Their findings show that performance expectancy is one the main factor that determines citizens' intention towards e-government services in Tunisia.
Information, Communication & Society .	2015	Ihm, J & Hsieh, Y	Pp 1-16	The implications of information and communication technology use for the social well-being of older adults."	This study centres on the disparities regarding older adults' ICT access and use. Because the effects of ICTs cannot be uniform for all users, the digital inequalities older adults experience might have different influences on their social lives when compared to other populations that have been studied in the previous literature. Drawing on surveys from 1780 older adults, the study demonstrate that while socio-economic status remains the major factor affecting their quality of life, social and instrumental ICT uses can also contribute to their well-being in varied and unexpected ways.
Poetics	2006	Selwyn, N	Vol 34 Pg 273-292	Digital division or digital decision? A study of non-users and low-users of computers	To develop a detailed conceptual understanding of people's non-use of computers. Firstly, it explores in detail which individuals may be excluded from computer use to varying degrees. Secondly, it considers why these individuals are not using computers in their day-to-day lives. A qualitative method inform of interview was used and the sample size comprised of 1001 adults.

Online communication channels (OSN/ Email)

Conference	Year	Authors	Vol/issue/page no	Article title	Findings
Computers in Human Behavior	2015	Basak , E & Calisir, F.	Voulme 48, pp 181–189	An empirical study on factors affecting continuance intention of using Facebook	The main aim of this study is to analyse the effects of the motivational factors on continuance intention of using Facebook. I.e. to identify the factors that significantly affects the continuance intention to use Facebook. The findings showed that 62% of Facebook users' continuance intention to use Facebook is explained by attitude and satisfaction. Between them, attitude has the strongest effect.
Information & Management	2008	Chiu ,C & Wang, E	Volume 45, pp 194–201	Understanding Web-based learning continuance intention: The role of subjective task value	The aim of this study is to explore individuals' intentions to continue using Web-based learning in a voluntary setting. Two models were used to assess the technological and value issues and thus obtain an understanding of individuals' actions: Unified Theory of Acceptance and Use of Technology and expectancy-value model of achievement motivation. The findings of this study showed that performance expectancy, effort expectancy, computer self-efficacy, attainment value, utility value, and intrinsic value were significant predictors of individuals' intentions to continue using Web-based learning
Computers in Human Behavior	2014	Lian, J & Yen, D	Volume 37 ,pp 133–143	Online shopping drivers and barriers for older adults: Age and gender differences	The purpose of this study is to increase a better understanding of the drivers and barriers affecting older consumers' intention to shop online. To this end, this study is developed by integrating the Unified Theory of Acceptance and Use of Technology (UTAUT) and innovation resistance theory. By comparing younger consumers with their older counterparts, in terms of gender the findings indicate that the major factors driving older adults toward online shopping are performance expectation and social influence which is the same with younger.
Technological Forecasting & Social Change	2014	Choudrie, J & Vyas, A	Volume 89, pp 293–305	Silver surfers adopting and using Facebook? A quantitative study of Hertfordshire, UK applied to organizational and social change	The aim of this research study is to investigate the factors affecting the likelihood of adoption and use of OSN within an older population. The findings revealed that — in a household situation — older individuals adopt internet technologies if they have 'anytime access' to internet capable devices, a fast reliable internet connection, the support of

					their family and friends, as well as an apparent provision of privacy.
International Journal of Public Administration in the Digital Age	2014	Nasri, W	Volume 1, no 2, pp 80-96	Citizens' E-Government Services Adoption: An Extension of Unified Theory of Acceptance and Use of Technology Model."	This study investigated the factors that influence citizens' intention to use e-government services and its causal relationships using the Unified Theory of Acceptance and Use of Technology model (UTAUT). Their findings show that performance expectancy is one the main factor that determines citizens' intention towards e-government services in Tunisia.
IEEE	2010	Shi. N, Lee .M, Cheung. C & Chen. H	Pg 1-10	The Continuance of Online Social Networks: How to Keep People Using Facebook?	The aim of the study is to build and test a theoretical model investigating the factors affecting users' continuance intention to use Facebook. An online survey was conducted and data from 125 respondents were analyzed using PLS. The results showed that satisfaction was important in determining users' continuance intention to use Facebook.
Proceedings of the 8th annual international conference on Digital government research: bridging disciplines & domains	2007	Dijk.J & Pieterson. W	Pg 173-182	Channel Choice Determinants; An exploration of the factors that determine the choice of a service channel in citizen initiated contacts.	The aim of the study is to explore those factors that determine channel choice in citizen-government interactions. A qualitative research was carried out using group and single interview in Dutch and all participants are 18 years and above. The results showed that habit is one of the most important drivers of channel choice.

Appendix 8 : Sample of survey questionnaire

Public sector online communication channel Survey: A case of E-mail Versus Facebook.

Copy of page: For individuals 50 years old and above. We need your help.

Dear Sir/Madam,

We would like to seek your co-operation in completing this survey which is part of an important research study being conducted at the University of Hertfordshire's Systems Management Research Unit (SyMRU), Business School.

The reason for this research is that government in this modern world are moving away from the face-to-face medium of communication to a more digital way of communication using the online channels e.g. E-mail and online social network such as Facebook, Twitter and LinkedIn to interact with its citizens. However, not everyone is making use of these changes, especially the older adults. Furthermore, the Unite Kingdom (UK) is experiencing an aging population due to the recent improvements in the quality of life and advances in health care treatment, thus, researchers are seeking to explore how to help assist older people especially in the use of modern internet technologies. Thus, the aim of this research is to investigate and identify the factors that encourage older adults in Hertfordshire County to continue using a particular online communication channel when interacting with the local government. This study is going to compare two online communication channels that are being used by the local government i.e. E-mail and Facebook.

For your information, the questionnaire will include a number of questions that should take approximately 15 minutes to complete. Please check (tick) all appropriate answers. If your answer is not displayed, could you please kindly state your answer in the "Other" option category.

Please be assured that any information you provide will not be disclosed and used for any other reason than for academic research purposes. This work has been approved by the Ethics Committee, University of Hertfordshire under the protocol number: BUS/PG/UH/00745

If you have any questions regarding this study, please feel free to contact the investigating team responsible for this project at the following address:

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Demographics information

*1. To which of the following age groups do you belong to? 50

- 59 years

60 - 69 years

70 - 79 years

80 - 89 years

90 years and above

2. Please state your gender?

Female

Male

Other (please specify)

3. Which of the following describes your highest educational level?

Higher Degree / Postgraduate Degree (MBA, PhD, MD, MA, MSc)

1st Degree (BA / BSc)

HND, HNC, Teaching

BTEC/College Diploma

A Level

GCSE/O Level

4. Please state your current employment status?

Pensioner 65+

Retired (under 65 years old)

Employed full time

Employed part time

Entrepreneur

*5. Which of the following do you think best describes your state of health?

- Excellent
- Good
- Poor

6. Which of the following best describes your current relationship status?

- Married
- Widowed
- Divorced
- Separated
- In a domestic partnership or civil union
- Single, but cohabiting with a significant other
- Single, never married

7. Please state your ethnicity?

- White British
- Any other White background
- White and Black Caribbean
- White and Black African
- White and Black Asian
- Any other mixed background
- Asian/Indian
- Asian/Pakistani
- Any other Asian Background
- Black and Black British
- Caribbean
- African
- Other Black groups
- Chinese
- Japanese
- Other ethnic groups

You and the Internet

9. Do you access and use the internet?

- Yes
- No

*10. How would you describe your level of knowledge and experience in the use of computers?

- I have no knowledge or experience of computers
- I am a user with little knowledge and experience
- I am a user with a lot of knowledge and experience
- Other (please specify)

11. What are your reasons for not accessing the internet?

- Just not interested
- I do not have the skills
- I do not feel comfortable using the internet
- Privacy worries (criminals might take control of my personal information)
- Bad experiences with hackers/virus
- Too old to learn
- I am too busy
- Other (please specify)

12. How often do you use the internet?

- Daily
- Several times of the day (every hour)
- Several times of the day (not every hour)
- Weekly
- Several times of the week (three times a week)
- Several times of the week (Less than three times of the week)
- Monthly
- Less than monthly

Other (please specify)

*13. What are your reasons for using the internet? (Please select the four most important).

- To book appointments
- Searching Google for information
- For Banking (e.g. internet banking)
- For Paying bills (e.g rent, council tax)
- For Work purposes (.e.g. Paid / unpaid work done at home)
- For Communication (e.g Checking Emails , Facebook, Video calling(Skype))
- For Leisure
- For general reading
- For Travel purposes
- For Entertainment purposes
- For Seeking Health care information
- For Interacting with government agencies (e.g Central and Local government services)

14. Do any of the following ailments affect your use of the Internet?(Please select all that apply)

- [ ] Visionary Impairments (seeing the screen, the text on the screen, the colours on the screen)
- [ ] Learning difficulties (cannot see the words correctly)
- [ ] Deafness
- [ ] Arthritis of the hand/s
- [ ] Arthritis of the fingers
- [ ] Alzheimer's Disease
- [ ] Other (please specify)
- [ ] Balance Disorders
- [ ] Ear Disorders
- [ ] Dementia
- [ ] Falls & Mobility Problems
- [ ] Generalized Anxiety Disorder
- [ ] Heart Disease
- [ ] High Blood Pressure
- [ ] Memory Loss
- [ ] Neck Fracture
- [ ] None of the above

You and your Local Council

15. Have you ever visited the Hertfordshire council website (http://www.hertsdirect.org)?

- Yes
- No

16. How often do you, or, have you visited the website?

- Daily
- At least once a week
- Once every two weeks
- Less than a month
- Monthly
- I do not access the Hertfordshire Council website

17. What was the purpose of your visit?

- To complete and fill a form
- To report problems E.g Bin collection
- To search for information
- To search for contact numbers about council services
- To book an appointment
- To make a complaint
- To Pay for parking permits
- To pay for fines
- To pay for council taxes
- To renew library books

Type of communication channel

Please specify the way that you communicate with the local council

19. What are the features that you consider important when choosing an online communication channel? (You may choose more than one answer)

- [ ] Fast to navigate through menus
- [ ] Entertainment (e.g. watching movies and playing games)
- [ ] Controlled messages (a safe and private area to communicate your message in)
- [ ] Clear and effective language
- [ ] Speed-quick delivery of message versus going physically to a council office
- [ ] Storage facility (e.g for storing of large documents)
- [ ] Document filling and retrieval (e.g retrieving a message/document from the trash box)
- [ ] Request a return receipt (e.g getting a notification when your message is sent)
- [ ] Downloading a web page
- [ ] Viewing a web page
- [ ] Uploading of documents
- [ ] A frequently answered question section
- [ ] Good signposts on the webpage
- [ ] Good colours on the web page
- [ ] Good colours on the portal
- [ ] Good text size
- [ ] A search facility
- [ ] A facility that allows text size to be altered
- [ ] A site that is recognised as safe and secure
- [ ] Other (please specify)

Usage of Email and reasons for its use

21. Do you have experience of an Email service?

- [ ] I am very experienced using email
- [ ] I feel that Email is easy to use
- [ ] I am comfortable using Email
- [ ] I feel competent using Email

Other (please specify)

22. What are the benefits of using Email for communication purposes? (Please you can choose as many answers as possible)

- [ ] Email helps me to save time while communicating with people
- [ ] Email allows me to learn of privacy
- [ ] Email allows me to share photographs with friends and colleagues at work
- [ ] Email allows me to share photographs with family
- [ ] Email allows me to have official conversations like interacting with local Government authorities
- [ ] The Email facility is easier to use
- [ ] Emails are more secure
- [ ] Emails have proved to be sources of evidence for me
- [ ] Email is the only way that my friends and family communicate with me, likewise me

Other (please specify)

*23. Please indicate to which extent you agree or disagree with the following sentences?Please rate each of the following factors on the seven -point scale. Note: 1 is Strongly Agree and 7 is Strongly disagree.

	1.Strongly agree	2	3	4	5	6	7.Strongly disagree
Email is simple to use even when using it for the first time							
Using Email increases my chances of achieving things that are important to me, especially fast feedback							
Email is trustworthy and reliable							
Email has enough safeguards to make me feel comfortable using it to interact with government online							
I do find that Email as a medium of communication is useful in my daily life							
The richness and quality of service being delivered by Email makes me to use it without thinking of an alternative communication medium							
People who are important to me at work (colleagues, managers) think that I should use							
People who are important to me in my personal life (friends and family) think that I should use Email to communicate							
People whose opinion I value in my personal life (friends and family) suggest using the Email facility to communicate with the							
People whose opinion I value in my work life (colleagues, managers) suggest using the email facility to communicate with the government							
The use of Email as an online communication channel has become a habit for me							
I am very satisfied using Email as a medium of communication							
I am satisfied using Email to interact with the Local council							

Other (please specify)

24. Do you intend to keep using Email to communicate with your Local Council? (You may choose more than one answer).

- [ ] I do plan to continue using Email in future
- [ ] I do intend to continue using Email to communicate with the Local council
- [ ] I will recommend to my family and friends the use of Email when communicating with the Local council
- [ ] I will recommend to all my work colleagues the use of email when communicating with the Local council
- [ ] Whenever possible, I intend to use Email in my daily life style
- [ ] In the future, I will try to use alternative online communication channels (eg Facebook)

☐ If essential, I will try to use other alternative online communication channels (e.g Facebook)

25. Do you feel that using an Email facility to interact with your local council improves peoples communication with the council?

○ Yes

○ No

If No, please give reasons

Using Facebook to interact with the Local Council and reasons for its use

If you do use Facebook to interact with the Local Council, please help us to answer the following questions.

26. Do you have experience of using Facebook?

- [ ] I am very experienced using Facebook
- [ ] I am comfortable using Facebook
- [ ] I feel competent using Facebook
- [ ] I do not use Facebook

27. What are the benefits of using Facebook as a communication tool? Please rate each of the following

Facebook allowed me to learn of privacy when dealing with people							
Facebook allowed me to share photographs with friends and colleagues							
It allowed me to share photographs with family							
It allowed me to become competent at using online social networks when interacting with people							
I became confident in using online social networks when interacting with people							
Facebook allowed me to communicate faster with the Local Council. This is in comparison to other online communication tool like Email.							
Facebook allowed me to form new online relationships with new colleagues after							
Facebook allowed me to reconnect with ex-colleagues and friends							
Facebook allowed me to follow people I liked online							
Facebook allowed me to become part of a new online social community network that communicates with the Local Council							

Other (please specify)

28. The following lists of words have been used to describe Facebook when communicating with the Local council? please indicate to the extent that you agree with the words using the rating scale of 1 being strongly agree to 7 being strongly disagree

	1.Strongly agree	2	3	4	5	6	7.Strongly disagree
Useful							
Reliable							
Trustworthy							
Fast Feedback							
Convenient							
Easy to use							
Trendy							
Informative							
Adaptable to lifestyles							
High quality							

29. Overall, how satisfied are you with using Facebook to communicate with the Local council?. Please, rate your satisfactory experience using the rating scale of 1 being very satisfied and 7 being very dissatisfied.

1.Very satisfied	2	3	4	5	6	7. Very dissatisfied

30. Do you intend to continue using Facebook to communicate with your Local Council? please indicate to the extent that you agree with the following using the rating

scale of 1 being least likely to 7 being most likely.

	1. Least Likely	2.	3.	4.	5.	6.	7. Most Likely
Yes, I intend to continue using Facebook to communicate with the Local council							
Whenever possible, I do intend to use Facebook when communicating with the Local Council							
Whenever possible, I do plan to use Facebook when communicating with the							
No, I will try to use other alternative online communication channels							

Other (please specify)

*31. Do you feel that using the online social network (Facebook) on your council's website improves peoples communication with the council?

- Yes
- No

32. Do you plan to use an online communication channel in future while interacting with the Local council?

- Yes, I intend to start using online communication to interact with the Local council
- No, I do not intend to start using online communication to interact with the government
- Yes, I predict that I will start using online communication to interact with the Local council
- Yes, I expect to start using online communication channel to interact with the Local council
- No, I do not have any plans of using online communication channel to interact with the Local council

Thank you

Thank you very much for your valuable time, co-operation and patience in completing this questionnaire. If you have any questions, comments, suggestions or would like to find out about the results of this research, please do not hesitate in getting in touch with us through the contact details at the following address:

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