

**DOCTOR OF BUSINESS ADMINISTRATION**

COHORT 14

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**Social inclusion: An e-government approach  
to access social welfare benefits**

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THESIS

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By

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## **Abstract**

Today, governments worldwide are seizing the benefits of the Internet for better government administration. Governments must provide services to all citizens, but this is most challenging to achieve electronically when some citizens are offline, yet transformational to the government administration when achieved. Therefore, the thesis investigated the factors influencing e-government adoption in Nottingham where social welfare benefits will be claimed exclusively online via the Universal Credit (UC) system. UC is an example of a government service conforming to the broader UK Digital by Default strategy for government administration, which supports the EU goal of improving social inclusion through digital inclusion. Therefore, the motivation for the thesis is social justice for those digitally excluded citizens who may be socially impacted by the unintended consequences of e-government initiatives.

The study used an adapted Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model to understand the factors influencing citizens' adoption of UC. The research model added Internet experience, awareness, security and trust as external factors influencing adoption, while hedonic motivation was modelled as an internal factor. UTAUT2 was also modified to reflect the broader goal of social inclusion. The study demonstrated that the behavioural intention to adopt e-government depended on whether the digital public service had a fall-back to use traditional channels or not. 61.3% of the benefits claimants were unaware of UC rollout in Nottingham, which indicates a lack of citizen readiness. Overall, the experience of using the Internet, facilitating conditions, behavioural intention and the habit of using digital public services determined usage behaviour. 40.2% of the participants thought digital inclusion improved their social lives, while 30.9% were indifferent. The 40.2% indicates a good starting point for e-government adoption. These findings led to the Modified UTAUT2 (M-UTAUT2) model, which is applicable outside the case study. The thesis also made other theoretical contributions.

The findings and the conclusions from the qualitative and quantitative researches conducted as part of the build-up to the thesis were used to derive an e-government adoption process that considers the continued use of e-government, which leads to successful e-government. The model has two processes: awareness (with two stages: awareness and initial use) and habitual (with one stage: continued use). Additionally, the study recommended the global digital technology market as a new e-government actor due to the changing digital inclusion landscape.

*This thesis is dedicated to:*

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*My wife, Loraine, for your enduring patience and support while I studied. I hope to pay you back.*

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*The rest of my family. You are an inconspicuous source of inspiration. Now you know!*

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## Declarations

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Chirara, S.C., Valero-Silva, N. and Lal, B., 2017. Digital inclusion enhancing social inclusion: a case study of Nottingham City Homes (NCH) e-government initiatives. In: E-Business and E-Government SIG, eds., 2017. *British Academy of Management (BAM2017) Conference, University of Warwick, Coventry, September 5-7 2017* [online]. Nottingham: NTU IREP, pp. 1-9, Available at: <http://irep.ntu.ac.uk/id/eprint/30705>.

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## Abbreviations

AGE	Age
ALMO	Arms' Length Management Organisation
AW	Awareness
BBC	British Broadcasting Corporation
BI	Behavioural Intention
BT	British Telecom
DBA	Doctor of Business Administration
DbyD	Through the Digital by Default
DOI	Diffusion of Innovation Theory
EE	Effort Expectancy
EU	European Union
EXP	Experience
FC	Facilitating Conditions
GEN	Gender
Gov UK	UK Government Internet domain
HB	Habit
HM	Hedonic Motivation
HP	Hewlett Packard
ICT	Information and Communication Technologies
MPCU	The Model of PC Utilisation
M-UTAUT2	Modified Unified Theory of Acceptance and Use of Technology 2
NCC	Nottingham City Council
NCH	Nottingham City Homes
PE	Price Value
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SCT	Social Cognitive Theory
SE	Security
SI	Social Influence
SPSS	IBM Statistical Package for the Social Science
TAM1	Theory of Acceptance Model 1
TAM2	Theory of Acceptance Model 2
TAM3	Theory of Acceptance Model 3
TPB	Theory of Planned Behaviour
TR	Trust
TRA	Theory of Reasoned Action
UC	Universal Credit
UN	United Nations
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	Unified Theory of Acceptance and Use of Technology 2

## Chapter 1: Introduction

This chapter presents the introduction to the thesis (Document 5) on electronic government (e-government). It gives a brief overview of digital inclusion and social inclusion, providing a context in which e-government operates. The overview is followed by a summary of the research findings from the previous Doctor of Business Administration (DBA) documents that were a build up to the thesis, which led to the decision to focus the thesis on e-government. Subsequently, the research objectives and research questions are presented.

### 1.1 Introduction

The thesis is a culmination of the research undertaken in Documents 1-4 of the DBA study. These previous documents acted as pilot studies, exploring digital inclusion and social inclusion, which provide the context in which e-government operates. *‘E-government’* is a model of public administration based on the intensive and strategic application of Information and Communication Technologies (ICT) (UN in Song and Guan 2015, p.79). The thesis focuses on e-government adoption in the north of Nottingham City, where there is consistent low Internet use, preference for local TV as opposed to social media and preference for receiving information via leaflets as opposed to local websites (Nottingham Insight, 2016a). Compared to the rest of Nottingham and the UK, the north of Nottingham has low levels of educational attainment, high unemployment levels and high social welfare benefits (commonly referred to as just *‘benefits’*) claimants (Nottingham Insight, 2017). There are also relatively high teenage pregnancies, high density of Council housing and high dwelling burglary rates (Nottingham Insight, 2017). This demographic texture affects the wider adoption of e-government in this area. The thesis uses Nottingham City Homes (NCH) tenants to understand the factors influencing e-government adoption in the north of Nottingham. It evaluates tenants’ use of NCH Web services (local government services) and the Universal Credit<sup>1</sup> (UC) (central

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<sup>1</sup> Universal Credit Social Welfare Reform is a UK Government initiative where social welfare benefits for those on low income or out of work are claimed exclusively online, replacing six previous benefits that are currently claimed separately offline, such as housing benefit, child tax credit, working tax credit, income support, income-related employment and support allowance and income-based job seeker’s allowance (Gov UK, 2016).

In Nottingham, the government started piloting the claiming of job seekers’ allowance by new single job seekers without dependents from 15 February 2016 (Nottinghamcity, 2016). After the pilot, the claiming of other benefits by all claimants started in April 2017 (Nottinghamcity, 2016).

government service). NCH is the largest Arms' Length Management Organisation (ALMO<sup>2</sup>) established to manage 29,000 social houses owned by Nottingham City Council (NCC). Some of the NCH tenants are on benefits and would be affected by the introduction of UC, whose objectives are worth highlighting.

The objectives of UC are: firstly, to encourage citizens to move off benefits and be employed. Mr Ian Smith (former Work and Pensions Secretary) argued that most citizens were trapped in the benefits system, preferring not to work because they would be financially worse off (BBC, 2015). Secondly, Mr Smith argued that UC would remove fraud and errors hitting the benefits system, which amounted to billions of pounds for taxpayers (BBC, 2015). These public service developments are interesting to the researcher because they relate to his job as an ICT Network Services Manager with NCC. The researcher is at the forefront of enabling digital public policies. Therefore, the ideas, as well as the constructs examined in the thesis, were refined through his managerial perspective and the findings from Documents 1-4.

The researcher is not naive of the fact that the primary objective of e-government is to provide better government to all citizens, which literature often understates (e.g., Ho, 2002; Reddick, 2005; Edmiston, 2003; Evans and Yen, 2006). Song (2004) articulated that '**better government**' means delivering public services to citizens in a convenient, citizen-focused, cost-effective and better way. Therefore e-government is another convenient way of public administration, but it is not the end goal. However, the government must provide services to all citizens, but this is most challenging to achieve electronically when some citizens are offline, yet transformational to government administration when achieved. Therefore, for those citizens who cannot use e-government, some traditional delivery channels (e.g., government offices, telephony or post) need to remain in place for a while. These traditional channels ensure that all citizens remain socially included while they learn e-government.

Sheha *et al.* (2016) argued that e-government adoption improves social inclusion. '**Social inclusion**', in contrast to social exclusion, refers to the degree to which citizens are, and feel, integrated into the different relationships, organisations and sub-systems that constitute everyday life (Phillips, 2006). The UN (2010) extended the discourse on social inclusion, outlining that the factors that influence it include economic, poverty, political, digital inclusion and other societal processes. Furthermore, Atkinson and Marlier (2010) viewed social inclusion

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<sup>2</sup> ALMOs are a government initiative aimed at introducing efficient private sector management practices into the provision of social housing (Pawson, 2006).

as the process by which societies combat poverty and social exclusion. The social inclusion resulting from e-government has been possible because of the evolution of the Internet.

## 1.2 Background and the drivers to study e-government

The Internet is no longer a technical tool; instead, it is a social phenomenon with direct everyday practical implications. Therefore, the application of digital technology is increasingly receiving research interest as governments across the world increase their digital technology expenditure and initiatives (European Commission, 2016). Consequently, there are five reasons for researching e-government in this study.

Firstly, the increasing use of the Internet in everyday activities is disrupting service delivery strategies in many ways. The disruptions mean that without current research on the dynamics of e-government, the literature on e-government becomes outdated for efficient public administration. E.g., Figure 1.2-1 shows a decrease of approximately 15% over five years in the use of offline channels by Internet users and digitally excluded citizens when accessing governmental services in EU.

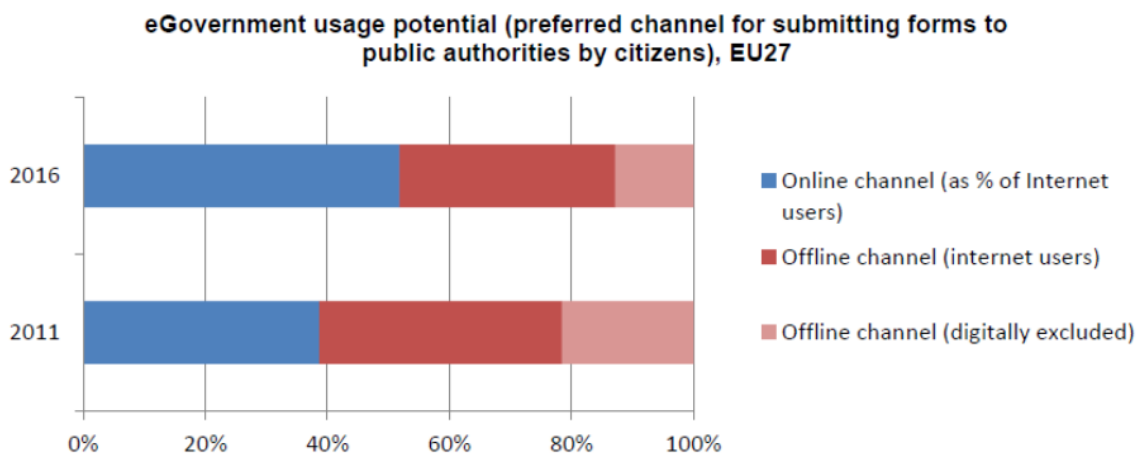
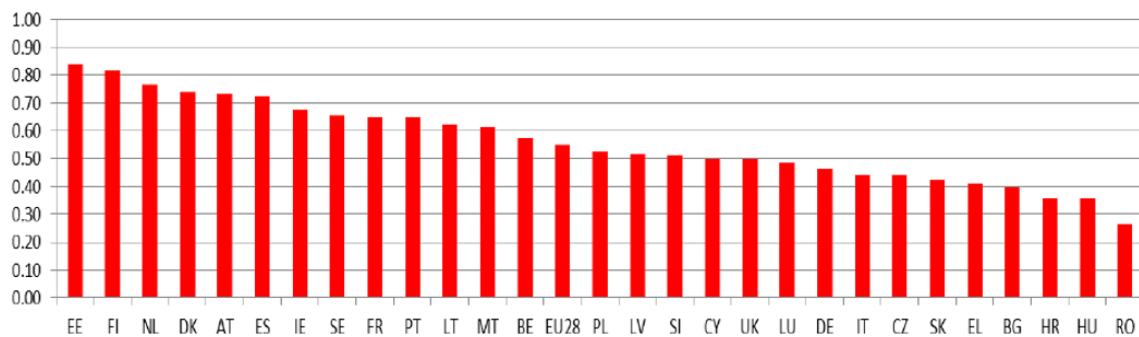


Figure 1.2-1: EU Digital Public Service changes between 2011 and 2016

(Source: European Commission, 2017)

This significant decrease means that the effects of the barriers to e-government are reducing as well. Therefore, ongoing and updated literature on e-government is necessary. The implementation and use of the Internet by governments to deliver public services is argued to improve citizens' access to information, services offered to citizens, efficiency and effectiveness of public administration (Haider *et al.*, 2015).

Secondly, in Europe, one of the European Commission goals was to achieve 50% Digital Public Services (i.e. e-government) by member states by 2015 (European Commission, 2016). Figure 1.2-2 shows the Digital Public Services scoreboard for EU member states. The score was derived using four indicators: e-government users; extent of already known citizens’ data pre-filled on online forms presented to the citizens; extent to which interaction with government is completely online; and the government’s commitment to open data (European Commission, 2016). Open data is the data freely available to citizens to access and publish as they wish, without restrictions and copyright controls (European Commission, 2016). Of the four indicators, the thesis focuses on factors influencing citizens to become e-government users.



Belgium	(BE)	Greece	(EL)	Lithuania	(LT)	Portugal	(PT)
Bulgaria	(BG)	Spain	(ES)	Luxembourg	(LU)	Romania	(RO)
Czech Republic	(CZ)	France	(FR)	Hungary	(HU)	Slovenia	(SI)
Denmark	(DK)	Croatia	(HR)	Malta	(MT)	Slovakia	(SK)
Germany	(DE)	Italy	(IT)	Netherlands	(NL)	Finland	(FI)
Estonia	(EE)	Cyprus	(CY)	Austria	(AT)	Sweden	(SE)
Ireland	(IE)	Latvia	(LV)	Poland	(PL)	United Kingdom	(UK)

Figure 1.2-2: European Commission 2017 Digital Public Services scoreboard

(Source: European Commission, 2017)

The UK’s score dropped from 55% in 2016 to 49% in 2017, taking it to below the EU target of 50% and EU average of 54% (European Commission, 2017). Compared to other states, such as Estonia (which has 84%), the UK can do more (European Commission, 2017). To improve the score, the UK enacted a Digital by Default (DbyD) strategy. DbyD means “digital services that are so straightforward and convenient that all those who can use them will choose to do so whilst those who can’t [*sic*] are not excluded.” (Cabinet Office 2013, p.2).



Thirdly, the researcher is an ICT practitioner who uses digital technology daily and helps formulate digital inclusion strategies for Nottingham City Council (NCC), however without direct interaction with citizens who are impacted by the strategies. The daily usage of digital technology by the researcher allows him to quickly adapt to digital technology changes, unlike some citizens who may not use it frequently or not at all. Therefore, the researcher wanted to study, first hand, the factors influencing citizens to adopt e-government, to formulate strategies that consider the challenges faced by citizens in the context of Nottingham. Practical strategies are relevant given that social welfare benefits would be claimed via the UC system and would socially impact some of these citizens who do not have the skills to use the Internet.

Fourthly, there are fewer published e-government academic journals (e.g., on Web of Science, Mendeley and Google scholar) that study the UK digital public services. However, there are many studies on e-government conducted by academics resident in the UK, but they mainly assess e-government in other countries<sup>3</sup>. Razak *et al.* (2010) argued that e-government has not been extensively studied in the UK compared to countries like the US. Earlier, Beynon-Davies (2005) argued that the UK public sector was struggling to construct an e-government identity as the world leader in digital public services. Today, the European Commission Digital Public Service scorecard discussed earlier (European Commission, 2017) still reflects a UK e-government identity gap. Therefore, the thesis contributes to the UK's e-government academic literature, as well as having a managerial impact.

Finally, previous documents submitted as part of the DBA programme (see 1.7) have shown that the skills to use the Internet, awareness, security and trust of digital services influence citizens' adoption of online services. Therefore, as a follow-on study, the thesis explores the impact of awareness, trust and security on adopting UC. Failing to claim benefits online successfully could potentially affect citizens' ability to buy food, pay utility bills or pay their social housing rent, thus potentially reinforcing social exclusion. Therefore, the thesis has some anticipated implications for various stakeholders.

### **1.3 Research implications**

The intended audiences of this research are academics, the government, local authorities and ICT practitioners. The anticipated research implications for these stakeholders are discussed in the next paragraphs.

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<sup>3</sup> Chapter 2 (Literature review) shows the different contexts where e-government has been studied.

E-government, as a research discipline, is strewn with criticisms. E-government research suffers from the definitional vagueness of the e-government concept, oversimplified and descriptive e-government development processes within complex political and institutional environments, and various methodological limitations (Gauld, Goldfinch and Horsburgh, 2007; Bannister and Connolly, 2015). However, following research on the e-government descriptive models, Bannister and Connolly (2015) counter-argued that the claim is overstated. The thesis is anticipated to further explore these criticisms and contribute to the e-government knowledge by proposing an empirically derived e-government adoption process. It is also anticipated to update the theoretical model used in the research, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), by updating the factors influencing the adoption of e-government. The thesis will provide supporting evidence, derived from citizens' views, for the arguments and the model proposed, thus mitigating the claim that e-government research models have the researchers' aspirational thoughts. There are also some managerial implications anticipated by the thesis.

The thesis is anticipated to contribute to understanding the factors influencing the use of e-government, especially the UC payment system. Failure to attenuate the barriers to the adoption of UC could lead citizens to fail to access their social welfare benefits, which can reinforce social exclusion. By knowing these factors, practitioners can be provided with some recommendations to mitigate their effects. The thesis findings will enable the government, Nottingham City Council (NCC), Nottingham City Homes (NCH) and other housing associations to implement effective strategies to improve the uptake of e-government. The successful adoption and use of UC will improve the UK's Digital Public Services score in EU. The research is also anticipated to have practical implications for practitioners.

The thesis findings will be operationalised in the same manner that the findings and conclusions from Documents 2-4 have been. For example, Document 3 identified that citizens wanted more hours of free Internet access to maximise the benefits of online services (Chirara, 2014). Subsequently, unlimited Wi-Fi access was incorporated into a contract for Public Wi-Fi in NCC buildings. The unlimited Internet access led to increased general Internet use, thus providing a good starting point for e-government adoption. Likewise, the findings from the thesis will be put into practice at NCC and NCH to improve citizens' social inclusion through digital inclusion.

## 1.4 Digital inclusion and social exclusion

Seale, Draffan and Wald (2010) defined '*digital inclusion*' as a phenomenon where marginalised citizens have equal access to and meaningful participation in social and civic activities using digital technologies. When a citizen is digitally included they are called a '*digital citizen*' of a virtual world (Webster, 2006; Hassan, 2008). Therefore, e-government users are digital citizens. That virtual world where digital citizens access and use the Internet is known as the '*information society*' (Webster, 2006; Hassan, 2008). The uses of digital technologies are wide and varied. However, Internet use is the current measure of digital inclusion (Anderson and Tracey, 2001; Steyaert and Gould, 2009; van Deursen and van Dijk, 2013a). The proliferation of the Internet and its consequent impact on citizens' social lives have led governments to draw up policies that exploit the benefits of digital inclusion.

Digital inclusion aims to counter social exclusion, which "evolved through an emerging European emphasis on social policy that was concerned with addressing complex forms of disadvantage" (Selwyn in Mervyn, Simon and Allen 2014, p.1087). '*Social exclusion*' includes factors combining to marginalise individuals from collective processes and benefits (Warren, 2007). Therefore, governments globally have developed various e-government initiatives to tackle social exclusion through digital inclusion (Sheha *et al.*, 2016). The argument that digital inclusion improves social inclusion (e.g., Sheha *et al.*, 2016; Rana *et al.*, 2016; Blagoeva, 2016; Alghamdi and Beloff, 2016) led to the aims of the thesis, which were investigated through a Nottingham City Homes case study.

## 1.5 Nottingham City Homes (NCH) e-government case study

The thesis assesses the factors that influence citizens' intentions to use e-government and subsequent usage behaviour, which determine the success of e-government. The study considers a case study of NCH tenants from the north of Nottingham City, where there is consistent low level of Internet use (Nottingham Insight, 2016a), to understand the citizens' e-government transformations. Low Internet use affects some tenants who must claim their benefits via UC. UC affects other citizens who are not in social housing or who are not NCH tenants. However, NCH was chosen to draw the research subjects from because it houses the highest number of Nottingham social housing tenants, thus providing a concentrated pool of potential participants.

UC adoption rates are important to the author in their profession. As a Senior ICT Practitioner within Nottingham City Council, which owns NCH, the researcher plays a crucial role in

contributing to its digital strategy and its delivery. The digital strategy aims to improve citizens' public services using the Internet (e-government) while saving costs for the Council. As such, the researcher is sometimes faced with conflicting values of trying to deliver e-government widely, accessible to all citizens while avoiding alienating those citizens who do not want to or cannot use online services. The study draws on literature from Information Systems (IS) theoretical models to understand the factors influencing citizens' adoption of e-government.

Using a modified Theory of Acceptance and Use of Technology 2 (UTAUT2) model shown in Figure 2.7-1, the thesis uses a quantitative methodology to determine the factors that influence the use of e-government in the north of Nottingham City. The justification for using UTAUT2 is outlined in 2.4. Before going further with the thesis, some fundamental concepts introduced in previous documents, need highlighting.

## 1.6 Other key concepts and definitions

Some additional critical concepts used in the thesis are now defined. The first concept is '*digital divide*', which is a historical term used to describe the gap between those with access to digital technology and those without (National Telecommunications and Information Administration, 1999; Bélanger and Carter, 2010; Hargittai in Bunyan and Collins 2013, p.588). At the time, the term mainly focused on access to computers and the Internet, as something that determined social structure. Having access to a computer was prestigious, regardless of what it was used for or not used. As the Internet developed and penetrated the world markets, its uses widened and started transforming the lives of ordinary citizens who were using it, leading to the term '*digital inclusion*'. Despite the increased proliferation of the Internet, some citizens are still offline, thus missing out on the benefits of digital inclusion.

Some citizens are not benefiting directly or indirectly from the use of the Internet. These are referred to as digitally excluded. The House of Commons (2010, p.31) defined '*digital exclusion*' as a:

... term used to describe the experience of those socio-economic groups who, for whatever reason, are unable to access the internet [*sic*] and the resources it has to offer. This may be the result of poverty or computer illiteracy. It also includes those individuals who do not want (or do not know they want) access to internet [*sic*].

What is interesting with this definition is that in some instances being digitally excluded includes citizens who are unaware of the innovation and its benefits and therefore are not using the Internet. Chapter 2 explored the concept of awareness. Similarly, Eynon and Helsper (2010)

further differentiated the non-use of technology to be either an involuntary action by citizens or choosing not to use the Internet.

One of the involuntary actions by a digitally excluded citizen relates to the skills required to use the Internet. Understanding what a computer can do and cannot is defined as '**computer literacy**' (Horton, 1983; McClure, 1994; Morgan, 1998). In today's environment, the word 'computer' can be argued to be inclusive of other devices now used to access the Internet (e.g., smartphones and tablets). Computer literacy is different from the ability to understand and effectively use information from a variety of sources presented via computers, which is called '**digital literacy**' (Bawden, 2001; Ferro, Helbig and Gil-Garcia, 2011). Both concepts should also not be confused with '**information literacy**', which is the ability to search for, find, evaluate and use information from a variety of sources (Goad, 2002). Here, the critical difference being that for digital literacy, the information is presented via a computer. The UN (2013) argued that digital literacy gives a nation competitive advantage, much as education does and can be viewed as human capital in the information society. The view supports previous work by Polat (2012, p.589) who emphasised the need for these new competencies in an information society in the statement,

In the age of the internet [*sic*], enjoying full citizenship requires new educational competencies as well as technological access and skills.

One of the benefits of having these literacies is that it allows enjoying full digital citizenship, e.g., through accessing e-government.

In some instances, some citizens use the Internet indirectly through other people for several reasons. Such citizens still enjoy the benefits associated with Internet use and are called '**proxy users**', and they are digital citizens by proxy (Goraya and Light, 2011). Nonetheless, Eklund (2015) links the traditional citizenship and digital citizenship arguing that viewing the boundary of the virtual world as dichotomous 'real world' and 'virtual world' is problematic because it is contingent upon existing offline links (traditional citizenship) between people. Here the argument is that existing social links are carried into the information society.

This study now builds on these concepts and the research findings from the previous documents, focusing on e-government. Moon (2006) argued that the process of learning brings to bear relevant prior knowledge and experience. Thus, the knowledge and experience gained from the previous documents in this DBA programme are reviewed in the next section.

## 1.7 Summary of previous DBA documents

It is prudent to draw attention to the early work in Documents 1 to 4 of the DBA study to appreciate the direction of the thesis. Document 1 was the research proposal, which had research questions that would be explored in Documents 2–5. The study started by reviewing the literature on digital inclusion in Document 2, using a general lens to explore the Internet uses. The literature review was followed by employing qualitative analysis on citizens' views of digital inclusion as a social phenomenon in Document 3. Subsequently, the theories from the literature review and those generated in Document 3 were tested quantitatively in Document 4.

Firstly, a literature review in Document 2 identified that the digital divide had moved away from mere access to a computer and the Internet (Meneses and Mominó, 2010; van Deursen and van Dijk, 2010; Abad-Alcalá, 2014). It is now multi-perspective, incorporating socio-economic issues leading to the term digital inclusion (Ferro, Helbig and Gil-Garcia, 2011). For example, increased participation in government administration through e-government initiatives.

Secondly, the social emphasis in digital inclusion sparked debates on the correlation between digital inclusion and social inclusion, which are frequently discussed in the opposite continuum of digital exclusion and social exclusion. Some research viewed the link between digital inclusion and social inclusion to be existent, arguing that the Internet was being standardised amongst citizens as it got incorporated into practical daily routines (Mutula, 2008; Wong *et al.*, 2009; Lê, Nguyen and Barnett, 2012). However, research from some developed countries challenged the strength of the correlation between the two, arguing that some communities were not digitally included yet they were not materially deprived (Selwyn, 2003; Longley and Singleton, 2009; Clayton and Macdonald, 2013). Polat (2012) further emphasised that digital technology could not address the entire fundamental issues of inequality and exclusion. The researcher concluded that the link between digital exclusion and social exclusion was more pronounced when a citizen was poor or lacked the requisite skills to use the Internet, and there were limited free public Internet facilities. The factors that influenced the general use of the Internet were explored.

Thirdly, Document 2 identified some factors that influenced citizens to use the Internet. These are perceived awareness, usability, ability to use, functional benefits, information quality, social image and trust (Cushman and Klecun, 2006; Hung, Chang and Yu, 2006; Shareef *et al.*,

2011). Contrary, where ICT infrastructure was poor and slow, perceived usefulness ceased to influence adoption behaviours to use the Internet (Lin, Fofanah and Liang, 2011). Thus, some constructs may be determinants in developed countries but not in developing countries. Additionally, digital and computer literacy significantly influenced digital inclusion (van Deursen and van Dijk, 2013; Abad-Alcalá, 2014). Income and employment did not necessarily influence digital inclusion in communities where there are sufficient digital technology resources with free public Internet but influenced the content accessed (2010; Taipale, 2013; van Deursen and van Dijk, 2013). Document 2 was followed by Document 3, which used the interpretivist<sup>4</sup> philosophical approach and where data was collected using three focus groups.

The research drew participants from the north of Nottingham City who, by UK's Indices of Multiple Deprivation<sup>5</sup> (IMD), were classed as socially disadvantaged. The research used a case study with NCH tenants. Some of these tenants were claimants of benefits and therefore could provide some initial insights into their use of the Internet. Document 4 and the thesis used the same participants' profile. The data from the focus groups was analysed.

Weick's Sense-Making in Management theoretical model was used in Document 3 to analyse citizens' views of digital inclusion from focus groups. Document 3 identified that participants viewed digital inclusion as having both a positive and negative social impact, however on balance, the positive impact outweighed the negative. Participants described online services using comparative adjectives such as quicker, faster and cheaper when compared to the traditional service delivery channels. The findings supported studies by Oyelaran-Oyeyinka and Lal (2005), Mutula (2008), Parsons and Hick (2008) and van Deursen and van Dijk (2010). However, the findings contrasted studies by Longley and Singleton (2009) who argued that the link between digital and social inclusion was weak in developed societies, where access issues

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<sup>4</sup> The interpretivist approach is a philosophical tradition which has substantial impact on social science especially in qualitative research methods (Cassell and Symon, 2004). It does not accept the existence of an orthodox or standard interpretations of a phenomenon (Fisher *et al.*, 2010), but sets aside the researcher's presuppositions about investigated phenomena (Cassell and Symon, 2004) and takes the view that reality is socially constructed (Fisher *et al.*, 2010).

<sup>5</sup> IMD is used as a social exclusion yardstick and it identifies the most deprived areas across the UK by combining a number of indicators (income, employment, health, education deprivations, suffering barriers to services and living deprivation), chosen to cover a range of economic, social and housing issues, into a single deprivation score for each small area (Gov UK, 2012).

were no longer a challenge. Further to this, factors influencing digital inclusion were investigated.

The conclusions after Document 3 research were that digital and computer literacy were the significant digital inclusion predictors. Perceived usefulness, perceived functional benefits, perceived information quality, perceived social image, perceived trust and perceived security concerns did not stop participants from being digitally included, however in some instances they led to temporary digital exclusion. '*Temporary digital inclusion*' was coined by the researcher to describe when avid digital citizens temporarily preferred offline service delivery channels on the grounds of nostalgia, concerns about Internet security and the complexity of the issue at hand. '*Temporary ex-users*' are digital citizens exhibiting such behaviour. There was insufficient evidence to determine if income and employment were predictors of the content accessed by citizens, as argued by Zillien and Hargittai (2009) and van Deursen and van Dijk (2013). The next stage of the DBA study was to employ quantitative principles, in Document 4, to validate the theories generated to date, using a questionnaire.

Document 4 research supported previous findings in Documents 2 and 3 with regards to the digital inclusion factors. However, there was an unanticipated finding worth highlighting. Document 4 showed a relatively strong correlation between education and digital inclusion, supporting studies by Aerschot and Rodousakis (2008) and Parsons and Hick (2008). The correlation meant that for adults, education still moderated Internet use. The study also showed a moderate correlation between education and digital literacy, which was plausible considering the definition of digital literacy. Furthermore, just over three-quarters of the participants were digital citizens, of which at some point, 63.8% used offline channels such as telephone services or face-to-face communication. Internet security concerns, complexity in clearly reporting issues online and nostalgia of offline channels influenced temporary digital exclusion. 10.1% of the digital citizens were proxy users. The findings demonstrate that a significant number of proxy users may not be counted as digital citizens if the research instrument does not explicitly tease out proxy use.

This background information paved the way for the in-depth e-government studies in the thesis.

## **1.8 The focus of the thesis**

In the Introduction (section 1.1), it was argued that there is a paradox with e-government, where governments must provide services to all citizens, but this is most challenging to achieve electronically when some citizens are offline, yet transformational to the government



administration when achieved. Furthermore, successful e-government is when citizens use digital public services (European Commission, 2016), which helps governments to achieve significant cost savings. Therefore, the aim of the thesis is social justice for those digitally excluded citizens who may be socially impacted by the unintended consequences of e-government. Thus, the thesis now narrows down the research to e-government, which is being driven in the UK by the government's Digital by Default (DbyD) strategy. One such service delivered using the DbyD strategy is the Universal Credit (UC) social welfare benefits payments, which is used as the case study to determine factors influencing its adoption by citizens. Under the DbyD strategy, the government has a cost-saving objective to reduce government administration expenditure from an estimated £4b each year to £1.3b each year (Gov UK, 2013). These cost-savings are aggressive and make understanding e-government barriers as well as addressing them more urgent. Addressing the barriers avoids reinforcing social exclusion for digitally excluded citizens. Of course, in the DbyD strategy, there is a provision for digitally excluded citizens to get assistance with accessing public services under the 'Assisted digital' provision. However, this is on a limited basis. "Assisted digital is the help government will give to ensure that we do not exclude any users of government services (whether citizens or businesses) who are not online" (Gov UK 2013, p.1). Additionally, the thesis infers citizens' views on the social impact of digital inclusion from their research responses. Subsequently, the objectives and research questions of the thesis were derived.

### **1.8.1 Research objectives and research questions**

The thesis objectives are to:

1. Understand the significant factors driving citizens in the north of Nottingham to use e-government or otherwise.

This objective will be assessed using NCH tenants' use of NCH Web services (as a benchmark of the current e-government use) and UC benefits payment system (being introduced in Nottingham). The failure by NCH tenants to use UC has social services implications to NCC and NCH, which have a social services responsibility to these citizens. At the time of data collection, UC had not yet been rolled out in Nottingham. Therefore, assessing citizens' awareness of UC as a new way of claiming social welfare benefits was prudent. Awareness of the changes would prepare the citizens for the changes. This awareness is not only crucial for the initial use of UC but its continued use, leading to the second objective.

2. Determine how aware citizens from the north of Nottingham are of UC rollout in Nottingham.

Subsequently, research questions to guide the investigation and structure the discussion were developed from these objectives.

The process of developing and focusing research questions is an iterative process (Bryman and Bell, 2015), where questions related to each other are used for a coherent argument development (Cohen, Manion and Morrison, 2009). Therefore, the research questions proposed in Document 1 for Document 5 were revised as new information emerged in Documents 2 to 4, resulting in the following:

1. What factors influence citizens' e-government adoption in the north of Nottingham City?
2. As UC is rolled out in Nottingham, how aware are citizens in the north of Nottingham of the changes in claiming social welfare benefits?

To methodically investigate and answer these questions, the thesis is organised as outlined in the next section.

### **1.8.2 Thesis outline**

Moving from this chapter, Chapter 2 reviews e-government and the broader digital inclusion and social inclusion literature. The chapter draws on the literature of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) to understand the e-government factors. Subsequently, the hypotheses are formulated, and the conceptual framework presented. In Chapter 3, the research design is outlined, and the chosen research paradigm (positivist), methodology and methods of data collection for the study are presented. The strategies for data collection and data analysis are presented, and ethical issues encountered during the research are outlined. Chapter 4 then presents the research findings and discussion. Finally, Chapter 5 outlines the theoretical and managerial contributions, the research limitations, themes for future research and the concluding remarks.

## 1.9 Summary

This chapter presented the background of the thesis, outlining that it is shaped by the work undertaken in Documents 1-4 of the DBA course, where a general lens on digital and social inclusion was used. The work from these previous documents culminated into focusing the thesis on e-government. The background of the research conducted in Documents 2 to 4 was given and how the findings have already been applied in practice in NCC. The research from these previous Documents and the thesis use a case study of NCH tenants in the north of Nottingham City, where there are consistent low levels of Internet use and other indicators of socio-economic deprivation, compared to the rest of Nottingham and the UK.

Documents 2 to 4 explored the setting in which e-government operates and demonstrated that, on balance, citizens predominantly thought digital inclusion improved social inclusion. Digital inclusion and social inclusion were defined as concepts whose emphasis is from an EU policy aimed at eliminating social exclusion using the Internet. Consequently, EU member states, such as the UK, have Digital Inclusion strategies to support this overarching EU policy.

In the UK, there is a Digital by Default (DbyD) strategy where the government aims to deliver public services through the Internet. One such DbyD services is the Universal Credit (UC) where social welfare benefits are claimed online. For those offline citizens, this has the potential to reinforce social exclusion due to the unintended consequences of digital inclusion, and this is what motivated focusing the thesis on UC adoption on the basis of social justice for digitally excluded citizens.

The next chapter reviews the literature on e-government and the broader goal of enhancing social inclusion through digital inclusion and formulates the conceptual framework.

## **Chapter 2: Literature review**

This chapter explores the e-government concept. It then provides an overview of the various theoretical models that can be used to explore citizens' adoption of e-government, before applying the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). It also evaluates the broader goal of digital inclusion as a social phenomenon and the policies driving digital inclusion. Subsequently, a conceptual framework for e-government and hypotheses are developed. Each construct of the conceptual framework is explained and a two-letter or three-letter acronym used for each construct is used in the hypotheses, the survey design in Chapter 3 that resulted in the questionnaire questions shown in Appendix A: Questionnaire. This linkage is summarised in Table 3.6-1 and Table 3.6-2 and links to the results in Chapter 4 using the same acronyms.

### **2.1 E-government: another channel for public administration**

E-government is defined as the use of technology to enhance access to and delivery of government information and services (Beynon-Davies, 2005; Hu *et al.*, 2009) to benefit citizens, business partners and employees (Silcock, 2001; Jaeger, 2003; Yildiz, 2007). The UN (2014) argues that e-government plays a crucial role in transforming how governments deliver public services and enhance stakeholder participation in public administration. The definition shows that the concept of e-government encompasses an array of stakeholders. Lee, Kim and Ahn (2011) alternatively define e-government as the electronic delivery of government services, primarily using Web technology. While Lee, Kim and Ahn's (2011) definition does not explicitly link e-government to any stakeholders, it can be assumed that the associated web technology benefits for the different user groups are brought to e-government. Some examples of e-government are access to online governmental information, reporting issues to the government, payment for public services, bidding for social housing, claiming social welfare benefits and so forth. Such electronic services provision results in some benefits to both the government and citizens.

From a government's viewpoint, e-government is transformational in public administration. It is cost-effective compared to other channels (Carter and Bélanger, 2005; Gov UK, 2013; Sun, Ku and Shih, 2015). An increased electronic footprint in public administrations means some civil servants are made redundant. Therefore, the cost-effectiveness of e-government is the monetised demise of the redundant civil servants, which can reinforce social exclusion. The

sentiments around redundant civil servants can affect the uptake of e-government by some citizens rebelling against this negative social impact and continue to use traditional channels, where available. This paragraph discussed e-government from a top-down view. However, there is also a bottom-up view from the citizens' perspective.

From a citizens' viewpoint, e-government benefits include a perception of responsiveness, convenience, improved access to information and reduction in corruption (Ho, 2002; Edmiston, 2003; Sun, Ku and Shih, 2015). However, Luna-Reyes and Gil-Garcia (2014) argue that there is little evidence of such transformations.

The realisation of the e-government benefits is sometimes challenged because literature focuses predominantly on technical issues (Alghamdi, Goodwin and Rampersad, 2011). While e-government is transformational in the government administration and provides many benefits, it has some adverse social effects on citizens. For example, under UC, housing benefit is now paid directly to the claimant's bank account instead of directly to the social housing landlord. Therefore, if a citizen is offline and does not make a successful UC claim, or receives a UC payment but fails to pay the landlord for whatever reason, then they can end up with rent arrears. Failure to pay rent could lead to eviction, thus potentially escalating social exclusion. Therefore, there must be a balance between technical and social benefits. When the balance between technical and social benefits is right and citizens buy-in to the benefits of the digital public service, then e-government use increases. Benedetti, Marchio and Russo (2014) argue that the yardstick for e-government maturity is when, on the one hand, the supply of services is widespread, while on the other hand it is used by citizens. Entirely delivering public services via e-government has a generational perspective to it. As more young citizens become adult digital citizens, traditional public service channels will die a natural death. Nonetheless, e-government contributes to a broader goal of enhancing social inclusion using the Internet.

## **2.2 The broader goal – enhancing social inclusion via digital inclusion**

Considering the rise in investments in Information and Communication Technologies (ICTs) and the desire to increase process efficiencies and social inclusion, discourses on digital inclusion agree that its goal is to lift citizens from disadvantaged communities such that they enjoy improved social inclusion through the use of the Internet (Van Winden, 2001; Warschauer, 2004; Helsper, 2008; Aerschot and Rodousakis, 2008; Lindgren and Jansson, 2013; van Deursen and van Dijk, 2013). Furthermore, the issue of protecting citizens from

digital exclusion and social exclusion is a concern for several stakeholders, which prompted joint working.

Steyaert and Gould (2009) argue that fighting digital exclusion, to avoid making it a platform for social exclusion, brought together governments, profit and non-profit making organisations and community development workers in a bid to bring citizens into the information society. E.g., in the UK there are several programmes where different stakeholders work together to promote digital inclusion; BT Community Connections where BT provides free broadband to community groups since 2005 (Bimson, 2012); and UK Online Centres that work with local authorities and groups of citizens to establish local Internet access centres (UK Online Centres, 2016). These examples show how different stakeholders are willing to invest in citizens and communities to eliminate digital exclusion, indicating that this is a big issue.

The main aim of digital inclusion is to deliver positive social impact through the use of the Internet (Scharf, Phillipson and Smith, 2005; Molla and Al-Jaghoub, 2007; Stevenson, 2009). Furthermore, improved and interactive citizens' participation through e-government is one of the processes towards furthering social inclusion (Polat, 2012). The argument here is that, if digital exclusion is one of the factors which reinforces or contributes to social exclusion, then by eliminating it one reduces the chances of social exclusion on citizens. Thus, from a policy standpoint, eliminating digital inclusion barriers has become part of a broader social exclusion agenda (Mason, Sinclair and Berry, 2012).

### **2.3 Policies driving digital inclusion and e-government**

In Europe, the European Commission included the 'Digital Agenda for Europe' in its Europe 2020 Strategy, which is the EU's growth strategy (Barroso, 2010). The strategy advises that the Digital Agenda for Europe targets bringing digital technology to all Europeans by 2020, enabling citizens to shop, create content, learn, socialise and interact online. EU member states are therefore expected to derive and drive digital inclusion strategies for their countries that support this overarching strategy, thereby providing another platform for improved social inclusion. Therefore, social inclusion policies can no longer be viewed in isolation of digital inclusion policies because a digital inclusion policy impacts social inclusion dynamics and vice versa. Internet use is fundamental for individual and community development and therefore local and national policymakers should put policies in place that offset usage variations (Ferro, Helbig and Gil-Garcia, 2011). Digital inclusion cross cuts other policy areas such as community development, data sharing and skills, social inclusion, transformational

government, product and services access (PwC, 2007). The Europe 2020 Strategy has led to revolutionary digital inclusion strategies for EU member states.

Governments of EU member states are continually gazetting legislation promoting digital inclusion. Several countries now have specific legislation protecting citizens from digital exclusion (Abascal and Nicolle, 2005). The protection includes enabling and supporting citizens to efficiently and competently access and use online services. In the UK, the government enacted the Digital Strategy (Gov UK, 2013), which sets out how the government was becoming Digital by Default (DbyD) in delivering public services. To facilitate the adoption of DbyD services by citizens, local government authorities, such as NCC, are critical playmakers because they assist some citizens to have free Internet access and help provide them with computer and digital literacy.

Firmstone and Coleman (2015) argue that local authorities play a pivotal role in the citizens' understanding of local democracy and their engagement in local issues through their communications and engagement strategies, of which digital media provides new opportunities in civic participation. To support national Digital Inclusion Strategies, at a local government level, NCC and NCH included digital inclusion in their Strategies to support one of the Council's objectives of a 'Digital Nottingham' for citizens, businesses and the public sector (Nottingham City Council, 2011). To deliver these strategies, NCC and NCH need to know the factors that influence citizens to use e-government in Nottingham. This understanding can be teased out using Information Systems (IS) theoretical models.

## **2.4 Information Systems (IS) adoption theoretical models**

The thesis uses the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model to determine the factors that influence citizens to adopt e-government. Before exploring UTAUT2, it is important to briefly highlight the other models that were used to build UTAUT2. This approach allows answering questions why the other models were not used in the thesis because each model's shortcomings which makes it unsuitable for the research context are advised. Furthermore, the thesis anticipates improving UTAUT2, therefore outlining its building blocks ensures that any proposed improvements have been thought through.

One of the thesis objectives is to determine the factors influencing e-government adoption. Adoption is underpinned by the notion that human beings have rational cognition that leads to planned behaviour, hence reasonably determining the factors influencing e-government becomes probable. Determining e-government factors this way is a disposition from the social

psychology discipline, which is a scientific field that is shaped by an understanding of the emotional commitments to identity that lead to varying behaviours in similar socio-economic contexts. When new digital technology emerges, its successful diffusion is contingent upon its characteristics and reliability; the processes by which it is publicised and its affordability; and the technical expertise of the intended users and any subjectivity which the users associate with the technology (Ramakrishnan, 2011; Wallace, 2013). Similarly, Ellway and Walsham (2015, p.133) argue that:

The information systems (IS) work practice literature recognises that the use of information technology in organisations and broader social structuring is composed of both human action and the properties of technology.

Therefore, human behaviour is central to the successful public administration transformations driven by e-government, and a theoretical model can be used to determine the factors influencing e-government adoption.

This thesis employs the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model, developed by incorporating constructs from eight previous models illustrated in Table 2.4-1. The research uses UTAUT2 for three reasons related to the diffusion of digital technology in a consumer setting. Firstly, UTAUT2 integrates some constructs from previous models and therefore mitigates their shortcomings. It is currently the most comprehensive model for a consumer setting where the use of the digital technology is voluntary. UTAUT2 is unlike the Technology Acceptance Model (TAM) and UTAUT (the original model) which are modelled for organisational settings, where the digital technology costs are paid by the company. Secondly, UTAUT2 incorporates the habitual use of digital technology, which the researcher believes is a significant precondition for sustained use of DbyD services. Digital technology changes frequently and habits formed using prior digital technology provide cues that help citizens to navigate new digital public services with ease. Thirdly, UTAUT2 recognises that the decision to adopt digital technology is influenced by facilitating conditions that include the resources and support available to adopt the DbyD services. Facilitating conditions attenuate the anxiety associated with using digital technology, which is critical in boosting citizens' confidence to try an unfamiliar innovation. The building blocks of UTAUT2 are now explored in the next section.

#### **2.4.1 Technology acceptance theories**

Table 2.4-1 shows the IS models used to develop UTAUT2.



Model	Developers	Constructs
The Model of PC Utilisation (MPCU)	Triandis (1977)	Beliefs, affect, subjective norms, perceived consequences towards behaviour, habit, facilitating conditions.
Theory of Reasoned Action (TRA)	Azjein and Fishbein (1980)	Attitude towards behaviour, subjective norms.
Theory of Planned Behaviour (TPB)	Azjein and Madden (1986)	Attitude towards behaviour, subjective norms, perceived behavioural control.
Social Cognitive Theory (SCT)	Bandura (1986)	Self-efficacy, expectancy outcome, identity.
Motivational Model (MM)	Davis, Bagozzi and Warshaw (1992)	Intrinsic motivation, extrinsic motivation.
Decomposed Theory of Planned Behaviour (DTPB)	Taylor and Todd (1995)	Attitude towards behaviour (relative advantage, complexity, compatibility), subjective norms (normative influence), perceived behavioural control (efficacy, facilitating conditions).
Diffusion of Innovation Theory (DOI)	Rogers (2003)	Knowledge (receiver variable, social system variable), persuasion (perceived characteristic of innovation), decision (adoption, rejection), implementation, confirmation.
Technology Acceptance Model (TAM1)	Davis (1986)	Perceived usefulness (PU) and perceived ease of use (PEOU).
TAM2	Davis, Bagozzi and Warshaw (1989)	PU (subjective norms, image, job relevance, output quality, result demonstrability), PEOU.
TAM3	Venkatesh and Davis (2000)	PU (subjective norms, image, job relevance, output quality, result demonstrability), PEOU (Anchor – computer efficacy, perception of external control, computer anxiety, computer playfulness; Adjustment – perceived enjoyment, objective usability), experience, voluntariness.
<b>UTAUT and UTAUT2</b>		
Unified Theory of Acceptance and Use of Technology (UTAUT)	Venkatesh et al. (2003)	Performance expectancy, effort expectancy, social influence, facilitating conditions, experience, voluntariness of use.
UTAUT2	Venkatesh, Thong and Xu (2012)	Performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, experience.

Table 2.4-1: Technology acceptance theories that led to UTAUT2

Each of the models is now briefly described and evaluate their application to previous e-government studies.

#### 2.4.1.1 The Model of PC Utilisation (MPCU)

Triandis (1977) developed the MPCU after being motivated by a quest to understand the variables that encouraged human behaviour to utilise PCs. The MPCU distinguishes between the cognitive and affective traits of attitude. Beliefs, affect, subjective norms, perceived consequences towards behaviour, the habit of doing something and facilitating conditions are the primary variables influencing behaviour. Subjective norm is an individual's perception that those significant important people to them think that they should perform the behaviour (Fishbein and Ajzen, 1975) while affect refers to an individual's liking of a behaviour (Li, 2010). Triandis (1977) argued that individuals interpret the consequences of behaviour and affirm behavioural traits by either changing the behaviour or changing the value of the

perceived probability of that behaviour. “Behavior is determined by what people would like to do (attitudes), what they think they should do (social norms), what they have usually done (habits), and by the expected consequences of their behavior” (Thompson, Higgins and Howell 1991, p.126). Therefore, how has the MPCU been applied to e-government studies?

A literature search on journal databases, such as Web of Science, Mendeley and Google Scholar, on where the MPCU was used to study e-government did not yield results. The MPCU is only referred to as a building block to later IS models. This trend is possible because e-government, as a research discipline, increased prominence in the new millennium, after other models were developed to address the MPCU shortcomings.

The model misses out the effort expected from a citizen, the price value and the behavioural competencies needed to adopt e-government, hence it was not used in the thesis.

#### 2.4.1.2 Theory of Reasoned Action (TRA)

Ajzen and Fishbein (1980) developed TRA by building on the research conducted during 1918 – 1970. TRA, shown in Figure 2.4-1, is a social psychology model focusing on predicting behavioural intention and actual behaviour in technology adoption. It is based on subjective norms of what others think, what experts think and the pressure to comply with others and the attitude towards the behavioural outcomes (Mao and Pavia, 2006). It is used in voluntary situations and posits that individuals are rational beings, continually evaluating their beliefs that shape their attitude towards a behaviour. Ajzen and Fishbein (1980) believed these factors influence the intention and the subsequent behaviour.

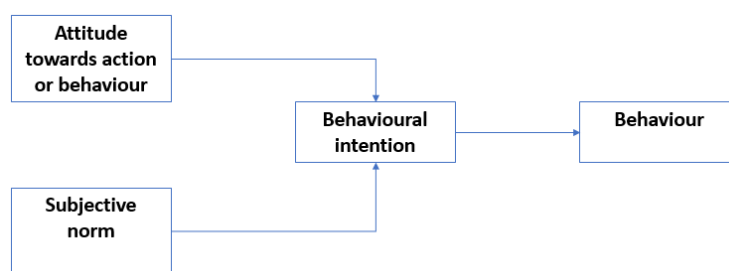


Figure 2.4-1: Theory of Reasoned Action

(Source: Ajzen and Fishbein, 1980)

E-government studies have not yet applied the TRA lens. However, Althunibat, Zain, and Ashaari (2011) studied mobile government in Malaysia by combining the constructs from TRA with some from UTAUT, TAM and trust. They found the model comprehensive for their study. TRA was applied, albeit with some adaptations, and validated in other topics such as electronic

banking (Stamenkov and Dika, 2016); social media (Chin, Lu, and Wu, 2015; Erkan and Evans, 2016); cloud computing classrooms (Shiau and Chau, 2016); cyberbullying (Doane, Pearson and Kelley, 2014; Doane, Kelley and Pearson, 2016), etc. Despite being used in recent research; the model has its limitations.

A study by Taylor and Todd (1995) criticised TRA and TPB, arguing that both models postulate that citizens have to be motivated to behave in a certain way. Sheppard, Hartwick and Warshaw (1988) criticised TRA, arguing that it does not hold well in situations that involve a choice problem and that a citizen’s behavioural intention was assessed when they did not have sufficient information to form a positive intention completely. Additionally, TRA does not illuminate the effort required from the citizen changing a behaviour. For these reasons, TRA fails to provide the theoretical basis needed for the thesis.

### 2.4.1.3 Theory of Planned Behaviour (TPB)

In addition to TRA’s attitude towards behaviour and subjective norms, Ajzen and Madden (1986) added perceived behavioural control as a variable determining behavioural intention to use technology in mandatory contexts. The result was TPB shown in Figure 2.4-2. Ajzen (1991, p.188) defined perceived behavioural control (PBC) as “the perceived ease or difficulty of performing the behaviour.” This addition closed one of TRA’s limitations, and therefore the model was used in several e-government studies.

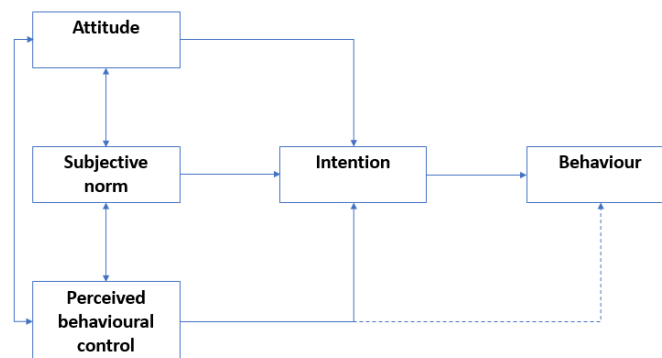


Figure 2.4-2: Theory of planned behaviour

(Source: Ajzen and Madden, 1986)

Mathieson (1991) conducted a study where a comparison of TPB and TAM were made and concluded that while TAM was easier to apply, TPB provided more specific information that guides better the development and adoption of IS. Ozkan and Kanat (2011) tested e-government adoption of student loans service of the higher education student loans and

accommodation association of Turkey using TBP. They concluded that it was more potent than TAM for predicting adoption. In this case, attitude was the primary behavioural intention predictor, in line with previous research by Ajzen (1991). They identified that trust and PBC influenced behavioural intention. A Taiwanese study on electronic toll collection concluded that attitude, subjective norm and PCB influenced behavioural intention (Chen, Fan and Farn, 2007). Other researchers (e.g., Lee, Kim and Ahn, 2011; Hung, Chang and Kuo, 2013) have also applied TPB. Apparently, TPB still has some limitations.

Since TPB is based on TRA, it still inherits some of TRA's limitations. Unlike TRA, TPB incorporates the effort required from the user changing behaviour but does not illuminate the performance gained from changing a behaviour that could influence the intention to change. It lacks the constructs that capture the diversity of citizens intending to adopt e-government. E.g. Hung, Chang, and Yu (2006) applied an extended TBP to evaluate the acceptance of a Taiwanese online tax filing system. They added perceived usefulness, ease of use, perceived risk, trust, compatibility, external influences, interpersonal influence, self-efficacy and facilitating conditions. TPB is not applied in the thesis because it does not capture the complexities of e-government.

#### **2.4.1.4 Social Cognitive Theory (SCT)**

Earlier models such as TRA and TPB assume a unidirectional causal relationship among the model variables (Li, 2010). In contrast, the Social Cognitive Theory (SCT) proposed by Bandura (1986) works on the premise that an individual's cognitive competence influences their behaviour towards technology and successful interaction with technology also influences cognitive perceptions (Compeau, Higgins and Huff, 1999). Bandura (1986) gives prominence to self-efficacy, expectancy outcome and identity as behavioural intention determinants, as shown in Figure 2.4-3. Self-efficacy is an individual's judgment of their ability to use technology to achieve a task (Compeau and Higgins, 1995). Personal outcomes, such as self-esteem, and performance-related outcomes, such as job-related outcomes, are part of the outcome expectations that determine behaviour (Compeau and Higgins, 1995). These enhancements to SCT make it more potent than its predecessors. However, its application in e-government studies is still limited.

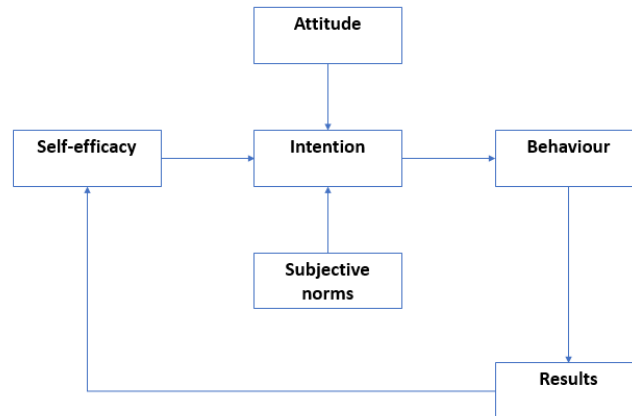


Figure 2.4-3: Social cognitive theory

(Source: Bandura, 1986)

The first complete application of SCT, albeit with an extension, was by Rana and Dwivedi (2015) in studying an Indian online public grievance redressal system (OPGRS). Their study validated the model and added ‘social influence’ as a construct. They added social influence because SCT lacks a contextual variable. However, ‘outcome expectation–performance’ was removed, and they left ‘outcome expectation–personal’ because with OPGRS the researchers were not mainly concerned about the system’s performance, but the personal benefits accrued. SCT has some limitations that rendered it unsuitable for the thesis.

SCT does not consider an individual’s associated financial cost incurred in adopting the technology. Perhaps SCT has not been prevalent because it was developed in the same year as the original TAM, which was immediately revised twice and incorporated more constructs pertinent to accurately determine behavioural intentions.

#### 2.4.1.5 Motivational Model (MM)

The MM was subsequently developed and postulates that behaviour is a factor of intrinsic motivation and extrinsic motivation (Davis, Bagozzi and Warshaw, 1992). Intrinsic motivation is conceptualized as computer playfulness (Venkatesh, 2000), while extrinsic motivation is the perceived usefulness (Alotaibi, 2012). Computer playfulness was a new construct that would later gain prominence in UTAUT2 as hedonic motivation. E-government studies have not used MM.

A literature search on journal databases such as Web of Science, Mendeley and Google Scholar on where the MM has been applied to e-government studies did not yield any results, except references to the model in the development of later models. The lack of results could be because its theoretical basis does not fit well with the complex variables at play in e-government.

MM overlooks the costs associated with adopting digital technology or considering other contextual factors, such as experience and age, which could influence citizens' perceived usefulness of e-government. These missing constructs make the model unsuitable for the theoretical basis sought by the thesis.

#### 2.4.1.6 Diffusion of Innovation Theory (DOI)

The DOI theory (shown in Figure 2.4-4) outlines a five-stage process for the diffusion of a new technology, namely knowledge of the innovation that drives an inspiration to seek out more information; persuasion, where related information about the innovation is sought; decision to adopt or reject based on accrued benefits; implementation, where the usefulness of the innovation is actually assessed; and confirmation of continued use if the innovation measures up to expectation (Rogers, 2003). Diffusion is the approach through which an innovation is communicated via various channels over time and amongst several individuals within society (Rogers, 2003). The original theory was later revised to reflect perceived attributes of innovation; the relative advantage of the innovation; compatibility with people when adopted; the complexity of understanding and using the innovation; trialability on a limited basis before adopting; and observability of the innovation results to others (Rogers, 2008).

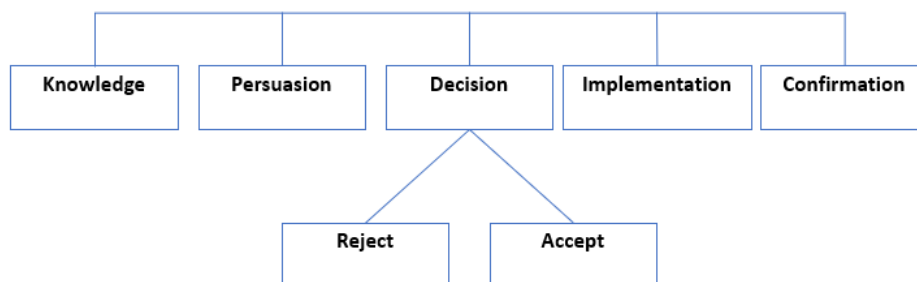


Figure 2.4-4: Diffusion of innovation theory

(Source: Rogers, 2003)

E-government studies using DOI are fewer. A UK study by Gilbert, Balestrini and Littleboy (2004) on citizens' perceptions of the barriers to e-government using constructs from DOI and TAM showed that trust, financial security, information quality, time and money determined usage. López-Sisniega *et al.* (2016) conducted an e-government correlation study in Mexico using DOI, TAM and models of web trust and found that, among many variables, the trust of the Internet and the government influenced adoption behaviours. However, age, literacy level, computer literacy level and gender did not independently determine behavioural intentions (López-Sisniega *et al.*, 2016). Like other IS models, DOI has its limitations.

DOI does not illuminate the factors that were later argued to be important in e-government adoption in later models (TAM3, UTAUT, UTAUT2), such as gender, experience, price value and age. Hence it was not used in the thesis.

#### 2.4.1.7 Technology Acceptance Model (TAM1, 2 and 3)

TAM, shown in Figure 2.4 5, was initially designed by Davis (1986) as a further adaptation of TRA. TAM is designed for modelling user acceptance in IS, unlike TRA that is a general theory of human behaviour (Mathieson, Peacock and Chin, 2001). TAM attributes technology adoption to mainly perceived ease-of-use (PEOU) and perceived usefulness (PU) of the technology in improving performance within an organisational context (Davis, Bagozzi and Warshaw, 1989). TAM is by far a popular IS model, not only in e-government studies.

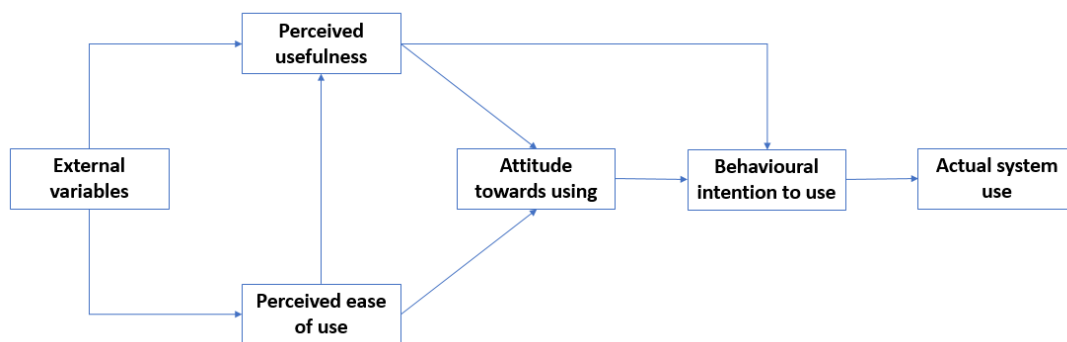


Figure 2.4-5: Technology acceptance model

(Source: Davis, 1986)

Before Davis (1986) postulated that PEOU and PU influenced digital technology adoption behaviours, there were prior studies that already hypothesised this (e.g., Schultz and Slevin, 1975; Robey, 1979; Bandura, 1982; Swanson, 1982). Studies by Robey (1979) confirmed earlier work by Schultz and Slevin (1975) who had found a correlation between PU and adoption of digital technology. Similarly, separate studies by Swanson (1982) and Bandura (1982) mirrored Schultz and Slevin's (1975) findings and confirmed that PEOU and PU determined behavioural intentions. In Swanson's (1982) studies, access costs equated to PEOU and perceived information quality equated to PU and the argument was that citizens made adoption decisions by considering the trade-off between the two. Over the years, additional variables were added to TAM following its application to several types of research. Subsequently, TAM2 (Venkatesh and Davis, 2000) and TAM3 (Venkatesh and Bala, 2008) were developed and applied to other e-government studies.

Hamid *et al.* (2016) studied e-government adoption by Malaysian public-school teachers and found that PEOU and PU influenced the continuance to use e-government and proposed that attitude should be added as a construct and as a product of PU and PEOU. Other researchers (e.g., López-Sisniega *et al.*, 2016; Lai and Pires, 2009; Venkatesh *et al.*, 2010; Zhang, 2013) used TAM in their e-government studies. A study by Gilbert, Balestrini and Littleboy (2004) using TAM concluded that the successful adoption of electronic services is increased when organisations have a trust relationship with citizens and assure them that their details are secure. A system is useful if it provides net benefits because citizens decide on adoption based on some benefits–risks assessment (Horst, Kuttschreuter and Gutteling, 2007). Although famous, TAM has some limitations.

One of TAM’s limitations is that it was built for organisational settings, where the company, and not the user, pays for the digital technology. Chuttur (2009) argued that while TAM is widely used in research, there are mixed opinions among researchers regarding its theoretical assumptions and practical effectiveness. Therefore, the thesis did not use TAM.

#### **2.4.1.8 Unified Theory of Acceptance and Use of Technology (UTAUT)**

UTAUT is a popular model used in at least 174 research analysis of IS (Williams, Rana and Dwivedi, 2015). The model is based on the premise that four external factors influence adoption behaviour; however, these are moderated by four internal factors, which are differences between individuals using a system. The external factors are performance expectancy, which is the perceived performance benefit of a system; effort expectancy, which is the degree of perceived ease of use of the system; social influence from important others to use the system; and facilitating conditions, which are the resources and support available to perform a behaviour (Venkatesh *et al.*, 2003). Internal factors moderate the influence of these external factors. These are age, gender, experience, and voluntariness. Experience is the passage of time from the initial use of digital technology (Venkatesh *et al.*, 2003). Just like TAM variants, UTAUT was developed for an organisational context but was subsequently adapted for a consumer context in UTAUT2.

#### **2.4.1.9 Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)**

The theoretical basis of the thesis was formed using an extended UTAUT2 model. The model, depicted in Figure 2.4-6, added four further variables to UTAUT. Hedonic motivation, price value and habit were added as external variables, while experience was added as an internal variable. Hedonic motivation is the enjoyment, fun or pleasure of using digital technology (Brown and Venkatesh, 2005; Venkatesh, Thong and Xu, 2012). Price value is an individual’s



cognitive trade-off between the application performance benefits and the cost of using the system (Dodds *et al.*, 1991). Habit is the extent to which, people tend to perform behaviours automatically because of learning (Venkatesh, Thong and Xu, 2012). Experience is the passage of time from the initial use of digital technology by a citizen (Venkatesh, Thong and Xu, 2012). Additionally, voluntariness to use digital technology, in the original UTAUT, was dropped as an internal moderating factor. This was because, in a non-organisational setting consumers have no organisational mandate to use digital technology, and the use becomes entirely voluntary, which results in no variance in the voluntariness construct amongst the users (Venkatesh, Thong and Xu, 2012). This trait potentially socially stratifies the use of digital technology, leading to social inclusion or exclusion.

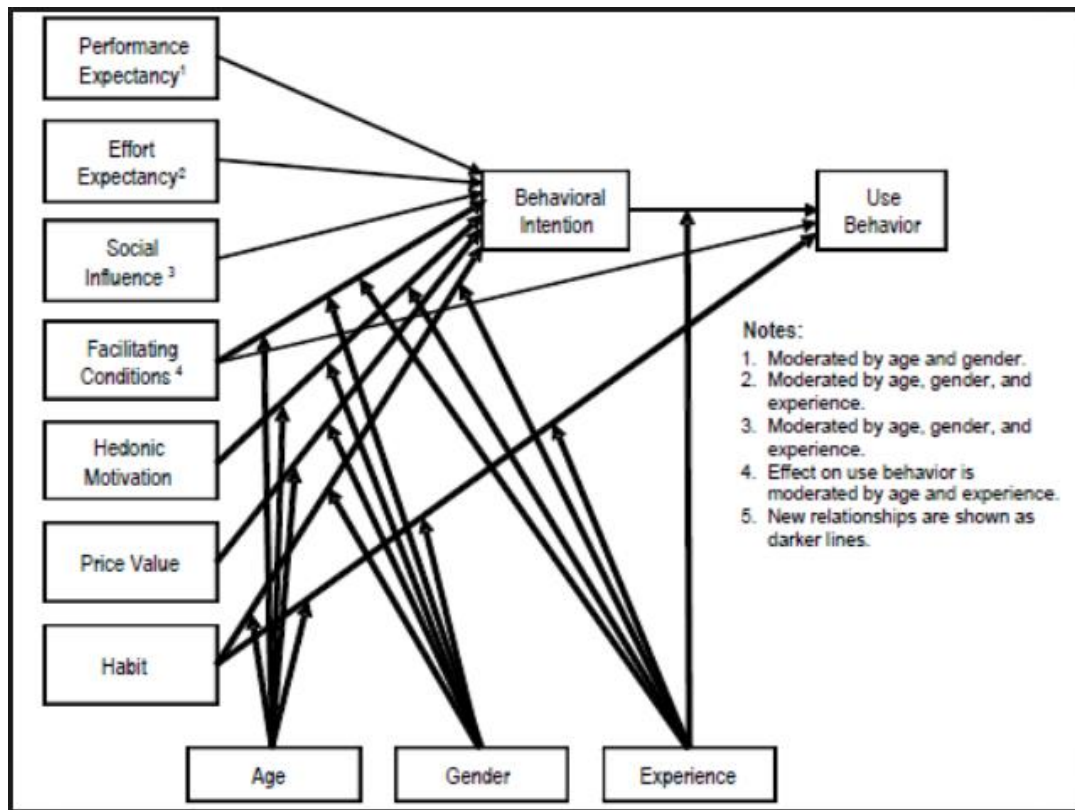


Figure 2.4-6: UTAUT2 model

(Source: Venkatesh, Thong and Xu, 2012)

UTAUT2 is so far uncommon in e-government studies, but other research has used it. E.g., Ramon-Jeronimo, Peral-Peral and Arenas-Gaitan (2013) investigated Internet Banking take-up by adults aged over 50 years in Spain and found that habit, performance expectancy, price value and effort expectancy influenced behavioural intention, in this order of influence by strength; however, social influence, facilitating conditions and hedonic motivation were not influential in the actual adoption behaviour. Morosan and DeFranco (2016) found that performance expectancy was the highest determinant of behavioural intentions, while hedonic motivation, habit and social influence had relatively low effects when they investigated Near Field Communication (NFC) mobile payments in the US. A similar study on mobile payments in the UK was conducted by Slade, Williams and Dwivedi (2013) using an extended UTAUT2. They validated the model and added perceived risk and trust as constructs. Borrero *et al.* (2014) studied social networking sites use by students and found that effort expectancy influenced behavioural intentions for female students and those with self-reported low-levels of technology readiness. Male students and those self-reporting high-levels of technology readiness had social influence as the strongest determinant (Borrero *et al.*, 2014). In the next section, the specific application of UTAUT2 in the few e-government studies is reviewed.

## **2.5 Predictors of e-government: a UTAUT2 application**

Fewer e-government studies have applied UTAUT2, as shown in Table 2.5-1.

Title	Main findings	Reference	Country	Framework
Acceptance of Health Information Application in Smart National Identity Card ( SNIC ) Using a New I-P Framework	Trust, perceived risk, privacy concern and perceived credibility are significant factors in the adoption of Smart National Identity Card and should therefore be incorporated in UTAUT2 (Hassan and Murad, 2014)	(Hassan and Murad, 2014)	Malaysia	Quantitative
Saudi citizens' perceptions on mobile government (mGov) adoption factors	Perceived risk, innovativeness; performance expectancy, effort expectancy, social influence, facilitating conditions, perceived value, hedonic motivation and behavioural intension influence behavioural intention to use mobile government services (Babullah, Dwivedi and Williams, 2015).  They adapted UTAUT2 and added perceived risk and innovativeness, but removed habit because they were investigating intention to use and therefore habit would not have formed yet (Babullah, Dwivedi and Williams, 2015).	(Babullah, Dwivedi and Williams, 2015)	Saudi Arabia	Quantitative
Web personalization for user acceptance of technology: An empirical investigation of E-government services	UTAUT2 was validated and extended to include web personalization (web recommender) as a moderator e-government using a lab experiment with university student, which is common in e-commerce (Krishnaraju, Mathew, Sugumaran, 2015).	(Krishnaraju, Mathew, Sugumaran, 2015)	India	Quantitative
Towards a Model for Driver Information Systems Use in a Developing Country	They studied Driver Information System (DIS) which includes online vehicle registration, electronic payment of fines and electronic toll collection services acceptance using UTAUT2 with an extension of political cultural, technical factors, organisational culture and self efficacy, however they removed price value, facilitating conditions and habit (Randle, Kekwaletswe, 2015). They found that all these factors influenced the successful adoption of DIS by citizens in a developing country (Randle, Kekwaletswe, 2015).	(Randle, Kekwaletswe, 2015)	South Africa	Quantitative

Table 2.5-1: UTAUT2 application in e-government studies

These studies have dropped some of the external variables. Others added new ones, such as trust (Hassan and Murad, 2014), perceived risk (Hassan and Murad, 2014; Babullah, Dwivedi and Williams, 2015), innovativeness (Babullah, Dwivedi and Williams, 2015), privacy concern and perceived credibility (Hassan and Murad, 2014), political, cultural, technical factors, organisational culture and self-efficacy (Randle and Kekwaletswe, 2015). Similarly, it was necessary to adapt UTAUT2 for this thesis, and these adaptations are discussed after highlighting the existing UTAUT2 moderating variables.

### **2.5.1 Moderating variables**

Moderating variables, by their nature, are contextual and are likely to affect adoption decisions differently for different citizens. However, a study by Haider *et al.* (2015) using UTAUT found no effect of moderating variables on external variables. Working on the premise that moderating variables affect external variables on adoption decisions, one of UTAUT2's moderating variables is Experience. Experience is a precondition for the formation of habit (which is an external variable); while on the other hand, the experience can result in the formation of different habitual levels correlated to the extent of interaction and familiarity with the technology (Venkatesh, Thong and Xu, 2012). Thus, habit reflects experience. Thus, it can be argued that, like habit, experience is an external variable. This argument will be tested in this study. Whether experience turns out to be an internal or external variable, there is an acceptance that it influences citizens' intention to use e-government. Before UTAUT2 was developed, an Australian and New Zealand study by Gauld, Goldfinch and Horsburgh (2007) identified that high users of ICT were more likely to use e-government and exhibited a more positive attitude towards e-government on some measures. Later studies by Voutinioti (2013) still support this finding on experience. Although using UTAUT, which does not have experience as a moderating variable, Haider *et al.* (2015) found that e-government was used more where social media was utilised in a Pakistan context, where most government services are offered online and are increased each year. Their findings were consistent with prior studies that argued that social media could benefit the adoption of e-government through increased interaction using this medium (e.g., Hand and Ching, 2011; Bonsón *et al.*, 2012). The researcher argues that the prior experience of using social media takes away the anxiety associated with using new digital technology and therefore increases the likelihood of e-government adoption. Of course, this assumes that the challenges with the general use of the Internet (e.g. access) have been attenuated, otherwise generic digital inclusion barriers would

need addressing first. Another moderator cited in UTAUT2 is age, which is discussed in the next paragraph.

A study by Gauld, Goldfinch and Horsburgh (2007) in Australia and New Zealand followed an earlier trend observed in a number of US studies where old age and less education stratified ICT and e-government support and usage. Predictions on the effect of age on e-government behavioural intentions may be borrowed from the general use of the Internet, where age stratifies digital inclusion (Cotten and Gupta, 2004; Carter and Bélanger, 2005; Parsons and Hick, 2008; Aerschot and Rodousakis, 2008; Workman, 2013; Damodaran, Olphert and Sandhu, 2014). This association is attributed to the decline in cognitive and memory capabilities associated with the ageing process (Posner, 1996). However, van Deursen and van Dijk (2013) argued that age has ceased to be a significant determinant of digital inclusion because young people have grown. While the author agrees with van Deursen and van Dijk (2013) that age is now a weak predictor, the reason is not plausible because there are citizens aged over 65 who were already old when the Internet penetrated communities at affordable prices, who are digital citizens. Gender is another internal variable in UTAUT2 and is discussed in the next paragraph.

Earlier studies on e-government showed that gender was no longer significant for adoption behaviours (Gauld, Goldfinch and Horsburgh, 2007). These findings mirror Spanish studies in other digital inclusion research. E.g., Internet banking amongst the over 50-year old (Arenas-Gaitán, Ramón-Jerónimo and Peral-Peral, 2015) and new media (Workman, 2014). Given the divergent views on the effects of some moderating variables, there was a need to adapt UTAUT2 based on literature findings and the results from previous DBA documents, and these adaptations warrant a discussion in the next section.

## **2.5.2 Adaptations to UTAUT2**

Firstly, the research model used for this study changed hedonic motivation from being an external variable to an internal variable. Awareness, security and trust of the Internet and e-government were added as external variables and the justifications for these adaptations are now outlined, starting with the internal variables.

### **2.5.2.1 Hedonic motivation (HM) as a UTAUT2 internal variable**

Brown and Venkatesh (2005) define hedonic motivation as the enjoyment, fun or pleasure derived from the use of digital technology by citizens. Hedonic motivation is argued to play a crucial role in influencing behavioural intentions to adopt and use digital technology (Thong, Hong and Tam, 2006). Thus, citizens who already enjoy using digital technology are unlikely

to dispense extra effort to use e-government. The researcher argues that in other instances, HM can lead to the formation of habit to use technology frequently, which could benefit e-government.

The effect of HM on e-government adoption is uncommon, however it has been cited in studies on mobile payments (Abdullah, Dwivedi and Williams, 2014; Qasim and Abu-Shanab, 2015), online purchasing (Zins and Bauernfeind, 2005; Escobar-Rodríguez and Carvajal-Trujillo, 2014), mobile health (Abdullah, Dwivedi and Williams, 2014), web personalisation (Vinodh and Mathew, 2012), among others. Ordinarily, it is plausible that HM determines and moderates behavioural intention and use of digital technology. Therefore, the research will confirm whether or not hedonic motivation is an external variable, in addition to it being used as an internal moderating variable, using the hypothesis,

HM H<sub>1</sub>: Hedonic motivation influences citizens' behavioural intention (BI) to use NCH Web services or the Universal Credit system.

The study anticipates that citizens who derive pleasure from using digital technology and are consequently more skilful in using the Internet will show a significant correlation between HM and behavioural intention to use e-government. This is because their effort expectancy and computer anxiety would be lower, leveraging on the frequent use of digital technology. The study anticipates that HM will moderate effort expectancy, facilitating conditions, security and trust of the Internet. The frequent use derived from the pleasure of using digital technology should attenuate the Internet security concerns and subsequently improve trust in e-government. The computer playfulness derived from hedonic motivation should reduce the need for training on digital technology because users exhibiting this trait use cues to manage new challenges posed by existing and new digital services. Citizens with high hedonic motivation tend to be industrious in gaining access to the Internet if they do not have it readily available so that they can satisfy their desire to be online. Besides this internal variable change, three external variables were added to UTAUT2 as detailed below.

#### **2.5.2.2 Awareness (AW) of e-government**

Wallace (2013) argued that the successful diffusion of new digital technology is contingent upon how it is publicised. Furthermore, the UN (2010) argued that awareness is a critical success factor for e-government. Shareef *et al.* (2011) extended this discourse, demonstrating that awareness is more significant when citizens seek information or make transactions using e-government. Thus, awareness of e-government is essential in adoption decisions. However,

López-Sisniega *et al.* (2016) argued that, individually, awareness does not relate to the intention to use e-government. When citizens are aware of an alternative to the traditional governmental channel, they may want to try the alternative channel. If they find some advantages and they can use the alternative channel, then they are likely to adopt. The source of information leading to awareness is external to a citizen. Therefore, awareness is modelled as an external variable. It is expected to be moderated by age and experience. Younger adults who are more exposed to digital technology and have experience of using digital services are expected become aware of e-government innovations quicker than older adults. Therefore, the following hypothesis is derived:

AW H<sub>1</sub>: Awareness of the Universal Credit system, moderated by age and experience, influences citizens' behavioural intention (BI) to use it.

### **2.5.3 Security (SE) and trust (TRi and TRe) in e-government**

Security and trust have featured in e-government research and generally where electronic transactions are involved. Additionally, the two constructs also featured in previous DBA qualitative and quantitative researches (Chirara, 2014; Chirara, 2015) that were a build up to the thesis. The author argues that security and trust have a close relationship and apply to e-government. Citizens who view e-government as secure are likely to exhibit high levels of trust in e-government. Both security and trust complement facilitating conditions that deal with the support and resources available to foster digital technology adoption. Security is discussed first.

#### **2.5.3.1 Security (SE)**

The thesis adds security as an external variable to extend the UTAUT2 constructs, as shown in Figure 2.7-1. E-government introduces security and privacy challenges (Alzahrani and Goodwin, 2012; Jaeger in Alawneh, Al-Refai and Batiha 2013, p.277). Governments are usually faced with scepticism and limited adoption of e-government due to the risk of privacy and personal information misuse that comes with the convenience of easy access to information provided by electronic services (Anastasopoulou and Kokolakis, 2013). As e-government matures and citizens' digital skills get sophisticated, the security expectations on e-government increase. An (2009) views information as a national asset, which Halchin (2004) argues can be used against a nation by terrorists. Consequently, information should be classified according to the information sensitivity, with the most sensitive information being secured (Becker *et al.*, 2004). Therefore, failing to tackle e-government security concerns can expose a nation and its citizens.



The government must show beyond reasonable doubt that citizens' data is protected for successful e-government adoption. Otherwise, successive e-government initiatives will be met with resistance. The resistance is probably why Anastasopoulou and Kokolakis (2013) argued that governments downplay privacy concerns to further e-government adoption. Data leaks are a sensitive issue for citizens (Evans and Yen, 2006). They touch on the delicate fabric of trust. However, it is fair to say that over the years, a wide range of initiatives across both the public and private sectors have been made to secure data, such as encryption, access rights with two-factor authentication, security awareness for the employees handling the data and backup/recovery strategies (Hof, 2003). There is a trade-off between security and the e-government benefits that tips the scale in favour of e-government use. There are some internal factors anticipated to moderate security views.

Security is expected to be moderated by age, with younger adults who have been exposed to the Internet at an early age likely to perceive e-government as secure. Gender is not expected to moderate security. However, the experience is expected to moderate security, with more experienced Internet users perceiving e-government as secure. Hedonic motivation is also expected to moderate behavioural intention, with citizens who show high levels of computer playfulness not being stopped by e-government security and trust concerns. The author argues that trust reduces the anxiety associated with paying attention to security and administration controls. The time and effort spent by citizens paying attention to e-government security and trust controls in place are lower when hedonic motivation is high. This leads to the hypothesis,

SE H<sub>1</sub>: Security concerns, moderated by age, experience and hedonic motivation, influence citizens' BI to use NCH Web services or the Universal Credit system.

The author argues that if citizens perceive e-government to be secure, they are likely to trust it and therefore likely to use it. Therefore, the next section explores trust as an additional UTAUT2 external construct.

### **2.5.3.2 Trust (TRi and TRe)**

Trust is an expectancy that the promise made by an individual or a group can be relied upon (Rotter, 1971). While trust is not theorised in UTAUT2, it is a prominent construct in e-government from early studies in diverse settings (e.g., Belanger and Carter, 2008; Colesca, 2009; Abu-Shanab and Al-Azzam, 2012; Rehman, Esichaikul and Kamal, 2012; Emad, 2014; Rana *et al.*, 2015). The dominant discourse is that trust is associated with any uncertainty related to electronic services. Harvey *et al.* (1995) and McKnight, Choudhury and Kacmar

(2002) associate trust with the perception of risk, arguing that trust helps attenuate the perception of risk posed by the uncertainty of behaviour and its outcome. Rehman, Esichaikul and Kamal (2012) argue that perceived risk leads to security and trust issues that act as barriers to using electronic services.

Furthermore, Zhou (2012) argues that where there are electronic transactions involved, trust is even more important due to geographic separation. Balan (2014) argues that lack of citizens' trust is a plague as e-government becomes part of the virtual economic landscape. In a study in the Netherlands, Horst, Kuttschreuter, and Gutteling (2007) argued that citizens needed to trust the integrity and information management capabilities of the government and its agencies, the digital technology and those managing it for successful e-government adoption. Although using UTAUT, a study by Cheng *et al.* (2008) on Romanian University students incorporated trust to the model, which they found to be significant to users' behavioural intentions. Ozkan and Kanat's (2011) studies on adoption of e-government by tertiary education students, using TPB, found that trust was partially mediated over attitudes and concluded that trust precedes both the attitudes and the intentions. Chen *et al.* (2015) studied a Philippines online tax filing system and found trust to be significant, but also added prior experience as influencing e-government adoption. How is trust operationalised in research?

An analysis of where trust is stated as an e-government determinant demonstrates that it can be operationalised in three ways (Belanger and Carter, 2008; Ozkan and Kanat, 2011; Alzahrani and Goodwin, 2012; Alsaif, 2013; Voutinioti, 2013; Alryalat, Dwivedi and Williams, 2013; Fakhoury and Aubert, 2015; Rana *et al.*, 2015). Firstly, trust in the government, which is image or perception driven (Teo, Srivastava and Jiang, 2008; Belanger and Carter, 2008; Weerakkody *et al.*, 2013; Nam, 2014; Fakhoury and Aubert, 2015). It is argued to influence citizens' perceptions of adopting e-government and is a long-term effort where government institutions must strive to improve their reputation by establishing consistent government policies, inform citizens, servicing citizens' needs, fighting corruption and increasing the field of civil rights (Voutinioti, 2013; Srivastava and Teo in Chen *et al.* 2015, p.252).

Secondly, trust in e-government is a prominent perceived risk feature (Mostafa and El-Masry, 2013; Rufin *et al.*, 2014). It is perceived as a function of data protection and system reliability (Chadwick, 2001). These risk functions, in turn, influence the behavioural intentions to use digital technology (O'Cass and Fenech, 2003) and are mitigated by increased trust in the electronic services (Pavlou, 2003). Other researchers (e.g., Douglas, 1983; Acquisti and

Grossklags, 2008) have argued that this risk perception is correlated with psychological, social and cultural factors. Carter and Weerakkody (2008) conducted a cross-national e-government study in the UK and USA and concluded that trust concerns were significant in either country, although other adoption factors varied on cultural grounds. Chen *et al.* (2015) draw parallels with the e-commerce world and articulate that trust in e-government is influenced by perceptions of the website.

Thirdly, citizens' trust of the Internet is critical in the adoption of e-government initiatives (Belanger and Carter, 2008; Alsaif, 2013; Weerakkody *et al.*, 2013; Taiwo, Downe and Loke, 2014). A study by Chen *et al.* (2015) on online tax filing indicated that trust in technology; trust in government and prior experience all directly influenced trust in e-government. There is also a relationship between trust and information quality since in all contexts of online exchanges, users are not in the appropriate position to touch, feel, and physically experience the object of exchange (Chen *et al.*, 2015). A study by AlAwadhi and Morris (2009) using University students showed that almost a third of the participants trusted the Internet on the belief that Internet security solutions were robust to intercept fraud against electronic transactions and hacking. However, Internet experience enhanced trust.

Trust will be measured by trust in e-government and trust of the Internet. If a citizen trusts at least one of the attributes, then their behavioural intentions to use e-government is likely to be high. Trust is expected to be moderated by age, with younger adults trusting more than the older adults. Gender is expected to be an insignificant moderator. Experience is expected to moderate trust, with citizens who have used other Internet services more likely to trust and use e-government as a service. Hedonic motivation is expected to moderate trust, with citizens who indicate low levels of trust likely to show low behavioural intentions. Thus, the study hypothesises that,

TRi H<sub>1</sub>: Trust of the Internet, moderated by age, experience and hedonic motivation, influences citizens' BI to use NCH Web services;

and

TRe H<sub>1</sub>: Trust in e-government, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Universal Credit system.

The next section now discusses the existing UTAUT2 constructs.

#### **2.5.4 Performance expectancy (PE)**

Studies have shown that PE is the strongest determinant of behavioural intention (Venkatesh, Thong and Xu, 2012). Several e-government studies that used UTAUT in diverse contexts found that PE was a significant determinant of citizens' behavioural intention to use the services (e.g., Mostafa and El-Masry, 2013; Raman *et al.*, 2014; Taiwo, Downe and Loke, 2014b). AlAwadhi and Morris (2009) measured PE using the citizens' perception of the e-government benefits, such as saving time, effort and money, facilitating communication with the government and improved customer service. Alawadhi and Morris (2008) further observed that PE was significant when moderated by Internet experience. This indicates that if a citizen has prior experience of using the Internet, they could easily relate to the benefits of e-government. The significance of PE mirrors other e-government studies where different theoretical models were used. E.g., Rana *et al.* (2016a) used DTPB and found that perceived usefulness, which is the equivalent of PE, had a strong and significant impact on citizens' attitude towards e-government. Similarly, Hung, Chang and Yu (2006), Cushman and Klecun (2006) and Shareef *et al.* (2011) found that perceived usefulness in TAM was a predictor of e-government adoption. Moreover, AlAwadhi and Morris (2009) discovered that citizens preferred e-government because there was no stress associated with traditional government services, such as waiting in long queues or dealing with uncooperative government employees.

While Venkatesh, Thong and Xu (2012) theorised that PE is moderated by gender and age, their effects are expected to be weak, in line with literature that argues that they have become weak predictors of Internet usage (van Deursen and van Dijk, 2013; ONS, 2013). Therefore, it is hypothesised that,

PE H<sub>1</sub>: There is a statistically significant correlation between PE and BI, moderated by age and gender, to use NCH Web services or the Universal Credit system.

There is some effort that must be expended by the citizens to realise the performance gains from using e-government.

#### **2.5.5 Effort expectancy (EE)**

EE in e-government, like 'ease of use' in TAM and TPB, is measured by the perceptions of ease of use and ease of learning, and it influences the behavioural intentions to use the service (AlAwadhi and Morris, 2008; Weerakkody *et al.*, 2014; Nasri, 2014; Alghamdi and Beloff, 2016). This is reflected in other e-government studies that used SCT, where self-efficacy was found to be significant on outcome expectations (Rana and Dwivedi, 2015). The effort associated with learning a new technology sometimes comes with anxiety. Compeau and

Higgins (1995) argued that high levels of anxiety and emotional reactions result in lower intentions to use a system. On the contrary, prior experience reduces these anxieties and AlAwadhi and Morris (2008) identified that Internet experience moderated EE. Therefore, it can be argued that for the successful adoption of e-government, the service should be easy to use, despite the level of Internet experience, so that anxiety associated with learning the service is low. A problematic e-government system deters learning the system and its continued use.

AlAwadhi and Morris (2009) found that some citizens who had some experience of using e-government were deterred from using the services again because of encountering problems using the service and eventually leading to visiting government offices. They also encountered citizens who questioned the usefulness of the service, given that some of the services required citizens to visit government offices for additional procedures such as signatures, stamps and payments. This underlines the importance of reliable and easy to use services to sustain continued use. Like PE, EE is expected to be slightly moderated by age and gender and significantly by experience and hedonic motivation. Citizens with high Internet experience, who derive pleasure from using the Internet are expected to exhibit high behavioural intention to use e-government. Thus, the following hypothesis is derived,

EE H<sub>1</sub>: EE, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.

In addition to understanding the efficiency gains from e-government, having the will to expend some effort learning and using the digital technology, be it independently or influenced by others, there should be facilitating conditions to encourage adoption and continued use.

### **2.5.6 Facilitating conditions (FC)**

FC could be measured by the perception of being able to access required resources, obtaining relevant knowledge and the necessary support needed to use e-government (AlAwadhi and Morris, 2008; Chu, 2013; Nasri, 2014; Alryalat, Dwivedi and Williams, 2013; Raman *et al.*, 2014; Rana *et al.*, 2016b). FC influence both the behavioural intention and the actual usage behaviour. Getting citizens to participate requires identifying target segments and equipping them with adequate skills (Holgerson *et al.*, 2010), which is critical for the continued use of the service. AlAwadhi and Morris (2008) further argue that the perception of the digital technology fitting into one's lifestyle and awareness of the service through aggressive campaigns also determine behavioural intentions. The digital technology fit introduces an

element of compatibility with old governmental services, which Medjahed, Bouguettaya and Elmagarmid (2003) and Carter and Bélanger (2005) argue is critical in influencing e-government adoption behaviours.

Therefore, it is pertinent that the government and local authorities engage citizens in building e-government services that increase citizens' positive experience. FC are expected to be slightly moderated by age and gender and strongly moderated by experience and hedonic motivation for behavioural intention, hence the following hypothesis,

FCb H<sub>1</sub>: FC, moderated by age, gender, experience and hedonic motivation, influence BI to use NCH Web services and the Universal Credit system.

Usage behaviour is expected to be moderated by age, experience and hedonic motivation, thus the following hypothesis,

FCu H<sub>1</sub>: FC, moderated by age, experience and hedonic motivation, influence citizens' usage behaviour of the Internet in general.

Their significant others could influence the effort expended by a citizen towards using e-government or their perceptions of the benefits of e-government.

### **2.5.7 Social influence (SI)**

SI has a positive and significant influence on behavioural intention to use e-government (Alryalat, Dwivedi and Williams, 2013; Nasri, 2014; Alghamdi and Beloff, 2016). In a separate study by AlAwadhi and Morris (2008) where undergraduate and postgraduate students were used, they changed the construct to 'peer influence'. The change was because, at that age, peers may have more influence on behaviour than other relations. They found that peer influence positively correlated to behavioural intention to use e-government. Similar conclusions were reached using other models such as SCT that uses social influence (Rana and Dwivedi, 2015) and DTPB that uses 'subjective norms' to measure SI (Rana *et al.*, 2015). However, Rana *et al.* (2015) found the link to behavioural intention weak. Studies that applied TAM3 (Shareef *et al.*, 2011) also showed that 'perceived image' determined e-government behavioural intention. Venkatesh (2014) defines a perceived image as the degree to which the use of an innovation is perceived to enhance one's status in one's social system. Shareef *et al.* (2011) argue that perceived image has no bearing at the information seeking stage of e-government and attribute this to the fact that citizens are not interacting with the government by any means, so they are not disclosing any personal or financial information in the virtual environment. It may be argued that while the perceived image may not be significant at the information seeking stage,

Shareef *et al.*'s (2011) explanation is not plausible. The definition of the perceived image relates to a citizen's perception of their social status regarding adoption, which has nothing to do with personal information disclosure. Regardless, a positive e-government experience by one citizen who shares it with significant others is likely to influence others' behavioural intentions towards adoption. According to Venkatesh, Thong and Xu (2012), SI is moderated by age, gender and experience. This study also adds hedonic motivation as a moderating variable, leading to the hypothesis,

SI H<sub>1</sub>: SI, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.

A positive experience with e-government shared with significant others might influence the perceptions of value for money when evaluating the costs associated with accessing the Internet.

### **2.5.8 Price value (PV)**

If citizens perceive the benefits of e-government to outweigh the costs of acquiring and using digital technology, then they will likely adopt e-government. In the context of digital consumer services, citizens have a choice to accept or reject the online services. E.g., when price discounts or promotional prices are extended to consumers who use online services. However, in an e-government context where sometimes the choice to use offline services is taken away from citizens (e.g., UC) and there are no apparent financial incentives differentials between online and offline services, then the justification for this construct becomes blurred. This is because the costs associated with being online become mandatory, in a way. In this case, the driver would be fear of losing social welfare benefits rather than price value. Let us further explore the effects of PV in e-government.

There is no prominence of PV in e-government literature. However, the costs associated with getting an Internet connection are mostly at the expense of the citizen, unless they use free public Internet services. This notion is mostly applicable in developed countries where there is a plethora of free Wi-Fi Internet access from the private and public sectors. Despite free Wi-Fi access, citizens must bear the cost of access devices, such as PCs or portable Internet access devices. However, local libraries have Internet-enabled PCs that attenuate this challenge. Moreover, the costs of portable Internet access devices, such as smartphones and tablets now come in marketing bundles that spread the capital cost over 18-36 months, giving the perception of affordability. Therefore, the researcher expects that PV would be a moderate to

weak determinant of behavioural intention to use e-government. It is also expected to be slightly moderated by age and gender. Hedonic motivation is expected to show significant moderating effects on PV, with citizens with high levels of hedonic motivation viewing Internet access costs as high value for money. Therefore, it is hypothesised that,

PV H<sub>1</sub>: PV, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Internet in general.

For some avid digital technology users, price value perceptions are influenced by the technology usage habits that have formed over time.

### **2.5.9 Habit (HB)**

Habit is conceptualised as the result of prior experiences (Venkatesh, Thong and Xu, 2012). Others conceptualise habit slightly different from Venkatesh, Thong and Xu (2012). Limayem, Hirt and Cheung (2007) operationalise habit as the extent to which one believes their behaviour is automatic, while Kim and Malhotra (2005) conceptualise it as prior behaviour. Either way, the common theme here is that it is linked to the previous behaviour, which in turn can be directly connected to the passage of time after an initial behaviour (i.e. experience). Habit influences both behavioural intention and usage behaviour (Venkatesh, Thong and Xu, 2012), so how is it operationalised in e-government?

In e-government, habit has no prominence yet. However, the researcher expects that citizens who indicate having HM from the use of technology would also indicate that their use of technology is a well-formed habit. Furthermore, the researcher argues that citizens who demonstrate that they use the Internet for social purposes would have formed habits to use the Internet that can help them navigate e-government. The continued use of e-government could benefit from the habitual use of the Internet, which can be argued to keep citizens' computer and digital literacy skills updated. The influence of habit on behavioural intention is expected to be moderated by age, gender, experience and hedonic motivation, although the effects of age and gender are anticipated to be low, hence the hypothesis,

HBb H<sub>1</sub>: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' behavioural intention to use the Universal Credit system.

For the direct effect of habit on usage behaviour, age, gender, experience and hedonic motivation are expected to moderate the effects, thus the following hypothesis,



HBu H<sub>1</sub>: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' usage behaviour of the Universal Credit system.

The internal and external variables discussed determine a citizen's behavioural intention to use e-government, which is discussed in the next section.

### **2.5.10 Behavioural intention (BI)**

BI is an individual's perceived likelihood to engage in a behaviour (Committee on Communication for Behavior Change in the 21st Century, 2002). It reflects how hard or motivated an individual is willing to try to perform a specific behaviour and is the most proximate determinant of behaviour (Ajzen, 1991). However, Limayem, Hirt and Cheung (2007) challenge this discourse, arguing that habit is another determinant of BI. Regardless, e-government studies have demonstrated that BI influences the actual usage of e-government (AlAwadhi and Morris, 2008; Alzahrani and Goodwin, 2012; Alsaif, 2013; Nasri, 2014; Fakhoury and Aubert, 2015). AlAwadhi and Morris (2008) posit that the intention, prediction and planned use of e-government are measures of BI. Venkatesh, Thong and Xu (2012) argue that BI influences usage behaviour and is moderated by experience, hence the hypothesis,

BI H<sub>1</sub>: Behavioural intention to use the Universal Credit system, moderated by experience, has a significant statistical relationship with the actual system usage behaviour by citizens.

Internet access with the last seven days will be used to measure digital inclusion.

## **2.6 Digital inclusion as a social phenomenon (DI)**

In section 2.2 it was argued that broader goal of digital inclusion is to improve social inclusion. The thesis results on their own, without a longitudinal study, cannot demonstrate if e-government improves social inclusion. Therefore, the thesis can only give a snapshot of the citizens' views of the social impact of e-government, which can be used as a starting point in formulating actions that promote the adoption of the Universal Credit by citizens. Hence, the following hypothesis was proposed,

DI H<sub>1</sub>: Digital inclusion improves social inclusion.

The literature explored in this chapter led to forming a research model for the thesis, which acted as the compass for the study.

## **2.7 Conceptual framework**

The conceptual framework of this thesis is a result of reviewing the conceptual frameworks proposed in the previous documents and taking account of the emerging themes from the thesis literature review. This iterative process is demonstrated by Schon (2003) who used an architectural example in which designers learn from iterations of moves, which lead them to reinvent and redraw designs until they understand the problem of this problem. Fisher *et al.* (2010, p.9) call this “learning to learn”.

In constructing the conceptual model, awareness, security and trust were added to the original UTAUT2 model. From the original UTAUT2, hedonic motivation was changed from being an external variable to an internal variable. The rationale for doing this was discussed in 2.5. The resultant research model is shown in Figure 2.7-1.

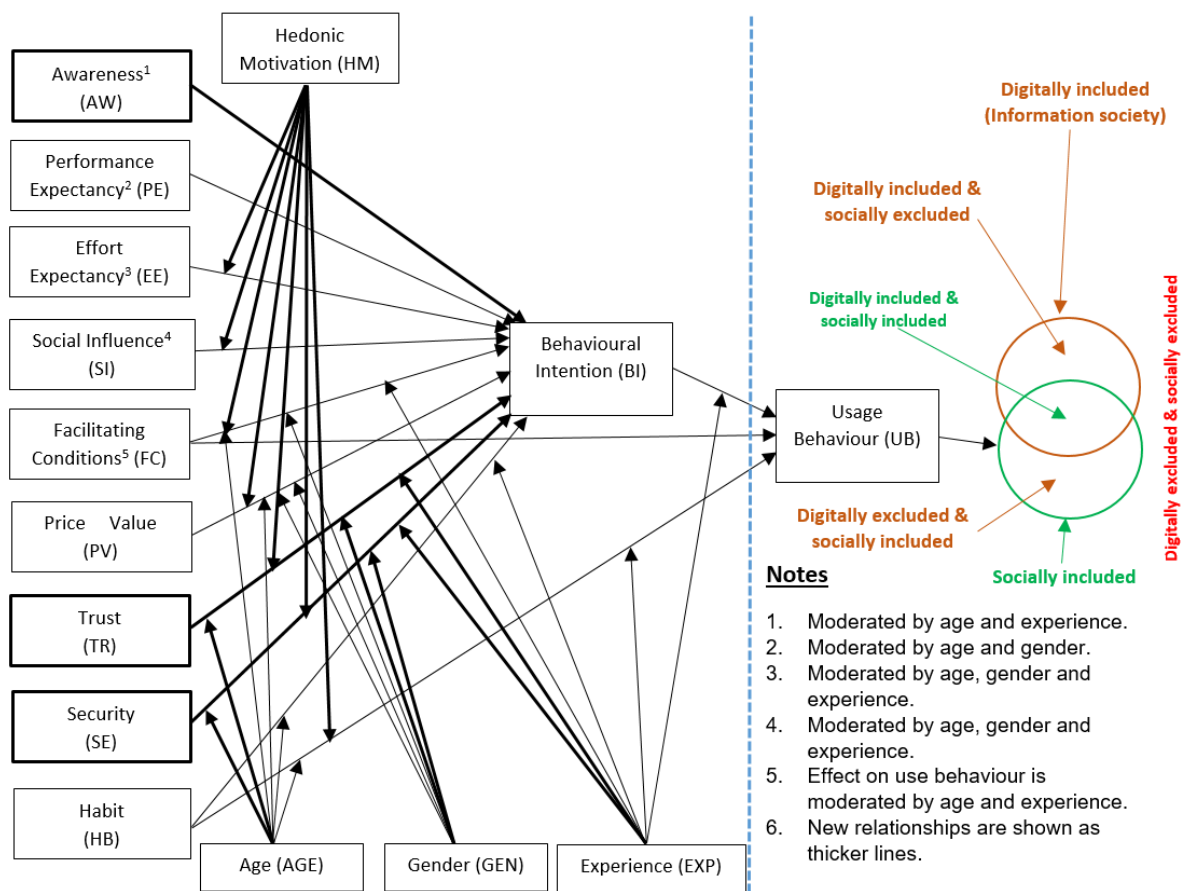


Figure 2.7-1: Conceptual framework – adapted UTAUT2

(Source: Adapted from Venkatesh, Thong and Xu, 2012).

In the research model, AW, PE, EE, SI, FC, PV, HB, SE and TR are the external variables and are theorised to influence BI, while HB, BI and FC are theorised to influence usage behaviour. The underlying logic for including awareness, security and trust as external variables in the conceptual framework has been discussed. The literature review showed that a citizen could be digitally included and feels socially included, digitally excluded and feels socially excluded, digitally included but feels socially excluded or digitally excluded but feels socially included. The two rings in the model capture these scenarios while mitigating the criticism by Alghamdi, Goodwin and Rampersad (2011) that e-government focused on technical issues. Age, gender, experience and hedonic motivation are theorised to moderate the effects of some of the external variables. These adaptations of UTAUT2 for different settings follow an open recommendation by the proponents of the model (Venkatesh, Thong and Xu, 2012).

## 2.8 Summary

The chapter examined the literature on e-government and identified that e-government is a transformational public administration service to both the government and citizens. E-government is one of the means to deliver better public administration to citizens and not the end goal. However, it was acknowledged that e-government could reinforce social exclusion for some digitally excluded citizens. The current literature does not emphasise this. It focuses on technical issues only when articulating e-government benefits, while neglecting the negative social impact to citizens. There are citizens with skills and access to the Internet who would rather use other channels of public administration. In the UK, social exclusion is possible for public services delivered using the Digital by Default strategy, such as UC, aimed at providing public administration online.

Although the primary focus of the thesis is getting citizens on board e-government, it is worth mentioning that there is very little literature tackling the factors influencing the continued use of e-government. The thesis will propose an e-government adoption process that focuses on continued e-government usage, which contributes to e-government knowledge and provides practitioners with a tool for effective e-government strategy formulation for improved digital inclusion.

The link between digital inclusion and social inclusion is more pronounced in communities where significant socio-economic inequalities exist, and there are no social welfare benefits available to the citizens. As this inequality narrows, the link becomes unclear because there are digitally excluded citizens who are not materially deprived. The chapter then explored the literature on factors influencing e-government adoption using UTAUT2, which was developed for a consumer setting.

The literature review identified that UTAUT2 had been used in very few e-government studies. Additionally, where it was used, it was adapted to suit the context. Similarly, the thesis incorporates awareness, trust and security, in the conceptual framework, which were identified as prominent e-government adoption factors. The next chapter now outlines the philosophical approach used to understand the research aims stated in Chapter 1.

## **Chapter 3: Research paradigm, methodology and methods**

This chapter outlines the research paradigm and the approach used to investigate the factors influencing e-government adoption in the north of Nottingham. The chapter starts by discussing three distinct paradigms from which positivism was chosen as the most suitable paradigm to address the research questions. The ontological, epistemological, axiological and methodological implications of positivism, concerning the research objectives, are outlined. The chapter goes on to discuss the reliability and validity of the research approach before discussing the method (questionnaire) for data collection. Finally, the chapter outlines the limitations of the questionnaire.

### **3.1 Research paradigm**

When deciding upon the research approach, a researcher considers their paradigm. There is no commonly agreed definition of paradigm. Even Thomas Kuhn who introduced the term used it differently in no fewer than twenty-one times (Masterman, 1970; Guba, 1990). Others inconsistently substitute paradigm for terms such as perspective, theory, discipline, school or method (Hassard, 1988). Regardless, when we conduct research we operate with a set of beliefs and a researcher should be aware of their beliefs, which influence the research interpretation. Guba (1990) refers to these belief systems as paradigms (Guba, 1990). They are a lens through which a researcher sees things, influences decision making and how the research is conducted. Guba (1990) argues that a paradigm is characterised by its ontology (the nature of reality), epistemology (the connection between the researcher and the known) and the methodology (how the researcher goes about finding out the knowledge). The methodology is not to be confused with the method. A method is an umbrella term for techniques used for data collection (Bryman and Bell, 2011). Methodology discussions help researchers to choose the most appropriate research methods to meet the research objectives. Several paradigms capture the underlying assumptions of a researcher that influence the research design.

The thesis considered three paradigms to use to address the research questions: positivist, critical realist, interpretivist and their definitions and philosophical perspectives are shown in Table 3.1-1.

Philosophical attributes	Positivist	Critical Realism	Interpretivist
Definition and general description	Positivism is a natural science epistemology that advocates for the application of methods of natural sciences to the study of social reality (Bryman and Bell, 2011). Focused on casual relationships and incremental contribution to theory (Saunders <i>et al.</i> , 2015)	Critical realism attempts to bring together realism and nominalism (Fisher <i>et al.</i> , 2010). Challenges the positivist view of objective reality arguing reality is stratified (Collier, 1994)	Interpretivism does not accept the existence of an orthodox or standard interpretation of a phenomenon (Fisher <i>et al.</i> , 2010). It sets aside the researcher's presuppositions about investigated phenomena (Cassell and Symon, 2004).
Ontology	Ontological realism (objective existence) (Fisher <i>et al.</i> , 2010). Independent of social actors (Blaikie, 2007).	Reality exists, not like physical objects, and is a function of experience, events and mechanisms (causes of the events) (Collier, 1994).	Reality is socially constructed (Fisher <i>et al.</i> , 2010). Text produced in interviews is shaped by context (Cassell and Symon, 2004).
Epistemology	Discover the truth and make predictions through observation and measurement (Fisher <i>et al.</i> , 2010).	Truth is excavated through historically situated facts and stories (Collier, 1994).	Meaning is constructed from narratives and interpretations (Cassell and Symon, 2004).
Axiology	Value-free and the researcher is detached from research and makes a neutral and independent stance (Blaikie, 2007).	Value-laden because researcher identifies causal structures and mechanisms (Collier, 1994).	Value-laden and the researcher is inseparable from the phenomena (Blaikie, 2007)
Methodological approach	Quantitative (Fisher <i>et al.</i> , 2010).	Quantitative and/or qualitative (Fisher <i>et al.</i> , 2010).	Qualitative (Fisher <i>et al.</i> , 2010).
Methods	Experiments, surveys (Blaikie, 2007)	A range of methods used for in-depth historical analysis (Collier, 1994).	Interviews, ethnography, grounded theory (Fisher <i>et al.</i> , 2010).

Table 3.1-1: Research paradigms beliefs

Several considerations determined the choice of the paradigm suitable for addressing the thesis research questions. The first consideration for the thesis relates to the ability to predict e-government adoption through observation and measurement. Understanding the factors influencing citizens to adopt the current digital public services helps the government and local authorities to predict future e-government adoption reasonably. Such predictions are possible if the current e-government usage can be quantified and measured. Another consideration relates to the voice of an actor (citizen) that literature review argued influences the success of e-government.

Understanding the e-government adoption factors from the citizens' perspective, without the researcher's subjective influences, helps formulate strategies to mitigate the actual (not the government's or researcher's) perceived barriers. Therefore, it is prudent to use a paradigm that minimises subjective interpretations of the researcher, especially considering that the researcher works for a local authority as an ICT practitioner and is biased towards digitally delivered services. More so, the researcher is not on social welfare benefits and has advanced ICT skills and therefore is bound to perceive the barriers differently from citizens who are financially disadvantaged or those with average or low computer and digital literacy, respectively. These factors introduce some bias not consistent with the research elements if the researcher's values are allowed to influence the citizens' views of e-government by using paradigms that are value-laden. The final consideration is influenced by the paradigms used in the previous DBA documents that influenced the focus of the thesis.

The thesis is testing the theories from the literature review, and the conclusions arrived at from early research conducted as part of this DBA study, stated in 1.7. One of these used the interpretive paradigm whose interpretations were used to formulate the questionnaire response options (method) and the other used positivism to test the general digital inclusion adoption factors. Subsequently, these adoption factors are now evaluated in an e-government context. All the above considerations influenced the paradigm choice.

Given the considerations outlined in the preceding paragraphs and mapping them to the three paradigms' attributes discussed in Table 3.1-1, the positivist paradigm is chosen as the most suitable for the aim of the thesis. The characteristics of positivism in Table 3.1-1 are further explained.

Auguste Comte, a French philosopher, is associated with the prominence of the doctrine of positivism that argues that "all genuine knowledge is based on sense experience and can be

advanced only by means of observation and experiment” (Cohen, Manion and Morrison 2009, p.9). It is a natural sciences paradigm that was lent to social sciences research (Bryman and Bell, 2015). Robson (2011) similarly argues that it is possible to transfer the natural sciences belief system and methods to social sciences. This argument is valid when a researcher is using observable objective facts to establish causal effects and make informed decisions, which is useful in evaluating the most significant factors influencing e-government adoption. The notion of using positivism points at using a quantitative methodological approach with associated methods for data collection.

The thesis uses a quantitative methodological approach, which is defined from the perspective of the presence of numbers. Punch (2005, p.3) defines it as “empirical research where the data are in the form of numbers.” Buglear (2007) further explains that quantitative data is concerned with ‘how many’ and ‘how much’ and are always of the interval or ratio type. Buglear (2007) appropriately places the application of quantitative research directly into everyday life, arguing that business is all about quantities and that numbers are integral to understanding the world around us. Similarly, Morris (2008) argues that numbers are a tool for planning and a means of communication that complements verbal communication. However, caution should be thrown on the emphasis of numbers when framing quantitative research discourses (Bryman and Bell, 2015). This caution allows us to analyse theory generation and verification from these numbers.

### **3.2 Theory generation and theory verification in quantitative research**

The existing theory discussed in the literature review is used to develop hypotheses that are tested and accepted or rejected. This approach leads to further theory development, which can be tested by future research (Saunders, Lewis and Thornhill, 2009). Therefore, the thesis takes a deductive research approach where theory determines the data collection (Fisher *et al.*, 2010). The concept of theory generation and theory verification, concerning quantitative research, is important and Punch (2014, p.21) argues that “... research that has explanation as its objective can set out to test theory or build theory.” This statement challenges the historical view that considered quantitative research as aligned towards theory verification and qualitative research as directed towards theory generation (Punch, 2014). Both research principles can be used for either theory generation or testing (Brewer and Hunter, 1989). In this study, the objective is to test e-government theories using hypotheses derived from literature review and propose new theories that close the literature gaps identified. Testing requires the measurement of concepts.



Bryman and Bell (2011, p.154) argue that the measurement of concepts is required because it “allows us to delineate fine differences between people in terms of the characteristic in question”. This measurement allows consistent comparatives on the relationship between concepts with other researches. E.g., this is what allowed making a comparison on e-government factors in Chapter 2. The outcome of the measure yields dependent or independent variables (Bryman and Bell, 2015). In the thesis, a citizen’s behavioural intention to use e-government services (provided by NCH and UC) and the actual usage behaviour are the dependent variables, while the rest of the variables are independent. Usage behaviour of either service is a dependent variable of behavioural intention. Measurement of concepts leads to questions about the validity and reliability of the thesis because of the need to demonstrate that the research has been conducted minimising bias.

### **3.3 Reliability and validity of quantitative research**

Reliability is the consistency of a measure of a concept, which should be replicable over time, instruments and groups of respondents and covers data collection to analysis (Cohen, Manion and Morrison, 2009; Bryman and Bell, 2015). On the other hand, “validity is concerned with the integrity of the conclusions that are generated from a piece of research” (Bryman and Bell, 2011 p.42). Looking at the correlation between reliability and validity, Sapsford (2007, p.16) argues that “reliability is essential for validity.” Overall, these terms relate to how the interpretations of the findings in this thesis are viewed as true. That assessment is made based on how the research is handled throughout. First, reliability issues relating to this thesis are discussed.

#### **3.3.1 Reliability**

In conducting the research, the concepts depicted in the conceptual framework are measured. A demonstration of how they are measured contributes towards assessing the reliability of the research instrument. Three factors are involved in evaluating the reliability, and these are stability, internal reliability and inter-observer consistency (Bryman and Bell, 2015). Alternatively, reliability can be assessed by asking three questions:

1. Will the measures yield the same results on other occasions?
2. Will similar observations be reached by other observers?
3. Is there transparency in how sense was made from the raw data? (Easterby-Smith *et al.* in Saunders, Lewis and Thornhill, 2009, p.156)

The fundamental principle here seems consistent across the researchers. E.g. Bryman and Bell (2015) assess stability by re-administering a measure to a group of respondents over time,

which is what Cohen, Manion and Morrison (2009) refer to as replicable over time and what Easterby-Smith asks in question 1 above. In this thesis, the way the research subjects were accessed, how the concepts were measured and coded or recoded is described, as this chapter progresses, to allow the re-administration of the measure on other occasions to demonstrate the stability of the measure.

The second factor, internal reliability, is concerned with whether the respondents' scores on any one multiple indicator measure are related to their scores on other multiple indicator measures (Bryman and Bell, 2015). Internal reliability can be measured using the split-half method (Cohen, Manion and Morrison, 2009). Alternatively, the correlation coefficient could be used, where a value of 0 denotes no correlation and 1 denotes a perfect correlation (Bryman and Bell, 2015). Lately, Cronbach's alpha is used to test internal reliability and is incorporated into statistical software for analysis (Bryman and Bell, 2015). This study uses correlation coefficients and Cronbach's alpha to test the internal reliability of the measures.

The third factor, inter-observer consistency, is concerned with consistencies in decision making on, say content analysis or categorisation of open-ended questions, and so on, where multiple observers are involved in research (Bryman and Bell, 2015). The decision-making process could be linked to Easterby-Smith's second question. Inter-observer inconsistency was possible because some NCH staff were used as research assistants. However, close-ended questions were used in the questionnaire, and the research assistants were not involved in the data analysis. Moreover, the researcher educated them on how to administer the questionnaire, thereby attenuating inter-observer inconsistency. There are threats to reliability worth keeping in mind as the thesis progresses.

When conducting this research, four threats to reliability were given attention and their risk mitigated. These are participant error, participant bias, observer error and observer bias. Misinterpreting the questions' instructions, e.g. crossing multiple responses instead of a single response, yields a participant error (Saunders, Lewis and Thornhill, 2009). Participant bias arises when participants respond, based on what they think the researcher wants to hear (Saunders, Lewis and Thornhill, 2009). Observer error arises when researchers working on one piece of research ask questions differently (Saunders, Lewis and Thornhill, 2009). In the thesis multiple people administered the self-completion questionnaire, giving rise to the possibility of observer error. However, those who assisted with the questionnaire administration were coached on how to do so. Moreover, the questionnaire was a self-completion questionnaire.

Therefore the questionnaire administrators were not asking participants any questions, thus reducing the probability of the observer error. Finally, observer bias arises when the researcher consciously or unconsciously causes problems in interpretation (Robson, 2011). For example, wording questions on the social benefits of e-government in a leading way biased towards one viewpoint. Observer error was possible in this research and was mitigated by following good practices in questions design recommended by Oppenheim (2003), Fisher *et al.* (2010), Bryman and Bell (2015) and Ekinici (2015), e.g., simple to understand questions, Likert scale questions with a neutral midpoint, among others. What we are trying to establish is the validity of the research, which is explored next.

### **3.3.2 Validity**

In the context of the thesis, validity answers the question, ‘Is there substantial evidence to support that citizens perceive the benefits of e-government as outweighing the effort to learn and use it?’ The way the empirical data is gathered, processed and conclusions reached allow answering this question. In texts, validity is broken down into a myriad of components. The variation in the meaning of validity arises from the fact that it is a term used in everyday language and a technical term in research, but the common thread is the similarity between the reality studied, and the reality reported (Punch, 2014). Validity should not be seen as an absolute but as a matter of degree due to the subjectivity of respondents, attitudes and perspectives that bring a degree of bias (Gronlund, 1981). Consequently, there are various kinds of validity.

The researcher is drawn to Sapsford’s (2007) version of validity that appears summative of the whole research process. These are, firstly, validity of measurement, which is the extent to which data constitute measurements of what is supposed to be measured; secondly, population validity, which concerns the accurate representation of the sample to the population; finally, validity of the design, which is the extent to which the comparisons made are sufficient to establish the arguments which rest on them (Sapsford, 2007). Regardless of how hard a researcher tries to improve the integrity of their research, there are shortcomings associated with quantitative research that need to be highlighted.

## **3.4 Criticism of quantitative research**

As a researcher, it is useful to acknowledge and attempt to minimise the effects of the limitations of the methodological approach used. The main criticism of quantitative research in social sciences is the employment of a natural sciences model to humans (Bryman and Bell, 2015). Early criticisms of this practice were levelled by Schutz, Natanson and van Breda (1963)

who argue that the capacity to interpret surroundings is absent among objects of natural science, which is unlike in social sciences where this thesis is set. The argument is that in social sciences, research findings are influenced by participants' interpretations of the contextual factors, and therefore the employment of quantitative research principles in social sciences is wrongly placed. Another criticism levelled against quantitative research in social sciences pertains to a false sense of accuracy.

Bryman and Bell (2015) argue that the measurement process in itself possesses an artificial and spurious sense of precision and accuracy. Cicourel (1964) argues that this flaw is introduced because the measurement presumes respondents will interpret key terms in the measurement instrument in the same way, which in other situations is not necessarily the case. The unbiased and straightforward phrasing and piloting of the questionnaire in this thesis helps minimise this limitation. The next limitation relates to the relevance of the research to the participants.

The third criticism is the question of importance respondents place on the research topic in relation to their lives (Bryman and Bell, 2015). Also, respondents' answers may be at variance with their actual behaviours (LaPiere, 1934). These criticisms err on the side that human behaviour that influences responses to the research instrument is not static but is influenced by several factors that cannot be easily predicted. In this thesis, the research participants are NCH tenants who are most likely to be on social welfare benefits and would be affected by the introduction of UC. This profile of participants is most likely to view the research topic as relevant to their lives because it affects their socio-economic wellbeing, hence their social inclusion.

Finally, the analysis of the relationship between variables is viewed as creating a static view of social life, independent of people's lives (Bryman and Bell, 2015). It omits the interpretive process that goes on in human groups when assessing the relationship between variables (Blumer, 1956). Regarding this point, the thesis provides a snapshot of the expected average citizen's behavioural intention towards e-government. This insight provides clues that can be used for decision making by e-government stakeholders. While positivism and a quantitative methodology are used in this thesis, the researcher is not strictly confined to this paradigm in all situations.

Given the attributes of the different paradigms shown in Table 3.1-1, the author prefers a pragmatic approach that, when uncertainty creeps in due to context, then qualitative research methodology is appropriate. However, where there is clarity of the characteristics of the

phenomenon under investigation, quantitative research is appropriate. Previous research conducted as part of this DBA course explored digital inclusion using a qualitative research methodology, where some theories were generated, which are now tested in this thesis using e-government. Thus, a discussion on the suitable data collection methods is necessary.

### **3.5 Methods**

Within the context of the thesis, careful consideration about the suitable methods was made. Decisions about which methods are employed in research are critical to the success of the study. Several methods are suited for this quantitative thesis. The most common methods employed are interviews, questionnaires, panels, ethnography and participant observations, documents and databases (Fisher *et al.*, 2010; Bryman and Bell, 2015). These methods are not necessarily connected or limited to a particular methodology. Fisher *et al.* (2010) argue that positivists can employ any of these methods for qualitative or quantitative research. In this study, four reasons determined the choice of a pre-coded questionnaire.

Firstly, the thesis is testing the factors that influence e-government adoption based on the theories derived in previous DBA documents that used both qualitative and quantitative methodologies, and a pre-coded questionnaire allows using these theories to guide participants' responses. The background research mitigates the shortcoming that pre-coded questionnaires have limited answer choices (Ekinici, 2015). Therefore, the answer choices are reasonably representative of the citizens' views.

Secondly, the thesis is testing the theories on a more extensive sample, inexpensively but within a short time and a questionnaire is more suited for that, according to Ekinici (2015).

Thirdly, with a pre-coded questionnaire, it is easy to produce standardised statistical data (Ekinici, 2015). Standardised statistics also allow future UC studies conducted in the same manner to track the changes in the factors influencing e-government adoption for effective policy formulation.

Finally, a questionnaire provides a logical structure for translating the thesis objectives into research questions, then into associated hypotheses, which allows generating questionnaire questions. Ekinici (2015) argues that the strengths of a questionnaire are that it refines the research objectives and the hypothesis testing and establishes a logical structure for decision making regarding the research questions and the research design. After deciding on using a questionnaire, how to administer it was considered.

A questionnaire can be administered in many ways and the thesis considered using the postal or face-to-face methods. It had been planned to use a postal questionnaire, but the face-to-face administration was used, and the reasons for the change are outlined in 3.6.1. Regardless of the method of questionnaire administration used, there are fundamental questionnaire design considerations employed for the thesis, which are discussed in the next paragraph.

Several questionnaire design considerations were made and followed. For example, Dillman in Bryman and Bell (2011, p.238) suggests not cramping the presentation, while Bryman and Bell (2015) suggest avoiding double-barrelled questions, long and ambiguous questions. Additionally, the use of the response option 'Don't know' was considered and there are divergent opinions amongst researchers on its use. Krosnick *et al.* (2012) advocate against its use, arguing that it gives respondents an easy option not to think about their responses. Opposed to this, Converse and Presser (1986) encourage its use, however with filter questions to filter respondents without an opinion on a topic. The thesis did not use the 'Don't know' option in a bid to encourage citizens to think about e-government, given that some would be socio-economically affected by the introduction of UC. While the questionnaire was chosen, the researcher is aware that it has limitations worth highlighting and keeping in mind throughout the thesis.

### **3.5.1 Limitations of questionnaires**

The researcher is not naive that a questionnaire will give all the answers sought by the thesis. However, some commonalities (in the findings) with other studies can be reached. The main limitation of questionnaires is low response rates (Baruch, 1999; Saunders, Lewis and Thornhill, 2009; Bryman and Bell, 2011; Ekinci, 2015). High response rates are important because they validate the reliability of research regarding the representativeness of the sample to the greater population (Saunders, Lewis and Thornhill, 2009). The literature demonstrates that response rates are influenced by the way the questionnaires are administered, with postal administered questionnaires yielding lower response rates than face-to-face administered questionnaires (Baruch, 1999; Neuman, 2005; Ekinci, 2015). What is also clear is that there is no consensus within each style of administration as to the average response rate. For face-to-face questionnaires, Neuman (2005) achieved 90%, and Lucas (1997) achieved 100%. It is worth noting that Lucas's (1997) questionnaire was administered to a class of students and the attendance and lecturer-student relationship are biased towards achieving a higher response rate. Given the circumstances of the thesis where strangers were approached to participate, the researcher expected a lower response rate than the above. Therefore, the researcher targeted a

70% response rate. After estimating a response rate, the thesis estimated the target sample size required to meet the estimated response rate.

### 3.5.2 Estimating actual sample size from estimate response rate

The thesis estimated non-response to the questionnaire that could be a result of a refusal to respond by participants, ineligibility to respond because the participant was not an NCH tenant, and so on. Saunders, Lewis and Thornhill (2009) provide the following formula for active response rate:

$$\text{Active response rate} = \frac{\text{Total number of responses}}{\text{Total number in sample} - (\text{ineligible} + \text{unreachable})}$$

Equation 3.5-1: Active response rate formula

They also propose the following formula for the actual sample size  $n^a$ .

$$n^a = \frac{n(100)}{re\%}$$

Equation 3.5-2: Actual sample size calculation

where  $n$  is the minimum (or adjusted minimum) sample size and  $re\%$  is the estimated response rate expressed as a percentage.

These formulas were used in planning for a strategy for data collection.

## 3.6 Strategy for data collection

### 3.6.1 Sampling

There are several sampling methods that the thesis could use. The different sampling methods have their advantages and disadvantages. Cohen, Manion and Morrison (2009) argue that the success of research is determined by the appropriateness of the chosen research methodology and the sampling strategy. The thesis used convenience sampling, drawing participants from NCH tenants, aged 18+ years, from the north of Nottingham City (Areas 1 to 3 in Figure 3.6-1).

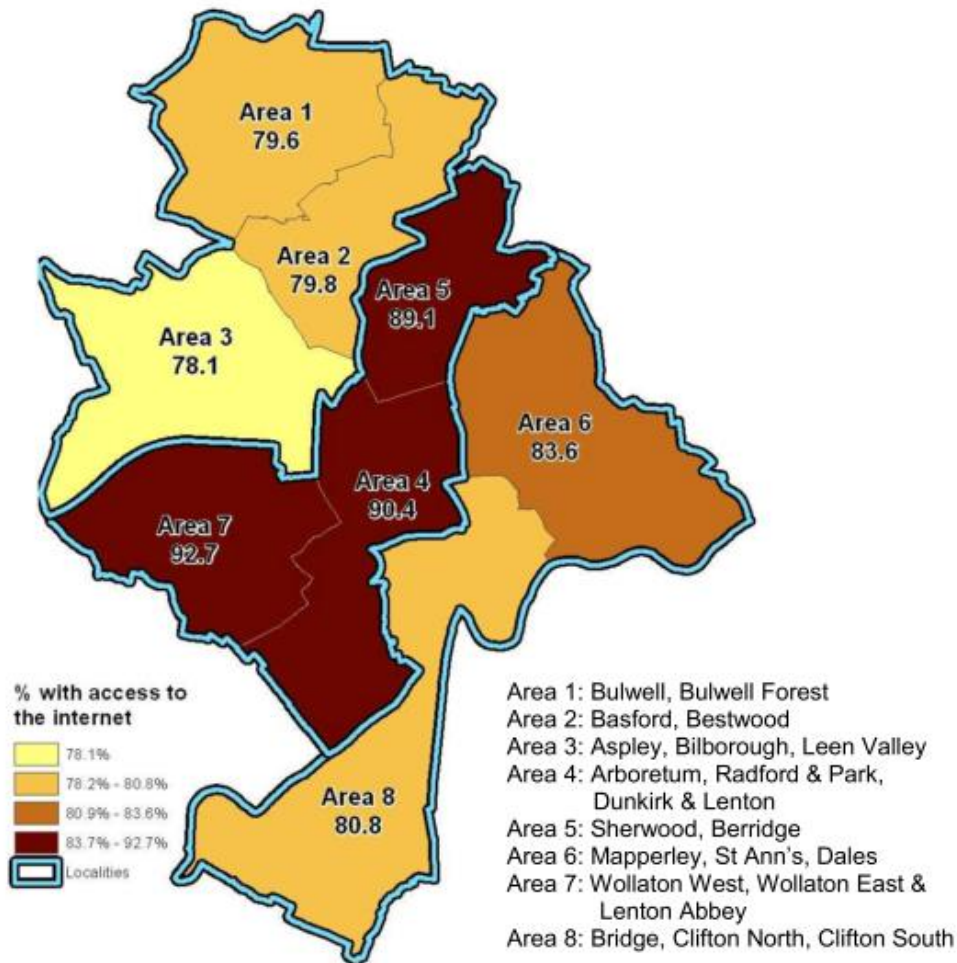


Figure 3.6-1: Nottingham enumeration districts

(Source: Nottingham Insight, 2014)

Initially, probability sampling with random selection was planned, where a postal questionnaire would be used. The sampling choice was influenced by the fact that each element of the sample has a known chance of being selected randomly, which reduces the sampling error (Bryman and Bell, 2015). However, due to the following challenges, this was abandoned. Firstly, the NCH newsletter in which the questionnaire was supposed to be inserted is printed by a contracted company, and there is no flexibility to insert the questionnaire in the target tenants' envelopes selectively. It was also considered to include all the 29,000 NCH tenants in the survey, thus eliminating the selective insertion of the questionnaire; however, the postal costs were astronomical for self-funded research. Secondly, the postal weight of the newsletter must be less than 100g on an A5 paper. By inserting the questionnaire and the return envelope, the maximum weight would have been exceeded, thereby attracting £5,000 additional costs. Therefore, after careful consideration, probability sampling was abandoned in favour of



convenience sampling. After deciding on convenience sampling, considerations about the sample size were made.

Using Equation 3.5-2, assuming an estimated response rate,  $re\% = 70\%$  and adjusted minimum sample size,  $n = 200$ , then the actual sample size targeted,  $n^a$ , was 286. The assumptions made about  $re\%$  and  $n$  were based on Bryman and Bell's (2011, p.187) statement,

... invariably decisions about sample size represent a compromise between constraints of time and cost, the need for precision ...

In this research, the primary constraints were the allocated time to complete the thesis and the cost of administering the questionnaire. To achieve the target response rate, how was access to NCH tenants gained?

### **3.6.2 Access to NCH participants**

One key decision point in accessing participants was to use a known and trusted channel. NCH tenants' events in Areas 1-3 organised by NCH staff were used, in addition to the researcher approaching NCH tenants directly at NCH offices. This decision was reached in consultation with NCH. The printed self-completion questionnaires were given to NCH staff attending tenants' events to administer, after coaching them how to do so. The completed questionnaires were collected at the event and returned to the researcher for analysis. How was the questionnaire designed?

### **3.6.3 Questionnaire design**

Illustrating the thought process behind the questionnaire development is important because it determined the statistical analysis methods used, based on the types of variables generated by the types of questions. The questions in the questionnaire were derived from each of the hypothesis, which in turn had been derived from each concept in the conceptual framework. The questionnaire design also considered making comparisons of e-government behavioural intention to use NCH Web services (already known and trusted by tenants) and UC (a new Central government service, where tenants' trust has not yet been tested).

Two sets of questions were used to allow comparatives between NCH Web services and UC. One set of questions teased out e-government from the viewpoint of NCH Web services, which allowed benchmarking the current e-government usage profile. These questions formed Section A of the questionnaire. Another set of questions formed Section B.

The second set of questions teased out participants' behavioural intentions towards UC and formed Section B of the questionnaire. A filter question was used so that participants who did not receive social welfare benefits would skip to the demographic details section (Section C).

Following recommendations by Bryman and Bell (2015), who advise that intrusive questions that may be off-putting are best left to the end, the gathering of personal information was left to the end of the questionnaire, which formed Section C. The thesis only asked personal information needed to test the hypotheses. A map of how the questions were used to test the hypotheses is shown in Table 3.6-1 (for NCH Web services and general Internet browsing) and

Research Questions	Research Questions		RQ 1					RQ 2		RQ 1									
	Question ID	Question ID	Questions used to test alternative hypothesis for the Universal Credit using only those who currently claim benefits (n=111 filtered using BE																
			USE_A1	USE_A2	SINC_A1	EXP_A1	EXP_A2	UC_A1	PE_B1	EE_B1	SI_B1	FC_B1	HM_B1	HB_B1	BI_B1	TRE_B1	SEC_B1	SEC_B2	
		Combined var	c_DigCitizen			c_Experience												c_UC_Se	
RQ 1	USE_A1	c_DigCitizen				EXPu H1:													
	USE_A2																		
	SINC_A1			DI H1:															
	EXP_A1	c_Experience																EXPb H1:	
EXP_A2	EXPu H1:																		
RQ 2	UC_A1																	AW H1:	
RQ 1	PE_B1																		PE H1:
	EE_B1																		EE H1:
	SI_B1																		SI H1:
	FC_B1																		FCb H1:
	HM_B1																		HM H1:
	HB_B1																		HB H1:
	BI_B1						EXPu H1:	AW H1:	PE H1:	EE H1:	SI H1:	FCb H1:	HM H1:	HB H1:					TRe H1:
	TRE_B1																		
	SEC_B1																		
	SEC_B2	c_UC_Security																	
SEC_B3																		SE H1:	

RQ = Research question associated with the questionnaire question.

Table 3.6-2 (for UC). A description of the logic behind the questions coding and how composite variables were generated from multiple variables is given in section 3.7.2.2.

Research Questions	Research Questions		RQ 1														
	Question ID	Question ID	Questions used to test alternative hypothesis for NCH Web services or general Internet browsing (n=246)														
			USE_A1	USE_A2	SINC_A1	PE_A1	EE_A1	SI_A1	FC_A1	HM_A1	PV_A1	BI_A1	EXP_A1	EXP_A2	TRi_A1	SEC_A1	
RQ 1	Question ID	Combined var	c_DigCitizen												c_Experience		
	USE_A1	c_DigCitizen													EXPu H1:		
	USE_A2				DI H1:					FCu H1:				BI H1:			
	SINC_A1		DI H1:														
	PE_A1												PE H1:				
	EE_A1												EE H1:				
	SI_A1												SI H1:				
	FC_A1		FCu H1:											FCb H1:			
	HM_A1													HM H1:			
	PV_A1													PV H1:			
	BI_A1		BI H1:			PE H1:	EE H1:	SI H1:	FCb H1:	HM H1:	PV H1:				EXPb H1:	TRi H1:	SEC H1:
	EXP_A1	c_Experience													EXPu H1:		
	EXP_A2		EXPu H1:												EXPb H1:		
	TRi_A1													TRi H1:			
SEC_A1													SEC H1:				

RQ = Research question associated with the questionnaire question.

Table 3.6-1: Mapping of the questions used to test hypotheses linked to NCH Web services and general Internet browsing.

Research Questions	Research Questions		RQ 1					RQ 2			RQ 1							
	Question ID	Question ID	Questions used to test alternative hypothesis for the Universal Credit using only those who currently claim benefits (n=111 filtered using BEN_A1)															
			USE_A1	USE_A2	SINC_A1	EXP_A1	EXP_A2	UC_A1	PE_B1	EE_B1	SI_B1	FC_B1	HM_B1	HB_B1	BI_B1	TRE_B1	SEC_B1	SEC_B2
RQ 1	Question ID	Combined var	c_DigCitizen			c_Experience												c_UC_Security
	USE_A1	c_DigCitizen				EXPu H1:												
	USE_A2				DI H1:													
	SINC_A1		DI H1:															
	EXP_A1	c_Experience																EXP H1:
EXP_A2	EXPu H1:																EXPb H1:	
RQ 2	UC_A1																AW H1:	
RQ 1	PE_B1																	PE H1:
	EE_B1																	EE H1:
	SI_B1																	SI H1:
	FC_B1																	FCb H1:
	HM_B1																	HM H1:
	HB_B1																	HB H1:
	BI_B1					EXPb H1:	AW H1:	PE H1:	EE H1:	SI H1:	FCb H1:	HM H1:	HB H1:		TRe H1:	SEH1:		
	TRE_B1														TRe H1:			
	SEC_B1	c_UC_Security																
	SEC_B2																	
	SEC_B3																	

RQ = Research question associated with the questionnaire question.

Table 3.6-2: Mapping of the questions used to test hypotheses linked to the Universal Credit system.

Besides the questionnaire layout outlined, the questionnaire was also drafted with anticipation of how the resultant data would be analysed.

The questionnaire contained only closed-ended questions. Some questions generated ordinal variables, some nominal and others dichotomous variables. The questionnaire utilised questions from the previous peer-reviewed research, although additional questions were added. Using previous researches' questions is recommended by Bryman and Bell (2015) because, in a sense, one is using questions that have been piloted. The questionnaire was subsequently piloted.

#### **3.6.4 Piloting**

For the survey questions to operate well, bearing in mind that with self-completion questionnaires there is no interviewer to clarify the questions, the questionnaire was piloted as recommended by Bryman and Bell (2015). The pilot comprised of ten NCH tenants outside Areas 1-3. The decision to pilot with NCH tenants outside the target sample followed a recommendation by Bryman and Bell (2015), who discourage selecting the pilot participants from the sample because piloting with the research subjects selects a sample subject out of the actual survey, which affects the representativeness of the sample. There were lessons learnt from the pilot that improved the survey.

Feedback from the pilot allowed adjusting some questions to make them operate well for the setting. The main changes were to drop some questions that measured the same concept, using different wording and to make the questionnaire short. Bryman and Bell (2015) argue that shorter questionnaires improve the response rate. A few questions were also reworded, e.g., 'social welfare benefits' was replaced with the word 'benefits', which is the common language used by citizens. The pilot also affirmed that constructs' definitional vagueness alters the interpretation of questions in a research method, leading to observer bias. Therefore, some questions were reworded following the pilot. The revised questionnaire was subsequently administered to another ten participants outside Areas 1-3 and was found to operate well. A formal process was followed to gain access to the sample.

#### **3.6.5 Negotiating access and ethical issues**

To ensure the thesis was not biased towards the researcher's employers who were granting access to the participants, the terms of reference with NCC and NCH were discussed and agreed when the research proposal was written. NCC and NCH supported the research. However, the objectives and direction of the research were driven by the researcher. The Nottingham Trent University's ethical approval process for the DBA programme was followed, and the research

supervisors granted ethical approval. The approval was for using participants who were at least 18 years old, who consented to complete the questionnaire. Also, there were some personal biases that the researcher had to ensure did not affect the research.

Being an ICT professional, the researcher is biased towards the view that the Internet is a useful innovation that citizens should embrace. While the researcher has this opinion, this was hidden by using neutral sentences and responses with five-point Likert scale. There were equal negative and positive response options, with a neutral point of 'Neither disagree nor agree'. Additionally, the bias was reduced by getting the questionnaire reviewed by colleagues who are not ICT professionals before it was piloted. The bias was also reduced by piloting and adjusting the questionnaire. Additionally, considerations on data storage were made.

The completed questionnaires are stored at the researcher's home in a designated bookshelf and will be shredded after completing the DBA. The statistical data is saved on the researcher's computer, which is password protected. The conclusions from the statistical data can be used in future research. There was an ethical challenge encountered worth highlighting.

Vulnerable adults were not included as participants. They were identified through their Carers accompanying them, who would advise that they were not eligible for the survey after reading the participant's information sheet. Occasionally, an ineligible Carer offered to participate. However, they were refused. Part of the research design also included coming up with a strategy for data analysis, which is discussed next.

### **3.7 Strategy for data analysis**

#### **3.7.1 Analysis approach**

To efficiently analyse the data, Lee and Forthofer (2006) recommend starting with a preliminary data exploration to determine the suitability of the data for meaningful analysis. Bryman and Bell (2015) cite that the advantage of doing this at an early stage is that it allows appropriate analysis techniques for variables to be decided. Therefore, the pilot data was analysed before the sample data collection. The analysis allowed developing a coding scheme, which is outlined in 3.7.2.2. It also allowed refining how constructs measured by more than one question would be combined to form a composite measurement, which again is outlined in 3.7.2.2. Another critical decision had to do with the statistical significance of the results.

The analysis followed a basic structure stipulated by Bryman and Bell (2015), where  $p < 0.05$  was established as the level of statistical significance, then determined the statistical significance of the findings. If the findings were statistically significant at  $p < 0.05$ , then the

alternative hypothesis would be accepted. Figure 3.7-1 was used as a guide for the appropriate test statistics.

	Nominal	Ordinal	Interval/ratio	Dichotomous
Nominal	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V  If the interval/ratio variable can be identified as the dependent variable, compare means + eta	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V
Ordinal	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V	Spearman's rho ( $\rho$ )	Spearman's rho ( $\rho$ )	Spearman's rho ( $\rho$ )
Interval/ratio	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V  If the interval/ratio variable can be identified as the dependent variable, compare means + eta	Spearman's rho ( $\rho$ )	Pearson's <i>r</i>	Spearman's rho ( $\rho$ )
Dichotomous	Contingency table + chi-square ( $\chi^2$ ) + Cramér's V	Spearman's rho ( $\rho$ )	Spearman's rho ( $\rho$ )	phi ( $\phi$ )

Figure 3.7-1 Methods of bivariate analysis

(Source: Bryman and Bell, 2015)

Chi-square ( $X^2$ ) was used for nominal x ordinal variables bivariate analysis. For 2x2 contingency tables, if 25% of the cells in the table had expected values <5, then the Chi-square assumption would have been violated (Dancy and Reidy, 2008) and the Likelihood ratio was the substitute (Robson, 2011). Chi-square was used in conjunction with Cramer's V to determine the strength of the association between the independent and dependent variables.

Table 3.7-1 shows Cramer's V scale used for interpretation:

Cramer's V		
Start of range	End of range	Association impact category
0.00	0.09	Negligible
0.10	0.19	Weak
0.20	0.39	Moderate
0.40	0.59	Relatively strong
0.60	0.79	Strong
0.80	1.00	Very strong

Table 3.7-1: Cramer's V values

(Source: Rea and Parker in Kotrlík, Williams and Jabor 2011, p.138).

For ordinal x ordinal variables analysis, a different test statistic was used. According to Figure 3.7-1, Spearman's rho is supposed to be used for ordinal scale variables. However, Kendall's tau b was used instead. Although in practice, both always lead to the same decision about the hypothesis testing (Gibbons, 1985), there are reasons why Kendall's tau was preferred. Firstly, the distribution of tau has better statistical properties; and secondly, the interpretation of tau in terms of the properties of observing the agreeable (concordant) and non-agreeable (discordant) pairs is straightforward (Statistics Solutions, 2017). Subsequently, the collected data was prepared for analysis.

### **3.7.2 Data preparation for analysis**

#### **3.7.2.1 Statistical analysis package**

IBM Statistical Package for the Social Science (SPSS) version 23, Release 23.0.0.0, 64-bit was used on a Windows 10 laptop for statistical computations. Firstly, codes were applied to the data before data entry.

#### **3.7.2.2 Coding of questions for statistical analysis**

Each question response option was assigned a numeral, which was entered in SPSS. For dichotomous variables, No=1 and Yes=2 were used as codes. For nominal variables, the same was applied, e.g. Male=1, Female=2, Non-binary=3, Prefer not to say=4. For ordinal variables, again each response option had a number assigned to a five-point Likert scale from Strongly disagree=1 to Strongly agree=5. 0 was used for missing responses. There was a filter question to determine citizens currently claiming benefits and 99 was used for responses 'Not applicable' for the filtered respondents. Furthermore, to ease the process of data analysis in SPSS, it was necessary to use easily identifiable names for the variables. Therefore a naming convention was determined.

The naming convention used the three sections of the questionnaire as follows:

*<Variable's two/three letter abbreviation in capitals>\_<Section ID (A, B or C)><Numeric ID for questions assessing a construct>.*

E.g., PE\_A1 represented question 1 that assessed performance expectancy for NCH Web services, SE\_B2 represented question 2 that assessed security views for the UC and AGE\_C1 represented the age group. The codes identified variables' names easily when combining responses for constructs measured through multiple questions.

Some constructs, such as security of the UC, were measured by more than one question. To aggregate such responses to a new combined variable, the Compute and Recode functions in

SPSS were used. **Transform->Compute Variable** generated an intermediate variable (prefixed with int\_), which was recorded into the composite variable (prefixed with a c\_) using **Transform->Recode into Different Variables**. A different approach was used for the filter variable.

A filter question was used to gain insights into how citizens on social welfare benefits viewed e-government from a UC perspective, without subjecting non-benefits claimants to questions not applicable to them. The **Data->Select Cases** menu was used, with the response to the question ‘Do you receive any benefits?’ forming the *If* condition BEN\_A1=2(Yes) to filter specific responses about UC in SPSS. The computation yielded 111 cases out of the total of 246 completed questionnaires. Before analysis, the data was cleansed.

### 3.7.3 Data entry, checking for accuracy and data cleansing

The essence of cleaned data is summed up in Robson's (2011, p.418) statement:

The ‘cleaned’ data set is an important resource for your subsequent analyses.

Therefore, every effort was made to have clean data, and this started with accurate data entry.

#### 3.7.3.1 Data entry into SPSS

The researcher manually entered the coded data from the completed questionnaires into SPSS. Data was entered immediately after collection in small batches at a time to minimise input errors. The entries were re-checked to confirm accuracy in line with Robson's (2011) recommendation of entering the data twice, which he likened to the proof-reading of text. Each questionnaire was given a unique numerical identifier, which corresponded to the SPSS case number. This made it easy to track input errors to the original questionnaire. When all data was entered in SPSS, additional checks were conducted, starting with missing value analysis.

#### 3.7.3.2 Duplicate cases and missing values

The **Data->Identify Duplicate Cases** menu was used to identify duplicate cases in SPSS, and Table 3.7-2 shows that there were no duplicate cases.

N	Valid	246	
	Missing	0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary Case	246	100.0	100.0	100.0

Table 3.7-2: Duplicate cases analysis



Next, unusual cases were analysed to determine if there was an input error, using the SPSS menu **Data->Identify Unusual Cases**. Two cases that had input errors were identified and corrected.

Reason: 1

Case	Reason Variable	Variable Impact	Variable Value	Variable Norm
204	TRI_A1	.062	5	1
53	HM_B1	.069	2	99

Table 3.7-3: Unusual cases

The dataset was then validated using SPSS menu **Data->Validation->Validate**. All the variables in the dataset were selected for validation. Figure 3.7-2 shows that the data passed validation checks.

Some or all requested output is not displayed because all cases, variables, or data values passed the requested checks.

Figure 3.7-2: Dataset validation

An accurate data set determines the quality of the conclusions of research (Robson, 2011), which aids in improving reliability and validity. Thus, missing value analysis was performed.

Youngman (1979, p.21) argues that “The most acceptable solution to the problem of missing information is not to have any.” Therefore, five questionnaires that were incomplete were excluded from data entry. The next step was to check for missing values caused by erroneous data entry in SPSS. Frequency analysis was used, and all variables were selected for checks using **Analyze->Descriptive Statistics->Frequencies** and there were no missing values. Because there were no missing values, the **Analyze->Missing Value** and **Analyze->Multiple Imputation->Analyze Patterns** SPSS analyses were not used for further missing values checks. Subsequently, the analysis methods were applied.

### 3.8 Application of analysis methods

When conducting research, “... The messages stay hidden and need careful teasing out.” (Robson 2011, p.408). Therefore, skill and proficiency in using the tools to tease out the hidden messages are paramount. Thus, the researcher acquainted himself with SPSS by analysing the pilot data, applying the analysis methods introduced in 3.7.1 before applying a series of tests to the sample data.

Initial tests analysed the effects of external variables on behavioural intention and usage behaviour before assessing the effects of moderating variables on the association. The effects of the moderating variables started with the application of a single internal variable then added another, changing the combinations and so on. Before discussing the findings, a summary of this chapter is provided.

### **3.9 Summary**

This chapter explored the three main lenses that could have been used for the thesis and justified choosing the positivist paradigm. The choice was driven by mapping the research objectives to the attributes of the different paradigms and then choosing the one that suitably helped answer the research questions. After choosing positivism, methodological considerations were made.

The chapter demonstrated the rationale for using a quantitative methodology and appraised the reliability and validity implications of the choice. Any research is bound to be affected by the inherent limitations of the methodology used. Therefore, the chapter outlined the criticisms of quantitative research and how their effects are minimised in the thesis, one of which is through carefully choosing an appropriate method for data collection.

A case was made on using a pre-coded face-to-face questionnaire for data collection, and four reasons for the choice were outlined. Low response rate is the main drawback of questionnaires, which was mitigated by following good questionnaire design principles, piloting and using a large sample. The results are discussed in the next chapter.

## **Chapter 4: Findings, discussion and closing the gaps**

In line with Weick's (1995) principle of extracted cues where subtlety can have surprisingly large effects on sensemaking, this chapter first outlines the setting in which the data was collected. Context influences the demographic characteristics of the sample and shapes the narrative. The general observations about the findings follow the context. Subsequently, the hypotheses test statistics and a discussion of the results are presented. The reliability and validity of the results are evaluated, leading to comments on the generalisation of the findings. Recommendations on closing the gaps in literature are then put forward.

### **4.1 Setting and sample demographic characteristics**

The data collection environment provides some subtleties that can make a massive difference to the results. The data was collected during working hours (Monday to Friday) over three months between Jan and Mar 2017 across three sites. Some questionnaires were administered at Bilborough library where citizens meet for tea every Tuesday morning. Data was also collected at Bulwell Riverside (BRS) joint services centre where there is a high footfall. BRS is a multitenancy building hosting NCC, NCH, pharmaceutical, library and doctors' surgeries. It also has a children's play centre where parents converge daily. The researcher also collected data from NCH Bestwood Housing Office. A few questionnaires were administered by NCH Managers at tenant events. This environment influenced the sample demographic characteristics, which are now outlined.

Figure 4.1-1 shows the population and sample demographic characteristics.

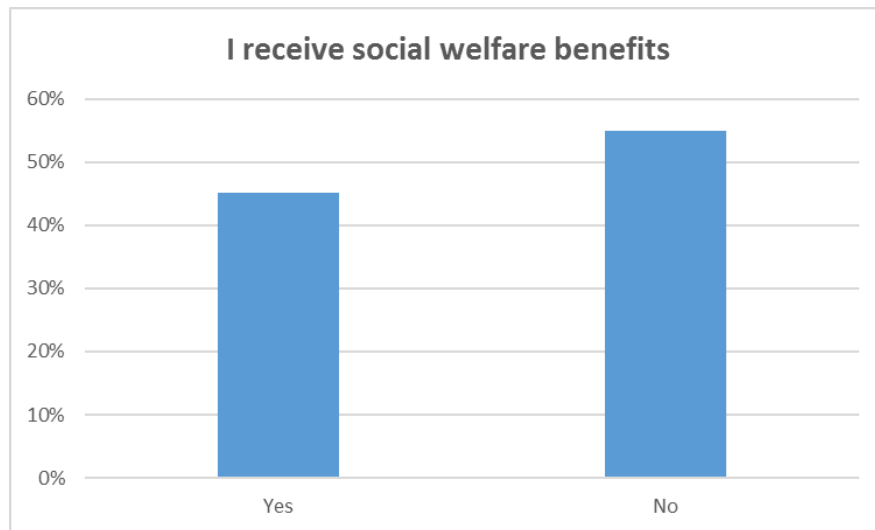
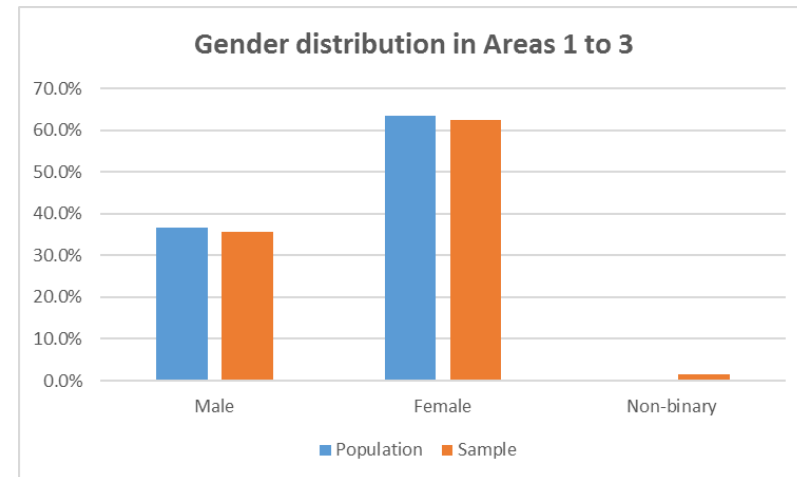
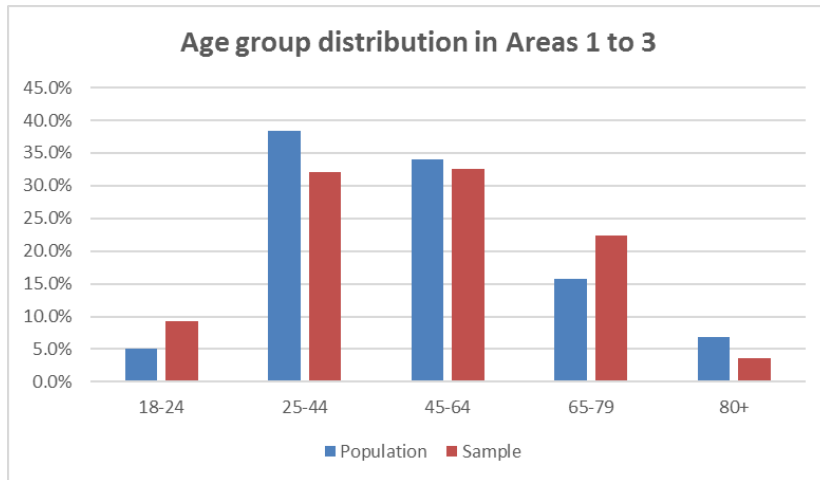


Figure 4.1-1: Sample demographic characteristics

The sample age groups distribution was similar to the Areas 1-3 trend and the UK trend in general (ONS, 2017). The gender ratio was like that in Areas 1-3 for NCH tenants. However, it was divergent from the UK trend of almost 1:1 for males and females, which does not have the non-binary gender (ONS, 2017). 50.5% of the under 65s were employed. The employment status could not be compared to the NCH tenants' employment figures because they do not actively update the records beyond the tenant's move-in date. The employment rate was lower than the UK average of 74.6% (ONS, 2017b). 45.1% of these were claiming social welfare benefits. There were some general findings worth highlighting.

## 4.2 General findings

80.9% of the participants were digital citizens, which means that e-government has a good foundation for adoption because a significant number already use the Internet. The finding compares to the previous Nottingham Citizens Survey (Nottingham Insight, 2016). Further analysis of the digital citizens showed that 5.0% of the digital citizens were by proxy use, as shown in Table 4.2-1.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Digital citizen by direct use	189	95.0	95.0	95.0
	Digital citizen by proxy use	10	5.0	5.0	100.0
	Total	199	100.0	100.0	

Table 4.2-1: Direct and proxy digital citizenship

This constituted 4.1% of all the participants, which is noteworthy. It demonstrates that when phrasing digital inclusion questions, proxy use must be checked explicitly for the conclusions to be accurate.

## 4.3 Hedonic motivation test as an internal variable instead of an external variable

In section 2.5, it was proposed that hedonic motivation should be an internal moderating variable in UTAUT2. The results showed that hedonic motivation moderated effort expectancy (n=111, Tau=0.597, p<0.001) and trust (n=111, Tau=0.711, p<0.001) for the behavioural intention to use UC, however it did not moderate the behavioural intention to use NCH Web services (for details, see Appendix B: Test statistics for Hedonic motivation (HM) as an internal variable). Statistically, the Tau values are relatively strong, and it is concluded that hedonic

motivation is an internal variable and moderated effort expectancy and trust of the Universal Credit system. Additionally, in section 2.5.2.1 it was hypothesised that,

HM H<sub>1</sub>: Hedonic motivation influences citizens' behavioural intention (BI) to use NCH Web services or the Universal Credit system.

The results indicate a partial correlation between hedonic motivation and behavioural intention where statistical results for the NCH Web services supported the alternative hypothesis (n=246, Tau=0.588, p<0.001) and UC did not support the alternative hypothesis (n=111, Tau=0.493, p=0.067) (see summary Table 4.9-1). The results were statistically significant. The effect of hedonic motivation on digital technology adoption has been acknowledged in other studies by Bagozzi, Davis and Warshaw (1992), Venkatesh (2000) and Thong, Hong and Tam (2006). The thesis also reviewed the overall moderating effects of internal variables on external variables.

#### **4.4 The moderating effects of internal variables**

The thesis showed that the association of external variables with behavioural intention and usage behaviour of e-government tended to be statistically stronger for UC compared to that of NCH Web services before applying the moderating variables (as shown in the results summary Table 4.9-1). Where the phenomenon directly affects their income, people are more likely to express stronger views. In the case of NCH Web services, citizens have more alternative service access channels unlike with the UC where services are predominantly accessed online. The effects of the external variables were slightly different when the moderating effect of internal variables was applied.

When internal variables were applied to the correlation between external variables and behavioural intention and usage behaviour, the effects of single moderating variables tended to be more pronounced on UC than on NCH Web services and demonstrated in the statistics in the **Appendices**. The strength and direction of the association of the dependent and independent variables were also assessed.

With UC, the participants' economic well-being that contributes towards improved socio-economic well-being is dependent on the benefits payments. The general trend observed is that the external variables had a positive correlation with behavioural intention to use e-government, i.e. both variables being tested increased together and this was statistically significant at p<0.001 confidence interval (see Table 4.9-1). E.g., participants who thought

accessing services via e-government was quicker had higher behavioural intention to use the service channel. Similarly, participants who thought accessing services via e-government was easier also tended to have a higher behavioural intention to use the service channel. However, there were two exceptions to this positive correlation.

As participants got older, their behavioural intention to use NCH Web services (n=246, Tau=-0.198, p<0.001) and UC (n=111, Tau=-0.238, p=0.001) declined. Only 11.3% and 8.1% of the participants aged 45+ years had the behavioural intention to use NCH Web services and to claim social welfare benefits using UC, respectively. These findings mirror earlier studies by Venkatesh, Thong and Xu (2012) who argued that age stratified digital inclusion, although in the thesis the association was weak. Similarly, gender had a weak and negative association with behavioural intention to use both NCH Web services (n=246, Tau=-0.070, p<0.001) and UC (n=111, Tau=-0.177, p=0.028) (see Appendix A: Questionnaire). This contradicted studies by Venkatesh, Thong and Xu (2012), where gender influenced digital inclusion. Detailed hypothesis tests are now explored in the next section.

#### 4.5 Hypotheses tests for factors influencing e-government

The findings from the hypotheses tests are reported and discussed with participants’ response characteristics shown in Figure 4.5-1.

		External factor (PE, EE, SI, FC, PV, HB, SE, TR)				
		Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I intend to use e-government services	Strongly disagree	Citizens in this segment have the most complex combination of reasons for not using digital services. These reasons range from computer/digital illiteracy, lack of confidence, lack of awareness of the benefits of digital services, lack of access devices, etc. They are the most challenging to persuade to use digital services. Therefore, the mitigation strategy should be to multifaceted, selling the benefits of digital services while addressing inhibiting factors.			Citizens in this segment have what it takes to use digital services, however they may desire for human interaction, lack awareness of digital services portfolio, have security and trust concerns, etc. Generally, a fall back to traditional methods of service delivery, publicising digital services and their benefits, making digital services reliable and educating on cyber security can win them over.	
	Disagree				Citizens in this segment might desire for human interaction, lack awareness of digital services portfolio, question the perceived usability and reliability of Websites or have security and trust. Most probably, fall back to traditional methods, publicising the benefits of digital services, periodic review of quality of Website, monitoring and improving digital services reliability and educating on cyber security might win these citizens over to use digital services.	
	Neither disagree nor agree	Citizens in this segment want to use digital services, but are inhibited somehow by some factors that they do not have much control over. If these inhibiting factors are addressed, these citizens are most likely to use digital services since they are already bought into using this service channel.			Citizens in this category are motivated to use digital services, perceive themselves not to have any inhibiting factors to use digital services and see a match between their needs and the service offered. Therefore, critical to maintain these citizens using digital services is to periodically review customer service satisfaction and continually improving service delivery to ensure their numbers do not drop.	
	Agree					
	Strongly agree					

Figure 4.5-1: Citizens’ potential characteristics based on questionnaire responses

The participants who fall in the red category are the most difficult to get to adopt e-government, followed by those in amber and then the green category. The thesis first discusses the findings from UTAUT2 adaptations.



#### **4.5.1 Experience (EXP) as an external variable instead of an internal variable**

The research model theorised that experience of using the Internet was an internal variable; however, in this study, it did not moderate any of the internal variables as shown by the examples in Appendix D: Test statistics for the Experience (EXP). Because of the previously argued link between habit and experience in 2.5.1, experience was tested as an external variable, much like habit, that influences the behavioural intention and usage behaviour. The following alternative hypotheses were proposed,

EXPb H<sub>1</sub>: Experience, moderated by age, gender and hedonic motivation, influences BI to use NCH Web services or the Universal Credit system;

and

EXPu H<sub>1</sub>: Experience, moderated by age, gender and hedonic motivation, influences citizens' usage behaviour of NCH Web services or the Universal Credit system.

Using combined questions EXP\_A1 and EXP\_A2 in Appendix A: Questionnaire, the results support the argument that experience is an independent external factor that determines behavioural intention (n=246, Tau=0.369, p<0.001 for NCH Web Services and n=111, Tau=0.372, p<0.001 for UC) (see Appendix D1: Test statistics for Experience (EXP) as a determinant for Behavioural Intention (BI) - (EXPb H<sub>1</sub>:)). Additionally, experience independently predicts the actual usage behaviour (n=246, X<sup>2</sup>=81.832, p<0.001; V=0.577, p<0.001 for NCH Web services and n=111, Likelihood Ratio=24.907, p<0.001; V=0.474, p<0.001 for UC) (see Appendix D2: Test statistics for Experience (EXP) as a determinant for Usage Behaviour (UB) - (EXPu H<sub>1</sub>:)). These results were statistically significant and both alternative hypotheses were accepted. The correlation between experience and usage behaviour was relatively strong and positive, but not moderated by age, gender and hedonic motivation. Moreover, experience was the strongest determinant of usage behaviour, contrary to studies by Venkatesh, Thong and Xu (2012) that suggested that BI was the strongest predictor. Therefore, this change in experience as an external variable is reflected in the Modified UTAUT2 (M-UTAUT2) in Figure 4.8-1.

#### **4.5.2 Awareness (AW) as a determinant of Behavioural Intention (BI) - (AW H<sub>1</sub>:)**

In section 2.5.2.2, it was hypothesised that,

AW H<sub>1</sub>: Awareness of the Universal Credit system, moderated by age and experience, influences citizens' behavioural intention (BI) to use it.

Using question AW\_A1 in Appendix A: Questionnaire, the results supported the addition of awareness as an external variable to UTAUT2. 61.3% of the benefits claimants were unaware of UC rollout in Nottingham, indicating a lack of readiness for the service (see Appendix E: Test statistics for Awareness (AW) as a determinant of Behavioural Intention (BI) - (AW H<sub>1</sub>:)). 26.1% did not intend to use UC and were unaware of its introduction in Nottingham. On the opposite spectrum, only 14.4% of the participants knew about the introduction of UC in Nottingham and intended to use it. These findings were statistically significant (n=111,  $\chi^2=11.793$ , p=0.019) and the alternative hypothesis was accepted. The correlation between awareness of UC and behavioural intention was moderate and positive (V=0.326, p=0.019) and not moderated by any internal variables. These findings highlight gaps in the marketing of UC. Potentially, these citizens could experience delays in effecting any changes to their benefits due to lack of awareness of UC. It is possible that some citizens who are not currently claiming benefits may need to do so in future should their financial circumstances change. Consequently, awareness of UC for the sample was analysed. 43.9% of the 246 participants did not receive benefits and were unaware of UC. This is still high and could benefit from other methods of publicity such as TV adverts. One can only use a technology that they are aware of. This argument supports a finding by Rogers (2008) where he added 'knowledge' as a construct for the revised DOI. Knowledge brings awareness of UC, which leads to wanting to try it if it is perceived as secure. Security also plays a prominent role in e-government adoption decisions.

#### **4.5.3 Security (SE) as a determinant of Behavioural Intention (BI) - (SE H<sub>1</sub>:)**

In section 2.5.3.1, it was hypothesised that,

SE H<sub>1</sub>: Security concerns, moderated by age, experience and hedonic motivation, influence citizens' BI to use NCH Web services or the Universal Credit system.

To test this hypothesis, security concerns were evaluated for both NCH Web services (using question SEC\_A1 in Appendix A: Questionnaire) and UC (using questions SEC\_B1 – B3 in Appendix A: Questionnaire). Table 4.5-1 shows that 13.4% of the participants believed that unauthorised people would not be able to access their personal information provided online and intended to use NCH Web services, while 23.4% believed that UC was secure and would claim benefits online.

	Security		
Behavioural intention	Strongly disagree/ Disagree	Neither disagree nor agree	Agree/ Strongly agree
Strongly disagree/ Disagree	28.5% NCH 24.3% UC	9.0% NCH 9.0% UC	10.1% NCH 10.8% UC
Neither disagree nor agree	9.0% NCH 7.2% UC	8.9% NCH 9.0% UC	11.4% NCH 9.9% UC
Agree/ Strongly agree	3.6% NCH 3.6% UC	6.1% NCH 2.8% UC	13.4% NCH 23.4% UC

Table 4.5-1: Security statistics

Just over a tenth of the participants believed that NCH Web services and UC were secure. However, they did not intend to use the services. Almost a quarter of the participants did not believe NCH Web services or UC were secure and therefore would not use them either. A significant percentage (28.5% for NCH Web services and 24.3% for UC) of the participants did not think e-government was secure and did not intend to use it. It would take much Internet security education to convince such citizens to use e-government. Nonetheless, the findings were statistically significant for NCH Web services ( $n=246$ ,  $\text{Tau}=0.349$ ,  $p<0.001$ ) and UC ( $n=111$ ,  $\text{Tau}=0.443$ ,  $p<0.001$ ) and the alternative hypothesis was accepted (see Appendix F: Test statistics for Security (SE) as a determinant of Behavioural Intention - (SE  $H_1$ :)). This mirrors previous studies that demonstrated security as a determinant of e-government adoption (e.g., Anastasopoulou and Kokolakis, 2013; Perez, 2015). Furthermore, the correlation between security and BI was positive and moderate for NCH Web services but relatively strong for UC. The findings are plausible since money, and personal details are always involved when claiming benefits. Hence the correlation was more pronounced for UC. The association between security and BI was conceptualised would be moderated by age, gender, experience and hedonic motivation; however, the study showed otherwise. These security concerns can be addressed.

The 6.1% (for NCH Web services) and 2.8% (for UC) of the participants who were indifferent about the security of e-government but intended to use them could benefit from Internet security education so that they move into the category of citizens who believe e-government is secure. The same could be done for participants who strongly disagreed/disagreed that e-government was secure (3.6% for both NCH Web services and UC) yet they intended to use the services.

The research model proposed adding security as an external variable to UTAUT2. The above findings, supported by previous studies outlined earlier in section 2.5.3, demonstrate that security is a valid addition to UTAUT2. Security perceptions could influence trust levels of e-government.

#### **4.5.4 Trust (TRi and TRe) as a determinant of Behavioural Intention (BI) - (TRi H<sub>1</sub>: and TRe H<sub>1</sub>:)**

Two hypotheses were specified for trust in section 2.5.3.2,

TRi H<sub>1</sub>: Trust of the Internet, moderated by age, experience and hedonic motivation, influences citizens' BI to use NCH Web services;

and

TRe H<sub>1</sub>: Trust in e-government, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Universal Credit system.

Trust of the Internet was tested through NCH Web services (TRi) (using question TRi\_A1 in Appendix A: Questionnaire) and then trust in e-government through UC (TRe) (using question TRe\_B1 in Appendix A: Questionnaire).

Figure 4.5-2 shows that 16.3% of the participants trusted the Internet and intended to use NCH Web services compared to 11.3% who trusted the Internet but did not intend to use NCH Web services. There were 2.8% of the participants who did not trust the Internet but still intended to use the NCH Web services. Much like security, a significant percentage (25.3%) of participants neither trusted the Internet nor intended to use NCH Web services. This group of citizens would be harder to get to use digital services. Nevertheless, these findings were statistically significant (n=246, Tau=0.359, p<0.001) (see Appendix G: Test statistics for Trust of the Internet (TRi) as a determinant of Behavioural Intention (BI) - (TRi H<sub>1</sub>:)). Thus, the alternative hypothesis TRi was accepted.

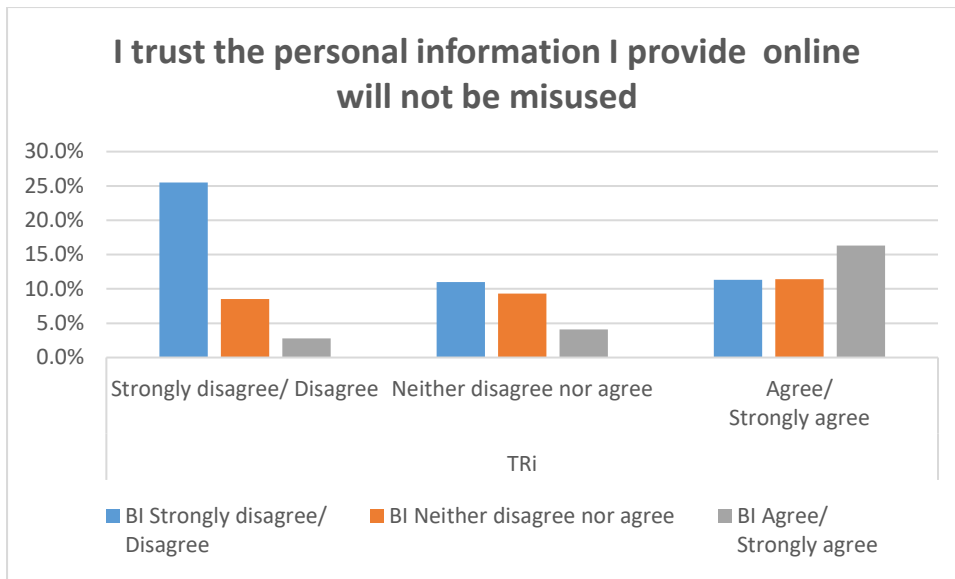


Figure 4.5-2: Trust of the Internet statistics

These findings support prior studies where trust of the Internet was a prominent factor for e-government adoption (e.g., AlAwadhi and Morris, 2009; Weerakkody *et al.*, 2013; Taiwo, Downe and Loke, 2014). Furthermore, the association between TRi and BI was of moderate strength and positive. Internal variables did not moderate the association. Similar tests were carried out on UC.

Figure 4.5-3 shows that 24.4% of the participants trusted claiming benefits online and intended to do so, while only 1.8% trusted UC but did not intend to use it. Like TRi, a high percentage of participants (36%) did not trust UC and neither intended to use it. This is very high and would benefit from Internet security education. These results were statistically significant ( $n=111$ ,  $\text{Tau}=0.711$ ,  $p<0.001$ ) and the alternative hypothesis TRe was accepted (see Appendix G1: Test statistics for Trust in e-government (TRe) as a determinant of Behavioural Intention (BI) - (TRe H<sub>1</sub>:)). This mirrored previous studies by Teo, Srivastava and Jiang (2008) and Nam (2014). Moreover, of all the external variables, trust in e-government had the strongest influence on BI.

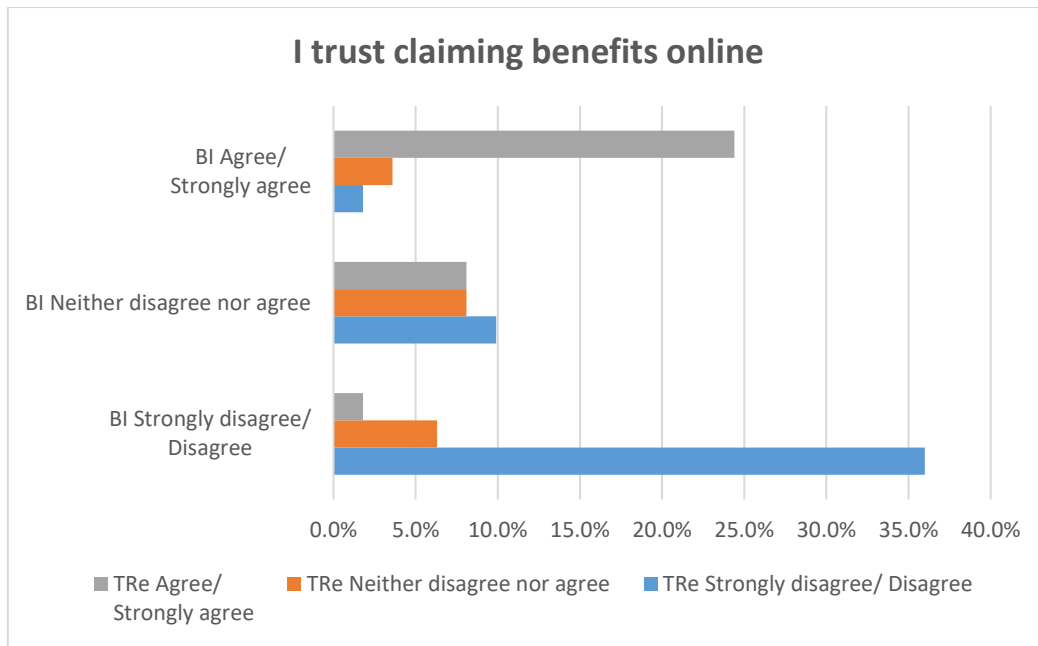


Figure 4.5-3: Trust in e-government statistics

The correlation between TRe and BI was positive and strong. Age, gender and hedonic motivation moderated the correlation. Young females and non-binary gender who thought using e-government was fun were more likely to have the behavioural intention to use e-government. Contrary to Venkatesh, Thong and Xu's (2012) study, experience did not moderate TRe. The moderation by hedonic motivation is entirely plausible because computer playfulness leads to regular use of digital technology, which subsequently increases the skills needed to navigate the information society, thus increases trust. The finding substantiates the proposition that trust is a valid addition to UTAUT2's external variables. Furthermore, the study showed that security was a significant predictor of trust for both NCH Web services (n=246, Tau=0.664, p<0.001) and UC (n=111, 0.660, p<0.001). Although, security on its own was one of the weak determinants of BI. The correlation between security and trust was also demonstrated by Alryalat, Dwivedi and Williams (2013). Given these views, what performance gains could be accrued from using e-government?

#### 4.5.5 Performance Expectancy (PE) as a determinant of Behavioural Intention (BI) - (PE H<sub>1</sub>.)

In section 2.5.4, it was hypothesised that,

PE H<sub>1</sub>: There is a statistically significant correlation between PE and BI, moderated by age and gender, to use NCH Web services or the Universal Credit system.

The analysis of the results used question PE\_A1 in Appendix A: Questionnaire to first explore the performance gains from NCH webservices before exploring the performance gains from UC using question PE\_B1 in Appendix A: Questionnaire. The results are shown in Table 4.5-2. 18.3% of the participants thought it would be quicker to access NCH services online and would do so (n=246, Tau=0.510, p<0.001) compared to 24.3% of social welfare benefits claimants who thought claiming benefits via UC would be easier and would do so (n=111, Tau=0.554, p<0.001) (see Appendix H: Test statistics for Performance Expectancy (PE) as a determinant of Behavioural Intention (BI) - (PE H<sub>1</sub>:)).

	Performance expectancy		
Behavioural intention	Strongly disagree/ Disagree	Neither disagree nor agree	Agree/ Strongly agree
Strongly disagree/ Disagree	26.4% NCH 32.4% UC	4.8% NCH 9.0% UC	1.2% NCH 3.6% UC
Neither disagree nor agree	14.2% NCH 4.5% UC	15.9% NCH 10.4% UC	3.6% NCH 1.8% UC
Agree/ Strongly agree	6.8% NCH 7.2% UC	8.6% NCH 6.3% UC	18.3% NCH 24.3% UC

Table 4.5-2: Performance expectancy statistics

On the other hand, 26.4% of the participants thought there were no efficiencies gained by using NCH Web services and did not intend to use the service compared to 32.4% for UC. The findings were statistically significant, and the alternative hypothesis was accepted. Unlike the study by Venkatesh, Thong and Xu (2012), PE was not the strongest determinant of BI. However, it was still significant enough to be the second strongest determinant for NCH Web services and the third for UC. The percentage of participants who bought into the benefits of e-government (be it NCH Web services or UC) was less than a quarter, and this is very low and indicates that more publicity of the benefits is needed. Despite the low percentage, the thesis supported previous studies that demonstrated PE as an e-government predictor (e.g., Alsaif, 2013; Mostafa and El-Masry, 2013; Nasri, 2014; Raman *et al.*, 2014). The correlation between PE and BI was positive and relatively strong. The research model theorised that age and gender would moderate the correlation. However, the study showed that only gender moderated the association. The non-binary gender and females were marginally more likely to have the behavioural intention to use e-government than males. The study supports previous studies by van Deursen and van Dijk (2013) and ONS (2013b) that rendered age as a weak

determinant of Internet usage. There are reasons why participants would not see the performance gains from e-government.

Some barriers to e-government could be digital illiteracy, computer illiteracy, illiteracy in general, fear of digital services, lack of confidence to seek computer training and attitude towards learning new things based on generational traits. In other cases lack of awareness of e-government benefits, desire for human interaction, the limited scope of online services to deal with complex scenarios, security and trust concerns, fear of the unknown, perception that online activities are monitored (Big Brother is watching) and so on, stop citizens from using e-government. These barriers could be addressed by tailoring computer training to different user-groups, publicising benefits of e-government and increasing awareness of sources of help through campaigns and training. Additionally, fall-back to traditional methods to deal with complex issues or to satisfy the desire for human interaction, educating on Internet security and using intermediaries, such as NCC and NCH, to assist citizens with digital technology mitigate the e-government barriers. Gaining these performance efficiencies requires expending some effort on the citizen's side.

#### **4.5.6 Effort Expectancy (EE) as a determinant of Behavioural Intention (BI) - (EE H<sub>1</sub>:)**

Effort expectancy was hypothesised in section 2.5.5 as,

EE H<sub>1</sub>: EE, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.

The results indicate that the effort expended by a citizen determines their behavioural intention to use e-government. Using question EE\_A1 in Appendix A: Questionnaire, Table 4.5-3 shows that 19.6% of the participants were comfortable accessing NCH Web services independently and intended to do so (n=246, Tau=0.469, p<0.001) (see Appendix I: Test statistics for Effort Expectancy (EE) as a determinant of Behavioural Intention (BI) - (EE H<sub>1</sub>:)). On the other hand, using question EE\_B1 in Appendix A: Questionnaire, 24.4% receiving social welfare benefits thought learning to claim benefits online would be easy and would do so (n=111, Tau=0.597, p<0.001). These are low and reflect a gap in digital skills and confidence. Regardless, the effects of EE matched findings from previous research that used other models to measure the equivalent of EE (e.g., AlAwadhi and Morris, 2008; Osman *et al.*, 2014; Nasri, 2014; Rana and Dwivedi, 2015; Alghamdi and Beloff, 2016).



	Effort expectancy		
Behavioural intention	Strongly disagree/ Disagree	Neither disagree nor agree	Agree/ Strongly agree
Strongly disagree/ Disagree	27.5% NCH 30.6% UC	8.2% NCH 8.1% UC	11.8% NCH 5.4% UC
Neither disagree nor agree	4.0% NCH 8.1% UC	8.1% NCH 9.9% UC	17.1% NCH 8.1% UC
Agree/ Strongly agree	2.0% NCH 1.8% UC	1.7% NCH 3.6% UC	19.6% NCH 24.4% UC

Table 4.5-3: Effort expectancy statistics

Conversely, there were participants without the behavioural intention to use e-government. 27.5% of the participants were not comfortable accessing NCH Web services and would not do so either. 30.6% did not think learning to use UC was easy and would not use the service. The findings were statistically significant. The association between EE and BI was positive and relatively strong. Therefore, the alternative hypothesis was accepted. The effects of the moderating variables were not as anticipated.

The effect of EE on BI was theorised would be moderated by age, gender, experience and hedonic motivation. Internal variables did not moderate EE association with NCH Web services; however, gender and hedonic motivation moderated UC, as shown in Table 4.5-4. The non-binary gender and females who derived pleasure from computer use and thought it was easier to use e-government, and were comfortable doing so, were more likely to do so than males, but the difference was marginal.

Symmetric Measures

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.561	.118	4.633	.000
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.657	.065	9.906	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.816	.167	2.449	.014
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table 4.5-4: Effort expectancy and behavioural intention moderated by gender

In the literature it is argued that prior experience reduces the anxiety associated with learning new technologies and therefore moderated EE (AlAwadhi and Morris, 2008). However, the thesis did not support this, but it demonstrated that experience independently was the most significant determinant of actual e-government usage behaviour.

Furthermore, and interestingly, a significant percentage of participants were comfortable accessing NCH Web services but would not do so (17.1%). 8.1% thought it would be easy to learn how to claim benefits via UC but would not do so. Such behaviour could be influenced by the desire for human interaction, lack of awareness of the digital services portfolio, perceived usability of e-government Web sites, reliability and availability of e-government, trust and security concerns, among others. These could be addressed through having a fall-back traditional channel, publicising digital services, periodic reviewing of the quality of Web sites to suit the citizens' needs, monitoring and improving digital services reliability, and education on Internet security. In some cases, citizens' views about e-government are influenced by other people surrounding them, whose views they respect.

#### 4.5.7 Social Influence (SI) as a determinant of Behavioural Intention (BI) - (SI H<sub>1</sub>):

In section 2.5.7, social influence was hypothesised as,

SI H<sub>1</sub>: SI, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.

The effects of social influence on the participants are shown in Table 4.5-5. 11.64% and 13.6% of the participants whose important others thought they should use NCH Web services (using question SI\_A1 in Appendix A: Questionnaire) and UC (using question SI\_B1 in Appendix A: Questionnaire), respectively, had the behavioural intention to use e-government. Contrastingly, 4.4% and 3.6% had their important others thinking they should use NCH Web services and UC, respectively, but they did not have the behavioural intention to do so.

	Social inclusion		
Behavioural intention	Strongly disagree/ Disagree	Neither disagree nor agree	Agree/ Strongly agree
Strongly disagree/ Disagree	31.3% NCH 29.7% UC	11.8% NCH 10.8% UC	4.4% NCH 3.6% UC
Neither disagree nor agree	8.1% NCH 10.8% UC	15.9% NCH 11.7% UC	5.3% NCH 3.6% UC
Agree/ Strongly agree	2.4% NCH 3.6% UC	9.4% NCH 12.6% UC	11.4% NCH 13.6% UC

Table 4.5-5: Social influence statistics

These findings were statistically significant for both NCH Web services (n=246, Tau=0.505, p<0.001) and UC (n=111, Tau=0.516, p<0.001) (see Appendix J: Test statistics for Social Influence (SI) as a determinant of Behavioural Intention (BI) - (SI H<sub>1</sub>:)). Thus, the alternative hypothesis was accepted. The association between SI and BI was positive and relatively strong for both NCH Web services and UC. The finding was contrary to studies by Rana *et al.* (2016) where the effects of SI were weak. However, the thesis supported other studies that found the association to be significant (e.g., Alryalat, Dwivedi and Williams, 2013; Nasri, 2014; Alghamdi and Beloff, 2016). Contrary to literature prediction, internal variables had no moderating effects on SI. The possible mitigating factors already discussed for PE and EE are pertinent to SI. Also, of influence on behavioural intention to use e-government are the facilitating conditions.

#### **4.5.8 Facilitating Conditions (FC) as a determinant of Behavioural Intention and Usage Behaviour (FCb H<sub>1</sub> and FCu H<sub>1</sub>:)**

Facilitating conditions were hypothesised in two ways in section 2.5.6 as,

FCb H<sub>1</sub>: FC, moderated by age, gender, experience and hedonic motivation, influence BI to use NCH Web services and the Universal Credit system;

and

FCu H<sub>1</sub>: FC, moderated by age, experience and hedonic motivation, influence citizens' usage behaviour of the Internet in general.

Therefore, the facilitating conditions for e-government were tested for both the behavioural intention to use (FCb) and usage behaviour (FCu). Questions FC\_A1 and FC\_B1 in Appendix A: Questionnaire were used for NCH Web services and UC, respectively. That said, at the time of the survey, the full UC had not been rolled out in Nottingham and therefore assessing the full usage of UC was not possible. Firstly, facilitating conditions were tested for general Internet use (FCu) and Figure 4.5-4 shows the test statistics. 57.7% of the participants had the resources necessary to access the Internet and were digital citizens.

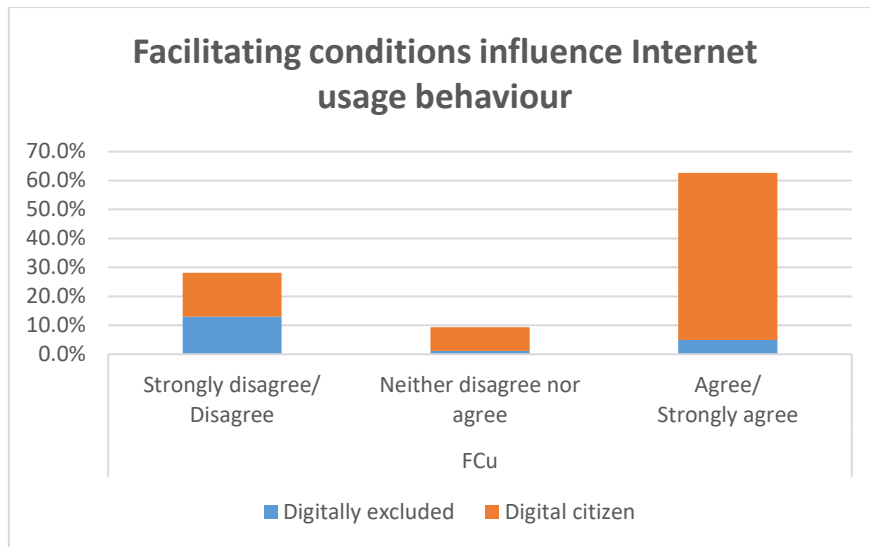


Figure 4.5-4: Facilitating conditions and usage behaviour statistics

There were 15.1% of the participants who did not have the resources to access the Internet, yet they were digital citizens. It could be argued that they rely on free Internet access or proxy use. 13.0% did not have the resources to access the Internet and were digitally excluded. These citizens could benefit from being supported with Internet access and access devices or being made aware of the free Internet access points in the city. These findings were statistically significant ( $n=246$ ,  $X^2=52.220$ ,  $V=0.461$ ,  $p<0.001$ ) (see Appendix K1: Test statistics for Facilitating Conditions (FC) as a determinant of Usage Behaviour - (FCu H<sub>1</sub>:)). Therefore, the alternative hypothesis FCu was accepted. There are previous studies that have also reported FC as a determinant of BI (e.g., Chu, 2013; Nasri, 2014; Rana *et al.*, 2016). The correlation between FCu and usage behaviour was positive and relatively strong and not moderated by internal variables, contrary to the prediction. Furthermore, the association between facilitating conditions and behavioural intentions to use NCH Web services and UC was assessed.

Looking at Table 4.5-6 that shows the statistics for FCb, 19.1% of the participants had the resources necessary to use the Internet and had the intention to use NCH Web services, while 20.8% had someone that could help them use UC if they encountered problems and intended to use UC.

Behavioural intention	Facilitating conditions		
	Strongly disagree/ Disagree	Neither disagree nor agree	Agree/ Strongly agree
Strongly disagree/ Disagree	22.3% NCH 25.2% UC	4.0% NCH 6.3% UC	21.2% NCH 12.6% UC
Neither disagree nor agree	3.2% NCH 4.5% UC	3.7% NCH 14.4% UC	22.4% NCH 7.2% UC
Agree/ Strongly agree	2.4% NCH 0.9% UC	1.7% NCH 8.1% UC	19.1% NCH 20.8% UC

Table 4.5-6: Facilitating conditions and behavioural intention statistics

Contrary, 22.3% of the participants did not have the resources to access the Internet and did not intend to use the NCH Web services compared to 25.2% who did not have someone to assist them to use UC, if needed, and did not intend to use UC. These findings were statistically significant for NCH Web services ( $n=246$ ,  $\text{Tau}=0.295$ ,  $p<0.001$ ) and UC ( $n=111$ ,  $\text{Tau}=0.430$ ,  $p<0.001$ ) (see Appendix K: Test statistics for Facilitating Conditions (FC) as a determinant of Behavioural Intention (BI) - (FCb H<sub>1</sub>:)). Thus the alternative hypothesis FCb was accepted. The association of FCb and BI was positive for both NCH Web services and UC; however, it was relatively stronger for UC than NCH Web services and was not moderated by internal variables, which was not predicted. The finding is plausible given the importance of social welfare benefits in paying for citizens' basic needs. This warrants discussing some contributing factors that impact facilitating conditions.

Other barriers and mitigating factors discussed so far for AW, PE, EE and SI apply to FC. However, there are additional barriers that could affect FC. Lack of access devices, Internet access or awareness of where to get support with using e-government could be reasons affecting facilitating conditions. These could potentially be mitigated by maintaining or establishing public places where there are free access devices and free Internet access such as existing libraries, areas with public Internet access in NCC and NCH buildings, and so on. Publicising sources of help on using e-government, such as libraries, increasing hours of free Internet access to the public in NCC and NCH offices and increasing places with free Internet access could improve behavioural intention to use the Internet. Organisations such as NCH and NCC could include Internet access costs in social housing rentals such that any tenants automatically have free Internet access when they take their tenancy. Although this might not

include access devices, it eliminates one barrier. In other instances, e-government adoption is influenced by the citizens' perceptions of value for money.

#### 4.5.9 Price Value (PV) as a determinant of Behavioural Intention (BI) - (PV H<sub>1</sub>.)

The hypothesis for price value proposed in section 2.5.8 as,

PV H<sub>1</sub>: PV, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Internet in general.

The thesis tested price value for general Internet access using question PV\_A1 in Appendix A: Questionnaire. Table 4.5-7 shows that 15.1% of the participants perceived the price they paid for Internet access as value for money and had the behavioural intention to use e-government. 12.2% thought digital services offered value for money, however, they were indifferent about the intention to use e-government.

	Price value		
Behavioural intention	Strongly disagree/ Disagree	Neither disagree nor agree	Agree/ Strongly agree
Strongly disagree/ Disagree	28.50%	10.60%	8.50%
Neither disagree nor agree	7.30%	9.80%	12.20%
Agree/ Strongly agree	4.80%	3.20%	15.10%

Table 4.5-7: Price value statistics

In contrast, 28.5% of the participants did not think the price paid for Internet access was reasonable for the associated benefits and did not intend to use NCH Web services. These results were statistically significant (n=246, Tau=0.370, p<0.001) (see Appendix L: Test statistics for Price Value (PV) as a determinant of Behavioural Intention (BI) - (PV H<sub>1</sub>:)). Therefore, the alternative hypothesis was accepted. The association between PV and BI was moderate and positive although it was surprisingly lower than expected for a demographic group classed as deprived, according to the UK's IMD (Nottingham Insight, 2016). The findings indicate that the drop in Internet access prices in the UK makes it easily accessible, especially given the proliferation of free Internet access hot spots. The effects of PV on BI have been reported in other studies (e.g., Venkatesh, Thong and Xu, 2012; Abdullah, Dwivedi and Williams, 2014; Arenas-Gaitán, Ramón-Jerónimo and Peral-Peral, 2015).

The association between PV and BI was hypothesised would be moderated by age, experience and hedonic motivation. Contrary to prediction, PV was moderated by age only. The

association between PV and BI was strongly moderated by the 80+, 65-79 and 18-24. Reduced financial responsibilities for these groups could explain the association. Most of the 18-24s may still have some financial assistance from their parents/guardians and could, therefore, have more disposable income for their level of needs. Characteristically, the 65+ may no longer have mortgage expenses and costs associated with childcare typical for the 25-44 age group, hence might have more disposable income for their level of needs. Price value perceptions are individual and a factor of disposable income, awareness of the benefits of e-government and the perceived usability of e-government. One cannot attach much price value if they are unaware of the benefits accrued from using digital services or if it is difficult to use. Improving one's earning potential through improved skills could lead to increased disposable income, thus improving the price value perception. Similarly, publicising the benefits of e-government and continually making the e-government Web sites more user-friendly could improve the price value perceptions, leading to improved behavioural intention to use. Another factor influencing e-government BI is a habit of using online services.

#### **4.5.10 Habit (HB) as a determinant of Behavioural Intention (BI) and Usage Behaviour (HBb H<sub>1</sub>: and HBu H<sub>1</sub>:)**

In section 2.5.6, habit was hypothesised as,

HBb H<sub>1</sub>: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' behavioural intention to use the Universal Credit system;

and

HBu H<sub>1</sub>: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' usage behaviour of the Universal Credit system.

Subsequently, habit was tested for behavioural intention and usage behaviour for UC using question HB\_B1 in Appendix A: Questionnaire. Figure 4.5-5 shows that 16.3% of the participants thought claiming benefits online would become a habit and they intended to do so.

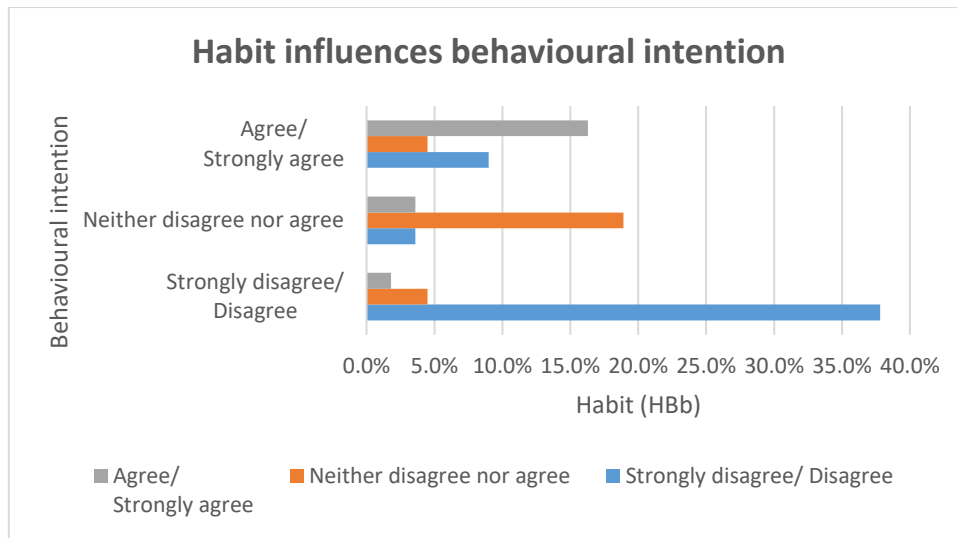


Figure 4.5-5: Habit and behavioural intention statistics

A comparatively high number (37.8%) of participants did not think claiming benefits online would become a habit and did not intend to use UC. These findings were statistically significant ( $n=111$ ,  $\text{Tau}=0.524$ ,  $p<0.001$ ) and the alternative hypothesis  $\text{HBb } H_1$  was accepted (see Appendix M: Test statistics for Habit (HB) as a determinant of Behavioural Intention (BI) - ( $\text{HBb } H_1$ :)). The association between  $\text{HBb}$  and BI was relatively strong and positive and was not moderated by any internal variables, contrary to prediction. Furthermore, as stated in the literature, habit has little or no prominence in e-government. E.g., Abdullah, Dwivedi and Williams (2014) discarded habit in their study. However, Cheung (2007) argued that habit influences usage; hence HB was tested against participants' usage behaviour.

Figure 4.5-6 shows that 18.0% of the participants were digital citizens and thought claiming benefits online would become a habit, which was higher than the 3.6% who were digitally excluded but thought claiming benefits would become a habit. Such citizens are likely to have realised that UC compelled them to use the Internet if they were to continue to rely on social welfare benefits. The results were statistically significant ( $n=111$ ,  $\text{Likelihood Ratio}=16.312$ ,  $p=0.003$ ) and the alternative hypothesis  $\text{HBu } H_1$  was accepted (see Appendix M1: Test statistics for Habit (HB) as a determinant of Usage Behaviour - ( $\text{HBu } H_1$ :)).



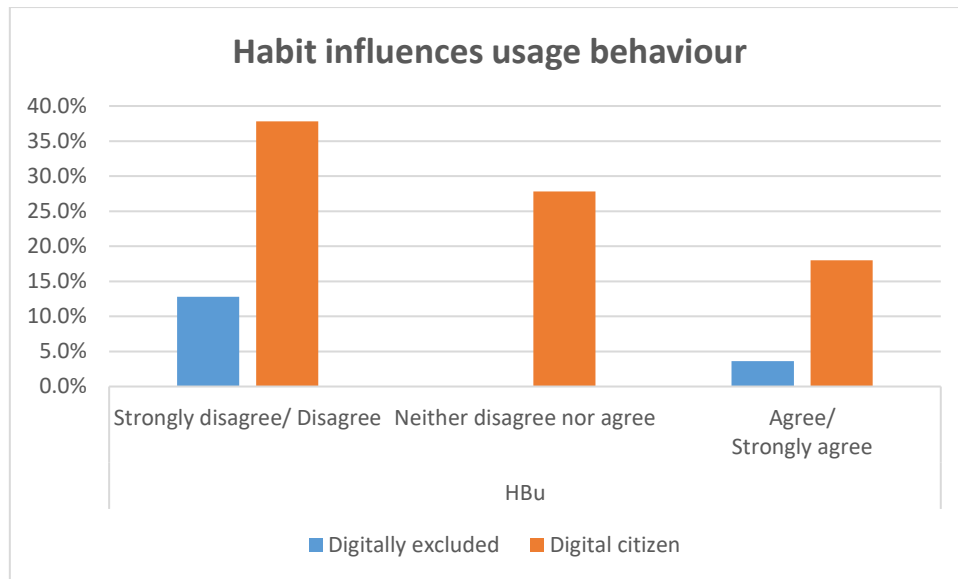


Figure 4.5-6: Habit and usage behaviour statistics

The correlation between HBU and usage behaviour was positive and moderate ( $V=0.333$ ,  $p=0.015$ ). None of the internal variables moderated habit. The formation of habit is linked to continuous usage of e-government. Thus the factors affecting BI discussed so far are pertinent to reinforcing habit. Sometimes continuous usage of e-government reinforces behavioural intention.

#### 4.5.11 Behavioural Intention (BI) as a determinant of Usage Behaviour (BI H<sub>1</sub>.)

The behavioural intention to use e-government was hypothesised in section 2.5.10 as,

BI H<sub>1</sub>: Behavioural intention to use the Universal Credit system, moderated by experience, has a significant statistical relationship with the actual system usage behaviour by citizens.

In UTAUT2, behavioural intention influences usage behaviour. Ajzen (2001) and Venkatesh, Thong and Xu (2012) argued that BI was the proximate determinant of usage behaviour. However, the thesis found it as the third strongest, after experience and facilitating conditions. BI was tested for both NCH Web services and UC using questions BI\_A1 and BI\_B1 in Appendix A: Questionnaire, respectively. Figure 4.5-7 shows that 19.1% of the participants intended to use NCH Web services and were digital citizens compared to 26.2% for UC, shown in Figure 4.5-8. On the other hand, 32.9% of the participants did not intend to use NCH Web services but were digital citizens. Similarly, 31.5% of the participants exhibited the same preference for UC. It could be argued that such citizens used other online services but did not prefer to use e-government.

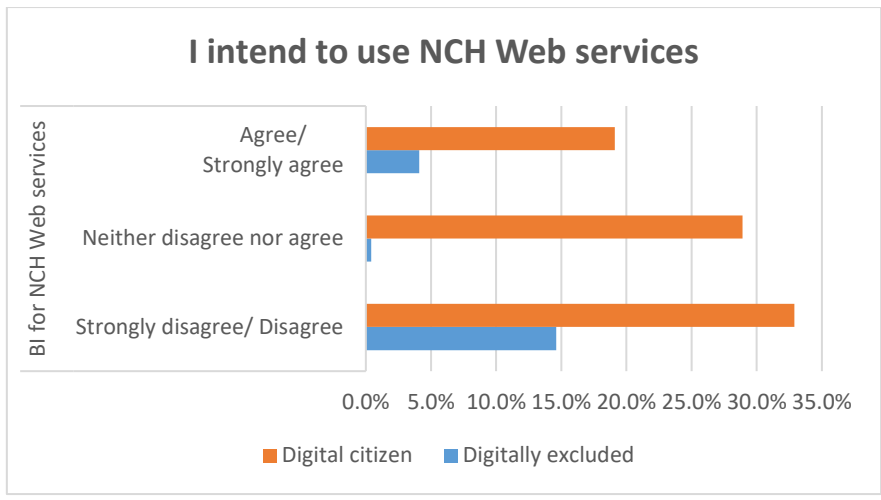


Figure 4.5-7: Behavioural Intention for NCH Web services statistics

Additionally, 4.1% and 3.6% of the participants were digitally excluded but intended to use NCH Web services and UC, respectively. The finding suggests that by addressing their digital inclusion barriers, these citizens could easily become digital citizens because they already have the will to use e-government. Just over a tenth of the participants did not intend to use e-government and was also digitally excluded. Such citizens would need a lot of time and resources investment to make them digital citizens.

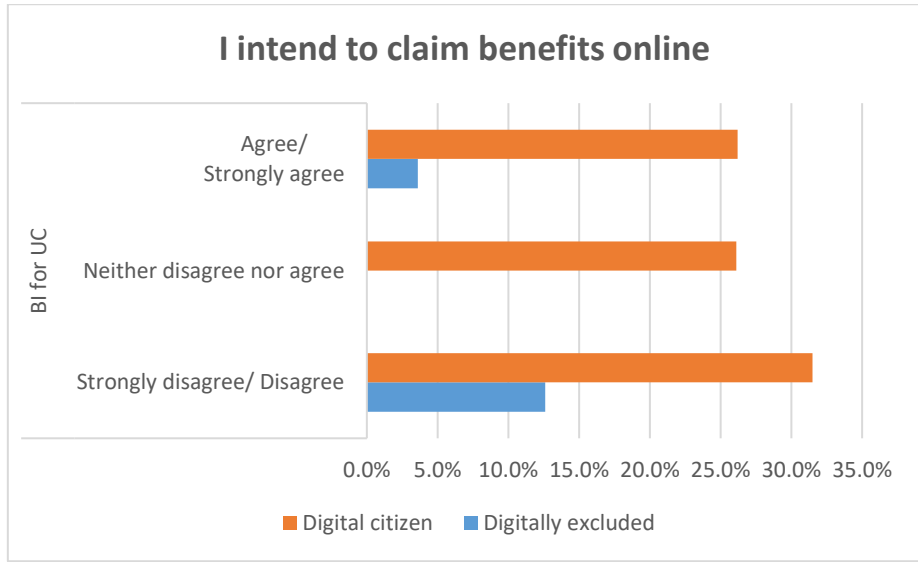


Figure 4.5-8: Behavioural Intention for Universal Credit statistics

The findings were statistically significant for both NCH Web services (n=246,  $\chi^2=33.561$ ,  $p<0.001$ ) and UC (n=111, Likelihood Ratio=17.844,  $p=0.001$ ) (see Appendix N: Test statistics for Behavioural Intention (BI) as a determinant of Usage Behaviour - (BI H<sub>1</sub>:)). Therefore, the alternative hypothesis was accepted. The correlation between BI and usage behaviour for both

NCH Web services ( $V=0.369$ ,  $p<0.001$ ) and UC ( $V=0.355$ ,  $p=0.007$ ) was positive and of moderate strength. The correlation was hypothesised would be moderated by experience; however, the study showed otherwise. Additionally, the findings disproved experience as an internal moderating variable. The hypotheses tested this far were theorised to have a goal of improving social inclusion through digital inclusion.

#### **4.6 Digital inclusion (DI) as a social phenomenon - (DI H<sub>1</sub>:)**

In section 2.6, it was hypothesised that,

DI H<sub>1</sub>: Digital inclusion improves social inclusion.

Therefore, to test this hypothesis, the composite score from questions USE\_A1 and USE\_A2 in Appendix A: Questionnaire was used to measure digital inclusion. Question SINC\_A1 in Appendix A: Questionnaire was used to measure citizens' feelings of social inclusion in the community. In this study, 40.2% of the participants thought digital inclusion improved social life, while 30.9% were indifferent. While a higher percentage of participants who thought digital inclusion improved social inclusion was expected, this is still a good starting point for e-government initiatives. These findings support studies that argued that there is a connection between digital inclusion and social inclusion (e.g., Wellman *et al.*, 2001; Mutula, 2008; Wong *et al.*, 2009; Lê, Nguyen and Barnett 2012; Steyaert and Gould, 2009; Chirara, 2014, Rana and Dwivedi, 2015; Chirara, 2015). However, the findings challenge the discourse that questioned the correlation between the concepts (e.g., Selwyn, 2003; Longley and Singleton, 2009; Polat, 2012; Clayton and Macdonald, 2013). Interestingly, 18.4% of the digitally excluded participants thought digital inclusion would improve their social life. Some of these participants might use the Internet in future since they can see the benefits of being online. Contrary, 45.2% of the digital citizens did not think being digitally included improved their social inclusion. These findings were statistically significant ( $n=246$ ,  $X^2=30.131$ ,  $p<0.001$ ) and the alternative hypothesis was accepted (see Appendix O: Test statistics for Digital inclusion (DI) as a social phenomenon - (DI H<sub>1</sub>:)). The association was moderate and positive ( $V=0.350$ ,  $p<0.001$ ). Additionally, that association was not moderated by age, gender experience and hedonic motivation.

Now that the study results have been discussed, it is worth evaluating the reliability and validity of the findings.

## 4.7 Reliability and validity of the results

The credibility of any research

... is to a considerable extent a matter of common sense. Have you done a good, thorough and honest job? Have you tried to explore, describe or explain in an open and unbiased way? Or are you more concerned with delivering the required answer or selecting the evidence to support a case? If you can't answer these questions with yes, yes and no, respectively, then your findings are virtually worthless in research terms (Robson 2011, p.85).

The next section uses statistical methods to demonstrate the reliability and validity of the thesis.

### 4.7.1 Reliability

The reliability of the thesis was evaluated in SPSS using Cronbach's Alpha. When interpreting the Cronbach's Alpha value, Duncan and Cramer (2009) recommend a value higher than 0.800. Alternatively, Hinton *et al.* (2004) categorise reliability using four groups:

0.90 – 1.00	Excellent
0.70 – 0.89	High
0.50 – 0.69	High moderate
0.00 – 0.49	Low

The reliability results of the thesis are shown in Table 4.7-1.

**Case Processing Summary**

		N	%
Cases	Valid	246	100.0
	Excluded <sup>a</sup>	0	.0
	Total	246	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.945	33

Table 4.7-1: Cronbach's Alpha reliability statistics

The Cronbach's Alpha value of 0.945 falls within the upper range proposed by Duncan and Cramer (2009) and Hinton *et al.* (2004). Therefore it is concluded that the study is reliable. Additionally, attention was also given to the threats to reliability throughout the research, e.g.,

**Participant error:** Participants who did not want to participate were not coerced into participation.

**Participant bias:** Through the Participant's Information Sheet, participants were advised that the research objective was to tease out factors that influenced their decision to adopt e-government, regardless of whether they were currently digital citizens or digitally excluded. They were advised there were no right or wrong answers.

**Observer error:** This was attenuated by coaching the colleagues who assisted in administering the questionnaire. Moreover, the fact that it was a self-completion questionnaire meant the assisting colleagues did not need to ask the participants any questions.

**Observer bias:** The questionnaire was piloted and repeatedly adjusted to improve its quality. Additionally, some questions from peer-reviewed published researches were adapted for the thesis.

The way reliability issues are handled influences the validity of the research, which is explored in the next section.

#### 4.7.2 Validity

Referencing back to Sapsford's (2007) validity concerns in 3.3.2, closed-ended questions were used. A reasonably large sample of 246 was used, thus addressing population validity. The basis of any comparisons was explicitly stated, alongside any assumptions made. Additionally, the response rate bias was evaluated.

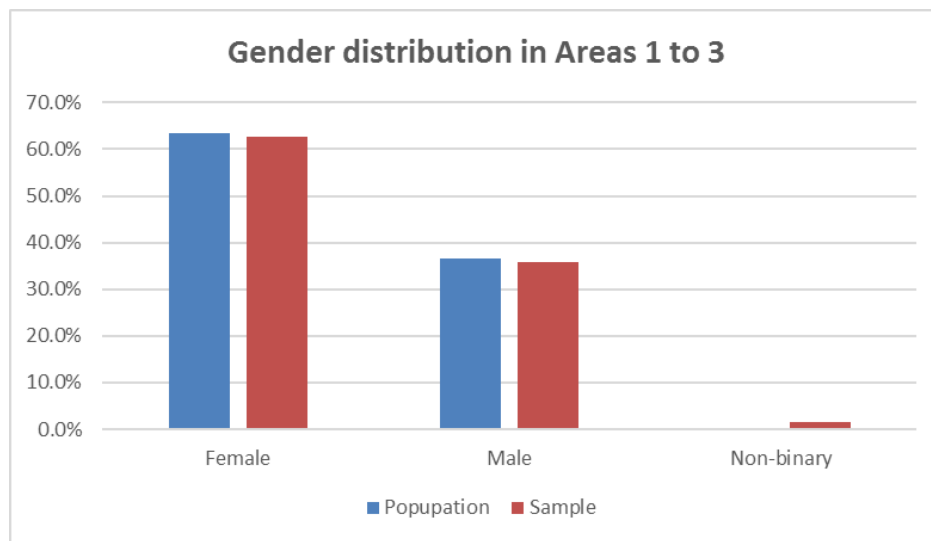
#### 4.7.3 Response rate and response rate bias

Response rate and response rate bias influence the credibility of the thesis. The response rate was measured by keeping track of the eligible NCH tenants who were approached and refused to complete the questionnaire. 25 people refused to complete the questionnaire. 5 more completed the questionnaire, but with a lot of missing values and were treated as research subjects who refused to participate. Therefore, using Equation 3.5-1,

$$\text{Active response rate} = \frac{246}{(246 + 25 + 5) - (0)}$$

the active response rate was 89.1%, which is higher than the 70% that was targeted for this study. It also falls close to the high face-to-face rate achieved by Neuman (2005), discussed in 3.5.1. Therefore, the response rate is acceptable for the conclusions of the study to be relied on. The response rate bias was also assessed.

The population characteristics obtained from NCH were used to assess the response rate bias. The assessment evaluates the representativeness of the sample to the population. Gender bias was assessed first, as shown in Figure 4.7-1.

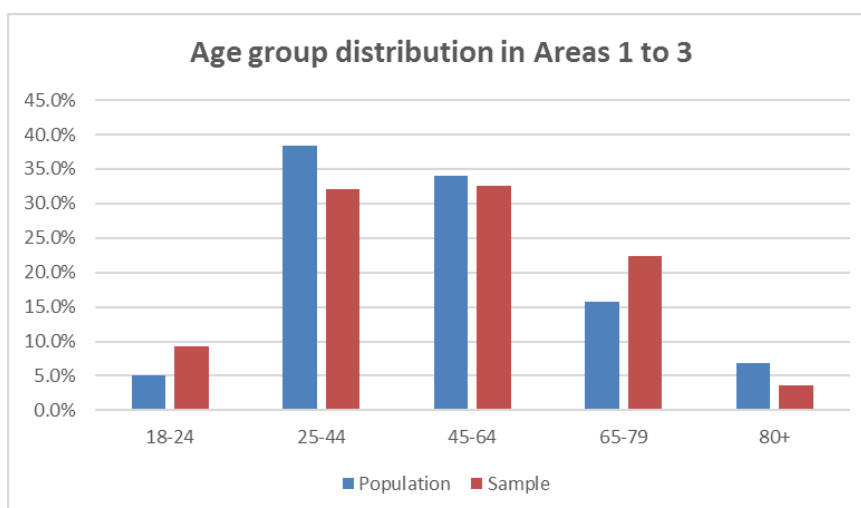


Gender	Popuation	Sample
Female	63.4%	62.6%
Male	36.6%	35.8%
Non-binary	0.0%	1.6%
<b>Total</b>	100.0%	100%

Figure 4.7-1: Population and sample gender distribution in Areas 1-3

The figure shows a negligible binary gender difference between the sample and the population because the NCH data did not have the non-binary gender. The graph demonstrates that the gender characteristics were representative of the population. Next, the age group bias was assessed.

Figure 4.7-2 shows the age group distributions of the population compared to the sample.



Age group	Population	Sample
18-24	5.1%	9.3%
25-44	38.3%	32.1%
45-64	34.0%	32.5%
65-79	15.8%	22.4%
80+	6.8%	3.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

Figure 4.7-2: Population and sample age group distribution in Areas 1-3

The median age was 45-64, which means that the sample was not skewed. For some age groups, there was a marginal difference in the age group distribution. However, the overall trend followed a normal distribution curve, which is also consistent with the UK population (ONS, 2017a).

Employment characteristics variance was not checked because NCH does not update the employment status beyond the start of tenancy; thus, the data was unreliable for comparison. Based on the above discussions, an overall statement on reliability and validity can be given.

To conclude on reliability and validity of the thesis, reference is made to Robson's questions:

Have you done a good, thorough and honest job? Have you tried to explore, describe or explain in an open and unbiased way? Or are you more concerned with delivering the required answer or selecting the evidence to support a case? (Robson 2011, p.85).

The research fulfils the reliability and validity principles because the answers to these questions, which are 'yes', 'yes' and 'no', respectively. Can the findings be generalised to the population?

#### **4.7.4 Generalisations**

Convenience sampling was used, which makes it difficult to justify generalising the findings to a broader setting. However, the findings can loosely be used to understand e-government dynamics in deprived communities that have similar socio-economic characteristics to the sample. In the UK, IMD is used to measure deprivation, and the findings can be applied to areas with IMD less than or equal to 60.0%, which compares to the IMD for Nottingham City Areas 1-3 (see Figure 4.7-3). Areas 1-3 cover Bulwell, Bulwell Forest, Bestwood, Basford, Leen Valley, Aspley, Bilborough. The findings can also be extended, with caution, to areas with IMD of 60.1-80.0%.



## Nottingham City | 2015 Indices of Multiple Deprivation

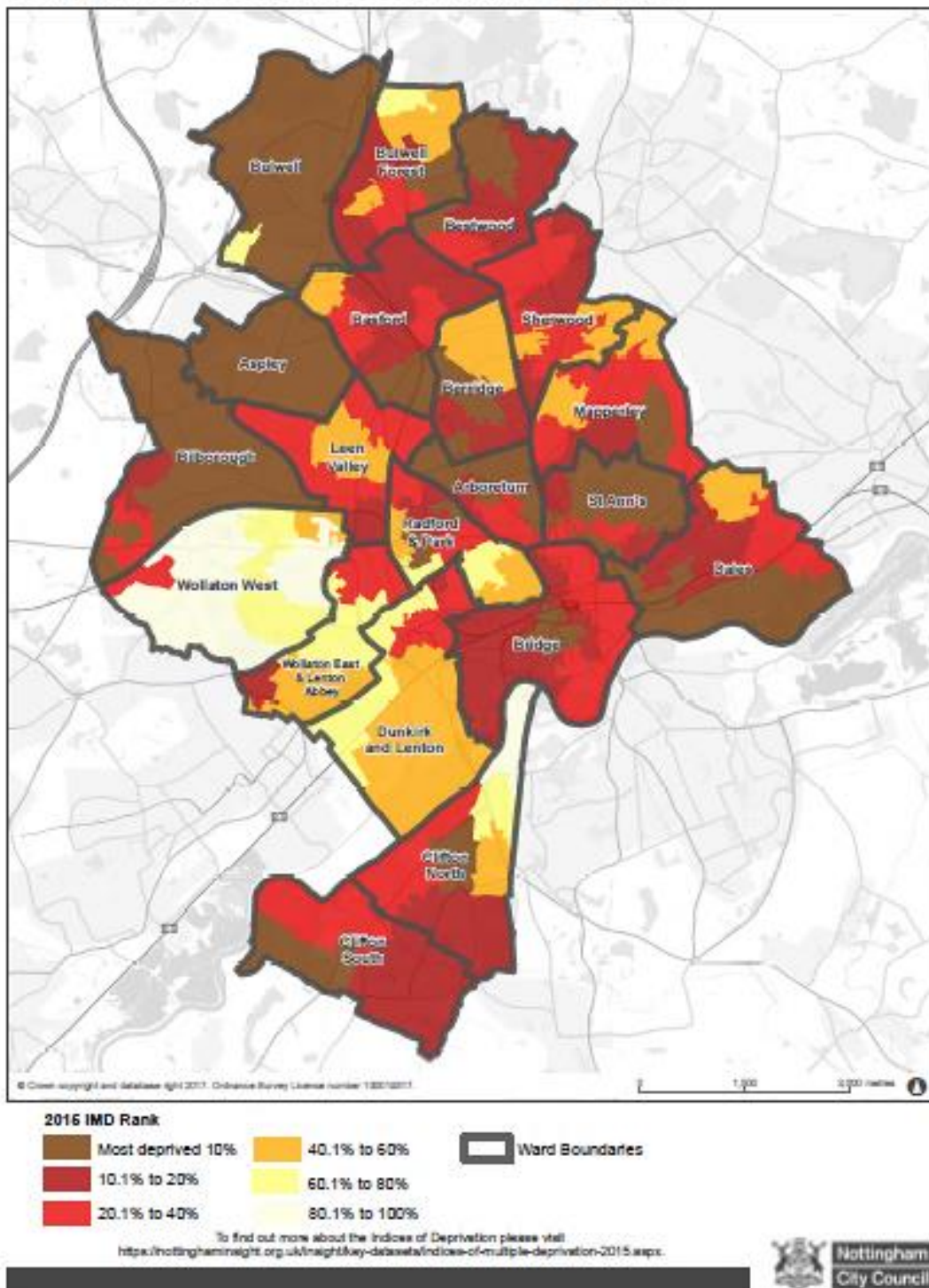


Figure 4.7-3: Nottingham City IMD for 2015

(Source: Nottingham Insight, 2015).

The findings in this chapter can now be used to close the gaps in the literature.

## 4.8 Closing the gaps

### 4.8.1 M-UTAUT2: A rethink of UTAUT2 in an e-government context

Chapter 2 highlighted that some basic constructs missing from UTAUT2 (awareness, security and trust) and that hedonic motivation was an internal variable and not an external variable. Two rings, one for social inclusion and one for digital inclusion were added to the model to reflect the broader objective of improving social inclusion through digital inclusion. The modification helps counter the argument by Alghamdi, Goodwin and Rampersad (2011) that e-government only focused on technical issues. Subsequently, a modified UTAUT2 was proposed as the conceptual framework. The thesis findings confirmed the adaptations and challenged some theories, particularly the moderating effects of internal variables on behavioural intention to use and the e-government usage behaviour. Additionally, the results demonstrated that experience did not moderate any external variables. Instead, it positively tested as an external variable. The results prompted amending UTAUT2, resulting in the Modified UTAUT2 (M-UTAUT2) shown in Figure 4.8-1.

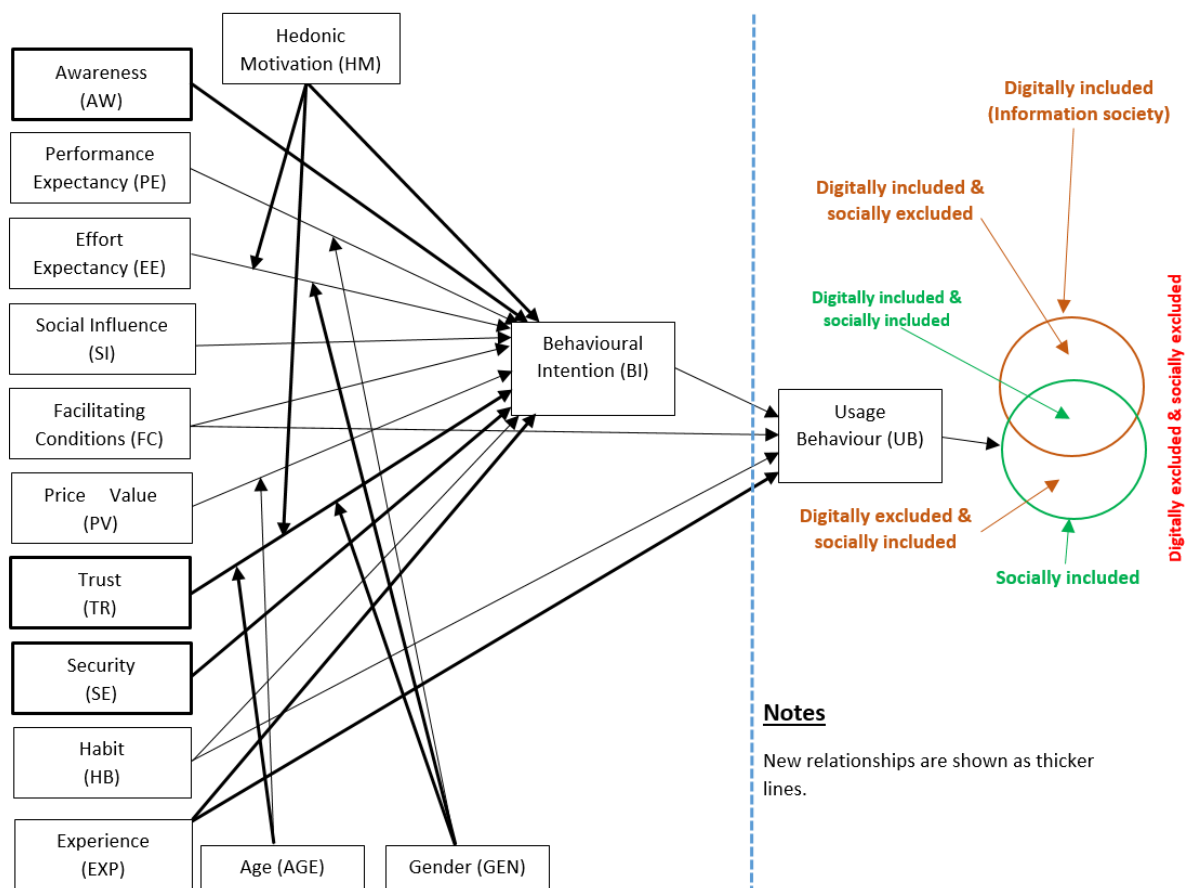


Figure 4.8-1: M-UTAUT2 - A rethink of the UTAUT2 model in e-government

(Source: Adapted from Venkatesh, Thong and Xu, 2012)

Statistics demonstrated that while hedonic motivation is an internal variable, it also significantly and directly influenced behavioural intention to use NCH Web services and UC. It makes it the only internal variable that also directly influences behavioural intention. The relative strengths of the factors influencing e-government adoption in this case study are now outlined.

In addition to being aware of e-government services, the thesis demonstrated that the most critical factors influencing behavioural intention to use e-government are trust, effort expectancy and performance expectancy, habit, social influence and facilitating conditions, respectively. Usage behaviour of e-government is significantly dictated by prior Internet experience, facilitating conditions, behavioural intention and habitual use, in that order. It is important to emphasise that these factors have been determined in a society where there are free and fast Internet access hot spots and social welfare benefits as a source of income for citizens classed as deprived. These factors demonstrate why price value did not come out as a very significant factor influencing e-government. To the researcher, e-government adoption is a process.

#### 4.8.2 E-government adoption process

An e-government adoption process proposed is based on the findings from this thesis and the findings from the previous DBA documents discussed in section 1.7. Remember from section 1.2, one of the four indicators used to derive the Digital Public Services scoreboard for EU member states is the number of e-government users (European Commission, 2016). This means that there must be continued use of e-government beyond the initial use. Therefore, adopting e-government must not be viewed as an event, but as a two-step process (formative process and habitual process). These two processes, in turn, have two stages and one stage each, respectively (see Figure 4.8-2).

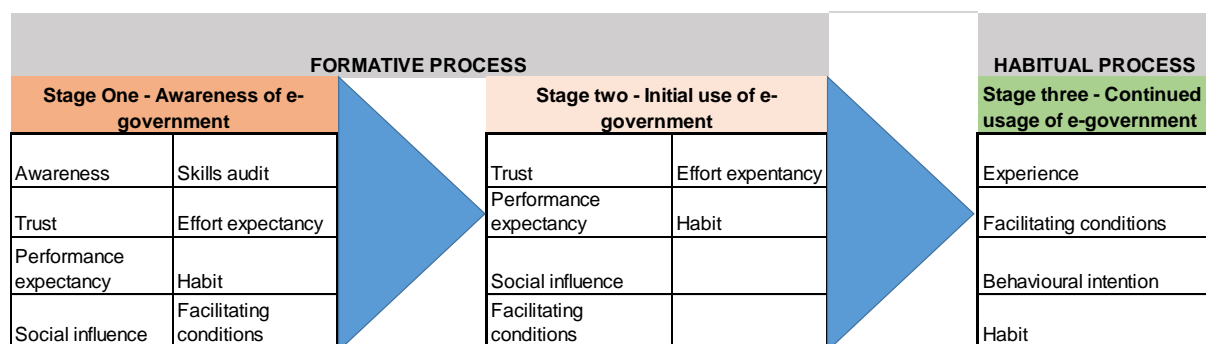


Figure 4.8-2: E-government adoption process

At each stage, the significant factors influencing behaviour towards e-government vary and it is important to know this for e-government initiatives to be successful. The formative process (which was the primary focus of the thesis) has two distinct stages, where citizens' awareness of e-government starts. At stage one (awareness of e-government), citizens evaluate if they have the skills necessary to use e-government. External and internal factors also influence the behavioural intention at this stage, which leads to the initial use of e-government in stage two. Stage two (initial usage of e-government) deals with harnessing the behavioural intention into action (actual usage of e-government). At this stage, citizens assess if e-government lives up to their expectations formed at stage one. If there is a gap between the expectation and the experience at stage two, it is critical that citizens are assisted in adapting so that they retain the intention to continue using e-government. Without this support, the citizens become ex-users. If citizens manage to complete the formative process, they transition to the habitual process.

The habitual process is grounded in identity construction as an e-government user. This process has stage three (continued usage of e-government, which becomes habitual). Sustained e-government usage is contingent upon extracted cues. Extracted cues are familiar and straightforward structures that are the seed from which people make sense of what is happening (Weick, 1993). The experience gained so far by citizens in using e-government forms the cues that allow them to now deal with any challenges that they encounter, e.g., evaluating the risk associated with a pop-up message and deciding whether it is an Internet security threat or a trusted informational message on the e-government Website. These processes and stages are now discussed in detail in the next sections.

#### **4.8.2.1 Formative process: stage one – awareness of e-government**

The first stage involves raising awareness of digital public services through various media campaigns. The associated benefits of using e-government need to be emphasised to citizens. When citizens are aware of the digital public services, they complete an informal skills audit, assessing their capability to learn and use the new service.

Requisite skills (computer and digital literacy) to use e-government help citizens generate the behavioural intention to use e-government. Therefore, stakeholders such as NCC, NCH and the central government who are promoting the Digital by Default (DbyD) public services must invest in equipping citizens with the skills and confidence to navigate the Internet web. Computer and digital literacy contribute to improving trust in e-government when one knows how to navigate the information society.

Stakeholders must put significant effort to make citizens trust the Internet and e-government. This involves having a programme of educating citizens on Internet security, which is strongly associated with trust. Security training should be administered through trusted channels, preferably familiar ones currently serving communities. The use of trusted sources in the diffusion of e-government was found to be significant by Bailey and Bakos (1997) and Al-sobhi (2011).

These actions, among others, help citizens to perceive the effort needed to use e-government as less, which increases their behavioural intention. The time it takes to transition from stage one is dependent on several factors such as cognitive ability, pre-existing computer skills, social influence, available formal or informal support to understand e-government and gain the requisite skills and the costs associated with acquiring the resources to access the Internet. The time spent at stage one is also determined by whether citizens have existing habits of using other Internet services other than e-government. When there is increased behavioural intention, usage follows at stage two of the adoption process.

#### **4.8.2.2 Formative process: stage two – initial usage of e-government**

The second stage of the e-government adoption process transitions from intention to use to actual usage behaviour. It is still part of the formative process, where a citizen can stop using e-government for whatever reasons, but mainly if they do not see any benefits of using it or have difficulties using it. Citizens can also continue using e-government if they have a positive experience that meets their expectations. The decision to continue using is also dependent on hedonic motivation and social influence by significant others in the citizen's life. That social influence in sense-making can be imagined or physically present (Weick, 1993). The support and resources required to use e-government should remain in place to sustain usage confidence. Rogers (2008) recognised this stage in his Diffusing of Innovation (DOI) theory and argued that users trial an innovation on a limited basis before adopting when there are demonstrable innovation results (i.e., performance expectancy).

At this stage, it is very crucial that e-government is easy to use and compatible with offline methods. This reduces the effort needed to learn and use the new digital public service (effort expectancy) and assures continued usage. Therefore, stakeholders must have plans and resources to support citizens at this stage. Eventually, repeat usage of e-government leads to the formation of a habit of using e-government by default (DbyD). After the initial stages of usage, the long-term success of e-government is dependent upon continuous usage, which leads to stage three.

#### **4.8.2.3 Habitual process: stage three – continued usage of e-government**

Stage three of the e-government adoption process is the one that ensures there is a return on investment on the government's DbyD initiatives. Without this stage, the anticipated billions of savings from using DbyD will not be achieved. The habitual process takes effect at this stage. The experience gained through usage, the facilitating conditions that support continued use, the behavioural intention to use and the initialisation of habitual use are amongst the reasons that reinforce continued usage. Sustained adoption of e-government is what allows the government to reduce expenditure associated with traditional governmental services. At this stage, there must be constant review and monitoring of e-government usage. Longitudinal studies would allow evaluating the effectiveness of the actions completed at all stages. Therefore, the adoption of new digital public services must be viewed as an ongoing process.

The above actions contribute towards improving the UK's digital public services position in EU. However, the UK voted to exit the EU in 2016. When it formally exits the EU, it is not yet clear whether it will continue the trajectory of improving digital public services through the DbyD strategy, which was instigated by EU policies. Sometimes the e-government strategies are dictated by the changing landscape of the digital technology market, which is explored in the next section.

#### **4.8.2.4 Global digital technology market: a powerful emerging e-government actor**

Close analysis of literature shows that the main e-government actors are the government and the citizens (Jaeger, 2003; Badri and Alshare, 2008; Khan *et al.*, 2013; Fan, 2013). When the Internet emerged, governments used to drive decisions on how they used digital technologies to deliver their objectives. The primary drivers for using digital technology were improved process efficiencies and cost savings. There was much control in the decisions on the public services delivery channels. However, lately, there is an emerging trend where that control is being eroded, and governments are reacting to the changes dictated by the digital technology market trends to deliver services. The influence of the global digital technology market on e-government (and other consumer digital services) is easy to underestimate, and this is reflected in the lack of literature that discusses its power.

The proliferation of powerful smartphones and mobile 'apps' (software applications) is changing the digital landscape and the provision of services. The innovations mean that sometimes e-government initiatives are driven by how digital technology is developing and how other countries are using it. E.g., the competitive prices for powerful mobile digital technology have shaped the adoption and delivery of digital public services such that Web sites

are mostly developed with a mobile view in mind. This makes the global digital technology market a significant actor in the provision of public services. The government and citizens are forced to adopt a different way of interacting because of the disruptions caused by the digital technology developments. The global digital technology market should start forming part of the narrative on e-government actors. Another gap in literature pertains to the proxy use of the Internet.

#### **4.8.2.5 The neglected proxy use**

Literature review argued that proxy users are digital citizens who also benefit from digital inclusion. The study confirmed that if proxy use is not captured, the digital inclusion statistics would be understated. Therefore, researchers must tease out proxy use explicitly. For example, as follows:

‘Have you used the Internet in the last  $X$  days?’

Have you asked someone to use the Internet for you in the last  $X$  days?’

If a participant answered ‘Yes’ to either question, then they are a digital citizen. If they answer ‘No’ to the first question and ‘Yes’ to the second, then they are a proxy user. If they answer ‘Yes’ to both questions, then they are temporary proxy users. Researchers and practitioners could look at the percentage of proxy use and determine if there are any trends and plan for their mitigation. E.g., the primary barrier for proxy users to use UC in the thesis was the experience of using the Internet (Likelihood Ratio=22.178,  $p<0.001$ ,  $V=0.362$ ,  $p<0.001$ ). This suggests that the remedy for improving direct Internet use, and subsequently e-government use, is related to Internet access, training or computer anxiety. Therefore, NCC and NCH can put measures in place to promote direct use, which improves privacy. Improved privacy reduces the risk of fraudulent activities perpetrated by those assisting the proxy user. Such fraudulent activities can turn proxy users into ex-users who prefer traditional government administration, thus derailing the objectives of the DbyD strategy. A great deal has been discussed in this chapter, which warrants a summary to highlight the crucial points.

## **4.9 Summary**

The chapter described the context in which the data was collected because it influences the demographic characteristics of the sample and the data collected. Overall, 80.9% of the participants were digital citizens, of which 5% were proxy users. Subsequently, the results of the statistical analysis for the factors influencing e-government adoption were reported and Table 4.9-1 shows a summary of the test statistics.



Alternative Hypothesis	Test results for NCH Web services and general Internet browsing							Test results for the Universal Credit						
	Test statistic			Cramer's V		Accept/Reject H1	Correlation Strength	Test statistic			Cramer's V		Accept/Reject H1	Correlation Strength
	Test Value	Test Used	P value	V	P value			Value	Test Used	P value	V	P value		
HM H1: Hedonic motivation influences citizens' behavioural intention (BI) to use NCH Web services and the Universal Credit system.	0.588	Tau	<0.001	N/a	N/a	Accept	Relatively strong	0.493	Tau	0.067	N/a	N/a	Reject	Moderate
EXPb H1: Experience, moderated by age, gender and hedonic motivation, influences BI to use NCH Web services or the Universal Credit system.	0.369	Tau	<0.001	N/a	N/a	Accept	Moderate	0.372	Tau	<0.001	N/a	N/a	Accept	Moderate
EXPu H1: Experience, moderated by age, gender and hedonic motivation, influences citizens' usage behaviour of NCH Web services or the Universal Credit system.	81.832	X2	<0.001	0.577	<0.001	Accept	Relatively strong	24.907	LR	<0.001	0.474	<0.001	Accept	Relatively strong
AW H <sub>1</sub> : Awareness of the Universal Credit system, moderated by age and experience, influences citizens' behavioural intention (BI) to use it.	Not applicable							11.793	X2	0.019	0.326	0.019	Accept	Moderate
SE H <sub>1</sub> : Security concerns, moderated by age, experience and hedonic motivation, influence citizens' BI to use NH Web services or the Universal Credit system.	0.349	Tau	<0.001	N/a	N/a	Accept	Moderate	0.443	Tau	<0.001	N/a	N/a	Accept	Relatively strong
TRi H <sub>1</sub> : Trust of the Internet, moderated by age, experience and hedonic motivation, influences citizens' BI to use NCH Web services;	0.359	Tau	<0.001	N/a	N/a	Accept	Moderate	Not applicable						
TRe H <sub>1</sub> : Trust in e-government, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Universal Credit system.	Not applicable							0.711	Tau	<0.001	N/a	N/a	Accept	Strong
PE H <sub>1</sub> : There is a statistically significant correlation between PE and BI, moderated by age and gender, to use NCH Web services or the Universal Credit system.	0.510	Tau	<0.001	N/a	N/a	Accept	Relatively strong	0.554	Tau	<0.001	N/a	N/a	Accept	Relatively strong
EE H <sub>1</sub> : EE, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.	0.469	Tau	<0.001	N/a	N/a	Accept	Relatively strong	0.597	Tau	<0.001	N/a	N/a	Accept	Strong
SI H <sub>1</sub> : SI, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.	0.505	Tau	<0.001	N/a	N/a	Accept	Relatively strong	0.516	Tau	<0.001	N/a	N/a	Accept	Relatively strong
FCb H1: FC, moderated by age, gender, experience and hedonic motivation, influence BI to use NCH Web services and the Universal Credit system	0.295	Tau	<0.001	N/a	N/a	Accept	Moderate	0.430	Tau	<0.001	N/a	N/a	Accept	Relatively strong
FCu H1: FC, moderated by age, experience and hedonic motivation, influence citizens' usage behaviour of the Internet in general.	52.220	X2	<0.001	0.461	<0.001	Accept	Relatively strong	Usage not tested because full UC rollout starts post data collection						
PV H <sub>1</sub> : PV, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Internet in general.	0.370	Tau	<0.001	N/a	N/a	Accept	Moderate	Indirectly tested using a general Internet question						
HBb H1: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' behavioural intention to use the Universal Credit system.	Not applicable							0.524	Tau	<0.001	N/a	N/a	Accept	Relatively strong
HBu H1: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' usage behaviour of the Universal Credit system.	Not applicable							16.312	X2	0.003	0.333	0.003	Accept	Moderate
BI H1: Behavioural intention to use the Universal Credit system, moderated by experience, has a significant statistical relationship with the actual system usage behaviour by citizens.	33.561	X2	<0.001	0.369	<0.001	Accept	Moderate	17.844	LR	<0.001	0.355	0.002	Accept	Relatively strong
DI H <sub>1</sub> : Digital inclusion improves social inclusion.	30.131	X2	<0.001	0.350	<0.001	Accept	Moderate	30.131	X2	<0.001	0.350	<0.001	Accept	Moderate

Table 4.9-1: Summary of test statistics

It was demonstrated that converting hedonic motivation from being an external variable to an internal variable and converting experience from being an internal variable to an external variable were statistically valid UTAUT2 modifications. The results demonstrated that awareness of UC, security and trust of the Internet and e-government were logical extensions to UTAUT2. The factors that influenced the behavioural intention to use digital public services varied based on whether there was a fall-back option to use traditional government administration channels or not. However, the factors determining the actual usage behaviour had no variance. Experience of using the Internet, facilitating conditions, behavioural intention and the habit of using e-government were the most significant e-government factors, respectively. Furthermore, the chapter gave a snapshot of what citizens thought of the social impact of digital inclusion. 40.2% of the participants thought digital inclusion improved their social inclusion. The results were reliable and valid as demonstrated by Cronbach's Alpha, the response rate and response rate bias. However, because convenience sampling was used, the findings could not be generalised but provided insights into e-government dynamics in deprived communities. Subsequently, the chapter revisited literature gaps in Chapter 2.

A Modified UTAUT2 (M-UTAUT2), an e-government adoption process, the effects of the changing global digital technology market on e-government strategies and the impact of proxy use when researching digital inclusion were discussed. The next chapter spells out the academic and managerial impacts of the thesis and provides the concluding remarks.

## **Chapter 5: Contribution and conclusion**

This chapter brings the thesis to a close by outlining the theoretical contributions made. The contributions are followed by a reflection on the research limitations and the recommended themes for future research. The managerial implications of the study are outlined before concluding the study.

### **5.1 Theoretical contribution**

#### **5.1.1 E-government adoption process**

In the literature, one of the factors that is discussed that influences the adoption of e-government is Habit. However, for a habit to form there must be continuous usage. E-government literature is short of the discourse on factors influencing ongoing usage (habit). Remember one of the four indicators used to derive the Digital Public Services scoreboard for EU member states is the number of e-government users (European Commission, 2016). Therefore, habitual use of e-government becomes critical to the success of e-government initiatives and thus must be addressed when discussing e-government adoption. Based on the thesis findings of the factors that influence e-government adoption and the qualitative and quantitative researches conducted in the previous DBA documents (Chirara, 2014; Chirara, 2015), the thesis proposed an e-government adoption process depicted in Figure 4.8-2 and explained in 4.8.2. The model can be applied to other e-government studies because the adoption lifecycle is constant, however, what might vary are the activities in each process that can be affected by the socio-economic and Internet infrastructural context. The adoption process includes a formative process and a habitual process. The strength of the factors pertinent to each process varies. Therefore academics, policymakers and practitioners must consider these points when discussing and formulating e-government strategies. The thesis also contributed to IS literature by adapting UTAUT2.

#### **5.1.2 M-UTAUT2: UTAUT2 adaptations incorporating thesis findings**

The thesis modified UTAUT2, following other studies that have done so to suit different contexts (e.g., Hassan and Murad, 2014; Babullah, Dwivedi and Williams, 2015; Randle and Kekwaletswe, 2015). The outcome is the Modified UTAUT2 (M-UTAUT2) shown in Figure 4.8-1. M-UTAUT2 is suitable for use outside the case study if it is a consumer setting. The idea of adapting UTAUT2 for different contexts was openly recommended by the model's creators (Venkatesh, Thong and Xu, 2012). The thesis further incorporated components that reflect the broader goal of e-government to improve social inclusion through digital inclusion. The rationale for the inclusion is to counter the criticism that e-government literature only focuses

on technical issues (Alghamdi, Goodwin and Rampersad, 2011). In the context where digital technology is advancing quickly, it is becoming difficult to have a robust ‘all-encompassing’ theoretical model because of very fluid contexts. UTAUT2 has not been used to analyse the provision of digital public services such as UC. Therefore, the thesis advances our understanding of UTAUT2 in this context. Another contribution relates to the recognition of the effects of the changing global digital technology market on e-government.

### **5.1.3 The global digital technology market – an e-government actor easy to overlook**

In section 4.8.2.4, the thesis demonstrated that the e-government literature clearly identifies two e-government actors, the government and the citizens. The researcher further argued that today, the global digital technology market is emerging as an e-government actor that can no longer be taken for granted. Citizens’ behaviour towards technology and subsequent service delivery expectations are being influenced by digital technology capabilities and marketing campaigns, especially from the private sector. This trend has an impact on the citizens’ service expectations from public sector organisations. Therefore, governments are sometimes playing ‘catch up’ to provide public services in a way that parallels the private sector. This makes the global digital technology market a significant actor in determining the success of government administration through e-government. Schon (2003) argued that reflection-in-action allows practitioners to arrive at a new theory of the phenomena by articulating their feelings about it. Moon (2006) explained that the process of learning brings to bear relevant prior knowledge and experience. Therefore, the knowledge from e-government literature and the experience from being an ICT practitioner led to arguing that the global digital technology market is now an actor of recognizing in e-government adoption. Therefore, e-government researchers, policymakers and practitioners should constantly look out for the global digital technology market trends in anticipation of citizens’ service expectations in government administration. Albeit, the thesis has some limitations worth highlighted.

## **5.2 Research limitations and themes for further research**

The research limitations are reported, firstly, about the participants and secondly, the measurement and data analysis. Concerning the participants, firstly, the usage behaviour is self-reported and is therefore based on the participants providing honest responses. Secondly, the population data from NCH was based on registered tenants at the beginning of the social housing contract, which thereafter was not updated. Therefore, the actual population demographics might be slightly different from the reported. Thirdly, it was observed that some tenants who were elderly and digitally excluded refused to complete the questionnaire, advising

they did not use the Internet directly (without qualifying whether there was proxy use). This was a lost opportunity to know the reasons for digital exclusion; however, the ones that participated gave sufficient insight into usage behaviours among the elderly. Finally, convenience sampling was used, and it does not lend itself to generalising the findings to a global setting.

The second set of limitations relates to measurement and data analysis. At the time of data collection, only Job Seekers' Allowance had been rolled out in Nottingham. The rest of the benefits were planned for rollout during the year. Therefore, the questions mainly teased out behavioural intention to use UC. There are recommendations for future research.

The thesis demonstrated that UC awareness was low, which potentially impacts the speed of e-government adoption. The low awareness represented a gap in e-government readiness. Therefore, future research could investigate e-government readiness of citizens for future digital public services. Such research would fall under the formative process of the e-government adopt process in Figure 4.8-2. There is another recommendation for future studies.

After UC has been rolled out in Nottingham, future research could test the validity of the e-government adoption process, now focusing on the factors influencing the continued use of e-government (habitual process). It will also be useful to find out if the process is applicable in other digital technology services adoption contexts outside e-government. Another recommendation for further research relates to M-UTAUT2.

Future research could also test the proposed M-UTAUT2 in other settings similar or dissimilar to the case study. Additionally, it has been discussed that the Internet proxy use was more common among males aged 45 and over who did not have hedonic motivation. It was also suggested that the remedy for improving direct Internet use, and subsequently e-government use, is related to Internet access, training or computer anxiety. Therefore, future research on e-government and general digital inclusion could include checks on reasons for proxy use, which would help further our understanding on the digital inclusion barriers for this set of users and help practitioners administer the correct remedies.

In addition to the academic contributions discussed above, the research has some managerial implications, which are discussed in the next section.

### **5.3 Managerial implications**

One of the primary objectives of a professional doctorate is to advance managerial practices. Therefore, this section outlines how the thesis findings can be applied to managerial practice.

#### **5.3.1 E-government factors**

The research aimed to find the factors influencing citizens to adopt e-government. The thesis used a case study of UC and surprisingly, a staggering 61.3% of benefits claimants were unaware of UC introduction in Nottingham. This represents a lack of readiness for the service and calls for improving the awareness methods used for new digital public services. Understanding the barriers to e-government adoption from the citizens' perspective helps formulate effective strategies with avoidable pitfalls, which the UK government has realised with UC.

Between registering for UC payments, providing documentary evidence and getting the first payment, there is a six-week waiting period (soon to be reduced to five-weeks). Although there is a credit 'advance payment' that the government can give while awaiting the UC payment, this can trigger spiralling into debt and subsequently lead to social exclusion. A UK Conservative Party Member of Parliament (MP) commented that the gap in payments was unacceptable, arguing that a "cavalier attitude that the poorest can muddle through is callous at best and downright cruel at worst" (BBC 2017, p.1). Commenting on the UC system, the Archbishop of York, Dr Sentamu, praised the rationale behind the UC system. However, pointed that it assumed poor citizens had an 'egg nest' to rely on while they waited for six-weeks, which he described as "grotesquely ignorant" (BBC 2017a, p.1). These comments came in the wake of an outcry by citizens to MPs about the six-weeks waiting period and the 55p per minute telephone call charge to the UC helpline. Subsequently, the UK Prime Minister, Theresa May, agreed the complaints were sensible and decided to scrap the telephone call charge (BBC, 2017b) and to reduce the UC waiting period to five-weeks (The Guardian, 2017). Early citizens' engagement could have avoided this. The six-weeks waiting period is antagonistic with facilitating conditions (FC) and that the 55p per minute call charge negatively influences the price value (PV) perceptions. Therefore, the thesis determined the significant factors influencing citizens' adoption of e-government.

The thesis determined the significant factors influencing the adoption of e-government when a public service is delivered exclusively online (UC) and when there is an option to use traditional channels (NCH Web services). It is also important to remember that for UC, the government offers 'Assisted Digital' under the DbyD strategy. However, the transaction still

must be completed online with assistance from someone (proxy use). Of the external variables tested in this study, the most significant factors influencing the behavioural intention to adopt UC are trust in e-government, followed by the effort citizens perceive is needed to learn and use it then the benefits derived from using it. However, if the public service is not exclusively delivered online and there are other options for accessing it (e.g., some NCH services), then hedonic motivation becomes the most significant predictor. In both instances, this was followed by the effort expended to learn and use the service, then the improved performance benefits and the social influence that comes from significant others to use the digital public service. Contrary to studies by Venkatesh, Thong and Xu (2012) and considering the participants were drawn from a deprived community, price value was not a major factor for citizens' intention to adopt e-government. However, these were just intentions that may or may not result in the actual usage.

Whether the governmental service is exclusively delivered online or has a fall-back to traditional service channels, actual usage is influenced by experience of using the Internet, then the facilitating conditions in place, the behavioural intention and finally the habit that may have formed as citizens use digital public services by default (DbyD). These factors can be mapped to different stages of the e-government adoption process to suitably focus the activities of addressing them to improve social inclusion.

### **5.3.2 Using the e-government adoption process for tailored addressing of e-government barriers**

Policy makers and practitioners can use the e-government adoption process in Figure 4.8-2 to formulate effective e-government adoption strategies, depending on what stage the digital public service is at, in terms of its diffusion in the society. The initial stages of introducing a new digital public service must be characterised by massive publicity campaigns while assisting citizens to acquire the necessary skills to use the innovation. Such campaigns allow users to evaluate the effort needed to use the innovation and the expected usage benefits. Additionally, efforts must be made to assure citizens that the digital public service is secure and educate them on security in the information society. These lead to increased trust, which is the strongest determinant of e-government behavioural intention to use.

When citizens start using e-government, there must be safeguards to ensure citizens continue using the digital public service. This is achieved by ensuring that citizens have the support and resources needed to continue using the digital public service. Without this support, the digital public service will die a natural death, which contradicts the goal of improving social inclusion

through digital inclusion. Another managerial implication pertains to training and development.

### **5.3.3 Deskilled: the consequence of the changing global digital technology market**

The thesis has highlighted that the global digital technology market is an underestimated e-government actor that drives and influences digital public services provision. Other actors identified are the government and the citizens. This new actor implies that practitioners can easily be deskilled over time if they do not keep up with the pace with which digital technology is developing. This makes the practitioners inefficient in formulating current digital public services strategies. Moreover, with the DbyD strategy, computer and digital literacy should be at the forefront of civil servants' competencies. Arguing the issue of technical skills, Mendoza (2009, p.113) argued that,

Together, business and IS should continually adapt to the competitive environment that require integration of various types and levels of expertise.

Therefore, to remain efficient in delivering public services and be able to meet citizens' complex requirements influenced by the dynamic global digital landscape, civil servants must appreciate and use digital technology. This ability empowers them to provide excellent digital public services. Thus, investing time to attend digital technology seminars, workshops and some relevant forms of digital technology training becomes paramount to gain knowledge of the direction of digital technology developments and anticipate citizens' services demands. To bring the thesis to a close, a conclusion of the whole research now follows.



## 5.4 Conclusion

The following objectives were set out at the onset: firstly, to understand the significant factors driving citizens in the north of Nottingham to use e-government or otherwise; secondly, to determine how aware citizens from the north of Nottingham are of the Universal Credit (UC) rollout in Nottingham. UC is a UK government's Social Welfare Reform where social welfare benefits are claimed online (Gov UK, 2016). It presents a paradox for the government, where it is supposed to provide services to all citizens, which is most challenging to achieve electronically when some citizens expected to use the service are offline, yet transformational to government administration when achieved. According to the European Commission (2016), successful e-government is measured using four indicators, one of which is the number of e-government users. This means that successful e-government is when citizens use digital public services rolled out by governments. Therefore, as an Information and Communication Technologies (ICT) practitioner, the thesis was motivated by five reasons related to social justice for digitally excluded citizens, improving professional practice and advancing e-government academic literature.

E-government is not the end goal in public administration, but a means to better government administration. When the government takes this viewpoint, it allows itself to consider the social impact of e-government initiatives and not only be driven by cost savings for the government. Nonetheless, e-government contributes to the broader goal of improving social inclusion through digital inclusion. In this study, 40.2% of the participants thought digital inclusion improved social life, while 30.9% were indifferent. The former percentage was anticipated to be higher. However, it is a decent foundation for e-government initiatives. Let us now highlight the findings on the e-government factors.

The research adopted the positivist paradigm to understand the e-government factors and utilised an adapted Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model, which was further enhanced to the Modified UTAUT2 (M-UTAUT) with additional constructs, following data analysis. The research took the approach of first assessing the factors influencing e-government utilisation using Nottingham City Homes (NCH) Web services using a face-to-face pre-coded questionnaire. NCH manages 29,000 social services homes in Nottingham on behalf of Nottingham City Council (NCC). The decision to research NCH Web services was meant to find some benchmark of the current e-government factors before tenants started claiming social welfare benefits through UC payment system. NCH Web services

conveniently provided an opportunity to research digital services that were already familiar to tenants. Hence, the researcher did not need to explain how e-government service worked.

The second part of the approach assessed citizens' intention to use UC, which is one of the digital public services that came out of the UK government's Digital by Default (DbyD) strategy. The strategy requires that citizens access public services online (Cabinet Office, 2013). Researching UC allowed making comparisons between a central government online service (UC) and a local government online service (NCH Web services). The comparison shed light on the possible adoption behaviour of UC by citizens claiming social welfare benefits. Knowing the adoption behaviours helps NCC and NCH to formulate strategies that ensure that citizens can continue accessing benefits despite the access channel changing to online to avoid reinforcing a virtuous cycle of social exclusion. Let us first highlight the factors influencing UC adoption.

The results Table 4.9-1 shows that the most significant factors influencing the behavioural intention to use UC were trust (TR) in e-government, followed by the effort citizens perceived was needed to learn and use the service (EE), then the benefits derived from using the service online (PE) and the habitual (HB) use of digital public services. UC is an exclusively online service. However, other digital public services allow falling back to use traditional channels, where the significant factors influencing e-government adoption are slightly different.

For some NCH Web services that have a fall-back to traditional channels, hedonic motivation (HM) was the most significant determinant of behavioural intention to use e-government. This was followed by the performance gains achieved from using the digital public service (PE), the effort expended to learn to use the digital public service (EE), and then the social influence (SI) that came from significant others. Contrary to Venkatesh, Thong and Xu's (2012) study, and considering that the participants were drawn from a deprived community, price value (PV) was not a significant factor for adopting e-government. The lack of correlation can be explained by the fact that in the UK deprived citizens receive social welfare benefits and that there are abundant free Internet hotspots. So far, the factors discussed relate to behavioural intention, which should transition to usage behaviour.

Regardless, of whether the public service is exclusively delivered online or has a fall-back offline channel, actual usage was influenced by the experience (EX) of using the Internet, then the facilitating conditions (FC) in place, then the behavioural intention (BI) and finally the habit (HB) of using online services.

The second objective of the thesis was determining the awareness of UC amongst the participants. 45.1% of the participants received social welfare benefits. Disturbingly, of these, 61.3% were unaware of the introduction of UC in Nottingham. This represents a lack of readiness for UC and could have serious socio-economic consequences for citizens who fail to claim their benefits via UC. Therefore, more publicity campaigns using a wide range of marketing channels are needed if UC adoption is to be successful. One of the fundamental changes brought by UC is that housing benefits are no longer paid directly to social housing landlords but to the benefits claimants. Coupled with the six-week waiting period before the first payment (soon to be revised to five-weeks), there is a risk of rent arrears that can lead to eviction, hence spiral into debt, thus reinforcing social exclusion. These findings led to some theoretical contributions from the thesis.

The most significant contribution of the thesis to the government, policymakers and practitioners is the 'e-government adoption process' depicted in Figure 4.8-2. The process is premised on the argument that for e-government to be successful it must not be viewed as an event, but as a process. The adoption process is divided into two, the formative process and the habitual process. The formative process captures the initial activities in e-government adoption, and these are divided into two stages (awareness and initial use stages). Past this point, the habitual process takes effect, and it has one stage (continued use). The model allows academics, policymakers and practitioners to focus e-government activities based on the development stage of the digital public service. The factors that sustain the formative process are different from those that sustain the habitual process. The next contribution relates to e-government factors.

The second contribution is the revision of UTAUT2 constructs. This revision of UTAUT2 for different contexts was recommended openly by the model's creators (Venkatesh, Thong and Xu, 2012). Therefore, the thesis added awareness, security and trust as external variables. Experience was changed from an internal variable to an external variable due to its close association with habit (an external variable). Experience became the strongest predictor of e-government usage behaviour. Hedonic motivation tested as an internal variable and not an external variable. Also, the model now reflects the broader goal of social inclusion through digital inclusion by adding overlapping rings for the two constructs. Additionally, the moderating effect of the internal variables was weak or non-existent in some cases, mirroring findings by Haider, Chen and Lalani (2016). This is not the only study that dropped or added constructs to UTAUT2. The modifications suggest that while UTAUT2 is mature and widely

applied elsewhere, it can be improved. The changes led to a Modified UTAUT2 (M-UTAUT2) depicted in Figure 4.8-1. The model can be used outside the case study if it is a consumer setting. There is another contribution that acknowledges the disruptive nature of the Internet.

The third contribution looks at the e-government actors. Besides the government and citizens being the actors in e-government, the thesis proposed that the global digital market is a new actor that must be acknowledged in e-government literature. The global digital technology market, to a large degree, directly or indirectly influences the direction of e-government. This requires that civil servants at all levels must be digitally competent be able to quickly respond to the changing citizens' service delivery demands caused by the changing digital inclusion landscape. Therefore, governments must invest in digital training and development regularly.

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## Appendix A: Questionnaire

### SURVEY ON THE USE OF THE INTERNET IN YOUR DAILY LIFE

#### SECTION A

Please put a cross (X) in the appropriate box.

Internet use	Yes	No
USE_A1. Have you used the Internet in the last seven days?	<input type="checkbox"/> Y	<input type="checkbox"/> N
USE_A2. Have you asked someone to use the Internet for you in the last seven days?	<input type="checkbox"/> Y	<input type="checkbox"/> N

Please put a cross (X) in the appropriate box, where: **1**=Strongly disagree, **2**=Disagree, **3**=Neither disagree nor agree, **4**=Agree, **5**=Strongly agree

Internet usage profile	1	2	3	4	5
SINC_A1. Using the Internet has improved my social life.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PE_A1. Using the Nottingham City Homes website would make it quicker to access services.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
EE_A1. I would be comfortable accessing services via the Nottingham City Homes website on my own.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
SI_A1. People who are important to me think that I should use the Nottingham City Homes website to access services.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
FC_A1. I have the resources necessary to use the Internet.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
HM_A1. Accessing services via the Nottingham City Homes website is fun.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PV_A1. The price I pay for Internet access is reasonable for the benefits I get.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
BI_A1. I intend to use services on the Nottingham City Homes website.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
EXP_A1. I have a lot of experience of using the Internet.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
EXP_A2. Overall, my experience of using the Internet has been positive.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
TRi_A1. I trust that the personal information I provide on the Internet will not be misused.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
SE_A1. I believe that unauthorised people will not be able to access my personal information provided via the Internet.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

AW_A1. I am aware that from April 2017 new benefits claims (or amendments to existing benefits) in Nottingham will be made through the Internet. (Y = Yes, N = No)	<input type="checkbox"/> Y	<input type="checkbox"/> N
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BEN_A1. Do you receive any benefits? (Y = Yes, N = No)	<input type="checkbox"/> Y	<input type="checkbox"/> N
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If you answered  Y GO TO SECTION B if you answered  N GO TO SECTION C.

**PLEASE TURN OVER FOR SECTIONS B AND C**

## SECTION B

Please put a cross (X) in the appropriate box, where: 1=Strongly disagree, 2=Disagree, 3=Neither disagree nor agree, 4=Agree, 5=Strongly agree

<b>Claiming benefits via the Internet</b>					
<b>PE_B1.</b> Claiming benefits via the Internet would be easier.	1	2	3	4	5
<b>EE_B1.</b> Learning to claim benefits via the Internet would be easy for me.	1	2	3	4	5
<b>SI_B1.</b> People who are important to me think that I should use the Internet to claim benefits.	1	2	3	4	5
<b>FC_B1.</b> I can get help from others should I have difficulties claiming benefits via the Internet.	1	2	3	4	5
<b>HM_B1.</b> Claiming benefits via the Internet would be fun.	1	2	3	4	5
<b>HB_B1.</b> Claiming benefits via the Internet would become a habit for me.	1	2	3	4	5
<b>BI_B1.</b> I intend to use the Internet to claim benefits.					
<b>TRe_B1.</b> I trust claiming benefits through the Internet.	1	2	3	4	5
<b>SE_B1.</b> I believe that the personal information I provide on the Internet to claim benefits will be treated with privacy.	1	2	3	4	5
<b>SE_B2.</b> I believe that unauthorised people will not be able to access my personal information provided while claiming benefits via the Internet.	1	2	3	4	5
<b>SE_B3.</b> I believe that the personal information I provide on the Internet to claim benefits will not be lost.	1	2	3	4	5

## SECTION C

Please put a cross (X) in the appropriate box.

<b>About you</b>	5.4.1	5.4.2
<b>EMP_C1.</b> Are you in paid employment? (Y = Yes, N = No)	<input type="checkbox"/> Y	<input type="checkbox"/> N
<b>GEN_C1.</b> What is your gender?	<input type="checkbox"/> Male, <input type="checkbox"/> Female, <input type="checkbox"/> Non-binary, <input type="checkbox"/> Prefer not to say	
<b>AGE_C1.</b> What is your age group?	<input type="checkbox"/> 18-24, <input type="checkbox"/> 25-44, <input type="checkbox"/> 45-64, <input type="checkbox"/> 65-79, <input type="checkbox"/> 80+	

**Thank you for taking the time to complete this survey.**

## Appendix B: Test statistics for Hedonic motivation (HM) as an internal variable

Hedonic motivation (HM) moderated effort expectancy (EE).

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to claim benefits online * It would be easy to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun claiming benefits online						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.531	.100	4.916	.000
N of Valid Cases			49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.530	.167	3.377	.001
N of Valid Cases			15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.446	.149	2.985	.003
N of Valid Cases			28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.488	.201	2.030	.042
N of Valid Cases			12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	1.000	.000	2.301	.021
N of Valid Cases			7			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Hedonic motivation (HM) moderated trust of e-government (TRe) measured using the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to claim benefits online * I trust claiming benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun claiming benefits online						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.472	.117	3.530	.000
N of Valid Cases			49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.776	.098	7.167	.000
N of Valid Cases			15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.768	.082	6.745	.000
N of Valid Cases			28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.701	.115	4.685	.000
N of Valid Cases			12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
N of Valid Cases			7			
Total	Ordinal by Ordinal	Kendall's tau-b	.711	.052	13.205	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because I trust claiming benefits online is a constant.

Examples where hedonic motivation did not moderate NCH Web services.

Hedonic motivation (HM) did not moderate the performance expectancy (PE) for the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to use NCH web services * It is quicker to access services via NCH website * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun accessing NCH web services						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.353	.089	3.595	.000
	N of Valid Cases		79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.515	.133	3.585	.000
	N of Valid Cases		31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.314	.085	3.595	.000
	N of Valid Cases		98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.433	.189	2.087	.037
	N of Valid Cases		24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.152	.293	.506	.613
	N of Valid Cases		14			
Total	Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Hedonic motivation (HM) did not moderate the facilitating conditions (FC) for the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to use NCH web services * I am comfortable accessing NCH website on my own * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun accessing NCH web services						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.388	.097	3.552	.000
N of Valid Cases			79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.217	.161	1.355	.176
N of Valid Cases			31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.195	.080	2.417	.016
N of Valid Cases			98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.390	.195	1.841	.066
N of Valid Cases			24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.098	.271	.360	.719
N of Valid Cases			14			
Total	Ordinal by Ordinal	Kendall's tau-b	.469	.045	10.342	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.



Hedonic motivation (HM) did not moderate the social influence (SI) for the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to use NCH web services * My colleagues think I should use NCH website * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun accessing NCH web services						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.351	.098	3.327	.001
N of Valid Cases			79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.288	.151	1.850	.064
N of Valid Cases			31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.240	.082	2.791	.005
N of Valid Cases			98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.566	.154	3.263	.001
N of Valid Cases			24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.016	.287	.056	.955
N of Valid Cases			14			
Total	Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

**Appendix C: Test statistics for the moderating effects of internal variables**  
 Gender (GEN) had a negative correlation effect on citizens' Behavioural Intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	-.070	.058	-1.193	.233
N of Valid Cases		246			

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Age (AGE) had a negative correlation effect on citizens' Behavioural Intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age group * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	-.198	.050	-3.931	.000
N of Valid Cases		246			

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Gender (GEN) had a negative correlation effect on citizens' Behavioural Intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	-.177	.080	-2.193	.028
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Age (AGE) had a negative correlation effect on citizens' Behavioural Intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age group * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	-.238	.073	-3.206	.001
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

### Appendix D: Test statistics for the Experience (EXP)

The original UTAUT2 by Venkatesh, Tong and Xu (2012) models experience (EXP) as an internal variable that moderates external variables. However, in this research experience did not moderate any variables, and below are some example SPSS outputs showing two constructs each for NCH Web Services and two for the Universal Credit (UC) system.

Experience (EXP) did not moderate the performance expectancy (PE) for the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It is quicker to access services via NCH website * I intend to use NCH web services * Intermediate I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Intermediate I have experience of using the Internet						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.273	.115	2.246	.025
	N of Valid Cases		54			
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	-.190	.363	-.516	.606
	N of Valid Cases		8			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.781	.135	4.844	.000
	N of Valid Cases		11			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.229	.236	.927	.354
	N of Valid Cases		10			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.548	.205	2.487	.013
	N of Valid Cases		20			
Agree	Ordinal by Ordinal	Kendall's tau-b	.349	.202	1.659	.097
	N of Valid Cases		15			
Agree	Ordinal by Ordinal	Kendall's tau-b	.257	.144	1.754	.079
	N of Valid Cases		37			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.336	.219	1.481	.139
	N of Valid Cases		25			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.557	.071	7.600	.000
	N of Valid Cases		66			
Total	Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Experience (EXP) did not moderate the social influence for the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should use NCH website * I intend to use NCH web services * Intermediate I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>Intermediate I have experience of using the Internet</b>						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.454	.100	3.651	.000
	N of Valid Cases		54			
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.200	.423	.478	.633
	N of Valid Cases		8			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.805	.064	7.036	.000
	N of Valid Cases		11			
Disagree	Ordinal by Ordinal	Kendall's tau-b	-.348	.197	-1.627	.104
	N of Valid Cases		10			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.267	.204	1.290	.197
	N of Valid Cases		20			
Agree	Ordinal by Ordinal	Kendall's tau-b	.506	.162	3.003	.003
	N of Valid Cases		15			
Agree	Ordinal by Ordinal	Kendall's tau-b	.493	.114	4.241	.000
	N of Valid Cases		37			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.363	.192	1.695	.090
	N of Valid Cases		25			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.498	.078	5.883	.000
	N of Valid Cases		66			
Total	Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Experience (EXP) did not moderate the effort expectancy for the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * Intermediate I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%



**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>Intermediate I have experience of using the Internet</b>						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.774	.133	2.148	.032
	N of Valid Cases		20			
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.273	.375	.707	.480
	N of Valid Cases		6			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.000	.461	.000	1.000
	N of Valid Cases		7			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.240	.301	.802	.423
	N of Valid Cases		6			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.334	.260	1.177	.239
	N of Valid Cases		8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.920	.074	6.025	.000
	N of Valid Cases		6			
Agree	Ordinal by Ordinal	Kendall's tau-b	.729	.110	6.479	.000
	N of Valid Cases		20			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.518	.206	1.846	.065
	N of Valid Cases		10			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.390	.176	2.173	.030
	N of Valid Cases		28			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Experience did not moderate the facilitating conditions for the behavioural intention to use the Universal Credit system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Should I get difficulties claiming benefits online, I can get help from others * I intend to claim benefits online * Intermediate I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>Intermediate I have experience of using the Internet</b>						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.325	.189	1.576	.115
	N of Valid Cases		20			
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.603	.317	1.604	.109
	N of Valid Cases		6			
Disagree	Ordinal by Ordinal	Kendall's tau-b	-.149	.326	-.450	.652
	N of Valid Cases		7			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.417	.268	1.369	.171
	N of Valid Cases		6			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.275	.355	.739	.460
	N of Valid Cases		8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.320	.203	1.477	.140
	N of Valid Cases		6			
Agree	Ordinal by Ordinal	Kendall's tau-b	.323	.120	2.598	.009
	N of Valid Cases		20			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.889	.073	20.656	.000
	N of Valid Cases		10			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.342	.175	1.980	.048
	N of Valid Cases		28			
Total	Ordinal by Ordinal	Kendall's tau-b	.430	.071	5.920	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix D1: Test statistics for Experience (EXP) as a determinant for Behavioural Intention (BI) - (EXPb H<sub>1</sub>):

In section 4.5.1, it was hypothesised that,

EXPb H<sub>1</sub>: Experience, moderated by age, gender and hedonic motivation, influences BI to use NCH Web services or the Universal Credit system.

Below are the test statistics for NCH Web services for EXPb H<sub>1</sub>:

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have experience of using the Internet * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

Symmetric Measures					
		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.369	.045	8.222	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Below are the test statistics for the Universal Credit (UC) for EXPb H<sub>1</sub>:

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have experience of using the Internet * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

	Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal Kendall's tau-b	.372	.067	5.541	.000
N of Valid Cases	111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix D2: Test statistics for Experience (EXP) as a determinant for Usage Behaviour (UB) - (EXPu H<sub>1</sub>):

In section 4.5.1, it was hypothesised that,

EXPu H<sub>1</sub>: Experience, moderated by age, gender and hedonic motivation, influences citizens' usage behaviour of NCH Web services or the Universal Credit system.

Below are the test statistics for NCH Web services for EXPu H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have experience of using the Internet * Digital citizenship	246	100.0%	0	0.0%	246	100.0%

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	81.832 <sup>a</sup>	4	.000
Likelihood Ratio	73.473	4	.000
Linear-by-Linear Association	61.612	1	.000
N of Valid Cases	246		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.82.

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.577			.000
	Cramer's V	.577			.000
Interval by Interval	Pearson's R	.501	.055	9.054	.000 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.471	.054	8.346	.000 <sup>c</sup>
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Below are the test statistics for the Universal Credit (UC) for EXPu H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have experience of using the Internet * Digital citizenship	111	100.0%	0	0.0%	111	100.0%

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.923 <sup>a</sup>	4	.000
Likelihood Ratio	24.907	4	.000
Linear-by-Linear Association	14.863	1	.000
N of Valid Cases	111		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.30.

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.474			.000
	Cramer's V	.474			.000
Interval by Interval	Pearson's R	.368	.089	4.127	.000 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.370	.082	4.154	.000 <sup>c</sup>
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

## Appendix E: Test statistics for Awareness (AW) as a determinant of Behavioural Intention (BI) - (AW H<sub>1</sub>):

In section 2.5.2.2, it was hypothesised that,

AW H<sub>1</sub>: Awareness of the Universal Credit system, moderated by age and experience, influences citizens' behavioural intention (BI) to use it.

Below are the test statistics for the Universal Credit (UC) for AW H<sub>1</sub>:

### I know about accessing benefits online (Universal Credit) \* I intend to claim benefits online

#### Crosstabulation

			I intend to claim benefits online					Total
			Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	
I know about accessing benefits online (Universal Credit)	No	Count	17	12	22	12	5	68
		% within I know about accessing benefits online (Universal Credit)	25.0%	17.6%	32.4%	17.6%	7.4%	100.0%
		% of Total	15.3%	10.8%	19.8%	10.8%	4.5%	61.3%
	Yes	Count	17	3	7	6	10	43
		% within I know about accessing benefits online (Universal Credit)	39.5%	7.0%	16.3%	14.0%	23.3%	100.0%
		% of Total	15.3%	2.7%	6.3%	5.4%	9.0%	38.7%
Total		Count	34	15	29	18	15	111
		% within I know about accessing benefits online (Universal Credit)	30.6%	13.5%	26.1%	16.2%	13.5%	100.0%
		% of Total	30.6%	13.5%	26.1%	16.2%	13.5%	100.0%



**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.793 <sup>a</sup>	4	.019
Likelihood Ratio	11.989	4	.017
Linear-by-Linear Association	.125	1	.723
N of Valid Cases	111		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.81.

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.326			.019
	Cramer's V	.326			.019
Interval by Interval	Pearson's R	.034	.101	.353	.725 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.017	.103	.177	.860 <sup>c</sup>
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

## Appendix F: Test statistics for Security (SE) as a determinant of Behavioural Intention - (SE H<sub>1</sub>)

In section 2.5.3.1, it was hypothesised that,

SE H<sub>1</sub>: Security concerns, moderated by age, experience and hedonic motivation, influence citizens' BI to use NCH Web services or the Universal Credit system.

Below are the test statistics for NCH Web services for SE H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to use NCH web services * I believe unauthorised poeople will not be able to access my online personal information	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.349	.047	7.351	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Below are the test statistics for the Universal Credit (UC) system for SE H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to claim benefits online * I believe Universal Credit is secure	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.443	.074	5.963	.000
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix G: Test statistics for Trust of the Internet (TRi) as a determinant of Behavioural Intention (BI) - (TRi H<sub>1</sub>):

In section 4.5.4, it was hypothesised that,

TRi H<sub>1</sub>: Trust of the Internet, moderated by age, experience and hedonic motivation, influences citizens' BI to use NCH Web services.

TRe H<sub>1</sub>: Trust in e-government, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Universal Credit system.

Below are the test statistics for NCH Web services for TRi H<sub>1</sub>:

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to use NCH web services * I trust my online personal details will not be misused	246	100.0%	0	0.0%	246	100.0%

### Symmetric Measures

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.359	.049	7.257	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Gender (GEN) did not moderate the correlation between Trust of the Internet (TRi) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust my online personal details will not be misused * I intend to use NCH web services * Gender	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.344	.078	4.377	.000
	N of Valid Cases		88			
Female	Ordinal by Ordinal	Kendall's tau-b	.385	.063	6.001	.000
	N of Valid Cases		154			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	-.183	.542	-.333	.739
	N of Valid Cases		4			
Total	Ordinal by Ordinal	Kendall's tau-b	.359	.049	7.257	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Age (AGE) did not moderate the correlation between Trust of the Internet (TRi) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust my online personal details will not be misused * I intend to use NCH web services * Age group	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.454	.147	2.918	.004
	N of Valid Cases		23			
25-44	Ordinal by Ordinal	Kendall's tau-b	.326	.090	3.585	.000
	N of Valid Cases		79			
45-64	Ordinal by Ordinal	Kendall's tau-b	.344	.092	3.710	.000
	N of Valid Cases		80			
65-79	Ordinal by Ordinal	Kendall's tau-b	.279	.104	2.621	.009
	N of Valid Cases		55			
80+	Ordinal by Ordinal	Kendall's tau-b	.500	.316	1.366	.172
	N of Valid Cases		9			
Total	Ordinal by Ordinal	Kendall's tau-b	.359	.049	7.257	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Experience (EX) did not moderate the correlation between Trust of the Internet (TRi) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust my online personal details will not be misused * I intend to use NCH web services * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.043	.108	.395	.693
	N of Valid Cases		62			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.394	.149	2.588	.010
	N of Valid Cases		21			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.421	.164	2.564	.010
	N of Valid Cases		20			
Agree	Ordinal by Ordinal	Kendall's tau-b	.221	.114	1.929	.054
	N of Valid Cases		52			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.184	.091	2.020	.043
	N of Valid Cases		91			
Total	Ordinal by Ordinal	Kendall's tau-b	.359	.049	7.257	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.



Hedonic motivation (HM) did not moderate the correlation between Trust of the Internet (TRi) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust my online personal details will not be misused * I intend to use NCH web services * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

It is fun accessing NCH web services			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.021	.099	.208	.835
N of Valid Cases			79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.160	.156	1.016	.309
N of Valid Cases			31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.098	.086	1.143	.253
N of Valid Cases			98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.254	.209	1.149	.250
N of Valid Cases			24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.277	.269	1.006	.314
N of Valid Cases			14			
Total	Ordinal by Ordinal	Kendall's tau-b	.359	.049	7.257	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix G1: Test statistics for Trust in e-government (TRe) as a determinant of Behavioural Intention (BI) - (TRe H<sub>1</sub>.)

In section 4.5.4, it was hypothesised that,

TRe H<sub>1</sub>: Trust in e-government, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Universal Credit system.

Below are the test statistics for the Universal Credit (UC) system for TRe H<sub>1</sub>:

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust claiming benefits online * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

### Symmetric Measures

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.711	.052	13.205	.000
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Gender (GEN) moderated the correlation between Trust of e-government (TRe) and the behavioural intention (BI) to use the Universal Credit (UC) system.

#### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust claiming benefits online * I intend to claim benefits online * Gender	111	100.0%	0	0.0%	111	100.0%

#### Symmetric Measures

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.568	.123	4.605	.000
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.785	.045	15.413	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.816	.167	2.449	.014
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.711	.052	13.205	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Age (AGE) moderated the correlation between Trust of e-government (TRe) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust claiming benefits online * I intend to claim benefits online * Age group	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.857	.093	6.438	.000
N of Valid Cases			7			
25-44	Ordinal by Ordinal	Kendall's tau-b	.680	.094	7.179	.000
N of Valid Cases			48			
45-64	Ordinal by Ordinal	Kendall's tau-b	.719	.066	9.545	.000
N of Valid Cases			43			
65-79	Ordinal by Ordinal	Kendall's tau-b	.683	.197	3.397	.001
N of Valid Cases			12			
80+	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
N of Valid Cases			1			
Total	Ordinal by Ordinal	Kendall's tau-b	.711	.052	13.205	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because I trust claiming benefits online and I intend to claim benefits online are constants.

Because of the partial correlation, Experience (EXP) did not moderate the correlation between Trust of e-government (TRe) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust claiming benefits online * I intend to claim benefits online * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.453	.189	2.112	.035
	N of Valid Cases		26			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.361	.246	1.435	.151
	N of Valid Cases		13			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.533	.358	1.604	.109
	N of Valid Cases		8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.865	.052	14.762	.000
	N of Valid Cases		26			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.649	.109	5.955	.000
	N of Valid Cases		38			
Total	Ordinal by Ordinal	Kendall's tau-b	.711	.052	13.205	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Hedonic Motivation (HM) moderated the correlation between Trust of e-government (TRe) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I trust claiming benefits online * I intend to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%



**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.472	.117	3.530	.000
	N of Valid Cases		49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.776	.098	7.167	.000
	N of Valid Cases		15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.768	.082	6.745	.000
	N of Valid Cases		28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.701	.115	4.685	.000
	N of Valid Cases		12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
	N of Valid Cases		7			
Total	Ordinal by Ordinal	Kendall's tau-b	.711	.052	13.205	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because I trust claiming benefits online is a constant.

## Appendix H: Test statistics for Performance Expectancy (PE) as a determinant of Behavioural Intention (BI) - (PE H<sub>1</sub>):

In section 2.5.4, it was hypothesised that,

PE H<sub>1</sub>: There is a statistically significant correlation between PE and BI, moderated by age and gender, to use NCH Web services or the Universal Credit system.

Below are the test statistics for NCH Web services for PE H<sub>1</sub>:

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It is quicker to access services via NCH website * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

### Symmetric Measures

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Gender (GEN) moderated the correlation between Performance Expectancy and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It is quicker to access services via NCH website * I intend to use NCH web services * Gender	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.473	.080	5.821	.000
	N of Valid Cases		88			
Female	Ordinal by Ordinal	Kendall's tau-b	.511	.059	8.362	.000
	N of Valid Cases		154			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	1.000	.000		
	N of Valid Cases		4			
Total	Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Age (AGE) did not moderate the correlation between Performance Expectancy and the behavioural intention (BI) to use NCH Web services.

#### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It is quicker to access services via NCH website * I intend to use NCH web services * Age group	246	100.0%	0	0.0%	246	100.0%

#### Symmetric Measures

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.700	.120	4.733	.000
	N of Valid Cases		23			
25-44	Ordinal by Ordinal	Kendall's tau-b	.493	.085	5.655	.000
	N of Valid Cases		79			
45-64	Ordinal by Ordinal	Kendall's tau-b	.465	.080	5.699	.000
	N of Valid Cases		80			
65-79	Ordinal by Ordinal	Kendall's tau-b	.470	.100	4.451	.000
	N of Valid Cases		55			
80+	Ordinal by Ordinal	Kendall's tau-b	.351	.330	1.003	.316
	N of Valid Cases		9			
Total	Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Experience (EXP) did not moderate the correlation between Performance Expectancy and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It is quicker to access services via NCH website * I intend to use NCH web services * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.224	.116	1.931	.053
	N of Valid Cases		62			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.440	.153	2.704	.007
	N of Valid Cases		21			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.548	.205	2.487	.013
	N of Valid Cases		20			
Agree	Ordinal by Ordinal	Kendall's tau-b	.292	.116	2.486	.013
	N of Valid Cases		52			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.528	.072	6.857	.000
	N of Valid Cases		91			
Total	Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Performance Expectancy and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It is quicker to access services via NCH website * I intend to use NCH web services * It is fun claiming benefits online	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.508	.094	5.078	.000
	N of Valid Cases		49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.425	.204	1.902	.057
	N of Valid Cases		15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.625	.130	4.412	.000
	N of Valid Cases		28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.053	.250	.213	.832
	N of Valid Cases		13			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.791	.174	5.516	.000
	N of Valid Cases		8			
Not applicable	Ordinal by Ordinal	Kendall's tau-b	.490	.063	7.713	.000
	N of Valid Cases		133			
Total	Ordinal by Ordinal	Kendall's tau-b	.510	.046	10.751	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.



Below are the test statistics for Universal Credit (UC) for PE H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

	Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal Kendall's tau-b	.554	.065	8.465	.000
N of Valid Cases	111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Gender (GEN) moderated the correlation between Performance Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * Gender	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.390	.135	2.870	.004
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.644	.069	8.867	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.816	.167	2.449	.014
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.554	.065	8.465	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Age (AGE) did not moderate the correlation between Performance Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * Age group	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.364	.414	.890	.373
	N of Valid Cases		7			
25-44	Ordinal by Ordinal	Kendall's tau-b	.530	.106	5.066	.000
	N of Valid Cases		48			
45-64	Ordinal by Ordinal	Kendall's tau-b	.593	.084	6.811	.000
	N of Valid Cases		43			
65-79	Ordinal by Ordinal	Kendall's tau-b	.417	.227	1.852	.064
	N of Valid Cases		12			
80+	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
	N of Valid Cases		1			
Total	Ordinal by Ordinal	Kendall's tau-b	.554	.065	8.465	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because It would be easy to claim benefits online and I intend to claim benefits online are constants.

Because of the partial correlation, Experience (EXP) did not moderate the correlation between Performance Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.527	.181	2.279	.023
	N of Valid Cases		26			
Disagree	Ordinal by Ordinal	Kendall's tau-b	-.246	.252	-.975	.330
	N of Valid Cases		13			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.000	.409	.000	1.000
	N of Valid Cases		8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.652	.101	6.026	.000
	N of Valid Cases		26			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.498	.118	4.220	.000
	N of Valid Cases		38			
Total	Ordinal by Ordinal	Kendall's tau-b	.554	.065	8.465	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Performance Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.404	.127	3.022	.003
	N of Valid Cases		49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.702	.127	4.887	.000
	N of Valid Cases		15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.399	.144	2.725	.006
	N of Valid Cases		28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.061	.250	.243	.808
	N of Valid Cases		12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	1.000	.000	2.301	.021
	N of Valid Cases		7			
Total	Ordinal by Ordinal	Kendall's tau-b	.554	.065	8.465	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix I: Test statistics for Effort Expectancy (EE) as a determinant of Behavioural Intention (BI) - (EE H<sub>1</sub>):

Effort expectancy was hypothesised in section 2.5.5 as,

EE H<sub>1</sub>: EE, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.

Below are the test statistics for NCH Web services for EE H<sub>1</sub>:

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I am comfortable accessing NCH website on my own * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

Symmetric Measures					
		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.469	.045	10.342	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Gender (GEN) did not moderate the correlation between Effort Expectancy (EE) and the behavioural intention (BI) to use NCH Web services.

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I am comfortable accessing NCH website on my own * I intend to use NCH web services * Gender	246	100.0%	0	0.0%	246	100.0%



**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Gender	Ordinal by Ordinal	Kendall's tau-b	.528	.073	7.240	.000
	N of Valid Cases		88			
Female	Ordinal by Ordinal	Kendall's tau-b	.462	.058	8.031	.000
	N of Valid Cases		154			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	-.183	.542	-.333	.739
	N of Valid Cases		4			
Total	Ordinal by Ordinal	Kendall's tau-b	.469	.045	10.342	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Age (AGE) did not moderate the correlation between Effort Expectancy (EE) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I am comfortable accessing NCH website on my own * I intend to use NCH web services * Age group	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.394	.137	2.691	.007
N of Valid Cases			23			
25-44	Ordinal by Ordinal	Kendall's tau-b	.385	.089	4.257	.000
N of Valid Cases			79			
45-64	Ordinal by Ordinal	Kendall's tau-b	.502	.072	6.925	.000
N of Valid Cases			80			
65-79	Ordinal by Ordinal	Kendall's tau-b	.421	.113	3.678	.000
N of Valid Cases			55			
80+	Ordinal by Ordinal	Kendall's tau-b	.693	.250	1.769	.077
N of Valid Cases			9			
Total	Ordinal by Ordinal	Kendall's tau-b	.469	.045	10.342	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Experience (EE) did not moderate the correlation between Effort Expectancy (EE) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I am comfortable accessing NCH website on my own * I intend to use NCH web services * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.332	.122	2.570	.010
N of Valid Cases			62			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.068	.201	.339	.735
N of Valid Cases			21			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.434	.165	2.287	.022
N of Valid Cases			20			
Agree	Ordinal by Ordinal	Kendall's tau-b	.265	.114	2.226	.026
N of Valid Cases			52			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.281	.085	3.223	.001
N of Valid Cases			91			
Total	Ordinal by Ordinal	Kendall's tau-b	.469	.045	10.342	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Effort Expectancy (EE) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I am comfortable accessing NCH website on my own * I intend to use NCH web services * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun accessing NCH web services						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.388	.097	3.552	.000
N of Valid Cases			79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.217	.161	1.355	.176
N of Valid Cases			31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.195	.080	2.417	.016
N of Valid Cases			98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.390	.195	1.841	.066
N of Valid Cases			24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.098	.271	.360	.719
N of Valid Cases			14			
Total	Ordinal by Ordinal	Kendall's tau-b	.469	.045	10.342	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Below are the test statistics for the Universal Credit (UC) for EE H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Gender (GEN) moderated the correlation between Effort Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * Gender	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.561	.118	4.633	.000
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.657	.065	9.906	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.816	.167	2.449	.014
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Age (AGE) did not moderate the correlation between Effort Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * Age group	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.250	.342	.720	.471
	N of Valid Cases		7			
25-44	Ordinal by Ordinal	Kendall's tau-b	.562	.100	5.608	.000
	N of Valid Cases		48			
45-64	Ordinal by Ordinal	Kendall's tau-b	.632	.093	6.668	.000
	N of Valid Cases		43			
65-79	Ordinal by Ordinal	Kendall's tau-b	.817	.045	13.587	.000
	N of Valid Cases		12			
80+	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
	N of Valid Cases		1			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because It would be easy to claim benefits online and I intend to claim benefits online are constants.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Effort Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
I have experience of using the Internet						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.679	.138	3.225	.001
N of Valid Cases			26			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.081	.308	.263	.793
N of Valid Cases			13			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.334	.260	1.177	.239
N of Valid Cases			8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.754	.098	7.452	.000
N of Valid Cases			26			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.461	.137	3.344	.001
N of Valid Cases			38			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Hedonic Motivation (HM) moderated the correlation between Effort Expectancy and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
It would be easy to claim benefits online * I intend to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%



**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.531	.100	4.916	.000
N of Valid Cases			49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.530	.167	3.377	.001
N of Valid Cases			15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.446	.149	2.985	.003
N of Valid Cases			28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.488	.201	2.030	.042
N of Valid Cases			12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	1.000	.000	2.301	.021
N of Valid Cases			7			
Total	Ordinal by Ordinal	Kendall's tau-b	.597	.063	9.539	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix J: Test statistics for Social Influence (SI) as a determinant of Behavioural Intention (BI) - (SI H<sub>1</sub>):

In section 2.5.7, social influence was hypothesised as,

SI H<sub>1</sub>: SI, moderated by age, gender, experience and hedonic motivation, influences citizens' BI to use NCH Web services or the Universal Credit system.

Below are the test statistics for NCH Web services for SI H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should use NCH website * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Gender (GEN) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should use NCH website * I intend to use NCH web services * Gender	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.594	.061	9.130	.000
	N of Valid Cases		88			
Female	Ordinal by Ordinal	Kendall's tau-b	.450	.059	7.588	.000
	N of Valid Cases		154			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.548	.387	1.342	.180
	N of Valid Cases		4			
Total	Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Age (AGE) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should use NCH website * I intend to use NCH web services * Age group	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.377	.181	1.946	.052
	N of Valid Cases		23			
25-44	Ordinal by Ordinal	Kendall's tau-b	.506	.067	7.133	.000
	N of Valid Cases		79			
45-64	Ordinal by Ordinal	Kendall's tau-b	.463	.089	5.292	.000
	N of Valid Cases		80			
65-79	Ordinal by Ordinal	Kendall's tau-b	.534	.094	5.387	.000
	N of Valid Cases		55			
80+	Ordinal by Ordinal	Kendall's tau-b	.793	.131	3.239	.001
	N of Valid Cases		9			
Total	Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Experience (EXP) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use NCH Web services.

#### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should use NCH website * I intend to use NCH web services * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.428	.101	3.972	.000
N of Valid Cases			62			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.193	.195	.994	.320
N of Valid Cases			21			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.267	.204	1.290	.197
N of Valid Cases			20			
Agree	Ordinal by Ordinal	Kendall's tau-b	.488	.089	5.365	.000
N of Valid Cases			52			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.464	.074	5.643	.000
N of Valid Cases			91			
Total	Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of the partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should use NCH website * I intend to use NCH web services * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun accessing NCH web services						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.351	.098	3.327	.001
	N of Valid Cases		79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.288	.151	1.850	.064
	N of Valid Cases		31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.240	.082	2.791	.005
	N of Valid Cases		98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.566	.154	3.263	.001
	N of Valid Cases		24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.016	.287	.056	.955
	N of Valid Cases		14			
Total	Ordinal by Ordinal	Kendall's tau-b	.505	.044	11.394	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Below are the test statistics for the Universal Credit (UC) system for SI H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should claim benefits online * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.516	.073	6.968	.000
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should claim benefits online * I intend to claim benefits online * Gender	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.313	.154	2.032	.042
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.683	.064	9.998	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	-.816	.167	-2.449	.014
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.516	.073	6.968	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Age (AGE) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should claim benefits online * I intend to claim benefits online * Age group	111	100.0%	0	0.0%	111	100.0%



**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.946	.053	7.714	.000
N of Valid Cases			7			
25-44	Ordinal by Ordinal	Kendall's tau-b	.426	.116	3.657	.000
N of Valid Cases			48			
45-64	Ordinal by Ordinal	Kendall's tau-b	.582	.104	5.315	.000
N of Valid Cases			43			
65-79	Ordinal by Ordinal	Kendall's tau-b	.061	.296	.208	.836
N of Valid Cases			12			
80+	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
N of Valid Cases			1			
Total	Ordinal by Ordinal	Kendall's tau-b	.516	.073	6.968	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because My colleagues think I should claim benefits online and I intend to claim benefits online are constants.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should claim benefits online * I intend to claim benefits online * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
I have experience of using the Internet						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.429	.176	2.482	.013
N of Valid Cases			26			
Disagree	Ordinal by Ordinal	Kendall's tau-b	-.082	.290	-.284	.777
N of Valid Cases			13			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.287	.394	.758	.448
N of Valid Cases			8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.582	.106	4.912	.000
N of Valid Cases			26			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.457	.136	3.276	.001
N of Valid Cases			38			
Total	Ordinal by Ordinal	Kendall's tau-b	.516	.073	6.968	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Social Influence (SI) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
My colleagues think I should claim benefits online * I intend to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.419	.128	3.269	.001
N of Valid Cases			49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.304	.191	1.548	.122
N of Valid Cases			15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.541	.116	3.531	.000
N of Valid Cases			28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.101	.282	.359	.719
N of Valid Cases			12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.645	.286	1.728	.084
N of Valid Cases			7			
Total	Ordinal by Ordinal	Kendall's tau-b	.516	.073	6.968	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix K: Test statistics for Facilitating Conditions (FC) as a determinant of Behavioural Intention (BI) - (FCb H<sub>1</sub>):

Facilitating conditions were hypothesised in two ways in section 2.5.6 as,

FCb H<sub>1</sub>: FC, moderated by age, gender, experience and hedonic motivation, influence BI to use NCH Web services and the Universal Credit system.

Below are the test statistics for NCH Web services for FCb H<sub>1</sub>:

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.295	.052	5.633	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use NCH Web services.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * I intend to use NCH web services * Gender	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.363	.079	4.509	.000
	N of Valid Cases		88			
Female	Ordinal by Ordinal	Kendall's tau-b	.274	.067	4.051	.000
	N of Valid Cases		154			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.000	.577	.000	1.000
	N of Valid Cases		4			
Total	Ordinal by Ordinal	Kendall's tau-b	.295	.052	5.633	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Age (AGE) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * I intend to use NCH web services * Age group	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.365	.161	2.120	.034
	N of Valid Cases		23			
25-44	Ordinal by Ordinal	Kendall's tau-b	.094	.104	.901	.368
	N of Valid Cases		79			
45-64	Ordinal by Ordinal	Kendall's tau-b	.202	.097	2.085	.037
	N of Valid Cases		80			
65-79	Ordinal by Ordinal	Kendall's tau-b	.366	.098	3.624	.000
	N of Valid Cases		55			
80+	Ordinal by Ordinal	Kendall's tau-b	.839	.077	4.243	.000
	N of Valid Cases		9			
Total	Ordinal by Ordinal	Kendall's tau-b	.295	.052	5.633	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * I intend to use NCH web services * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
I have experience of using the Internet						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.157	.127	1.215	.225
N of Valid Cases			62			
Disagree	Ordinal by Ordinal	Kendall's tau-b	-.177	.224	-.782	.434
N of Valid Cases			21			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	-.436	.178	-2.368	.018
N of Valid Cases			20			
Agree	Ordinal by Ordinal	Kendall's tau-b	-.027	.133	-.207	.836
N of Valid Cases			52			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.086	.094	.909	.363
N of Valid Cases			91			
Total	Ordinal by Ordinal	Kendall's tau-b	.295	.052	5.633	.000
N of Valid Cases			246			

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * I intend to use NCH web services * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>It is fun accessing NCH web services</b>						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.197	.096	2.018	.044
N of Valid Cases			79			
Disagree	Ordinal by Ordinal	Kendall's tau-b	-.022	.156	-.141	.888
N of Valid Cases			31			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	-.023	.084	-.277	.781
N of Valid Cases			98			
Agree	Ordinal by Ordinal	Kendall's tau-b	.014	.235	.059	.953
N of Valid Cases			24			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.532	.174	2.045	.041
N of Valid Cases			14			
Total	Ordinal by Ordinal	Kendall's tau-b	.295	.052	5.633	.000
N of Valid Cases			246			

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Below are the test statistics for the Universal Credit (UC) system for FCb H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Should I get difficulties claiming benefits online, I can get help from others * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%



**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.430	.071	5.920	.000
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Should I get difficulties claiming benefits online, I can get help from others * I intend to claim benefits online *	111	100.0%	0	0.0%	111	100.0%
Gender						

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.335	.129	2.546	.011
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.441	.095	4.591	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.500	.306	1.225	.221
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.430	.071	5.920	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Age (AGE) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Should I get difficulties claiming benefits online, I can get help from others * I intend to claim benefits online * Age group	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.259	.356	.720	.471
N of Valid Cases			7			
25-44	Ordinal by Ordinal	Kendall's tau-b	.562	.097	5.714	.000
N of Valid Cases			48			
45-64	Ordinal by Ordinal	Kendall's tau-b	.340	.110	3.049	.002
N of Valid Cases			43			
65-79	Ordinal by Ordinal	Kendall's tau-b	.118	.266	.445	.657
N of Valid Cases			12			
80+	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
N of Valid Cases			1			
Total	Ordinal by Ordinal	Kendall's tau-b	.430	.071	5.920	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because Should I get difficulties claiming benefits online, I can get help from others and I intend to claim benefits online are constants.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Should I get difficulties claiming benefits online, I can get help from others * I intend to claim benefits online * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
I have experience of using the Internet						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.416	.158	2.478	.013
N of Valid Cases			26			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.246	.187	1.255	.209
N of Valid Cases			13			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.275	.355	.739	.460
N of Valid Cases			8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.316	.110	2.800	.005
N of Valid Cases			26			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.463	.139	3.322	.001
N of Valid Cases			38			
Total	Ordinal by Ordinal	Kendall's tau-b	.430	.071	5.920	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Facilitating Conditions (FC) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Should I get difficulties claiming benefits online, I can get help from others * I intend to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.412	.091	4.529	.000
N of Valid Cases			49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.049	.202	.241	.810
N of Valid Cases			15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.397	.175	2.227	.026
N of Valid Cases			28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.748	.075	7.034	.000
N of Valid Cases			12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	1.000	.000	2.301	.021
N of Valid Cases			7			
Total	Ordinal by Ordinal	Kendall's tau-b	.430	.071	5.920	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix K1: Test statistics for Facilitating Conditions (FC) as a determinant of Usage Behaviour - (FCu H<sub>1</sub>):

Facilitating conditions were hypothesised in two ways in section 2.5.6 as,

FCu H<sub>1</sub>: FC, moderated by age, experience and hedonic motivation, influence citizens' usage behaviour of the Internet in general.

Below are the test statistics for NCH Web services for FCu H<sub>1</sub>:

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	52.220 <sup>a</sup>	4	.000
Likelihood Ratio	50.762	4	.000
Linear-by-Linear Association	49.348	1	.000
N of Valid Cases	246		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.44.

### Symmetric Measures

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.461			.000
	Cramer's V	.461			.000
Interval by Interval	Pearson's R	.449	.058	7.845	.000 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.426	.052	7.358	.000 <sup>c</sup>
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Facilitating Conditions (FC) and the usage behavioural for NCH Web services.

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * Digital citizenship * Gender	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Nominal by Nominal	Phi	.394			.008
	Nominal	Cramer's V	.394			.008
	Interval by Interval	Pearson's R	.389	.100	3.919	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.374	.089	3.735	.000 <sup>c</sup>
	N of Valid Cases			88		
Female	Nominal by Nominal	Phi	.529			.000
	Nominal	Cramer's V	.529			.000
	Interval by Interval	Pearson's R	.499	.072	7.103	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.465	.065	6.480	.000 <sup>c</sup>
	N of Valid Cases			154		
Non-binary	Nominal by Nominal	Phi	1.000			.261
	Nominal	Cramer's V	1.000			.261
	Interval by Interval	Pearson's R	-.258	.308	-.378	.742 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.258	.428	-.378	.742 <sup>c</sup>
	N of Valid Cases			4		
Total	Nominal by Nominal	Phi	.461			.000
	Nominal	Cramer's V	.461			.000
	Interval by Interval	Pearson's R	.449	.058	7.845	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.426	.052	7.358	.000 <sup>c</sup>
	N of Valid Cases			246		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Because of partial correlation, Age (AGE) did not moderate the correlation between Facilitating Conditions (FC) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * Digital citizenship * Age group	246	100.0%	0	0.0%	246	100.0%



**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Nominal by Nominal	Phi	.359			.564
		Cramer's V	.359			.564
	Interval by Interval	Pearson's R	-.041	.046	-.188	.853 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.017	.070	.077	.939 <sup>c</sup>
	N of Valid Cases		23			
25-44	Nominal by Nominal	Phi	.352			.044
		Cramer's V	.352			.044
	Interval by Interval	Pearson's R	.310	.131	2.865	.005 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.297	.085	2.729	.008 <sup>c</sup>
	N of Valid Cases		79			
45-64	Nominal by Nominal	Phi	.413			.009
		Cramer's V	.413			.009
	Interval by Interval	Pearson's R	.325	.112	3.032	.003 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.306	.102	2.840	.006 <sup>c</sup>
	N of Valid Cases		80			
65-79	Nominal by Nominal	Phi	.565			.002
		Cramer's V	.565			.002
	Interval by Interval	Pearson's R	.558	.100	4.902	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.559	.098	4.913	.000 <sup>c</sup>
	N of Valid Cases		55			
80+	Nominal by Nominal	Phi	.516			.301
		Cramer's V	.516			.301
	Interval by Interval	Pearson's R	.472	.314	1.415	.200 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.408	.322	1.183	.275 <sup>c</sup>
	N of Valid Cases		9			
Total	Nominal by Nominal	Phi	.461			.000
		Cramer's V	.461			.000
	Interval by Interval	Pearson's R	.449	.058	7.845	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.426	.052	7.358	.000 <sup>c</sup>
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Facilitating Conditions (FC) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * Digital citizenship * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>I have experience of using the Internet</b>						
Strongly disagree	Nominal by	Phi	.304			.220
	Nominal	Cramer's V	.304			.220
	Interval by Interval	Pearson's R	.194	.123	1.533	.130 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.180	.127	1.417	.162 <sup>c</sup>
	N of Valid Cases			62		
Disagree	Nominal by	Phi	.379			.556
	Nominal	Cramer's V	.379			.556
	Interval by Interval	Pearson's R	.111	.243	.485	.633 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.096	.250	.419	.680 <sup>c</sup>
	N of Valid Cases			21		
Neither disagree nor agree	Nominal by	Phi	.546			.202
	Nominal	Cramer's V	.546			.202
	Interval by Interval	Pearson's R	.105	.080	.447	.660 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.189	.117	.816	.425 <sup>c</sup>
	N of Valid Cases			20		
Agree	Nominal by	Phi	.300			.322
	Nominal	Cramer's V	.300			.322
	Interval by Interval	Pearson's R	.000	.040	.000	1.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.073	.056	.517	.607 <sup>c</sup>
	N of Valid Cases			52		
Strongly agree	Nominal by	Phi	.143			.602
	Nominal	Cramer's V	.143			.602
	Interval by Interval	Pearson's R	.012	.065	.117	.907 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.071	.105	.667	.506 <sup>c</sup>
	N of Valid Cases			91		
Total	Nominal by	Phi	.461			.000
	Nominal	Cramer's V	.461			.000
	Interval by Interval	Pearson's R	.449	.058	7.845	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.426	.052	7.358	.000 <sup>c</sup>
	N of Valid Cases			246		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

Because of partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Facilitating Conditions (FC) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I have resources required to use Internet * Digital citizenship * It is fun accessing NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun accessing NCH web services						
Strongly disagree	Nominal by	Phi	.508			.000
	Nominal	Cramer's V	.508			.000
	Interval by Interval	Pearson's R	.488	.083	4.908	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.499	.086	5.055	.000 <sup>c</sup>
	N of Valid Cases			79		
Disagree	Nominal by	Phi	.368			.380
	Nominal	Cramer's V	.368			.380
	Interval by Interval	Pearson's R	.260	.157	1.452	.157 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.262	.147	1.465	.154 <sup>c</sup>
	N of Valid Cases			31		
Neither disagree nor agree	Nominal by	Phi	.244			.213
	Nominal	Cramer's V	.244			.213
	Interval by Interval	Pearson's R	.084	.082	.823	.413 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.126	.098	1.245	.216 <sup>c</sup>
	N of Valid Cases			98		
Agree	Nominal by	Phi	.258			.449
	Nominal	Cramer's V	.258			.449
	Interval by Interval	Pearson's R	.158	.094	.751	.461 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.171	.095	.815	.424 <sup>c</sup>
	N of Valid Cases			24		
Strongly agree	Nominal by	Phi	.145			.863
	Nominal	Cramer's V	.145			.863
	Interval by Interval	Pearson's R	-.128	.073	-.447	.663 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.144	.082	-.504	.624 <sup>c</sup>
	N of Valid Cases			14		
Total	Nominal by	Phi	.461			.000
	Nominal	Cramer's V	.461			.000
	Interval by Interval	Pearson's R	.449	.058	7.845	.000 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.426	.052	7.358	.000 <sup>c</sup>
	N of Valid Cases			246		

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

## Appendix L: Test statistics for Price Value (PV) as a determinant of Behavioural Intention (BI) - (PV H<sub>1</sub>;) )

The hypothesis for price value proposed in section 2.5.8 as,

PV H<sub>1</sub>: PV, moderated by age, experience and hedonic motivation, influences citizens' BI to use the Internet in general.

Below are the test statistics for NCH Web services for PV H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Internet access is cost-effective * I intend to use NCH web services	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.370	.049	7.595	.000
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Price Value (PV) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Internet access is cost-effective * I intend to use NCH web services * Gender	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Gender						
Male	Ordinal by Ordinal	Kendall's tau-b	.269	.085	3.143	.002
	N of Valid Cases		88			
Female	Ordinal by Ordinal	Kendall's tau-b	.451	.058	7.754	.000
	N of Valid Cases		154			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	.000	.577	.000	1.000
	N of Valid Cases		4			
Total	Ordinal by Ordinal	Kendall's tau-b	.370	.049	7.595	.000
	N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Age (AGE) moderated the correlation between Price Value (PV) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Internet access is cost-effective * I intend to use NCH web services * Age group	246	100.0%	0	0.0%	246	100.0%



**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.394	.177	2.108	.035
N of Valid Cases			23			
25-44	Ordinal by Ordinal	Kendall's tau-b	.228	.089	2.562	.010
N of Valid Cases			79			
45-64	Ordinal by Ordinal	Kendall's tau-b	.314	.089	3.518	.000
N of Valid Cases			80			
65-79	Ordinal by Ordinal	Kendall's tau-b	.398	.113	3.345	.001
N of Valid Cases			55			
80+	Ordinal by Ordinal	Kendall's tau-b	.746	.217	2.523	.012
N of Valid Cases			9			
Total	Ordinal by Ordinal	Kendall's tau-b	.370	.049	7.595	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Price Value (PV) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Internet access is cost-effective * I intend to use NCH web services * I have experience of using the Internet	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
I have experience of using the Internet						
Strongly disagree	Ordinal by Ordinal	Kendall's tau- b	.201	.137	1.404	.160
N of Valid Cases			62			
Disagree	Ordinal by Ordinal	Kendall's tau- b	.294	.158	1.825	.068
N of Valid Cases			21			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau- b	.151	.218	.684	.494
N of Valid Cases			20			
Agree	Ordinal by Ordinal	Kendall's tau- b	.265	.113	2.342	.019
N of Valid Cases			52			
Strongly agree	Ordinal by Ordinal	Kendall's tau- b	.103	.092	1.114	.265
N of Valid Cases			91			
Total	Ordinal by Ordinal	Kendall's tau- b	.370	.049	7.595	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Hedonic motivation (HM) did not moderate the correlation between Price Value (PV) and the usage behavioural for NCH Web services.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Internet access is cost-effective * I intend to use NCH web services * It is fun claiming benefits online	246	100.0%	0	0.0%	246	100.0%

**Symmetric Measures**

It is fun claiming benefits online			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.172	.120	1.451	.147
N of Valid Cases			49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.325	.226	1.428	.153
N of Valid Cases			15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.331	.129	2.476	.013
N of Valid Cases			28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.131	.208	.624	.533
N of Valid Cases			13			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.977	.026	5.715	.000
N of Valid Cases			8			
Not applicable	Ordinal by Ordinal	Kendall's tau-b	.427	.062	6.879	.000
N of Valid Cases			133			
Total	Ordinal by Ordinal	Kendall's tau-b	.370	.049	7.595	.000
N of Valid Cases			246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

## Appendix M: Test statistics for Habit (HB) as a determinant of Behavioural Intention (BI) - (HBb H<sub>1</sub>):

In section 2.5.6, habit was hypothesised as,

HBb H<sub>1</sub>: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' behavioural intention to use the Universal Credit system.

Below are the test statistics for the Universal Credit (UC) system for HBb H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * I intend to claim benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	.524	.076	6.839	.000
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Habit (HB) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * I intend to claim benefits online * Gender	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Gender			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Male	Ordinal by Ordinal	Kendall's tau-b	.379	.164	2.303	.021
	N of Valid Cases		37			
Female	Ordinal by Ordinal	Kendall's tau-b	.608	.081	7.441	.000
	N of Valid Cases		71			
Non-binary	Ordinal by Ordinal	Kendall's tau-b	-.500	.306	-1.225	.221
	N of Valid Cases		3			
Total	Ordinal by Ordinal	Kendall's tau-b	.524	.076	6.839	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Age (AGE) did not moderate the correlation between Habit (HB) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * I intend to claim benefits online * Age group	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Ordinal by Ordinal	Kendall's tau-b	.572	.319	1.800	.072
N of Valid Cases			7			
25-44	Ordinal by Ordinal	Kendall's tau-b	.432	.124	3.472	.001
N of Valid Cases			48			
45-64	Ordinal by Ordinal	Kendall's tau-b	.540	.120	4.555	.000
N of Valid Cases			43			
65-79	Ordinal by Ordinal	Kendall's tau-b	.836	.080	7.097	.000
N of Valid Cases			12			
80+	Ordinal by Ordinal	Kendall's tau-b	. <sup>c</sup>			
N of Valid Cases			1			
Total	Ordinal by Ordinal	Kendall's tau-b	.524	.076	6.839	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. No statistics are computed because Claiming benefits online would become a habit to me and I intend to claim benefits online are constants.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Habit (HB) and the behavioural intention (BI) to use the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * I intend to claim benefits online * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

I have experience of using the Internet			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.680	.136	3.547	.000
N of Valid Cases			26			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.052	.320	.162	.871
N of Valid Cases			13			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.211	.391	.555	.579
N of Valid Cases			8			
Agree	Ordinal by Ordinal	Kendall's tau-b	.635	.132	4.594	.000
N of Valid Cases			26			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	.376	.155	2.410	.016
N of Valid Cases			38			
Total	Ordinal by Ordinal	Kendall's tau-b	.524	.076	6.839	.000
N of Valid Cases			111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Because of partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Habit (HB) and the behavioural intention (BI) to use the Universal Credit (UC) system.

#### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * I intend to claim benefits online * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

#### Symmetric Measures

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
It is fun claiming benefits online						
Strongly disagree	Ordinal by Ordinal	Kendall's tau-b	.445	.125	3.360	.001
	N of Valid Cases		49			
Disagree	Ordinal by Ordinal	Kendall's tau-b	.603	.123	3.920	.000
	N of Valid Cases		15			
Neither disagree nor agree	Ordinal by Ordinal	Kendall's tau-b	.300	.175	1.691	.091
	N of Valid Cases		28			
Agree	Ordinal by Ordinal	Kendall's tau-b	.380	.194	1.963	.050
	N of Valid Cases		12			
Strongly agree	Ordinal by Ordinal	Kendall's tau-b	-.246	.141	-1.038	.299
	N of Valid Cases		7			
Total	Ordinal by Ordinal	Kendall's tau-b	.524	.076	6.839	.000
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.



## Appendix M1: Test statistics for Habit (HB) as a determinant of Usage Behaviour - (HBu H<sub>1</sub>):

In section 2.5.6, habit was hypothesised as,

HBu H<sub>1</sub>: Habit, moderated by age, gender, experience and hedonic motivation, influences citizens' usage behaviour of the Universal Credit system.

Below are the test statistics for the Universal Credit (UC) system for HBu H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * Digital citizenship	111	100.0%	0	0.0%	111	100.0%

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.331 <sup>a</sup>	4	.015
Likelihood Ratio	16.312	4	.003
Linear-by-Linear Association	3.937	1	.047
N of Valid Cases	111		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 1.95.

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.333			.015
	Cramer's V	.333			.015
Interval by Interval	Pearson's R	.189	.102	2.011	.047 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.217	.102	2.319	.022 <sup>c</sup>
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Because of partial correlation, Gender (GEN) did not moderate the correlation between Habit (HB) and the usage behaviour for the Universal Credit (UC) system.

#### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * Digital citizenship * Gender	111	100.0%	0	0.0%	111	100.0%

#### Symmetric Measures

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Gender						
Male	Nominal by Nominal	Phi	.328			.407
		Cramer's V	.328			.407
	Interval by Interval	Pearson's R	.041	.204	.241	.811 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.058	.206	.342	.734 <sup>c</sup>
		N of Valid Cases	37			
Female	Nominal by Nominal	Phi	.397			.025
		Cramer's V	.397			.025
	Interval by Interval	Pearson's R	.266	.119	2.295	.025 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.298	.120	2.592	.012 <sup>c</sup>
		N of Valid Cases	71			
Non-binary	Nominal by Nominal	Phi	-.500			.386
		Cramer's V	.500			.386
	Interval by Interval	Pearson's R	-.500	.306	-.577	.667 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.500	.306	-.577	.667 <sup>c</sup>
		N of Valid Cases	3			
Total	Nominal by Nominal	Phi	.333			.015
		Cramer's V	.333			.015
	Interval by Interval	Pearson's R	.189	.102	2.011	.047 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.217	.102	2.319	.022 <sup>c</sup>
		N of Valid Cases	111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Because of partial correlation, Age (AGE) did not moderate the correlation between Habit (HB) and the usage behaviour for the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * Digital citizenship * Age group	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

Age group			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
18-24	Nominal by Nominal	Phi	.645			.405
		Cramer's V	.645			.405
	Interval by Interval	Pearson's R	-.577	.239	-1.581	.175 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.525	.224	-1.378	.227 <sup>c</sup>
	N of Valid Cases		7			
25-44	Nominal by Nominal	Phi	.311			.327
		Cramer's V	.311			.327
	Interval by Interval	Pearson's R	.147	.173	1.005	.320 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.158	.172	1.084	.284 <sup>c</sup>
	N of Valid Cases		48			
45-64	Nominal by Nominal	Phi	.406			.131
		Cramer's V	.406			.131
	Interval by Interval	Pearson's R	.181	.156	1.180	.245 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.199	.164	1.298	.201 <sup>c</sup>
	N of Valid Cases		43			
65-79	Nominal by Nominal	Phi	.707			.050
		Cramer's V	.707			.050
	Interval by Interval	Pearson's R	.686	.117	2.981	.014 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.671	.124	2.860	.017 <sup>c</sup>
	N of Valid Cases		12			
80+	Nominal by Nominal	Phi	. <sup>d</sup>			
	N of Valid Cases		1			
Total	Nominal by Nominal	Phi	.333			.015
		Cramer's V	.333			.015
	Interval by Interval	Pearson's R	.189	.102	2.011	.047 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.217	.102	2.319	.022 <sup>c</sup>
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

d. No statistics are computed because Claiming benefits online would become a habit to me and Digital citizenship are constants.

Because of partial correlation, Experience (EXP) did not moderate the correlation between Habit (HB) and the usage behaviour for the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * Digital citizenship * I have experience of using the Internet	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>I have experience of using the Internet</b>						
Strongly disagree	Nominal by Nominal	Phi Cramer's V	.525 .525			.067 .067
	Interval by Interval	Pearson's R	.472	.103	2.625	.015 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.524	.135	3.013	.006 <sup>c</sup>
	N of Valid Cases		26			
	<b>Disagree</b>					
Disagree	Nominal by Nominal	Phi	. <sup>d</sup>			
	N of Valid Cases		13			
<b>Neither disagree nor agree</b>						
Neither disagree nor agree	Nominal by Nominal	Phi Cramer's V	.488 .488			.386 .386
	Interval by Interval	Pearson's R	.459	.218	1.264	.253 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.452	.212	1.240	.261 <sup>c</sup>
	N of Valid Cases		8			
	<b>Agree</b>					
Agree	Nominal by Nominal	Phi Cramer's V	.632 .632			.034 .034
	Interval by Interval	Pearson's R	-.435	.174	-2.368	.026 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.403	.181	-2.157	.041 <sup>c</sup>
	N of Valid Cases		26			
	<b>Strongly agree</b>					
Strongly agree	Nominal by Nominal	Phi Cramer's V	.295 .295			.507 .507
	Interval by Interval	Pearson's R	-.224	.109	-1.376	.177 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.223	.109	-1.373	.178 <sup>c</sup>
	N of Valid Cases		38			
	<b>Total</b>					
Total	Nominal by Nominal	Phi Cramer's V	.333 .333			.015 .015
	Interval by Interval	Pearson's R	.189	.102	2.011	.047 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.217	.102	2.319	.022 <sup>c</sup>
	N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

d. No statistics are computed because Digital citizenship is a constant.

Because of partial correlation, Hedonic Motivation (HM) did not moderate the correlation between Habit (HB) and the usage behaviour for the Universal Credit (UC) system.

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Claiming benefits online would become a habit to me * Digital citizenship * It is fun claiming benefits online	111	100.0%	0	0.0%	111	100.0%

**Symmetric Measures**

			Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
<b>It is fun claiming benefits online</b>						
Strongly disagree	Nominal by	Phi	.397			.103
	Nominal	Cramer's V	.397			.103
	Interval by Interval	Pearson's R	.348	.061	2.549	.014 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.388	.066	2.888	.006 <sup>c</sup>
	N of Valid Cases			49		
Disagree	Nominal by	Phi	.612			.131
	Nominal	Cramer's V	.612			.131
	Interval by Interval	Pearson's R	-.259	.267	-.967	.351 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.169	.260	-.619	.546 <sup>c</sup>
	N of Valid Cases			15		
Neither disagree nor agree	Nominal by	Phi	.413			.312
	Nominal	Cramer's V	.413			.312
	Interval by Interval	Pearson's R	-.189	.098	-.982	.335 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.252	.127	-1.328	.196 <sup>c</sup>
	N of Valid Cases			28		
Agree	Nominal by	Phi	.522			.351
	Nominal	Cramer's V	.522			.351
	Interval by Interval	Pearson's R	-.392	.177	-1.347	.208 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.414	.189	-1.437	.181 <sup>c</sup>
	N of Valid Cases			12		
Strongly agree	Nominal by	Phi	-.167			.659
	Nominal	Cramer's V	.167			.659
	Interval by Interval	Pearson's R	-.167	.116	-.378	.721 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	-.167	.116	-.378	.721 <sup>c</sup>
	N of Valid Cases			7		
Total	Nominal by	Phi	.333			.015
	Nominal	Cramer's V	.333			.015
	Interval by Interval	Pearson's R	.189	.102	2.011	.047 <sup>c</sup>
	Ordinal by Ordinal	Spearman Correlation	.217	.102	2.319	.022 <sup>c</sup>
	N of Valid Cases			111		



- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on normal approximation.

## Appendix N: Test statistics for Behavioural Intention (BI) as a determinant of Usage Behaviour - (BI H<sub>1</sub>;) )

The behavioural intention to use e-government was hypothesised in section 2.5.10 as,

BI H<sub>1</sub>: Behavioural intention to use the Universal Credit system, moderated by experience, has a significant statistical relationship with the actual system usage behaviour by citizens.

Below are the test statistics for NCH Web services system for BI H<sub>1</sub>:

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to use NCH web services * Digital citizenship	246	100.0%	0	0.0%	246	100.0%

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.561 <sup>a</sup>	4	.000
Likelihood Ratio	39.148	4	.000
Linear-by-Linear Association	14.976	1	.000
N of Valid Cases	246		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 3.82.

Symmetric Measures					
		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.369			.000
	Cramer's V	.369			.000
Interval by Interval	Pearson's R	.247	.064	3.986	.000 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.257	.066	4.154	.000 <sup>c</sup>
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Below are the test statistics for the Universal Credit (UC) system for BI H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
I intend to claim benefits online * Digital citizenship	111	100.0%	0	0.0%	111	100.0%

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.951 <sup>a</sup>	4	.007
Likelihood Ratio	17.844	4	.001
Linear-by-Linear Association	5.083	1	.024
N of Valid Cases	111		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 2.43.

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.355			.007
	Cramer's V	.355			.007
Interval by Interval	Pearson's R	.215	.104	2.298	.023 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.228	.104	2.441	.016 <sup>c</sup>
N of Valid Cases		111			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

## Appendix O: Test statistics for Digital inclusion (DI) as a social phenomenon - (DI H<sub>1</sub>;) )

In section 2.6, it was hypothesised that,

DI H<sub>1</sub>: Digital inclusion improves social inclusion.

Below are the test statistics for the correlation between Digital Inclusion (DI) and Social Inclusion (SINC) for DI H<sub>1</sub>:

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Digital citizenship * Using the Internet has improved my social life	246	100.0%	0	0.0%	246	100.0%

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.131 <sup>a</sup>	4	.000
Likelihood Ratio	28.079	4	.000
Linear-by-Linear Association	22.316	1	.000
N of Valid Cases	246		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.01.

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.350			.000
	Cramer's V	.350			.000
Interval by Interval	Pearson's R	.302	.065	4.945	.000 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.289	.064	4.713	.000 <sup>c</sup>
N of Valid Cases		246			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

