A Framework for Evaluating Citizens' Continued Intention to Use Public Sector Online Services

A thesis submitted for the degree of Doctor of Philosophy

By

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Dedication

To my parents, family and friends

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I give thanks to Allah, through whose inspiration I was able to undertake this project and through whose mercy I have been able to complete it.

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Declaration

I declare that, to the best of my knowledge, no portion of the work referred to in this thesis has been submitted in support of an application for another degree, or qualification, to any other university, or institute of learning.

The thesis conforms to the British Standard BS 4821: 1990, the British Standard Recommendation for the Presentations of the Thesis and Dissertations, and follows the Harvard referencing system.

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ABSTRACT

The increasing use of the Internet over recent years has forced governments and individuals to utilise Information & Communication Technology (ICT) in the form of electronic government (e-government), more specifically Public Sector Online Services (PSOS) as a subset of e-government. However, the success of PSOS delivery is dependent on usage and on the growing concerns about the perceived information and service quality of PSOS and their influence on self-efficacy, satisfaction and personal outcome expectation towards 'continuance intention' to use the PSOS systems. Retaining current PSOS users is crucial to ensure better utilisation of ICT investments through a regulated process that considers citizens' personal factors while using PSOS. If the level of PSOS quality is low, citizens are likely to revert to using traditional systems, leaving the new ICT systems underutilised.

Few studies have investigated the influences of information and service quality on personal factors, such as self-efficacy, personal outcome expectation and satisfaction, towards intention to continuing to use PSOS. To fill this gap, the present study develops a PSOS quality model by associating it with citizens' self-efficacy, satisfaction, personal outcome expectation, social influence, prior experience, and continuance intention. Therefore, the purpose of this study is to investigate the salient factors influencing citizens' intention in the context of PSOS use.

A research model of eight constructs is developed by integrating Social Cognitive Theory (SCT), Expectation Confirmation Theory (ECT), the DeLone and McLean IS success model, and E-S-QUAL. To validate the model, a quantitative-positivist approach methodology is used as the research paradigm; it employs a cross-sectional survey design as well as component-based structural equation modelling (SEM) by using Analysis of Moment Structures (AMOS) as the data analysis technique. In total, 471 self-administrated questionnaires were found usable for data analysis and 17 hypotheses were formulated and tested.

Overall, the modelling demonstrates a good fit with the observed data. The findings show that prior experience, social influence, information quality and services quality are significant predictors of citizens' intention to use PSOS if these latent constructs are regulated through self-efficacy. The results exhibit positive relationships with the other constructs in the model except social influence and information quality towards personal outcome expectation and satisfaction. Further, the results show that service quality is the most influential variable in the present model. This highlights the vital role of service quality while delivering PSOS.

Theoretically, the present study extends the roles of pre-adoption and post-adoption by offering a self-regulating process through self-efficacy as a physical ability. Further, the study reveals the importance of personal outcome expectation (internal stimuli) as well as satisfaction (external stimuli) as cognitive factors that represent personal goal assessments. Practically, the current study offers managers a mechanism in how to deal with end-users on a continuance basis while delivering online service through short- and long-term strategies. In summary, the present study marks a significant contribution in better understanding the utilisation of e-government systems and can serve to better self-regulate outcomes for both citizens and government.

Keywords: electronic service, e-service, electronic government, eGovernment, e-government, service quality, information quality, social influence, self-efficacy, personal outcome expectation, satisfaction, continuance intention.

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LIST OF ABBREVIATIONS

AGFI: Adjusted Goodness of Fit Index

AMOS: Analysis of Moment Structure

AVE: Average Variance Extracted

B2B: Business-to-Business

B2C: Business-to-Consumer

BI: Behaviour Intention

C2C: Customer-to-Customer

CFA: Confirmatory Factor Analysis

CFI: Comparative Fit Index

CI: Continuance Intention

CMV: Common Method Variance

CR: Composite Reliability

df: degrees of freedom

D&M IS Success: DeLone and McLean IS Success Model

DOI: The Diffusion of Innovations Theory

DSS: Decision Support System

DTPB: The Decomposed Theory of Planned Behaviour

e-Business: Electronic Business

e-Commerce: Electronic Commerce

e-Government: Electronic Government

e-Learning: Electronic Learning

e-Services: Electronic Services

ECT: Expectation Confirmation Theory

G2C: Government-to-Citizen

G2E: Government-to-Employee

G2G: Government-to-Government

GFI: Goodness of Fit Index

GOF: Goodness-of-Fit

ICT: Information and Communication Technology

IQ: Information Quality

IS: Information System

ISP: Internet Service Providers

IT: Information Technology

LISREL: Linear Structural Relationship Analysis

MIS: Management Information System

MM: Motivational Model

MPCU: Model PC Utilization

NFI: Normed Fit Index

OECD: Organization for Economic Co-operation and Development

PE: Prior Experience

POE: Personal Outcome Expectation

RMSEA: Root Mean Square Error of Approximation

SAT: Satisfaction

SCT: Social Cognitive Theory

SE: Self-Efficacy

SEM: Structural Equation Modelling

SI: Social Influence

SQ: Service Quality

TAM: Technology Acceptance Model

TPB: The Theory of Planned Behaviour

TPB/DTPB: The Theory of Planned Behaviour and the Decomposed Theory of Planned Behaviour

TRA: Theory of Reasoned Action

UN: United Nations

UTAUT: The Unified Theory of Acceptance and Use of Technology

VIF: Variance Inflation Factor

WWW: World Wide Web

CHAPTER ONE: INTRODUCTION

1.1. Introduction

Recently, there has been a great deal of interest among researchers and practitioners in the factors that influence the pre- and post-adoptive process of Information and Communication Technology (ICT) systems in the private sector (Bhattacherjee, 2001; Hsu et al., 2004; Park et al., 2012) and also in the public sector (Venkatesh et al., 2011). The increasing use of the Internet over recent years has forced governments and individuals to utilise ICT in the form of electronic government (e-government). However, e-government is a diverse and complex field (Bollettino, 2002). Previous studies have focused on how to deploy e-government within various public and private bodies (e.g., Chu et al. 2004), the public sector (e.g., Wang et al., 2003), online tax-filling (e.g., Carter and Bélanger, 2005; Hu et al., 2009), and revenue online service (Connolly et al., 2010). Indeed, e-government practice can be used as an umbrella that covers many diverse applications that utilise the Internet for delivering government services, based on UN/ASPA (2002). However, a further point regarding e-governance is that it is distinct from other ICT adoptions (e.g., e-commerce), in that it can be made mandatory rather than just voluntary (Chan et al., 2010; Warkentin et al., 2002). An example of mandated e-government use is the requirement to present smart cards for personal identification in order to gain access to the public sector (Smith, 2005). Simultaneously, the Internet can be used as a digital device by the general public (citizens) to receive online services and information (West, 2005). In some studies on e-government online service applications, scholars have examined the factors that influence citizens' adoption and have used the expression "Public sector online services" in their research (e.g., Connolly et al., 2010). Indeed, studies on public sector online services (PSOS) as a subset of e-government has been a common concern among e-government scholars in order to fulfil and represent the public interest (e.g., Tan and Pan, 2003; Chan et al., 2010, Connolly et al., 2010; Tan et al., 2013; Liang and Lu, 2013). In this vein, the present study hereafter will use the expression "PSOS" as a subset of e-government, and the focus will be on examining the delivery of online public services to citizens.

Although there are many stakeholders in e-government, the present study looks at services and examines the information quality of PSOS from the point of view of the citizen. More specifically, PSOS in the present study refers to the use of Driver and Vehicle Licensing Agency (DVLA) applications under e-government practice in the United Kingdom (UK), which will be introduced later. The idea is to enhance the quality of government information and services to citizens through Web-based Internet applications (Wang and Liao, 2008). It could also be said that "service quality" is merely a subset of "system quality", which is assessed on an organisational level; DeLone and McLean (2003) argued that "service quality" is a separate variable. In this way, the present study focuses on information and service quality, rather than system quality (technical related issues) within the PSOS paradigm. Indeed, PSOS as a term is suitable for measuring specific service and information quality metrics in a public sector website from a customer or a citizen perspective. In general, citizens compare their expectation of PSOS with their experience in the private sector and, not unreasonably, expect the same level of service quality and system responsiveness (Horner, 1999). According to The Economist (2000), e-government can be utilised to transform both the public sector services that are delivered to users online and the relationship between government agencies and citizens as end-users (Teicher et al., 2002).

ICT is a growing services tool in the public sector because of the use of PSOS, which acts as a driver for ICT services delivery improvement in terms of effectiveness and efficiency (Steyaert, 2002; Heeks and Bailur, 2007). Prior research argued that PSOS can shift existing public services through harnessing the uses of ICT as a social technology to bring about more interactivity in the information era (Tapscott and Agnew, 1999). Other studies also recommended PSOS as a method for government agencies to utilise the greatest potential of ICT in PSOS delivery services, such as in web-based applications (Fang, 2002). However, research on individual-level uses of ICT has now reached maturity through adoption stage research, based on Venkatesh et al. (2007); for example, Chan et al.'s (2010) study of smart card uses in PSOS, which was based on technology adoption variables from the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). On the other hand, others argue that the post-adoptive process is a new phenomenon that needs further investigation (Venkatesh et al., 2011; Kim, 2012).

The present study focuses on PSOS from a citizen's (as a user) perception and, specifically, examines the post-adoption stage.

Nearly all government agencies at all levels launched their PSOS in the late 1990's (Wang and Liao, 2008; Torres et al., 2005); for example, the Internet, or more specifically the World Wide Web (WWW), is considered to be the most popular and is used for many diverse business purposes including sharing information (Hong, 1999). Transformational ICT in PSOS practice cannot be undertaken effectively without taking the voice of the users into account at both the adoption stage and at the continuance stage. In a recent study in Canada, Reddick and Turner (2012) found that PSOS websites, as a contact channel, were most commonly used for information purposes. However, government needs to mitigate the digital divide by providing more access channels to the Internet for all target users. In this case, government should understand citizens' needs and assess whether they are satisfied with the services provided. Reddick and Turner (2012) stressed that a positive view of a channel leads to a positive overall view of public services; thus, evaluating PSOS website channels can improve the overall view of public services.

In the field of PSOS, the goal is to improve services delivery for the stakeholders (Layne and Lee, 2001). Nevertheless, the available evidence suggests that the functional potential of working ICT applications is under-utilised and this state of affairs forces organisations to set a strategy to encourage users to be tolerant of imperfections in the system in order to gain benefit from the technology provided (Jasperson et al., 2005).

There are many definitions of PSOS; one such definition, which will be used in the context of the present study, is the following United Nations' (2004:15) definition: "the use of information and communication technology (ICT), and its application, by government for the provision of information and basic public services to the people". However, the author will use other definitions later on in Chapter Two. Most of these definitions consider information and systems but later focus on services quality.

1.2. Research background

Over the last three decades, PSOS strategies have been intensely debated by researchers (Heeks & Bailur, 2007). A considerable number of studies in PSOS have focused on adoption and acceptance, based on the Technology Acceptance Model (TAM, Davis, 1989) as a core construct. This previous research sought to conceptualise, validate or extend TAM to investigate ICT acceptance or adoption in various contexts. Perceived ease of use, usefulness and attitude towards using the technology were the most used constructs in TAM (Davis et al., 1989). Perhaps the most influential study has been the UTAUT (Venkatesh et al., 2003) in the last decade.

In the literature concerned with ICT adoption, there is a consensus that those barriers at the individual level have been fully investigated; for example, Venkatesh et al. (2007) and Davis (1993) addressed the user's acceptance or rejection of ICT and how acceptance has influenced system characteristics. Subsequently, the literature investigates the adoption and acceptance of ICT using two distinct constructs, namely, perceived usefulness and ease of use, based on TAM. However, with the rapid progress in using ICT in general, PSOS users' expectations have increased and they expect the same level of services from the public sector as from the private sector, particularly after the maturity of acceptance and adoption of ICT in their daily lives. In order to add more value to the present services in both the private and public sectors, acquiring new customers and retaining existing customers is necessary (Zhao et al., 2012), therefore, previous studies have emphasised the role of satisfaction in retaining existing customers and adding more profitability to an organisation (Fornell et al., 1996). In this respect, citizen satisfaction is a crucial factor in the behaviour of continuance for users of PSOS.

TAM based prior studies were focused on examining the attitude of users towards the actual use of systems; for example, TAM-based studies have typically focused on first acceptance models regardless of continuation, therefore, TAM-based studies measured all the constructs simultaneously (Straub and Burton-Jones, 2007), whereas perceived consequences of behaviour are specific to the individual user (Fishbein and Ajzen, 1975). "This suggests that pre-usage beliefs may serve as anchors for post-usage beliefs as people tend to rely on their initial beliefs and early impressions in the formation of future beliefs" (Venkatesh et al., 2011:532). Therefore, new government policies should consider all voices, one of which is the voice of the continuance users of PSOS.

By examining the interactivity between the two main stakeholders (government agencies and citizens) of PSOS, it will help to discover what causes continuance.

While previous research examining the adoption and acceptance of ICT has reached its maturity, research looking at post-adoptive or continuance use frequency or intention to use ICT has increased (Jasperson et al., 2005); however, in reality there is a tendency for the ICT application to be replaced by a new application (Rogers, 1983, 1995). Thus, diffusion of innovations may vary after the adoption stage; therefore, observing this change is important for the short-run and long-run strategies while investing in ICT. Accordingly, the radical change in ICT and social development places a premium on personal ability for self-development and regulation throughout the life cycle (Bandura, 2001). Hence, shaping service quality is worthy of further investigation to identify how to improve citizens' perception of ICT applications in order to encourage them to acquire the necessary skills for maximising the services delivered by ICT.

There are many definitions of quality in an organisation; for example, Reeves and Bednar (1994) associated quality with different terms such as: excellence, values, conformity to standards, or as meeting customer expectations. However, meeting users' expectations might be implicit rather than explicit in some situations; therefore, with respect to self-development in the post-adoptive stage, Kim (2012: 220) stated, "Customer satisfaction is a post-purchase attitude formed through a mental comparison of the service and product quality that a customer expected to receive from an exchange and the level of service and product quality the customer perceives from the exchange." However, these expectations have been selected by previous scholars in the management field who have employed similar constructs in order to explain the acceptance, continuity, and utilisation of ICT (e.g., Compeau and Higgins, 1995b; Hsu et al., 2004; Jasperson et al., 2005); for example, a study in Sri Lanka shows that the delivery of quality information and services are critical factors for evaluating public value (Karunasena and Deng, 2012). In addition, they found that creating a positive experience for citizens can influence satisfaction with PSOS. However, this cannot be done without understanding the citizens' personal factors, for example, understanding how citizens assess, perceive and evaluate PSOS is important in seeking to deliver superior service quality (Papadomichelaki and Mentzas, 2012).

This relationship between government and citizens can be considered as a shared responsibility based on reciprocal interaction and consequent behaviour in the specific situation; hence, the experience of each instance of use leads to a new behavioural pattern (Bandura, 1986). Thus, in PSOS, the resulting continuance behaviour interaction between users (cognitive factors), social, technological and organisational (environmental factors) will add more depth to the present study by improving understanding of the relationships among them; for example, Coiera (2003) emphasised the role of interaction between humans and computational agents. He concluded that the characteristics of individual technologies, psychological and social issues can be combined to explain the overall decisions that individuals make when using ICT so that we can make robust predictions about how the group as a whole will behave. However, the challenge is how to keep holding and improving the level of expectations among users, and matching these expectations, and the ICT services provided by the government, with the skills of the actual users. Therefore, some researchers have noted that user satisfaction, rather than behavioural intention, is a more appropriate dependent variable in mandated use environments (Brown et al., 2002; Brown et al., 2008; Chan et al., 2010; Venkatesh et al., 2011).

Previous research has investigated the role of measures of organisational impact; for example, DeLone and McLean (2003) emphasised the role of different factors used to measure the success of Information Systems (IS) in order to be able to measure research results, compare them and validate the findings, and also to measure possible interactions among the success dimensions so that various independent variables can be isolated with dependent variables. However, satisfaction with technology does not mediate the interaction between citizens and government in PSOS. Bandura (1986) stressed the role of an individual's ability in a process where people can regulate their behaviour based on what they are able or unable to do, which influences continuance. For this reason, an individual's ICT skill related to a particular action is critical when using PSOS, as it develops gradually. However, lack of use of PSOS would create a gap between different socio-economic levels and hinder them from gaining the benefits of the potential ICT services (Chircu and Lee, 2005; Carter and Weerakkody, 2008; Dwivedi and Irani, 2009).

1.3. Research problem

An evaluation of PSOS responsiveness from a user's perspective has still not been undertaken and is considered a major gap in the present dominant PSOS maturity models (Andersen et al., 2011). Prior studies emphasise the role of initial adoption in obtaining the benefit from ICT and the usage of PSOS channels; however, there is a need for further examination of post adoption because the success of PSOS depends on its continued use rather than adoption or acceptance (Bhattacherjee, 2001; Limayem et al., 2007). In addition, Wangpipatwong et al. (2009) related the desired outcome of PSOS to the number of citizens that move beyond initial use and how those citizens interact with PSOS on a regular basis. Furthermore, adoption may lead to either continuance use or discontinuance use; in this perception discontinuance use indicates that PSOS, as an innovation or system, does not meet the citizen's expectation regardless of prior success in the adoption process (Roger, 1995; Hsu et al., 2004; Limayem et al., 2007; Wangpipatwong et al., 2009). Thus, maximising the potential of ICT investment is crucial for an organisation to be successful not only in the short-run but also in the long-run on a continuance basis. Similarly, initial use (adoption or acceptance) of online services does not necessarily ensure success; however, continuance use can be considered as a dependent factor for its success (Hsu et al., 2004). "Despite the large number of already existing PSOS, users face significant problems concerning the level of their quality. To overcome quality problems management needs to periodically measure the quality of existing PSOS, as the basis of a continuous improvement process." (Halaris et al., 2007:397)

Oliver (1980) suggested that if the user is satisfied, continuance will ensue, and that on the other hand if the user is dissatisfied, discontinuance is the result. Accordingly, Roger (1995) classified rejection of the system into two types: either there is a problem with the innovation itself or with the idea. Thus, there should be regulating processes that manage the relationship between the provider and the receiver from the receiver's perspective because they are the only ones who can use the system. Bandura (1986) postulated that people are varied in performance. Hamner and Al-Qahtani (2009) recognised the efforts of PSOS from the supply side (e.g. system infrastructures and service policies); however, they emphasised the shortage of PSOS on the demand side (e.g., desirability of services from citizens' viewpoint) due to lack of actionable website quality standards for citizen-centric PSOS. Tan et al. (2013: 78) mentioned that in PSOS, "An overemphasis on the overarching concept of service quality alone tends to

neglect the underlying design principles for creating citizen-centric, quality-driven e-government websites."

There has been heavy investment in PSOS to automate work processes in order to build ICT-enabled work-systems environments; for example, in 2007, the CIO of the UK Department for Work and Pensions estimated a public sector IT expenditure of £14 billion a year, with only 30% of the government's IT projects succeeding (Collins, 2007). Hence, to gain an adequate understanding of PSOS evaluation frameworks, criteria-based evaluation is required that is grounded in one or more specific perspectives or theory (Alalwany and Alshawi, 2008); for example, there is a lack of integration between social and network dimensions in the study of PSOS (Norris and Lloyd, 2004). Therefore, there is a need to distinguish between the willingness of the citizens to be involved and the actual level of involvement with PSOS (Chen and Dimitrova, 2006). Accordingly, an ICT user's readiness depends on his or her skills to use the PSOS.

The usage of PSOS in general, and PSOS websites in particular, can be divided into two stages: "initial usage" and "continued usage to not revert to face-to-face systems." It was observed that in most cases after "initial usage" of PSOS, many users revert to traditional ways of acquiring information and services, such as telephone inquiry, personal visits, and so forth (Andersen and Henriksen, 2006). Therefore, the utilisation of the invested ICT can be reduced, and can fail economically, if the current users return to the traditional system; this is why it is crucial to study citizens' evaluation of PSOS quality. Previous studies have recommended service quality factors (e.g., Hsu et al., 2004) in order to present a better understanding of both levels, that is, the individual level (cognitive and personal beliefs) and the environmental level with related factors such as social, technical and managerial factors. Furthermore, Gupta and Jana (2003) suggest that there is a need for evaluation efforts to assess the development of PSOS in order to ensure that government agencies are capable of providing the services that meet citizens' expectations in order to create a successful ICT-enabled environment.

In summary, there has been little research that focuses on evaluating the personal factors that lead to continuance of use of PSOS by citizens and outstanding factors that influence the process of continuity use have been ignored in previous studies of PSOS. By understanding the salient factors that influence the continuity of use of PSOS, government agencies can easily improve the key performance measures for the coming

years including the take-up level of digital services and help in managing change in other services (e.g. continuous insurance enforcement, collecting tax for the government, maintaining the accuracy of vehicle registrations, increasing customer satisfaction through service delivery, improving sustainability, such as reducing carbon emissions, and increasing freedom of information through increasing the response rate). To date, there have been few useful empirical studies in PSOS literature to help in understanding its use, and there has been a lack of comprehensive models that take into consideration the capability of citizens as users with respect to personal, environmental and behavioural factors that would lead to a continuing use of the service. Drawing on previous studies (e.g., Bandura, 1977a/b, 1978, 1982, 1986; Parasuraman, et al., 1985; Parasuraman, et al., 1988; Parasuraman, et al., 2005; Compeau and Higgins, 1995a/b, 1991; Compeau et al., 1999; Bhattacherjee, 2001a/b; DeLone and McLean, 1992, 2003; Venkatesh et al., 2003; Chan et al., 2010, Venkatesh et al., 2010; Kim, 2012), there has been a considerable amount of revision of the role of services quality, social influence and outcome expectation on the initial stages in both the private and public sectors; however, few of these have focused on the post-stages of PSOS. Therefore, addressing this gap will help develop a more holistic understanding of continuance intention towards using PSOS.

1.4. Significance and justification of the research

A long-term business strategy must be implemented to ensure that users continue to use the service once they have initially adopted it (Zhao and Lu, 2012). The study provides an understanding of the customer's perception of the quality of PSOS and continuance behaviour by examining his or her personal factors (e.g., self-efficacy, personal outcome expectations, satisfaction and prior experience). Hsu et al. (2004: 766) stated: "Clearly, understanding the factors influencing the customer's intention to continue using the WWW is a critical issue for researchers and practitioners." This comment is applicable to PSOS uses throughout the website. Since user acceptance in the area of ICT has reached its maturity level, recent studies in ICT research have identified increasing interest toward the post-adoption aspects in the context of IS use in organizations (Venkatesh et al., 2003; Jasperson et al., 2005; Chan et al., 2010; Venkatesh et al., 2011). In addition, Jasperson et al. (2005: 526) stated: "Organizations may be able to achieve considerable economic benefits (via relatively low incremental

investment) by successfully inducing and enabling users to (appropriately) enrich their use of already-installed IT-enabled work systems during the post-adoption stage." However, there are other vital issues to be considered in PSOS, rather than simply facilitating technical issues within the organisational domain (Hung et al., 2006); therefore, decision makers should include both short and long-term strategies. Previous studies have suggested that the post-acceptance stage is the most significant stage, as continuity in using ICS (e.g., PSOS development) is shown by customers' psychological motivations after the acceptance stage (Bhattacherjee, 2001a; Hsu, et al., 2004; Venkatesh et al., 2011).

Certain relationships should be expected in PSOS due to the change in either the quality of PSOS or the citizen's personal factors (e.g., self-efficacy, personal outcome expectations and satisfaction). Understanding the continuity process based on the relationship between cause and effect within different situations can help maximise the investment in ICT whilst at the same time assess the citizen's capability of using the systems. This will facilitate PSOS managers in focusing on what can be utilised in their short-term and long-term strategies to ensure continuance, and consequently, citizens would be less likely to choose to visit a traditional government office. Furthermore, understanding continuance users could enable managers to retain current users, which makes economic sense for both the organisation and the citizen. The system could be made more effective and efficient by using a reflective process; moreover, an accurate prediction of the citizen's personal outcome expectation and satisfaction could shape any future plan, which would afford managers a better opportunity for control. Moreover, managers may be able to identify the causes of the deficiencies that exist in the current system.

The integration of different theoretical perspectives will be utilised in the present study. Incorporating various contexts, such as the individual context, social context and organisational context, make important contributions to the ICT research streams. Furthermore, the present study distinguishes between the ability factors, represented by self-efficacy, and mental factors, represented by personal outcome, expectation and satisfaction. Hence, the role of belief, attitude, intention and behaviour has been extended by emphasising the role of physical ability (self-efficacy) and mental ability (cognitive factors). The present study integrates SCT and ECT as well as E-S-QUAL. SCT is used as an umbrella in the present study and represents the reciprocal

relationship between personal factors, environmental factors and behavioural factors. However, SCT does not specify the external or environmental factors, which is PSOS in the present study; therefore, E-S-QUAL is used to represent the external factor as an external stimulus to an individual. In order to evaluate the PSOS and identify the extrinsic feelings of personal factors, ECT was adopted, as it applies the role of satisfaction in continuance. These two dominant theories (SCT and ECT) have been used in IS research to predict adoption and post-adoption; hence, the present study creates a comprehensive view of adoption and post-adoption stages.

In summary, the results of the present study will enhance personal motivation, perception, learning and beliefs, and attitudes toward a better understanding of PSOS phenomena. There is a need for a cultural shift towards efficiency and effectiveness for creating convenience services around the world, therefore, improving the quality of services throughout the life cycle will initiate new motivation that forces both the citizen and the organisation to cope with the up-to-date issues in the ICT field. As an external stimuli, understanding PSOS on a continuance basis forces decision makers to influence citizens' behaviour toward more involvement by informing people of the potential benefits that PSOS could bring to them. The value that the present research study provides is that it can enhance the understanding of how citizens' perceive quality of PSOS on a continuance basis. Since the government has already heavily invested in ICT, citizens will need to educate themselves about its uses and realign their approaches toward reusing the PSOS in order to cope with the changes that ICT development brings. In return, coping with radical changes in ICT will maintain a mutual interest between government and citizens that acts as a driver for further enhancement in the PSOS delivery processes.

As an inference from the above, it can be said that "organisations may be able to achieve considerable economic benefits (via relatively low incremental investment) by successfully inducing and enabling users to (appropriately) enrich their use of already-installed ICT-enabled work systems during the post-adoption stage" (Jasperson et al., 2005: 526). Likewise, evaluating the performance of PSOS from a citizen's point of view creates public value for all citizens because it aims to directly benefit the general public (Moore, 1995; Alford & O'Flynn, 2009).

1.5. Research questions, aim and objectives

This study attempts to identify and comprehend the salient factors that determine citizens' continuance use of PSOS. Therefore, the research questions addressed in this study are:

1) What are the salient factors that determine citizens' continuance in using PSOS?
2) How do these factors influence continuance intention behaviour?
3) How do the ECT constructs enhance the explanatory power of SCT in predicting citizens' intention to continue using PSOS?

Research aim and objectives

The present research study is designed to address a research problem related to the factors that most significantly influence the continuity usage process in PSOS. Therefore, it develops and validates a G2C continuance usage model in order to assess and evaluate the antecedent factors in the continuance use of PSOS (e.g., expectations and satisfactions). The key constructs of the proposed model are delivered from different disciplines (e.g., information systems, psychology and social science), all of which fall under management research as an umbrella.

The present study aims to achieve these objectives:

1) To critically review and analyse previous literature with respect to PSOS adoption and continuance use based on G2C perspectives
2) To identify continuance antecedent factors and to develop a conceptual model that determines the salient factors that influence continuance intention to use PSOS
3) To empirically test the relationships between continuance intention and its antecedents as well as the consequences, and to validate the proposed conceptual model in a cross-sectional field study based on PSOS service in the context of the UK.
4) To analyse the results and write a conclusion

1.6. The context of the study

The present study is adapted to the government to citizen (G2C) context. The citizens will evaluate the official portal (https://www.gov.uk/government/organisations/driver-and-vehicle-licensing-agency) based only on the information and services provided; therefore, the organisation (government agencies) implementation process is beyond the scope of the present study. As there are various needs and incentives; the researcher will focus on how the citizen's needs are served, by understanding citizens' behaviour or actions as a continuance user of ICT in the PSOS system. However, because the government is targeting the whole population, the researcher has selected a specific government online service provider in order to ensure that the area of need represents the individual's (traditional citizen) needs and motivation/incentives rather than employees or groups.

1.7. UK PSOS

The UK government has already established the required infrastructure and offers many online services and information to assist its citizens in this regard (Daniel and Ward, 2006). Based on Weerakkody and Choudrie (2005), the UK government's services can be accessed by its citizens through the Internet at both levels of government (national and local levels). Further to this, the UK citizen, as a user, can take part in a two-way interaction with government (Senyucel, 2005). The website can be considered as the interface of the PSOS where citizens can obtain information and interact with services (Weerakkody and Choudrie, 2005). Therefore, evaluating the quality of the website (e.g. information quantity, information quality) is crucial because it has the potential to change the way citizens interact with government and thus enhances communication, participation, and the decision making process (Gil-Garcia, 2006). The UN Public Administration Program (2003, 2004, 2005, 2008, 2010, and 2012) reported that the UK is ranked among the 192 member countries of the UN; almost 98% of these countries have already established their website for PSOS systems (see Figure 1.1).

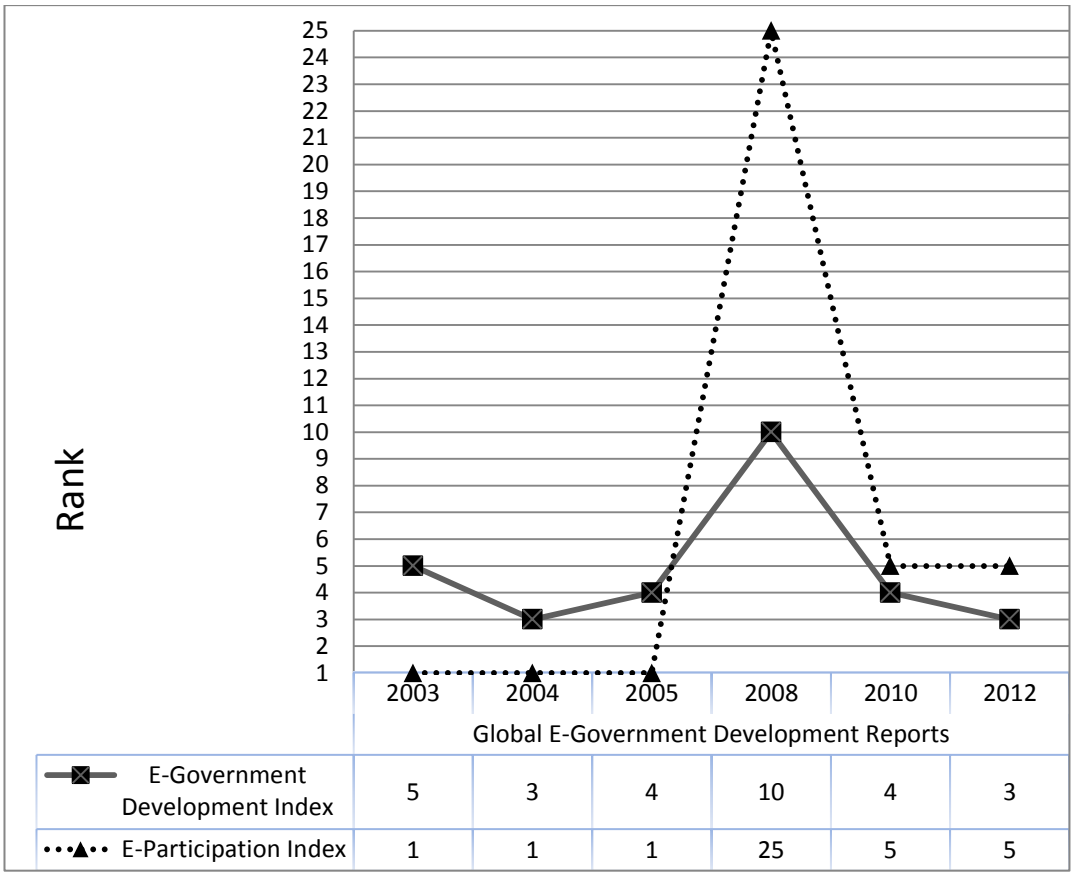


Figure 1.1: UK rank based on UN PSOS surveys. (Source: http://unpan3.un.org/egovkb/global_reports/12report.htm)

On October 17th, 2012 the new portal address of the UK PSOS (www.gov.uk) replaced the old address (Directgov.gov.uk) and (Business link). Currently, UK citizens and residents are able to access a variety of government online services and information via its new official website or portal (www.gov.uk). Large key components have evolved or are under construction (e.g. online services and other tools) as part of the development of the UK PSOS systems. Nevertheless, the development that has occurred has not covered all the core mechanisms of the PSOS systems.

The www.gov.uk PSOS has gathered all ministerial departments in one place; for example, one of the most active links on gov.uk, based on a survey of May 27th 2013 are: Universal Job match job search, log in to student finance, passport fees, jobseeker's allowance, council tax bands, running a limited company, driving theory test, car tax rates, get a car tax disc and VAT rates. Car tax service (obtaining a tax disc for a

vehicle) is one of the active online services. The next sub-section will provide more details about obtaining a tax disc via PSOS systems and the department that provides it.

1.8. Driver and Vehicle Licensing Agency (DVLA) – GOV.UK

The Driver and Vehicle Licensing Agency's **(**DVLA) Annual Report and Accounts for 2011-12 reports (via its website) that the number of vehicles has increased slightly, as well as first registered vehicles, by 0.3 per cent when compared with the year 2010-11. Based on the website report, "In 2011-12, the Agency received 22,120,739 million customer enquiries to its contact centre, a drop of 1,369,555 (5.8 per cent) from the previous year. DVLA local offices dealt with 2,224,181 visits for its counter services. The average queuing time within the local office was 10 minutes 34 seconds, an increase of 40 seconds (6.46 per cent) compared to the previous year". Table 1.1 illustrates the transaction volumes of the years 2010/12/13 (DVLA Annual Report & Accounts, 2012).

Table 1.1: Transaction volumes of the years 2010/12/13. (Source: DVLA Annual Report & Accounts 2011-12, DVLA Annual Report & Accounts 2011-12).

	2010-11 Actual	**2011-12 Actual**	**2012-13 Business Plan**
Vehicle volumes	99,859,095	100,982,270	103,671,564
Driver volumes	15,393,658	15,609,638	16,890,684
Electronic take up target	49%	53%	54%
Electronic take up (actual)	51%	53.7%	n/a

According to the DVLA Annual Report and Accounts (2012), DVLA is an Executive Agency of the Department for Transport (DfT) and is part of the Motoring Services Directorate. DVLA main headquarters is located in Swansea with a network of 39 local offices across the country. DVLA's main responsibilities are to (www.gov.uk):

- Maintain 44.8 million driver records and 36.5 million vehicle records
- Collect £6 billion a year in vehicle excise duty (VED)
- Limit tax evasion to no more than 1 per cent
- Support the police and intelligence authorities in dealing with motoring-related crime

1.8.1. Justification for using DVLA as a case study

The investigation into DVLA online users was undertaken as a part of a research process, conducted in a systematic manner while collecting the data; otherwise, it could not be called research in the true meaning of the word, according to Walliman (2001). The primary reason behind the decision to use the DVLA as a case study was in order to answer the research question: "What are the salient factors that determine citizens' continuance of using PSOS". Connolly et al. (2010: 650) state, "If such a system is to be successful it has to be both attractive and trustworthy". DVLA as a widely accepted e-government application made it easier for the researcher to find participants in order to meet the researcher objectives (Agell and Sellers, 2012; Gandhi et al., 2014). Hence, because DVLA is simple and has been successful, the researcher felt motivated to examine it.

Previous studies have emphasised the role of the DVLA as a regulator, as it provides guidance to doctors, informing them of patients who are drivers but who may also be affected by psychiatric conditions; for example, Agell and Sellers (2012) conducted a survey on DVLA regulations in order to identify any legal loopholes; their study was not specifically targeted at health professionals in the UK or at enhancing patient care. The patients may or may not see their doctors resulting in not receiving the advice with respect to their fitness to drive. In another study, Gandhi et al. (2014) conducted a survey among senior orthopaedic technicians in 348 hospitals in the UK; they found that only 11.7% of respondents referred patients to the DVLA as a regulatory authority in order to take advice on driving.

The past decade's developments in ICT have heightened the need for service quality applications (e.g. Parasuraman et al., 2005: E-S-QUAL; Connolly et al., 2010: E-PS-QUAL), in particular for measuring the service quality delivered by websites. However, a major problem with this kind of work is that service quality as a dimension by itself is not sufficient for measuring the quality delivered by a PSOS website; previous studies have identified service quality as one of three essential metrics for ICT system success; the others being information quality and system quality (e.g., DeLone & McLean, 1992, 2003). In other words, there are clearly variables that may lead to success (rather than just service quality measures), for example, efficiency and fulfilment. Indeed, information quality metrics should be assessed while examining any technology that delivers PSOS (DeLone & McLean, 2003). Thus, the researcher

excluded system quality from the present study because it is expected that continuance users are familiar with the PSOS system (e.g., usability or using the system). However, the researcher also expects continuance users to exhibit a certain level of agreement while evaluating service quality metrics such as efficiency (see Parasuraman et al., 2005) for example: the degree to which the website is simple to use; the degree to which the website makes it easy to find what they want; the degree to which the website loads its pages sufficiently quickly (or is easy to navigate). Accordingly, this is also applicable to each citizen's level of agreement while evaluating information quality (e.g., accuracy, timeliness, completeness, relevance and consistency). In summary, each citizen's level of agreement in the evaluation process will have an impact on customer satisfaction and continuance usage, rather than just on initial usage (acceptance/adoption) decisions in using PSOS.

The purpose of the present study is to investigate the factors that most significantly influence PSOS continuance users, and to test the relationships (theory testing) between the constructs with respect to continuity use. The DVLA online service repetitive use application as a PSOS is expected to emphasise the salient factors that influence continuance usage; however, other PSOS applications may omit these salient factors due lack of experience or lack of continuity to use the system. This is unlike the DVLA system because citizens have to renew their tax disc on a continuance basis. In terms of generalisation, the DVLA online system might be used as a model for other PSOS systems if it demonstrates reliability between constructs. Hence, a clear purpose is crucial for a research before collecting data and information in order to test the relationships between the factors that support this successful phenomenon and in order to produce an idea or knowledge that interprets this fact, based on a continuance basis.

The recent radical changes in ICT may influence citizens' perception toward using a system like DVLA, and thereafter it may negatively influence their cognitive factors besides their ability to use the system. Nevertheless, in this present study, the researcher undertakes the research in a systematic manner and to draw conclusions only to increase knowledge. Based on Rogers's (1983, 1995) Diffusion of Innovation (DOI) theory, DVLA application users can grasp new ideas and spread technology use to many different types of DVLA user in the UK. Hence, not only those 2.5% innovators are eligible to participate in the survey but also early adopters, early majority, late majority and laggards. In this vein, there is the potential that lower social status

segments are also continuance users of the DVLA system. Furthermore, the selection of DVLA allows the researcher to apply integrated theories as a systematic research approach; in particular, Social Cognitive Theory (SCT), which depicts reciprocal relationships among personal, environmental and behavioural factors, and Expectation Confirmation Theory (ECT), where prior experience is essential. Also, DVLA's high accessibility rates make it easier to find participants with prior use of its applications. This helps the researcher to collect data within the allowed framework for a PhD thesis and to meet the research objectives and finish the PhD. The use of DVLA applications motivates the researcher as it offers an enhanced understanding of the continued use of PSOS, which is the goal of the present study. Furthermore, the current research is based on logical relationships and not solely on beliefs (Ghauri and Gronhaug, 2005) to understand the factors that influence the continued use of PSOS, represented by the DVLA system.

1.9. Research methodology

It is crucial to define the PSOS systems and the word "systems" used in this study. Hu et al. (2009) viewed systems as designed systems for societal uses, such as a PSOS website that provides a wide array of innovative services to citizens. Therefore, PSOS websites are merely our focus in this study rather than other channels. Hence, only the features that are on the website of the PSOS and their services related issues are analysed and discussed in order to narrow the focus of this study. The research philosophy is 'quantitative-positivist' (Straub et al., 2004); the research method is 'field study'(Jenkins 1985); the data collection technique is 'cross-sectional survey' (Pinsonneault & Kramer, 1993); and the unit of analysis is the individual user (citizen) of the PSOS website. This study specifies that the nature of the theory is 'explaining and predicting' (Gregor, 2006).

1.10. Organisation of the thesis

The current study consists of nine chapters as shown in Table 1.2 below, which gives a brief overview of each chapter.

Table 1.2: Organisation of the present thesis

Description	Chapter Name
Introduction to the thesis outlines	**Chapter 1**: Introduction
(PSOS context)	**Chapter 2**: Literature Review
Eight constructs have been formed: prior experience, social influence, information quality, service quality, self-efficacy, personal outcome expectations, satisfaction and continuance intention to use PSOS	**Chapter 4**: Conceptual framework and Hypotheses Development
Quantitative method has been utilised.	**Chapter 5**: Methodology
SPSS version 20 and AMOS version 20 has been used as a tool to analyse 471 respondents.	**Chapter 6**: Data analysis and Findings
Overall discussion and hypotheses results discussion	**Chapter 7**: Discussion
Conclusion, limitations and future research	**Chapter 8**: Conclusions
References	
Appendix A: Pilot Study Survey Appendix B: CFA and SEM diagrams Appendix C: Main survey and ethical introduction Appendix D: Measurement Validity	**Appendices**

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the current study with respect to PSOS. The aim of this section is to review previous studies in the ICT domain (e.g., adoption, post-adoption and services quality) and the PSOS domain. Reviewing the literature critically is considered to be a foundation for research because it develops a good understanding and insight into relevant previous research (Saunders et al., 2007, 2010). Therefore, an important part of the emergent literature attempts to conceptualise PSOS by classifying articles under three broad approaches: definitional, evolutionary and stakeholder-oriented (Gil-García and Luna-Reyes, 2003). The main stakeholders in the present study are government and citizens as end users of PSOS. Based on UN (2003), three minimum threshold levels may influence the PSOS practice, the ICT, human capital and their interactivity through the electronic channels. Therefore, the central idea of this literature review has been divided into two sections (Figure 2.1).

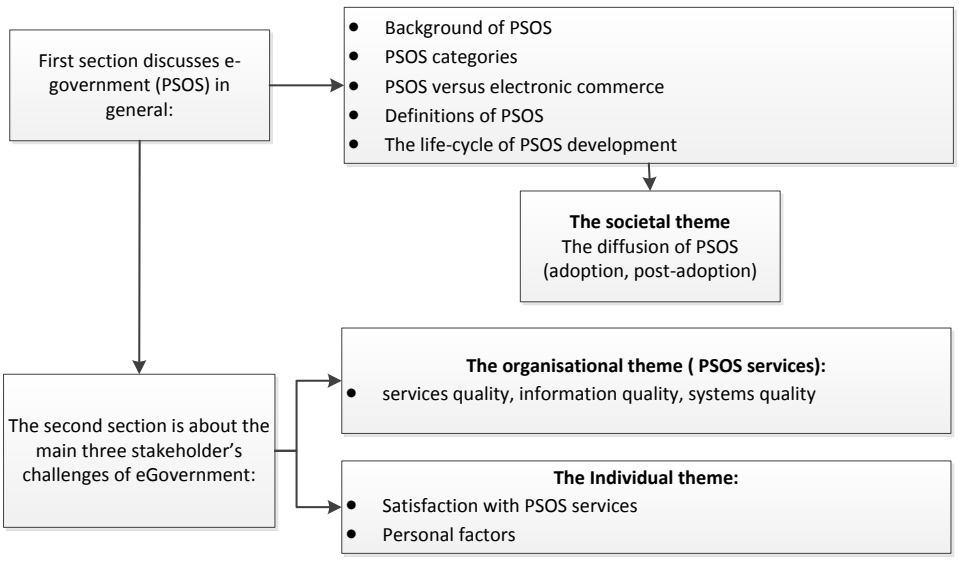


Figure 2.1: Structure of the Literature Review in Ch 2

2.2 Background of PSOS

Both developed and developing countries have established their own official websites (United Nations, 2010) that offer different online services, such as online transactions and renewing driver licences (Moon, 2002; Howard, 2001). However, while Layne and

Lee (2001) stressed that the goal of PSOS is to deliver faster and cheaper services and information to the government stakeholders, such as citizens, business partners, employees and other agencies, Seddon (1997) stressed that the uses of ICT is not only a measure of success but also of behaviour; for instance, Seddon (1997) used "perceived usefulness" instead of "use" as a general measure for net benefits (Wang and Liao, 2008). In this manner, would it be possible to replace "perceived usefulness" as a general measure with more precise measures of both behaviour and success. There is also, however, a further point to be considered with respect to the PSOS evaluation process; it is in terms of the relationship between the two major stakeholders in PSOS: government as a PSOS provider and the citizen as a PSOS receiver. This critique, unfortunately, implies a mutual cause for the PSOS success measure and entails assessing this relationship as a shared experience rather than a singular cause. In the face of this, West (2004) points out that many government agencies are striving to improve the quality of PSOS for their citizens by building mutual trust between the citizens and the government in order to reduce costs (and time) through improving the efficiency and effectiveness of PSOS. Having considered the mutual relationship between government and citizens, it is also reasonable to examine citizens' perceptions. In this way, if the provided PSOS does not match the citizens' perception of benefit, it would be difficult to continue using it (Wescott, 2002). For this reason, PSOS as a sub-set of e-government is more than just electronic services (e-services); it is about transforming government processes and renewing the role of all stakeholders including the government itself. With respect to e-government practice, PSOS has become a major concern of academic research in diverse fields such as public administration, organisational behaviour, information systems science and other technological fields (Scholl, 2004), as PSOS can be altered by the new behaviours of ICT personnel in public administration arenas while delivering their PSOS to the citizens. Basically, renewing the role of the major stakeholders in PSOS is critical. This point is also sustained by Löfstedt (2005) in terms of the role of new ideas in this interaction in transforming processes in society.

Commonly, a more integrated socio-technical view is crucial in order to involve people in technologies; for instance, Jaeger and Thompson (2004) believe that normative behaviour, or social context, can be applied to research in information as a framework for future studies. By the same token, other researchers have classified PSOS into themes; this was illustrated by Irani et al. (2007) as they classified PSOS terminology

through groups such as technical, social or organisational. To conclude, the idea is to merge certain factors with the associated group; however, it is important to highlight that classifying PSOS into three streams, or themes, has to be organised through strong relationships. To this point, and in order for this study to be theoretically robust, a strong theory is needed to study the relationships between the organisation as a provider of ICT and the associated groups in society.

2.3 PSOS categories

Previous researchers have classified PSOS into three main categories: 1) Government to Business (G2B); 2) Government to Government (G2G); and 3) Government to Citizen (G2C). All three categories of PSOS systems can benefit from the PSOS delivery evaluations (Jaeger, 2003); however, the benefits should be distinguished based the interactions among those three stakeholders, namely, government, businesses and citizens. Before considering the three stakeholders, it is important to note that the present study is focused on citizens, in particular, on the G2C context; however, each of these streams (G2G, G2B and G2C) has its own strengths and weaknesses. On the one hand, there are the strengths; for G2G: PSOS increases communication within government departments, promotes consistency, and reduces employees' task times; for G2B: PSOS introduces cost savings while trading goods and services, and increases efficiency; and finally, for G2C: PSOS enhances the quality of any public participation in government, as citizens can be more informed about regulations and other services available to citizens (e.g., on employment, tax returns, registration renewals and online payments) regardless of geographical location, anywhere, anytime (Heeks, 2002; Ndou, 2004; Carter and Belanger, 2004a/b, 2005; Jaeger, 2003; Larsen and Rainie, 2002). Often, there is mutual benefit in each stream. On the other hand, the weaknesses can be summarised by the difficulties entailed in implementation (e.g., transition from publishing to transacting) and up-dating the system (Jaeger, 2003; West, 2006). In relation to the implementation and development process, one can mention citizens' convenience, completion of information, usefulness, ease of use, privacy and security-related issues as examples of potential weaknesses (Bhattacharya et al., 2012). It could also be said that there is a relationship between government and their employees (G2E) through providing policies and rules (Carbo and William, 2004).

Given the advantages of e-government outlined in the previous paragraph, the present study has tried to focus on the citizens' reasonable expectations of PSOS; in other words, the citizen's perception side of services and information quality in relation to PSOS and their tendency to continue using it. So far, however, little attention has been paid to the relationships between the citizens and their government (C2G) or to citizens' experience after receiving PSOS in a G2C stream. PSOS could be made more successful through a citizen-centred approach, which could be delivered through examining the citizen's perspective (Akman et al., 2005).

2.4 PSOS versus electronic Commerce (e-Commerce)

Perhaps the key difference between PSOS and e-Commerce is that in PSOS there is a possibility that a system is mandatory whereas in other technologies users are allowed to use other options, in other words voluntary (Warkentin et al., 2002). It is important to highlight that PSOS government agencies may be the sole provider of certain ICT facilities to citizens, for example, as in Chan et al.'s (2010) study of smart cards used in PSOS; however, previous studies suggest that most consumers' behaviours in the outside-workplace context are voluntary (Brown and Venkatesh, 2005; Chan et al., 2010).

One question that needs to be asked, however, is whether citizens in PSOS should be treated as customers or as clients. Osbourne and Gaebler (1992), proposed that citizens should be regarded and treated as customers, suggesting that the delivery of PSOS should be redesigned with a customer focus. However, on the other hand, Mintzberg (1996) distinguished customers from clients because customers buy products (this includes services or goods) while clients buy services. Despite this, citizens should be treated differently because they have rights that "go far beyond those of customers or even clients" (Mintzberg, 1996:77). Accordingly, it is more appropriate to use the term "citizen" instead of "customer" or "client" while delivering PSOS. The need to reinvent PSOS is crucial, however, calling citizens "customer" or "client" will misrepresent the relationship between government and citizens (Ciborra, 2003).

Indeed, since there is a relationship between G2B, some researchers mention that the studies of ICT in business (e.g. e-Commerce) could also be applied to the PSOS context (Hussein, et al., 2011), as both PSOS and e-Commerce use web-based technology to

serve their customers (Pavlou, 2003; Gefen et al., 2003). In both the e-Commerce context and the PSOS context website users can access the service 24/7; however, it is more likely that the citizen would expect the service from PSOS to be a one-stop-shop service (Chan et al., 2010; Hu et al., 2009). Other researchers believe that citizens would tend to show more loyalty to the PSOS than those in business because PSOS is designed to meet the citizens' needs (Hussein et al., 2011). In this manner, PSOS practice can be considered as a monopoly because there are no competitors in the G2C domain; for example, there is only one driving licence issuer in the country (Hussein et al., 2011).

Another point to consider is that, in studies on mandatory settings, performance expectancy, effort expectancy, social influence and facilitating conditions have been found to be significant determinants of behavioural intention or use (Venkatesh et al., 2003; Chan et al., 2010). Unfortunately, Venkatesh et al. (2003) was based on a workplace environment rather than on the traditional consumer outside work. It could also be said that employees must "use" the system in a workplace to perform their job, and therefore, there is a distinction between attitudes towards using ICT and intention to use ICT in a mandated system (Brown et al., 2002). Hence, other beliefs, such as system rewards and punishment, can be considered (Brown et al., 2002).

Having considered the workplace consumer as a level of analysis, it is also reasonable to look at a non-workplace consumer, i.e. traditional citizens. Accordingly, this research seeks to address the salient factors that influence citizens outside the workplace, in the context of PSOS, as a level of analysis. Furthermore, little effort has been expended on both mandatory and voluntary contexts, more specifically, intention to use PSOS, in previous studies. Most of those studies were devoted to understanding technology adoption in both e-commerce and e-government (e.g., Venkatesh et al., 2003) and other related areas. The core of certain previous studies was perceived usefulness and perceived ease of use (Chu et al., 2004; Brown et al., 2008; Chan et al., 2010); those studies used TAM-based models, which are relevant to technological innovation and adoption in ICT research (e.g., Carter and Bélanger, 2005). However, they do not reflect intention to use or reward and punishment beliefs relating to what citizens expect from using a system.

2.5 Definition of e-government

There are many definitions of e-government and the term itself is not universally used (Verdegem and Verleye 2009). Table 2.1 explains some previous PSOS definitions.

Table 2.1: previous PSOS definitions

Definition	References
The European Union (Commission of the European Communities, 2003) defined PSOS as, "The use of ICT in public administrations combined with organisational change and new skills in order to improve public services and democratic processes and strengthen support to public policies".	(Commission of the European Communities, 2003)
In another definition, PSOS is: "government's use of ICT, particularly web-based internet applications, to enhance the access to and delivery of government information and service to citizens, businesses, employees, and other agencies and entities".	(Wang and Liao, 2008: 718).
The United Nations (UN) defines PSOS as, "Utilising the Internet and the World Wide Web (WWW) for delivering government information and services to citizens".	(United Nations, 2001: 1).
Furthermore, the OECD (2003) defined PSOS as the use of ICT, particularly the use of the Internet as a tool to achieve better government, which is a technology perspective focusing on the use of ICT regardless of the stakeholders' consideration, such as organisation resources and citizens' ability to use the system.	OECD (2003)
Later, West (2005) defined it as the use of the Internet and other digital devices by the public sector to deliver services and information.	West (2005)
Accenture (2005) defines PSOS as the provision by governments of information about their services, as well as the ability to conduct government transactions, via the Internet.	Accenture (2005)
The World Bank (2003) defines PSOS as the use of ICT to improve the efficiency, effectiveness, transparency and accountability of government.	The World Bank (2003)

Indeed, there is a pragmatic definition that lies between the two schools of what is meant by "e-government"; the first school defines e-government as the delivery of government services over the Internet and the Web, while the second school defines e-government as any use of ICT in public administration (Bannister, 2007). Having considered these two schools, the present study focuses on the first school, which is the delivery of PSOS over Internet applications, as a subset of e-government; for example, Andersen and Henriksen (2006) used the term "e-government and public sector process rebuilding" to be more focused on citizen activities (as a centre of the process), rather than technological activities. In this manner, there is a distinction between organisational activities and citizen (as end-user) activities.

Most previous definitions on e-government are focused on the use of Internet or the WWW as a mean for delivering PSOS to citizens. However, the majority of these definitions see public administrations in terms of organisational change and to some extent merge PSOS with new skills in order to enhance the delivery of government

online information and services to the general public. In particular, the OECD (2003) definition expands PSOS to include government services such as infrastructure and the role of other partners, such as Internet Service Providers (ISP), to allow users to access the Internet and banks in order to make transactions. Similarly, West (2005) focused on the uses of ICT but added services, which were emphasised there in terms of supply and demand; therefore, there is continuity in the relationship between the government and the citizen due to the supply and demand reciprocal/mutual relationship. Hence, there would be changes in behaviour between the government and the citizen, and there would also be management issues. On the other hand, the Accenture definition is more focused on the government perspective, neglecting the demand side and looking at it as a legal instrument for supplying necessities in order to meet the needs of citizens. Again, the World Bank specified the kind of relationship from a managerial perspective, which emphasised the role of quality services when delivering PSOS to citizens.

In fact, Layne and Lee (2001) believe that PSOS offers an opportunity for governments to re-organise themselves, and to position themselves closer to the citizens and to co-operate with society as a whole. Layne and Lee make it clear that the government should act as a facilitator to link the stakeholders together in order to greater consistency through coordination. Layne and Lee mentioned society and other partners and the relationships among them; however, they stated that the government should be closer to the citizens rather than to other parties, which implies that the service should primarily be beneficial to the citizen because companies, such as ISPs, might increase their prices, resulting in hindering this aim from being realised.

Nevertheless, there has been an increasing concern that PSOS depends on the ability of marketing managers in delivering PSOS; for instance, Kotler et al. (2005), from the marketing perspective, believe that ICT has changed the world by introducing strategic management as a way of integrating all management activities. Kotler et al. (2005) consider ICT as a tool for integrating the environment, citizens and organisations, in which entities can compete by utilising the Internet revolution in the era of globalisation. In addition, Kotler et al. believe that consumer behaviour still plays the major role and acts as a driver in all activities.

Generally, there is agreement amongst scholars that PSOS entails the use of ICT (e.g., computers, web-based Internet applications) to improve access and to efficiently deliver government information and services to PSOS stakeholders (e.g., citizens, business,

employees, government entities and other agencies) (Hernon, 1998; Fountain, 2001; Brown and Brudney, 2001; Evans and Yen, 2006). At the same time, other researchers have taken into consideration the citizen's ability to communicate (Kaylor et al., 2001), less costly performance (Relyea, 2002), improved managerial effectiveness (Gil-Garcia and Pardo, 2005) and citizen's empowerment (Tung and Rieck, 2005).

Although previous definitions have focused on the outcomes that PSOS can deliver and on the potential of PSOS for the citizen, few of these definitions have considered the capacity or the role of citizens (and also of business) when implementing PSOS (Van-Deursen et al., 2006). Reviewing the previous definitions could lead to the major stakeholders (citizens and government as an organisation) being involved in a relationship, mediated through ICT, that includes the whole of society. Most of these definitions are focused on improved service delivery through PSOS. The most commonly used words are "use", "utilise", "services", "change" and "skills", as well as "government", "citizens" and "society"; they also mention other stakeholders. Clearly, there is an organic structure behind this phenomenon; there appears to be a growth in PSOS definitions for various situations, based on different times; hence, there is an implication that there is a changing behaviour within the process of PSOS practice and a reflection of ICT continuity use, based on demand and supply perspectives with respect to services delivery. The change in environment might be coming from changes in ICT features (e.g., information and online services) or from society as a whole. It can be argued, from a public administration point of view, that there is the potential to change the citizen's perception of PSOS from time to time due to changes in circumstances.

2.6 The life-cycle of PSOS development

According to Max Weber, the rational bureaucracy of the public sector is a form of rigid procedure and a traditional system. In general, the public sector is criticised for its inefficiency and for being incapable of serving its people (Ho, 2002); however, introducing PSOS has created an opportunity to replace this rigid traditional system by utilising the full potential of ICT to facilitate the relationship between government agencies and citizens (Moon and Welch, 2005). More importantly, government agencies are continually improving their ICT and by then the PSOS aiming for better performance (Moon and Welch, 2005). Likewise, PSOS was introduced as a tool to transform the public sector by improving the quality of services that government

agencies offered to their stakeholders in various sectors so that it could be more effective and efficient (Hanna, 2011); furthermore, PSOS has evolved and moved towards its state of maturity. Accordingly, it is important to highlight the fact that the life-cycle of PSOS has been evolving through applying and validating several different models. Table 2.2 below explains certain previous PSOS life-cycle stages as a subset of e-government maturity models.

Table 2.2: Previous PSOS as a sub-set of e-government maturity models

Model name & Authors	**Stages**	**Synopsis**
1- Asia Pacific's six stage model (Wescott, 2002)	A six stage model: 1) Setting up an email system and internal network; 2) Enabling inter-organizational and public access to information; 3) Allowing; 2-way Communication; 4) Allowing exchange of value; 5) Digital democracy and 6) Joined-up government	A citizen-centric model emphasised the role of web portal to integrate PSOS among agencies and citizens. Mostly focused on the organisational workflow neglecting the ability side of the actual user by not explicitly addressing the technical and non-technical factors that are related to the organisation and citizens. It assumes that the user accepts the IT and has the appropriate skills for that, such as self-efficacy.
2- Chandler and Emmanuel (2002)	A four stage model: 1) Information, 2) Interaction, 3) Transaction, 4) Integration	The model focused on managerial and technical factors but without stating details regarding how government and citizens interact especially in the transactional stage. Alignment was the focus through vertical and horizontal integration for the integration stage. The model calls for more collaboration among PSOS stakeholders
3- Deloitte and Touche, (2001)	A six stage model: 1) Information publishing, 2) Transaction, 3) Multipurpose website, 4) Personalisation, 5) Clustering services 6) Integration.	The model calls for different levels of services, which require different levels of skills so that personalisation of the services can meet the citizens' demands.
4- Gartner group (Baum & Maio. 2000)	A four stage model: 1) Web presence, 2) Interaction, 3) Transaction, 4) Transformation where all government operational processes are integrated, unified and personalised.	The model calls for more personalisation at the final stage
5- Hiller and Blanger (2001)	A five stage model: 1) Information dissemination, 2)Two-way communication, 3) Transaction, 4) Integration, 5) Political support	The model provides more focus on services and political support

6- Howard (2001)	A three stage model: 1) Publishing, 2) Interacting, 3) Transaction	The model is lack of integration and political support
7- Layne and Lee (2001)	A four stage model: 1) Catalogue stage; 2) Transaction; 3) Vertical; 4) Horizontal integration	A formal presence on the Internet where some agencies have a web page with some downloadable forms at the first stage. In the second stage, services are integrated with other government agencies in their systems where that database supports the online transaction. The last two stages integrate vertical and horizontal systems that reinforce intragovernmental data integration with similar/different functions
8- Moon (2002)	A five stage model: 1) One-way communication, 2) Two-way communication, 3) Transformation, 4) Vertical and horizontal integration, 5) Political participation.	Moon (2002) extended Layne & Lee's (2001) model with a new stage known as political participation
9- United Nations (2001)	A five stage model: 1) Web presence, 2) Enhanced web presence, 3) Interactive web presence, 4) Transactional web presence, 5) seamless/networked web presence	The model mostly focused on the web as a major tool for communication and infrastructure; however, it is more technical than managerial where integration and services were not in the stages.
10- Darral West West (2004)	A four stage model: 1) Static-web, 2) Services delivery, 3) Integrating services, 4) Political transformation	The model considers customisation of the services and political change
11- The World Bank (2003)	A four phase model: 1) Publishing, 2) Interactivity, 3) Completing transactions, 4) Delivery	The world bank stated the vital part of services delivery at the end as a marketing tool of communication
12- Andersen and Henriksen (2006)	A four stage model: 1) Cultivation, 2) Extension (personalisation), 3) Maturity, 4) Revolution	Called the Public Sector Process Rebuilding (PPR) Model, an extension of the Layne and Lee Model. It is a more citizen-centric approach than technical.
13- Siau and Long Model Siau and Long (2005)	A five stage model: 1) Web presence, 2) Interaction, 3) Transaction, 4) Transformation, 5) E-democracy	This model proposes online voting, which is more political than the previous ones

Although the stage models have common characteristics, these models have not dealt with end-user perspectives and other personal factors (e.g., satisfaction and expectation). These maturity models have looked at PSOS development from the public administration standpoint, i.e. at the level of an organisation. Furthermore, most of these studies have only focussed on system quality (e.g., web presence, hardware integration, transactional web characteristics); however, only a few of these have focused on the citizen (e.g., Andersen and Henriksen, 2006; The World Bank, 2003). The pertinent previous research attempts have been conducted to ensure that the PSOS

exercise is on the right track. However, this track is a G2C standpoint. Layne and Lee (2001) stressed the influences of previous models, technological, and organisational complexity in progressing the PSOS exercise through time as a continuance process.

It is important to highlight the role of end-users; more specifically, there should be recognition of the citizen as the core of the PSOS practice because citizens influence the transformation process (Weerakkody et al., 2011). In other words, the PSOS life-cycle describes an evolutionary approach as a holistic approach that selectively uses previous research in order to suggest the different stages of PSOS. In addition, reflecting those maturity models, the majority were similar by being more organisation-centric, with service-orientation delivery and political support; they also integrate the stakeholders. More importantly, a social theme was absent in the process, which reflected the lack of diffusion in society. Most of these stages have taken place within the organisation rather than integrating the system according to the citizen's ability to use ICT or focusing on the social aspect in general. The citizen's opinion of the installed ICT was not taken into consideration by the government agency's management.

In summary, the three main points to be derived from stage models are: published information, transactions and PSOS. These three points offer engagement with citizens, resulting in a feedback loop over time, in turn resulting in a foundation for PSOS reform (Chen, 2002). Similarly, "Interaction with the citizenry becomes richer as time passes. Beginning with simple information dissemination or publication, governments often proceed to engage the governed in two-way discussions on policies and to gather feedback electronically" (Singh et al., 2007: 635). However, rapid changes in the means of interaction between government and citizens are having a serious effect on the willingness of citizens to continue to use the services, even as new value-added ICT services are released (Zhao et al., 2012). At the same time, future continuation is a subject only for satisfied customers and cognitive judgement (e.g., the quality of information and services), which in turn drive continuance intention as behaviour (Zhao et al., 2012).

2.7 The diffusion of PSOS

Rogers's (1983) Diffusion of Innovation (DOI) Theory identifies attributes of innovations: relative advantage, compatibility, complexity, observability and trialability.

However, relative advantage depends on new practice and is compared with existing values or beliefs, based on Rogers (2003). Hence, how PSOS is perceived as being an innovation in contrast with traditional systems influences both the initial stage of adoption (i.e. email vs. fax use in traditional systems) and the second stage of adoption; the first can then be compared with the second. In this manner, there is a change in citizens' perception while continuing to use PSOS (the transition from the first adoption to the second adoption stage of PSOS, and so on), depending on the quality of service or information, and this change is subject to trust in the Internet or government, the user's skills or accessibility-related issues (Kanat and Ozkan, 2009). There appears then to be acceleration in the growth of citizen's experience on how difficult the innovation is to use, comparing it with their own needs and how others think about it. According to Rogers' (1995) DOI Theory, how the user perceives the value of the innovation with respect to his or her past experience and needs is the major factor that influences the rate of diffusion.

There are variations among individuals in the use and perception of ICT, which are based on many factors; for example, Agarwal and Prasad (1998) refer to individual differences and to individual characteristics (personality and demographic variables), which influence users' beliefs and behaviour, based on situational factors. Indeed, personal innovativeness in ICT and dynamic individual differences in computer self-efficacy and anxiety are considered to be the key ones that influence an individual's beliefs about their uses of ICT (Compeau and Higgins, 1995a/b; Thatcher and Perrewe, 2002; Compeau et al., 1999; Thatcher et al., 2007; Chou and Chen, 2009). "Dynamic individual differences refer to malleable dispositions that affect individuals' responses to stimuli. Stable, situation-specific traits predispose individuals to consistent response, but such traits are applicable only to narrow context or specific targets (such as using new or complex IT)" (Chou and Chen, 2009: 484). In the face of individual differences, Chou and Chen (2009) used users' "expectations" to assess the differences between performance and original expectations and "satisfaction" as a measurement of their confirmation or disconfirmation. Chou and Chen (2009) used this assessment based on Expectation-Confirmation Theory (ECT) (Bhattacherjee, 2001; Oliver, 1980). Evidence in support of this position can be found in Compeau and Higgins (1995b) and Compeau et al. (1999), as they found that these constructs are considered to be cognitive beliefs for predicting ICT users' behaviour.

The assumption of the present study is that the PSOS system is a non-mandatory system that allows the user to use an alternative traditional channel. People are free to select their uses based on DOI theory (Moore and Benbasat, 1996). If the systems are non-mandatory then people are encouraged to use the system. In general, PSOS is considered as a new innovation and needs to be diffused among citizens (Sahu and Gupta, 2007). There is a variation between developing and developed countries due to socio-economic differences (Lin et al., 2011); these differences may slow down the take-up process of PSOS adoption and continuity process. Evidently, literacy rate differences and the inability to effectively use IT are potential factors that influence the diffusion of IT within developing and developed countries (Lin et al., 2011). A good example for diffusion of PSOS is Figure. 2.2, which illustrates the rate of online take up in Taiwan since 1998.

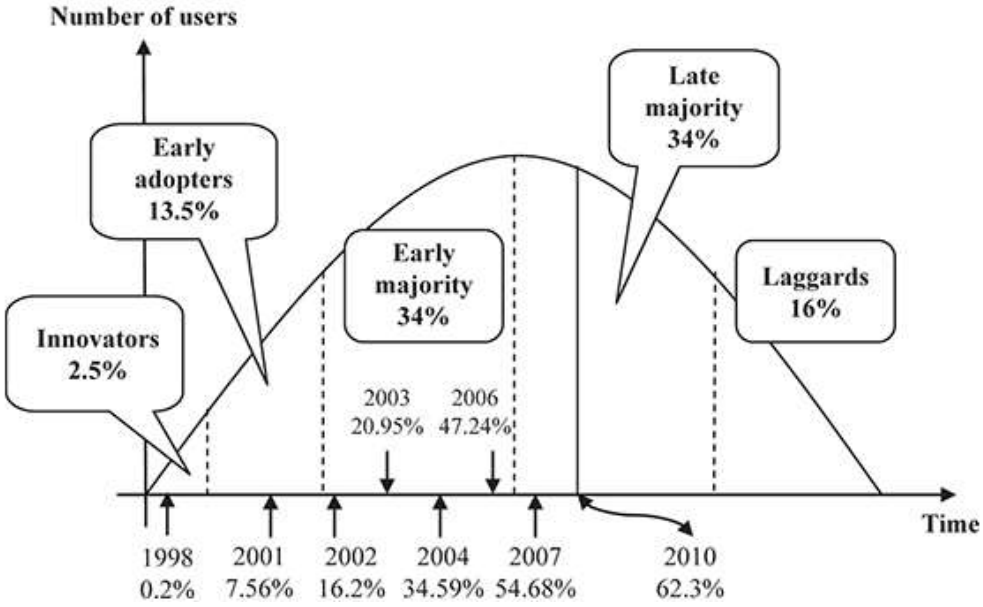


Figure 2.2: Technology adoption lifecycle of the online tax system (source: Liang and Lu, 2013)

In PSOS projects in a developing country, Heeks (2003) states that almost 35 per cent of e-government projects are total failures and only 50 per cent of these projects are partial failures in developing countries. It is important, however, not to assume that all Internet users have the capability of using PSOS projects in all cases; the failure might be from either side, the suppliers (PSOS as a subset of the e-government side) or the demanders (citizens' side). However, there is still no evidence that the citizen has the

absolute right to select traditional government means over online services or PSOS practice (Carter and Belanger, 2005). For this reason, previous studies state that in PSOS initiatives, acceptance, diffusion and success are contingent upon citizens' willingness to use the PSOS online services (Shareef et al., 2009, 2011).

2.7.1 PSOS adoption

In the last two decades, the study of the adoption of ICT by users/citizens has been focused on utilising various technology models by assessing the use of technology in the early stages of the adoption process (e.g. Venkatesh et al., 2003, 2011). With respect to other acceptance models, Technology Acceptance Model (TAM) has been the most frequently utilised model for predicting users' adoption intention of PSOS (Wang, 2002; Venkatesh, 2003, 2011; Kanat and Ozkan, 2009). TAM specified the causal relationships between system design features, perceived usefulness, perceived ease of use, attitude toward using the system, and the actual usage behaviour (Davis, 1993). The most cited model was the "Unified Theory of Acceptance and Usage of Technology (UTAUT)" (Venkatesh, 2003). The UTAUT is another model of TAM and is considered as a robust model in the literature (Sahu and Gupta, 2007). In addition, Carter et al. (2012) used the UTAUT to investigate the use and adoption of an ISR-e-file system. A brief of these studies of PSOS adoption is presented in Table 2.3.

Table 2.3: Literature on PSOS acceptance/adoption (TAM based studies)

Study	Synopsis
Liang and Lu (2013)	A tax-filing systems study in Taiwan. The paper investigates factors that influence the willingness of the public online tax filing services in Taiwan. They emphasise the role of triability and observability as a social role that influences the adoption process. However, self-efficacy has no influence on the adoption intention process. They have recommended a user-friendly system for online services such as tax-filing system in PSOS.
Chan et al. (2010); Teo et al. (2008)	They suggest extending the general theoretical model of technology acceptance and to think differently with respect to the context. They emphasise the role of satisfaction as an appropriate measurement for PSOS success.
Sahu and Gupta (2007)	They examined internal users in the Indian government. They developed and empirically tested the model using 163 participants, testing user intention to accept PSOS.
Tahinakis et al. (2006	Examined the influence of PSOS on Hellenic taxation system in Greece (TAXISnet). Online payment tax creates a socioeconomic environment that satisfies both the government agencies and the tax payers.
Hung et al. (2006)	Based on the theory of planned behaviour, they modified a model that explains 72% of behaviour intention to adopt the system. The study was on Taiwan's online tax filing system.
Chang et al. (2005)	Tax-filling acceptance, study. TAM usefulness proved to be greater impact than ease of use.

Fu et al. (2004)	Tax-filling adoption, Taiwan. Online users are more satisfied than those using traditional system. The online system has more efficiency than traditional system.
Wang (2003)	TAM-based study in Taiwan agency for tax payment. They identified the crucial factor of online services. They identified 15 variables for users' intention to use PSOS. User awareness and trust are crucial for PSOS success.
Wang and Liao (2008)	The study adapted DeLone and McLean's IS success model in the context of G2C (information quality, system quality, service quality, use, user satisfaction, and perceived net benefit). They used the techniques of Structural Equation Modelling (SEM) to examine 119 users of G2C PSOS systems in Taiwan. They found that information quality has a significant influence on satisfaction and usage whereas service quality was not significant.
Venkatesh et al. (2007).	They mentioned that research on individual-level technology adoption has reached its maturity with respect to the IS research field.
Wimmer (2003)	Citizens' capability for self-confidence is a crucial factor for the success in delivering electronic services.
Marche and McNiven (2003).	From a citizen's view of PSOS, major challenges are trust, security, and transparency. These critical issues may influence continuity of using PSOS online services.
The Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003)	The UTAUT presents four core determinants of user acceptance and use (behavioural intention and usage behaviour): 1) performance expectancy; 2) effort expectancy; 3) social influence; and 4) facilitating conditions. The aim of the UTAUT was to understand intention/usage as the dependent variable. Eight theoretical models have been combined in the UTAUT. Furthermore, age, gender, experience and voluntariness of use act as moderator variables in the UTAUT. The uses of UTAUT have been tested in organisational settings. It has been showed significant prediction of usage.
Randeurope (2003)	Personal information is sensitive for an individual. Therefore, citizens may not become involved in PSOS if there is a request for personal information. Hence, the utilisation process might be reduced by citizens in PSOS practice.

In fact, the research stream of acceptance/adoption "has culminated in the unified theory of acceptance and use of technology (UTAUT; Venkatesh et al., 2003) that synthesizes previous adoption models" (Chang et al., 2010: 520). Accordingly, it is important for any PSOS initiative to enhance the relationship between the PSOS agency and the citizens (as the main stakeholders in the present study); more specifically, the adoption levels are subject to each citizen's personal factors (Al-Sobhi, 2012). Furthermore, Venkatesh et al. (2007) argued that research technology adoption has reached its maturity in the ICT stream of research; however, at the same time, there has been much attention on diffusion and adoption if PSOS among ICT researchers (Bélanger & Carter, 2006). We should also consider that the diffusion and adoption processes might be followed by a transformational stage, which refers to working towards re-engineering and e-enabling back-office processes and information systems to facilitate more joined-up citizen-centric e-government services, in particular, PSOS (Weerakkody & Dhillon,

2008); it also could be called t-government for the transformational stage. There appears then to be an acceleration in the growth of adoption by other agencies at the same time, which may lead to integration in PSOS, resulting in changes in the other stakeholders, in particular, citizen expectation and satisfaction (due to the transformational stage).

In the adoption stage, satisfying the whole population is impossible due to differences in their abilities (i.e. self-efficacy toward the uses of ICT). For this reason, people who are unsatisfied with the current services are more unlikely to recommend and visit the government website (Zhang and von Dran, 2000). On the other hand, people who have used the PSOS and are happy with it will certainly recommend it to their friends, colleagues and their social circle. In this vein, Reffat (2003) stated that lack of marketing issues, such as awareness, may act as a barrier in the adoption of PSOS services; for example, in an Internet shopping study, Connolly and Bannister (2008) found an interesting insight in their research, that an individual with technical knowledge is more likely to understand the key features of Internet shopping (e.g. security), and therefore, will have greater confidence and be more in control than someone who has no experience of the Internet. Similarly, this can be applied to PSOS practice because there is shared experience within society of PSOS online services. Reffat (2003) stresses the role of awareness in the adoption stage, as it may act as a barrier to PSOS services. In this manner, one should note that there is a radical change in ICT development due to changes in ICT applications (software and hardware). In this way, understanding the role of current developments in ICT could help in enhancing citizens' everyday lives in the future; however, this cannot be achieved without experiencing PSOS on more than one occasion. Although, previous theoretical works related to technology adoption (e.g., UTAUT; Venkatesh et al., 2003) have explained adoption and technology related issues, no systematic effort to integrate adoption within a theoretical framework that offers several stages of involvement in ICT usage, rather than just initial acceptance, has been undertaken in order to better comprehend the phenomenon. It is important to undertake this from a scientific standpoint (Greenwood, 1974; Gioia & Pitre, 1990; Venkatesh et al., 2011). Furthermore, critics of UTAUT point to the fact that "the UTAUT itself is lacking in that it does not provide for situations where disconfirmation of expectations about key beliefs may occur and, consequently, influence outcomes such as behavioural intention and use" (Venkatesh et al., 2011:529).

In summary, citizen's second perception of service quality in PSOS cannot be investigated in current technology adoption/acceptance studies, as the role of prior experience is omitted in technology adoption with respect to cognitive factors such as outcome expectations. Nevertheless, previous studies emphasised the role of prior experience of ICT in long-term usage intention such as continuance intention (Bhattacherjee and Premkumar, 2004). The diversity in the population targeted for PSOS use shows some variation in perception or cognition as well as skill toward intervention in the whole process while participating in PSOS (Shneiderman, 2000; Zahedi et al., 2001); however, this variation in a citizen's perception of cognition while using PSOS cannot be observed at the adoption stage. In this manner, continuance shared experience can contribute to the citizen's awareness or social influence. The variation of the citizen's ability to use ICT is a challenge to utilising the Internet revolution in the era of globalisation. Kotler et al. (2005), from a marketing perspective, considered ICT to be a tool for integrating the environment, the citizen and the organisation, in which entities can compete, by utilising the Internet. Therefore, satisfaction with the provided PSOS online services could be used as a measurement to assess the level of satisfaction or "marketing impact", based on the immediate situation of the interaction between the end users and the provided services.

2.7.2 PSOS post-adoption

In the PSOS environment, managers need to have strategies in place to ensure citizens' continuous use of PSOS with respect to system integrity (organisational and end-user processes) and their feedback. In this regard, understanding post-adoption is imperative, as highlighted by Jasperson et al. (2005) in order to utilise the functional potential of the majority of the installed ICT applications and the narrow uses of the ICT by users. While such issues must not be discounted, Oliver (1980) proposed a model based on cognitive factors to express consumer satisfaction by thoughtful interpretations of causes and effects. It is believed that this model influences attitude and repurchase intention based on expectation and expectancy disconfirmation or confirmation. Since that time, many studies have been conducted in the private sector (e.g. Bhattacherjee, 2001; Hsu et al., 2004; Venkatesh et al., 2011) and in the PSOS (e.g., Hu et al. 2009; Venkatesh et al., 2011). The idea has been to enhance the understanding of post-adoption as a phenomenon with respect to initial acceptance or adoption.

Based on Anderson and Henriksen (2006), the usage of websites in general, and PSOS websites in particular, can be divided into two stages: 1) initial usage, and 2) continued usage. More importantly, it can be observed that in most cases after 'initial use' of PSOS websites, many users revert to traditional ways of acquiring information and services, such as telephone inquiry, personal visits, and so forth. Table 2.4 below shows PSOS studies that use continuance intention towards behaviour.

Table 2.4: Key prior research on post-adoption studies

Study	**Synopsis**	**Findings**
Venkatesh et al. (2011)	They introduced two extensions to the ECT. They include three predictors from the UTAUT: effort expectancy, social influence and facilitating conditions. Furthermore, they include trust as a key contextual belief in the model. They conducted a longitudinal field study on Hong Kong citizens (N=3159).	The results support the expanded model where it explains the change in the pre-usage beliefs and attitudes towards IS continuance intention.
Chan et al. (2010)	They developed and tested a model of mandatory citizen's adoption of a PSOS technology (smart cards). They identified four external factors derived from a UTAUT model: performance expectancy, effort expectancy, social influence, and facilitating conditions. Four stages have been introduced: market preparation stage (awareness), targeting stage (compatibility and self-efficacy); positioning stage (flexibility and avoidance of personal interaction); finally, the fourth stage, execution stage (trust, convenience, and assistance). (N=1179) in Hong Kong citizens.	There are various variables linked to different stages in order to predict satisfaction with PSOS technology.
Wangpipatwong et al. (2009)	The aim was to examine the PSOS portal quality towards continued use of PSOS. Their model was based on the three quality aspects of the D&M IS Success Model (information, systems, and services). The limitations of this study are:1) the dimensions used to measure information quality, 2) system quality, and 3) service quality are equally weighted. They recommend lower income and education in future research.	By using multiple regression analysis, the results revealed that website quality corresponding to information quality, system quality, and service quality enhanced the continued use of PSOS websites.
Santhanamery and Ramayah (2012).	E-filing system study in Malaysia. Because of the increased number of e-filers, intention to use the system is not enough, based on the adoption process. Post-adoption is encouraged.	They proposed trust as a major challenge for post-adoption stage.
Zhang et al. (2011)	They developed a model based on TAM in China within the academic and governmental context. Managers tend to force the system in the initial stages followed by a sharp decline in using the system.	Compatibility and facilitating conditions are crucial factors in retaining the current users.
Azad and Faraj (2009)	They believe in institutionalising the organisation environment in order to improve online services delivery in PSOS.	They provided generic institutionalisation measures and practice. However, this is a

	The embedded status functionalities in an organisation. The focus is on actor-networkers not end-users.	work-place environment; therefore it is important to understand the embedded services or functionalities in the organisation.
Gefen and Straub (2000)	They examined TAM ease-of-use and usefulness.	Perceived ease-of-use has no influence on the intention to use the website in transaction (purchasing) task whereas usefulness is important when purchasing online.
Bhattacherjee (2001a)	The scope is to identify the antecedents of consumer continuance intentions from customer relationship management (CRM) perspectives.	Satisfaction and usefulness positively influence continuance intention
Bhattacherjee (2001b)	The scope is to identify the differences between acceptance and continuance behaviour	
Gefen (2002)	Examined service quality influence on loyalty	Trust and service quality have a positive influence on loyalty. However, he emphasised the role of switching costs to another online providers

By reviewing previous research into continuity usage, it has been realised that the term "e-loyalty" and the term "continuance intention" have been used interchangeably. It is also important to highlight that Bhattacherjee (2001a) and Parasuraman et al. (2005) are considered among the most influential empirical studies on electronic loyalty (e-loyalty) or continuance intention (Valvi and Fragkos 2012). Indeed, these studies were based on Oliver (1980: ECT). However, in order to retain the current users of the PSOS systems, a specific theory or a model is needed to reflect the dynamic nature of the services and information quality with respect to the user's capabilities and interaction with systems.

Unfortunately, there was no theory or model that measures the dynamic nature of this changeable environment in PSOS practice. A user-centric model is needed in PSOS practice that reflects the quality of PSOS systems by evaluating the service quality and information quality as outcomes of the systems. Most studies in the field of PSOS have focused on the adoption process whereas few have focused on continuity use or usage.

The creation of PSOS systems alone does not mean that the system is utilised by the end user (the citizen in this case), rather, the usage of PSOS in general can be integrated into two stages, namely, "initial stage" and "continued stage". In the initial usage or *adoption* stage, the user may choose not use the PSOS systems and return to the traditional system (Andersen & Henriksen, 2006). Thus, there must be consideration of

the personal experience of the user and also of the time and place while gathering data. The radical change of a system in ICT in general, and PSOS in this case, may influence the services while empirical investigation is taking place. The provided online services and information is embedded with respect to the time and place in empirical investigation (Orlikowski and Iacono, 2001). Accordingly, Verdegem et al. (2010) call for more studies from the demand side because there is a lack of understanding of the user-centric viewpoint. However, in different situations there might be a change in the scales that are used to measure that situation (based on the context), which implies a relationship between the context gaps and the empirical gaps.

In the continuity process, there is interactivity between factors (constructs) based on situational actions. Time, place and selected services should be distinguished from other services with respect to stakeholder type. According to Cooil et al. (2007), both demographic and situational characteristics determine the contextual factors. In this manner, there is a need for a theory that clarifies the situational factors with respect to continuity process and at the same time takes into consideration the citizen (as a user/customer/client) and the PSOS systems provided by the government as an external stimulus for the citizen. Subsequently, the context is vital as it may influence the desired behaviour (Anderson et al., 2008; Venkatesh et al., 2003).

Teerling and Pieterson (2010), in their conclusion, think that there is a need for a new area of research that deals with switching behaviour by providing the citizens with multiple channels. Thus for managers, there is a lack of previous studies in PSOS provision that deal with switching the end users (also can be used for the employees) from the traditional channel to the digital channel. Further, Jasperson et al. (2005) think that post-adoption behaviour would influence technology sense making which by then drives the government to require a change in the technology therefore this would influence the business technology industry in general. Managers (decision-makers in general) would have to rethink the end-user confirmation and disconfirmation consequences of using the current technology. There is a need for more studies in understanding the association of the user learning interventions with the work system interventions after post-adoptive behaviour. This cannot be done without understanding the individual cognition with respect to their differences in the post-adoptive behaviour.

In summary, having reviewed previous studies, there has been insufficient explanation of how PSOS should advance in the long and short run-strategy. There is a lack of

consistent findings that allow both stakeholders (citizen and PSOS agencies) to be more self-reflective or more self-regulated to aid continuance. Furthermore, there has been a lack of managerial explanation for understanding the phenomenon of changing behaviour in the long-run strategy and how this changing behaviour at the individual-level influences the behaviour of organisation as providers of PSOS. The managerial explanation needs to provide more explanation of how to apply the variation of self-reflective process in order to stabilise the work environment on a daily basis.

There are issues with the "why" and "how" questions in order to understand what are going on and how we can apply it. Hence, an empirical study is needed to fill these gaps with respect to individual-level perspectives of PSOS in the long-run strategy such as continuance intention with respect to societal group feelings. This empirical study may contribute to the contextual gap in order to enrich generalizability in the literature for more advanced studies.

2.7.3 The diffusion of ICT in societal groups

Previous studies have considered social influence as a challenge factor (Malhotra and Galletta, 1999; Venkateshand Davis, 2000; Venkateshet al., 2000; Lee et al., 2006); for example, Fishbein and Ajzen's (1975) theory regarding social influence or "subjective norms" has been used in several previous models. Although people may influence each others' attitudes toward a favourable practice, they might perform such behaviour even if the procedure and its consequences are not favourable (Venkatesh and Davis, 2000). In this manner, the outcome expectation of a societal group is vital in order to improve our understating of the attitude toward a certain practice. One question that needs to be asked, however, is whether this practice is favourable or unfavourable, and hence their satisfaction is also required. However, there are considerations that technology adoption as a barrier at the individual level has reached its maturity within the literature of IS research (Venkatesh et al., 2007), "This suggests that pre-usage beliefs may serve as anchors for post-usage beliefs as people tend to rely on their initial beliefs and early impressions in the formation of future beliefs" (Venkatesh et al., 2011: 532).

It is argued that individuals often change their cognitive behaviour to meet the expectations of others or comply with group norms (Fishbein and Ajzen, 1975). This approach is similar to the Karahanna et al. (1999) position, which classified social

influence into two categories: informational and normative. Further, facilitating a relationship with other group members may encourage individuals to cope with the change of a group behavioural norm (Goodwin, 1987) as recognition observation. In this vein, Kelman (1958) emphasised the role of identification in which it leads individual to copy others' behaviour by observing them through an internalisation process. Table 2.5 below shows selected social research with respect to PSOS studies.

Table 2.5: Social research themes within PSOS studies

References	Synopsis
Barnes (2009)	Faith such as religion may influence the use of Internet.
Gold and Prince (2008)	People with low income and education use the Internet more than those with higher education and income..
Venkatesh et al. (2003; 2008).	In their Unified Theory of Acceptance and Use of Technology (UTAUT) study that assesses technology acceptance from the organisational level, they theorise that facilitating conditions and social influence determine behavioural intention for an individual
Jones et al. (2007)	They argue that the social aspect must be included in PSOS evaluation model to improve understanding of PSOS impact. .
Vicente and Lopez (2006)	In the European Union (EU), inequalities in social and economic factors are the reason for digital divides between nations.
Weerakkody and Choudrie, (2005)	They emphasise the role of advertisements in awareness among citizens, therefore, marketing has a great influence.
Reffat (2003).	Awareness is crucial for PSOS practice. Therefore, lack of it may act as a barrier.
Venkatesh and Brown (2001)	Media (e.g. newspapers) may influence individual behaviour toward technology adoption.
Bandura (1986).	Social ties and communications can influence the diffusion of new innovation and the resources associated with it. People live together in this world, therefore, they can observe and learn from the success and failure of other people and select their way based on this experience. Thus, it is critical to make a distinction between the impact of widespread adoptions on the social level and the psychological factors.
Mahajan and Peterson (1985)	They claim that the peer effect has an influence on the Internet usage (e.g. word-of-mouth) in transferring the information.
Rogers (1983)	Rogers's diffusion of innovation (DOI) model categorises adoption into five groups: 1) Innovators; 2) Early adopters; 3) Early majority; 4) Late majority and 5) Laggards. Not surprisingly, the percentage of innovators is only (2.5%) of the whole group, those innovators can act as a model by giving others the opportunity to observe and oversee the subsequent uses of PSOS.

2.8 Service Quality

Service quality can be offered through traditional service (face-to-face) or through online applications like Internet services. In PSOS practice, there are many agencies

and many services with different aspects (e.g., healthcare, driving licence renewal, education, etc.) each of which has its own context and timescale. Therefore, DeLone and McLean (2003) emphasized the effects of these variations while measuring the contextual variance in an empirical investigation. The type of the system and to whom it may be applied influences the evaluation process (Seddon et al., 1999). Although it is important to discuss the three quality dimensions (system, information and services quality), as DeLone and McLean (2003) emphasized, the current study is focused only on information and services quality.

2.8.1 Traditional service quality

Traditional services quality (SERVQUAL) refers to all non-Internet-based users Parasuraman et al. (2005). However, there was a suggestion that traditional users compare the traditional service quality with their feelings or opinions about what that company offers (Parasuraman et al., 1985, 1988, 1991). The SERVQUAL scale measures (reliability, responsiveness, assurance, empathy, and tangibility) have been used in many previous studies to measure service quality. Having considered SERVQUAL together with traditional services, it is also reasonable to consider SERVQUAL with electronic services (through considering Internet-based users). In this case, new items should be introduced and those items relating to non-Internet-based aspects should be removed; for example, how should we represent tangibility in electronic services? Furthermore, how should we measure empathy with people when delivering the services? More importantly, the interaction in electronic services is mostly with the systems rather than with people; hence, the service variations in the system or the web design create different opinions and feelings, which in turn impact on the user's satisfaction. Thus, in PSOS online services, segmentation plays a large role in how people perceive online services; consequently, prior experience leading to positive or negative feelings of how people perceive online services should be embraced (Parasuraman, 2000).

Given, the current high-profile debate with regard to private and public sector users on the one hand and traditional services and electronic services on the other, it is quite surprising that in the private sector, the users are called "customers", "clients" or "consumers", whereas in the public sector they are called "citizens" or "residents". However, Osbourne and Gaebler (1992) stressed that citizens should be treated as

customers. As a result, PSOS delivery should be redesigned with a focus on citizens as customers. In this manner, Mintzberg (1996) distinguishes the role of citizens from customers and clients because citizens have rights besides duties and they might be forced to respect the law or suffer the consequences (e.g., paying tax or driving licence renewal).

Although SERVQUAL (Parasuraman et al. 1988) served the traditional services context (e.g., customer-employee and employer-employee) in the last two decades as a global assessment model, ICT (e-service) research assessment significantly differs from traditional services interaction assessment (Parasuraman et al., 2005). In this regard, the following section will explain in more detail the role of electronic service context (citizen as a customer versus employee as an organisational interaction).

2.8.2 Electronic service (e-Service)

Electronic service (e-service) in general is a user experience and how citizen perceives the new e-services or system, in the PSOS is an experience of PSOS (Yang and Jun, 2002) based on adopting new systems as explained by Davis (TAM, 1989). However, communication with end users establishes self-confidence between the user/citizen and the online service (Yang et al., 2005). As a result, previous experiences and self-efficacy can influence the perception of citizen's satisfaction and expectations towards using PSOS (Chan et al., 2010). In this way, there is a potential to provide citizens and businesses with better and more efficient services by the use of ICT that the government offers as a facilitator. Nevertheless, there has been criticism regarding the provision of PSOS, which proposes a more user-oriented approach and more focused on users' needs as a centre of focus for the improvement of electronic public services performance and the impact of new services on the public e-services (Verdegem and Verleye, 2009).

According to Gilbert and Balestrini (2004), service quality is one of three main approaches that have theoretical and empirical bases for adoption and they are; 1) diffusion of innovation (DOI), (Rogers, 1995); 2) extension of existing theory to technology such as the Technology Acceptance Model (TAM), (Davis, 1989), and, 3) applying the Theory of Reasoned Action (TRA). Hence, service quality is a move from one-way communication to communication among countries all over the world (Layne and Lee, 2001). Based on DOI and TAM the number of Internet users is increasing,

therefore, meeting their expectations is not an easy task with the rapid technological development that requires training. Nevertheless, developed and developing countries have established their own official websites that offer different online services such as online transactions and renewing driver licences (Moon, 2002). However, if the provided PSOS service does not match citizens' self-benefit it would be difficult to continue using it (Wescott, 2002). In this respect, evaluating continuity is vital in order to match the variations of citizens' self-benefit in a changeable environment. In short, there is a need to identify PSOS environmental factors with respect to citizens' needs. A theory should represent the role of environmental factors and their influences on personal factors (with respect to behavioural factors).

Moore and Benbasat (1991) consider lack of a theoretical foundation for the adoption of information technologies research as a major cause of mixed and inconclusive outcomes. In their research, they tap respondents' reactions in an "initial adoption" environment and they highlighted the role of compulsory and voluntary adoption factors as a significant issue. Their focus was on the perceived characteristics of innovations because they believed that the primary characteristics of innovations have been inconsistent. Thus, to reach such consistency, an individual or organisation has to interact several times with each other in order to shape their course of action based on satisfaction with what is delivered by the innovation and the desired outcome of the user. The study relied on Rogers' (1983) general attributes of innovations: relative advantage, compatibility, complexity, observability and trialability. Hence, how PSOS is perceived is influenced by traditional systems at the initial stage of adoption (i.e. email vs., fax uses in traditional systems) or how difficult is the innovation comparing with their self-efficacy and how others think about it. Table 2.6 provides selective studies of organisational research with respect to service delivery (G2C).

Table 2.6: Key prior research on online services quality

References	Synopsis
Reddick & Roy (2013)	In examining the perception and use of PSOS by businesses in Canada only 13.3% of businesses utilised the PSOS project as an initial contact channel for service delivery. There is a need for a regulatory change from the stakeholders (citizens, government, and business).
Delone and Mclean (1992)	In order to assess IS performance, Delone and Mclean identified six critical factors of IT performance and they are: system and information quality; user satisfaction; individual and organisational impact as well as the actual use
UNDESA (2003)	The increased use of ICT in all countries indicates that there is an increase in government expenditure on ICT within government public agencies. This is an implication on how PSOS is diffused in all

	countries in the world.
Allen et al. (2001)	The challenges of PSOS are far beyond technological related issues. There is a need for organisational structure, skills, new forms and leadership. The transforming process requires interactions among citizens, public and private sectors as well as social style.
Gupta and Jane (2003)	There is a need to overcome current organisational culture in order to utilise the digital world. A competent present performance may act as a barrier to PSOS practice. This may lead to undermining the role of PSOS practice and therefore providing a low level of quality.
Choudrie et al (2004)	Emphasise the role of PSOS as a facilitator and link the PSOS performance to the PSOS role as a facilitator.
Haftez and Warner (2004)	There is political control over ICT resources distributions. This conflict may lead to variations in quality based on the power of government agencies. .
Li (2011)	Empowered public would enhance the relationship between the public and the government. This would increase the organisation side satisfaction as it is crucial for decision makers.
Zarie et al. (2008)	Training workers is crucial in the organisational side so that they can be more effective for PSOS change. Hence, those workers are citizens at the same time and have a social circle.
Heeks and Davis (1999)	There is a shortage of awareness among middle and top management and politicians in IT skills.
Li (2011)	Transparency and decision-making satisfaction are critical factors for decision makers. Satisfaction can be an indicator of citizens-empowerment and a sense of how good is the relationships between the government and the citizens. Satisfaction is an indicator of being in control for both citizens and government (self-regulated progress). An increase in satisfaction could help to increase investments in on-line services.
Morgeson et al. (2011); Karavasilis et al. (2010)	Trust and citizens' confidence in future performance are crucial. PSOS as a technology has the potential to increase the citizen's confidence in the agency's performance while experiencing the online service which leads to higher satisfaction
Lee & Ahn (2011)	Transactions increase willingness to adopt PSOS applications. A high quality service is a driver for a citizen to adopt an online service. Trust has no influence on satisfaction of prior experience.
Teerling and Pieterson (2010)	The power of mass communication to transfer information from government to citizens is an important factor. Communication has a great influence on citizens' satisfaction in digital services. There is a need for marketing in PSOS technology practice if we wish to increase the online usage of PSOS.
Floropoulos et al. (2010)	Information, system and service quality as constructs are key factors. (Based on DeLone and McLean 2003). The results provide strong evidence between DeLone and McLean (2003) and user satisfaction.
Liu et al. (2010)	Measured user perceived service quality. They found that privacy and security are crucial for satisfaction while measuring online services. This study focused on measuring user evaluation of using online auction services.
Ho et al. (2010)	User experience of short message service technology is a key factor. Time is crucial for comparing the traditional methods with digital methods in communication in the public sector. This is crucial for informing the public about new policy announcements. Hence, satisfaction might be raised in PSOS provision.
Saha et al. (2010); Hu et al. (2010)	They emphasise the role of satisfaction and support services. According to the 425 users in Sweden who participated in the survey, website support is more important than privacy. They relate satisfaction with eService quality. Hu et al., (2010) supporting this by investigating 1,600 agencies in Taiwan. They found that satisfaction is related to support services as a strong predictor.

Verdegem et al. (2010)	The focus is demand-side (user-centric focus). User's perception of eService is crucial. They emphasise the role of contextual variables and satisfaction and the relationships between them. They look at the user rather than government when evaluating the online services of the PSOS systems.
Chan et al. (2010)	The consequences of mandatory adoption of technologies are crucial factors. Technologies adoption variables can be used as a prediction of citizens' satisfaction in PSOS technology.
Hu et al. (2009)	Security and convenience are key factors. In a longitudinal online survey of 518 participants in eTax services in Hong Kong, they found that both security and convenience are crucial for user satisfaction.
Verdegem and Verleye (2009)	Security/ privacy, content and usability are key factors. From a user-oriented view, citizens' needs and expectations are crucial when measuring user satisfaction of PSOS services.
Lai and Pires (2009)	Information quality, system quality and social influence are crucial factors for measuring quality. With 464 online citizens in Macao to test PSOS portal acceptance, they found that information quality, system quality and social influence are important factors that influence satisfaction. However, perceived effectiveness has no influence for the success factors of user satisfaction.
Bhattacharya et al. (2012)	Large investments have already been made in ICT infrastructure and a continuous effort is being made at the strategic level to reform the service delivery model. However, outcomes of these reforms and restructuring have not been very encouraging as there is gap between design and reality
Papadomichelaki and Mentzas (2009)	The study highlights six factors of PSOSquality model, "e-GovQual": 1) Ease of use; 2) Trust; 3) Functionality; 4) Reliability; 5) Content; and 6) Organisational support.
Wangpipatwong et al. (2009)	Quality of systems, services and information can be used as a determinant for continued use of PSOS online services.
Gupta et al. (2004)	Merging traditional systems with digital systems in PSOS practice can meet citizen's needs.
Sung et al. (2009)	Six dimensions have been proposed for PSOS portal: 1) Reliability, 2) Responsiveness, 3) Information and 4) Systems quality, 5) Website design and 6) Personalisation.
Kanat and Ozkan (2009)	They emphasise the role of trust as a critical factor towards PSOS. They also recognise the role of citizens' skills in enhancing PSOS adoption process.
DeLone and McLean (1992)	Their 1992 model motivates the use of IS in an organisation. They only introduce information quality and system quality as determining factors towards use or intention of use and use satisfaction of the organisation system. The ultimate yield is net benefits at both individual and organisational level.
DeLone and McLean (2003)	They updated the 1992 model by adding services quality. They emphasised the role of context.
Parasuraman et al. (2005)	They proposed the E-S-QUAL and E-Rec-Qual measurement of services quality.
Wang and Liao (2008)	They validate the D&M IS success model in a study based on Taiwan citizens (G2C). They identified six dimensions: information quality, system quality, services quality, use, user satisfaction; and perceived net benefit.
Rocheleau and Wu (2005)	They emphasise the role of website transaction as a cost reduction and as a mechanism to improve performance.
Gilbert and Balestrini (2004).	Found that trust, financial security, relevant, accurate and updated information are major barriers
Loiacono et al. (2000) WebQual	They identified 12 dimensions for web site rating and they are as follows: informational fit to task, interaction, trust, response time,

	design, intuitiveness, visual appeal, innovativeness, flow-emotional appeal, integrated communication, business processes, and substitutability. Although the researchers focused on website quality, they recognised the important role of interaction with the end user.
Barnes and Vidgen (2002) WebQual	Developed a site's quality scale with five dimensions: 1) Usability, 2) Design, 3) Information, 4) Trust, and 5) Empathy. The survey's respondents were university students and staff.
Yoo and Donthu (2001) SITEQUAL	They have developed four dimensions of site quality measurement: 1) Ease of use, 2) Aesthetic design, 3) Processing speed, and 4) Security. Data were gathered from students.
Connolly et al. (2010)	They proposed E-PS-QUAL, a modified version of the E-S-QUAL instrument, which is designed for public sector online services. E-OS-QUAL emphasises the role of ease of completion. However, they have excluded the role of loyalty intention and compensation. Their paper examines the quality of the PSOS provided by the Irish Revenue Commissioner's tax filing and collection system, Revenue Online Service (ROS). They recommend focusing more on communicating the functionality of the PSOS.

Although, previous researches in e-service quality have provided insights into service quality criteria in general, and e-services in particular, additional research on this topic is required, especially with the recent dramatic changes in ICT; this may reflect different users' perceptions over time. So far, there has been a lack of rigorous key metrics for the performance of PSOS applications from the citizen's perspective, i.e. with respect to systematic and psychometric measures (Lin & Hsieh, 2011).

Having considered this new context of e-service, it is also reasonable to redevelop conventional service quality assessments to meet e-service end-user expectations. Most previous empirical study instruments have examined specific Internet measurements (see Table 2.6). However, the interactivity between citizens and an organisation in the e-service context requires more sufficient systematic and psychometric measures with respect to the generalisability of such scales (e.g., website and online satisfaction). A major problem with these kinds of website/online service application measures is a lack of synthesising customer criteria within e-service applications, such as personal variables/traits (e.g., personal outcome expectations and self-efficacy). To date there has been little agreement on what real value to citizens PSOS could offer in being more citizen-centric (Zhao, 2010); for example, Connolly et al. (2010) combined perceived value, loyalty intentions and website service quality items to form a new construct called "perceived public value". The Connolly et al. analysis does not take account of convergent validity, nor do they examine discriminant validity (see Hair et al., 2010). The four combined items (including items added by revenue officials) could differ based on user attitudes and intention to use (see Fishbein and Ajzen, 1975).

Asubonteng et al. (1996), defined service quality as the difference between customers' expectations of service performance prior to the service encounter, and their perceptions of the service received; hence, there should be clear distinctions among customer expectation, service quality, intention to use, social influence and satisfaction (see Oliver 1980, 1993; Bhattacherjee, 2001). In such cases, expectation could be the expected value rather than service performance, satisfaction or intention to reuse. Despite this criticism, each of these theoretical positions makes an important contribution to enhancing our understanding of personal factors towards specific behaviours, based on Bandura (1986; SCT). In this manner, there should be a clear distinction between intrinsic (e.g., outcome expectation) and extrinsic (e.g., satisfaction) motivational factors. An analysis based on a strong theoretical model is required to enhance our understanding of PSOS as a subset of e-government as a global phenomenon.

2.8.3 E-Service quality key metric

There has been a notable increase in recent studies that discuss user satisfaction in e-service quality studies as a key metric (Cohen, 2006). The term "satisfaction" has been defined as, "ultimately a state experienced inside the user's head" based on Tessier et al. (1977: 383). In this regard, satisfaction can be considered as a cognitive factor or it might be considered as an intellectual and emotional expression (Tessier et al., 1977), personal feelings toward a certain factor based on a situation (Waxim and Todd, 2005) or a feeling after a certain experience (Oliver, 1993).

It could also be said that satisfaction is not enough as a key metric for ECT assessment. In this vein, Wang et al. (2005) suggested that "return on investment" is yet another key metric of service quality research; however, the citizen's perception of PSOS online services should be considered as a critical element from the perspective of competitive advantage for an organisation. In this respect, to be able to understand e-service key metrics, understanding service quality is necessary for ICT measurement effectiveness (Pitt et al., 1995); however, measurement without including service quality might be misleading for ICT in general and for PSOS in practice.

In general, there is a tendency for services to be more intangible compared to manufactured products or goods (Zeithaml et al., 2006). For this reason, services can be

subject to variations from time to time; however, in PSOS, "Satisfaction with PSOS can be defined as the ability of citizens to get the information they desire and have a service experience that solves their problems" (Reddick and Roy, 2013: 2). In this manner, the quality of information and services in PSOS can be used as a key metric; however, these two key metrics are subject to the radical changes in ICT. To be able to understand the role of information, systems and services in the ICT field, the updated D&M IS Success Model provides insight into these dimensions. The updated D&M IS Success Model emphasises that service quality is the overall support that is delivered by the service provider; this applies regardless of whether this support is delivered by the ICT department, a new organizational unit, or outsourced to an Internet service provider (ISP) (DeLone and McLean, 2003: 24). In this vein, there should be a task to assess. As a result, when citizens accomplish a task in PSOS, it increases their level of satisfaction and encourages further use (Cohen, 2006). Furthermore, previous research indicates that user satisfaction is an appropriate determinant in a mandated environment such as PSOS practice (Brown et al., 2008); for example, Welch et al. (2005) examined the factors which led to citizens' satisfaction with PSOS and found that PSOS satisfaction is related to website use and positively associated with trust which eventually influences continuance intention and satisfaction. In addition, Hu et al. (2009) examined the effects of both service and technology characteristics on service quality of e-tax services and found that security and convenience are major factors influencing service quality. Indeed, Xu (2009) asserted that the final target of PSOS is providing consummate and convenient service for the public, thus using public satisfaction to evaluate the service quality of PSOS is a vital factor for success. It is also important to highlight that Kotler et al. (2005) consider ICT as a tool for integrating the environment, citizen and organisation, in which entities can compete by utilising the Internet. In this way, it is reasonable to look at personal factors (as a key metric) besides environmental factors (as another key metric) with respect to any specific behaviour. In fact, such behaviour could help explain the variations in perception or cognition as well as skills while participating in the PSOS process (Shneiderman, 2000; Zahedi et al., 2001); however, many of these studies have been applied on the business environment, which is a voluntary system.

Conversely, it is also important to highlight the role of the e-services key metric in the mandatory use of a PSOS system; for instance, Chan et al. (2010) employs the UTAUT model with mandatory use and adopted satisfaction as a dependent construct in their

model. However, in a mandatory system, Brown et al. (2002) found that there was no relationship between user's attitudes toward using the mandated system and users' intention to use the system. Brown et al. (2002) think that users' intention to use the system is related to other beliefs rather than beliefs about the system. Chan et al. (2010) found satisfaction to be more relevant for an organisation to focus on; therefore, Chan et al. (2010) proposed user satisfaction as a dependent variable and not behaviour intention to use in their model. The variables were separated into external and core technology variables. The core variables were identified as performance expectancy, effort expectancy, and social influence and facilitating conditions, where all of these influence satisfaction. Chan et al. (2010) examine how marketing can influence satisfaction in new technology adoption; however, their study ignores the influence of prior experience on satisfaction. In this respect PSOS is seen as a mechanism for government agencies to reduce the cost and time for citizens to access their services by improving efficiency and effectiveness (West, 2004). However, there is a question to be asked regarding the need for satisfaction in a mandatory environment: do we really need to satisfy the citizen when the system is mandatory? Or do we need to ensure that the user is able to use the system before forcing them to use it? Such questions raise the importance of self-efficacy or the ability to use the system with respect to the radical changes in the ICT environment.

Compared with traditional systems, citizens in developed and developing countries are reluctant to use PSOS online services (Carter and Bélanger, 2005). Other studies emphasise the role of citizens' willingness to use PSOS online services with respect to acceptance and diffusion of PSOS initiatives (Shareef et al., 2009, 2011). Thus, it is necessary to have significant research and develop models of service quality so that the advantages of e-service can be explained to citizens. An existing literature review on e-service of government portals shows that most studies are conceptual and based on theories of management (Alanezi et al., 2010). Although SERVQUAL (Parasuraman et al., 1988) has been used as a measurement for service quality in the last two decades for the private sector, research has found that the introduction of ICT significantly differs from traditional service quality (Parasuraman et al., 2005). Previous research shows that there is a tendency among users to embrace new technologies; however, overall feelings about technology influence this tendency in the form of positive or negative feelings (Parasuraman 2000).

Understanding the fluctuation of the citizen's prior experience would reflect the situation of the present quality in general. With regard to PSOS, Wangpipatwong et al. (2009) stressed the role of citizen's education, knowledge and experience with respect to service quality in PSOS. Thus, there was a need to add service quality to the DeLone and McLean model of IS success (D&M IS Success Model; DeLone and McLean, 2003) besides the recommendations of previous researchers; for example, for IS to be up-to-date is important and considered as tangible, and when IS is modified to the user's best interests, it is considered as empathy. DeLone and McLean (2003: 23) state, "use" must precede "user satisfaction" *in a process* sense, but positive experience with "use" will lead to greater "user satisfaction" in a *causal* sense. Similarly, increased "user satisfaction" will lead to increased "intention to use", and thus, "use". Therefore, further work is needed with respect to citizens' perception of the PSOS online services from continuity based experience in order to understand the feedback loops. Furthermore, from a continued use perspective, Connolly et al. (2010), in their conclusion, suggested that perceived public value (which emerged from website service quality, perceived value and loyalty intentions) and ease of completion are the most important predictors of continued use in PSOS. However, perceived value should be explained more with respect to who gains this value, the citizen or the organisation?

With respect to perceived value, there is a suggestion from previous scholars that service quality relates to the customers' feeling of what should be offered by a company (e.g., their expectations) and the actual service performance (Parasuraman et al., 1985). In another study, Parasuraman et al. (2005) mentioned that web presence is not yet enough of a driver for success, and that, therefore, service quality is vital in order to meet the citizen's expectations and how they feel toward the provided online services. Hence, perceived value can be interpreted with respect to the citizen's feelings and outcome expectations towards specific behaviour, rather than summing different factors in one construct and calling it "perceived value"; for example, "When consumers could not complete transactions, products were not delivered on time or at all, e-mails were not answered, and desired information could not be accessed, the viability of Web channels was jeopardized" (Parasuraman et al. 2005: 213). Hence, there is a possibility that this danger can be applied in PSOS practice. However, a considerable amount of literature has been published on PSOS online services. These studies measure service quality; for example, Parasurman et al. (2005) E-S-QUAL and E-RecS-QUAL is widely used in different applications for measuring online services. In general, service quality

is considered to be a vital key metric factor for both government and citizens (Srivastava, 2011). Indeed, the Gorla et al. (2010) results show that service and information quality have been identified as the most influential variable, followed by system quality; however, the radical changes in ICT may result in inconsistency in citizens' perceptions of PSOS on a continuance basis.

2.8.4 The discrepancy of service quality

There are potential negative outcomes of the provided services; therefore, previous researchers agree that expectations and performance have to work together; for example, Lewis and Booms (1983) mention that delivering quality services must be consistent with what is expected by the customer because meeting customer expectations is considered to be a measure of whether or not the customer is satisfied with the current service. Therefore, the citizen's perception of PSOS quality is measured through comparing it to what was expected. In fact, "the construct s*ervice quality* has been defined as the degree of discrepancy between customers' normative expectations for service and their perceptions of service performance" (Gorla et al., 2010: 213). There is also, however, a further point to be considered with respect to the "tangibles" as a construct. Previous researchers have excluded the tangibles dimension due to low reliability in ICT-adopted service quality assessment (Pitt et al., 1995; Kettinger and Lee, 1997; Carr, 2002; Gorla et al., 2010). It is also, however, reasonable to draw a distinction between tangible product *goods* and intangible product *services* while delivering PSOS. In this manner, any tangible product that is related to PSOS should be excluded when evaluating PSOS.

March (1982) mentioned that there is uncertainty in PSOS practice, as there might be a conflict between self-interest and organisational benefits of change; hence, their outcome expectation may differ and lead to a mismatch. However, knowing what citizens expect from the government when delivering PSOS can be used as a key for future services. Citizens' expectations (as customers) are crucial for enhancing PSOS online services because they bring their experiences with them and this enriches the service experience; on the other hand, citizens' perceptions are subjective assessments of actual service experiences (Parasuraman et al., 1985; Zeithaml et al., 2006). The customer gap (as shown in Fig. 2.3 below) is the difference between citizens'

expectations (e.g. what they believe the system should do) and their perceptions of the provided online services.

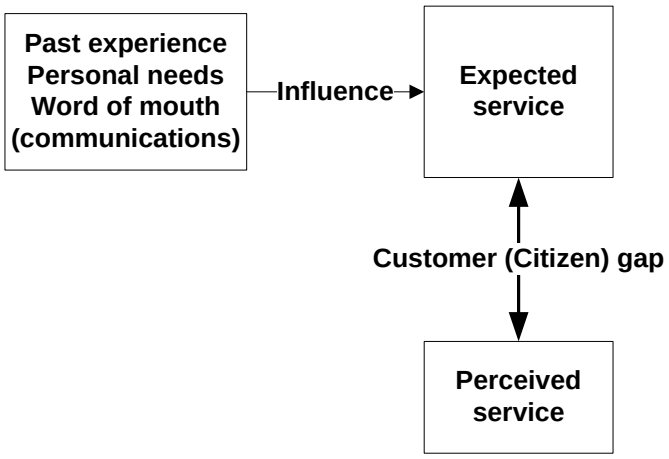


Figure 2.3: The Customer (Citizen) Gap (source: Parasuraman et al., 1985)

In this respect, satisfaction with services in general can be related to confirmation or disconfirmation of expectations (Smith and Houston, 1982); however, a lack of knowledge of what citizens expect in PSOS online services might lead to a lack of identifying and providing appropriate services, quality design and standards. Subsequently, suitable action when responding to citizens' complaints is vital for service recovery (Gronroos, 1988). As a result, altering the negative attitudes of dissatisfied customers through addressing negative complaints is crucial, and ultimately retains those citizens (Miller et al., 2000). It is, however, important to note the limitations of acceptance/adoption in this manner; hence, it can be argued that rather than acceptance/adoption measurement, continuance intention to use is more appropriate for observing any discrepancy in service quality. To support this, Michel et al. (2009) asserted that continuance recovery is vital for an organisation to identify dissatisfied citizens through responding to complaints by providing a better e-service quality and by restoring citizens' satisfaction. Accordingly, interactivity with citizens may produce favourable behaviour through compensation or offering apology, empathy, speedy recovery (Ozgen and Kurt, 2012). Thus, a self-regulating system through self-reflective processes is necessary for locus of control attribution in various situations; therefore, it is vital to maintain positive service quality perception through observation procedure (Weiner, 2000). However, it can also be said that maintaining positive quality requires continual observation procedures.

DeLone and McLean's IS success model is critical when measuring the success of public service delivery through the official portal of the government. A higher quality service would increase the satisfaction measurements and create positive emotions (Clark and Isen, 1982). Nonetheless, if the PSOS provided does not match the citizens' own expectations in using such services, it is unlikely that citizens will continue to utilise PSOS (Wescott, 2002). It is important here to distinguish between job performance (efficiency and effectiveness, as associated with using computers) and personal performance at work; "Personal outcome expectations relate to expectations of change in image or status or to expectations of rewards, such as promotions, raises, or praise" (Compeau et al., 1999: 147) with respect to general outcome expectancy. However, Bandura (2001: 10) related performance to the outcomes that an individual expects based on a certain action; "The likelihood that people will act on the outcomes they expect prospective performances to produce depends on their beliefs about whether or not they can produce those performances" (Bandura, 2001: 10). In other words, a personal outcome expectation does not necessarily have to be related to an employee-at-work environment (e.g., upgrading position); personal outcome expectations may relate to the traditional citizen outside work (e.g., completion of a paper process for a given procedure in a government agency), which is the focus of the present research.

2.8.5 Previous quality models

Recent developments in the ICT field have heightened the need for quality as a measurement; however, quality has different definitions, for example, Reeves and Bednar (1994) defined quality in an organisation as a value, a confirmation of specifications and as meeting customer expectations. The current study focuses on G2C from a citizen's perspective; more particularly, on citizens' expectations, as a measure of the quality for an organisation's services. Earlier studies have listed some previous academic researchers who have developed scales to evaluate service quality models (e.g., Bhattacharya et al., 2012; Parasuraman et al., 2005; Connolly and Bannister, 2008; Connolly et al., 2010); for example, Loiacono et al. (2000) developed the WebQual as a scale that rates websites based on 12 dimensions. These dimensions include: informational fit to task, response time, design intuitiveness, trust, interaction, visual appeal, emotional flow, communication integrity, and business processes and substitutability. The WebQual scale (Barnes and Vidgen, 2002) likewise offers an

index of a site's quality according to the perception of customers and how they rate it. This index has five dimensions as follows: trust, empathy, usability, information quality and website design. Furthermore, SITEQUAL (Yoo and Donthu, 2001) is a scale with nine items divided into four dimensions as follows: ease of use (well-known TAM measurable variable), aesthetics, security, speed, and website design. Moreover, Szymanski and Hise (2000) used an online survey to seek customers' perceptions about products using a scale of design quality and security in order to assess customers' perception about financial information related issues. In order to sort tasks, Wolfinbarger and Gilly (2003) used the eTailQ scale for online and offline group focus. The scale has 14 items covering website design, which deals with customisation with respect to customer preferences and product selection; reliability, which assesses how likely the system is to fulfil their requirements based on their orders; trust in the website, which is concerned with how the system is secured and protects their privacy; and customer services, which concerns the effectiveness of solving customers' problems through online inquiries.

However, other researchers suggest that PSOS portal presence may be considered as moral support for citizens; however, the presence of the portal does not guarantee citizens' satisfaction, and therefore, other factors are crucial for attaining this (Verdegem and Hauttekeete, (2007). Thus, usability, security, privacy, quality of contents, ease of use, cost effectiveness, transparency, and responsiveness must also be included. Jun et al. (2009) therefore proposed E-G-S-QUAL (22-item-scale) and E-G-RecS-QUAL (10-item scale based on E-S-QUAL and E-RecS-QUAL, with 3 dimensions: contact, compositeness and compensation). More importantly, Papadomichelaki and Mentzas (2009) conceptualised a PSOS quality model through e-GovQual, by proposing six factors including ease of use, trust, interaction with environmental functions, content and support. Again, Sung et al. (2009) and Alanezi et al. (2010) shared the same dimensions: website design, reliability, responsiveness, personalization, information quality and system quality. However, it is also important to highlight Wangpipatwong et al. (2009), who emphasised the role of service quality as well as system and information quality in ensuring the continuity of PSOS in Thailand. Similarly, Connolly et al. (2010: 658), in their conclusion, suggested: "two new constructs, Perceived Public Value and Ease of Completion are the most important factors influencing users' perceptions of public sector service quality and are good predictors of continued use". In this manner, the researcher concludes that personal

outcome expectations (represented by perceived public values and ease of completion), services quality, information quality and satisfaction are the factors influencing the citizen's perception of PSOS with respect to continuance use.

2.8.6 Citizens' expectations of services

There is a large volume of published studies describing the role of satisfaction; however, the ECT model (Oliver 1980, 1993) is considered to be the dominant conceptual model (Kristensen et al. 1999) when comparing post-purchase with pre-purchase expectation of a service (Kim, 2012). However, Bhattacherjee (2001b) represented expectation (ex post) as perceived usefulness (ex post) in the post-acceptance model. In addition to that, Bhattacherjee (2001b) illustrated expectation as a belief, or some beliefs, in which ease of use and usefulness can be included in expectation because expectation from a theoretical view is a broader construct; hence, there is a chance that expectation may involve some other measurable variables. One question that needs to be asked, however, is whether expectation relates to an organisation's perceived value of a service or whether it relates to the citizen's perceived value of that service; hence, the level of analysis is vital in this area. In the present study, it is important to emphasise that previous approaches have failed to take personal outcome expectations into account. Indeed, one of the findings in Connolly et al. (2010) showed that ease of completion was considered to be one of the most important dimensions of website service quality as it influenced ROS users' perceptions of value. However, in another study, any increase in one's sense of accomplishment is considered to be a personal outcome expectation that positively influences usage (Compeau et al., 1999). The aim of the present study is to evaluate PSOS from the citizen's perspective. Hence, there is an overlap in using this definition (i.e., perceived values and expectations) which is the right body to define value, is it the citizen or the organisation? Accordingly, the researcher stresses the role of personal outcome expectation for a traditional citizen as part of perceived public value (combined perceived value, loyalty intentions and website service quality items), which is, however, considered to be a broader definition, as explained by Connolly et al. (2010). Furthermore, an individual is more likely to adopt a behaviour that is believed to bring valued outcomes to them as a result of their actions that emphasises the role of prior experience (Bandura, 1986; Compeau and Higgins, 1995b). The main weakness of previous studies is the failure to address how to make a distinction among personal

factors (e.g., expectation and satisfaction), environmental factors (service quality and people influence or social influence) and behavioural factors (intention to use or usage). Hence, it is important to notice that an individual's behaviour is a reciprocal causation process with personal factors and environmental factors (Bandura, 1986); in fact, there is a vital need for a theory to explain such merits in a logical order.

In general, a user-oriented approach has suggested that in order to measure user satisfaction of PSOS services, citizens' needs and expectations towards PSOS are essential considerations (Verdegem and Verleye, 2009). There is a higher level of expectation on the part of citizens in the public sector toward increasing the service quality offered through any PSOS portal, compared with the traditional channels (Schellong and Mans, 2004). However, the relationships between government and citizens cannot be examined without action on the part of the citizen. In this respect, Social Cognitive Theory (SCT) holds that "outcome expectations about the consequences of behaviour are a strong force guiding individuals' actions" (Compeau and Higgins, 1995b: 122). In addition to this, Expectation-Confirmation Theory (ECT) holds that there is a positive correlation between expectation and satisfaction (Oliver, 1980, 1993). Similarly, expectancy is perceptually a catalyst of human motivation, as it is the perception that one's efforts possibly leads to an achievement of the desired result which is rooted in an individual's past experience, self-efficacy, and perceived difficulty of the assigned task (Scholl, 1981). In this manner, the reward (of achieving the task) based on personal outcome expectation is seen as accomplishment (*intrinsic*), more than social recognition or promotion (*extrinsic*) (Lim et al., 2005). This argument is further extended by Wasko and Faraj (2005), who emphasise the role of expectation of personal benefits in terms of individual motivation. However, Bandura (1986: 18) posits, "[i]n the social cognitive view people are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocality in which behaviour, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other." In this way, outcome expectancy is defined as a person's estimation that a given behaviour will lead to certain outcomes, which is different to "efficacy-expectation" or how one can successfully execute the targeted behaviour (Bandura, 1977a, b).

Compeau and Higgins' (1995b) study found that performance-related outcome expectations had a significant effect on technology use (e.g. computer usage). In another study, Stone and Henry (2003) found that outcome expectation is related to the computer end user's organisational commitment. Furthermore, Heinze and Hu's (2009) study found that self-evaluating outcome expectation is positively related towards an IT career. For this reason, shaping the online services accordingly should lead to a fully IT-enabled environment. Prior experience (success or failure) would increase self-efficacy by formulating new expectations that match the current situation. Hence, there is a need to closely observe what the actual user is able to achieve in using the system in order to provide a service that matches his or her ability and outcome expectations based on new experience. Normally, people choose a course of action based on their capabilities (self-efficacy) and sustain their efforts with the expected outcome of their actions through cognitive beliefs (Bandura, 1986). Prior research also indicates that users are more likely to execute tasks that are similar to those performed by their peers and "weak expectations are easily extinguishable by disconfirming experiences, whereas individuals who possess strong expectations of mastery will persevere in their coping efforts despite disconfirming experience" (Bandura, 1977a:194). In this respect, Connolly and Bannister (2008) in their in-progress study have associated the level of performance with expectations; for example, the quality of services is to be judged as low when performance falls below expectation and increases when the performance exceeds the user's expectations. Hence, the citizen's expectations can be a key in their evaluation process. In this case, satisfaction can be used as an indicator of how to represent citizens' feelings and opinions (Asubonteng et al., 1996).

Although previous studies empirically have assessed and supported previous models and theories there is a need for more studies to add more validity (e.g., constructs validity by relying more on latent variables rather than manifest variables) In other words, there is a need to distinguish the cyclical process of PSOS while delivering ICT and to be more consistent with respect to individual-level personal factors; for example, the orderliness discussion of Fishbein and Ajzen (1975) and the Ajzen and Fishbein (1980) distinguish between beliefs, attitudes, intention and behaviour. There have been valuable efforts made in the initial adoption stage decision that lead to a minimal cost in the continuity process due the frequent use of the system. The post-adoption of the current set in future has to be successful; otherwise it will lead to unsatisfied users' expectations and discontinue the current PSOS users. Thus, satisfaction and meeting

users' expectations are predictors for users' continuance intention of ICT (Hong et al. 2011).

2.9 A general critique of the previous studies relating to PSOS

Critiques of the previous literature were summarised by Pitt et al. (1995: 173), as they observed, "commonly used measures of IS effectiveness focus on the products rather than the services of the IS function. Thus, there is a danger that IS researchers will mis-measure IS effectiveness if they do not include in their assessment package a measure of IS service quality". Further to this problem, Van Dyke et al. (1997) identified problems with reliability, and discriminant and convergent validity in SERVQUAL metrics and recommended "quality of information services" for further studies. In 2003, DeLone and McLean (2003) updated the D&M IS Success Model and addressed these problems by adding service quality beside the information and system quality measures. One of the weaknesses in previous works was not addressing service quality in the ICT field relating to the public sector (Connolly et al., 2010). To capture the right picture, the focus should not only be on technological aspects (e.g., system or organisational activities) but should also be on capturing the capacity of the end-users or citizens in any given case. Handling the effectiveness of PSOS should focus on the end-user's capabilities as well as on the services and information quality. End-users are generally unaware of what happens in the organisation or in the hardware and system within ICT departments, and if they do not use the system, then it is pointless to invest in ICT. Based on Andersen and Henriksen (2006), the World Bank and the Layne and Lee models are more technological and driven by a business focus.

The second problem is that many organisations (e.g., ICT department managers) prioritise internal data integrations and are busy with data integration, rather than focusing on end-users; thus, ICT investment as a strategic goal for government will not be productive if it is not associated with end-user capabilities, or in other words not citizen-focused in the present study. In this vein, data integration has not been linked to the end-user's interface (e.g., information quality and service quality). Official government portals have often targeted other public agencies, rather than end-users.

A third problem is that there has been a lack of any sense of a pattern in the progression of government agencies over time while providing online services. Evaluating an agency's website should reflect the strength of the relationships among the factors that

assist in shaping the evaluation process. These factors are not only technological capabilities but also social factors and personal factors (e.g., the capabilities of end-users and their feelings towards the service). A possible progression measure is to consider their previous experiences and to include them in the evaluation process. It has not been stated clearly how to consider previous experience in current situations.

A fourth problem is that there is an inherent problem in previous models, which can be divided into two stages: the first, the intrinsic stage, which deals with end-user outcome expectations or personal capabilities and future goals, and the second is extrinsic, which deals with end-user feelings towards the given service. Previous models do not emphasise the role of these problems; in this regard, few studies have recognised the role of personal expectations outside work. Many previous works have focused on the work environment of an individual, rather than on his or her personal goals or expectations with respect to his or her capabilities.

A fifth problem is that dynamic consumer expectations result in persistent business transformation in the private sector (Davenport, 1998; Tan and Pan, 2003), creating norms for the private sector to compete in a complex business environment. This dynamic expectation in a changing environment, however, is exclusive to the private sector but public sector agencies are also challenging each other, as well as having their own their own internal challenges (e.g., against previous rankings or evaluations), and can even challenge the traditional system. Discrepancies in service quality should be addressed for future plans, based on a continuance basis; thus, the level of service is becoming a strategic and vital part of many government agencies.

A sixth problem is that previous researches on adoption have reached their maturity, according to Jasperson et al. (2005), and many of these researches have focused on reflective cognitive processing in assessing technology's usefulness and ease of use (in associating with initial use of ICT) rather than focusing on continuance use; however, Oliver (1980) distinguished between pre-adoption and post-adoption. In this vein, post-adoption behaviour may provide a better understanding of e-governance as a phenomenon, if it is based on the number of engagements made by individuals.

The final problem is that few studies have assessed the use patterns within the PSOS features that have been recently adopted. ICT use history from an end-user's perspective has been examined but only in terms of simplistic performance measures in previous

studies (e.g., Venkatesh et al. (2003)'s model was moderated by experience). However, it can be said that it is difficult to generalise the significant successes or failures in PSOS in many previous studies, specifically in relation to those ICT adoption studies that do not employ a robust theory.

2.10 Chapter summary

The objective of this chapter is to investigate previous studies with respect to PSOS practice. The research questions of the present study attempt to identify the salient factors that influence the community use of PSOS by the citizens. These factors have been highlighted within the scope of the three domains of PSOS: citizens as a user or a customer, the organisation as a service and information provider and the interaction between the user and the PSOS systems. Previous research strengths and weaknesses have been reviewed with respect to the research questions; while discussing previous research, the researcher has attempted to be objective is his assessment by referring to previous work. The researcher has identified the areas that need to provide fresh insights in order to support the arguments, highlighting omissions in certain areas and inconsistencies with current research, as PSOS practice is continually evolving; to date, there has been a lack of investigation into repeated actions within the organisation and the citizen as a user. However, the main focus of the present study is G2C; therefore, the course of action towards the behaviour (continuity use) must be stabilised by retaining the current users and learning from their experience.

The following chapter will discuss the theories and models in more details with respect to satisfaction, personal factors and continuance use.

CHAPTER THREE: RESEARCH FRAMEWORK MODEL AND HYPOTHESIS

3.1. Introduction

In order to justify the use of the constructs employed in this study, a definition of PSOS ought first to be given. From the literature definitions given in Chapter Two, one can perceive the important factors entailed in delivering information and services to citizens; for example, the United Nations (UN) defines PSOS as "utilizing the Internet and the World Wide Web for delivering government information and services to citizens" (United Nations, 2001: 1). Hence, there is a link between government as an organisation that provide the PSOS and citizens as receivers. Thus, it is crucial to consider those citizens' personal factors whilst experiencing PSOS as an external incentive. Jaeger (2003) emphasised the role of citizens' responsiveness to PSOS in order to better utilise the invested ICT so that an over-expectation can be avoided while implementing PSOS; for example, the United Kingdom spent billions of pounds in the early stages of PSOS implementation but the majority of citizens were reluctant to use it because there was a general lack of awareness (Jaeger, 2003; Carter and Weerakkody, 2008). This may be applicable at any time owing to the fact that there is an increase in population whom have not experienced PSOS before, in particular those currently under age. There has been a dramatic change in ICT use in both business and the public sector in recent years, and therefore escalating citizens' capability toward these services is crucial for public administrators to avoid a large gap developing between the private and public sectors. Hence, meeting citizens' personal expectations and sense of satisfaction toward continued use of online services should be the objectives of every government as it strives to survive and flourish in the digital era.

From previous studies, satisfaction and expectation can be used as indicator factors for decision makers through providing a higher sense of empowerment to the public as well as a good relationship with the government; this gives a better feeling of being in control while delivering PSOS in general. Therefore, this course of action among the major stakeholders would encourage investment in online services (Li, 2011). However, in PSOS systems, there are different stakeholders (e.g. G2G, G2B, G2C and G2E), and therefore it is crucial to distinguish between government agencies, businesses, citizens and employees. Stakeholders have different meanings and opinions

based on their personal requirements with respect to their benefits (Seddon et al., 1999). Consequently, as previously mentioned, the focus on this study is citizens as stakeholders and their relationships with PSOS systems. Furthermore, experiencing online services that provide higher quality will increase a citizen's confidence in the agency's performance (Morgeson et al., 2011; Karavasilis et al., 2010); thus, willingness to adopt online services will increase (Lee et al., 2011), improving communication and leading other citizens to the digital channel (Teerling & Pieterson, 2010). Accordingly, 'Individuals will engage in behaviour that they perceive as eventually leading to valued rewards' (Scholl, 1981: 591).

As the focus of this study is on the measurement of G2C system success from the perspective of citizens, continuance intention in this study refers to the future continuation of satisfied citizens with respect to his or her personal outcome expectations and self-efficacy. In general, the hypotheses in the proposed conceptual model hypothesise that personal factors (prior experience, self-efficacy, personal outcome expectations and satisfaction) as well as environmental factors (social influence, information and services quality) lead to citizens' satisfaction, which in turn drive behaviour (continuance intention). The continuation process is crucial in PSOS systems as it retains the current users and at the same time regulates the relationships among the main stakeholders in the present study (government and citizens).

3.2. Previous theories and models: a critical review

In the second half of the nineteenth century, Max Weber's Theory of Bureaucracy (Weber, 1947, 1968) explained bureaucracy as a new form of communication system that organisations perform. In his theory, Weber claims that leadership and authority are driven by *rational* processes rather than *charisma* or *tradition*. Weber believes that in bureaucratic organisations, values of logic, efficiency and reason are major drivers for leaders; the main objective is to solve problems and, therefore, decision-makers are guided by efficiency and prediction of future problems. An organisation that prefers given targets is regulated by strict guidelines and rules. In order for bureaucratic systems to evolve, maximising efficiency is the best choice; however, in bureaucracy there is a tendency that excessive control over employees may act as a barrier to the given targets. In this respect, Carter and Belanger (2003) recognised the role of ICT in

bureaucratic organisations in improving efficiency while stakeholders are accessing PSOS services. Government agencies have realised the role that ICT plays in the transformation process; delivering services in PSOS systems requires citizens to participate, regardless of their location (Abdulkarim, 2003). Oliver (ECT: 1980, 1999a) emphasised the role of expectation confirmation and satisfaction assessment, which influence repurchase intention.

This section explains the previous theories and models with respect to PSOS, more specifically, continuity to use online services in a public administration. The following discusses the background, applications, other related theories and models (and any criticisms), and why these theories have been excluded from the proposed model. In IS in general, there are many theories and models, and for the purposes of the focus of this study, only those theories and models having a major contribution to the present study will be emphasised; thus, excluding other theories and models does not mean there is no relationship with the present study. Therefore, the researcher will try to be concise in summarising and critically analysing the previous models and theories. There is a need for greater ICT support in most of the activities that form an interaction between the main stakeholders of PSOS practice, namely government and citizens; hence, a theoretical lens is needed to understand and define the conceptual grounding through PSOS initiatives and continuity processes. An understanding of the proposed theoretical lens will assist in examining the critical factors that influence the continuity process of PSOS progression. Therefore, a complex theory is crucial in order to explain the relationship among technologies as an external incentive, citizens as an individual or a user, and the resultant behaviour or trend following this interaction. For example, Scholl (2001) investigated stakeholder theory to examine PSOS research; Bardach (2002) investigated Network Theory to examine IT-enabled interagency collaboration; Lazer (2002) investigated Diffusion of Innovation to examine the impact of computerisation on innovation within government; Jain (2004) investigated Weber's theory of bureaucracy to examine contemporary PSOS-related research and literature. However, IT models are job-related model rather than individual goal-related.

Many theories have been developed to explain and interpret the effect of the user/customer/citizen/client's expectation with respect to product performance (goods or services). However, there is a need to distinguish between the initial expectation level and the secondary expectation level, and the degree of positive or negative judgment

following service exposure. For example, previous studies suggest a dominant expectation effect, whereas the detection of disconfirmation or confirmation phenomena may have been clouded by a conceptual and methodological over-determination problem (Oliver, 1977). Regardless of the relationships between expectancy and satisfaction, there is a need to focus attention on the effect of confirmation and disconfirmation of expectation in terms of how the user evaluates the service (Anderson, 1973). There are potential inconsistencies in any PSOS quality (services or information) and accordingly a discrepancy in the citizen's service exposure due to change in the situational factors as well as personal skills (Bandura, 1986; SCT). Thus, the researcher's argument is that social influence, PSOS quality (information and service quality), and prior experience all influence the citizen's self-efficacy, outcome expectation and satisfaction towards continuity use, based on the circumstances of the situation and on any change in the external stimuli or environmental factors, as in SCT. These external factors are a form of information and service quality as well as social factors; for example, DOI (Rogers, 1983) has been used widely through previous research as a theoretical framework (Alomari, 2012). DOI has been employed to discover the factors that may influence PSOS adoption in many countries as well as how an individual perceives an innovation as a new practice.

3.2.1. Theory of Reasoned Action and Theory of Planned Behaviour

Ajzen and Sheikh (2013:155) provide a summary of Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB); thus, "Beliefs about behaviour's likely consequences (behavioural beliefs) are assumed to determine *attitudes toward the behaviour*; beliefs about the expectations and behaviours of others (normative beliefs) are assumed to determine *subjective norms*; and beliefs about potential facilitating or inhibiting factors (control beliefs) are assumed to determine *perceived behavioural control*. Attitudes, subjective norms, and perceptions of control in turn combine to produce intentions that, together with actual control, determine performance of the behaviour. When a measure of actual control is unavailable, perceived behavioural control is used as a proxy under the assumption that perceived control reflects actual control reasonably well."

Fishbein and Ajzen (1975) first proposed the Theory of Reasoned Action (TRA). TRA and the Theory of Planned Behaviour (TPB) (Ajzen, 1991) presume that beliefs influence attitude, which in turn influence intention toward some target behaviour. TRA postulates that belief, attitude, intention and behaviour all experience interrelationships working as feedback loops in which the resultant behaviour again influences beliefs (Fishbein and Ajzen 1975). A version of TPB was proposed by Ajzen (1985) to include behaviour that is not under volitional control. The purpose of both TRA and TPB is to develop a theory in order to predict and explain the influences of human behaviour (Ajzen & Fishbein, 1980). Perhaps (ibid) TRA and TPB give indications of previous theories (e.g., learning theories, expectancy-value theories, balance theory, theory of cognitive dissonance, and theories of attribution), and have done since the years of 1918-1970 when previous scholars tried to understand all the various influences of an individual's attitudes and behaviour.

The TRA variables are: attitude towards the behaviour (positive or negative evaluation of performance of behaviour); subjective norms (how an individual perceives what people think or should think towards a specified behaviour); and intention (as an immediate antecedent of behaviour, it indicates the readiness of an individual to perform the target behaviour). Based on TRA, personal attitudes or social/normative factors determine behavioural intentions. In addition to the TRA variables, in TPB, perceived behavioural control is added in order to: facilitate the beliefs, attitude and intention process and to predict behaviour in a direct way (Armitage & Conner, 1999, 2001). Therefore, there is interference within the whole process. Ajzen (2006) summarised the behavioural action antecedents for a TPB into three categories: behavioural beliefs, normative beliefs, and control beliefs. In addition to these constructs, an actual behavioural control was added in which a person ensures that he or she has acquired the required skills and resources as a necessary prerequisite for the desired behaviour. The actual behavioural control is mostly consistent with the 'self-efficacy' concept that Bandura (1986, 1977) proposed, based on Ajzen (1991). However, Armitage & Conner (2001) claim that there is a difference between self-efficacy and perceived behavioural control; they think that self-efficacy is mostly associated with cognitive factors based on internal (controlled) factors, whereas perceived behavioural controls are associated with external factors. Armitage & Conner (2001) think of perceived behavioural control as an antecedent to self-efficacy. Ajzen

(2002) refers perceived behavioural control to the overall performance of the behaviour that an individual expects with respect their capabilities.

In TRA, there is insufficient explanation on the relationship between attitude and behaviour with respect to an individual's level of control (Chan and Lu, 2004). There is a need for an adequate explanation that specifies how to assure that the targeted behaviour is under an individual's control. The criticism over TRA is it does not explain how to ensure that the behaviour is indeed under the individual's control. A correspondence (communication-related issues) within beliefs, attitudes and behaviour limits the theory based on Ajzen (1985), and there is lack of agreement on type of action, timeframe, target and the context of the behaviour among attitude, intention and behaviour while predicting procedure (Sheppard et al., 1988).

Although TPB considers volitional control as a limitation of TRA (by adding perceived behavioural control), TPB is criticised for not accepting change because the behaviour is already planned based on a specific reason (Mathieson, 1991); hence, the intervention of external factors or even personal factors represents a constraint once the behaviour is planned. In SCT, there is a chance for reciprocal interaction or relationships among behaviour, personal factors and environmental factors; however, there might be a change in TPB but this change is subject to situational factors. If the assumption is based on the situational factors then the author concern must consider how long these situational factors are going to be with respect to organisational strategies (e.g., short and long-run strategies).

3.2.2. TAM

Davis (1989) proposed TAM as an adaptation of TRA (Ajzen and Fishbein, 1972); it mentions that an individual's intention to perform a certain behaviour influences the actual behaviour. TAM is used to explain the acceptance of IS by users (Chan and Lu, 2004); it has been used enormously in IS research as a theoretical framework, for example, to measure citizens' intention to use a government website (Alomari, 2012). There are two main determinants in TAM influencing a user' attitude towards usage intention: perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989; Venkatesh and Davis, 1996). The basic idea of TAM is that there is a relationship between the 'ease of use' and the 'usefulness' of the technology and an individual's

attitude and intention to use that technology (e.g., PSOS). In electronic commerce, PEU and PU were considered to be the most significant elements influencing attitude by Shih (2004). PEU and PU are considered as cognitive beliefs in social psychology (Lin et al., 2011). Cognition, effect and conation are considered the three components of attitude in social psychology (Breckler, 1984). Lin et al. (2011) found attitude to be a determinant in predicting continuance intention; that is, they consider attitude to be a key driver of users' continuance intention (in their study of e-learning). In previous studies, both Bhattacherjee (2001) and Chiu et al. (2005) found satisfaction to be a strong attitude (Weiss 2002) or a conation of users' continuance intentions to utilise a given service. Thus, PEU and PU can work in parallel to satisfaction in influencing users' intention to continue using the provided services.

TAM is criticised as comprising only simple components (usefulness and ease of use), and therefore it does not afford enough understanding of behavioural intention in contexts of complex relationships that involve perspectives relating to prior use (Taylor and Todd, 1995); for example, ease of use and usefulness are insufficient to explain a complex situation because there are no antecedent components helping to explain the relationships (Chan and Lu, 2004). Based on Legris et al. (2003), there are difficulties in generalising TAM because respondents are mostly students or professionals. Also, lack of flexibility is considered to be a limitation in how it influences usage (Venkatesh et al., 2003). Sun & Zhang (2006) mention a weakness in explanatory aspects and inconsistencies among the constructs.

Kim et al. (2007) mention that the aim of TAM is to understand the initial adoption intention of technologies in organisational settings; it is important to highlight that those technologies are for work purposes, and the cost of mandatory adoption and usage is borne by the organisation. Lin et al. (2012) support this by distinguishing between the technology user and the technology consumer; technology users are different to technology consumers because the latter take into consideration their outcome expectations based on their personal capabilities without organisational support. Lin et al. (2012) refer to technology consumers as risk-takers because they participate in online services; therefore, in PSOS online services, when a citizen (as a consumer and a user at the same time) makes a decision, he or she estimates other options and anticipates the consequences (Bandura, 1986; Zeithaml, 1988). Therefore, service

quality (or E-S-QUAL) is crucial to the present study because, based on it, the citizen makes a decision as to whether to continue in PSOS or to switch to a traditional system.

TAM does not include antecedent factors that can influence perceived usefulness and ease of use, based on Chan and Lu (2004). Therefore, the tendency is to extend TAM through social influence and usage intention as well as other cognitive factors (Venkatesh and Davis, 1996) in order to increase the comprehensive understanding of behaviour intention (Taylor and Todd, 1995a/b).

3.2.3. The UTAUT

Venkatesh et al. (2003) reviewed eight models in formulating their UTAUT as a unified model that integrates elements across all eight. These eight elements are: 1) Theory of Reasoned Action (TRA); 2) TAM; 3) Motivational Model (MM); 4) Theory of Planned Behaviour (TPB); 5) Combined TAM and TPB; 6) Model of PC Utilisation (MPCU); 7) DOI Theory; and Social Cognitive Theory (SCT). The core constructs of these models are: attitude toward behaviour, subjective norms, perceived usefulness, perceived ease of use, extrinsic motivation, intrinsic motivation, perceived behavioural control, job-fit, complexity, long-term consequences, affect towards use, social factors, facilitating conditions, relative advantage, image, visibility, compatibility, results demonstrability, voluntariness of use, outcome exceptional (performance and personal), self-efficacy, affect, and anxiety. However, in UTAUT, Venkatesh et al. (2003) used only these constructs: performance expectancy, effort expectancy, social influence, behavioural intention, and use behaviour, and they moderated these constructs with gender, age, experience, and voluntariness of use. However, in the present study, the objective is to investigate the G2C context with respect to continuity intention; therefore, performance expectancy does not fit with the current objective of the present study because it is taken from the job-fit construct (Thompson et al., 1991) based on the Venkatesh et al. (2003) definition of performance expectancy. Further, the UTAUT model focuses on expectation performance rather than personal expectation; hence, it is out of the traditional citizen's scope and only fits with work-place environments. In addition, UTAUT explains extrinsic motivation based on job performance, pay or promotion, which does not fit within out-of-work environments. Also, perceived usefulness in UTAUT is related to job performance rather than outside job individuals. In general,

the UTAUT model has explained 70 percent of the variance in intention in the acceptance stage and technology usage; therefore, Venkatesh recommended further studies on identifying constructs that can add to the prediction of intention and behaviour over or above their model. Although the previous theoretical perspectives in TAM and ICT usage that are presented in UTAUT helps to explain ICT usage, Venkatesh et al. (2011) believe that there is a need to develop a comprehensive view in order to understand the PSOS as a phenomenon based on a scientific standpoint (Gioia and Pitre, 1990). Therefore, there is a need for more investigations similar to Wixom and Todd (2005) by integrating research streams (e.g., user satisfaction and technology). Such integration is considered to be the future contribution for scientific advancement (Greenwood, 1974). The UTAUT focus is adoption in terms of different technologies; therefore, it does not explain the disconfirmation of expectations about key beliefs that may have occurred in the continuation process of ICT usage (Venkatesh et al., 2011). For this reason, Venkatesh et al. (2011) integrate UTAUT with ECT to better understand ICT usage on a consequences basis.

Clearly, there is currently a lack of a proper theoretical framework/model that represents the dynamic changes in PSOS. Scholars across the IS research community in general have been widely investigating ICT success in terms of efficiency and effectiveness. However, there is some debate on how theorists identify the best measure of ICT success (Rai et al., 2002). There is a lack of theories in prior research that take into their account the typical characteristics of PSOS (Yogesh et al., 2011). Previous studies and theories have mainly focused on IS streams regardless of communication, and therefore Yogesh et al. (2011) argue that there is a need for PSOS-specific theories and methodologies. According to Garson (1999), PSOS can be perceived according to its theoretical background.

Hsu et al. (2004) stressed that TAM, TPB and DOI view online services or Web applications as a unidirectional causal relationship in which there is only one-way influence: from the Web application (environmental factor) to cognitive beliefs (personal factors) towards attitude and behaviour. Therefore, Hsu et al. (2004) emphasised the role of SCT, in which they proposed a continuous reciprocal causation among environmental factors, personal or cognitive factors, and the existing human behaviour (Bandura and Wood, 1989; Hsu et al., 2004). Therefore, personal factors (e.g., self-efficacy and outcome expectancy) influence behaviour. In turn, prior

behaviour influences personal factors and environmental factors. Thus, in this paper SCT has been selected as it involves an encompassing analysis of behavioural intention as compared to the other cognitive learning models (Ratten and Ratten, 2007).

3.3. The dynamic interaction between citizen and PSOS

In SCT, a triadic (personal, environment and behavioural factors), dynamic reciprocal interaction predicts a specific behaviour (Bandura, 1986). SCT, in contrast with TAM, acknowledges the human behaviour intention complexity; therefore, the radical change in ICT has meant that SCT is a reliable theoretical framework in that it understands human behaviour (Ratten and Ratten, 2007). This relationship does not mean that there is a similarity in strength for each path; in other words, there are variations in the process based on specific situations (Bandura, 1989). The author posits that beliefs are not enough to be successful in a challenging situation within the PSOS environment but that skills are also required; therefore, people with high self-efficacy can achieve their higher-level tasks in PSOS successfully (and for longer) with strategic thinking (Bandura, 1986, 2006; Zimmerman, 2000). Furthermore, Bandura (1998) emphasises that self-efficacy can be improved by successful performance, persuasion, vicarious experience, and physiological feedback (e.g., training). Thus, the model is complex (see Fig. 3.1).

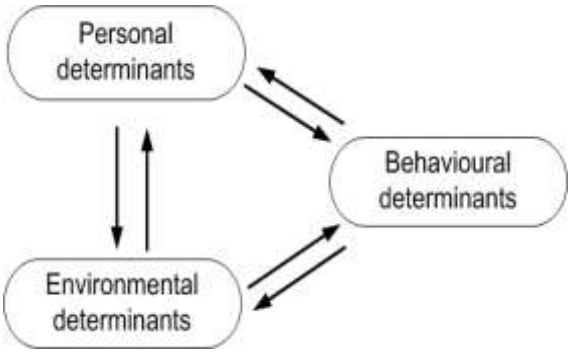


Figure 3.1: Schematisation of triadic reciprocal causation in the causal model of social cognitive theory (Bandura, 1986)

It is important to notice that an individual's behaviour is a reciprocal causation process illustrated as the bi-directional effects (unlike TAM, which is a unidirectional process) of that individual's thoughts and actions (Bandura, 1986); for example, a person's

expectations, beliefs, feedback, self-perceptions, goals, and intentions all together give a shape and direction to behaviour (see Fig. 3.2). On the other hand, the behaviour that is carried out will then affect one's thoughts and reactions in future situations.

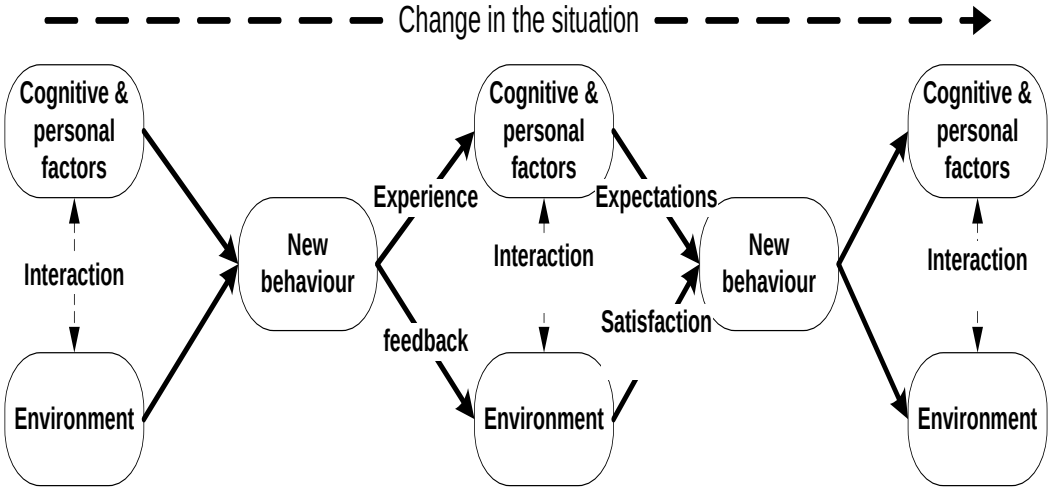


Figure 3.2: Reciprocal causation process (developed by the researcher, source: Bandura, 1986)

People are both products and producers of their environment (Bandura, 1986). Inherently, people can shape their destiny by reinforcing their personal factors to influence the environmental ones. Having considered the enduring relationship between government and citizens with respect to short- and long-term strategies, it is also reasonable to look at the interactivities through different time-framed situations. Bandura (1986) mentioned that people do not live isolated in private worlds, and hence they can observe the success and failure of others, and learn from their direct experiences. For the context of the present study, PSOS practice is considered to be a potential experience for all citizens, and therefore citizens are expected to experience the information and service quality as well as being aware of their social surroundings, their past experiences and what they would recommend. There is a need for a reciprocal manner in which to clarify and explain the relationship between PSOS and Bureaucracy (Jain, 2004).

Albert Bandura (1986) was the originator of the SCT; it stems from Social Learning Theory (SLT). SCT is a psychology discipline and one of the most important theories of human behaviour (Bandura, 1986, 1997). It has been widely applied and validated in the IS literature (e.g., the UTAUT). Originally, it was named Social Learning Theory (SLT) and then renamed to SCT to better reflect the distinction between the cognitive

approach and behaviourist approaches (Crosbie-Brunett and Lewis, 1993). From a historical point of view, Tolman (1932) introduced the term expectancy as an unobservable variable (cognition); hence, SLT was formulated by three components: people, environment and process. Mischel (1979) introduced the 'new experience' as an antecedent to one's cognition. Later on, Bandura (1986) first focused on the role of 'vicarious learning and modelling' and then introduced self-efficacy and the reciprocal relationships among the personal, environmental and behavioural factors. Therefore, human cognitive variables (as mediators) explain the stimulus-response into a specific behaviour based on different situations. As noted by (Thomas, 1990), behaviour can be explained as observable acts and as stimulus-response sequences. Behaviourists focus on the state of being contiguous in a series of continuous connections between stimulus and response, based on the potential learning outcome. Stimulus and response has long been debated among behaviourists with respect to mediating factors in order to regulate behaviour; for example, Freud proposed instinct while Tolman proposed cognition as mediating variables (Woodward, 1982). SCT stresses the role of cognitive factors as the response-consequence mediators of a specific behaviour in which these consequences form expectations of what is going on as well as the outcomes (based on the person's ability); hence, behaviour is expected before it is implemented (Bandura, 1986). SCT relies on the human mind as an active player to reflect the expected reality of an individual's position by decoding the information and placing a scenario of values and expectations (Jones, 1989). In SCT, self-efficacy plays an important role in regulating the interplay or course of action in various situations. Self-efficacy has been widely used in IS researches since 1995 (e.g., Campeau and Higgins, 1995). Therefore, the perception of citizens in PSOS practice about their own capabilities guides their present action towards what they will gain from being involved in PSOS systems (Bandura, 1977a/b).

Furthermore, Bandura (1977b) extended Skinners' work by demonstrating that people can learn new behaviours by observing others, so that an individual can learn by imitating other behaviours, as they are part of society. A new behaviour is seen and felt by people, and therefore it is 'observable'; this is associated with DOI (Rogers, 1983). It also explains that not all people are involved in a new behaviour. Hence, there are different situations within a social environment for being aware of PSOS practice, or maybe a portion of them are engaged and those are called the 'innovators' or 'early adopters'. Table 3.1 illustrates some previous studies in IS that have used SCT.

Table 3.1: Diffusion and use of SCT in IS according to year as well as the citation for each year. (Source: Alruwaie et al., 2011)

Year	Articles Published/Year	Citation of Articles Published/Year	% Total Citations/Year	Most Cited Authors	Citation Count
2010	9	1	0.00	(Ambrose and Chiravuri, 2010)	1
2009	9	13	0.01	(Gu *et al.*, 2009)	5
2008	9	52	0.02	(Wang *et al.*, 2008)	14
2007	9	107	0.04	(Hsu *et al.*, 2007)	54
2006	5	157	0.06	(Chiu *et al.*, 2006)	75
2005	4	137	0.05	(Jasperson *et al.*, 2005)	102
2004	1	11	0.00	(Onwuegbuzie and Jiao, 2004)	11
2003	7	1228	0.48	(Venkatesh *et al.*, 2003)	974
2002	3	113	0.04	(Thatcher and Perrewe, 2002)	57
2001	1	44	0.02	(Davis and Wiedenbeck, 2001)	32
2000	1	61	0.02	(Johnson and Marakas, 2000)	61
1999	2	280	0.11	(Compeau *et al.*, 1999)	276
1998	1	131	0.05	(Marakas *et al.*, 1998)	131
1997	0	0	0.00	NA	0
1996	0	0	0.00	NA	0
1995	1	208	0.08	(Compeau and Higgins, 1995)	208
Total:	62	2543	1.00		2001

From Table 3.1, it appears that the first SCT citation in the IS field was in 1995, which reflects the revolution in the computer industry. It also appears that the most cited authors were Venkatesh et al. (2003) with 974 counts, which reveals the formulation of their unified model, the so called the Unified Theory of Acceptance and Use of Technology (UTAUT). The second most-often cited is Compeau et al. (1999) with 276 counts. This citation gives a certain impression as there is a link between the number of articles and the number of citations; also, it provides in indication of how far the discussion among the scholars in such subjects has developed. There is also sign of

fewer citations in recent years (such as 2009 and 2010), which indicates a reliance on citations from the three years before and more.

SCT is a suitable theoretical framework in that it can understand the research streams of human behaviour with respect to the rapid changes in the technology environment because it associates the adoption process of technology with the user's skill and confidence in order to use the current technology (Compeau et al., 1999). One of these research streams, as an example, is related to ICT, such as computer systems and Internet usage (Compeau and Higgins, 1995a, 1999; Johnson and Marakas, 2000; Easley et al., 2003; Venkatesh et al., 2003; Hsu et al., 2004).

According to SCT, *forethought* (or expectations) regulates future human behaviour; hence, there is a purpose or a reason in how to act in the present, based on future outcomes. Therefore, the future outcome acts as a motive for the present action or, in other words, guides the present action (Bandura, 1989); for example, if people are happy with their experience of PSOS, they will recommend it to others. Bandura (2001) argued that outcome expectancy is linked with media and modelling, as information sources affect the decision process. In this respect, PSOS users would formulate personal outcome expectations based on the information and service quality from the government agencies. Henry and Stone (1999) support the notion that outcome expectation has an influence on future behaviour, yet Godding and Glasgow (1985) suggested that outcome expectancy was not enough to predict behaviour. Therefore, ECT included satisfaction as an effect of present action.

3.4. Predicting citizens' satisfaction with PSOS on a continuance basis

Expectation Confirmation Theory (ECT) is a well-known model that explains and predicts user satisfaction and continuance intention (Oliver, 1980; Bhattacherjee 2001b; Chiu et al., 2005). ECT is widely used in the study of user satisfaction (e.g. Hsu et al., 2004; Venkatesh et al., 2011) and post-buy behaviour, and holds that users' intention to reuse the system as a service is determined primarily by their satisfaction with prior use of that service (Anderson and Sullivan, 1993). Based on ECT, the customer/user/consumer firstly forms an initial expectation prior to purchase, and then build perceptions about the performance of the consumed product (either goods or services) after consuming that product. Then the consumer decides on his or her

'confirmation' with respect to his or her prior experience and expectations. According to the level to which his or her satisfaction meets with the prior expectation (above, at or below) the consumer, consequently, forms a decision either to continue re-purchasing or to discontinue (i.e. confirmation or disconfirmation); therefore, a satisfied consumer will form a continuance intention to return. Oliver (1999b) relates satisfaction to service quality and prior experience as a mental and behavioural measurement based on an attitude. Bhattacherjee (2001b) adopted ECT in order to understand IS continuance use, and looked at continuance as an extension of acceptance behaviour; he addressed post-adoptive behaviour in online banking and found that satisfaction with IS use is the strongest predictor of continuance intention. Figure 3.3 illustrates the key constructs and relationships in ECT (A, the original ECT model; B, the Bhattacherjee 2001b post-acceptance model).

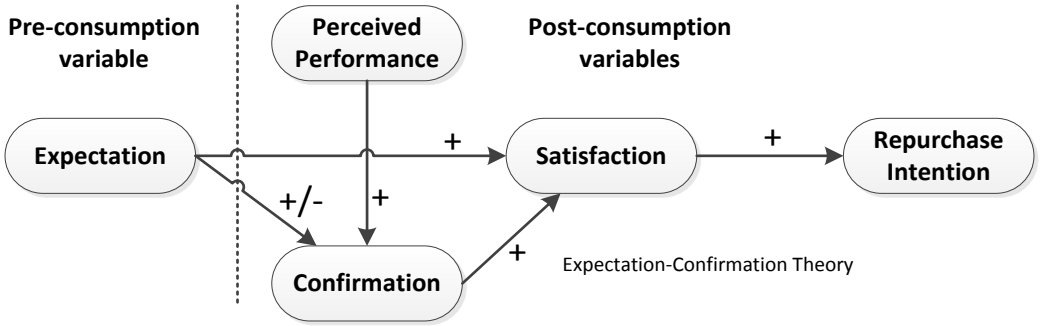


Figure A illustrates key constructs and relationships in ECT (Oliver 1980, 1993; Anderson & Sullivan, 1993).

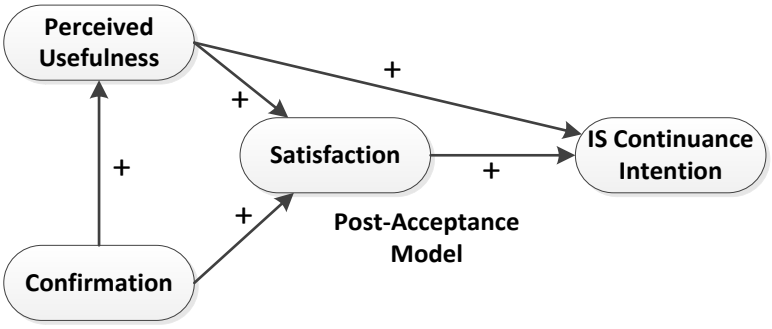


Figure B illustrates key constructs and relationships in Bhattacherjee (2001b) model

Figure 3.3: Expectation Confirmation Theory, (sources: A: Oliver, 1980, 1993; and B: Bhattacherjee 2001b)

The two models above are relatively intuitive. However, in Figure A (Oliver, 1980) the model is associated with prior experience (expectation) by considering pre-acceptance,

whereas in Figure B (Bhattacherjee, 2001) it is associated with post-adoption as an initial step and explains continuance as an extension of acceptance behaviour (e.g., TAM-based models). Hsu et al. (2004) extended the use of ECT by integrating it with the SCT model in order to examine the motivational factors that influence one's intention to continue using Internet applications. The results of that study found that there are variances between continuity of using the Internet, and outcome expectation and satisfaction. Such findings suggest that in the PSOS realm, it is crucial to understand the factors that influence citizens' behaviour to continue using the online services provided by public agencies. Lin et al. (2012) argue that continuance intention is determined by net value. In this respect, net value can be considered as usefulness or outcome expectations that motivate the citizen to participate in the PSOS online service (Venkatesh et al., 2011). Net benefit was also used by DeLone and McLean (2003), and therefore it can be used as an antecedent of continuance intention in a form of what is to be expected from using the PSOS system.

Although Hsu et al. (2004) utilised both ECT and SCT to assess the nature of websites and how they affect users' standards, their study did not include any online assessment of service quality; accordingly, they recommended further studies into ICT success criteria in order to comprehend the formation of the user's confirmation with respect to critical ICT components.

The researcher has assessed the previous models within the literature and now provides some criticisms of their approaches before presenting the proposed service quality model.

3.5. System, information and services quality models

It is important, however, to understand how citizens comprehend the PSOS as a whole system (this includes system hardware and software as well as the information on the website, its design and the service level). Indeed, the DeLone and McLean (2003) model considers such concepts by representing the relationships between the system, the information and the services as quality models. Furthermore, DeLone and McLean (2003) depict the relationship between quality ICT models (system, information and service) and user satisfaction. While such issues must not be discounted, the researcher here has tried to exclude the system as a quality model because citizens are unable to

evaluate the system's hardware or software; however, citizens can indirectly evaluate the system by noticing that the PSOS application is running 24/7, from which they infer that the system is running and that the information is up to date. In fact, the ICT aspects are inter-related with the PSOS as provider and the citizen as end-user, and there should be line between them in order to ensure that the citizen is able to access the PSOS in his or her environment; this issue actually relates to infrastructure.

Based on the literature relating to websites, there is a need to distinguish between in-depth information and service quality, based on Parasuraman et al. (2005), in order to capture all the aspects of online transactions. The question is how to distinguish these factors in a model that associates them together under one topic, albeit based on a robust theory; for instance, the primary purpose of the WebQual scale developed by Barnes and Vidgen (2002) was to generate information for website designers, rather than to measure the experience of customers in terms of service quality. The research that produced the scale involved students visiting websites in order to evaluate them, rather than actual purchasers evaluating their experiences; furthermore, WebQual does not include fulfilment as a dimension (Parasuraman et al., 2005; Connolly and Bannister, 2008). Another example: the second WebQual by Yoo and Donthu (2001), SITEQUAL, does not cover all aspects of the transaction process while purchasing; therefore, service quality is not experienced with respect to customer experience or fulfilment aspects. Satisfaction with the website design has been paid more attention than service quality. Although, the measurement scales of Wolfinbarger and Gilly (2003) were excellent, they were based on Parasuraman et al. (2005); their comprehensive approach raises several questions pertaining to their reliability and fulfilment dimensions in terms of being less internally consistent and distinct. Yet, Szymanski and Hise (2000) paid more attention to satisfaction, rather than just measuring service quality.

Before considering the role of system, information and service quality models, it is important to note that DeLone and McLean (1992) proposed a six-factor framework (D&M) for measuring IS research, categorised as: system quality; information quality; use; user satisfaction; individual impact; and organizational impact. However, in the original D&M model, there was no distinction between organisational and individual impact, and furthermore social impact is omitted. The original model considered use, satisfaction, individual and organisational impacts as a measurement of effectiveness

success, whereas systems and information quality were seen as a measurement of accuracy and efficiency, taking into account the effect of the information on the system user. In this manner, recent developments have heightened the need for a clear distinction between organisational control variables and those related to end-users; for instance, DeLone and McLean (2003: 17) stated, "It is essential that IS researchers distinguish between the management control variables and the desired results in terms of quality, use satisfaction, and impacts." As a result, there is a need to distinguish the various impacts based on their streams. Indeed, in the IS research community, researchers are tackling the issue of how to develop a construct that would best measure ICT success (Rai et al., 2002; Wang and Liao, 2008). Thus, Wang and Liao (2008) suggest that the G2C context within PSOS fits nicely into the updated D&M (2003) IS success model and its six success dimensions. Figure 3.4 illustrates both D&M models (A, 1992 and B, 2003).

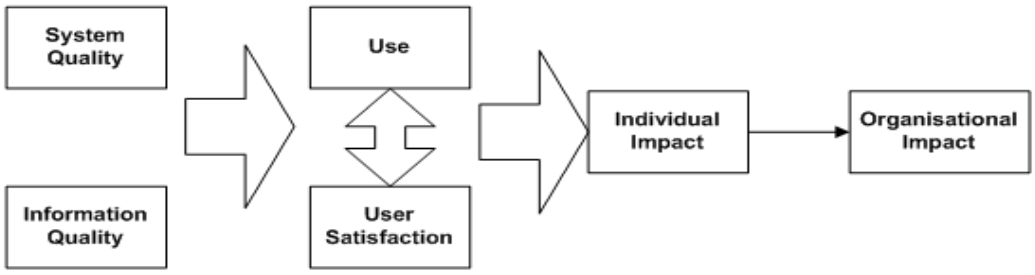


Figure A) DeLone and McLean's 1992 model.

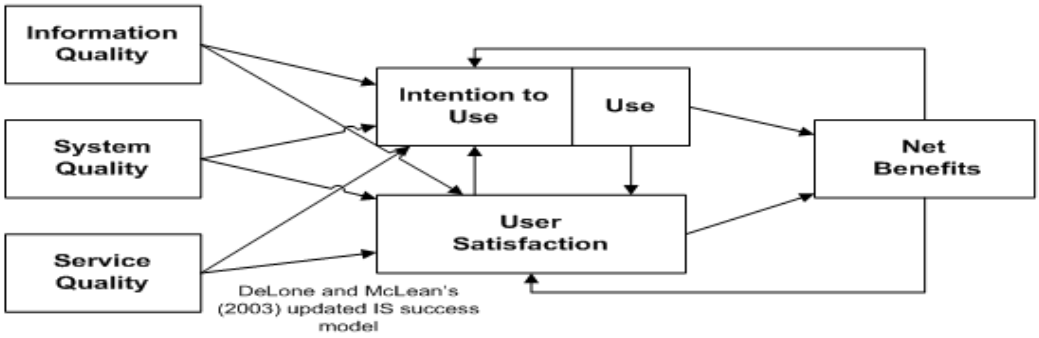


Figure B) DeLone and McLean's 2003 updated IS success model

Figure 3.4: Both D&M models (A, 1992 and B, 2003).

The DeLone and McLean models evolved from 1992 to 2003. The key difference between these models is that DeLone and McLean (2003) added online service quality to information quality and suggested that it should be assessed. The quality of an online

service has an influence on customer satisfaction and usage decision besides system and information quality. Furthermore, DeLone and McLean (2003) combined "individual" and "organizational impacts" into a single variable, "net benefits". One might infer from this that ICT effectiveness was focused on measuring the products rather than the services, and this will mis-measure ICT effectiveness, based on Pitt et al. (1995). Also, linking "intention to use" as an attitude with "use" as a behaviour makes it difficult to measure. Clearly, there is an overlap between "user satisfaction" and "intention to use" together with "use". However, "net benefits" cannot be recognised at the first usage; continual use may determine the "net benefits" but this depends on whether the system is mandatory or voluntary. Accordingly, the single variable, "net benefits" raises questions, such as: who is going to use the system, and are they going to reuse it? Positive net benefits are like negative net benefits in a mandatory system because the user has to use the system, and hence satisfaction is redundant in this matter.

Previous studies have assessed PSOS system success and validated the second D&M model. For example, Wang and Liao (2008), in their discussion, noted that the effect of system quality on use was not significant. The reason is that "citizens have higher computer self-efficacy and Internet experience in the Internet age, and the system quality or ease of use of an PSOS system is not critical for citizens in determining whether to use the system or not. Thus, respondents showed more concern about information quality (e.g., usefulness) and service quality (e.g., transaction safety) than on system quality (e.g., ease of use)" (Wang and Liao, 2008: 729). They suggest that concise administrated periodic success measures (with good psychometric properties) may enhance PSOS-authorised persons in understanding how the citizen perceived the net benefit (and its antecedents), and then take necessary corrective actions to improve their systems. The Bhattacharya et al. (2012) study was purely based on previous studies and emphasised the role of the D&M IS success model, recommending it to be used in explaining the dynamics of online services and their impact on end-users (e.g., citizens in PSOS).

D&M (2003) recommends that system quality, service quality and information quality be assessed. As a consequence of interacting with various systems on a regular basis, previous studies expect that users will learn that a good system is necessary to obtain good information (Xu et al., 2013). Thus, Parasuraman et al. (2005) presented a solution to this problem by offering their service quality model, namely E-S-QUAL,

which measured variables relating to the system through the user's perspective; for example, they asked whether or not the service is working 24/7. In other words, working 24/7 reflects that the system is reliable. Hsu et al. (2004) also encourage further studies to decompose the important constructs in order to examine the hypothesized relationships between different types of website. As a result, this researcher integrates E-S-QUAL with information quality based on the D&M recommendation. E-S-QUAL is considered one of the most influential empirical studies for measuring e-service quality (Valvi and Fragkos, 2012), and therefore it can be used for PSOS for the present study.

The DeLone and McLean (2003) IS success model is used as an umbrella for the quality of services but it does not provide empirical results. Further, it postulates three streams of quality (service quality, system quality and information quality). It is also important to emphasise the context of the present study (G2C, citizens at large and those employees within the organisation whom are experts in the system). Thus, as in a previous study, Wang and Liao (2008) found that most users' concerns relate to information quality and service quality rather than system quality. They refer their finding to the users' familiarity with the system, which is based on their previous use, which in turn improves their computer/Internet self-efficacy. In their study, they found that the effect of system quality was not significant in the PSOS context, and hence it is not critical for citizens at large; therefore, the author excludes the system from the present study and places more emphasis on service quality and information quality. However, in service quality, there are certain measurable variables that indicate system quality, as mentioned earlier (e.g., the service being available 24/7 and privacy).

3.6. The need for standardisation in PSOS quality

Within two stages of empirical data collection (E-S-QUAL and E-RecS-QUAL), Parasuraman et al. (2005) refined and tested a multiple-item scale (E-S-QUAL) for measuring service quality. E-S-QUAL is a four-dimensional, 22-item scale that captures the critical dimensions of service quality outlined in the extant literature. The dimensions are efficiency, fulfilment, system availability, and privacy. The scale has an accompanying subscale called E-RecS-Qual, which contains items focused on handling service problems and is relevant to customers who have had non-routine recovery

service encounters with the website. E-RecS-Qual consists of a three-dimensional, 11 item scale. Understanding how consumers perceive and evaluate online services is crucial for companies or government agencies in order to deliver superior service quality (Parasuraman et al., 2005).

The purpose is to measure service quality regardless of the type of the website. The idea of E-S-QUAL is to propose an electronic context to measure traditional service quality through the website channel. In a previous study, the E-S-QUAL measures recognised the weak points in online apparel retail outlets to avoid any customer expectations that may lead to dissatisfaction (Kim et al., 2006). E-S-QUAL has been used extensively in service quality research, including in PSOS research **(**Connolly and Bannister, 2008). E-S-QUAL has also been utilised as a theoretical frame for previous studies in the domain of service quality in which a website facilitates efficient and effective shopping, purchasing and delivery (Tan et al., 2013).

3.7. Research framework and development of hypotheses

The conceptual framework proposed in this chapter is based on the previous literature with respect to PSOS- and ICT-related models and theories. The proposed framework reflects the role of pre-adoption and post-adoption processes within a continuity concept that relies on self-efficacy, outcome expectations and satisfaction in order to encourage reuse of the PSOS system. Post-adoptive behaviour is defined as "the myriad feature adoption decisions, feature use behaviours, and feature extension behaviours made by an individual user after an IT application had been installed, made accessible to the user, and applied by the user in accomplishing his/her work activities" (Jasperson et al., 2005: 531). The purpose is to develop a comprehensive conceptual framework that explains the pre- and post-adoption stages. The intended framework assists in ensuring that there is harmony between the external factors (e.g., social influence, PSOS) and the personal factors (e.g., self-efficacy, personal outcome expectations and satisfaction) towards continuance behaviour.

The present construct measures are adapted from past studies, as seen in Table 3.2, in order to propose new constructs to formulate the proposed framework of this study. Therefore, the present study is stimulated by the contributions of previous theories and models, more specifically, SCT (Bandura, 1986; Compeau and Higgins, 1995b), ECT

(Oliver, 1980, 1993, 1999a; Bhattacherjee, 2001; Hsu et al., 2004), service quality (DeLone and McLean, 1992, 2003), E-S-QUAL (Parasuraman et al., 1985, 1988, 2005), and UTAUT and its related models (Chan et al., 2010; Venkatesh et al., 2003, 2011).

Table 3.2: Proposed factors for conceptual framework to examine continuance intention in using PSOS

Constructs	Description/definition	Theory/ model	Sources
Personal Outcome Expectations (POE):	"Is a person's estimate that a given behaviour will lead to certain outcome" (Bandura, 1977a: 193). Or "a judgment of the likely consequence such performances will produce". "Attitudes, in turn, are predicted by a person's outcome expectations" (Ajzen and Fishbein, 1980). "Outcome expectancy is defined as what outcomes an individual believes will happen from doing a certain action" (Bandura, 1986).	SCT/ECT	Bandura, 1986; Bandura, 1997: 21; Davis, 1989; Davis et al., 1989; Thompson et al., 1991; Compeau & Higgins 1995b; Venkatesh et al., 2003; Chan et al., 2010; Compeau et al., 1999;
Self-Efficacy (SE):	"An individual's belief in his or her capability to perform a specific task -Self-efficacy is a type of self-assessment that influences decisions about undertaking certain behaviours, and the effort put into something during difficult times" (Bandura, 1997). **Task specific computer self-efficacy** (CSE) refers to "an individual's perception of efficacy in performing specific computer-related tasks within the domain of general computing."(Marakas et al., 1998: 128). "Self-efficacy refers to a judgment of one's capability to use a technology" (Compeau and Higgins, 1995b).	SCT/ECT	Bandura, 1986, 1997; Compeau and Higgins 1995b
Prior Experience (PE)	Bandura refers to prior experience as enactive mastery. Compeau and Higgins (1995a) emphasised the vital role of successful experience in fostering self-efficacy by offering software training.	SCT/ECT	Bandura, 1986; Johnson and Marakas, 2000; Taylor and Todd, 1995a/b Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975

Satisfaction (SAT)	Oliver mentioned that satisfaction is derived from the Latin *satis* (enough) and *facere* (to do or make) (Oliver, 1997, p. 11). User effects (feelings about) prior PSOS use. Satisfaction refers to "the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience" (Oliver, 1981: 29). Seddon (1997: 246) defined satisfaction in the D&M model as "a subjective evaluation of the various consequences evaluated on a pleasant–unpleasant continuum" This is relevant to services aspects (as pleasant or unpleasant) (Oliver, 1993a). "User satisfaction remains an important means of measuring our customers' opinions of our e-commerce system and should cover the entire customer experience cycle from information retrieval through purchase, payment, receipt, and service." (DeLone and McLean, 2003: 25)	ECT and D&M	Bandura, 1986; Bhattacherjee, 2001b; Bhattacherjee & Premkumar, 2004; Chan et al., 2010; Seddon, 1997; Teo et al., 2008; DeLone and McLean, 1992, 2003; Oliver, 1997; Oliver, 1981
Continuance Intention (CI)	Users' intention to continue using PSOS online services	ECT	Oliver, 1980, 1993a; Anderson & Sullivan 1993; Bhattacherjee, 2001b; Bhattacherjee & Premkumar, 2004
Information Quality (IQ)	According to DeLone and McLean (1992), information quality is concerned with the measure of the information that the system produces and delivers. Information quality captures "the e-commerce content issue. Web content should be personalized, complete, relevant, easy to understand, and secure if we expect prospective buyers or suppliers to initiate transactions via the Internet and return to our site on a regular basis." DeLone & McLean, 2003: 25).	D &M/ UTAUT	DeLone & McLean, 2003; Teo et al., 2008; Seddon & Kiew, 1996; Wang & Liao, 2008; Wangpipatwong et al., 2009

Service Quality (SQ)	Parasuraman et al. (2005: 217) define online service quality as "the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery". Service quality is an abstract and complex construct that is difficult to define, assess, and communicate (Brown & Swartz, 1989). Service quality is an attitude as it represents a long-term evaluation process (Cronin and Taylor, 1992; Parasuraman et al., 1988) Service quality is "the overall support delivered by the service provider, applies regardless of whether this support is delivered by the IS department, a new organizational unit, or outsourced to an Internet service provider (ISP). Its importance is most likely greater than previously since the users are now our customers and poor user support will translate into lost customers and lost sales." (DeLone & McLean, 2003: 25) One's judgment about a product's services taken as a whole. Quality, in their consideration, is the difference between service delivered and customer expectation. E-S-QUALScale, consisting of 22 items on four dimensions, which we label and define as follows (Parasuraman et al., 2005): 1. *Efficiency:* The ease and speed of accessing and using the site. 2. *Fulfillment:* The extent to which the site's promises about order delivery and item availability are fulfilled. 3. *System availability:* The correct technical functioning of the site. 4. *Privacy:* The degree to which the site is safe and protects customer information. E-RecSQUAL - consisting of 11 items on three dimensions: 1. *Responsiveness:* Effective handling of problems and returns through the site. 2. *Compensation:* The degree to which	D &M, SERVQUAL, E-S-QUAL	DeLone & McLean, 2003; Zeithaml, 1988; Lewis and Booms, 1983; Parasuraman et al., 2005; Li et al., 2002; Wang & Liao, 2008; Wangpipatwong et al., 2009; Wang and Tang, 2003; Zeithaml et al., 2000

	the site compensates customers for problems. 3. *Contact:* The availability of assistance through telephone or online representatives (Parasuraman et al., 2005).		
Social Influence (SI)	Social influence is comprised of subjective norms, social factors, and image. The construct name "social norms" has been used in prior literature and is similar to "subjective norm" within the Theory of Reasoned Action (Thompson et al., 1991). None of the social influence constructs were found to be significant in voluntary contexts; however, all of them were found to be significant when usage was mandatory (Venkatesh et al., 2003). Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new IS (Venkatesh et al., 2003). Venkatesh et al (2003) define social influence as the degree to which an individual perceives that important friends believe he or she should use the new IS. Subjective norm refers "on one hand to beliefs that specific referents dictate whether or not one should perform the behaviour or not, and on the other, the motivation to comply with specific referents" (Ajzen and Fishbein, 1980).	UTAUT/SCT	Fishbein and Ajzen, 1975; Bandura, 1986; Thompson et al., 1991; Davis et al, 1989; Taylor and Todd, 1995a/b; Venkatesh et al., 2003, 2011; Chan et al., 2010

Drawing on the theoretical models and related constructs discussed above (Table 4.1), Figure 3.5 illustrates the conceptual framework together with its impacts with respect to the two main stakeholders in the PSOS process: citizens and the PSOS agency providing the services.

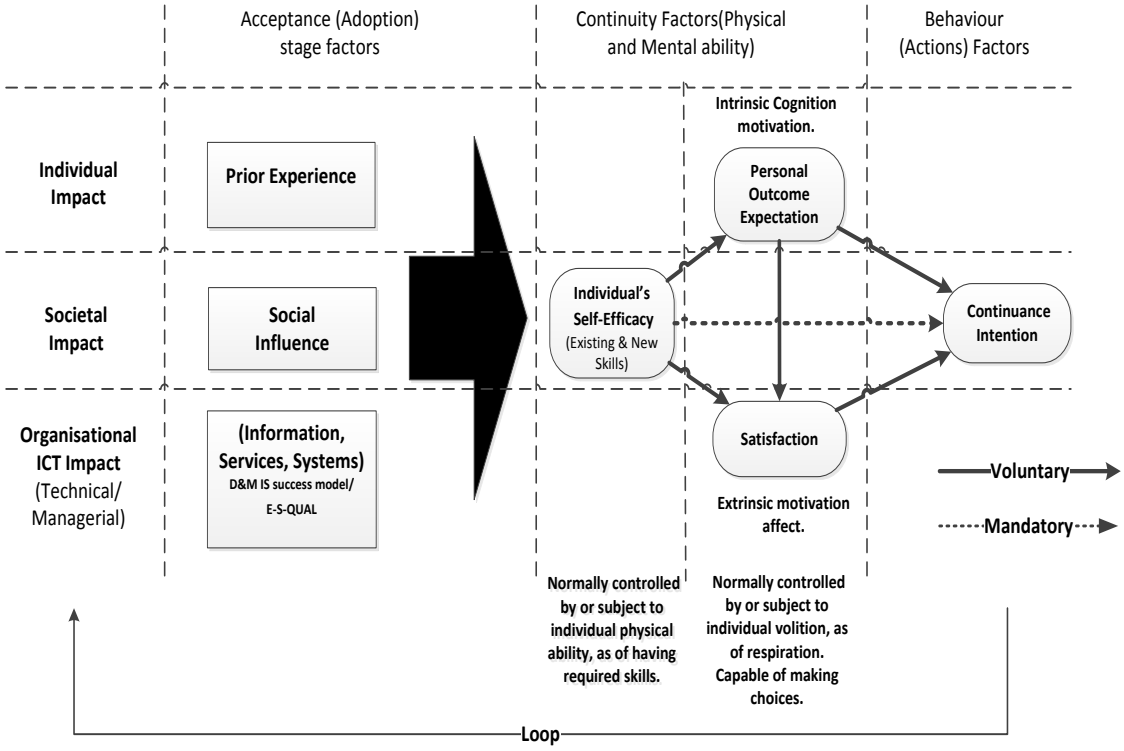


Figure 3.5: An illustration of the process of the conceptual framework development

The goal is to integrate and conceptualise the post-adoptive behaviour from previous models (SCT, ECT, D&M IS Success and E-S-QUAL) into a theoretical framework. Thus, this research addresses post-adoptive behaviour, which has already been modelled and influenced by factors that lead to acceptance and initial use (Jasperson et al., 2005).

3.8. Instrument construction and hypotheses

The present study is guided by Figure 3.5, which presents the research model. The model is formulated based on SCT, ECT and the IS success model as well as E-S-QUAL. Eight constructs are measured in this study: Social Influence (SI); Prior Experience (PE); Self-Efficacy (SE); Personal Outcome Expectation (POE); Satisfaction (SAT); Information Quality (IQ); Services Quality (SQ); and Continuance Intention (CI). The proposed model is consistent with the foundations of SCT in which an individual learns new ideas in PSOS by practising the PSOS systems through his or her interaction with information and service quality as well as social influence (Bandura, 1986).

3.8.1. Prior Experience (PE)

Bandura refers to prior experience as 'enactive mastery' (Bandura, 1986; Johnson and Marakas, 2000). Prior experience reflects one's psychological perceptions of the last experience in online services systems (Hussein et al., 2011). Bandura (2009) pointed out that past experience, especially successful experience, increases one's confidence in self-efficacy and functionality with what has been already adopted. Prior experience is considered as a key source of self-efficacy (Compeau and Higgins, 1995b) besides social influence. Prior use is considered indirectly as confirmation and directly as computer experience skills (Jasperson et al., 2005). In SCT, Bandura (1986) associates prior performance in self-efficacy with outcome expectations. Prior experience is held to be the strongest source of information on self-efficacy, based on SCT. Chan et al. (2010) used 'compatibility', which implicitly indicates prior experience or preferences as a construct that influences performance expectancy in mandatory online services in public sector systems. Kettinger and Lee (1994, 1997) found support for a significant correlation between disconfirmation (the gap between perceived service delivery and expectations of service) and user information satisfaction. Bhattacherjee (2001) found that performance disconfirmation is an important determinant of user satisfaction with the online banking system. Hsu et al. (2004) found that there is a positive relationship between users' level of prior perceived disconfirmation and their level of satisfaction with prior use of the WWW and with their outcome expectations of continuing use. Furthermore, empirical evidence suggests that more information about outcome expectation may be available through direct experience than indirect experience (Fazio and Zanna, 1981). Information derived through prior experience is likely to result in the individual being more able to evaluate the outcome clearly and confidently (Compeau and Higgins, 1995b). Furthermore, Compeau and Higgins (1995a) emphasised the vital role of successful experience in fostering self-efficacy by offering software training. Therefore, the following hypotheses are proposed:

H1a: *There is a positive correlation between citizens' level of prior experience and citizens' personal outcome expectations.*

H1b: *There is a positive correlation between citizens' level of prior experience and citizens' self-efficacy.*

H1b: *There is a positive correlation between citizens' level of prior experience and citizens' satisfaction.*

3.8.2. Social Influence (SI)

Social influence is defined as the degree to which an individual perceives others' belief that they should use a new system (Venkatesh et al., 2003). Different measurements have been used in order to assess social influence on one's behaviour (Hussein et al., 2010; Venkatesh et al., 2011). Social influence can be seen as the degree to which one's peers influence one's use of the system, whether positively or negatively, based on the individual's internalisation of the reference group (Fishbein and Ajzen, 1975; Bandura, 1986; Thompson et al., 1991; Davis et al., 1989; Taylor and Todd, 1995a/b; Chan et al., 2010; Venkatesh et al., 2003, 2011). 'Subjective norms' (or normative beliefs) is yet another term that has been used in association with the adoption stage (Venkatesh et al., 2003); there is some overlap in labelling constructs. These cognitive social influence actions have a significant impact on subsequent actions in self-efficacy, personal outcome expectations and satisfaction, or in other words personal performances (Compeau and Higgins, 1995b). Bandura (1977) mentioned that enactive mastery, vicarious experience and verbal persuasion, including emotional arousal, can influence self-efficacy. People are part of this society and are not isolated in this world (Bandura, 1986), and therefore observing others (friends, co-workers and family) would help in imitating the same practice either by modelling them or encouraging them. "When experiential verification is difficult or unfeasible, *social* verification is used, with people evaluating the soundness of their views by checking them against what others believe. In *logical* verification people can check for fallacies in their thinking by deducing from knowledge that is known what necessarily follows from it" (Bandura, 2009: 97). Society can be a communication channel that diffuses an innovation within the public over time among the members of a social group in society (Rogers, 1983, 1995). Carter and Bélanger (2005) pointed out the role of compatibility by indicating that citizens who are willing to use the e-services of the Web socially, economically and professionally can be expected to use online services and interact with systems as they are familiar with similar systems, for example, using social applications (e.g., email, downloading music), economically (online shopping, banking), or professionally (using the Internet for business or job-related issues, such as insurance). Furthermore, Chan et al. (2010) mentioned that social influence has a positive impact on user satisfaction. Therefore, the following hypotheses are proposed:

H2a: *Social influence is positively correlated with personal outcome expectations.*

H2b: *Social influence is positively correlated with citizens' self-efficacy.*

H4c: *Social influence is positively correlated with satisfaction.*

3.8.3. Information Quality (IQ)

According to DeLone and McLean (1992), information quality (IQ) is concerned with the measure of the information that the system produces and delivers. Information quality captures the e-commerce content issue: "Web content should be personalized, complete, relevant, easy to understand, and secure if we expect prospective buyers or suppliers to initiate transactions via the Internet and return to our site on a regular basis" (DeLone & McLean, 2003: 25). Several studies have used IQ as a crucial factor in the ICT field (e.g., Teo et al., 2008; Seddon & Kiew, 1996; Wang & Liao, 2008; Wangpipatwong et al., 2009). Previous researchers consider IQ as the most salient factor as it influence the process of making decisions and then user intention behaviour toward using the system again (DeLone & McLean, 1992, 2003, 2004; Molla & Licker, 2001; Wangpipatwong et al., 2009). Thus, IQ influences self-efficacy and personal outcome expectations as those factors together regulate the future decision-making processes of an individual, based on SCT. In addition, previous empirical studies have found that information quality is associated with user satisfaction (Seddon, 1997; Negash et al., 2003; Wangpipatwong et al., 2009). This factor is critical, as it has paved the way for service quality in all previous PSOS evolution lifecycles, as seen in Chapter 2. Therefore, the quality of information has an influence on a citizen's ability to access and read this information, on forming his or her outcome expectation towards revisiting the website or not, and on his or her satisfaction. The degree of website information quality stimulates the citizen to use this website (based on SCT) and encourage the citizen to use it again. Timely, accurate, well-organised and relevant information are considered to be essential website measurements in the public sector; for example, in the Malaysian public sector e-filing service, the public can receive detailed useful information from the website. There are also steps to guide the users in paying their tax in Malaysian public sector systems (Hussein et al., 2011). Therefore, the following hypotheses are proposed:

H3a: *There is a positive correlation between information quality and citizens' personal outcome expectations.*

H3b: *There is a positive correlation between information quality and citizens' self-efficacy.*

H3c: *There is a positive correlation between information quality and satisfaction with online public systems.*

3.8.4. Service Quality (SQ)

Service quality is defined as: "the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery" (Parasuraman et al., 2005: 217). Service quality is an abstract and complex construct that is difficult to define, assess and communicate (Brown and Swartz, 1989), although it is an attitude as it represents a long-term evaluation process (Cronin and Taylor, 1992). Consistent with SCT, early conceptualisation of service quality was associated with customer expectations (Lewis and Booms, 1983). Previous studies have recognised it as an essential metric of IS success (e.g., DeLone and McLean, 1992, 2003; Zeithaml et al., 2006, 1996; Zeithaml, 1988; Rai et al., 2002). Thus, focusing on the services within an IS function is crucial for measuring IS effectiveness (Pitt et al., 1995). The quality of online services influences customer satisfaction and personal decisions (DeLone and McLean, 2003). Furthermore, based on SCT, service quality can act as a motivation or as an external stimulus with respect to self-efficacy and personal outcome expectations. Motivation can influence what, when and how we learn (Schunk, 1991), where goal-directed performance is provoked (e.g., IS acceptance process) and can continue or be sustained over time (Pintrich and Schunk, 2002); hence, service quality can reveal important differences in the acceptance and usage of technologies as well in the continuity process. In other studies, Wangpipatwong et al. (2009: 24) refer to service quality as "the quality of personal support services provided to citizens through public sector Web sites, such as answering questions, taking requests, and providing sophisticated solutions to citizen's problems." This definition is consistent with the D&M IS success model definition of service quality (DeLone and McLean, 2003, 2004); the focus in this definition is more on contact or user-support services. Therefore, the following hypotheses are proposed:

H4a: *There is a positive correlation between service quality and citizens' personal outcome expectation of continued use of PSOS.*

H4b: *There is a positive correlation between service quality and citizens' perceived self-efficacy.*

H4c: *There is a positive correlation between service quality and citizens' satisfaction with PSOSs.*

3.8.5. Self-Efficacy (SE)

Compeau and Higgins (1995b: 191) define self-efficacy as: "an individual's perceptions of his or her ability to use computers in the accomplishment of a task". This is consistent with the ability to use ICT facilities in order to utilise online services to achieve one's task, whether in the public or private sector. Task-specific computer self-efficacy (CSE) refers to "an individual's perception of efficacy in performing specific computer-related tasks within the domain of general computing" (Marakas et al., 1998: 128, 2007). Furthermore, Bandura (1986) defines four sources of self-efficacy information: guided mastery, behaviour modelling, social persuasion, and physiological states. Performing a specific task is a type of self-assessment that influences decisions about undertaking certain behaviours, and the effort needed to put into something during difficult times (Bandura, 1997). Self-efficacy or beliefs about one's ability to perform a particular task or behaviour represents a set of realistic expectations (Bandura, 1986; Compeau and Higgins, 1995b). Citizens whom attain high self-efficacy are more likely to perform the task with less effort than those with lower self-efficacy because they have the skills and experience in how to use public sector systems, which leads to greater control over up-to-date technologies (Venkatesh and Davis, 1996). Hussein et al. (2011) found that lacking technical skills and lack of trust in online transactions on the part of Malaysian taxpayers is a subject for more investigation in order to encourage their intention to use the e-filling system. Self-efficacy as a belief is considered to be a crucial element for regulating behaviour towards competencies (Pintrich, 1999). The principal point among the myriad definitions, interpretations and explanations is that the estimation of self-efficacy is a composite of numerous factors, each of which serves to have a direct effect on the final individual judgment and on the relationship of that judgment to the actual performance (Marakas et al., 1998). SCT argues that self-efficacy perceptions influence an

individual's outcome expectations (Bandura, 1978, Compeau and Higgins, 1995b). It has been found that there was a significant positive relationship between self-efficacy and personal outcome expectations (Compeau and Higgins, 1991). Therefore, the following hypotheses are proposed:

H5a: *There is a positive correlation between citizens' self-efficacy and their personal outcome expectation.*
H5b: *There is a positive correlation between citizens' self-efficacy and their satisfaction with PSOS.*

3.8.6. Personal Outcome Expectation (POE)

Personal outcome expectation is "a person's estimate that a given behaviour will lead to certain outcome" (Bandura, 1977: 193). Outcome expectancies are the consequences of doing a certain action (Bandura, 1986). Several studies have utilized POE (Bandura, 1986; Bandura, 1997; Davis, 1989; Davis et al., 1989; Thompson et al., 1991; Compeau and Higgins 1995a/b; Venkatesh et al., 2003; Chan et al., 2010; Compeau and Higgins, 1999). Personal outcome expectation is considered to be a self-reward system in which an individual anticipates a certain outcome after his or her involvement; it is not a reward for a job. There is a link between the required skills, including physical ability (self-efficacy) and psychological ability (personal outcome expectation); physical ability normally arises before psychological ability in the continuance process (Bandura, 1986, 1977). Compeau and Higgins, (1995b: 122) stated: "individuals who expect positive benefits from using computers would be expected to be more highly motivated than those who do not expect positive benefits, and to persist more in their attempts to learn". Thus, favourable consequences represent a judgement of self-efficacy and outcome expectations because people normally take an action based on how they perceive their own capabilities, and therefore, the expectations of this action sustain their efforts (Bandura, 1986). Johnson and Marakas (2000) emphasised the power of positive outcomes in motivating people to undertake tasks, and thereafter looking for a more complex task because they are satisfied with the development. Predicting the behaviour is determined by outcome expectations if there are uncontrolled efficacy beliefs (Bandura, 1997).

In previous studies, Bostrom et al. (1990) found that motivation, more specifically, perceived usefulness, which has been widely used in TAM, is similar to outcome expectations; this emphasises how different constructs overlap in their labelling among researchers. In the same way, Fagan et al. (2008) stated that perceived ease of use and extrinsic motivation are operationalized as perceived usefulness, or in other words, net benefit (DeLone and McLean, 2003). Therefore, some previous researchers overlap constructs that have common characteristics. Bhattacherjee (2001b: 365) found, "Satisfaction with IS use was predicted primarily by users' confirmation of expectation from IS use and secondarily by their perceived usefulness of initial IS use. Therefore, the following hypotheses are proposed:

H6a: P*ersonal outcome expectation is positively correlated with citizens' continuance intentions in public sector systems.*

H6b: *Personal outcome expectation is positively correlated with citizens 'satisfaction in PSOS.*

3.8.7. Satisfaction (SAT)

Satisfaction reflects collective feelings based on previous experiences with online services (Oliver, 1980, 1981). Seddon (1997: 246) defined satisfaction as "a subjective evaluation of the various consequences evaluated on a pleasant-unpleasant continuum". Pleasant or unpleasant feelings are relevant to various service aspects (Oliver, 1993a/b). "User satisfaction remains an important means of measuring our customers' opinions of our e-commerce system and should cover the entire customer experience cycle from information retrieval through purchase, payment, receipt, and service" (DeLone and McLean, 2003: 25). Previous researchers have recognised that satisfaction would be an appropriate dependent variable in online services studies (Brown et al., 2002; Brown et al., 2008; Chan et al., 2010) and an appropriate measure of the success of online services (Teo et al., 2008). By linking satisfaction with the continuity process (and according to ECT), satisfaction with the provided services would be a strong predictor of users' continuance intention (Bhattacherjee, 2001b). Hsu et al. (2004) found that the ability to perform specific features while using the WWW (e.g. filing income tax returns using online services) had a significant influence on users' continuance intention to use e-services. Satisfaction and continuance intention is an appropriate use to predict

intention to continue using a system in the post adoption stage or 'continuance stage' of the public service website (Teo et al., 2008). Furthermore, there is a suggestion that satisfaction may change the adoption or acceptance process toward a system (Bhattacherjee and Premkumar, 2004). Therefore, the following hypotheses are proposed:

H7: *There is a positive correlation between citizens' satisfaction with PSOS and their continuance intention to use PSOS.*

3.9. The initial research model and hypothesised paths

Based on the above discussion and previous literature review, the researcher presents the initial research model, which specifies eight constructs: prior experience, social influence, self-efficacy, information quality, service quality, satisfaction, personal outcome expectation and continuance intention. Having described the initial model and the theoretical rationale, Figure 3.6 illustrates the initial hypotheses with their associated links.

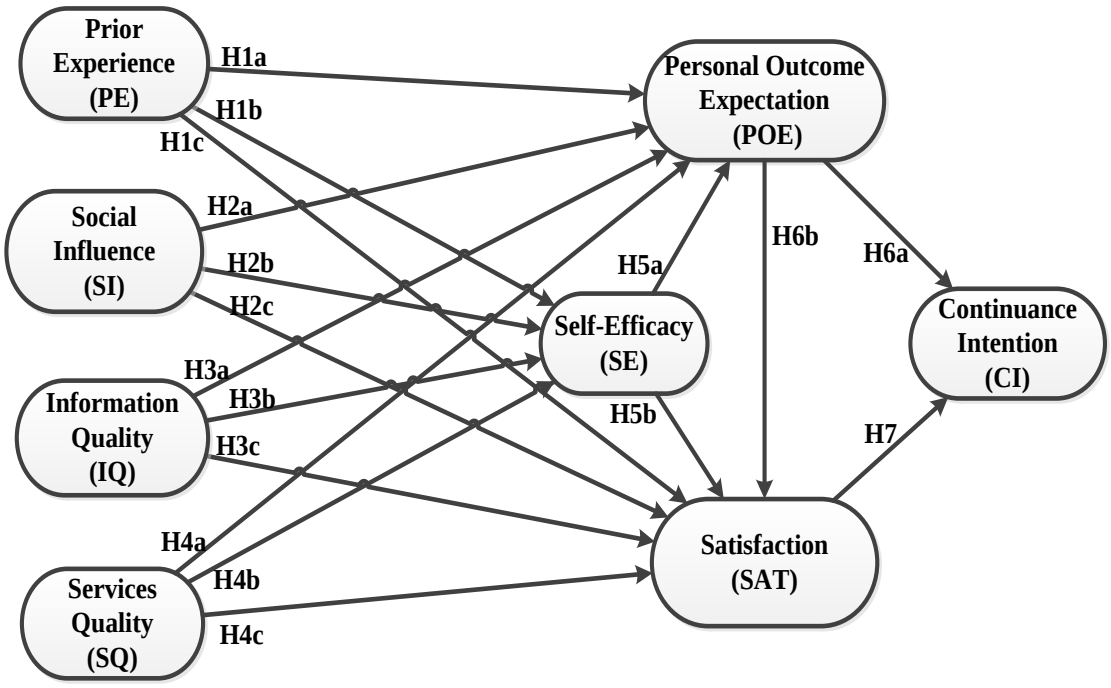


Figure 3.6: The proposed research model construct and hypotheses

3.10. Summary

The research framework and hypotheses development are based on the reviewed literature, as illustrated in Table 3.2 above. Following this, the hypotheses are explained among the proposed constructs in the provided conceptual framework, and they are: social influence, prior experience, self-efficacy, personal outcome expectations, information quality, services quality, satisfaction, and finally continuance intention.

The following section will discuss the methodology used in this study. The research is a quantitative approach based on the research model. In order to guide the procedure of the present study, and based on the research paradigm, Figure 3.7 provides an overview of the procedure used in this research.

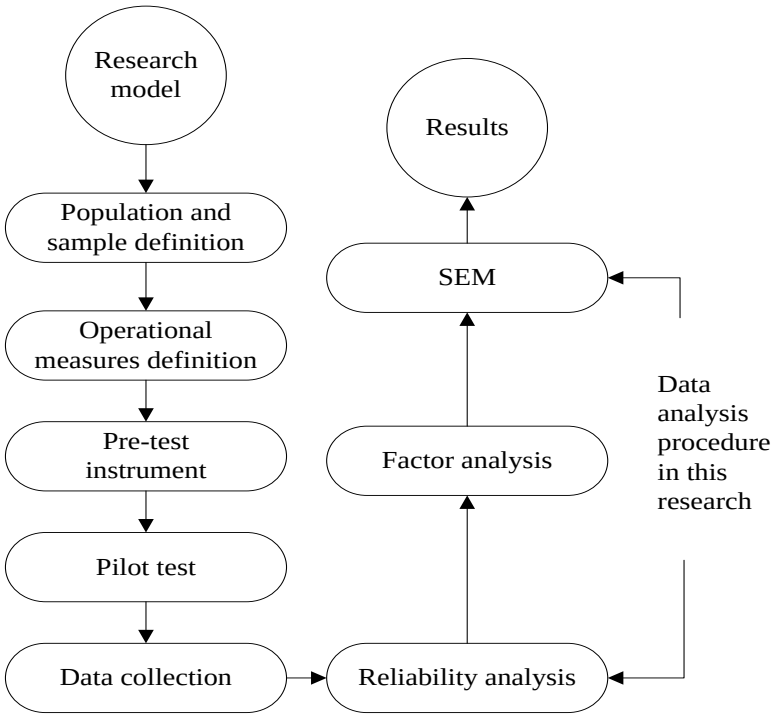


Figure 3.7: The research design

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1. Introduction

The previous chapters include formulating and clarifying the research topic, critically reviewing the literature, and introducing detailed information about the theoretical and conceptual framework and hypotheses; therefore, the literature assists the author to identify theories and models that are applicable for this research (e.g. SCT & ECT as well as D&M and E-S-QUAL). Thus, the present chapter will provide the research methodology for testing these theories. The researcher's most important concern in this chapter is to select the best method in order to answer the research question. The first that came in the researcher's mind is whether to administer a questionnaire or to conduct interviews. Guba and Lincoln (1994:105) argue that questions regarding which paradigms are applicable to the research is of prime importance to the question of which research methods to use by stating, "questions of methods are secondary to questions of which paradigm, which we define as the basic belief system or world view that guides the investigation, not only in choices of methods but in ontologically and epistemologically fundamental ways". Therefore, this chapter justifies the outline of methodology used in this study.

The present chapter also includes the process of designing the research, collecting data, and then analysing the data; hence, this chapter clarifies the philosophy and approach of the present study. Furthermore, this chapter addresses the issue of understanding different research philosophies, including positivism, realism and interpretivism including deductive and inductive approaches. Based on Saunders et al. (2007), the idea behind this is to challenge the author to think about his/her own values and views with respect to this world and reflect these values and views through the undertaken research supported by research design and strategies such as the differences between quantitative and qualitative methods as well as research ethics etc.

4.2. Research philosophy

There are several factors that influence the research philosophy; perhaps the most important one is the selection of the research question (Bryman, 2001; Yin, 1994). Based on Guba and Lincoln (1994), the research methodology is considered to be a part

of the paradigm; therefore, the researcher follows a framework that is based on a research paradigm. The framework is considered as a guide for a researcher (Guba and Lincoln, 1994; hence, the research philosophy helps in establishing standards for the study. In other words, a research paradigm is a map for a researcher that he or she follows. Hence, it is crucial to express the assumptions about how the author views this world with respect to the chosen research strategy and methods (Saunders et al., 2007). In the following part, the author examines three major ways of thinking about research philosophy: epistemology, ontology and axiology.

4.2.1. Epistemology

Based on Saunders et al. (2007:102), "epistemology concerns what constitutes acceptable knowledge in a field of study". The researcher in the present study is concerned with the "feelings" and "attitudes" of the citizens towards their continuity use of PSOS online services. However, feelings such as "satisfaction", "outcome expectation" and "continuance intention" cannot be seen in reality; these are not objects and, therefore, cannot be measured unless the researcher presents (interprets) the collected data into a narrative. Hence, the feelings can exist objectively, externally and validly if they are based on observations of the external realities.

4.2.1.1. Positivism

Positivism is a philosophical stance which comes from the natural sciences that prefers working with an observable social reality and believes that the result "can be law-like generalisations" (Remenyi et al., 1998:32); the observed phenomena can lead to the gathering of credible data. Therefore, pre-existent theories can generate hypotheses, so, the hypothesis is tested through an existing theory; in other words, it is a deductive or theory testing approach. Thus, SCT and ECT are utilised in this research in which the researcher can select a deductive research strategy to collect the required data. After that, the selected hypotheses will be developed and tested which leads to them being either rejected or confirmed. Thereafter, a recommendation will be presented for further development of the chosen theories or for future research. The term "positivism" is associated with the French philosopher Auguste Comte in the first half of the nineteenth

century and has been used through to the current day, and historically it has been the dominant paradigm in research inquiry (Cohen et al., 2007).

The assumption is that "the researcher is independent of and neither affects nor is affected by the subject if the research" (Remenyi et al., 1998:33). This is unlike a personal interview where the researcher involves their feelings in their interpretation of what the respondents say; hence, consistency is required in positivism because the questions are the same for every respondent, which is different to a personal interview. Therefore, it is important to differentiate between the human and an automatic system. However, the use of a highly structured methodology is likely to be adopted by a positivist researcher so that he or she can facilitate the replication (Gill and Johnson, 2002).

In the positivist position, there is a focus on opinions gathered through direct observation through survey or an experiment that can be measured through statistical analysis (Blaikie, 1993; Saunders et al., 2007). Some researchers link this approach to the organisational context and how it can be measured through the systems and the people's behaviour, which leads to information about reality in the end (Hatch and Cunliffe, 2006). In the positivistic school of thought, researchers remain neutral (Tashakkori and Teddlie, 1998).

Natural science has developed the research methods that are used in the positivistic approach for studying natural phenomena; for example, in management information systems, surveys and laboratory experiments quantitative methods have been the most common methods used (Orlikowski and Baroudi 1991). Hence, before gathering data to test the validity of the hypothesis, deductive reasoning is required to postulate the hypothesis in quantitative research approach.

4.2.1.2. Realism

Another epistemological position is Realism, which is related to scientific enquiry. Realism is similar to positivism in that it is regarded as a scientific approach. "The essence of realism is that what the senses show us as the truth: that objects have reality existence independent of the human mind" (Saunders et al., 2007:104); hence, reality is quite independent of the human mind, which is contrary idealism (only the mind and its contents exist). There are two types, direct and critical realism.

The first, direct realism states that what you can see is what you get. Direct realism might be a response to critical realism in some cases. There might be a misleading impression of reality through what is perceived being different from what is real; hence, direct realism might misinterpret the real by creating a false mental image or by having insufficient information.

The second, critical realism refers to our experiences as sensations or as images of what we see in the real world. Therefore, critical realism might deceive researchers because there is a chance that our senses might not give true information. Critical realists believe that sensory data may create an illusory view of the world. Critical realism can be divided into two steps; first, the thing itself and the sensations it conveys; second, the mental processing of what is seen and how it is linked to our senses; however, in direct realism, the first step is sufficient. Understanding the social structure behind the phenomena assists in understanding the social world in business and management research (Bhaskar, 1989), and practical and theoretical processes of social sciences help in identifying those structures. Hence, there are different views of the big picture and by integrating these views through multi-level studies (e.g. individual level, organisational level), researchers are able to understand what is being studied; this world is constant (direct realism) and at the same time the social world is constantly changing based on different sensations or interpretations. This dynamic change reflects the world of business and management research in order to understand the reason for the phenomena (Saunders et al., 2007).

4.2.1.3. Interpretivism

Interpretivism is "an epistemology that advocates that it is necessary for the researcher to understand the differences between people in our role as social actors" (Saunders et al., 2007:106). Therefore, it highlights people's differences rather than differences in the objects of study. Interpretivism argues that the social world is too complex to be described by a series of a law-like generalisations. If the researcher is involved (sympathises) in the problem domain then he or she is closer to the Interpretivist position; thus, the term "social actors" is crucial in this position. The researcher's own set of values lead the interpretation process (Saunders et al., 2007). An adjustment of

the researcher's values and actions is made through a continual process of interpretation. The view in this position is that the world can be understood through the subjective interpretation of human behaviour and experience (Bryman, 2001). Other researchers believe that one cannot separate the knower from the known, therefore, in order to understand reality, a subjective approach is better than an objective one (Guba, 1990). However, the qualitative style involves a detailed description compared with the quantitative style; hence, in the quantitative style, a context-free generalisation is neither desirable nor acceptable. However, some would argue that Interpretivist epistemology is better for understanding organisational behaviour because of the unique nature of the cases it deals with (Saunders et al., 2007). In organisational behaviour, there are particular cases, which raises issues of generalisability for the research. Hence, the Interpretivist perspective does not lend itself to generalisability; it aims to capture the complexity of the social situation because it is not of crucial importance (Saunders et al., 2007). Thus, the changing environment might be influencing the value of generalisations, and at the same time, viewing all organisations as unique would render generalisation less valuable. Table 4.1 introduces a summary of the main differences between Positivism and Interpretivism.

Table 4.1: Main differences between positivism and interpretivism. Source: Hussey and Hussey, 1997: 312; Weber, 2004.

Positivism	Interpretivism
Large sample size	Small sample size.
Researcher is not involved in the domain problem (must be independent). (Ontology)	Researcher is involved in the domain problem.
Artificial location. Researcher and reality are separate (epistemology).	Natural location (life/world), researcher and reality are attached.
Specific and precise data. Research results can be reproduced.	Subjective data. Researcher recognises and addresses implications of subjectivity. Subject to interpretive awareness.
Testing hypothesis. Data measure reality.	Developing theories. Defensible knowledge claims.
Generalises from the sample to the population	Generalises from one setting to another.
Uses statistics and content analysis methods	Hermeneutics and phenomenological issues, etc.
The research object has inherent qualities that exist independently of the researcher.	The research object is interpreted by the researcher. It is subject to the researcher's experience.

A serious weakness with the above argument, however, is that there is an assumption that social and economic conditions can be altered by people. However, there are barriers (e.g., social, cultural and political barriers as well as limited resources) that bind one's abilities to improve such conditions (Myers and Avison, 2002).

4.2.2. Ontology

Ontology is concerned with the nature of reality; therefore, acceptability of the knowledge can be gained through the research process. The two aspects of ontology are likely to be accepted as producing valid knowledge. These aspects are objectivism and subjectivism (Saunders et al., 2007).

4.2.2.1. Objectivism

Objectivism states: "social entities exist in reality external to social actors concerned with their existence." (Saunders et al., 2007:108); for example, in PSOS practice, making changes in the organisational formal management structure with respect to ICT will not change how people view the PSOS online services; the reality is separate from the organisational actors that inhabit the reality. Thus, subjectivism emphasises the role of consequences and interactions with actors. In other words, there is a big system and it is difficult to change this system piecemeal.

4.2.2.2. Subjectivism

Subjectivism states: "social phenomena are created from the perceptions and consequent actions of those social actors concerned with their existence." (Saunders et al., 2007:108). Subjectivism is a continual process based on the actor's perceptions through the process; therefore, there is a revision process through time. Hence, studying the whole situation is crucial in order to understand the reality (Remenyi et al., 1998), which is similar to social constructionism. SCT holds that the mutual relationships between personal factors, environmental factors and behavioural factors determine the situation (Bandura, 1986). Therefore, social actors such as citizens that this study presents may have various interpretations on the situations based on their previous experience and views and how they perceive the PSOS practice and its consequences. Hence, these various views may influence their actions or other's actions based on the nature of social circle they are in or the environmental group. It is also crucial to emphasise the context where this interaction takes place in order to be meaningful when drawing from the event (e.g. G2C based on specific online service). Understanding the context would help in understanding citizens' motives, actions and intentions in a way that is meaningful (Saunders et al., 2007). Subjectivists are interested in the "is" rather than the "has", which means subjectivism emphasises the role of the continuity process.

Therefore, subjectivists think about re-creativity through a complex process rather than seeing things as variables. This includes social interactions and physical factors.

4.2.2.3. Pragmatism

The debates on positivist and interpretivist research philosophy can be framed as either epistemology or ontology. Hence, there are choices between things that are unrealistic in practice based on the pragmatic position. Pragmatism emphasises the role of the research question rather than the methods; in other words, mixed methods can be adopted (e.g. quantitative and qualitative). Thus, various forms of methods are acceptable if these forms determine the meaning through practical consequences rather than a dogma or a theory. Tashakkori and Teddlie (1998) suggest that pragmatism is more appropriate because what bring value to you is more appropriate for your value systems.

4.2.3. Axiology

Axiology underlines the role of values including aesthetics and ethics in the research process. Heron (1996) claims that human actions are based on value reasoning. Hence, demonstrating axiological skill in research presents the researcher's values and how he or she wishes to be presented and credited. The chosen philosophical approach reflects the researcher's values; for example, whether the researcher is in favour of the personal interview over secrecy through a questionnaire or the opposite. Therefore, the situation of data collection techniques may determine the process. Personal values are crucial in this approach, such as personal career development. The researcher's value can be addressed in the conclusion of the research, which allows the research to be credited and differentiated from others.

4.3. Research approaches

The present research involves theories such as Social Cognitive Theory (SCT) and Expectation Confirmation Theory (ECT). However, the use of these theories might not be apparent in the research approach even though they will be highlighted in the

findings and conclusions. The following will explain the different implications among the research approaches.

4.3.1. Deductive approach: testing a theory

Deduction is the dominant research approach in the natural sciences in which the anticipation of a phenomenon predicts its occurrence and then allows for a suitable adjustment. A deductive approach is driven by scientific research. It means that a researcher develops a theory and hypotheses and then tests these hypotheses; hence, a rigorous test is essential in this approach (Collis and Hussey, 2003).

There are several steps to be taken within a deductive approach; for example, Robson (2002) indicates four steps for deduction:

- First step; construct hypotheses that can be considered as testable propositions of certain variables within the theory.
- Second step; express the operational terms of the hypotheses by showing how these variables can be measured.
- Third step; the testing step, consists of testing the operational hypotheses.
- Final step; examine the outcome by either confirming the theory or proposing a modification in light of the findings.

The deductive approach has to be strictly defined (operationalised) (Saunders et al., 2007). Another advantage of the deductive approach is that the conclusions can be generalised (generalisation); hence, a sufficient size of sample is required. The sample size would make it possible for the researcher to make an inference about the process and the situation. The role of cause-effect is clear between two or more variables in the deductive approach and that allows people to better interpret their social world. However, this approach has been criticised for not allowing for further explanation. Even though an alternative theory might be suggested by this approach, it is limited to the research design. Furthermore, the deductive approach is narrower in nature when compared with the inductive approach, as validation testing and confirming hypotheses through mathematical relationships (between quantitative variables) are based on a logical theoretical argument or on applying rigorous testable theories in the real world (Lancaster, 2005). Thus, a scientific method is being considered here in order to build a

sound research (Sekaran, 2003). In general, deduction concerns a process that draws a conclusion from a logical analysis, and an argument is valid if it is possible to be true, if the premises are "based on logic or theory" with respect to any falsification or the hypothesis testing results (Fitzgerald & Howcroft, 1998).

For the present study, the antecedents of continuance intention to use PSOS are presented by the integrated theories SCT and ECT and the E-S-QUAL features; therefore, these constructs predict the occurrence of PSOS continuance usage and through them permit these antecedents to be controlled as described in Collis and Hussey (2003). In this respect, the researcher uses the deductive approach by testing these theories through empirical study in order to discover the law that explains the basis of the causal relationships between the variables. Therefore, the deductive approach allows the researcher to test the hypotheses and, at the same time, ensures reliability through the use of a highly structured methodology (Gill and Johnson, 2002). Hence, the researcher is independent of what is being observed. Furthermore, the constructs have been operationalised, as explained in the previous chapter, to enable facts to be measured quantitatively so that the results can be generalised. In the present study, the researcher selects those citizens who have experienced use of PSOS and a sufficient numerical size sample has been tested statistically (the following chapter provides more details).

4.3.2. Inductive approach: building a theory

Induction is another approach that is not used in the present study where the researcher interviews a sample of people to gain a feeling of what is going on so that the researcher is able to understand the situation. This approach leads to a formulation of theory (Saunders et al., 2007); that is, a researcher looks for a reason for the problem rather than goes out to test one.

4.3.3. Combining research approaches (deductive and inductive)

Deciding which approach is applicable depends on the researcher and his or her knowledge of the topic, and whether he or she can frame hypotheses based on the literature. Therefore, the nature of the research topic and the given time may decide the

proper approach. Table 4.2 summarises some of the major differences between the deductive and inductive approach.

Table 4.2: Summary of the major differences between deduction and induction (source: Saunders et al., 2007)

Deduction	Induction
• Scientific principles • Moving from theory to data • The need to explain causal relationships between variables • The collection of quantitative data • The application of control to ensure validity of data • The operationalisation of concepts to ensure clarity of definition • A highly structured approach • Researcher independence of what is being researched • The necessity to select a sample of sufficient size in order to generalise conclusions	• Gaining an understanding of the meanings people attach to events • A close understanding of the research context • The collection of qualitative data • A more flexible structure to permit changes of research to be emphasised as the research progresses • A realisation that the researcher is part of the research process • Less concern with the need to generalise

4.4. Research philosophy and approaches adopted in this study, and why

It would miss the point if the researcher believes that one approach is better than the other and it is the research question of the study that guides the research approach. Business and management research mostly falls within the positivist paradigm or uses interpretivism in order to reflect a realist position (Saunders et al., 2007). The present research study is conducted to identify the salient factors that influence PSOS continuity; therefore, it seeks to understand the relationships among these factors. Relevant to the research explanation (based on various theories and models in IS in general and for the PSOS field), a hypothesised model was developed. Therefore, a positivist (quantitative) approach is used in this study.

Through extensive study of previous literature, a positivistic approach is an appropriate process for establishing a theory and constructing hypotheses (Hussey and Hussy, 1997); hence, a positivist approach is adopted in this study for the following reasons. Firstly, hypotheses are formulated based on extensive study of previous literature including theories and models; hence, there is a need to collect data through a self-administrated questionnaire and to test these hypotheses. Therefore, the researcher is detached from the realm of the problem (Hussey and Hussey, 1997). Secondly, the researcher adopted a neutral position during the research process. Thirdly, the chosen

approach allows the researcher to collect the data in an economical manner based on the clear theoretical focus of the study. Thus, the researcher adopted a positivist perspective to study the PSOS online services.

This study adopts a deductive approach. The use of theories drives the present study to use a deductive approach; a theory and hypotheses were developed because the researcher had a sufficient understanding of the topic. The researcher is interested to explain what is happening based on rigorous theories; hence, a reason behind what is going on is already explained in the theories. Therefore, a design strategy is needed in order to test these hypotheses. Easterby-Smith et al. (2002) suggest that understanding different research approaches helps in deciding which research design is the most appropriate. The researcher has prior knowledge of the subject and has access to data that allows him to frame hypotheses based on sufficient understanding of the topic. Creswell (1994) suggests a deductive approach if the topic has a wealth of literature from which a researcher can define a theoretical framework and hypotheses. Hussey and Hussey (1997) support Creswell by studying the literature and establishing an appropriate theory and hypotheses that are associated with a positivist approach. Furthermore, the time available is an issue. The researcher has scholarships that have a specific timeframe; hence, although perusing research approaches might be a good idea, it may lead to the study taking an excessive length of time. Furthermore, deductive research is quicker to complete (Saunders et al., (2007). There are risks in both approaches; however, deduction is a lower-risk strategy if we discount the risk of the questionnaires and non-completed items. Moreover, the deductive approach falls within the intentions and preferences of the researcher; however, these preferences have not changed the essence of the research question.

The researcher then decided to research a population in which he expects to find evidence and by then administer the questionnaire to a large sample of citizens. The researcher was not interested in the citizen's feelings about the PSOS that they had experienced or how they cope with the problem. Rather, the researcher was interested in what factors have influenced their experience and how they rank these factors. The researcher is interested in understanding the relationships between these factors with respect to the chosen theory (e.g. SCT and ECT in this study). Acceptable knowledge through observing social reality is what the researcher is interested in. Thus, a theory and hypotheses were developed and a research strategy designed to test the hypotheses.

4.5. Research design

Research philosophy influences the way to the researcher goes about answering the research question which will inform the research strategy. Hence, thinking about the research design is crucial where the researcher can distinguish between the main research strategies and the differences between quantitative and qualitative approaches while collecting data. Research strategies, research choices and time horizons can turn the research question into a research project (Robson, 2002). Research design helps in answering the research questions. The author was aware that accessing data, time and money can act as a constraint on the research in order to collect data. Being consistent with research philosophy and rationalising the chosen problem by procedure is determined by the research questions and the objectives.

4.5.1. The purpose of research

The researcher is concerned to answer the research question and to meet the objectives. Therefore, the research question will drive the selection process (e,g. descriptive, explanatory or both of them) (Saunders et al., (2007). Thus, the research questions highlight the purpose of the current study. There are three ways to classify the research purpose: exploratory, descriptive and explanatory (Cooper and Schindler, 2001). However, there is the possibility of having more than one purpose, based on the situation (Robson, 2002).

4.5.1.1. Exploratory study

Robson (2002) indicates that an exploratory study is meant to assess the phenomena in a new light in order to understand what is going on by asking questions. This would help in better understanding the problem especially if there is a part that is considered to be ambiguous. The unclear part can be predicted by previous studies and their recommendations for further studies in a particular field. Therefore, exploratory research is needed in order to conduct a search of previous literature, interviewing experts, or conducting focus group interviews. Exploratory study may influence the researcher to change his direction based on new data that appears through reading the literature. Based on these views, the researcher narrowed the initial broad focus into a narrower one as work progressed. Adam and Schvaneveldt (1991) suggest that

flexibility is inherent in exploratory study because new data will appear to the researcher.

4.5.1.2. Descriptive study

A clear picture is needed of the phenomena before collecting data. Therefore, portraying an accurate profile of persons, events or situations is the objective of a descriptive study (Robson, 2002; Saunders et al., 2007). However, there are some concerns about studies being too descriptive. Therefore, evaluating and synthesising ideas and data is a key for not being too descriptive. This can be done by drawing a conclusion from the data.

4.5.1.3. Explanatory study

Explanatory study is the study that is concerned with causal relationships between variables. However, data collected can be subject to statistical tests such as a correlation test. Therefore, explanatory research assists in clarifying the relationships between two or more variables (Saunders et al., 2007). Further, data can contain more than one type of relationship whilst the researcher is attempting to assess the strength of an individual relationship. First, "a change in one variable is accompanied by a change in another variable but it is not clear which variable caused the other to change, called 'correlation'. Second, a change in one or more independent variables causes a change in a dependent variable, called 'a cause-and-effect relationship'". (Saunders et al., 2007: 450)

4.5.2. Research strategy

There are different strategies to be employed in the research. Some of these strategies are associated with the deductive or the inductive approach and can be used for exploratory, descriptive or explanatory purposes (Yin, 2003). Enabling the researcher to answer the research question(s) and meeting the objectives is the most important part in selecting the proper strategy, and therefore there is no such thing as a superior strategy. Further, the strategy should not be considered as exclusive (Saunders et al., 2007). In other words, there is a possibility for integrating the survey within a case study. There are a number of strategies to be assessed, e.g., experiment, action research, grounded theory, ethnography, archival research, case study and survey.

4.5.2.1. Experiment

Hakim (2000) indicates that experiments tend to examine the causal link between two variables such as independent and dependent variables. This approach is used in exploratory and explanatory research. There are two groups in a classic experiment, an experimental and a control group. In the experimental group there is a planned intervention whereas in a control group there is no such intervention. Experiment is not feasible because some people are not willing to participate. However, it is useful for particular organisations (e.g., university students). Further, with a large sample, Hakim (2000) thinks that this is a costly and complex process.

4.5.2.2. Survey (quantitative)

The survey is popular in business and management research. Usually, it is associated with the deductive approach and tends to be used with descriptive and exploratory research (Saunders et al., 2007). A self-administered questionnaire can be used to collect standardised data which can be easily compared. The survey strategy can be analyse quantitatively (quantitative approach) by using descriptive and inferential statistical applications (e.g., SPSS application). Further, a model can be produced from particular relationships between variables. The challenge is to ensure that the collected data are representative of the whole population. Therefore a reasonable response rate is crucial in order to generate representative findings. A questionnaire as well as structured observation/interviews can be used as a data collection technique.

4.5.2.3. Case study

A case study "involves empirical investigations of particular contemporary phenomena within its real life context using multiple sources of evidence" (Robson, 2002:178). Hence, the context is crucial in a case study; this is unlike the experiment where the boundaries between the phenomenon and the context are not clearly evident (Yin, 2003). It is different from the survey based on variables for which the data are obtained even though the context is the same. The case study enables the researcher to answer the questions of "What?" and "How?" which is similar to the survey strategy (Saunders et al., 2007).

4.6. The rationale behind the chosen research design method in this study

The research questions of this study drive the researcher to adopt a survey strategy. There are many reasons behind this selection.

- First, a survey has considerable ability in terms of generating answers to "What?" questions, which are used in the research questions in the present study.
- Second, commonly, the survey is associated with the deductive approach which is popular in business and management. Besides, the survey is perceived as confident by people and easy to explain and understand. Thus, the collected data can be statistically analysed using descriptive and inferential statistics. This will give the author more control over the research process.
- Third, through sampling, it is possible to generalise the findings at a lower cost. This is unlike the qualitative approach.
- The selected method allows the researcher to use descriptive, explanatory and exploratory research, which permits more flexibility for the researcher when analysing the data.
- The researcher is interested to test and develop a theory rather than build a theory, and therefore an inductive approach was excluded. In other words, some of the strategies have been excluded, such as grounded theory. PSOS continuance practice is not considered to be sufficiently formed or established to think about establishing a theory. Thus, it is worth spending time on understanding the phenomenon based on current theories.

4.6.1. Data Collection Technique

Qualitative and quantitative methods are widely used in business and management research. These techniques are used with different techniques and data analysis procedures. Table 4.3 below explains the difference between qualitative and quantitative methods (Saunders et al., 2007).

Table 4.3: Quantitative verses qualitative	
Quantitative	**Qualitative**
• Focuses on numeric (numbers) • Uses a questionnaire for data collection technique • Uses graphs or statistics to generate numerical data for data analysis procedure	• Focuses on non-numeric (words) • Uses interviews for data collection technique • Uses categorical data as a data analysis procedure that use non-numerical data

4.6.2. Time horizons

There are two different timescales: the cross-sectional study and the longitudinal study. The cross-sectional study is associated with a particular point in time, whereas the longitudinal one is more concerned with events over a certain given period. Time constraints forced the researcher to select the cross-sectional study. Even though the time horizon is independent of the research strategy, the cross-sectional approach often employs the survey strategy (Easterby-Smith et al., 2002; Robson, 2002). In a longitudinal study, observing events over time may enhance control over variables (Adams and Schvaneveldt, 1991).

4.7. Ethical considerations

Ethics is a crucial implication behind accessing the data; therefore, the present study is governed by ethical considerations. The present research design is interested in focusing on the citizen who has been using PSOS, and not employees in an organisation. Thus the data are collected from citizens as end-users of the PSOS system. The ideal population are those who have used PSOS and particularly those who renew their tax disc through the government's official portal (www.gov.uk).

As with any research that involves human participation, Brunel University requires research ethical approval before conducting any data collection. The researcher completed the participant information sheet and the participant consent form, and gained approval before collecting the data. The researcher took into consideration that the ethical consideration would yield data that are valid. The research design is governed by clear participant consent before undertaking the study (see main questionnaire introduction attached in Appendix C). Therefore, the researcher has read and understood the Brunel University Code of Ethics and the information has been confirmed by the researcher's supervisor.

Therefore, the participants have consented that they are taking part in research that has a purpose, as identified on the cover of the questionnaire. The data are collected from individuals rather than from an organisation. Confidentiality and anonymity were adhered to during the data collection process. Furthermore, taking part in the survey was voluntary; therefore, the participant had the right to withdrawn at any time even if they had consented to participate. Any relevant information about the participants has been detached. This includes their IP address while taking the online survey. Hence, privacy has been taken into consideration.

4.8. The research design credibility and reliability

Raimond (1993) believes that a scientific methodology ought to be considered as what it truly is. Thus, the scientific approach helps in reducing the possibility of getting the answer wrong. In addition, selecting SCT and ECT as platforms of the current study should help in adding more reliability to the current study because there have been similar observations in previous studies using the same constructs. However, the researcher, through the scientific approach, will make sure of the reliability in the next chapter. Making sense of the used data with respect to transparency is crucial; therefore, the researcher follows several steps in order to make sure that data that are subject to participant error or bias were removed. Further to this, the research design helps in evaluating the relationships between the variables (causal relationships), which adds more credibility to the validity about whether the findings are really about what they appear to be about. The results of the analysis and discussion in the subsequent chapters provide more details about how the present findings are consistent with other occasions. However, the adopted SCT in the present study counts on reciprocal relationships among personal factors, environmental factors and behavioural factors.

4.9. Selecting Samples (sampling strategy)

The need for sampling in business and management research is crucial; therefore, feasibility and sensibility of collecting data are essential issues. Hence, it is important to select the appropriate sampling techniques for the current study in order to collect the data that are associated with the research question and then reduce the data collected

with respect to the focus of the current study. Further, the selected sample may help in assessing the extent to which this sample can be generalised with respect to the research questions.

4.9.1. Population

Based on the literature, the research objectives identify the targeted group (population) that is the subject of interest (Zikmund, 2000, 2003; Burns and Bush, 1995). In other words, the population is "the full set of cases/elements from which a sample is taken, called population. In sampling, the term 'population' is not used in its normal sense, as the full set of cases need not necessarily be people" (Saunders et al., 2007: 205). The population of the current study is the UK citizens who have used DVLA online services for renewing their tax disc through the UK government's official portal (www.gov.uk). The UK government has already established the required infrastructure and offers many online services and a variety of information to help its citizens (Daniel and Ward, 2006). These information and services are available online; based on Weerakkody and Choudrie (2005), the UK government can be accessed by its citizens through the Internet at both national and local levels. Further to this, the UK citizen as a user can interact (in a two-way manner) with the government (Senyucel, 2005). The website can be considered as the interface of the PSOS, where citizens can reach the information and interact with the services (Weerakkody and Choudrie, 2005). Therefore, evaluating the quality of the website (e.g., information quality, information quality) is crucial because it has the potential to change the way a citizen interacts with the government, thereby enhancing communication, participation and the decision-making process (Gil-Garcia, 2006). The UN Public Administration Program (2003, 2004, 2005, 2008, 2010 and 2012) reported that almost 98% of the 192 member countries have already established their websites for PSOS systems. One question that might be asked is, are there any encouraging signs for the user/citizen while visiting one of the government online services to repeat his or her visit rather than just initial acceptance? The huge investments in ICT should be utilised in a better way by retaining the current users. Initial success in accepting ICT in PSOS does not necessarily result in the eventual success of some long-term strategy (Bhattacherjee, 2001), and therefore continued use can be seen as a long-term strategy for PSOS practice. Understanding the continued use

of a PSOS system in the UK is used as an example of understanding continuance use of PSOS generally, which is the goal of this study.

4.10. The significance of selecting the sample

The research question of the present study allows the researcher to collect data from the entire population. However, it would be impossible for the researcher to survey the entire population because of the time and budget constraints. Thus, there is a need to select a sample. The plan is to use a questionnaire as a data collection technique. There is no need to ask permission from the traditional citizen who has been renewing his or her tax disc through the government's official website (www.gov.uk). The sampling technique allows the researcher to collect and manage the data through a statistical application, such as SPSS. It is theoretically possible for the researcher to collect the data from the whole population; however, sampling would make it feasible to manage the collected data during the period of the study. There is a strict deadline for the researcher, as he has been given a scholarship by the Kuwait government to conduct the study within a maximum of four years. Therefore, sampling saves time. Thus, only the sampled data will be analysed. The computer software (SPSS) allows the researcher to code and store the collected data. This procedure should enhance the quality of the information and the accuracy of the collected data. Henry (1990) recommends sampling because it improves accuracy. In addition, sampling can help in allocating more time for testing and checking data for accuracy before analysing the collected data in more detail. Therefore, sampling techniques can be divided into two types: probability or non-probability techniques.

4.10.1. The selected sample of the present study

The sampling method used in the present study is a combination of cluster sampling (probability sampling), in which the researcher groups the data by type of PSOS user (DVLA users) and convenience sampling (non-probability sampling), in which the researcher selects those cases that are easiest to obtain. Hence, the researcher's choice of sampling technique is dependent on the feasibility of collecting the data, and can be best described as a pseudorandom sampling approach. The reason behind this choice is that the selected sampling process can assist in answering the research questions and

help in meeting the researcher's objectives. The researcher will select techniques that are associated with the survey; this will allow the researcher to statistically estimate the characteristics of the population from the sample. It was not practical for the researcher to construct a sampling frame for the target population for security reasons; in this case, cluster and convenience sampling were selected as alternative sampling procedures, as they do not require a sampling frame of the target population. Further reasons for selecting cluster and convenience sampling are that DVLA users are widely dispersed and that data collection through these techniques requires less time and money relative to other sampling methods (e.g., random sampling). The targeted population is defined as those who have used DVLA's online service on at least a few occasions, i.e., citizens who have experience in using the DVLA's online services to obtain or exchange tax discs.

4.10.2. Probability (representative sampling)

The probability sample (a representative sample) is mostly associated with a survey-based approach. There are four stages for its process: 1) identify the sample frame; 2) decide the sample size; 3) select the most appropriate sampling techniques and then select the sample; finally, 4) check that the sample is representative of the population (Saunders et al., 2007). These stages will be discussed as follows:

4.10.2.1. Identifying the sampling frame

This process begins by selecting the targeted sample from the available members of the population. For the present research, each citizen or resident (individual or PSOS end-user) who has been using the PSOS through the website is considered to be a member of the population. Therefore, the user (citizen/resident) who has been using the PSOS online services, more particularly, a car owner who has renewed his or her tax disc in the past was chosen. There was an absence of available online data through which the researcher could obtain the required sample, so the researcher administered a survey questionnaire so that the researcher could identify the subjects for this study. It is impossible for the researcher to approach the entire population because there are some constraints such as time and money as explained before. The researcher has selected the sample from this frame and was cautious about the completeness of the sampling frame because the researcher can only generalise the findings based on the selected sample.

Accordingly, the researcher, therefore, ensured a sampling frame that is relevant to the research topic and can answer the research questions. The data must be currently compiled, unbiased and accurate. However, the researcher may make claims rather than defining the limits on the generalisability of the findings resulting from some constraints such as time and money.

4.10.2.2. Deciding on a suitable sample size

The larger the sample size, the better the chances of generalising the findings to the population. The sample size may be compromised by the availability of resources, such as time and money, and the effort needed to analyse the data. The choice of sample size is governed by how far the collected data is considered as representative of the population, the accuracy of the data, and the selection of the statistical techniques (e.g. chi square), and the size of the population where the sample is taken. Stutely (2003) suggests 30 as a minimum number, as a rule of thumb, for statistical analyses. In various situations, the researcher tries to reach a 95 percent level of certainty with respect to the sample size, which allows the researcher to draw conclusions from the analyses about the population. The researcher is aware of maximising the sample in order to ensure that there is a sufficient response rate to be within the required margin of error. For example, with a margin of error of 5%, the sample size requires 384 responses out of a population of 10,000,000 at the 95 percent level of certainty (Saunders et al., 2007). Therefore, a high response rate is important in order to be representative of the population.

In order to calculate the total and active response rates, Neumann (2000) suggests that the research report should include all eligible respondents. There are two calculations for the response rates based on Neumann (2000): total response rate and active response rate. Those formulae can be calculated as in the following:

$$\text{Total response rate} = \frac{total\ number\ of\ obtained\ responses\ from\ the\ sample}{total\ number\ in\ sample - ineligible}$$

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

Unfortunately, the researcher was unable to calculate the active response rate due to the lack of the accurate number of unreachable responses.

Acceptable sample size provides the study with the needed confidence in the data collected. Therefore, in order to make sure that the sample size is large enough, the researcher considered the margin of error to be within acceptable limits and that sufficient detail had been recorded in order to initiate the analysis. Thus, the estimate of the likely response rate is crucial. Hence, the actual sample size can be calculated using the following formula:

$$n^a \text{ (the actual sample size)} = \frac{n\ (the\ minimum/adjusted\ sample\ size)\ X\ 100}{re\ (the\ estimated\ response\ rate)\%}$$

The researcher decided to send a link to the questionnaire (www.surveymonkey.com) to UK citizens and calculated that an adjusted minimum sample size of 400 was required based on Saunders et al. (2007). The researcher estimated the response rate to be 50 percent as recommended by Reddick (2008). Therefore, the researcher could make a calculation of the actual sample size using the above formula:

$$n^a \text{ (the actual sample size)} = \frac{400\ X\ 100}{50} = \frac{40000}{50} = 800 \text{ as minimum sample size}$$

However, in PSOS research, less than 50 percent is considered reasonable, based on Dwivedi et al. (2006). The researcher was able to estimate the likely response based on similar surveys. The table below (Table 4.4) explains some previous samples of response rates and the percentage of each category.

Table 4.4: Response rates for related surveys

Ranging Response Rates (percent)	Descriptions	Author/s
Less than 50%	• In the PSOS research the response rate is normally less than 50% • Reddick suggest 50% in PSOS	(Dwivedi et al., 2006) (Reddick, 2008).
35 %	• Consider as a reasonable response rate in most academic studies.	(Baruch, 1999)
50-65 %	• North American University-based questionnaire surveys of business • Lower response in individual questions	(Willimack et al., 2002)
50-75 %	• There is variation based on the methods used of collecting data. for example, 50% for postal surveys and 75% for face-to-face interviews	(Healey, 1991);
10-90 %	• 10-50 % for postal surveys • Up-to 90 % for face-to-face interviews	(Neumann, 2000).

It ought to be considered that the response rate can vary while collecting primary data; for example, postal surveys attain a lower response rate compared to face-to-face interviews. Hence, the highest response rate could be attained from face-to-face interviews where the lowest is postal surveys. In the present survey, there has been a variation in the response rate. Nonetheless, applying different techniques could help the researcher to enhance the response rate based on the data collection method. This will be discussed in the following sections.

4.10.2.3. Sampling techniques and the sample

The researcher's selection of the most appropriate sampling techniques depends on the nature of the research questions and the objectives. Hence, it is important for the researcher to select the most appropriate sampling techniques in order to obtain the best possible representative sample, after selecting the sampling frame and the assessment of the actual sample size required. There are five types of probability or representative sample: 1) simple random; 2) systematic; 3) stratified random; 4) cluster; and 5) multi-stage. Table 4.5 illustrates the impact of various factors on the choice of probability sampling techniques.

Table 4.5: Impact of various factors on choice of probability sampling techniques. (Source: Saunders et al., 2007)

Probability sample						
Sample technique	***Sampling frame required***	***Size of sample needed***	***Geographical area to which suited***	***Relative cost***	***Easy to explain to support workers?***	***Advantages compared with simple random***
Simple random	Accurate and easily accessible	Better with over a few hundred	Concentrated if face-to-face contact is required, otherwise does not matter	High if large sample size or sampling frame is not computerised	Relatively difficult to explain	-
Systematic	Accurate, easily accessible and not containing periodic patterns. Actual list not always needed	Suitable for all sizes	Concentrated if face-to-face contact is required	Low	Relatively easy to explain	Normally no difference. However, it may contain inherent risks of bias. The researcher needs to ensure that the lists do not contain periodic patterns.

Stratified random	Accurate, easily accessible, divisible into relevant strata	-	Concentrated if face-to-face contact is required, otherwise does not matter	Low, provided that lists of relevant strata are available	Relatively difficult to explain	Much more efficient. Differential response rates may necessitate re-weighting
Cluster	Accurate, easily accessible, relates to relevant clusters	As large as practicable	Dispersed if face-to-face contact is required and geographically based clusters used	Low, provided that lists of relevant clusters are available	Relatively difficult to explain until clusters are selected.	Quick but reduced precision. However, it is necessary to guard against the risk of selection bias, which can be quite tricky to do.
Multi-stage	Initial stages: geographic. Final stage: needed only for geographical areas selected	Initial stages: as large as practicable.	Dispersed if face-to-face contact is required, otherwise no need to use this technique	Low, as sampling frame for actual survey population required only for final stage	Initial stages: relatively difficult to explain.	Difficult to adjust for differential response rates. Substantial errors possible

4.10.3. Making sure that the sample is representative

It is possible that the researcher can check whether the present sample is representative or not by comparing the data collected with another source for the population. Otherwise, a longitudinal study is required in the future to assess the representativeness of the sample.

4.10.4. Non-probability (judgemental sampling)

In previous sections, there were probability techniques for selecting samples that were based on the assumption that the sample will be chosen statistically at random. However, it is possible that there is no need for a sampling frame for some researches in business studies (Saunders et al., 2007). Hence, the subjective judgment of the researcher is needed to select an alternative way of probability sampling, which is non-probability or judgemental sampling.

If the researcher tries to obtain a sample as quickly as possible, there is no control over the content and there is no attempt to obtain a representative sample that allows the researcher to generalise in a statistical sense to a population. Thus, quota sampling, convenience sampling, self-selection sampling, purposive sampling and snowball sampling are used as techniques between these extremes. Table 4.6 illustrates the non-probability techniques and the impact of various factors on choices.

Table 4.6: Non-probability techniques of the impact of various factors on choices. Source: Saunders et al. (2007), developed from Kervin (1999) and Patton (2002).

Sample type	Likelihood of sample being representative	Types of research in which useful	Relative cost	Control over sample contents
Quota	Reasonable to high, although dependent on selection of quota variable	Where cost constrained or data needed very quickly so an alternative to probability sampling needed	Moderately high to reasonable	Relatively high
Purposive	Low, although dependent on researcher's choices: extreme case Heterogeneous Homogeneous Critical case Typical case	Where working with very small sample Focus: key themes Focus: in-depth Focus: importance of case Focus: illustrative	Reasonable	Reasonable
Snowball	Low, but cases will have desired characteristics	Where difficulties in identifying cases	Reasonable	Quite low
Self-selection	Low, but cases self-selected	Where exploratory research is needed	Low	Low
Convenience	Very low	Where very little variation in population	Low	Low

4.11. Development of the survey questionnaire

4.11.1. Data collection procedure

The researcher has already formulated the research questions and objectives and the research strategy has already been adopted. Accordingly, secondary data might be useful to some extent; however, it does not match the need of the researcher who has a specific purpose in mind with respect to the research questions and objectives of the study. The researcher aimed to gather data from citizens with respect to their use of DVLA's online services (renewing their tax disc) but was unable to find this

information anywhere (the information available was not suitable for the proposed framework of the present study). Hence, the questions that have been formulated for the targeted population were not available in the public domain. For these reasons the researcher selected the data collection method by collecting data using questionnaires. "Within business and management research, the greatest use of questionnaires is made within the survey strategy" (Saunders et al., 2007: 354). The researcher considered other methods (e.g., secondary data, observation, semi-structured/unstructured interviews) before deciding on the questionnaire as a means of collecting primary data. Thus, the questionnaire was selected because it can be used for descriptive research (using attitudes and opinions to identify the variability in different phenomena) and explanatory research (examining and explaining the relationships between variables). SCT and ECT as theories are influenced by cause-and-effect relationships, which is the main interest of the researcher.

4.11.2. A questionnaire as a data collection method

Previous researchers pointed out that the questionnaire can be used as the only data collection method (Saunders et al., 2007). Based on Oppenheim (2000), questionnaires can have a variety of definitions in common usage; for example, they refer it to the process of a person answering questions (Kervin, 1999) or that it can be administrated by face-to-face interviews or by phone (Bell, 2005). Others use general terms by including all techniques that are used to collect data in which a person can answer a similar set of organised questions (deVaus, 2002). In the questionnaire, the person (*respondent*) is asked to answer (*respond to*) the same set of questions. Therefore, the questionnaire is a useful method of collecting data from a large sample before analysing the data quantitatively.

The questionnaire technique has been used in the present study as a data collection method because it is the most appropriate method to answer the research questions and objectives of the present study. Robson (2002) stated that questionnaires can best work with standardised questions which can be interpreted in the same way by all respondents. The researcher therefore ensured and confirmed with experts and previous scholars through published papers that the data collected were precise enough to answer the research questions. Response rate, validity and reliability of the questionnaires can be enhanced by careful design of the questions, clarity of the layout, carful explanation

of the purpose of the questionnaires, and the process of distribution and managing the questionnaires.

4.11.3. Types of questionnaires and the choice

There are two types of questionnaire; the first is the self-administrated questionnaire (e.g., Internet-mediated, postal/mail, or delivery-based questionnaires). The second type is the interviewer-administered questionnaire (e.g., telephone or structured interview) (Saunders et al., 2007). However, the choice of questionnaire can be influenced by the characteristics of the respondents, sample size, types and number of questions. The researcher considered self-administrated, Internet-mediated questionnaires to be the best choice because they meet the study's objectives and research questions. Those who have been using DVLA online services are the target of the present study; therefore, an Internet-mediated questionnaire can assure the researcher that those respondents are familiar with online services. In addition, an e-mail has been sent to the potential users with a link to the website where they can complete the questionnaire over the Internet.

A self-administrated questionnaire was thus collected through distributing the printed questionnaire to colleagues or random citizens in public areas (e.g., coffee shops, within trains/buses, or car park areas) and then collected. The researcher emphasises the role of the characteristics of the respondents from whom the team wish to collect the data and the importance of the respondents' answers being protected and not used in a misleading way. Further, the size of the sample has been taken into consideration in both pilot study and main survey. The number of questions has also been considered in order not to tire the respondents and kept to the minimum required to answer the research questions and to meet the research objectives.

The Internet-based-application allows the researcher to better design the survey so that it is easy to enter data, follow-up the process and to complete the questionnaire in a more comfortable way in their free-time. The Internet-based-application allows the researcher to be more organised in downloading the data and analysing these data with statistical software such as SPSS and Analysis of Moment Structure (AMOS) or EXCEL. This process fostered the analysis process, which will be explained later.

4.11.4. Type of data collected

The questions that are posed in the questionnaire in the present study have been defined precisely prior to data collection based on the reviewed literature and carefully discussed with colleagues. As for management and business research, the data collected can be used either for descriptive or explanatory purposes.

A fixed time (cross-sectional) approach has been used for the present study to describe the population's characteristics. The questions have been verified with English people in order to avoid ambiguous terminology or language; thus, culture-related issues have been taken into consideration. The present study's objective is to test the relationships between two theories, SCT and ECT; therefore, explanatory research requires data to test these theories with respect to PSOS continuity intention.

4.11.5. Designing the questionnaire

Designing a questionnaire requires both artistic and scientific skills as well as experience (Malhotra, 1999). For the present study, the researcher ensured that the design of the questionnaire would motivate the respondents in their participation. The questions are simple, easy and readable. Ambiguity was removed from the questions through the pilot study and the experts' comments. Foddy (1994) discussed the validity and reliability of questions and whether they make sense or not by emphasising the role of respondents' understanding of the questions. Foddy (1994) identified four stages: stage 1, researcher is clear about the data required and designs questions; stage 2, respondents decode the questions in the way the researcher intended; stage 3, respondents answer the questions; and stage 4, the researcher decodes the answers in the way the respondents intended.

For assessing validity and in order to make sure that the questionnaire is able to measure what the researcher intend to measure, internal validity was assessed. Blumberg et al. (2005) refer the validity of the questionnaire to content validity or construct validity. In the present study, criterion-related validity provides adequate coverage of what was intended to be investigated through the questionnaires. Careful definitions were provided in Chapter 4 (Conceptual Framework), through the literature review and with other experts and colleagues. Therefore, the research ensured that the questionnaire used was suitable to measure the citizens' continuity use of PSOS online services.

Thus, the questionnaire reflects the citizen's continuity usage behaviour of PSOS online services. Construct validity, refers to the measurement of questions and whether they measure the presence of those constructs which the researcher intended.

For testing the reliability or consistency of the questionnaire, the questionnaire should produce consistent findings in different conditions. Based on Mitchell (1996), there are three common approaches to assessing reliability or consistency: test re-tests, internal consistency and alternative forms. For test re-test, the data collected is correlated with similar questionnaires used under similar conditions if possible. Internal consistency correlates the responses to each question in the questionnaire with other questions in the same questionnaire. An alternative form is to compare responses with alternative forms of the same question or groups of questions.

In the present study, the researcher adapts questions used in other questionnaires as recommended by Bourque and Clark (1994). This type of questionnaire allows the researcher to compare results with similar studies which ensure more reliability. However, a few of the circulated questions were excluded after taking the experts' comments into consideration. According to Sekaran (2000, 2003), there are certain steps in the questionnaire development process: set up clear objectives; incorporate results from previous studies; compare questionnaire designs; use multiple, high-level items; exploit expert comments; pretest the design; and the final step, pilot the design. Accordingly, the present research objectives were clarified in Chapter One, including research questions. Further, previous results and findings were detailed in Chapters One and Two. The design and the contents of the questionnaire were compared with previous studies; for example, service quality (SQ) questions from Parasuraman et al. 2005); information quality (IQ) from Teo et. al. (2008), Seddon and Kiew (1996) and Gorla et al. (2010); continuance intention (CI) from Hsu et al. (2004) and Bhattacherjee (2001b); satisfaction (SAT) from Hsu et al. (2004); personal outcome expectations (POE) from Hsu et al. (2004) and Compeau et al. (1999); self-efficacy (SE) from Compeau et al. (1999) and Hsu et al. (2004); social influence (SI) from Ajzen (1991), Davis et al. (1989), Fishbein and Azjen (1975), Mathieson (1991), Taylor and Todd (1995a, 1995b) and Venkatesh et al. (2003); and prior experience (PE) from Hsu et al. (2004). In addition, each construct has been associated with at least three items in order to provide a better representation of their meanings (Churchill, 1987). Expert comments were taken into consideration and the preliminary version was tested before

distributing the actual questionnaire. However, the questions that were adopted have been reworded to fit with the current study (see Appendix C for more information).

4.11.6. Ranking questions

Rating questions should not be confused with scales. Rating questions most frequently use the Likert-style rating scale. Scales in the present study are nominal and ordinal. After reviewing 80 years of research, Cox (1980) recommended five to nine scale points with respect to each of the research circumstances. Therefore, a five-point attitude rating scale is used in the present study. A Likert-style rating scale is used to ask the respondents how strongly they agree or disagree with the statements. Dillman (2000) recommended keeping the same order so as not to confuse the respondents. Thus, the researcher had the same order in all the statements as a five-point rating scale (1-strongly disagree, 2- disagree, 3-neutral, 4- agree, 5- strongly agree).

Further details about the layout of the questionnaire, the covering letter and how the questionnaire was introduced will be discussed in the pilot study and the main survey in the next chapter.

4.12. Data analysis techniques

There are many analytical tools; however, in the present study Structural Equation Modelling (SEM) is used as a cutting-edge technique in multivariate analysis. SEM "has the ability to simultaneously estimate multiple dependence relationships (similar to multiple regressions) and has the ability to incorporating multiple measures for each concept (i.e., akin to factor analysis) has been embraced across almost every academic discipline" (Hair et al., 2010: 627).

The mathematical difficulty of SEM acted as a barrier to using its application until new technologies in computers and software became widely available. The Statistical Package for Social Science (SPSS) 20.0 as well as AMOS 20.0 have been utilised to compute the measures for the present study. This section provides an overview of the measures that were used in SEM as an estimation of a series of dependence relationships and measurements as a multivariate procedure. SEM aims to test construct validity and theoretical relationships among variables. Therefore, SEM is a proper

measurement to test the uses of SCT and ECT constructs and relationships in the present study. Further, principles of factor analysis and multiple regressions form a basis for understanding SEM (Hair et al., 2010).

4.13. Exploratory Factor Analysis and Confirmatory Factor Analysis

It is important to distinguish between Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) before discussing SEM. There is a similarity between EFA and CFA; however, philosophically they are quite different. Table 4.7 provides more details about the differences between EFA and CFA.

Table 4.7: Differences between EFA and CFA. Source: modified from Hair et al. (2010).

Exploratory Factor Analysis (EFA)	Confirmatory Factor Analysis (CFA)
Explores the data and provides the researcher with information about how many factors are needed to best represent the data.	Testing how well measured variables represent a smaller number of constructs
All measured variables are related to every factor by a factor loading estimation used by statistical software. The high load determines the associations between factor and variables.	Instead of statistical software, a theory used to associate variables with the corresponding construct.
The researcher does not how many factors/constructs and set of variables exist.	The researcher knows how many factors/constructs and set of variables exist (see Chapter 4, the conceptual framework and how these constructs are operationalised).
EFA statistics shows how the actual data match reality.	CFA statistics show how well the theoretical specification of the constructs matches reality or the actual data.
It does not confirm (reject or accept) the preconceived theory.	It confirms (rejects or accepts) the preconceived theory.
Cross-loadings are a potential.	There are no cross-loadings.

4.14. Structural Equation Modelling (SEM)

Based on the desire of genetics and economics researchers, SEM was developed so it can establish causal relationships among variables (Blalock, 1962). SEM has the ability to test theories where constructs can be dependent and independent at the same time; therefore, SEM can examine a series of dependence relationships simultaneously. Hence, it is important to understand the characteristics of SEM as a multivariate technique and distinguish between the variables and constructs or a set of variables and their relationships with respect to cause-and-effect relationships and types.

4.14.1. Foundation of SEM

SEM is based on both factor analysis and multiple regression analysis. SEM has the ability to examine the structure of interrelationships based on the relationships of the constructs/latent factors/unobservable factors (the dependent and independent variables) as a series of equations, which is in contrast to regression analysis or other techniques where only a single equation is used to measure the relationships among constructs. The benefit of latent variables or factors is that they can represent the theoretical concepts by using multiple measures in order to reduce the measurement error of the concept, which improves the statistical estimation of the entire relationship among constructs.

4.14.2. SEM characteristics

SEM has three characteristics, based on Hair et al. (2010): the estimation of multiple and interrelated dependence relationships; the ability to represent unobserved concepts and measurement error calculations; and the ability to define and explain the entire set of relationships in the defined model. In SEM, likewise in multiple regression and MANOVA, it is important to distinguish between dependent and independent variables. Independent variables are called *exogenous* and dependent variables are called *endogenous* in SEM. Defining a model can represent the relationships among constructs in that theory by representing how measured variables come together in order to form the latent variable of the construct and how these constructs are associated with each other. Thus, there should be an underlying strong theory behind using SEM that can provide an explanation of the associated relationships among constructs.

4.14.3. A path diagram

A path diagram can be used as a visual portrayal of the model. There is no single variable that can completely represent a construct by itself; therefore, a set of variables can form a construct as indicators based on theoretical justifications. Constructs can be represented by ovals or circles, and measured variables can be represented by squares or rectangles. A straight arrow from the construct to the measured entity can be used to distinguish between the exogenous (independent) and endogenous (dependent)

constructs. However, the researcher is the one who determines which construct is endogenous or exogenous, based on the theory being selected.

4.14.4. Model fit

In order to make sure that the model is fit or not, the researcher measures the predictive accuracy that reflects the fit of the overall relationships of the model. This is unlike R^2 in regression or statistical significance in MANOVA. Hence, based on the overall fit of the model, the researcher either accepts or rejects the model. Therefore, selecting a strong theory or theories can help in explaining the input data and the relationships among variables because the entire model is the focus as a whole and not single equations as in multiple regressions. How the observed covariance matrix corresponds with the estimated covariance matrix determines the model fit. It is a matter of matching reality in an observed covariance matrix (Hair et al., 2010).

4.14.5. The need for theory in SEM

A causal inference can be hypothesised based on the path or the structural relationships between these constructs. Hence, there is a need for a strong theoretical base when specifying the measurements and the structural model in SEM. Theoretical justification is more suitable than empirical results to guide the confirmatory method in SEM and to lead the sequence of effects from one construct to another in cross-sectional data (Hair et al., 2010).

4.14.6. Setting up SEM for path analysis

The theories used in the present study were defined in previous chapters, which allow the researcher to test the relationships between variables prior to designing the questionnaire. Table 4.8 below presents which variables ares dependent or independent.

Table 4.8: Dependent (*exogenous*) or independent (*endogenous*) variables

Dependent (Endogenous construct)		Independent (Exogenous construct)
Self-Efficacy (SE)	←	Information Quality (IQ)
Self-Efficacy (SE)	←	Service Quality (SQ)
Self-Efficacy (SE)	←	Prior Experience (PE)
Self-Efficacy (SE)	←	Social Influence (SI)
Personal Outcome Expectation (POE)	←	Information Quality (IQ)
Personal Outcome Expectation (POE)	←	Service Quality (SQ)
Personal Outcome Expectation (POE)	←	Social Influence (SI)
Personal Outcome Expectation (POE)	←	Prior Experience (PE)
Personal Outcome Expectation (POE)	←	Self-Efficacy (SE)
Satisfaction (SAT)	←	Personal Outcome Expectation (POE)
Satisfaction (SAT)	←	Information Quality (IQ)
Satisfaction (SAT)	←	Service Quality (SQ)
Satisfaction (SAT)	←	Social Influence (SI)
Satisfaction (SAT)	←	Prior Experience (PE)
Satisfaction (SAT)	←	Self-Efficacy (SE)
Continuance Intention (CI)	←	Satisfaction (SAT)
Continuance Intention (CI)	←	Personal Outcome Expectation (POE)

The relationships (see Table 4.8) among constructs are going to be tested through statistical analysis using AMOS/SEM. The next chapter will present the results. Dillman (2000) mentioned three types of data variable: opinion (respondents' feelings represented by yes or no); behaviour (what respondents do or experience); and attributes (respondents' characteristics such as age, gender, etc.). The researcher is interested in the respondents' behaviours (beliefs and attitudes towards continuance intention behaviour of PSOS usage) rather than in their opinions or attributes. Therefore, the researcher ensured that only data that were essential to answering the research questions were included in the questionnaire.

4.14.7. Using SEM in assessing model fits

The collected data can be used in order to use SEM to test the theories used in this particular study. Theories can be expressed in terms of relationships between measured variables and latent constructs. Hair et al. (2010) suggests six stages in SEM as shown in Table 4.9. The idea behind SEM analysis is to represent constructs and relate these

constructs to each other or to how these constructs are constructed based on a measurement theory.

Table 4.9: Six stages in SEM. Source: developed from Hair et al (2010)

Stage	Assessment process	Remarks	Present study
1	Defining individual constructs	What items are to be used as measured variables? Established scales or modifying an existing scale is important. Operationalising the constructs through theoretical definition. Pre-testing is important when measuring the same context.	Scale from prior research studies has been utilised. All 8 constructs have been operationalised as in Chapter 3 (Table 3.2). The context of the present study is different to previous research studies; therefore, pre-testing is not required.
2	Developing the overall measurement model (model specification)	This is about associating measured variables with the identical construct. A path diagram is used as a visual portrayal of the model to depict the constructs and the associated variables.	Each latent construct in the proposed model has been identified and associated to the measured indicator variables. Figure 3.5 & 3.6 in Chapter 3 provide more explanation. Also, the survey (Appendix B, CFA and SEM diagrams) and Appendix C (main survey) shows the assigned measured variables with the corresponding constructs.
3	Designing a study to produce empirical results	Sample size and adequacy assessment. What estimation methods are to be used and how to deal with missing data and the impact of sample size. Using correlations or covariance while analysing data.	Chapter 4 presents more explanation of the design of the current study. Chapter 5 will present further explanations. Covariance analysis has been selected based on Hair et al.'s (2010) recommendation because the software makes the selection of one type verses another during data computing. The missing data are random and do not exceed 10 percent; therefore, the researcher has no caution about conclusions relating to fit. The sample size has been increased to 471 to produce more information and greater stability. AMOS software was used as a completely graphical interface. Maximum Likelihood Estimation (MLE) was used because multivariate normality assumption was met.
4	Assessing the measurement of model validity	Assessment of Goodness-of-Fit index (GOF). If the measurement model is valid, then proceed to stage 5, else refine measures and design a new study. (It is important to mention that construct validity is a prior step of this stage.)	Appendix D provides more details about the measurements used in SEM. These include the basics of Goodness-of-Fit, Absolute Fit Indices and Parsimony Fit Indices. Chapter 5 (Results) provides more explanation about the model validity measurements of the present study.
5	Specifying the structural model	Convert the measurement model to structural model	Appendix B shows a diagram of the current study in terms of CFA and SEM, all associated with each constructs' variables. Further, in Chapter 3, Figure 3.6 shows the initial research model constructs and hypotheses.

6	Assessing structural model validity	Assess GOF and other required estimations. If structural model valid then draw substantive conclusion and recommendations, otherwise, refine model and test with new data.	Testing the structural validity and its corresponding hypothesised theoretical relationships of the present study model can be seen in Chapter 6.

4.15. Summary

This chapter provides the methodology and methods that have been used in the present study. The present study adopts the positivist philosophy and a deductive approach. Therefore, a survey was used as a strategy for collecting quantitative data in a cross-sectional time horizon. SEM/AMOS will be used to analyse the collected data. An overview of the distinguishing characteristics of the SEM has been provided in this chapter, which enables a better understanding of the next chapter while analysing the data. Further, the six stages of SEM are illustrated and associated with the current study.

This chapter has explained the choice of the design of the study, which underpins the credibility of the following chapters (findings and conclusions). Figure 4.1 illustrates the present research philosophy:

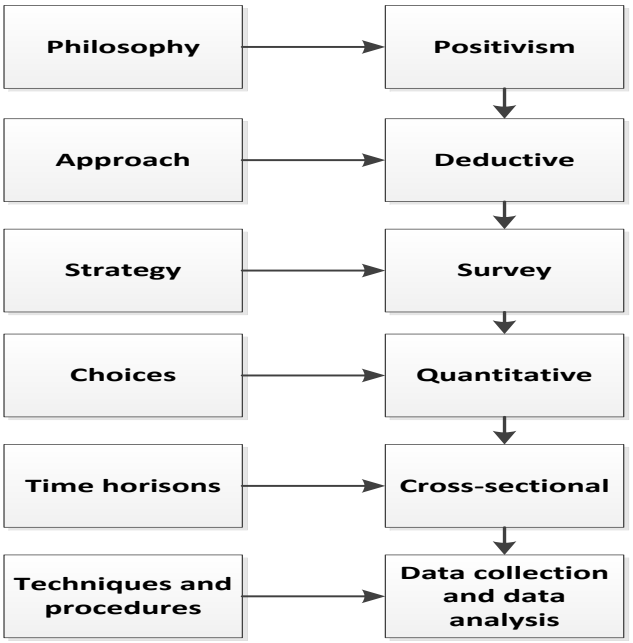


Figure 4.1: Present study philosophy

In the next chapter, a number of applications will be discussed for the analysis of the pilot study and main survey. Exploratory factor analysis and confirmatory factor analysis (which extends the preliminary analysis in the exploratory factor analysis and which determines the number of variables) should be used together with their loading with respect to the associated factors. CFA will explain the construct validity during the measurement procedure. After that, the theoretical relationships between factors are tested using SEM for accuracy because SEM corrects the relationships for measurement errors and tests the overall fit and the pre-specified hypotheses' validity.

CHAPTER FIVE: DATA ANALYSIS AND RESULTS

5.1. Introduction

This chapter will analyse the data and present the findings. Firstly, it will discuss the pilot study and its results; furthermore, the reliability and validity of the pilot study will be tested. Secondly, the examination and screening data and outliers will be tested. Subsequently, the researcher will examine the main survey. Exploratory factor analysis, confirmatory factor analysis and structural equation modelling measurement tests will be conducted to ensure the validity of the proposed model. Finally, structure equation modelling will be used to test the hypothesised relationships among the research constructs as illustrated in the proposed hypotheses (Chapter 3, Figure 3.6). Conclusions are drawn at the end of this chapter. Figure 5.1 shows the key steps for this chapter.

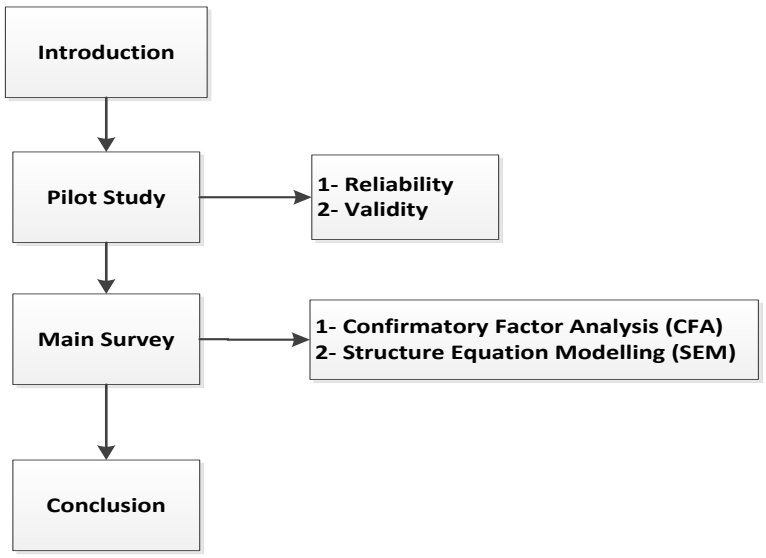


Figure 5.1: Data analysis steps (Source: Developed for the current research)

5.2. Pilot study

The purpose of the pilot study is to refine the questionnaire (Saunders et al., 2007); furthermore, it allows the researcher to obtain questions about validity. Preliminary analysis during the pilot study is crucial in order to ensure that the data collected will enable the researcher to investigate and assess the reliability and validity of the proposed measurement of all the factors/constructs. Face validity, or whether the

questionnaire appears to make sense, is a crucial step towards final measurement. Fink (2003) believes that a minimum number of 10 is reasonable for a pilot study whereas Dillman (2000) recommends 100 and 200 for large surveys. Bell (2005) suggests that the pilot study is important because it helps in evaluating the length of the questionnaire, clarity of instructions, unclear questions, difficult questions, clarity of layout, attractiveness, and other comments.

120 questionnaires were distributed; however only 74 were considered as suitable for statistical testing with a response rate of 61%. The researcher ensured that all respondents had used the DVLA online services (renewing tax disc through the website) by emphasising this in the questionnaire. The duration of the pilot survey was three weeks (20 Sep 2012 - 11 Oct 2012). A paper-based survey was conducted for UK citizens and residents in London. As the capital of the UK, London was a convenient location because of its large population size and density. Furthermore, London is considered as the major centre of business in the UK. The target places were car parks, coffee shops and train stations. Two local citizens were recruited to assist the researcher in collecting data.

5.2.1. Content validity

Before conducting the pilot study, questionnaire content validity was taken into consideration. Content validity refers to "the extent to which a specific set of items reflects a content domain" (DeVellis, 2003, p. 49). The researcher provided a conceptual definition of the constructs and asked some experts (academics, researchers and PhD students) in the ICT field and e-government field to evaluate the measurement items in order to assess the logical validity of the content. Those groups often acted as judges of content validity (Arnold and Reynolds, 2003), and their comments were used to improve the design; for example, a UK PhD student suggested rewording the questions in a way that would seem natural to traditional UK citizens. Some of the suggested comments were not in the researcher's interests (e.g., adding more age groups).

The researcher formulated 51 questions. Some alterations were made due to the content validity findings, which identified problems with the length of time the questionnaire took to complete, the clarity of the instructions and questions, questions that were

difficult to answer, the layout and other comments (Bell, 2005); thus, ambiguity was removed to ensure the correct readability of the scales and sentences. The researcher then reduced the number of questions to only 40 following the pilot study. Table 5.1 lists the deleted items.

Table 5.1: The deleted items following the pilot study.	
SQ_Efficiency	The DVLA website enables me to complete a transaction quickly.
SQ_Fulfilment	The DVLA website delivers the tax disc as promised.
SQ_Fulfilment	The DVLA website makes the tax disc available for delivery within a suitable timeframe.
SQ_Fulfilment	The DVLA website is truthful in its statements.
SQ_Privacy	The DVLA website protects my credit card data.
SQ_Responsiveness	The DVLA website handles product returns well.
SQ_Responsiveness	The DVLA website tells me what to do if my transaction is not processed.
SQ_Responsiveness	The DVLA website takes care of problems promptly.
SQ_Compensation	The DVLA website compensates me for any problems it creates.
SQ_Compensation	The DVLA website compensates me when what I ordered does not arrive on time.
SQ_Contact	The DVLA website offers the option to speak to a real person if there is a problem.

Evidently, most of these deleted questions deal with the delivery of a tax disc as a physical product (e.g., delivery and compensations) and with communication problems, such as opting to speak to a real person to answer questions. Furthermore, one of the comments was on how one can know that the DVLA website protects credit card data. Citizens do not know the circumstances of the system or who is sharing their online data. This is related to the DVLA website statements, and whether or not such information is trustworthy. Some of the experts commented that tax disc delivery is associated with other service partners (e.g., Post Office services or delivery issues), and hence is not directly related to DVLA's level of service quality.

As a result, the questionnaire was revised, based on the respondents' suggestions, and the final questionnaire was used for the pilot study. SPSS (originally, Statistical Package for the Social Sciences, later modified to Statistical Product and Service Solutions) version 20 was used to analyse the data. The following sections offer more details.

5.2.2. Pilot study demographic profile

This section discusses the demographic information of the respondent of the pilot study. It also describes participant's general computer and Internet knowledge and usage. Furthermore, the participants were asked whether he or she had completed a transaction with the DVLA online services. These questions help the researcher in verifying the nature of the participants and confirm previous usage of Internet and more specifically the DVAL online services. Table 5.2 presents the participants' gender, age, educational background, occupation and marital status, ethnicity, annual income.

Table 5.2: Frequencies of the pilot survey sample demographic (*N* = 74)

Option	Characteristics	Per cent %	Frequency
1. What is your gender?	1) Female	36%	27
	2) Male	54%	40
2. How old are you?	1) Under 26	19%	14
	2) from 26 to 35	27%	20
	3) from 36 to 45	30%	22
	4) from 46 to 55	15%	11
	5) Over 55	7%	5
3. What is your educational background?	1) Secondary Education	5%	4
	2) Further Education (A-Levels / GNVQ / BTEC or similar qualification	30%	22
	3) Higher Education (degree or postgraduate qualification)	61%	45
4. What is your employment/occupation status?	1) Public sector	42%	31
	2) Private sector	30%	22
	3) Unemployed	15%	11
	4) Self-employed	8%	6
	5) Other	3%	2
5. What is your marital status?	1) Married	34%	25
	2) Single	47%	35
	3) Divorced	12%	9
	4) Other	4%	3
6. What is your ethnicity?	1) White	35%	26
	2) Mixed	8%	6

	3) Asian or Asian British	14%	10
	4) Black or Black British	12%	9
	5) Other	14%	10
7. What is your annual household income?	1) Less than £10,000	12%	9
	2) £10,000 - £24,999	19%	14
	3) £25,000 - £49,999	30%	22
	4) £50,000 and above	30%	22
8. How would you describe your general computer knowledge?	1) I am an Expert User	36%	27
	2) I am an Intermediate User	51%	38
	3) I am a Novice User	9%	7
9. How would you describe your Internet knowledge?	1) I am an Expert User	39%	29
	2) I am an Intermediate User	49%	36
	3) I am a Novice User	7%	5
10. How often do you use the Internet per day?	1) Not at all	4%	3
	2) from 1 to 2 hours	19%	14
	3) from 3 to 4 hours	22%	16
	4) More than 4 hours	53%	39
11. How long have you been using the Internet?	1) Less than 3 months	0%	0
	2) from 3 to less than 6 months	0%	0
	3) from 6 to less than 12 months	0%	0
	4) from 12 months or more	99%	73
12. When did you last visit the DVLA website?	1) In the last 3 months	36%	27
	2) In the last 6 months	12%	9
	3) In the last 12 months	16%	12
	4) Longer ago	35%	26
13. Have you ever completed a transaction with the Driver and Vehicle Licensing Agency (DVLA) online?	1) Yes	65%	48
	2) No	35%	26
14. How often do you use the Internet to complete a government transaction (e.g. renew your licence, pay taxes, etc.)?	1) Everyday	0%	0
	2) Several times a month	7%	5
	3) Once a month or less	72%	53
	4) Never	4%	3

5.2.3. Reliability test

The most common measure of scale reliability is Cronbach's Alpha (Field, 2009). Cronbach (1951) introduced a measure that takes the value average derived from splitting the data into two in every possible way and computing the correlation coefficient for each split, which is equivalent to Cronbach's Alpha, α (Field, 2009). Cronbach's Alpha first calculates the variance within the item and the co-variance among the item's groups on the same scale. The purpose of the reliability test is to ensure that all the items in the same group are measured in the same way (DeVellis, 1999; 2003).

Commonly, the value of 0.7 to 0.8 is an acceptable value for Cronbach's Alpha (α); however, Kline (1999) claims that a cut-off point of 0.7 is more suitable. Generally, the value of 0.7 or above is considered as acceptable for a reliable test (De Vaus, 2002; Nunnally, 1967, 1978; Nunnally and Bernstein, 1994); therefore, the value of 0.7 can be used as a reflection of a single dimension and homogeneity within the scale (Churchill, 1979). However, in the early stages of analysis, Alpha values between 0.5 and 0.6 are satisfactory, based on Nunnally (1978). The number of items on the scale may influence the value of Alpha; therefore, researchers should take heed of the general guidelines of the value of Alpha (Cortina, 1993). Furthermore, Grayson (2004) notes that Alpha can have different structures; therefore, several factors exist that can be applied separately to similar factors based on Cronbach's (1951) suggestions. Table 5.3 shows the results of the reliability test.

Table 5.3: Group reliability test

Construct	Number of Items	Cronbach's Alpha
Service Quality (SQ)	10	.763
Information Quality (IQ)	7	.844
Continuance Intention (CI)	3	.842
Satisfaction (SAT)	3	.778
Personal Outcome Expectation (POE)	6	.771
Self-Efficacy (SE)	5	.724
Social Influence (SI)	3	.815
Prior Experience (PE)	3	.798
All Items:	**40**	**.943**

The results of Table 5.2 shows that service quality, information quality, continuance intention, satisfaction, personal outcome expectations, self-efficacy, social influence and prior experience all had high reliabilities, Cronbach's α = .943. However, the self-efficacy subscale had relatively low reliability, Cronbach's α = .724, and information quality had relatively high reliability, Cronbach's α = .844. Thus, SPSS version 20 Output shows that the data is reliable based on the Cronbach's Alpha during the basic reliability analysis. However, in a reliable scale, all items should be correlated with the total score from the questionnaire (Field, 2009).

Table 5.4 shows the results of the basic reliability analysis. The value in the column labelled Corrected Item-Total Correlation shows that six items are less than 0.4. Even though these items might have been dropped, as they were causing problems, the researcher decided to keep them because there is an acceptable value for reliability (above 0.7). These six items (the highlighted items in Table 5.4: SQ 07, 08, 09, 19; POE 28; and SE 32) reflect the change in Cronbach's Alpha; however, deletion of these items is not essential in this exploratory stage with a sample of 74. There might be an increase of correlation with a higher sample size. Therefore, deletion of these items does not affect the reliability because the researcher gains the required reliability for the current stage and defers the deletion process towards confirmatory factor analysis (CFA) in a later stage for more reliability. To ensure that these items have not affected the factor structure, the researcher reruns the factor analysis as well.

Table 5.4: Item Statistics

Items	N0.	Mean	Std. Deviation	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SQ	01	3.81	.771	31.43	20.605	.595	.633	.724
	02	3.65	.748	31.59	21.285	.510	.523	.735
	03	3.62	.735	31.62	20.321	.680	.709	.715
	04	3.77	.987	31.47	19.486	.563	.681	.723
	05	3.57	.994	31.68	19.345	.575	.471	.720
	06	3.46	.924	31.78	19.679	.589	.566	.720
	07	3.36	.915	31.88	21.204	.394	.422	.748
	08	3.39	.889	31.85	22.978	.188	.229	.775
	09	3.58	.922	31.66	22.501	.230	.200	.770
	10	3.03	.979	32.22	23.459	.100	.269	.790

IQ	11	3.51	.983	22.32	17.674	.602	.438	.822
	12	3.64	.945	22.20	18.219	.559	.493	.828
	13	3.84	.892	22.00	18.110	.621	.476	.819
	14	3.82	.881	22.01	19.055	.492	.296	.837
	15	3.80	1.020	22.04	17.053	.656	.559	.813
	16	3.64	1.001	22.20	17.780	.573	.491	.826
	17	3.59	1.033	22.24	16.735	.688	.576	.808
CI	18	3.72	.986	7.32	2.989	.721	.527	.766
	19	3.72	.884	7.32	3.318	.722	.525	.772
	20	3.61	1.031	7.43	2.934	.687	.472	.804
SAT	21	3.73	.816	7.27	2.255	.631	.435	.684
	22	3.62	.823	7.38	2.156	.676	.475	.635
	23	3.65	.898	7.35	2.204	.546	.302	.782
POE	24	3.53	.815	17.34	8.610	.664	.527	.701
	25	3.31	.950	17.55	8.168	.622	.437	.708
	26	3.42	.828	17.45	9.264	.496	.319	.743
	27	3.51	.880	17.35	8.752	.561	.448	.726
	28	3.19	.839	17.68	10.441	.240	.171	.802
	29	3.91	.847	16.96	8.998	.538	.367	.732
SE	30	3.70	.754	14.81	5.032	.590	.579	.638
	31	3.77	.803	14.74	4.769	.622	.586	.621
	32	3.36	.869	15.15	5.882	.227	.067	.781
	33	3.77	.786	14.74	5.235	.485	.375	.677
	34	3.91	.779	14.61	5.063	.549	.411	.652
SI	35	3.39	.857	6.81	2.566	.723	.526	.690
	36	3.32	.952	6.88	2.492	.628	.406	.789
	37	3.49	.880	6.72	2.644	.653	.452	.758
PE	38	3.41	.757	6.43	2.112	.623	.430	.746
	39	3.16	.794	6.68	2.085	.584	.364	.786
	40	3.27	.833	6.57	1.756	.728	.534	.628

Services Quality (SQ); Information Quality (IQ); Continuance Intention (CI); Satisfaction (SAT); Personal Outcome Expectations (POE); Self-Efficacy (SE); Social Influence (SI); Prior Experience (PE).

5.2.4. Validity test

It is important to know when to use factor analysis. Field (2009: 628) stated, "in social sciences, researchers often trying to measure things that cannot directly be measured (so-called latent variables)". Thus, the researcher in the present study cannot measure continuance usage directly; therefore, different aspects are needed (e.g., satisfaction, expectations, self-efficacy). Correlation coefficients among the subsets of variables or the relationships among these aspects can lead to what the researcher is trying to

measure. Reducing the subset of variables helps in measuring the same underlying dimension (factors or latent variables). How to find these latent variables is what the author is trying to discover in this exploratory factor analysis. However, the author's objectives are to use confirmatory factor analysis (CFA) and structured equation model (SEM); therefore, more details can be analysed during CFA and SEM during the main survey because the large sample size helps the researcher to conduct further analysis.

In this pilot study, the sample size was 74, which helped in discovering factors as a preliminary analysis in order to generate the intended hypotheses in the main survey because the researcher was interested in hypothesis testing techniques or CFA. There are different types of methods that determine the selection of factors; however, the pilot study is interested in investigating the criteria for these potential factors. One of these is principal components. The author hopes to generalise the findings from the sample in the main survey to the population by testing specific methods. "Testing hypotheses about the structure of latent variables and their relationships to each other require considerable complexity and can be done with computer programs such as AMOS" (Field, 2009: 636). CFA and SEM can be applied for hypotheses testing, which the author will explain in the next section in the description of the main survey.

The main idea of the pilot study is to explore the findings and refine the questionnaire for the main survey. The researcher is not interested in inferential methods; therefore, the main idea of this stage is explore the data to generate future hypotheses in the main survey. Still, the assumption is that the participants are randomly selected; therefore, the method of maximum-likelihood will be applied in the main survey using CFA and SEM because it will be possible to generalise the results to a large population. Thus, the techniques of the maximum-likelihood method hold true only for the set of variables measured, unlike the principal components method, where the generalisation of the results can be achieved only if analysis using different samples reveals the same factor structure (Field, 2009).

5.2.5. Communality

There are two components of total variance for each particular variable: common variance and unique variance. Common variance reflects the total variance that is shared with other variables or measures, whereas unique variance is restricted to the

same variable or measure. Communality refers to the proportion or quantity of common variance present in a variable. A communality of 1 reflects random variance or has no specific variance, and a communality of 0 reflects a non-sharing variance. The author is interested in common variance. Common variance is of interest to the researcher because it helps in finding common underlying dimensions within the data; therefore, factor analysis was carried out as seen in Table 5.5.

Table 5.5: Communality

Items	Initial	Extraction	Items	Initial	Extraction
01	1.000	.796	21	1.000	.734
02	1.000	.734	22	1.000	.772
03	1.000	.787	23	1.000	.710
04	1.000	.829	24	1.000	.794
05	1.000	.849	25	1.000	.805
06	1.000	.815	26	1.000	.824
07	1.000	.799	27	1.000	.757
08	1.000	.840	28	1.000	.746
09	1.000	.870	29	1.000	.811
10	1.000	.805	30	1.000	.825
11	1.000	.849	31	1.000	.811
12	1.000	.801	32	1.000	.845
13	1.000	.763	33	1.000	.758
14	1.000	.741	34	1.000	.857
15	1.000	.830	35	1.000	.812
16	1.000	.777	36	1.000	.797
17	1.000	.835	37	1.000	.773
18	1.000	.780	38	1.000	.858
19	1.000	.816	39	1.000	.832
20	1.000	.822	40	1.000	.806

The results of the factor analysis show that the proportion of common variance varies from 0.7 to less than 0.9, which suggests that there is a chance to rearrange the original data into constituent linear components or analysed by principal component analysis, as mentioned before. Another way is to use alpha factoring (using squared multiple correlation) for each variable with respect to all other variables (see Table 6.3). Therefore, Table 6.4 shows that there are some share variances among the original data in the pilot study, which implies that there is a relationship between the two theories used in the present study, which are SCT and ECT, as well as with the online services

variables. However, there are some concerns with variables SQ08, 09, 10, IQ14, POE28 and SE32, as they have low Squared Multiple Correlation, as seen in Table 5.3. Cliff (1987), unlike Stevens (2002), considered error random variance as best when using principal component analysis because these variances were unrecognisable in mass data, whereas Stevens concluded that the evidence with 30 or more variables with communalities greater than 0.7 are unlikely to have different solutions. This is why using the maximum-likelihood method is more appropriate for this kind of study through using SEM, as it takes into consideration the error in the measurement for the total variance.

The researcher reported these variables for the main survey results, as we will see in the main survey. In general, the results are encouraging and can be used to establish a linear component, or a trend, based on principal component analysis. In consequence, more complex factor analyses can be carried out through CFA during the main survey, where discriminant analysis can be conducted.

5.2.6. Factor extraction: eigenvalues and scree plot

There is debate among researchers over the retained factors in an analysis (Field, 2009). Thus, large eigenvalues can be used to underline the important number of factors that a researcher can consider. Cattel (1966) drew a graph called a "scree plot" (see Figure 5.2, the scree plot results of the pilot study). In order to select factors based on the scree plot, the point of inflexion can used as a cut-off point for the selection process, where there is a dramatic change in the slope line. Based on the amount of variation, Kaiser (1960) recommended that factors be retained above eigenvalues of 1 (see Fig 5.2), whereas Jolliffe (1986) considered only factors above 0.7 (see Fig 5.2) with respect to the number of variables and sample size. Kaisre's criterion is more suitable with a sample size of more than 250 and with average communalities of 0.6 or above. In the scree plot (Fig 5.2), a linear deviation is shown in the data. Hence, the researcher can determine the significant factors. Nannally and Bernstein (1994) criticised Kaisre's criterion as there are variations among the variables and the explanations of these variables based on percentage issues (e.g., with 100 variables, it explains only 1% and with 10 variable factors it explains 10%). For this reason, communalities are better used to retain factors based on their greater values as less information can be discarded. However, in the end, the researcher has used SCT and ECT factors based on previous

studies; therefore, eight factors have been decided upon as latent factors. Furthermore, Goodness-of-Fit tests (e.g., maximum-likelihood factor analysis) can be better used to estimate the factor extraction in the present study, as will be explained in CFA and SEM in the following sections.

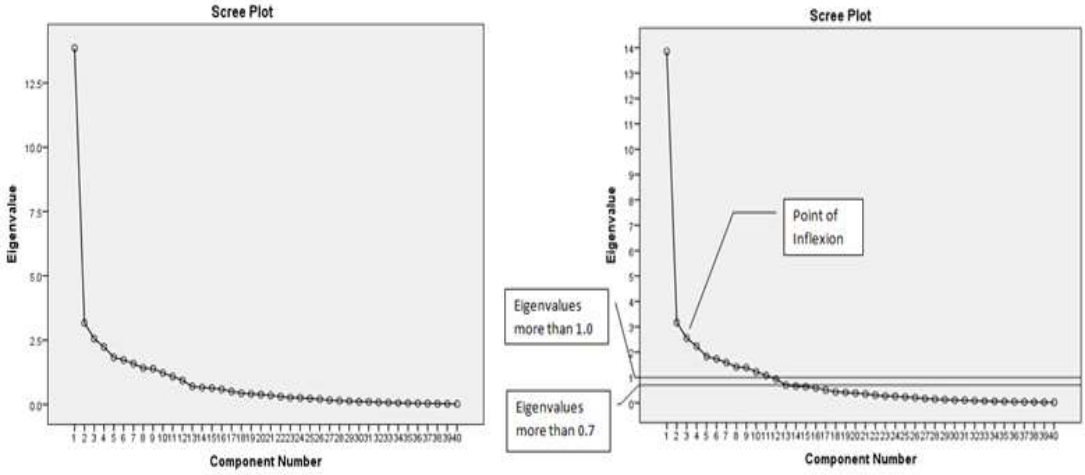


Figure 5.2: Scree plot result

However, applying Cattell's (1966) scree test can be tricky. It is worth noting that this method has been criticised for its subjectivity, as deciding the point of inflection on a scree plot can be an arbitrary process (Zwick & Velicer, 1986).

5.2.7. Kaiser-Mayer-Olkin (KMO) and sample size

The reliability of factor analysis is dependent on sample size because there is a fluctuation among correlation coefficients within different samples. As a rule of thumb, researchers suggest 10 to 15 participants per variable. Kass and Tinsley (1979) recommended 5 to 10 participants per variable up to a total of 300. Tabachnick and Fidell (2007) support Kass and Tinsley in having at least 300 cases for factor analysis. Guadagnoli and Velicer (1988) suggest that sample size and factor loadings determine the reliability of factor solutions.

The Kaiser-Mayer-Olkin measure of sampling adequacy (KMO) (Kaiser, 1970) represents "the ratio of the squared correlation between variables to the squared partial

correlation between variables" (Field, 2009:647). Based on Kaiser (1974) the recommended value is above KMO > 0.5; therefore, the results of the pilot study show KMO = .714, which is acceptable. In other words, the sum of partial correlations is small relative to the sum of correlations. Thus, the result yields reliable factors in the pilot study, which is positive towards the main survey analysis with a large sample. Bartlett's test of sphericity x^2 (780) = 2581.791, p < .001, indicating that the correlations between items were sufficiently large for a principal component analysis (PCA). Table 5.6 shows KMO and Bartlet's test.

Table 5.6: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.714
Bartlett's Test of Sphericity	Approx. Chi-Square	2581.791
	df	780
	Sig.	.000

Based on Table 6.5, KMO = 0.71, according to Hutcheson and Sofroniou (1999). Bartlett's test of Sphericity (p < 0.001, significant) shows that the test of factor analysis was appropriate. Based on these results, there is a relationship between the variables; therefore, further analysis is encouraging in CFA and SEM for a larger sample size in the main survey.

5.3. Main Survey

5.3.1. Sampling and sample size (*N*=471)

The researcher ensured that all respondents had used the DVLA online services (renewing tax disc through the website) by asking about this in the questionnaire. The target sample for this study was those who have obtained or renewed their tax disc through the DVLA online service (www.gov.uk) on at least a few occasions. Practically, it was not possible to know how many people used the DVLA online services.

For the main survey, the respondents completed an online survey between 5 February 2013 and 29 April 2013. Web-based surveys have several advantages over traditional paper-based surveys: lower costs, faster responses, geographically unrestricted samples, and higher response rates (Kaplowitz et al., 2004), and so this was the chosen method.

The validity of the research methodology depended on the volunteers' willingness to provide responses (Gosling et al., 2004). The data for the main survey were gathered in two steps: firstly, 671 respondents were collected without forcing the system not to ignore any questions; secondly 182 respondents were collected with system enforcement (not to skip any of the 40 questions but with the opportunity to ignore any or all demographic characteristics questions). More details can be found in the Missing Data Analysis section (5.4.1).

Nevertheless, the complexity of the proposed model required the researcher to select over 400 for the sample size because eight constructs were used and each has at least three measured variables (Hair et al., 2010). Thus, out of 853 total respondents, 471 were usable responses, which represent a 55% response rate. SEM requires a larger sample size compared to other multivariate approaches. Factors such as multivariate normality, estimation techniques, model complexity, amount of missing data, and average error variance among the reflective measured variables/indicators do influence the selection of the sample size

5.3.2. Main survey demographic characteristics

Among the respondents, the male proportion was 253(53.7%), which is 10% higher than female. There was no radical change in the percentage for years of age under 46 years old; the range is between 94 and 128 (20% - 27%). However, age percentage declines above 46 years of age; 79 (16.8%) and 32 (6.8%) above 55 years of age. Table 5.7 below presents the overall demographic characteristics of the participants.

Table 5.7: Demographics of the main survey respondents (N = 471).

Measure	Option	Frequency	Per cent (%)
1. What is your gender?	1) Female	208	44.2
	2) Male	253	53.7
2. How old are you?	1) Under 26	94	20.0
	2) From 26 to 35	128	27.2
	3) From 36 to 45	125	26.5
	4) From 46 to 55	79	16.8
	5) Over 55	32	6.8
3. What is your educational background?	1) Secondary Education	82	17.4
	2) Further Education (A-Levels / GNVQ / BTEC or similar qualification	134	28.5
	3) Higher Education (degree or postgraduate qualification)	232	49.3
4. What is your employment/occupation status?	1) Public sector	115	24.4
	2) Private sector	177	37.6
	3) Unemployed	82	17.4
	4) Self-employed	66	14.0
	5) Other	19	4.0
5. What is your marital status?	1) Married	111	23.6
	2) Single	203	43.1
	3) Divorced	103	21.9
	4) Other	40	8.5
6. What is your ethnicity?	1) White	141	29.9
	2) Mixed	128	27.2
	3) Asian or Asian British	53	11.3
	4) Black or Black British	35	7.4
	5) Other	38	8.1
7. What is your annual household income?	1) Less than £10,000	48	10.2
	2) £10,000 - £24,999	95	20.2
	3) £25,000 - £49,999	202	42.9
	4) £50,000 and above	69	14.6
8. How would you describe your general computer knowledge?	1) I am an Expert User	97	20.6
	2) I am an Intermediate User	242	51.4
	3) I am a Novice User	120	25.5
9. How would you describe your Internet knowledge?	1) I am an Expert User	166	35.2
	2) I am an Intermediate User	191	40.6
	3) I am a Novice User	95	20.2

5.4. Main survey data cleansing

The characteristics of the data have been examined as an initial step in the analysis. In the following subsections, the researcher evaluates and identifies the impact of the missing data and outliers, and selects the appropriate tests for the assumptions underlying most multivariate techniques. SPSS software (version 20) has been used as a tool to conduct the appropriate tests. These tests are: evaluation of missing data, identification of outliers and testing for normality assumption.

5.4.1. Missing data analysis

Missing data result from errors in data collection or data entry, or in the form of omissions of answers by respondents (Hair et al., 2010). As a rule of thumb, less than 10% of the data were missing, so imputation methods could be applied (Hair et al., 2010). There are various imputation techniques: imputation using only valid data; imputation using known replacement values; imputation by calculating replacement values; and model-based methods for MAR missing data processes. The researcher used imputation by calculating replacement values through mean substitution because it is easily implemented and provides cases with complete information; however, the disadvantage of this method is that it reduces the variance of the distribution. This method is best used when there are relatively low levels of missing values and relatively strong relationships among variables. In order to double-check and analyse the missing data patterns, Little's MCAR test was performed using SPSS 20.0. This test was used to analyse the variables for random missing data. The results of Little's MCAR test found no missing data: this means that the response rate is 80% before exploring the outliers.

5.4.2. Outlier detection

Outliers are "the observations with a unique combination of characteristics identifiable as distinctly different from the other observations" (Hair et al., 2010: 64). Thus, there is the potential that some of the observations stand out from other observations, either in high values or low values. These outliers cannot be classified as beneficial or

problematic. They should be considered as part of the context. Hair et al. (2010) classified outliers as follows:

- Procedure errors (22 cases were identified) due to data entry errors or mistakes in coding
- Extraordinary events (0 cases were identified)
- Extraordinary observations (has no explanation). The researcher feels that these values do not represent a valid element of the population (e.g., never used the Internet to complete a government transaction such as renewing a license). (141 cases were identified.)
- Observations that fall within the ordinary range of values on each of the variables. They are unique in their combination of values across the variables. (31 cases were identified.)

685 – (22 + 141 + 31) = 685 - 194 = 491

In order to detect and handle outliers in univariate, bivariate and multivariate situations, various methods can be used (e.g., univariate detection, bivariate detection and multivariate detection). These methods do not prevent the researcher from retaining the outliers based on the objective of the analysis. The researcher's objective is to make sure that there is consistency within the results and that they meet the best required values that fulfil the standards while using the CFA and SEM model measurements.

There are more than two variables involved in multivariate analyses; therefore, the bivariate method is inadequate because it requires a large number of graphs. Alternatively, the Mahalanobis D^2 (d-squared) measure has been used as a multivariate assessment tool for each observation. The Mahalanobis D^2 measure can be easily identified by using AMOS software. As a rule of thumb, the "multivariate method best is suited for examining a complete variant, such as the independent variables in regression or the variable in factor analysis; therefore, threshold level for the D^2/df measure should be conservative (.005 or .001), resulting in values of 2.5 (small samples) versus 3 or 4 in large samples" (Hair et al., 2010:67).

Table 5.7 shows the 13 outliers that have been retained in the present study after deleting 20 outliers (that have been identified).

685 – (22+ 141+ 31) = 685 -194 = 491 – 20 (outliers) = 471 (last sample used in the present study)

The objective of the present study is to test the relationships between the constructs using AMOS software as an analysis tool; therefore, multivariate detection is preferred. Therefore, the researcher managed to acquire the best Goodness-of-Fit (GOF) of the present study results. The researcher is wary of deleting many outliers as this action increases the level of risk by limiting the study's generalisability. Therefore, 20 cases were deleted and 13 cases were retained, as shown in Table 5.8.

Table 5.8: Mahalanobis D^2 (d-squared) measure results.

Observation number	Mahalanobis d-squared	p1	p2
340	68.744	0	0.077
85	66.828	0	0.009
27	66.774	0	0
159	63.171	0.001	0.001
290	61.992	0.001	0
69	60.815	0.002	0
5	60.501	0.002	0
376	60.076	0.002	0
58	59.674	0.002	0
448	57.982	0.003	0
155	57.849	0.003	0
324	57.073	0.004	0
65	56.878	0.004	0
1	56.433	0.005	0
96	55.815	0.006	0

5.4.3. Testing for normality assumption

Normality (normal distribution of data) is the most fundament assumption in multivariate analysis (Hair et al., 2010). Variation from normal distribution should not be too large; otherwise, the resulting statistical tests are invalid. If a multivariate normality is met then univariate normality is met correspondingly. However, multivariate normality is difficult to test (Stevens, 2002). Kurtosis refers to the height of the distribution and to skewness, which describes the balance of the distribution. Any left- or right-shifted distribution is considered as unbalanced, whereas a centred

one is considered as balanced or symmetrical distribution. When distribution is shifted to the left it is considered as positive, else it is considered as negative. If the skewness or kurtosis values are not zero, then it means that it is not normal. A platykurtic (flatter) distribution is a negative kurtosis, whereas a leptokurtic (peaked) one refers to positive values.

There are some concerns with skewness issues but not with kurtosis issues. However, due to the large sample in the present study (sample > 200), the departure values of skewness and kurtosis from zero are not large enough to warrant attention (Hair et al. 2010). Thus, the researcher considers the sample size of the present study to be adequate. Furthermore, a test for normality using a histogram was implemented for the 40 items to compare the observed data values in the distribution. The approximate results show normal distribution even though there was a slight skewness (negative) to the right. Table 5.9 below shows the analysis of the skewness and kurtosis values.

Table 5.9: Skewness and Kurtosis values (developed for the current study)

No.	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
1	-.586	.113	.476	.225
2	-.325	.113	.173	.225
3	-.315	.113	-.005	.225
4	-.344	.113	-.455	.225
5	-.432	.113	-.208	.225
6	.068	.113	-.122	.225
7	-.064	.113	-.311	.225
8	-.096	.113	-.463	.225
9	-.326	.113	-.296	.225
10	.014	.113	.089	.225
11	-.440	.113	.005	.225
12	-.137	.113	-.617	.225
13	-.514	.113	.137	.225
14	-.412	.113	-.226	.225
15	-.470	.113	-.191	.225
16	-.395	.113	-.054	.225
17	-.424	.113	-.072	.225
18	-.257	.113	.288	.225
19	-.498	.113	.569	.225
20	-.378	.113	.716	.225
21	-.828	.113	.842	.225
22	-.473	.113	.877	.225
23	-.954	.113	1.446	.225
24	-.347	.113	-.244	.225
25	-.268	.113	.167	.225
26	-.302	.113	-.048	.225
27	-.687	.113	.809	.225
28	-.316	.113	-.003	.225
29	-.654	.113	.647	.225
30	-.837	.113	.985	.225
31	-.499	.113	.640	.225
32	.058	.113	.882	.225
33	-.858	.113	.919	.225
34	-.980	.113	1.633	.225
35	-.097	.113	.586	.225
36	-.118	.113	.195	.225
37	-.171	.113	.490	.225
38	-1.056	.113	1.318	.225
39	-.706	.113	.785	.225
40	-.627	.113	.534	.225

In reality, however, data are often skewed and kurtotic; therefore, a departure from zero is expected. Hence, a small multivariate kurtosis value (e.g., less than 1.00) can be ignored in a large sample size.

5.5. Assessment of the overall structural model fit

The following will illustrate the results based on the CFA and SEM tests in general. Hair et al (2010) listed the six stages of SEM to examine the role of theory in the process by selecting the variables that will be measured, and conclude with the assessment of the overall structural model fit. The first four stages provide the results of using CFA, whereas the last two stages provide the results of using SEM. Table 5.10 summarises the six-stage process.

Table 5.10: Summary of the six-stages process in assessing CFA and SEM. Source: Hair et al. (2010).

Stage	Process	SEM Stage progression
1	Defining individual constructs	CFA
2	Developing the overall measurement model	CFA
3	Designing a study to produce empirical results	CFA
4	Assessing the measurement model validity	CFA
5	Specifying the structural model	SE
6	Assessing structural model validity	SE

In the following sections the author will emphasise the results of using SEM as a technique as well as EFA and CFA as a preliminary analysis tool. The researcher will use the six stages as a foundation of the analysis; however, the author may use other explanations based on other studies to support the analysis because some of the steps have been explained in other parts of this study.

The goal is to test the theory and the path analysis with respect to the proposed hypotheses in Chapter 4. SCT and ECT have been utilised as a theoretical basis to test the model because, without theory, SEM cannot be conducted. Therefore, the following tests illustrate the use of SEM to test the relationships that help online service providers make key managerial decisions.

5.6. CFA main survey results

The general research questions have been defined in the present study to identify the salient factors that influence the continuity process of using online services with respect to the power of SCT on ECT in the process. The following are the four stages of CFA: defining individual constructs, developing the overall measurement model, designing a study to produce empirical results, and assessing the measurement model validity. After that, the author will examine the last two SEM stages of the six stages.

5.6.1. CFA, stage one: Defining individual constructs

Stage one requires individual construct definitions. All the constructs were defined in Chapter 3 (see Table 3.1), which clarifies the existence of face validity because of the matching words in the definitions. Therefore, specific constructs/factors have been selected to represent the theoretical framework. All indicators used to operationalise the constructs were based on prior research and adapted to meet the current PhD research study of DVLA online services. The Likert scale is used for all items; it is a 1 to 5 Likert scale: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) and 5 (strongly agree). The questionnaire was posted on the website using surveymonkey.com online facilities. The constructs and the number of the associated items are shown in Table 5.11.

Table 5.11: Constructs and number of items before deletion process

No.	**Construct**	**Number of Items**
1	Prior Experience (PE)	3
2	Social Influence (SI)	3
3	Information Quality (IQ)	7
4	Services Quality (SQ)	10
5	Self-Efficacy (SE)	5
6	Personal Outcome Expectations (POE)	6
7	Satisfaction (SAT),	3
8	Continuance Intention to use DVAL online services (CI).	3
	Total (before deleting the 8 items)	40 items

5.6.2. CFA stage two: Developing the overall measurement model

In order to specify the measurement model to be tested, the relationships among the constructs have been defined, as shown in Chapter 4 (see Table 4.9). All multiple-items are on a reflective scale to measure the constructs. A measurement theory model (CFA) visual diagram can be seen in Figure 5.3 (items are represented by number in the diagram. Appendices A and C show the main survey where each item's number is associated with the corresponding item). The model shows 40 measured indicator variables and eight latent constructs, each of which is associated with its corresponding latent constructs. All constructs were allowed to correlate with other constructs in the CFA stage (independent and dependent constructs and error terms are shown in the SEM stage only in stages 5 and 6). As a rule of thumb, at least three indicators are recommended for each.

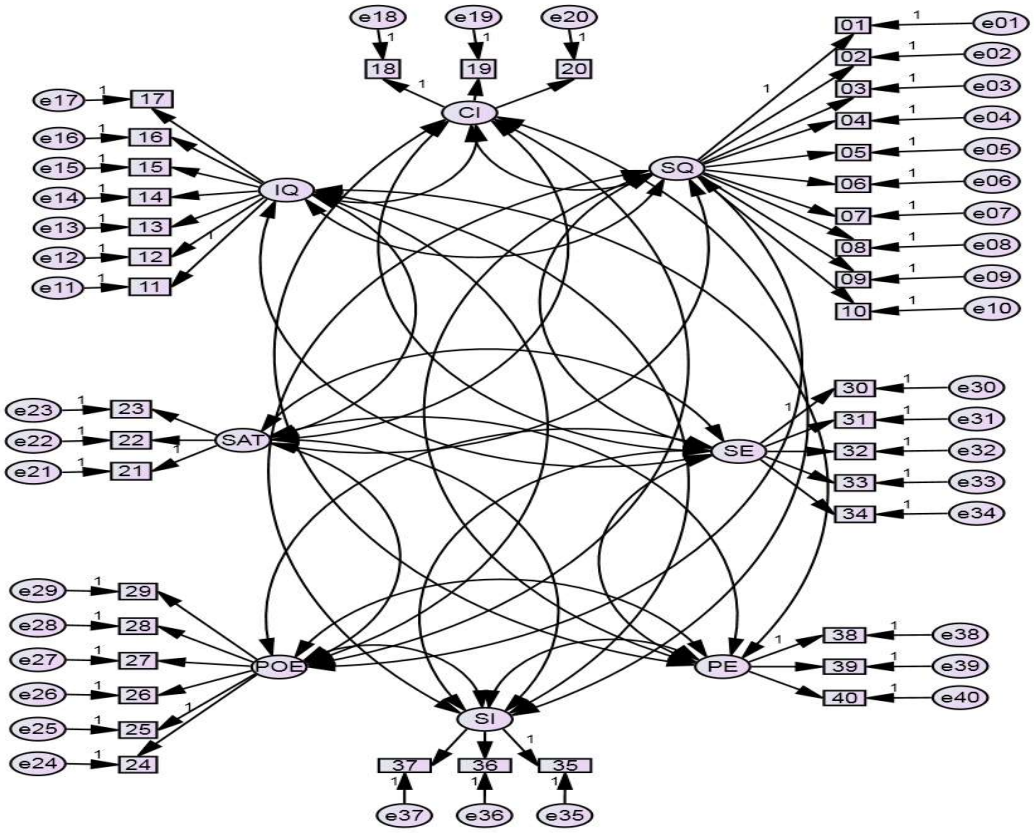


Figure 5.3: Measurement Theoretical model (CFA) for DVLA online services

From Figure 5.3, the latent constructs are: PE, SI, IQ, SQ, SE, POE, SAT and CI. An error term (e.g., e30) is associated with each item. The two-headed arrow represents the

covariance between the each two constructs, whereas the one-headed arrow represents the reflective relationships between the latent construct and the indicator (e.g., SAT → square shape item no. 23). Thus, each construct has its own sharing indicators.

5.6.3. CFA stage three: Designing a study to produce empirical results

In Chapter 5, the researcher provided more details about gathering data through a sample of UK citizens who have used the DVLA's online services at least a few times. For the current study, the researcher has selected that type of data, missing data approach and sample size based on the following sub-sections.

5.6.3.1. Type of data used in the present study

The researcher restricted the observed or measured variables to metric data (interval/ordinal) in order to be responsive to the calculation of covariance among items while using CFA and SEM. Thus, an appropriate type of data matrix has been carefully selected to meet SEM statistical calculation as a multivariate technique; AMOS, as reliable software in this study, can carry out these calculations. A covariance matrix has been used because SEM was originally developed using covariance. Correlation also has been used to support the results. The advantage of covariance is that it request a standardised solution (e.g., range between -1.0 to +1.0), and therefore covariance has an advantage over correlations with respect to its statistical properties (Hair et al, 2010).

5.6.3.2. Computer program used

AMOS (Analysis of Moment Structure) as a computer program is convenient for performing SEM because it is a module in SPSS. AMOS also has a graphical interface which makes it easier than using syntax commands or codes as in LISREL. AMOS was used to specify the model (see Figure 5.3 or Appendix B for CFA and SEM drawn model). Maximum likelihood was used as an estimation procedure.

5.6.4. CFA, stage four: Assessing the measurement model validity

In this section, the researcher tests the measurement theory by comparing the theoretical measurement model against reality. Therefore, the researcher will test the overall model fit in CFA and the construct validity (convergent validity and discriminant validity).

5.6.4.1. Overall fit

The results of the first time run of CFA (see CFA output in Figure 5.4) for the measurement model shows that there are few items are to be deleted due to low communalities, low reliability, or high cross-loading with other factors. The deletion of these items will increase the model's overall fit in the CFA process.

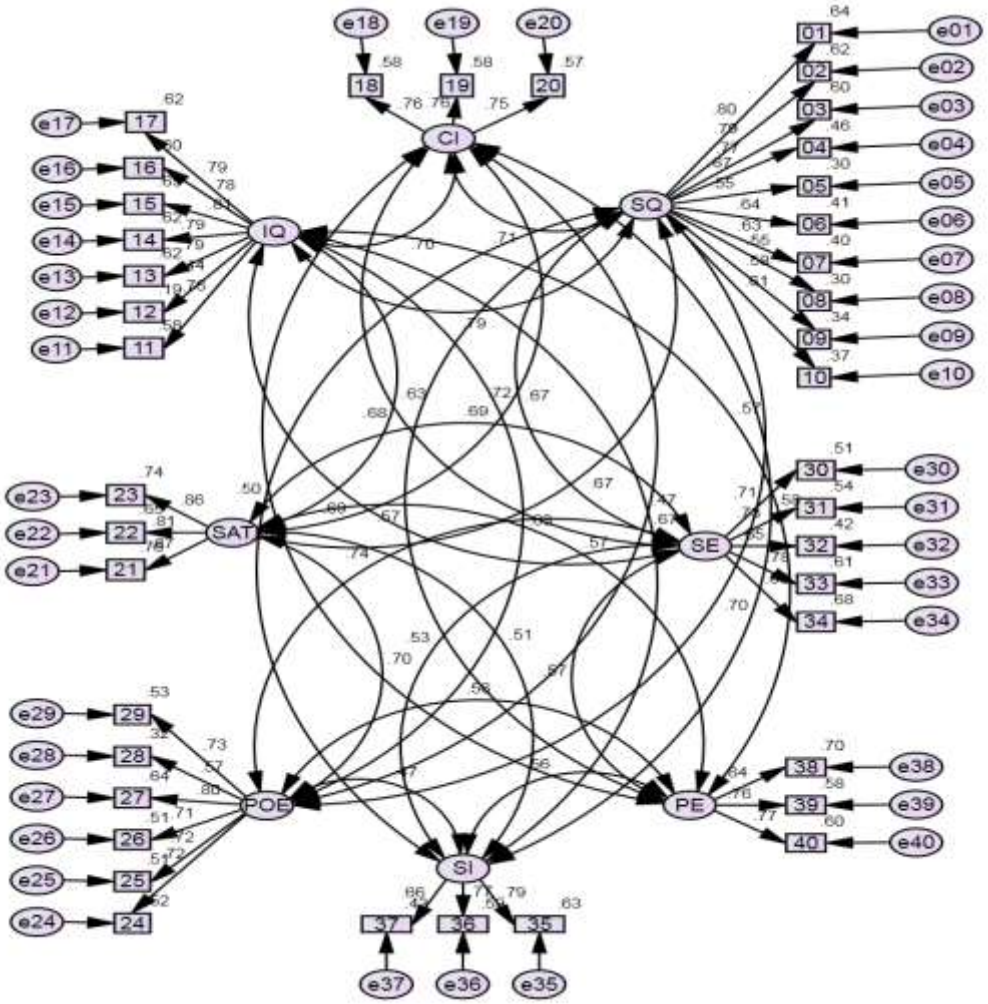


Figure 5.4: CFA results with the associated values

The deletion of the measured variables confirms what was reported in the pilot study, EFA, where the Corrected Item-Total Correlation values of these items (SQ7, 8, 9 and 10, POE32 and SE28) were below the recommended values. It is worth mentioning that CFA and the sample size provide more detail than EFA in the smaller sample size of the pilot study because more items were dropped, such as SQ07 and IQ12, as these measured variables were not recognised in the pilot study as weak items. In total, eight items were dropped in the CFA process. Table 5.12 provides a summary of deleted items during the CFA process.

Table 5.12: A summary of item purification process

Construct	**Item dropped**	**Reason**
Services Quality (SQ)	SQ05	Low communalities = .30 which is less than .40
	SQ07	Cross loaded with other factors is very high
	SQ08	Low communalities = .30 which is less than .40
	SQ09	Low communalities = .34 which is less than .40
	SQ10	Low communalities = .37 which is less than .40
Information Quality (IQ)	IQ12	Low com .19 < .4, loading 44 < .5
Personal Outcome Expectations (POE)	POE28	Low communalities = .32 which is less than .40
Self-Efficacy (SE)	SE32	Low communalities = .42 which is less than .40

Because there are many fit indices in CFA, the researcher will include only the key GOF values based on the rules of thumb (see Appendix E). However, the key values such as $\chi 2$ statistics, the CFI, and the RMSEA are common key values in SEM programs. Table 5.13 below provides selected fit statistics from CFA output for all 40 (before deleting eight items) and the 32 measured variables after deleting eight items.

Table 5.13: The DVLA CFA selected fit statistics output (40 and 32 measured variables).

Measurement type	Present study results		
	Index	**Test for 40 items**	**Test for 32 items after deletion process**
Chi-square (X^2)	Chi-square	1323.224	720.500
	Degree of freedom	712	436
	p-Value	.00	.00
Absolute Fit Measures	Goodness-of-Fit Index (GFI)	.872	0.914
	Root mean square error of approximation (RMSEA)	.043	0.037
	90 per cent confidence interval for RMSEA	(0.039; 0.046)	(0.032; 0.042)
	Root mean square error residual (RMR)	.026	0.022
	Normed chi-square = Chi-square / Degree of freedom = (CMIN/DF)	1.858	1.653
Incremental Fit Indices	Normed Fit Index (NFI)	.880	0.921
	Comparative Fit Index (CFI)	.940	0.967
Parsimony Fit Indices	Adjusted Goodness-of-Fit Index (AGFI)	.853	0.895
	Parsimony Normed Fit Index (PNFI)	.803	0.81

In both results of the 40 and the 32 measured variables output (see Table 6.10), $\chi 2$ Goodness of Fit statistics does not indicate that the observed covariance matrix matches the estimated covariance matrix within the sampling variance. The value of RMSEA in the absolute fit index was improved from 0.043 in the 40 items to 0.037 in the 32 items. The value of RMSEA is quite low and is below the 0.08 guideline (Hair et al., 2010) for a model with 32 measured variables and a sample size of 471. Furthermore, the RMSEA value is between the 90% confidence interval; therefore, RMSEA is between 0.032 (lower bound) and 0.042 (upper bound of RMSEA). It also shows that the upper bound of RMSEA is low in the present case. Thus, RMSEA supports the present model fit. Next, the normed $\chi 2$ in the absolute fit statistic is $\chi 2$ = 1.653, which is smaller than 2.0 and is considered very good (between 2.0 and 5.0 is acceptable); therefore, the normed $\chi 2$ suggests an acceptable fit for the CFA model. For the incremental fit indices, the CFA in the DVLA CFA (32 items) model has a value of (CFA = 0.967), which is above the guideline of greater than 0.90 for the present model with this complexity and sample size. The AGFI has a value of 0.895 (which is 0.90 after approximation), reflecting a good model fit even though it is not compared to other models. Even though Table 6.10 shows a satisfactory progression in the output after

deleting the eight items and the effective sample size of 471, and problems that are associated with considering only this test, another fit is recommended for examination.

In summary, the CFA results suggest the DVLA measurement model provides a reasonably good fit, and thus it is suitable to proceed to further examination of the model results. Therefore, construct validity will be examined in the next section.

5.6.4.2. Construct validity

In assessing construct validity, the researcher needs to examine convergent, discriminant, nomological and face validity. However, as mentioned before, the contents of the corresponding items were enough to recognise face validity based on the literature and the opinions of professionals. Therefore, the following sections will assess the other three validities.

5.6.4.3. Convergent validity

The estimated impact of the maximum likelihood factor-loading has been taken into consideration in this process, even though it is not associated with a specific range of values in the CFA procedure. The results of standardised factor-loading estimates (regression weight loading or loading estimates) are statistically significant to the present model at the 0.001 level, which provides a good sign for convergent validity. Standardised loadings were examined instead of unstandardised loadings because it provides the required information in the calculation process of discriminant validity and reliability estimations. Regression weight has to be at least 0.50 and preferably 0.70 and variance extracted measures should be at least 0.50, whereas 0.70 is the minimum threshold for construct reliability (unless exploratory research has been conducted) (Hair et al., 2010; Fornell and Larcker, 1981; Fornell et al. 1996).

In order to test the reliability of the instrument used in the present study, both, Cronbach's Alpha (α) and CR were used. Table 5.13 shows that both the Alpha and the CR values were greater than the thresholds of each factor. The lowest standardised regression weight loading obtained is 0.61 in the services quality construct item SQ06. Furthermore, services quality construct item SQ05 also falls below the 0.70 standard loading estimates. All of the AVE values exceed the 0.50 percent as a rule of thumb. The AVE estimates range from 0.55 (for the POE and SI constructs) to 0.72 (for the

SAT construct). For construct reliabilities, all values range from 0.79 for SI to 0.91 for IQ. All reliability values exceed 0.70, which is considered to be an adequate reliability.

The AVE and CR values were calculated using specific formulas as following:

Formula for Variance Extracted

$$VE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

In the formula above, λ represents the standardized factor loading and *i* is the number of items. So, for *n* items, AVE is computed as the sum of the squared standardised factor loadings, divided by the number of items, as shown above.

Formula for Construct Reliability

$$CR = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{(\sum_{i=1}^{n} \lambda_i)^2 + (\sum_{i=1}^{n} \delta_i)}$$

Construct reliability is computed from the sum of factor loadings (λ*i*), squared for each construct and the sum of the error variance terms for a construct (δ*i*) using the above formula. Error variance is also referred to as delta. Table 5.14 below presents the analysis results of EFA besides CFA.

Table 5.14: Results of EFA and CFA

Constructs	Items	Exploratory factor analysis (N= 471)		Confirmatory factor analysis (N= 471)		
		Factor loadings	α	Standardized loadings	**CR**	**AVE**
Services Quality (SQ)*	SQ01	0.73	0.86	0.84	0.87	0.57
	SQ02	0.70		0.81		
	SQ03	0.77		0.83		
	SQ04	0.55		0.64		
	SQ06	0.60		0.61		
Information Quality (IQ)*	IQ11	0.63	0.91	0.76	0.91	0.62
	IQ13	0.68		0.79		
	IQ14	0.72		0.79		
	IQ15	0.72		0.81		
	IQ16	0.70		0.78		
	IQ17	0.66		0.78		
Continuance Intention (CI)	CO18	0.58	0.80	0.76	0.80	0.58
	CO19	0.56		0.77		
	CO20	0.55		0.75		
Satisfaction (SAT)	SA21	0.77	0.88	0.87	0.88	0.72
	SA22	0.73		0.81		
	SA23	0.75		0.86		
Personal Outcome Expectations (POE)*	OE24	0.66	0.86	0.74	0.86	0.55
	OE25	0.64		0.71		
	OE26	0.64		0.72		
	OE27	0.67		0.80		
	OE29	0.61		0.72		
Self-Efficacy (SE)	SE30	0.65	0.85	0.72	0.85	0.59
	SE31	0.69		0.74		
	SE33	0.72		0.79		
	SE34	0.69		0.82		
Social Influence (SI)	SI35	0.70	0.78	0.80	0.79	0.55
	SI36	0.68		0.77		
	SI37	0.66		0.66		
Prior Experience (PE)	PE38	0.78	0.83	0.84	0.84	0.63
	PE39	0.74		0.76		
	PE40	0.72		0.77		
*SQ5, 7, 8, 9, 10; IQ12; POE28; SE32 all these variables have been deleted in the CFA process						

The results confirm the convergent validity of the present model. The values of all Cronbach's Alpha and composite reliability (CR) values are above the 0.70 threshold (Nunnally, 1978; Nunnally and Bernstein, 1994). This indicates that the scales and internal consistency have high reliability. Furthermore, the AVE for each construct is greater than 0.5; therefore, the scales have good convergent validity and the standardised loading of all items are above 0.7, excepting SQ4, SQ06 and SI37 (above 0.60) (Bagozzi and Youjae, 1988). Therefore, the researcher retained all the 32 measured variables/items because the model fitted relatively well until this point. However, discriminant validity has to be examined in the next step.

5.6.4.4. Discriminant validity

In order to test discriminant validity, the researcher first has to examine the inter-construct covariance. Table 5.14 compares the AVE estimates for each factor with the squared inter-construct correlations associated with that factor as suggested by Fornell and Larcker (1981) and Hair et al. (2010). As shown in Table 5.15 (above the diagonal), the square roots of the AVE for all constructs are higher than the inter-construct correlations coefficients, which provide support for the discriminant validity of the measures.

Table 5.15: The inter-construct and the squared correlations

AVE		SAT	SI	PE	SE	CI	IQ	POE	SQ
0.717	**SAT**	**1.000**	**0.261**	**0.328**	**0.446**	**0.448**	**0.393**	**0.480**	**0.430**
0.551	**SI**	0.511	**1.000**	**0.316**	**0.264**	**0.336**	**0.221**	**0.213**	**0.250**
0.628	**PE**	0.573	0.562	**1.000**	**0.298**	**0.308**	**0.317**	**0.300**	**0.280**
0.592	**SE**	0.668	0.514	0.546	**1.000**	**0.434**	**0.453**	**0.521**	**0.480**
0.575	**CI**	0.669	0.580	0.555	0.659	**1.000**	**0.491**	**0.450**	**0.494**
0.617	**IQ**	0.627	0.470	0.563	0.673	0.701	**1.000**	**0.397**	**0.561**
0.545	**POE**	0.693	0.461	0.548	0.722	0.671	0.630	**1.000**	**0.450**
0.566	**SQ**	0.656	0.500	0.529	0.693	0.703	0.749	0.671	**1.000**

Note: (Source: Developed for the current study from Hair et al., 2010).

- Values below the diagonal are correlation estimates among constructs, diagonal elements are construct variance. All constructs were significant at level ***=0.001.
- Values above the diagonal are squared correlations.

The results in Table 5.14 show that comparing the AVE estimates for each factor with the squared inter-construct correlations associated with each factor has no problems with discriminant validity for the present model (DVLA model). Furthermore, there was no cross-loading among the measured variables and the error terms, which support the discriminant validity. This suggests that the scales have good discriminant validity.

5.6.4.5. Nomological Validity

The constructs in the present study are expected to be positively related toward continuance use of the DVLA online services and, as previously hypothesised, based on the literature review and theories (SCT and ECT). Thus, the correlation matrix between the factor scores for each construct, as shown in Table 5.14, provide a good start in this

effort to the extent that there is a positive relationship among constructs. The results suggest that these constructs are positively related to one another. Values below the diagonal (Table 5.14) are correlation estimates among constructs; diagonal elements are construct variance. All constructs are significant at level ***= 0.001.

5.6.5. The model CFA Summary

The CFA results generally support the measurement model. The $\chi 2$ statistic is significant above the .001 level at the 471 sample size, which is not unusual at this sample size. Both CFI (= 0.967) and RMSEA (= 0.037) support the model and appear quite good. Overall, the results of the fit statistics suggest that the estimated model reproduces the sample covariance matrix reasonably well. In addition, convergent, discriminant and nomological validities support the construct validity. Therefore, and at this point, the present model can be fairly confident in terms of how these eight constructs or measures relate to one another. The outcomes of Stages 1, 2, 3 and 4 of the CFA process suggest that the results are conceptually consistent, which is more important than being a better fit alone. However, "CFA alone is limited in its ability to examine the nature of relationships between constructs beyond simple correlations" (Hair et al., 2010: 727). Thus, an assessment of a conceptual representation (structural theory) of the structural relationships between constructs is needed to examine the nature of these relationships. Therefore, the next step is to measure Stages 5 (Specifying the structural model) and 6 (Assessing structural model validity) of the structural relationships, which can be presented by a structural theory.

5.7. SEM main survey results (stage 5 and 6)

These two stages (stage 5 and 6) are considered as a transition from a measurement model (non-causal or correlations) to a structural model (causation or causality). Nevertheless, the observed covariance model is the same in CFA and SEM (structural model). The structural model can be used to represent the structural theory or the structural relationships between the constructs through a set of structural equations, which can be illustrated with a visual diagram. Thus, a theoretical model can represent the path estimate between two constructs, based on a causal model or so-called

causation course. Therefore, specifying each construct to one another is necessary for causation, which can be illustrated as a regression coefficient through path estimate values between the two correspondent constructs. This is similar to CFA; however, the correlational relationships in CFA changed to a one-headed arrow (a dependent relationship) in the causal model or structural model to represent the nature of the relationship between any two constructs in the causal model. Therefore, exogenous constructs should be clearly distinguished from endogenous constructs. However, independent constructs as exogenous or predictors can still be correlated, whereas dependent constructs as endogenous or the outcomes cannot be correlated with other constructs. In SEM, a construct can be exogenous and endogenous at the same time, which is consistent with the multivariate approach.

In summary, in CFA the researcher tests the relationships between latent constructs, whereas in the structural model the researcher tests the hypothesised theoretical model, such as overall fit and structural parameter estimates as a path estimate between two constructs.

The evaluation process is based on how well it reproduces the observed covariance matrix based on the hypothesised direction between one construct and another. If the model in Figure 5.5 shows good fit and the hypothesised paths specified in the model are significant, then the model is supported; however, further tests for an alternative model may be needed to acknowledge the model test results, even though it is good fit, to ensure nomological validity for the negative relationships, as seen later in the present study tests. In the present study, the researcher assumes that all relationships between constructs are positive, based on the proposed theories (SCT and ECT as well as E-S-QUAL and D&M IS success model) as illustrated in the theoretical model and how well the model fits the data.

Based on Hair et al (2010), a two-step approach has been used; therefore, the researcher splits the measurement model into two steps to avoid bad measurement. The first step (stages 1, 2, 3 and 4) tests the fit and construct. After having a satisfactory test in the first step, then the researcher moves to the second step to test the structural theory (stages 5 and 6). Therefore, the following sections are stages 5 (specifying the structural model) followed by stage 6 (assessing the validity of the structural model).

5.7.1. SEM, stage five: Specifying the structural model

5.7.1.1. Unit of analysis

The unit analysis of the present study is a person's (traditional citizen) opinion or feelings towards using the DVLA online services from the individual perspective. Thus, the researcher ensures that the model's measures capture those feelings of that unit of analysis. For example, a personal outcome expectation (POE) is the expectation of the traditional person (the citizen) outside the organisation to ensure that the opinion does not interfere with the organisation's opinion. This goes for other constructs such as satisfaction, prior experience and self-efficacy towards a person's intention to continue using the DVLA online services. This helps in comparing all views based on the same level of analysis as characteristics of the traditional citizen overall. In this respect, the citizen reflects the organisational or government agency (G2C) such as in the present study of the DVLA online tax renewal's level of service towards his or her continuity use of those services. Hence, the desired level is at the individual level.

5.7.1.2. Model specification using a path diagram

Figure 5.5 illustrates the expanded theoretical model of the present study, which represents both fixed and free parameters. This is unlike the relationship between service quality and self-efficacy (which is a free parameter and can be estimated), and is the focus of this stage. In the present study, the researcher uses AMOS software, which considers all structural relationships similarly.

Figure 5.5 shows the structural model of the present study after it is converted from the CFA model. It specifies the free and fixed parameters between the eight constructs. Furthermore, each construct is indicated by at least three indicator items; therefore, the eight constructs are measured by 32 measured indicator variables.

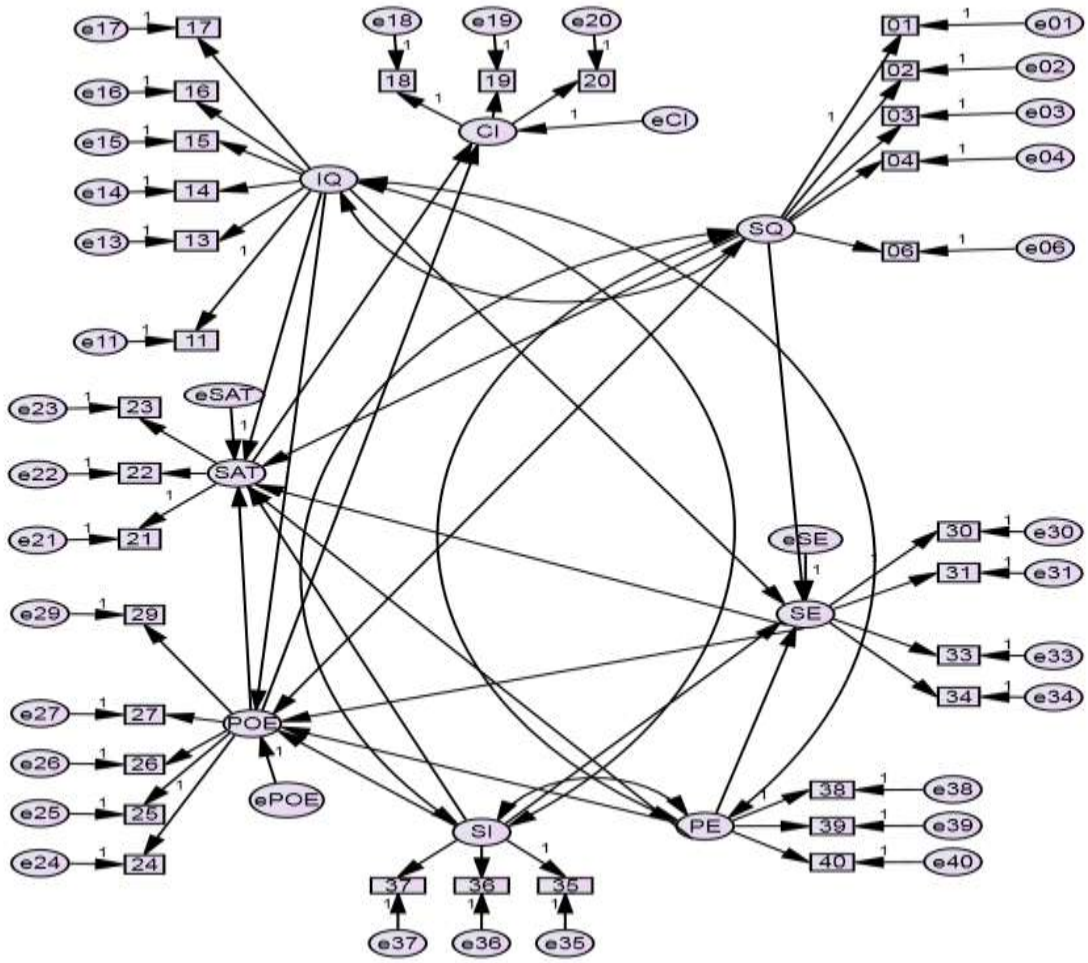


Figure 5.5: Structural model based on AMOS software (after deleting 8 items)

Based on Figure 5.5 and the diagram that is illustrated by AMOS software in Figure 5.5, there is a distinction made between endogenous and exogenous constructs (Table 5.15 provide more details). However, this distinction cannot be seen in the CFA model (see Figure 5.4). The present model is recursive, which means there are no arrows going both ways between the two corresponding constructs. Because the model is recursive, the structural model is identified as long as CFA is satisfied because the structural model is nested in the CFA model. The CFA model fit will be used as a convenient basis of comparison in assessing the fit for the structural model of the present study in the next section.

5.7.2. SEM, stage six: Assessing the structural model validity

This is the final stage; the researcher will examine the validity of the structural model and compare the structural model with the CFA results. However, there is a need to clarify the distinction between the CFA and the structural mode or what is called SEM. Furthermore, the researcher will determine the statistical significance of each hypothesised path. Finally, the researcher will determine if there is any possible re-specification of the model.

5.7.2.1. How to differentiate structural model (SEM) fit from CFA fit

In the CFA model, an adequate fit was found; therefore, the researcher is not going to fix the performance of the CFA model. In other words, a lower $\chi 2$ from CFA is not possible in the recursive structural model. However, and in order to understand the structural model fit from CFA fit, the observed sample covariance matrix will be compared with the estimated covariance matrix. Therefore, the researcher ensured that the SEM model's number of structural relationships is different to what was specified in the CFA model; otherwise, there would be no new insight if the researcher examines the saturated theoretical models or the correlations in the CFA. Thus, assessing SEM (the structural model) is the same as what is seen in the CFA model but with lower relationships between constructs; this is because SEM does not require the pattern restrictions of free and fixed parameter estimates as that in CFA. This means that at least one absolute index and one incremental index can be used in the evaluation process as well as the model $\chi 2$.

In summary, the structural model fit must be better than the CFA model in order to validate the structural theory (Anderson and Gerbing, 1992). CFA assumes that there is a relationship between constructs; therefore, the purpose of SIM is to precisely explain the possible inter-construct relationships based on the theoretical model. Thus, the insignificant $\Delta \chi 2$ value with the CFA model considered as an adequate structural fit.

5.7.2.2. Assessing the structural model validity: GOF Index

First, the researcher will assess the SEM (structural model) fit and then the inter-construct relationships in terms of whether they are positive (supportive of the theoretical expectations) or negative (inconsistent with the theoretical expectations).

Table 5.16 provides more details about the comparison of Goodness-of-Fit measures between the current study research structural model and CFA model overall fit.

Table 5.16: Comparison of Goodness-of-Fit measures between the structural model and CFA model.

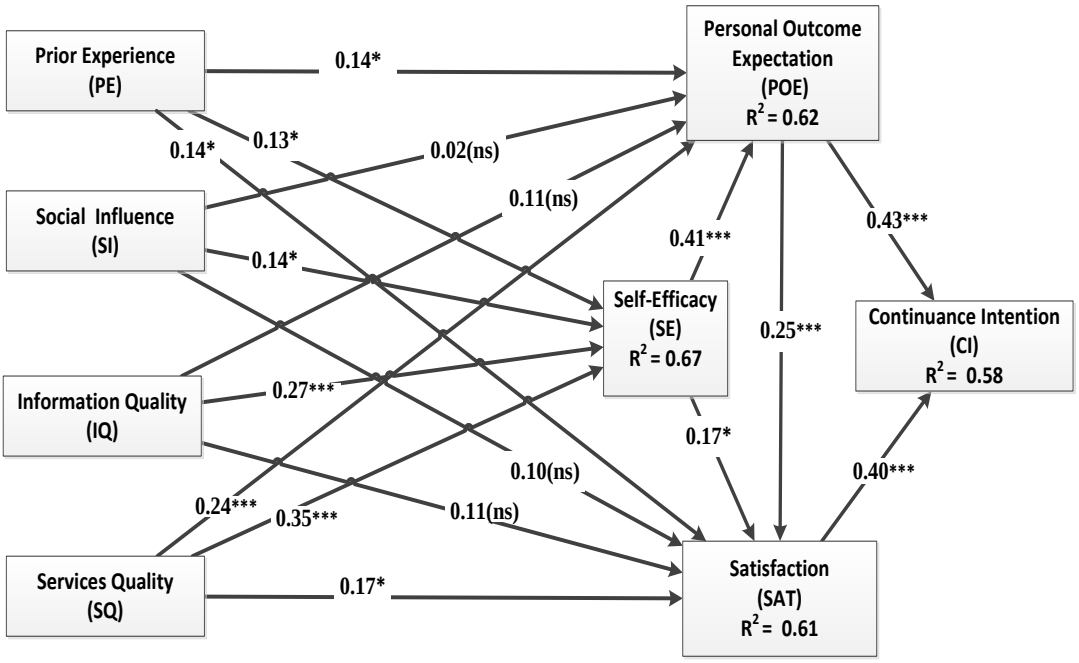
Index	**SEM**	**CFA**	**Thresholds**
Absolute Fit			
Chi-square (X^2)	787.645	720.500	NA
Degree of freedom	441	436	NA
p-Value	.000	.000	$p < 0.05$ (Hair et al., 2006)
Goodness-of-Fit Index (GFI)	0.906	0.914	> 0.80 (Etezadi-Amoli and Farhoomand, 1996); > 0.90 considered good (Hair et al, 2010);the smaller the better; Hair et al., 2006
Root mean square error of approximation (RMSEA)	0.041	0.037	< 0.05 (Browne and Cudeck, 1993); < 0.08 is acceptable (Joreskog and Sorbom, 1993); < 0.08 (Hair et al., 2006)
90 per cent confidence interval for RMSEA	(0.036; 0.045)	(0.032; 0.042)	
Root mean square error residual (RMR)	0.028	0.022	
Normed chi-square = Chi-square / Degree of freedom = (CMIN/DF)	1.786	1.652	< 5.00 (Bentler, 1988)
Incremental Fit Indices			
Normed Fit Index (NFI)	0.914	0.921	> 0.90 (Hayduk, 1987; Bentler, 1988; Hair et al., 2010) > 0.90 (Hayduk, 1987; Bentler, 1988)
Comparative Fit Index (CFI)	0.96	0.967	
Parsimony Fit Indices			
Adjusted Goodness-of-Fit Index (AGFI)	0.888	0.895	
Parsimony Normed Fit Index (PNFI)	0.812	0.81	

The information in Table 6.13 shows that all of these measures are within the range that would be associated with good fit, based on Hair et al. (2010) and other researchers (as seen in the table). For the structural model, the $\chi 2$ is 787.645 with 441 degrees of

freedom (P < 0.05), and the normed chi-square is 1.786. The CFI is 0.96 with an RMSEA of 0.041 and a 90% confidence interval of (0.036; 0.045). There is an increase in chi-square of 67.145 in the structural model from the CFA model, which supports the validity of the measurement. The results suggest that the model provides a good overall fit. Next, the examination is the path coefficients and loading estimates.

5.7.3. Assessing the structural model validity: path coefficients and loadings estimates

The researcher established the structural relationships among the constructs using AMOS software, which depicts the model testing results. Figure 5.6 clearly presents the seventeen hypotheses that have been tested for the model and the associated loading estimates for each path. Four of the seventeen hypotheses were found not supported by the data. Neither social influence nor information quality had significant effects on personal outcome expectation or satisfaction. Prior experience had a significant positive effect on personal outcome expectations, self-efficacy and on satisfaction. Social influence had a significant positive effect on self-efficacy. Information quality was found to have a significant positive effect on self-efficacy. Services quality was found to have a significant positive effect on personal outcome expectations, self-efficacy and on satisfaction. Significant positive effect on both personal outcome expectations and satisfaction were found from self-efficacy. Personal outcome expectations has a significant positive effect on both satisfaction and continuance intention. Finally, satisfaction had a significant positive effect on continuance intention.



*p < 0.05; **p < 0.01; ***p < 0.001; ns: not significant.

Figure 5.6: Standardised path estimates for structural model (hypotheses testing results)

Table 5.17 below shows the hypothesised dependence relationships of the present study. The examination of hypothesised dependence relationships increases theory validity if they are statistically significant and in the predicted direction.

Table 5.17: The hypothesised dependence relationships of the present study (shaded areas show no support).

Hypothesis	+/ -	*Direction	Supported?
H1a: *There is a positive relationship between citizen's level of prior experience and citizens' personal outcome expectations*	+	*PE → POE	**Yes**
H1b: *There is a positive relationship between citizen's level of prior experience and citizens' self-efficacy*	+	PE → SE	**Yes**
H1b: *There is a positive relationship between citizen's level of prior experience and citizens' satisfaction*	+	PE → SAT	**Yes**
H2a: *Social influence is positively associated with personal outcome expectations*	+	SI → POE	**No**
H2b: *Social influence is positively associated with citizen's self-efficacy*	+	SI → SE	**Yes**
H4c: *Social influence will positively influence satisfaction*	+	SI → SAT	**No**
H3a: *There would be a positive relationship between information quality and citizen' personal outcome expectation*	+	IQ → POE	**No**
H3b: *There would be a positive relationship between citizen' information quality and citizen' perceived self- efficacy*	+	IQ → SE	**Yes**
H3c: *There would be a positive relationship between citizen's information quality of and satisfaction with online public system.*	+	IQ → SAT	**No**
H4a: *There would be a positive relationship between service quality and citizen's personal outcome expectation of continued use public sector systems.*	+	SQ → POE	**Yes**
H4b: *There would be a positive relationship between service quality and citizen's perceived internet self- efficacy*	+	SQ → SE	**Yes**
H4c: *There would be a positive relationship between service quality and citizen's satisfaction with public sector systems.*	+	SQ → SAT	**Yes**
H5a: *There would be a positive relationship between citizen's perceived self- efficacy and their personal outcome expectation*	+	SE → POE	**Yes**
H5b: *There would be a positive relationship between citizen's perceived internet self- efficacy and their satisfaction of public sector systems.*	+	SE → SAT	**Yes**
H6a: P*ersonal outcome expectation is positively related to citizen continuance intentions in public sector systems.*	+	POE → CI	**Yes**
H6b: *Personal outcome expectation is positively associated with satisfaction in public sector systems.*	+	POE → SAT	**Yes**
H7: *There would be a positive relationship between citizen's satisfaction with public sector systems and their continuance intention.*	+	SAT → CI	**Yes**
*Note that the construct that is located at the left side of the arrow are exogenous constructs and those at the right side of the arrow are endogenous constructs (e.g., IQ → POE, IQ is exogenous and POE is endogenous). In SEM, there is a chance to find one construct as both endogenous and exogenous at the same time.			

Figure 5.6 and Table 5.16 show that all but four (H2a, H4c, H3a and H3c) structural estimates are significant and in the expected path. The four unsupported path estimates

are social influence (SI) and information quality (IQ) towards personal outcome expectations (POE) and satisfaction (SAT).

5.8. Examining SEM model diagnostics

In order to consider model re-specification, the researcher evaluated the SEM model by estimating new paths. The researcher evaluated the SEM model by examining the model through the available paths and observed the differences in degrees of freedom. The differences in degrees of freedom show the possible structural paths to be estimated. Table 6.14 shows that CFA model *dof* is 436 and SEM1 *dof* (before deleting the 4 unsupported hypothesised paths) is 441; SEM2 *dof* (after deleting the four unsupported hypothesised paths) is 445, which was increased by 4 because of the 4 deleted paths; and SEM3, after adding a new path SE → CI based on SCT strong relationships between personal factors and behavioural factors, shows that *dof* is 444. The results of the SEM3 show more satisfactory values in GFI, RMSEA, RMR, normed chi-square and CFI (see Table 5.18).

Table 5.18: Comparison of Goodness-of-Fit measures between the structural model and CFA model.

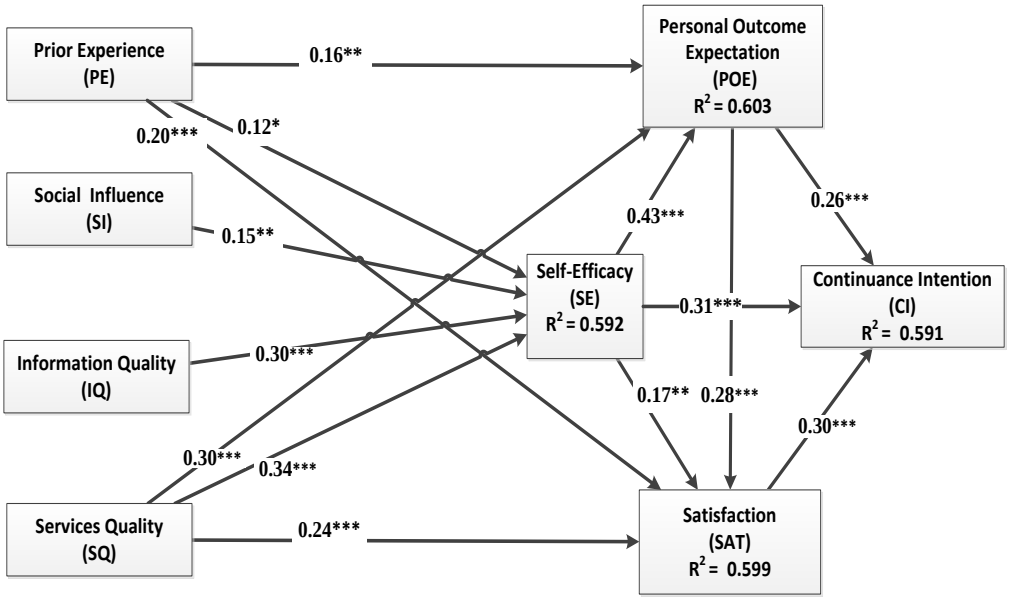
Index	SEM1	CFA	SEM2	SEM3	Thresholds
Absolute Fit					
Chi-square (X^2)	787.645	720.500	796.290	780.345	NA
Degree of freedom	441	436	445	444	NA
p-Value	.000	.000	.000	.000	p < 0.05 (Hair et al., 2006)
Goodness-of-Fit Index (GFI)	0.906	0.914	.906	.907	> 0.80 (Etezadi-Amoli and Farhoomand, 1996); > 0.90 considered good (Hair et al, 2010);the smaller the better; Hair et al., 2006
Root mean square error of approximation (RMSEA)	0.041	0.037	.041	.040	< 0.05 (Browne and Cudeck, 1993); < 0.08 is acceptable (Joreskog and Sorbom, 1993); < 0.08 (Hair et al., 2006)
90 percent confidence interval for RMSEA	(0.036; 0.045)	(0.032; 0.042)	(0.036; 0.046)	(0.035; 0.045)	
Root mean square error residual (RMR)	0.028	0.022	.030	.027	
Normed chi-square = Chi-square / Degree of freedom = (CMIN/DF)	1.786	1.652	1.789	1.757	< 5.00 (Bentler, 1990)
Incremental Fit Indices					
Normed Fit Index (NFI)	0.914	0.921	.913	.915	> 0.90 (Hayduk, 1987; Bentler, 1988; Hair et al., 2010)
Comparative Fit Index (CFI)	0.960	0.967	.959	.961	> 0.90 (Hayduk, 1987; Bentler, 1988)
Parsimony Fit Indices					
Adjusted Goodness-of-Fit Index (AGFI)	0.888	0.895	.888	.890	
Parsimony Normed Fit Index (PNFI)	0.812	0.81	.819	.819	
SEM1: The original proposed hypotheses SEM2: The original proposed hypotheses without the four unsupported paths SEM3: The original proposed hypotheses without the four unsupported paths by adding a new supported path (SE→ CI)					

The researcher estimated the path between prior experience to continuance intention (PE → CI) and found it statistically significant ($p < .005$); however, this new path has a negative influence in the SEM model because it influenced the relationship between prior experience to self-efficacy (PE → SE), and turned it into an unsupported path based on the proposed hypothesised paths. Thus, the researcher preferred to ignore this path (PE → CI) and retains the original path of PE → SE. Furthermore, there are three structural paths (SI → CI; IQ → CI; and SQ → CI); these paths are out of the scope of the present study because the author is interested only with environmental factor (SI, IQ and SQ) through personal factors towards CI. Hence, these paths will be recommended for future studies.

5.9. The revised model (Final model, a post hoc analysis)

Figure 5.7 shows the SEM3 (see Table 6.14) results after deleting the four unsupported paths and adding a new path (SE → CI) based on the SCT theoretical base relationships, as illustrated in Table 5.17. Hsu et al. (2004) mentioned that behaviour is influenced by both outcome expectation and self-efficacy; therefore, the SE → CI path is theoretically supported.

In particular, behaviour is affected by both outcome expectations and self-efficacy.



*p<0.05; **p<0.01; ***p<0.001; ns: not significant.

Figure 5.7: The final model: Standardised path estimates for the revised DVLA structural model. Hypotheses testing results after deleting the 4 unsupported paths and adding a new path (SE → CI)

Table 5.19 below shows the overall deleted paths and the new added path. The new path (SE → CI) supports the hypotheses as it positively links self-efficacy with continuance intention.

Table 5.19: The hypothesised dependence relationships of the present study

Hypothesis	+/ -	direction	Supported?
H1a:	+	PE → POE	**Yes**
H1b:	+	PE → SE	**Yes**
H1b:	+	PE → SAT	**Yes**
H2a: deleted	+	SI → POE	**No**
H2b:	+	SI → SE	**Yes**
H4c: deleted	+	SI → SAT	**No**
H3a: deleted	+	IQ → POE	**No**
H3b:	+	IQ → SE	**Yes**
H3c: deleted	+	IQ → SAT	**No**
H4a:	+	SQ → POE	**Yes**
H4b:	+	SQ → SE	**Yes**
H4c:	+	SQ → SAT	**Yes**
H5a:	+	SE → POE	**Yes**
H5b:	+	SE → SAT	**Yes**
H6a:	+	POE → CI	**Yes**
H6b:	+	POE → SAT	**Yes**
H7:	+	SAT → CI	**Yes**
****H8:*** *There would be a positive relationship between citizen's self-efficacy with public sector systems and their continuance intention.* ***(new path estimation added)***	+	SE → CI	**Yes**
*Note that H8 was just added after the diagnoses process			

The revised model (Figure 5.7) shows a slight improvement on the original model based on Table 6.14. Most notably, the new estimated path (SE → CI) is significant ($p < .005$). The $\Delta\ \chi 2$ value between the revised SEM model and CFA model is 780.345 - 720.500 = 59 (rounded), with eight degrees of freedom (the researcher explained why these available *dof* have not been utilised). Furthermore, which is more important, the squared multiple correlation R^2 for continuance intention (CI) has shown a slight improvement of 0.01 with the addition of the new path (SE → CI).

5.10. Summary

This chapter has presented the results of the data analysis based on a quantitative approach. The pilot study and main survey study results have been presented and described. There has been a low level of randomly missing data. A two-step approach

has been used as recommended by Hair et al. (2010) in estimating the model measurement (CFA) and structural analysis. Goodness-of-fit suggested acceptance of the model, and the constructs were found reliable. Convergent and discrimination as well as nomological validity were confirmed for all constructs. Thirteen out of the seventeen hypotheses were supported by the model. Social influence and information quality were not supported for personal outcome expectation and satisfaction. The model has been re-specified by deleting the unsupported relationships and adding a new relationship based on a theoretical base (self-efficacy → continuance intention). The results show a better fit for the model.

The following chapter will discuss the findings of the present study in more detail.

CHAPTER SIX: DISCUSSION

6.1. An overview of this research

The present research was undertaken in a systematic manner with interpretation of the data collected conducted under a clear purpose. Thus, the data were collected and interpreted systematically to generate findings based on logical relationships in order to increase knowledge in the field of PSOS as a subset of e-governance.

Despite the fact that this study differs from previous studies in terms of the research model, the findings of this study provide support for SCT and ECT perspectives on PSOS. However, one of the possibilities is that the negative relationships found in the results may be interpreted as lack of social encouragement and information quality to meet citizens' expectations and, therefore, satisfaction. The other possibility is that a change has been made to the website of the DVLA's official online portal. The present study has extended the SCT constructs by combining them with the ECT constructs within the PSOS context with respect to service quality variables. Furthermore, the personal outcome expectation and prior experience (prior perceived confirmation) constructs are seen as common constructs in SCT and ECT; all of which are considered to be personal factors based on SCT. On the other hand, social influence and PSOS (service and information quality) are considered to be environmental factors based on SCT.

Based on SCT, the interaction of personal factors with environmental factors influences the anticipated behaviour (citizen's continuance use of PSOS). Each of these theoretical positions makes an important contribution to our understanding of PSOS as subset of the e-governance phenomenon. Before considering the contribution of the present research, it is important to understand the flow of the process (based on the proposed research framework), as this study has revealed that service quality and information quality affect the flow of the process. This is consistent with the findings of Zhou (2013). As described by Csikszentmihalyi and Csikszentmihalyi (1988), flow represents a holistic sensation that people experience when they act with total involvement. Thus, flow can be represented as the transition from beliefs (prior experience, social influence and PSOS) towards self-efficacy (physical ability), associated with personal outcome expectation (intellectual ability and cognitive process)

as well as satisfaction (as an effect) towards continuance intention to use PSOS. The whole process is regulated by the combination of self-efficacy (SCT), personal outcome expectation (SCT and ECT) and satisfaction (ECT).

It is, however, important to note the psychological background of the present model with respect to other disciplines. Corresponding with Fishbein and Ajzen's (1975) definition and the transition of beliefs, attitude, intention and behaviour, the researcher has classified the flow into three transitions: first, prior experience, social influence and PSOS (information and service quality) are considered as beliefs due to the fact that they are existent; second, self-efficacy, personal outcome expectation and satisfaction are attitudes; however, these attitudes reflect the current situation while encountering PSOS. Third, citizens' continuation intention to use PSOS is considered as an intention towards the desired behaviour. Furthermore, the researcher split attitude into two terms: physical attitude, represented by self-efficacy, and intellectual attitude, represented by personal outcome expectation (implicit motivation) as well as satisfaction (explicit motivation). However, behaviour is excluded because the main idea of continuity is that the personal outcome expectation (cognitivist) drives the process. This is in contrast to behaviourism, which is driven by a change in the current situation without knowledge of the consequences of the current actions. In this respect, personal factors (e.g., prior experience, self-efficacy, personal outcome expectation and satisfaction) and environmental factors (e.g., social influence and PSOS, including information and service quality) can be considered as 'objects' or 'attributes' as beliefs (used as a generic sense of the individual's world), based on Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980)). These beliefs can be directly influenced in the current situation by the personal factors. The researcher assumes that an attitude can be taken with respect to the citizen's moment of action while engaging in PSOS. Thus, SCT emphasises the role of situational factors on a continuance basis.

It is important to note, however, that citizen or user disengagement vis-à-vis using PSOS is a cumulative decision, based on various situations (in a selective process, relating to that person) but grounded by the SCT cognitive factors. Perhaps citizen or user disengagement is a weak point in which a citizen can stop using PSOS at any time due to a change in cognitive factors. Notwithstanding this, in the PSOS lifecycle, Web presence and information were first set as a one-way process from the Web to the user; therefore, information quality is the first concern of the citizen as he or she decodes the

instructions. Thus, information quality can influence personal outcome expectation as a mental (intellectual) process; thereafter, the citizen assesses his or her ability in coping with what this information implies in future physical implementation. It should be noted that, in the present study, the assumption is that the citizens have used the Internet and PSOS on at least a few occasions. After having personal outcome expectation (as a mental process) associated with self-efficacy (as a physical process), then an initial satisfaction is produced. This initial satisfaction at the moment of encountering PSOS is produced based on the attitude of each citizen's personal factors before interacting with PSOS (e.g., personal outcome expectation as a cognitive factor influencing satisfaction before encountering PSOS); however, the citizen in that stage can refer to his or her prior experience and the role of social influence to increase his or her satisfaction, based on a change in the situation. Consequently, service quality has its impact starting from the current situation and continues thereafter. In the whole process, the citizen re-evaluates these factors through personal outcome expectation for future goal-setting. At this point, and after considering all these factors (information and service quality, social influence, prior experience, self-efficacy), final satisfaction is produced as an explicit factor towards continuance intention to re-use PSOS. However, satisfaction might not be sufficient toward the continuation process; therefore, personal outcome expectation and self-efficacy are crucial factors in driving the process of PSOS continuation. In PSOS, continuation is driven by achievement as goal-setting rather than usefulness; for example, paying tax is not useful for the payers but it is crucial for the payers to complete the needed documents; therefore, he or she is driven by achievement to proceed in his or her own business.

Data from a survey of 471 www.gov.uk DVLA's online users were used to test the hypothesised relationships using SEM through SPSS (version 20) and AMOS (version 20) software. The PSOS users' intention to continue using the DVLA's online services is determined by their personal factors (satisfaction, personal outcome expectations and self-efficacy). Personal factors, in turn, are influenced by environmental factors (social influence and PSOS, service quality and information quality). The results suggest that the citizens' continuance intention in terms of using PSOS is significantly related to the SCT and ECT constructs as well as to service and information quality features.

6.1.1. The salient factors and the role of ECT on SCT

From development perspectives, PSOS has shifted the existing services and at the same time redefined the term 'social' into 'social technologies' by utilising ICT (Tapscott and Agnew (1999). The argument is that PSOS remains relative to three major interactive themes: individual, social and organisational.

An SCT assumption is that people in their environment are normally influenced by others through reciprocal causation between personal factors, environmental factors and behavioural factors.

Personal factors: Self-efficacy in association with personal outcome expectation can form future goal-setting in the current situation of PSOS. Any accumulated prior experience alters the current situation capabilities toward using PSOS; therefore, a slight change in ICT innovation in PSOS may not disturb the current ability of using the system. Thinking about what citizens can or cannot do is crucial in PSOS, not only based on their capabilities but also the consequential circumstances. If the citizen fails in a PSOS task, there is a great probability that they will not repeat their experience and, by then, it is difficult for the PSOS managers to retain those users. In this respect, resilience-efficacy varies based on differing situations and the citizen's social and learning environment. This is actually based on SCT, where an individual is driven by future rewards; therefore, an individual will try his or her best to acquire the required knowledge/training (self-efficacy) in order to be able to perform the anticipated task (which was unsuccessfully performed previously). Hence, a low rate of previous failure may encourage citizens to repeat their previous attempts, hoping for better performance; however, citizens in this case should prepare themselves with the required capacity for another attempt by altering their own capabilities through more training. Satisfaction is considered as an effect of personal factors towards external stimuli; therefore, it can be used as a measure of the quality that PSOS produces. While a personal outcome expectation reflects the internal stimuli of a citizen's goal-setting, satisfaction reflects external stimuli and can be used as an explicit sign for organisation managers. SCT holds that self-efficacy is a form of self-evaluation that influences decisions regarding what behaviours to undertake, based on Hsu et al. (2004).

Environmental factors: Social influence as well as PSOS acts as reinforcement or as a barrier. First, social influence is mostly associated with what others can do or recommend as word-of-mouth about their experience in PSOS. Social negative feedback can act as a potential obstacle to using PSOS whereas positive feedback can act as positive reinforcement to its use; hence, in the citizen's social circle, other people's experiences impact on using PSOS. However, learning from them is optional for current users as long as they have their own experience and sufficient belief in their capabilities.

Second, PSOS acts as an external stimulus to the whole process and, at the same time, as an incentive for individual personal outcome expectation. This is unlike the adoption or acceptance stage, where users are not aware of the consequences because they are not experienced in the use of ICT on a continuance basis. In this respect, it is vital to distinguish between information and services because the information is received prior to the service activities, and acts in a one-way direction. Therefore, on the one hand, PSOS information can be considered as a digital/social arena because it influences the user's perception about their environment; thus, information quality is crucial in the information era, and hence, information should be considered as a social driver. Service quality, on the other hand, is associated with interaction with the system and the contingency that it may bring; thus, citizens should be aware of the contingency in changing services while accessing PSOS. This cannot be done without experiencing PSOS on a continuance basis. Citizens' activities can be better shaped through their experience and the assessment of their ability to cope with new up-dating issues on PSOS. The incentives that PSOS bring to citizens can adjust their involvement by increasing or decreasing their future access of PSOS.

Behavioural factors: Continuance intention to use PSOS results in self-regulating behaviour. The citizen's cognitive engagement in PSOS on a continuance basis can assist in shaping and setting personal goals based on SCT; however, PSOS as an external motivation environment along with social influence decides the length of the relationships between citizens (as end-users) and a government agency (as an ICT provider). Thus, the return on ICT investment depends on the citizens' willingness and ability to utilise the full potential of PSOS. Therefore, a harmony between government agencies can be created after several successful attempts of using PSOS. Correspondingly, government agencies can gauge this relationship through a

satisfaction measurement, as an effect of personal factors. The resulting self-regulating behaviour of the whole process can lead to clear short-term and long-term strategies; in other words, government agencies act as monopoly institutions in which they have control and responsibility over the success and failure of the process.

6.2. Methodological issues

The results show strong evidence of discriminant validity among the constructs; however, sub-dimensions have emerged under service quality. Consistent with DeLone and McLean (2003), the results distinguish between information quality and service quality, which helps in reducing the effects on the dependent variables (personal outcome expectation, self-efficacy and satisfaction). Based on Oliver's (1980) methodological issues and limitations, the expectation and disconfirmation are both measureable variables. Personal outcome expectation represents the cognitive measured variable in the present study and acts as an attitude for each innovative situation (associating it with prior experience), which is a measureable level of the overall outcome expectation of previous situations. Once this new experience is consumed, personal outcome expectation becomes a belief as long as it is not altered by self-efficacy or social influence (or by changes in the PSOS since the last interaction). In this respect, personal outcome expectation acts as an attitude in the new task and transfers it as a belief from a prior experience. However, the evaluation process is subject to the new situation, based on SCT. In turn, satisfaction captures the overall attitude of the current situation in an explicit manner, based on personal expectation, in association with self-efficacy as a base-line for the whole process. In the present study, disconfirmation is subject to external factors; therefore, the researcher operationalises it as a level of expectation (below, met or above expectation) as a prior experience rather than disconfirmation or confirmation.

6.3. Hypotheses Testing

The following section discusses the hypothesised relationships between each construct, as shown in the framework.

6.3.1. Prior Experience (PE)

Prior experience relationships have been linked for the current study to personal outcome expectation, self-efficacy and satisfaction. This suggests that current PSOS is compatible with prior use; in other words, there is some extent of consistency in PSOS as an innovation with current values, needs, and experiences. Oliver (1980) referred to disconfirmation as an actual product experience, and emphasised that a cognitive comparison between the level of how one perceives stimuli and the actual experience determines any assessment of the continuation process. Therefore, the potential use of PSOS can be determined by comparing previous experience with cognitive factors, as in SCT (e.g., personal outcome expectation). Hence, current experience will turn into prior experience in future uses, and will be subject to a new evaluation in order to revise the perceptions level of incentive of PSOS. Oliver (1980) emphasised that linking experience and the product itself (PSOS as service) with satisfaction provides a better understanding while interactivity is developed. Thus, satisfaction may reflect various levels whilst continuity progresses due to changes in the PSOS and to changes in the characteristics of the individual or his/her social network, or experiences with the contact personnel at the government agencies.

The function of perceptions of PSOS through various situations can be deviated, in which it may exceed, meet, or fall short of one's expectations; hence, prior experience can be used as a measure of accumulated previous experiences. Thus, disconfirmation cannot be assessed if the level of previous experience falls short in the last encounter but more than in the ones before. In this respect, personal outcome expectation sets future goals based on cognitive factors with regard to previous history while experiencing PSOS. Overall experience is crucial for any satisfaction assessment of PSOS due to changes in feelings. Basili and Caldiera (1995) emphasise the role of collective experience in ensuring software quality for developers; accordingly, collective experience is critical for end-users in order to ensure the evaluative process of software quality in their feedback to ICT providers; hence, self-efficacy is advanced with positive experience. In the PSOS domain, past experience can be generalised to other domains, such as the private sector domain, as mentioned by Bandura (1997); therefore, the private sector and the public sector can share experiences in ICT-related issues, resulting in higher beliefs in their ability; however, fluctuations in failures and successes in a particular domain may negatively influence personal outcome

expectations. Thus, any variation in a citizen's experience between the private sector and the public sector may influence the level of personal expectation and satisfaction; nevertheless, the level of self-efficacy will increase as long as there is an engagement in either sector. Compeau and Higgins (1995a) emphasised the vital role of successful experience in fostering self-efficacy by offering software training. In this respect, training is crucial for sustainable ICT evolution in general, and in PSOS in particular.

In summary, the results suggest that the effect of prior experience on satisfaction is substantially greater than the effect of prior experience on self-efficacy and personal outcome expectation. Accordingly, the effect of prior experience shows greater influence on personal outcome expectation than self-efficacy (see Figure 5.7).

6.3.2. Social Influence (SI)

No effect of social influence on personal outcome expectation or satisfaction was identified; however, self-efficacy mediated the relationship between social influence and both personal outcome expectation and satisfaction. Social encouragement for using PSOS represents the influence of the social circle on self-efficacy, outcome expectation and satisfaction. Bandura (1986) as well as Compeau and Higgins (1995a) emphasised the role of the individual's perceived similarity with and credibility of the influencing individual in considering the impact of social influence. Thus, in continuation usage of the PSOS course of action, citizens are expert users; they rely on their personal experience. However, if there is sufficient similarity and credibility, they may accept social influence on their usage of PSOS but not on their personal outcome expectation or satisfaction. This supports the SCT explanation of the role of modelling and how people learn from each other; hence, observing others may help in encouraging people to use PSOS, particularly role models and close friends.

Social influence has limited empirical history in terms of shaping an individual's use of ICT (e.g., Venkatesh and Davis 2000). This is consistent with the present study; however, self-efficacy has the power to regulate the influence of society through the learning process of observation. Hence, it is a great benefit for society to encourage learning through community associations. Citizens are willing to learn how to use PSOS from others but may not have much interest in their opinion or feelings. The results are consistent with social influences theory (Kelman, 1958), which recognises

the role of joining groups in order to adopt new behaviour and accept the opinions of others due to similarities in intellectual perspectives and processes. SCT recognises the significant role of social influence in predicting behaviours and attitudes. Changing citizens' opinions towards specific situations, such as PSOS in DVLA tax disc renewal, may reflect changes in the information, or a potential change in their behaviour towards using DVLA's online services in particular and online services in general, due to changes in information or services; thus, taking social change into consideration is critical.

Coping with the opinions of others or with subjective norms (Fishbein and Ajzen 1975) is the dominant conceptualisation of social influence. Social influence is operationalised to confirm an agreement in a certain topic (PSOS in the present study) in society; however, previous studies consider word-of-mouth as the main source of social influence; word-of-screen is yet another source that can be considered as a tool of alteration of social feelings and opinions; thus, social influence and information quality have similar influences in the present study because neither supported personal outcome expectation or satisfaction, but both have a positive influence on self-efficacy. Hence, there is agreement in external stimuli (environmental factors) on personal factors. It is important to note that no interactivity was found in social influence or information; therefore, it is crucial to distinguish these factors from service quality, where interactivity does occur. There is a tendency for citizens to have a low level of appreciation in terms of how they perceive social pressure, largely due to their own experience and familiarity with PSOS based on previous use. This confirms Venkatesh et al. (2003) in that individuals rely more on their own experience after IS adoption. In continuance usage, social influence is subject to change in PSOS because it affects an individual's characteristics and by then a certain percentage (based on the selected sample in a population) of those influenced individuals form a new social group. Hence, social influence may require a period of time based on the 'DOI' as described by Rogers (1995). Allowing a reasonable timescale is crucial for social measurement in order to observe the change of each effect (or to update it), otherwise diversity of effects across multi-channels will make it difficult to maintain a level of regularity in the whole process. More generally, a slight change in the website may produce a slight change in social influence in the future, resulting in some low-level distraction in terms of PSOS use.

In summary, the results suggest that the effect of social influence on self-efficacy is substantially greater than the effect of social influence on satisfaction and personal outcome expectation. Accordingly, the effect of social influence on satisfaction and personal expectation has been deleted due to lack of support (see Figure 5.7). The explanation of this lack of support would indicate that in continuity usage of PSOS there is a change in the situation (based on SCT); therefore, this lack of support and its relationships should be assessed in future studies, as the current study is based on the cross-sectional data collection method.

6.3.3. Information Quality (IQ)

As with social influence, information quality has no positive influence on personal outcome expectations or satisfaction but it does have on self-efficacy. It seems that citizens rely heavily on their own information, based on their own experience, unless the information imparts changes in how to using the system or in their ability to use the system.

An organisation, as a producing unit of information, may be measured in terms of its activities in presenting the information in a logical manner. Thus, accuracy, clarity, reliability and updating information is targeted at various types of people while delivering PSOS. Citizens' needs may vary based on their experience with other websites (e.g., private sector e-commerce or e-business websites); hence, the fluctuations in how people receive and perceive information produce the variations in their interpretations. Based on SCT, negative information can be considered as a failure of a previous experience. Furthermore, negative information might be a result of variations on a semantic level; the conveyed meaning may be misinterpreted. Therefore, the meaning of the information on the website should be derived from the citizen's point-of-view and not solely from that of the system users (ICT employees). In the PSOS context, the target audiences are diverse; therefore, matching their level of understanding is a challenging task. Thus, in order to resolve the issue of semantic problems, instructions should be presented in the simplest terms; otherwise the public should be segmented into various groups based on their level of understanding. Information needs to be related to the citizen's intellectual level, and should provide instructions on how to use the technology, as it impacts on behaviour more than on beliefs with regard to ease of use, as mentioned by Rai et al. (2002). However,

receiving and understanding the information by end-users without affecting their behaviour is a sign either of their familiarity with the system or the system being obsolete and requiring update activities. In PSOS, normally people are familiar with the procedure; however, they may require clearer and simpler instructions regarding the use of PSOS for their specific task.

In summary, the results suggest that the effect of information quality on self-efficacy is substantially greater than the effect of information quality on satisfaction and personal outcome expectation. Accordingly, the effect of information quality on satisfaction and personal expectation has been deleted due to lack of support (see Figure 5.7). This is similar to social influence, where cause and effect may influence the process in part; hence, explanation of lack of support would indicate a change in the situation (based on SCT). Therefore, this lack of support and its relationships with other factors should be revisited in future studies.

6.3.4. Service Quality (SQ)

The findings demonstrate the vital role of service quality. Service quality as an external stimulus (belief) has the greatest influence among the environmental factors (social influence, information quality) as well as prior experience on personal outcome expectation, self-efficacy and satisfaction (see Figure 5.7). Service quality does not mean only the current online encounter but also the history of citizens and how they perceived the extent to which that particular PSOS has recovered from poor service. Johnston (1995) and Vaerenbergh et al. (2013) emphasised the role of service recovery on outcome expectations, in which poor service recovery decreases the outcome expectation, whereas successful recovery increases the outcome expectation; hence, in terms of PSOS continuity usage, records of previous poor service must be recovered in order to meet citizens' minimum expectations.

The E-S-QUAL scale has been utilised for measuring the service quality delivered in PSOS by websites to reflect citizens' experience in renewing their tax disc (for the context of the present study). With respect to information quality (in the previous section), communication is crucial in transferring the information from the website to the receiver. Therefore, information and recovery on a daily basis necessitate better delivery through better service; for example, recovery from a failed transaction requires

an online representative and a communication method. Unless the website is clear and simple to understand, and can be found easily by citizens, it is difficult to recover the failed transaction; hence, there is a need for a system that is available 24/7 in order to enable rapid recovery. Service quality mostly deals with complaints that something is wrong with the procedure or the system; therefore, citizens should expect to be able to find their way with ease into a recovery system in a trustworthy environment, i.e. one which ensures that their records and details are safe.

Adequate service quality should be associated with the ability of the citizens (self-efficacy) in order that they may better utilise their current skills in the systems being offered by the government agencies; thus, different types of website may disrupt the quality of PSOS because it is difficult to maintain a specific format for information quality (see information quality in the previous section). Website design is mostly associated with information quality rather than service quality because it does not interact with the end-user to fulfil their requirements; therefore, understanding personal factors is vital when dealing with service quality in order to understand their abilities and other intellectual features based on each individual or group of individuals. Thus, encouraging citizens into groups (community associations) is critical in order to bundle their requirements, based on a marketing perspective. It is a challenge to satisfy every individual in the PSOS population, as segmentation is difficult when delivering PSOS, whereas in the private sector every entity has its own product; hence, capturing all aspects of the online service is not an easy task due to wide variations within the population.

This discussion will lead to satisfaction- or dissatisfaction-related issues in PSOS. Does a government agency need to satisfy their users or citizens? Providing a better online service is not meant to entail satisfying the citizens more than enabling them to accomplish their task. In other words, there is a need to match the citizen's capabilities and outcome expectations with the provided service as well as measuring their satisfaction as a meter to mitigate any hedonic factors while performing their task.

In summary, the results suggest that the effect of service quality on self-efficacy is substantially greater than the effect of service quality on satisfaction and personal outcome expectation. Accordingly, the effect of service quality on personal outcome expectation shows greater effect than service quality on satisfaction. All service quality relationships support the theoretical hypothesised relationships (see Figure 5.7).

6.3.5. Self-Efficacy (SE)

Consistent with previous studies, self-efficacy has considerable positive influence on personal outcome expectation, satisfaction and new behaviour, as postulated in SCT (e.g., Compeau and Higgins; 1995a/b; Hsu, et al., 2004). However, self-efficacy is guided by three streams; prior experience level of expectation, social influence and PSOS level of service; hence, any change in one of these three self-efficacy antecedents may influence the new exposure. Thus, self-efficacy moderates any PSOS influences on the citizen's decision to engage in PSOS through successful performance; successful performance increases personal outcome expectation and satisfaction towards PSOS continuity usage, based on SCT. Successful implementation (Internet or computer-based tasks) increases the level of satisfaction. In the present study, self-efficacy acts as a regulator of the whole process, as it directs personal outcome expectation towards the task to be conducted. PSOS interaction requires an action to be performed (either physical or verbal); without this action, nothing will be performed. Self-efficacy influences choice; a citizen can select whether to undertake his or her task through PSOS or through a traditional office; hence, it influences behaviour towards continuity usage or termination of PSOS usage. Citizens may not have the ability to perform PSOS; therefore, effort and persistence need to be exerted to overcome the obstacles in order to master their behaviour. Thus, training or learning by observing others, together with prior experience, plays a major role in the citizen's self-regulation while dealing with PSOS as an external environment or stimulus. Self-efficacy is the citizen's perception of his or her ability to accomplish a specific task; therefore, it is important to distinguish this from behaviour. There are similar definitions of self-efficacy (e.g., effort-performance expectancy or locus of control); Venkatesh et al. (2003) used the term 'effort expectancy' in UTAUT. Previous studies have not associated self-efficacy with personal outcome expectation in which the user acquires the required capacity in order to expect better future outcomes. De Charms (1968) used the concept of 'perceived locus of causality', which emphasises self-guided analysis of one's experience and how this leads to intrinsic motivation. Better self-efficacy motivates citizens to be independent of external influences; thus, citizens do not require an organisation's employee to take control of their situation. Enhancing intrinsic motivation through enabling citizens to undertake their own tasks encourages them to set their own goals and future plans, which, in turn, leads to satisfaction. If citizens are encouraged by their social circle to use PSOS, they will require the particular skills in

order to use it effectively; however, once they have mastered these and, if they have a successful experience of PSOS, they will be satisfied with their task. However, this course of action is associated with their personal outcome expectation in which they will compare their experience of PSOS with that of the traditional system, and hence, will select the better choice. If using PSOS leads to better outcomes, then their continued persistence in overcoming obstacles will be enhanced.

Perceptions of self-efficacy are subject to the variations of situations; therefore, it cannot be generalized to other situations or other tasks. Thus, standardizing or customizing tasks based on group interest or qualification, such as self-efficacy, may be generalized to other tasks. In this respect, citizens judge their ability based on the ability of others in performing such tasks, as they join similar interest groups and share similar skill or qualification levels: for example, in the Association of Accounting, PSOS may be used in order to facilitate activities in managing tax payment. Self-efficacy levels of use might be measured in terms of group member assistance or recommendation. There are different domains in the population that can be segmented based on particular tasks. In PSOS, there is a need to standardise information before service in order to instruct citizens in using the website effectively, based on a similar format and flow of the process. Updating rules and policies for teaching citizens through online contact is crucial; this also enriches the social circle with more professional people skilled in using PSOS. The researcher has tailored self-efficacy measures to the PSOS domain in order to maximize predictions based on SCT recommendations.

In summary, the results suggest that the effect of self-efficacy on personal outcome expectation is substantially greater than the effect of self-efficacy on satisfaction and continuance intention. Accordingly, the effect of self-efficacy on continuance intention has a greater effect than satisfaction. A new theoretical hypothesised relationship has been added to link self-efficacy with continuance intention, resulting in a better fit for the model. This suggests the vital role of self-efficacy within SCT and personal outcome expectation within SCT and ECT, as well as satisfaction within ECT on the present study (see Figure 5.7).

6.3.6. Personal Outcome Expectation (POE)

In 1995, Compeau and Higgins (1995a) mentioned that since the start of MIS research in the mid-1970s, the adoption of new technology remained below users' expectations. In 2013, the study conducted by Tan et al. (2013) attempted to meet citizen expectation of service quality by offering guidance on how PSOS websites could be better utilised. It has taken almost 43 years of MIS researchers' attempts to solve the problem of an individual's expectation and how such expectation can be satisfied by providing better utilisation of ICT use. This reflects the vital role of expectation in the ICT domain with respect to MIS research in general. Valued outcome expectation can be better realised through the continuance basis; thus, citizens are more likely to re-use PSOS if they perceive a better outcome compared with their previous experience in PSOS. However, a refined self-efficacy can be more fruitful when it encompasses outcome expectation in using PSOS. While the usefulness construct in TAM can be considered as a belief or expectation, the present study distinguishes this construct by allocating outcome expectation to *personal* outcome expectation rather than usefulness, as this latter may reflect work-related outcomes (or other business outcomes). Furthermore, the present study associates expectation with self-efficacy (as another physical expectation) in order for them to work together in using PSOS. Personal outcome expectation is a motivational construct that reflects the personal goal-setting of the citizen; the aim of using personal outcome expectation is to enhance self-esteem or control of PSOS, as it impacts on personal-related issues. Citizens expect the government to support the PSOS process; furthermore, they expect encouragement from others and enhancement in their ICT skills. The consequences of using PSOS can be evaluated through the citizen's prior experience based on his or her level of expectation, which reflects PSOS, social influence and self-efficacy along with previous experience. Through the PSOS influence on personal outcome expectation, government agencies reflect the formal position of government and its attitudes toward directing citizens' behaviour.

In summary, the results suggest that the effect of personal outcome expectation on satisfaction is substantially greater than the effect of personal outcome expectation on continuance intention. All hypothesised relationships are supported (see Figure 5.7).

6.3.7. Satisfaction (SAT)

The present study has empirically examined how the role of prior experience, social influence and PSOS (as environmental factors), together with self-efficacy and personal outcome expectation, enhance citizens' continuity of PSOS usage through their interactivity with the website. Perceived PSOS interactivity can be better improved when understanding how the antecedents of satisfaction interact with each other. Understanding satisfaction antecedents and consequences helps in producing better satisfaction decisions, based on Oliver (1980); furthermore, it helps in improving the citizen's self-evaluation process in terms of how they perceive PSOS, based on SCT. In the adoption process, satisfaction can be considered as an initial standard, which lacks discrepancy (unlike in continuance usage). In continuance PSOS usage, citizens are aware of the consequences based on previous usage; therefore, citizens can expect the consequences based on their evaluation of inconsistencies in past experience. That is why adoption, as an initial acceptance of ICT, usage does not provide a better evaluation process for citizens or for government agencies.

In the present study, the antecedents of the theoretical hypothesised relationships of personal outcome expectation and satisfaction are the same (prior experience, social influence, information and service quality as well as self-efficacy). This is consistent with the suggestion of Oliver (1980) and Helson (1959) in their adoption discussion. They suggest that 'product' as well as prior experience, communication (including social context) and individual characteristics should apply in both satisfaction and expectation decisions. The shared antecedents of outcome expectation and satisfaction indicate a better evaluation of how personal outcome expectations can influence satisfaction. Satisfaction, therefore, can be considered as additive to expectation level and to the new experience (of the new behaviour); it can be used as a meter of personal factors (e.g., prior experience, self-efficacy, personal outcome expectation) and also a meter of social influence (besides PSOS) as an external factor, as SCT hypothesises together with ECT in the present study. Hsu et al. (2004) in their model reversed the relationship between satisfaction and outcome expectation, in which satisfaction influences outcome expectation; this is unlike the hypotheses of Oliver (1980) and the present study. Satisfaction is a function of the continuity process based on outcome expectation and the adoption of new behaviours in PSOS. Prior experience is a meter of previous accumulated expectations regardless of their satisfaction status; thus,

satisfaction is an attitude towards the current situation including prior experiences. It should be noted that satisfaction cannot be produced unless the citizen performs the current task, and thereafter, the continuance intention decision will be executed. In this respect, satisfaction is the immediate impact of PSOS as an external factor, based on ECT which helps SCT in considering internal stimuli (prior experience, self-efficacy and personal outcome expectation impacts) besides external stimuli (PSOS and social influence impacts). Accordingly, ECT empowers the sense of SCT in its explanation of environmental factors.

In summary, the results suggest that the effect of satisfaction on continuance intention is supported; however, the effect of self-efficacy is substantially greater than the effect of personal outcome expectation or satisfaction on continuance intention (see Figure 5.7).

6.3.8. Continuance Intention (CI)

In PSOS, continuance intention is not always mandatory; therefore, there remains the option for citizens to switch to the traditional system. Thus, understanding continuance intention to use PSOS may help in improving PSOS, allowing the government to draw down the face-to-face channels. The present study extends the understanding in the literature on how personal outcome expectation, self-efficacy and satisfaction affect intention in terms of PSOS continuance. This dynamic interactivity between personal factors and PSOS cum social influence provides insight into ICT stability and self-regulatory processes for both citizens (as end-users) and government agencies (as PSOS providers). Thus, continuance intention is a function of the variation between PSOS and the citizen's willingness toward using PSOS on a regular basis. The present study's results are consistent with those of previous studies e.g., positively affected by satisfaction, as in Bhattacherjee (2001) and Lin et al. (2005), and outcome expectation and self-efficacy, as in Hsu et al. (2004). Decisions based on adoption or acceptance reveal some uncertainty about consequences relating to beliefs or attitudes, whereas, continuance intention bridges this gap by mitigating risks through learning from previous mistakes. The findings support the role of SCT's reciprocal relationships between external factors and personal factors. ECT's satisfaction is found to be a meter for the whole process when considering a citizen's feelings and his or her selection decision over whether or not to continue using the PSOS. Personal outcome expectation and citizen's self-efficacy without satisfaction may reflect the uses of

mandatory PSOS, in which it is a must to use the PSOS. Continuation or discontinuation is then a matter of mandatory or voluntary system-related issues. The assumption in the present study is that PSOS acts as an alternative to traditional systems; therefore, PSOS competes with traditional systems towards serving citizens' needs with respect to government bureaucracy.

In order to recognise the salient factors that determine citizens' continuance in using PSOS, a number of studies share similar results, stating that satisfaction, personal outcome expectation and self-efficacy are the salient factors in determining the continuance intention to use ICT in general and PSOS in the present study (e.g., Oliver, 1980; Bandura, 1986; Compeau & Higgins, 1995a/b; Hu et al., 2009; Chan et al., 2010; Venkatesh et al., 2011). However, these constructs (self-efficacy, personal outcome expectation and satisfaction) are driven by three major themes, based on the proposed framework of the present study: the individual theme represented by personal prior experience, the social theme and the organisational theme. The organisational theme is represented by PSOS (information and service quality) in the present study, based on the G2C context.

The satisfaction construct in ECT theory makes citizens' opinions or feelings explicit, unlike personal outcome expectation in SCT wherein citizens may conceal some of their goal-setting based on variations in self-efficacy or other situational factors. Consequently, in order to recognise the hidden feelings, the author hypothesized that personal outcome expectation influences satisfaction; thus, decision-making may rely on satisfaction as well as personal outcome expectation (jointly with self-efficacy). For this reason, the researcher integrated SCT and ECT. In a previous study, Hsu et al. (2004) hypothesised that satisfaction influences expectation, whereas the author argues that this direction may not lead to the correct flow because satisfaction is an effect.

To conclude, the present chapter has discussed the key findings of the present study. The proposed model in the present study has assisted in explaining the pattern of the relationships between the personal factors and PSOS as well as social influence as an external factor by predicting the initial changes in people's impressions of the provided services (through altering their perception before altering their ability). Even though there were variations in the citizens' opinions towards information quality in the PSOS, citizens are more likely to continue using it. In terms of continuance vis-à-vis PSOS,

citizens seem to be relying on their overall experience of the actual requirements of the service (the DVLA service in the present study).

The following chapter will present the conclusion, the limitations, recommendations for further studies, and theoretical and managerial implications.

CHAPTER SEVEN: CONCLUSION, LIMITATIONS AND FUTURE WORK

7.1 Introduction

The introduction of ICT activities such as PSOS in recent decades has changed the manner in which individuals interact with each other and with government; this has changed society as well. Citizens know how to deal with many of the various government agencies through the traditional systems (post, telephone and face-to-face), and the experiences they have had may engender bad or good impressions about government services in general. However, in traditional systems, the government agencies (through their employees) accomplish the citizen's tasks, whereas in PSOS, it is the citizen who acts as an agent in order to accomplish the task; therefore, he or she must interact with the system based on a number of actions on the mouse or keyboard. The extent of the citizen's interactivity with the system depends on the online service and the information or instructions on the screen.

As well as providing an online service, in a deeper sense, government agencies need to be aware of personal factors (e.g., self-efficacy, personal outcome expectation and satisfaction); considering personal factors helps in understanding how to encourage further involvement on the part of citizens. A successful experience with PSOS encourages the citizen to repeat his or her usage of PSOS in general, and that citizen may then encourage others to use PSOS systems, which, ultimately, will direct public behaviour towards continual use of PSOS.

The dramatic changes in ICT development may act as a barrier hindering citizens from coping well with PSOS. Citizens may learn new skills while interacting with the system; however, their learning and expectation may have changed by the second experience. Also, during the PSOS lifecycle, there must be changes to service quality due to the fact that new situations must be accounted for (e.g., changes in fees or address). Other key changeable factors are the Internet skills of citizens and possibly the PSOS management style. Therefore, continuance intention to use/reuse PSOS may be associated with a variety of factors that reflect the situation of the individual. ICT and social influence are deemed to be environmental factors in the present study, and all other factors are personal or behavioural factors.

Thus, the first implementation of any process within PSOS represents a crucial step for the citizen, as it leaves an initial impression on how it appears to work; this then influences that citizen's social environment (as an external factor). Furthermore, the dramatic changes in ICT (as external stimuli) may have discouraged some citizens from using PSOS; this represents a negative influence on the part of the social environment, and therefore, any slight change towards a positive impression in the second step (i.e. beginning a task) is key to overcoming this risk in negative social influence.

PSOS acts as an external stimulus, due to service modification, for the whole process. Thus, it is considered as a cause, and based on causal relationships; therefore, citizens' satisfaction, from the citizens' perspective, can be considered as an effect, i.e., based on citizens' feelings and opinions towards using PSOS. In return, if government agencies take into consideration the citizens' level of satisfaction and adjust their services accordingly, then PSOS acts as an effect in the process. However, continuance intention is considered as an overall effect from the perspective of government agencies using PSOS. Satisfaction is appreciated but not necessary for government agencies, particularly in mandatory use cases; government agencies can pass their PSOS as fit for purpose by ensuring that citizens are sufficiently skilled to perform the online tasks; however, if the online task does not meet their expectation it would be difficult to perform even if it is mandatory. Meeting citizens' expectations encourages citizens to acquire the required skills towards using PSOS; otherwise, they would resist using PSOS due lack of skills or resources.

The experience that an individual gains through previous involvement acts as a basic unit of social influence; therefore, experienced citizens are critical during the diffusion process. Accordingly, accumulated social influence is established while the number of personal experiences increases over time. The level of expectation of those experienced citizens (social influence) influences an individual's self-efficacy and expectation as well as satisfaction in either negative or positive terms.

At this point, one can consider the amount of change that ICT can load into the citizens' capacity, with respect to their Internet capabilities, as PSOS includes the whole of society in its services. Furthermore, each citizen's reaction is based on their prior experience with previous services or in other words with previous management styles in the PSOS management profile. Management styles rarely change in the public sector, which makes it difficult for the organisation to recognise the new perceptions of new

generations, especially those younger ones who are more familiar with technology. Fulfilling their demands is a real challenge, which is unlike the private sector, where managers can easily be hired to fit the requirements of the ICT market, based on the private sector's fast recruitment processes.

7.2 Conclusion

This research has attempted to demonstrate the value of the personal constructs (prior experience, self-efficacy, personal outcome expectation and satisfaction) in association with environmental constructs (social influence and PSOS) towards continuance intention to use PSOS. These factors were borrowed from the integration of SCT and ECT and were included with the online service variables of E-S-QUAL and the D&M IS success model. All of these factors are crucial for the continuation process in the online service domain in general, and more specifically in PSOS.

The results indicate that personal factors along with environmental factors, working in collaboration, act as incentives to enhance our understanding of the PSOS transformation phenomenon. Why people continue to use ICT in general and PSOS for the current study is represented by internal (personal outcome expectation) and external stimuli (satisfaction with PSOS). However, these internal and external motivators are useless without the power of self-efficacy, which acts as a driver and regulator of the whole process in PSOS. Prior experience should be considered as a gauge of the accumulated previous experiences of both the public sector and the private sector, as these practices are considered to be a joint experience. The level of personal outcome expectation reflects past practice in the form of prior experience, i.e., the ability to perform the task for the current situation with respect to the current PSOS service and the influence of the social environment. Social influence is considered as a reflection of a collection of individual experiences; it is other people's experience of PSOS transmitted into word-of-mouth (personal recommendations) or word-of-screen (the information quality of the website).

The model presents the relationships between the three major contexts (citizen, society and organisation) with respect to the pre- and post-adoption process. The model as an objective of the present study recognised five findings based on the real-world study (the DVLA) with respect to the influence of services and information quality as external

stimuli. The first, prior experience, confirms personal outcome expectation and satisfaction by affirming the user's intention to continue using the online services. The second, social influence and information quality, reflects the fact that there has been a change in the process; however, this change has no or only a slight effect on the continuity process in the present study. The third, service quality, appears to be the greatest influence on the continuity process. The fourth, from an individual perspective, self-efficacy, is the best representative of self-regulation in the continuity process. The fifth, personal outcome expectation and satisfaction, is superior in reconciling the process of continuity in a voluntary model. The aim is to improve the empowerment of the end-users by tolerating sovereignty and self-control over their daily-life issues.

The present model may be considered as a voluntary model, as it incorporates the user's personal outcome expectations and satisfaction. The study was able to investigate and distinguish the various roles of the personal factors, the environmental factors and the behavioural factors with respect to SCT and ECT by providing empirical evidence. Therefore, in order to ensure the success of an organisation or agency in the continuity process on a large scale, gauging and balancing the provided information and services with the users' capabilities is crucial. In order to carry out future processes, organisations ought to focus not only on people-organisation relationships but also on customer-as-end-user-organisation relationships. End-users as individual customers should be considered while investing in high-quality ICT. Continuity in this regard is crucial as it informs, facilitates and adjusts the whole process. Overall, the IS user's continuity coping behaviour can be regulated through self-efficacy, sustained by personal outcome expectations and satisfaction. Social influence and information can be used as a sign or as a measure of any degree of change in the online service. How long this continuance behaviour can last is a matter of organisational effort (as external stimuli) in terms of providing better services. Thus, the corrective experiences of users reinforce their self-efficacy to eliminate obstacles to continuing to use online services. The most important aspect among the relationships in the model is that outcome expectation can be more realistic after several successful attempts but only if associated with self-efficacy, and therefore, it can be exploited to provide strategies for effective performance. PSOS providers could be better organised if they took into consideration continuance intention as a priority in their plans, as it underpins short- and long-term business strategies.

In summary, emphasising incentives for PSOS continuance use as a subset of e-government can be better controlled if practitioners take into their consideration: first, the ability of citizens to perform the PSOS on the one hand; and second, the system rewarding outcomes based on each citizen's self-interest as well as their satisfaction with PSOS on the other hand. Working on these incentives could help in establishing a positive social influence and enhancing the citizen's experience. Accordingly, the results should encourage PSOS managers to make further (targeted) improvements.

7.3 Theoretical implications

1. The present research has contextualised environmental factors in psychology from the purely social context to the ICT context (as an additional environmental factor); for example, in SCT, the explanations of external stimuli (environmental factors) were merely referred to social influence from psychological discipline perspectives; however, in the present study, the author classified external factors as a social influence and any ICT influence is represented by service quality and information quality. Therefore, there is a need for more investigations, similar to Wixom and Todd (2005), by integrating research streams (e.g., user satisfaction and technology). Such integration would be considered a future contribution for the advancement of science (Greenwood, 1974).

2. The present research has contextualised attitude towards external stimuli into physical (self-efficacy as a physical ability to use PSOS) and then mental processes (personal outcome expectation as a measurement for intrinsic incentive of future goals as well as satisfaction as a measurement for extrinsic incentives such as PSOS). For example, self-efficacy is the first step towards experiencing PSOS, and then comes the personal expectation factor, which deals with the internal cognitive processes towards future goals (such as personal outcome expectation) as well as the satisfaction factor, which acts as a psychological response to the direct and indirect influence of the external stimuli (social influence, services and information quality). Thus, ICT and PSOS represent a new external environment based on the development of the continuity process.

3. The present research has contextualised current streams in ICT in general into three main streams: the first, is the stream that deals with personal factors (individual prior experience, self-efficacy, personal outcome expectation and personal satisfaction as a meter for organisational ICT factors); the second is the stream of social influence that represents public feeling; and the third is the organisational stream that represents the PSOS as an ICT (information and service quality).

4. Confirmation and disconfirmation can be calculated as the sum of all constructs in the process. A low level in a citizen's ranking represents disconfirmation, whereas a higher level in a citizen's selection (e.g., 4 or 5 on the Likert scale) represents confirmation. However, the researcher stresses that personal outcome expectation is a cognitive factor; therefore, only a citizen's justification of his selection can inform the final decision.

5. The research has incorporated different theoretical models into one model (SCT, ECT, D&M IS success model, and E-S-QUAL) for evaluating continuity of use in PSOS systems. Thus, the researcher recognised prior research efforts.

6. The current research has distinguished between adoption/acceptance and post-adoption. Pre- and post-adoption have also been distinguished. Hence, the current study involves personal outcome expectation (pre-adoption) rather than usefulness (post-adoption), and considers the personal, environmental and behavioural factors that influence continuity, based on SCT. Therefore, technology, services and personal cognitive factors are considered in PSOS adoption and continuity of use.

7. The present study contributes to the theoretical field by introducing an explanation to technology adoption research through the mandatory and voluntary adoption environments and the relationships between them. The direct influence of self-efficacy as a single connection towards continuance intention represents mandatory adoption, whereas including satisfaction and personal outcome expectation (as long as self-efficacy is towards continuance intention) represents voluntary adoption. Previous research suggests that there is

a difference between mandatory and voluntary adoptions (Brown and Venkatesh, 2005; Brown et al., 2002, 2008; Chan et al., 2010). There is a lack of research in the context of consumers outside the workplace because consumers' behaviour in that context is mostly voluntary and not mandatory (see Brown and Venkatesh, 2005).

7.4 Managerial implications

1. In a broader sense, the present study can be considered as offering guidance for decision makers in the PSOS domain. The study highlights the role of the social, individual and organisation factors that influence the continual use of PSOS systems. PSOS managers can recognise the motivational aspects of the personal factors and match these with their PSOS, such as understanding citizens' self-efficacy and personal outcome expectation.

2. Based on SCT, citizens may pursue their capacity for learning how to be up-to-date with the current dramatic changes in ICT-related issues; therefore, they can acquire the requisite skills for using PSOS if there is a worthy reward compared with the traditional system. In this respect, PSOS managers should assess the value to citizens of delivering PSOS, compared with their traditional system, on a regular basis. The major proposition of SCT is that citizens can influence their actions based on their self-interest.

3. It is recommended that PSOS managers distinguish between the personal outcomes expectation perspectives of those inside and outside the workplace. Ordinary citizens must pay Internet costs to achieve their own goals, whereas in the workplace, employees are charged with satisfying the goals of the employer.

4. The present study recognises the role of service recovery on the level of outcome expectation (based on continuance) in which poor service recovery decreases the outcome expectation whereas successful recovery increases outcome expectation. The results form a new level of experience for future uses; hence, in the continuity use of PSOS, records of previous poor service must be recovered in order to meet a citizen's expectation.

5. The present study recommends that managers encourage citizens to join groups based on shared interest because those shared interests or intellectual backgrounds can help in shaping behaviour through word-of-mouth. Similarly, customising websites for those groups would assist in shaping their behaviour towards using PSOS, as sharing online experiences improves self-efficacy towards using ICT in general. Also, the meaning of the information on the website should be derived from the citizen's point-of-view and not the system user's (the ICT employee). Furthermore, utilising a single PSOS portal is vital in order to better predict social change; multiple channels (websites) may disrupt the flow of social influence due to variations in updating each website.

6. Managers should recognise the intrinsic motivational factors in the present study (personal outcome expectation and the ability to use the system) as well as the extrinsic motivational factors (satisfaction with PSOS) in order to encourage citizens' involvement in PSOS use. Understanding these factors will help managers cope with the changes that ICT delivers.

7. The present study encourages the power of thought so that both managers and users can explore their abilities and acquire what they want/need through encouraging thinking (as a cognitive factor).

8. The ICT literature suggests that the demand and use of ICT is set to increase (Dewan et al., 1998; Hitt, 1999). Post-adoption analysis allows decision-makers to overview long-term processes in a greater detail, which then increases their confidence in taking decision with respect to investments in ICT. This could lead to an impact on sales for businesses as well as an impact on internal operations through sharing information among key stakeholders.

9. The present study helps managers in learning from their previous experiences. Technology-enabled service success is crucial for an organisation (whether public or private) because it allows managers to realise the benefits of their ICT investments and the processes that Rai et al. (1997; 2006) mentioned. Lack of continual system upgrade and enhancement may not meet senior managers' expectations due to lack of functionality but it may better fit with end-users'

expectations, as Jasperson et al. (2005) mentioned. Thus, understanding the required application for the new process cannot be done without understanding the circumstances that have accumulated through continual interaction between the organisation and citizens. Observing citizens' experiences helps managers to investigate the impact of any service recovery that has been done during ongoing development. Managers can observe prior experience and social influence, and can assess how they can produce high or low outcome expectations, self-efficacy and satisfaction when service quality and/or information quality are held constant. In the same manner, managers can observe outcome expectations (if voluntarily), self-efficacy (if mandatory) and satisfaction (if voluntarily) when service quality or information quality is held constant, and can match these with continued use. Managers, through several attempts, can use service quality and information as a gauge to measure the flow of continuity; however, without the capability of users to cope with technology, information and services would be a waste of investment. In this case, managers should escalate the users' ICT capability to match the provided services. Yet, if top management decisions result in changing the line managers, any track of previous conduct may be lost, unless it was recorded in order to provide a trend. It ought to be noted that negative influence does not mean that the service is bad; it may indicate that either the standards of the end-users have been promoted through experience of other online services or that there has been a change in the service. The range of service quality might be fluctuating in a range that is above the average, and thus a low service level does not imply bad service in all cases; rather, it may imply a change in the organisation's systems (e.g., hardware or software), or a change in management due changes in the work environment.

10. The present study distinguishes between physical ability (self-efficacy) and mental ability (personal outcome expectation and satisfaction), as shown in the model. Thus, the present study encourages entrepreneurship in which they first focus on self-ability before seeking to satisfy citizens. This is more realistic for new opportunities; the idea is to empower citizens with respect to their ability. There is variation among government agencies on how to facilitate online service to their citizens. To some extent, government agencies should seek help

or encourage the private sector to be involved in the process in order to invent new applications or tools to transform the PSOS process. In this, the ICT industry, together with entrepreneurs in the ICT field have the opportunity to generate new business with the government; this would also serve to empower citizens with respect to their ability to use up-to-date technology. This is a cyclical process among government, business and citizens, and must be encouraged to evolve. Resulting from their newly acquired skills in up-to-date technologies, citizens should have the capacity to cope with this new PSOS paradigm, and it is the responsibility of government agencies to facilitate this through training courses. This is a digital environment where managers need to associate themselves with other business environments and to share their experiences, playing the role of mediators, in order to improve service quality.

11. The idea behind online services in general is to empower citizens to do their own work independently; however, support from a social network or from the organisation in question (through personal contact or email) is crucial. Thus, managers should ensure that any support is associated with some kind of instruction to teach the citizen on how to undertake the task independently the next time; at the same time, this gives the citizen the opportunity to teach others in similar situations.

12. Managers should scale their business strategy in any massive digital network of people and data. The ability to deliver mixed data types is crucial and must be on a continual basis, as Bharadwaj et al. (2013) mentioned; therefore, the quality of the information is vital with respect of its meaning, transmission or the level of influence it leaves on the target audience, who are the citizens in this case. Therefore, the present study provides an insight into PSOS digital business strategy by understanding the voice of citizens while interacting with PSOS quality (information and services quality) on a continual basis. Thus, managers in PSOS can become better self-regulated in that they can more easily make their efforts efficient in the context of rapid ICT development. Managers should scale up their business strategy in a digital network of people and data by acting as facilitators, increasing their interactions among businesses (product producers), processes (ICT-related issues) and services (including

communication and connectivity technologies to end-users), to transform government capabilities and the relationships among government agencies, citizens and business. Accordingly, managers should fully capture the scope, scale and speed of their PSOS strategy as well as the source of value creation. This can be achieved through capturing a sense of the flow of the process on a continuance basis (i.e., through the extent of ICT integration within the system and on the part of end-users and product producers). Furthermore, managers should form alliances with other partners to leverage their network in the ICT infrastructure in order to speed up Internet connectivity, etc.

13. This research emphasises the crucial role of satisfaction and outcome expectation in online services with respect to PSOS services by facilitating continued usage. The research addresses post-adoption behaviour by addressing the role of the citizen in the PSOS process through extending the concepts of SCT, ECT and D&M IS success with respect to the IS field in PSOS practice. Continuing to use PSOS will account for PSOS's eventual success for an organisation.

14. Managers are required to maintain a level of understanding vis-à-vis target users' skills in order to match the provided services with their skills. Understanding the mechanisms of the present model in both the short- and long-term would shape managers' financial performance perspectives towards when and how to invest in potential ICT-related issues. The present model recognises that best practice between the organisation and the citizen is achieved by correctly assessing any potential investment based on the citizen's needs and skills.

7.5 Summary of research contribution

There are two main contributions from the proposed model: theoretical and practical. The first, the theoretical contribution of this research, has implications for several IS streams within particular research aspects (e.g., adoption, acceptance and continuity) within individual, social and organisational contexts. It offers a methodology for taking various theoretical models to synthesise into one model. Furthermore, the research

offers personal outcome expectation as a standalone construct that influences satisfaction towards continuance intention. The personal expectation perspective has been credited as a novel and relevant lens in order to appraise citizens' acceptance behaviour toward public sector use and continuance usage. The second contribution (practical) of the research highlights the role of social, individual and organisational factors that influence the continual use of ICT, offering guidance to decision-makers. Furthermore, the study considers the influence of psychological, socio-economic and managerial factors toward the involvement of the citizens with ICT systems. Moreover, the research examines both intrinsic and extrinsic motivational factors in order to encourage citizens' involvement in ICT use.

7.5.1 Achievable actions that PSOS managers can take

The aforementioned management implications can be reduced to a small number of genuinely value-adding and achievable actions that managers can take. For example:

A. PSOS managers must shift their focus to Web channel online services. Tax discs should be replaced by electronic evidence. This should assist in reducing viability within PSOS. This is consistent with the views of Parasuraman et al. (2005).
B. PSOS managers should improve accessibility and speed through aligning themselves with other businesses to improve infrastructure.
C. PSOS managers should have a sense of how online services are evaluated by citizens with respect to time and cost, as extrinsic cues to infer quality. Advertising the experiences of current online users may encourage other citizens to use PSOS. In PSOS, lower costs and less time is generally seen as evidence of the quality of online services.
D. There should only be very slight changes in the information on the website. Any radical change in the website's information could negatively influence the citizen's expectation (and thence satisfaction), although not their ability to perform the task at hand. Accordingly, this would establish a negative social influence. It is preferable to keep people familiar with what they saw in their previous visit in order to reduce the time needed to explore the website's links.

E. PSOS managers should recognise the important role of responsiveness, empathy and assurance in their online support in order to facilitate problem-solving. This could be done by reallocating current employees to more interactive positions (e.g., having a real person on the website, answering phone calls, replying to emails and answering questions, etc.). The human touch may assure citizens over security and privacy issues, as they do not what is happening behind the website. This is consistent with the service quality concerns of DeLone and McLean (2002, 2004) in terms of user-support services delivered by the service provider.

F. Service recovery is vital and cannot be recognised in the first use. PSOS managers should recover any failure in information or service as soon as possible. This can be done by updating the system on a continual basis; the system here includes hardware, software and the work process (including citizen services and information).

G. PSOS managers should observe private sector progress in order to bridge the gap between government and private sector online services. Perhaps a complementary online service could be offered to citizens as customers, thereby assessing competitors' service quality and decisions; this is key to survival in business and would bridge the gap with other entities in terms of citizens' expectations.

H. Managers in PSOS, in general, should be associated with other stakeholders/authorities who are involved in assessing and providing information to the general public (e.g., insurance companies, police and citizens) to make clear who is responsible for any information or service provided to the general public, particularly in the event of ambiguities in the advice given on an online service. In other words, there should be the opportunity to give specific advice beyond the normal rules and codes; for example, Rule 79 of the Highway Code clearly states: "It is the driver's responsibility to make sure you are fit to drive".

7.6 Limitations

Although the findings of the present study have meaningful implications for using PSOS on a continuance basis, it has certain limitations, as most field surveys do.

1. The technical implementation of PSOS from an organisation or government agency's point of view is beyond the purpose of the present study. The present study focused on the citizen's perspective.
2. The data collected for the present study were cross-sectional; therefore, longitudinal data will be needed in future to investigate the factors that influence an individual's perception in continuing to use PSOS in order to validate the present research model.
3. The data collected are based on a voluntary system (DVLA tax disc online renewal); therefore, the findings may not be generalised to mandatory systems.
4. The data were obtained from specific users of the DVLA website system; therefore, the findings may vary based on other services or on social influence. Thus, it is recommended to test other systems/applications of PSOS (e.g., mobile systems or the Kiosk system) through users' groups. The nature of information quality and service quality differ from website to website, and this may affect citizens' in using PSOS.
5. The effects of the determinants in the present study's model are subject to the citizens' experience over time
6. Another participant from a different population is recommended, preferably in a developing country, to reflect different societal and experiential issues, as the data collected for the present study only represent a developed country (UK).
7. The findings of the present study were obtained from a single case study in PSOS as a subset of the e-government umbrella, focused on a DVLA online service and a DVLA user group; thus, generalising the findings should be conducted with care. It is recommended to investigate other cases in order to validate the level of this study's generalisability.
8. There are concerns with the selected sample in the present study. It was difficult to obtain a sampling frame of DVLA users as a guideline for sample for security reasons and the restricted timeframe of the study.
9. There is a limitation in terms of the statistical methods used in the present study; Structural Equation Models as a technique is driven by a theory. SCT has been

used in the present study with the integration of ECT to represent the relationships among variables. Thus, SCT as an umbrella drives the development of the present study.

10. The educational level of the survey respondents in the pilot study is considerably higher than that of the population as a whole. Presuming that this is also true in the main study, this might be considered as a potential source of bias.
11. Due to the influence of situational factors within SCT, the negative relationships should not be omitted from future studies.

7.7 Future research

The sample frame used in the present study remains a potential source of error; therefore, more revision would be appreciated in future studies. The present study context is based on G2C in which SCT and ECT investigated and examined the role of PSOS. Thus, the focus of the present study was on PSOS from the citizen's perspective by investigating citizens' personal factors (e.g. prior experience, self-efficacy, personal outcome expectation and satisfaction towards continuance intention to use PSOS).

To capture the full range of issues related to citizens and services, all the phases of the present research were focused on one website (DVLA). Future studies may also try another PSOS domain/website, or may examine the role of SCT and ECT on mobile users instead of using website users. Mobiles, as a resource of information and service quality, may enrich future studies, as mobile users tend to have more interaction with PSOS.

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Appendices

Appendix A

Pilot Study Survey (51 items and 40 items)

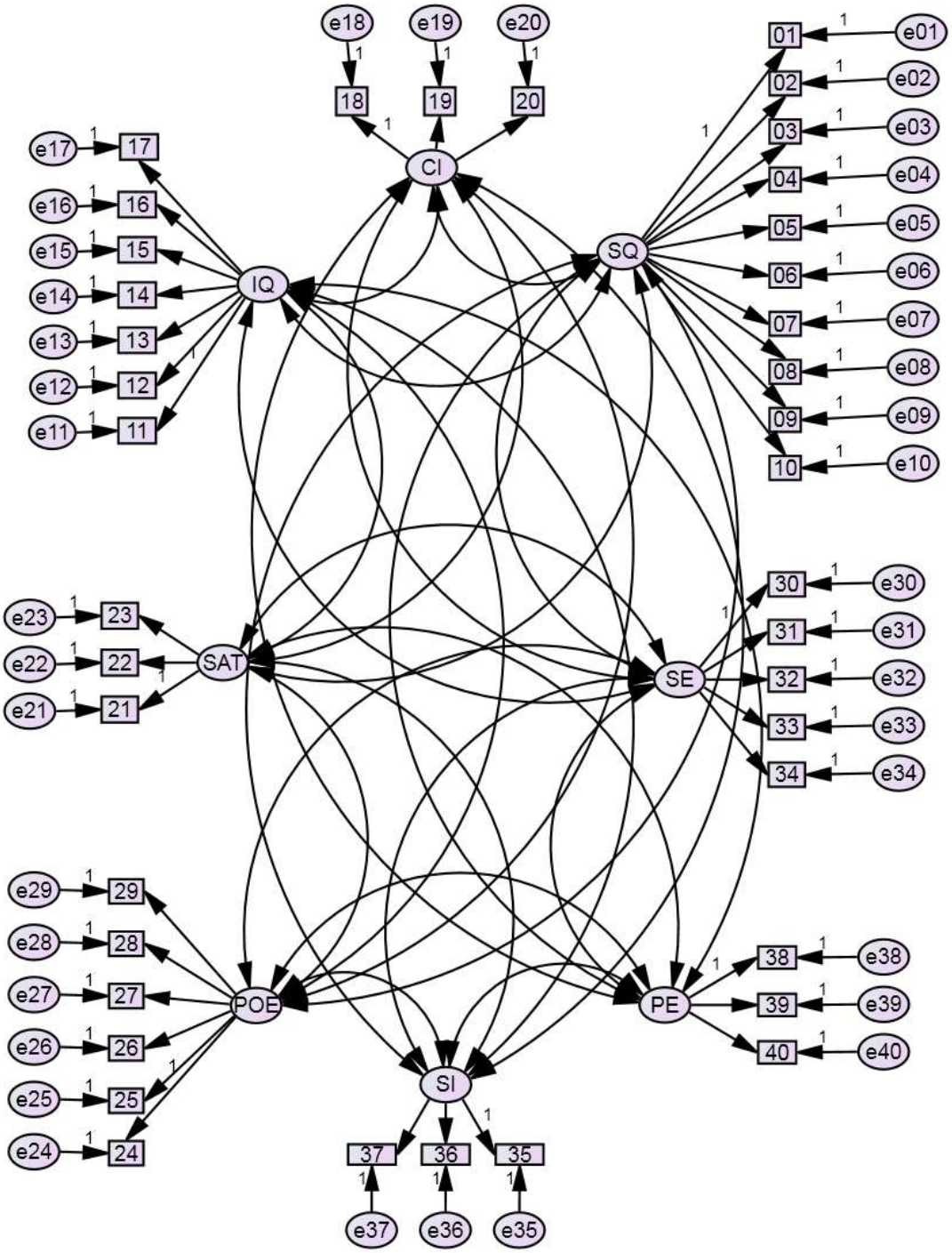
	The highlighted items have been removed based on experts' recommendations during the pilot study: 51 (questions) - 11 (deleted questions) = 40 (final questions for the main study in the next tab).		
No.	**Code**	**Item**	**Reason for deletion**
1	SQ_Efficiency	**The DVLA website makes it easy to find what I need.**	
2	SQ_Efficiency	**The DVLA website makes it easy to get anywhere on the site.**	
3	SQ_Efficiency	**The DVLA website enables me to complete a transaction quickly.**	Expert recommendation
4	SQ_Efficiency	**The DVLA website is simple to use.**	
5	SQ_Systems	**The DVLA website is always available (24/7).**	
6	SQ_Systems	**The DVLA website launches and runs right away.**	
7	SQ_Systems	**The DVLA website does not crash**	
8	SQ_Fulfilment	**The DVLA website delivers the tax disc as promised.**	Expert recommendation
9	SQ_Fulfilment	**The DVLA website makes the tax disc available for delivery within a suitable timeframe.**	Expert recommendation
10	SQ_Fulfilment	**The DVLA website is truthful in its statements.**	Expert recommendation
11	SQ_Privacy	**The DVLA website protects information about my Web-shopping behaviour.**	
12	SQ_Privacy	**The DVLA website does not share my personal information with other sites.**	
13	SQ_Privacy	**The DVLA website protects my credit card data.**	Expert recommendation
14	SQ_Responsiveness	**The DVLA website handles product returns well.**	Expert recommendation

15	SQ_Responsiveness	**The DVLA website tells me what to do if my transaction is not processed.**	Expert recommendation
16	SQ_Responsiveness	**The DVLA website takes care of problems promptly.**	Expert recommendation
17	SQ_Compensation	**The DVLA website compensates me for any problems it creates.**	Expert recommendation
18	SQ_Compensation	**The DVLA website compensates me when what I ordered does not arrive on time.**	Expert recommendation
19	SQ_Contact	**The DVLA website provides a telephone number.**	
20	SQ_Contact	**The DVLA website has customer service representatives available online.**	
21	SQ_Contact	**The DVLA website offers the option to speak to a real person if there is a problem.**	Expert recommendation
22	Info_Quality	**Through the DVLA website, I get the information I need in time.**	
23	Info_Quality	**Information provided by the DVLA website meets my needs.**	
24	Info_Quality	**Information provided by the DVLA website is in a useful format.**	
25	Info_Quality	**Information provided by the DVLA website is clear.**	
26	Info_Quality	**Information provided by the DVLA website is accurate.**	
27	Info_Quality	**Information provided by the DVLA website is up to date.**	
28	Info_Quality	**Information provided by the DVLA website is reliable.**	
29	Continue	**I intend to continue using the DVLA website in the future.**	
30	Continue	**I will continue using the DVLA website in the future.**	
31	Continue	**I will regularly use the DVLA website in the future.**	
32	Satisfaction	**I am satisfied with the information quality on the DVLA website.**	
33	Satisfaction	**I am satisfied with the service quality of the DVLA website.**	
34	Satisfaction	**Overall, I am satisfied with the quality of the DVLA website.**	

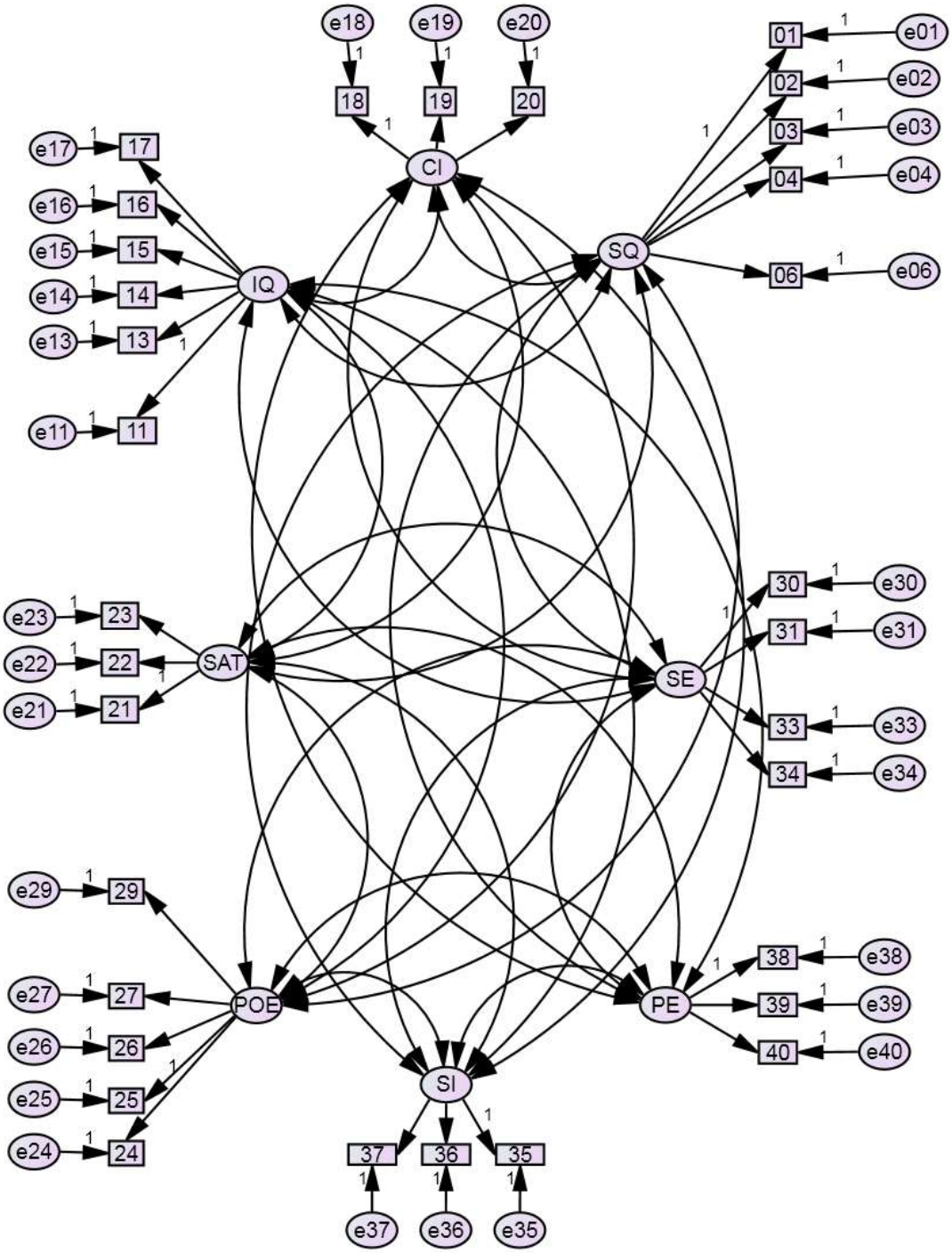
35	POE	**If I use the DVLA website, I will gather complete and timely information, compared with traditional systems.**	
36	POE	**If I use The DVLA's website, I will increase my sense of accomplishment.**	
37	POE	**If I use a computer to access the DVLA website, I will be better organized, compared to traditional systems.**	
38	POE	**If I use the DVLA website, I will spend less time, compared to traditional systems**	
39	POE	**If I use the DVLA website, I will spend less money, compared to traditional systems.**	
40	POE	**I expect the DVLA website to be trustworthy.**	
41	Self-Efficacy	**I feel confident finding my way through the DVLA website.**	
42	Self-Efficacy	**I feel confident looking for information by querying the DVLA website.**	
43	Self-Efficacy	**I feel confident e-mailing the DVLA website.**	
44	Self-Efficacy	**I would find it easy to use the DVLA website to renew my tax disc.**	
45	Self-Efficacy	**Overall, I am confident in my ability to access the DVLA website.**	
46	Social_Influence	**People who influence my behaviour would think that I should use the DVLA website to renew my tax disc.**	
47	Social_Influence	**People who are important to me would think that I should use the DVLA website to renew my tax disc.**	
48	Social_Influence	**People who are in my social circle would think that I should use the DVLA website to renew my tax disc.**	
49	Personal_Experience	**The information quality of the DVLA website was better than I expected.**	
50	Personal_Experience	**The service quality of the DVLA website was better than I expected.**	
51	Personal_Experience	**Overall, the quality of the DVLA website was better than I expected**	

Appendix B

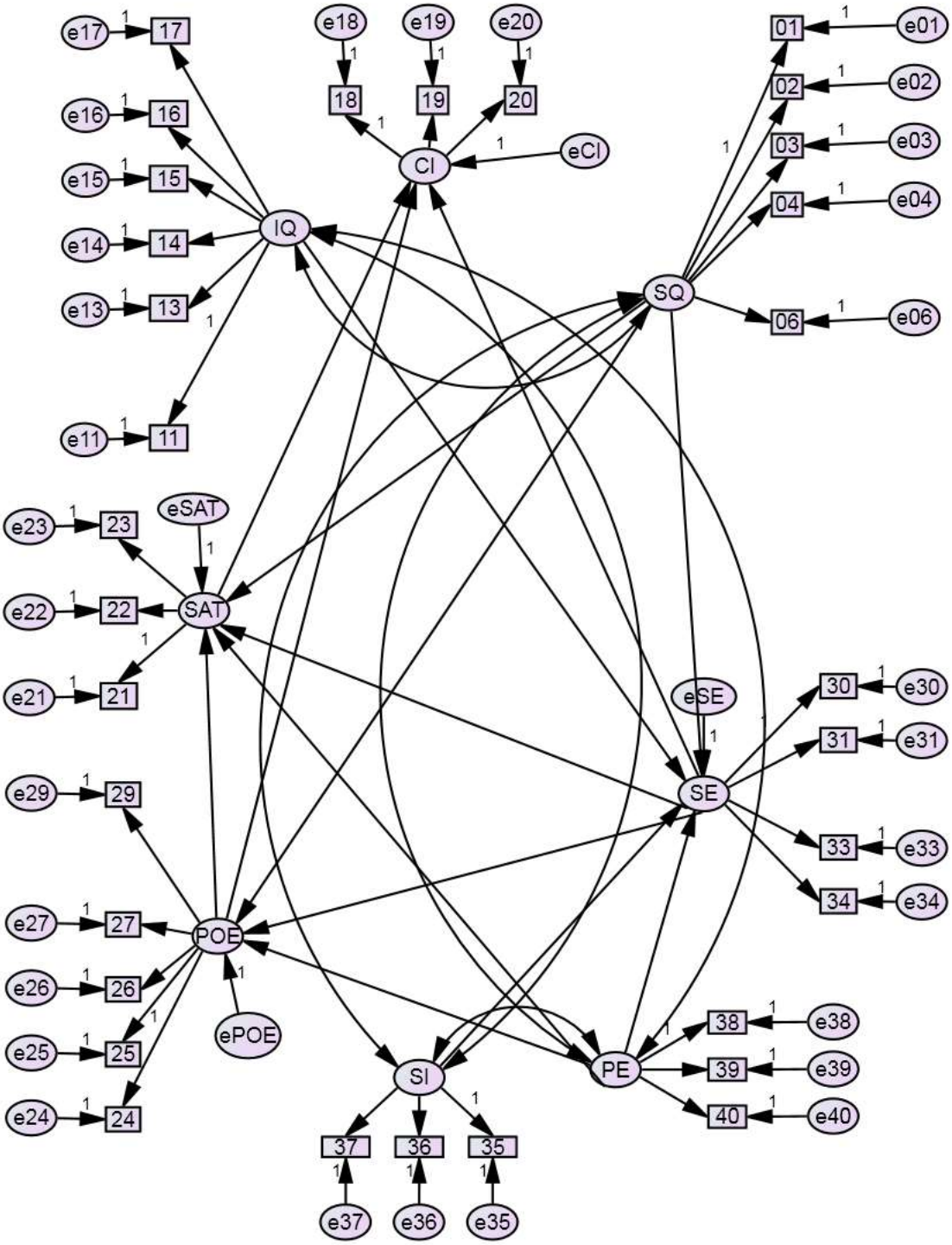
CFA All measured variables before deletion (40 items, 8 constructs)



CFA Final (32 items, 8 constructs)



SEM final (32 items, 8 constructs, new self-efficacy hypothesis is included)



APPENDIX C

MAIN SURVEY:

1. Participant Information Sheet

This survey is intended for those who have used DVLA's online service on at least a few occasions, therefore, if you are experienced in using the DVLA's online service to obtain or exchange your tax disc, I would be most grateful if you would fill out this questionnaire. The views you express in this questionnaire will contribute towards a better understanding of user experience and satisfaction in using the www.gov.uk online services in the UK.

1. Title of Research: A FRAMEWORK FOR EVALUATING CITIZENS' OUTCOME EXPECTATIONS AND SATISFACTION TOWARD CONTINUED INTENTION TO USE E-GOVERNMENT SERVICES.

2. Researcher: Student MUBARAK ALRUWAIE on PhD Management Research Studies, Brunel Business School, Brunel University, UK

3. Contact Email: mubarak.alruwaie@brunel.ac.uk

4. Purpose of the research: To investigate UK citizens' continuing use of the Driver and Vehicle Licensing Agency (DVLA) online service, more specifically, obtaining and exchanging tax discs through the www.gov.uk online services website.

5. What is involved: There are two parts involved in this questionnaire. Part A consists of a set of demographic questions. Part B concerns the evaluation of the DVLA's online services website, which involves 40 questions separated into eight sections, as follows: 1) Service quality; 2) Information quality; 3) Continuity intention to use the online services; 4) Satisfaction with the online services; 5) Personal outcome expectation; 6) Internet and computer self-efficacy; 7) Social influence; 8) Prior experience. There is also a space for optional personal comment. The questionnaire will only take 5 to 15 minutes of your time to complete.

6. Voluntary nature of participation and confidentiality: The information you provide will only be used for research purposes, as part of a PhD study at Brunel University. Your responses will be kept strictly confidential and no individuals will be identified in the study. Completing and returning the questionnaire constitutes your consent to participate. Your participation is entirely voluntary; if you do not wish to participate, simply discard the questionnaire. A summary of the results will be posted to you (after the data have been analysed) if you provide your email address.

2. Part A consists of a set of demographic questions and Internet experience

1. **What is your gender?**
    1) Female
    2) Male
2. **How old are you?**
    1) Under 26
    2) From 26 to 35
    3) From 36 to 45
    4) From 46 to 55
    5) Over 55
3. **What is your educational background?**
    1) Secondary Education
    2) Further Education (A Levels / GNVQ / BTEC or similar qualification)
    3) Higher Education (degree or postgraduate qualification)
4. **What is your employment/occupation status?**
    1) Public sector
    2) Private sector
    3) Unemployed
    4) Self-employed
    5) Other
5. **What is your marital status?**
    1) Married
    2) Single
    3) Divorced
    4) Other
6. **What is your ethnicity?**
    1) White
    2) Mixed
    3) Asian or Asian British
    4) Black or Black British
    5) Other
7. **What is your annual household income?**
    1) Less than £10,000
    2) £10,000 - £24,999
    3) £25,000 - £49,999
    4) £50,000 and above
8. **How would you describe your general computer knowledge?**
    1) I am an Expert User
    2) I am an Intermediate User
    3) I am a Novice User

9. **How would you describe your Internet knowledge?**
    1) I am an Expert User
    2) I am an Intermediate User
    3) I am a Novice User
10. **How often do you use the Internet per day?**
    1) Not at all
    2) From 1 to 2 hours
    3) From 3 to 4 hours
    4) More than 4 hours
11. **How long have you been using the Internet?**
    1) Less than 3 months
    2) From 3 to less than 6 months
    3) From 6 to less than 12 months
    4) From 12 months or more
12. **When did you last visit the Driver and Vehicle Licensing Agency (DVLA) website?**
    1) In the last 3 months
    2) In the last 6 months
    3) In the last 12 months
    4) Longer ago
13. **Have you ever completed a transaction with the Driver and Vehicle Licensing Agency (DVLA) online?**
    1) Yes
    2) No
14. **How often do you use the Internet to complete a government transaction (e.g. renew your license, pay taxes, etc.)?**
    1) Everyday
    2) Several times a month
    3) Once a month or less
    4) Never

3. Part B: Your experience and continuity intention to use the DVLA's online services

In this part, the purpose of the study is to understand your opinions based on your experience in using the DVLA's online service to obtain or exchange your tax disc through www.gov.uk. Please rate the following statements on a scale of 1 (Strongly disagree) to 5 (Strongly agree) according to whichever best describes your lifestyle preference.

(Section 1) Service quality of the DVLA's online service: This is your judgement about the DVLA's online service quality.

1. **The DVLA's online service makes it easy to find what I need.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
2. **The DVLA's online service makes it easy to get anywhere I need to on the website.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
3. **The DVLA's website is simple to use.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
4. **The DVLA's online services are available 24/7.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
5. **The DVLA's website does not crash.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 2) Information Quality of the DVLA's online service website: Information quality reflects your feelings about the quality of the information provided by the DVLA's website.

6. **Through the DVLA's online service, I get the information I need in good time.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
7. **The information provided by the DVLA website is in a useful format.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
8. **The information provided by the DVLA website is clear.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
9. **The information provided by the DVLA website is accurate.**
   1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
10. **The information provided by the DVLA website is up to date.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
11. **The information provided by the DVLA website is reliable.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 3) Continuity intention to use the DVLA's online service website: This reflects your future plan to continue using the DVLA's online service.

12. I intend to continue using the DVLA website in the future.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

13. I will continue using the DVLA website in the future.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

14. I will regularly use the DVLA website in the future.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 4) Satisfaction with the DVLA's online service website: This relates to your feelings about your last visit to the DVLA's online service website.

15. I am satisfied with the information quality on the DVLA's website.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

16. I am satisfied with the service quality of the DVLA's website.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

17. Overall, I am satisfied with the quality of the DVLA's website.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 5) Personal Outcome Expectation: This reflects your expectation that using the DVLA's online services will lead to certain outcomes, or it is your judgement of the likely consequence of using the DVLA's online service.

18. If I use the DVLA's online services, I will gather complete and timely information.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

19. If I use the DVLA's online services, I will increase my sense of accomplishment.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

20. If I use a computer to access the DVLA's online services, I will be better organised.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

21. If I use the DVLA's online services, I will spend less time.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

22. I expect the DVLA's online services to be trustworthy.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 6) Internet and Computer Self-Efficacy: This is your perception of your ability in completing computer related tasks within the DVLA's online service website.

23. I feel confident finding my way through the DVLA's online service website.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

24. I feel confident looking for information by querying the DVLA's online service.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

25. I would find it easy to use the DVLA's online service website.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

26. Overall, I am confident in my ability to access the DVLA's website.

1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 7) Social Influence: This is the degree to which peers influence your use of the DVLA's online service website, whether positively or negatively.

27. **People who influence my behaviour would think that I should use the DVLA's online services.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
28. **People who are important to me would think that I should use the DVLA website.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
29. **People who are in my social circle would think that I should use the DVLA website.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

(Section 8) Prior Experience: This refers to your previous experiences in using the DVLA's online service website.

30. **The information quality of the DVLA website was better than I expected.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
31. **The service quality of the DVLA website was better than I expected.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree
32. **Overall, the quality of the DVLA website was better than I expected.**
    1-Strongly disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly agree

Thank you!

Your email address or any other comments (optional):

Mubarak Alruwaie, Brunel Business School, Brunel University
Uxbridge, Middlesex, UB8 3PH

Appendix D

Overall fit measurement assessment of model validity

Measurement assessment of model validity (source: modified from Hair et al. (2010))		
Measurement	**Comments**	**Thresholds**
The basis of Goodness-of-Fit (GOF). How well the specified model reproduces the observed covariance matrix among the indicator items/variables.		
Chi-squares (X^2) GOF	The difference in the observed and estimated covariance matrices. Chi square (statistically significant) increases with more cases. A large correlation means a poor fit. Therefore, alternative measures of fit are crucial. A small *p*-value for X^2 represents differences between the two covariance matrices.	$X^2 = N$ (overall sample size) -1 (SEM estimated covariance matrix). Depends on the sample size. Smaller *p*-values (less than .05) can be used to indicate that a significant relationship exists.
Degree of freedom (*df*)	Represents the amount of mathematical information available to estimate model parameters.	$df = \frac{1}{2}(p)(p+1) - k$ p (total number of observed variables), k (the number of estimated (free) parameters.
GOF is classified into three groups:1) absolute measures; 2) incremental measures; and 3) parsimony fit measures. A new measure that reflects various facets is what researchers are striving for.		
1) **The Absolute Fit Indices** (how well a researcher's theory fits the sample data). A low X^2 value supports the model as representing the data. It is considered as a fundamental SEM measure for absolute fit indices because it reveals differences between the matrices (the observed and the estimated covariance matrices). A large sample and more indicators in the model would make X^2 less desirable for assessing the model's overall fit. Therefore, alternative measurements have been developed to handle the bias of a large sample size and model complexity.		
Goodness-of-Fit Index (GFI)	The sample size *N* is not included in the formula; therefore it is less sensitive to a large sample size.	Range between 0 and 1. A higher value means a better fit. Recent developments have reduced its usage (Hair et al., 2010)
Root Mean Square Error of	Measures the tendency if the X^2 GOF.	Lower RMSEA values

Approximation (RMSEA)	It is used to reject models with a large sample size or a large number of observed variables. It can be used to represent the population and only the sample used for estimation (Hu & Bentler, 1999). It validates model complexity with a large sample size.	indicate better fit. RMSEA between 0.03 and 0.0.08 can give a 95% level of confidence (Hair et al., 2010).
Root Mean Square Residual (RMR) and Standardized Root Mean square Residual, i.e. standardized RMR (SRMR)	The square root of the mean of the squared residuals. The average of the residuals. However, it has a problem with the scale of covariance. Instead, SRMR is used for comparing fit across models. Sometimes called badness-of-fit.	Lower RMR and SRMR indicate better fit. A rule of thumb is that SRMR above .1 indicates a problem with fit.
Normed Chi-square (X^2/df)	A ratio of X^2 to the degrees of freedom for a model	3:1 or less is considered a better fit.
2) Incremental Fit Indices (*comparative fit indices*) Assess how well the estimated model fits, relative to some alternative baseline model or the so-called *null model* in most common baselines. This is unlike absolute model fit which independently evaluates each model. The assumption is that they are uncorrelated.		
Normed Fit Index (NFI) or Bentler Bonett Index	This is the ratio of the difference in the X^2 value for the fitted model and a null model divided by the X^2 value for the null model.	Range between 0 and 1. The higher the better. It is less used nowadays.
Non-normed Fit Index (NNFI) or Tucker Lewis Index (TLI)	This considers model complexity by comparing the chi-square values for the null model and the specified model.	Either below 0 or above 1 as a non-normed fit index. Higher value = better fit.
Comparative Fit Index (CFI)	A modified NFI	Range between 0 and 1. The higher the value, the better the fit. Widely used because of its insensitivity to model complexity. Values above 0.9 are considered as a well fitting model.
Relative Non-centrality Index (RNI)	Compares the observed fit resulting from testing a specified model to the null model.	RNI above 0.9 is considered as a good fit.
3) Parsimony Fit Indices Information pertaining to which model among a set of competing models is best with respect to		

complexity and fit. Calculate the *df* of a model with respect to total *df* available. It is like adjusting R^2. This is not useful when assessing the fit of a single model.		
Adjusted Goodness-of-Fit Index (AGFI)	Considers different degrees of complexity by taking the ratio of the *df* of a model with the total *df* that are available of other models.	Only guidelines to fit.
Parsimony Normed Fit Index (PNFI)	Relates some of the incremental fit indices to absolute fit indices with less sensitivity to model complexity.	Similar to NFI, the higher the value, the better the fit.