

The Role of Information Transparency in Citizens' Intention to Use e-Government

Phuong Hai Tran

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**The Role of Information Transparency in Citizens' Intention
to Use e-Government**

Phuong Hai Tran

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**Department of Business Information Systems
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ATTESTATION OF AUTHORSHIP

“I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.”

Author's Signature:

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ABSTRACT

Governments have been investing billions of dollars in both developing and maintaining e-Government systems. The success of these systems depends on the level of citizens' use of these systems. However, citizens' use of e-Government has not reached expectations. According to United Nations' reports on e-Government throughout the world, citizens often use e-Government at lower levels (e.g. searching for information) rather than higher levels of citizens' use (e.g. active participation). To ensure the success of the e-Government systems it is important to improve the level of use. Academia has, therefore, been investigating the reasons that affect citizens' usage of e-Government systems. Apart from the traditional factors such as usefulness and ease of use, information transparency has been shown to have a positive influence on individuals' beliefs and behaviour in the literature of marketing, management, and adoption of IT/IS. In the government context, information transparency has also been shown to be important to citizens' beliefs and behaviour in relation to higher use (e.g. participation in policy and decision making process). For these reasons, information transparency is particularly relevant for encouraging higher levels of e-Government use, such as participation in the policy and decision making process.

The term '*information transparency*' as used in the context of this study refers to government making information about data, process and policy both open and visible, and disclosing that to its citizens. There are three aspects to information transparency: data transparency, process transparency and policy transparency. Data transparency refers to the data and figures of government; process transparency refers to steps in the processes; and policy transparency refers to the rationale for making final decisions and policies. Citizens have high expectations for information transparency from government and how transparent this information is perceived to be can affect the use of e-Government. To date, the literature has yet to highlight the factors that impact on information transparency in a computer-mediated environment, and to what extent the perception of information transparency impacts and facilitates citizens' intention to use e-Government.

To bridge these gaps in the literature, this study integrates DeLone and McLean's Information System Success Model with the fundamental concepts of information transparency, to investigate the antecedents of information transparency and its effect on

levels of citizens' intention to use e-Government. E-Government uses in this study include three levels: *passive use* which includes searching for general information and search for policy and decision information; *active use* which includes communication and transactions; and *participatory use* which includes consultation and active participation in the policy and decision-making process.

In order to test the research model, a survey was conducted with New Zealand citizens who have used e-Government. A total of 234 usable responses were collected. SmartPLS was used to examine the data and test the research model and hypotheses. The results identified that information quality and service quality positively enhance information transparency but that system quality was not significant. These three antecedents together explained 0.498 of the variance observed in information transparency. On the other hand, information quality, system quality and service quality all have a significant impact on satisfaction. They explained 0.543 of the variance observed in satisfaction.

The results also demonstrate that information transparency plays a significant role in determining participatory use intention but is not significant for lower level use intentions toward e-Government use (i.e. active and passive use). Satisfaction has a significant impact on both active use and participatory use intentions.

These results have significant theoretical and practical implications. In terms of theoretical contributions, this study provides a conceptual model of the role of information transparency in citizens' intention to use e-Government. As this study is the first to provide empirical evidence on predictors of information transparency in a computer-mediated environment, the results provide an understanding of transparency that can then be applied in interdisciplinary literature. The study also contributes to the information system post-adoption literature and, specifically, e-Government post-adoption literature. To encourage citizens' higher levels of e-Government use, the results identify satisfaction and information transparency as particularly important. In order to improve further citizens' perceptions of transparency and hence their uses, governments should focus not only on publishing information (e.g. disclosing the facts and figures of government, and information about its operations and decision-making) but also on improving the quality of the information provided and the services that support the e-Government. By doing this, government will be able to encourage the citizens' use of e-Government services that are offered, and ensure the success of such systems.

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1. CHAPTER ONE - INTRODUCTION

1.1. Introduction

The first chapter of this thesis will discuss the significance and motivation for examining the role of information transparency in citizens' intention to use e-Government. The chapter also briefly discusses the concept of information transparency, and the theoretical framework used to identify and explain the antecedents and consequences of information transparency in relation to different levels of e-Government use. The research questions, methodology and expected contribution of this research are also briefly discussed. In addition, as a guide to readers, the structure of the thesis will also be outlined.

1.2. Significance and Motivation of the Research

The beginning of Chapter 1 will discuss both the relevance and significance of information transparency, for not only the business sector but also the government sector. The limitations of prior research in conceptualising information transparency will then be outlined. How to improve information transparency in the computer-mediated environment and how information transparency impacts e-Government usage intention will be described. In this study, the term *information transparency* is used to refer to transparency in general and both of the terms, *information transparency* and *transparency* are used interchangeably.

1.2.1. The importance of information transparency

This section will discuss important values of customers and citizens regarding information transparency in the business and government sectors, and why it is important to understand the role of information transparency in e-Government adoption. The section begins with a broad discussion on transparency in general.

Information transparency has received increasing attention and interest from researchers of several disciplines (R. Oliver, 2004). In business management, transparency is considered to be a core value for the success and profitability of an organisation. Baum (2005) and McManus, Holtzman, Lazarus, Anderberg, and Salvatico (2006) argued that transparency in leadership can enhance satisfaction, avoid getting into "deeper trouble", and provide "long-term success and sustainable profits". In a more recent book (World

Rules from People Operations of Google), Laszlo Bock (2015) mentions that an essential element for a successful business is transparency as, once a company is being open and honest with employees, it becomes more accountable and trustworthy, providing a motivating working environment. Embracing transparency when managing a university is also shown to improve staff-perceived fairness and motivation (Podder, 2013). The customer's perception of how transparent a business organisation is (e.g. price transparency), influences trust, attitude and intention to purchase products, and so affects business performance (Dapko, 2012; Trenz & Veit, 2012). Therefore, transparency has been identified as an important part of organisational strategy and policy, and is a key criterion for organisations that want to improve performance, and ultimately to benefit financially (Ozcelik & Ozdemir, 2008).

Attention to transparency is increasing, not only in the business sector but even more in the government sector (Christensen & Cornelissen, 2015; Piotrowski & Ryzin, 2007; Schnackenberg & Tomlinson, 2014). In the government sector, citizens often do not have other options as the government is a mono power control institution. Because of the lack of alternatives, it is easy to understand why citizens' expectations and demand for transparency from government is even higher than that expected from business (Piotrowski & Borry, 2009). Transparency is invaluable to any government due to its ability to enhance democracy and accountability, decrease corruption and protect human rights (Bannister & Connolly, 2011; Bauhr & Grimes, 2012; Hood & Heald, 2006).

Transparency can be closely identified with 'the right to know' which is considered one of the essential human rights (Florini, 2007; Hood & Heald, 2006). Citizens should have the right of access to information of government and that information should be available for them to access. Based on the importance of the right to know, the Freedom of Information Act (FOIA) has been adopted by 95 countries in order to deliver an open and transparent government (Anonymous, 2015). FOIA legally allows the public to access data and information held by a nation's government (Jewell, 2002). By ensuring access to information, governments can increase democracy and accountability. If governments are willing to share and disclose information about their decision- and policy-making processes, citizens will have the opportunity to know about the decisions and policies that will affect their lives (Gilley, 2009; H  ritier, 2003). In addition, transparency is known to be a key tool in combating corruption in government administration (UN - HABITAT & Transparency International, 2004). If information about governmental processes and policies is disclosed to citizens, it is more difficult for agencies and governmental officers

to take advantage of being privy to information and so abuse their power for private gain (Florini, 2007; Kaufmann, 2005; Kolstad & Wiig, 2009). For example, in Brazil, the lack of transparency in government plans and budgets created opportunities for government officers to misuse the money received from citizens' taxes. As a consequence, it led to citizens being dissatisfied and huge protests from millions of Brazilians (Anonymous, 2013).

Understanding the importance of being transparent to citizens, governments throughout the world have been adopting information and communication technologies (ICTs) to provide a platform that discloses information and delivers services to citizens, so-called e-Government. Practitioners and scholars believe that the ICTs of e-Government possibly enhance transparency (Bertot, Jaeger, & Grimes, 2010; Welch, Hinnant, & Moon, 2005). Bertot, Jaeger, and Grimes (2010) provide evidence of successful e-Government in promoting information transparency. Some of the examples: are India with the Bhoomi electronic land record system; the Philippines with an e-procurement system allowing public bidding on government contracts; Chile with ChileCompra e-procurement system allowing government officials and citizens to compare the costs of bids to, and services purchased by, the Chilean government. These e-Government systems have saved billions of dollars previously lost through corruption and enhance the transparency of the various governments.

Despite this, the concern about information transparency in e-Government development has been growing rapidly amongst scholars, with the number of published journal papers and books relating to transparency in e-Government increasing from just a few in 2000 to almost 600 in 2015. This demonstrates that information transparency is continuing to be an important issue during the era of increasing technologies (Lanvin, 2008). However, there has been a lack of understanding about what is meant by information transparency and how it should be conceptualised, how ICTs enhance information transparency in e-Government, and what role information transparency plays in citizens' intention to use e-Government. The following sections will explain and discuss these gaps in our understanding.

1.2.2. The conceptualisation of information transparency

Before investigating any concept, it is essential to understand what the concept is and how to operationalise it in a specific study context. There have been numerous efforts to define and conceptualise information transparency. However, the definitions and its framework have had their limitations and inconsistencies in prior works (Christensen & Cornelissen, 2015; da Cruz, Tavares, Marques, Jorge, & de Sousa, 2015; Dapko, 2012; Kaufmann & Bellver, 2005; Schnackenberg & Tomlinson, 2014). This section will briefly describe some of the limitations and inconsistencies of the concept of information transparency.

The section will refer to *information transparency* as transparency in general. This is because among the many existing definitions of transparency, the common object is *information*. For example, price transparency refers to information about “prices and characteristics or attributes of goods or services on offer” (Soh, Markus, & Goh, 2006, p. 706); financial transparency is about fiscal information (Guillamón, Bastida, & Benito, 2011); information about services (Humphry & Wong, 2009); information about decision-making process (Moreno & Molina, 2014). Hence, in this study, the focus will be on information transparency; both of these terms: *information transparency* and *transparency* will be used interchangeably.

The first inconsistency when defining the concept in the literature concerns the characteristics of information transparency (Christensen & Cornelissen, 2015; da Cruz et al., 2015). Within the same group of studies on transparency (i.e. firm transparency), different studies have adopted different definitions. For example, Vaccaro and Madsen (2006) define firm transparency as the “degree of completeness of information” while Dapko (2012) defines it as being “open and forthright” (letting customers know what’s happening). This inconsistency has often led to confusion and difficulty in building a cohesive body of research and knowledge around the concept.

In particular, the characteristics of information transparency are often confused with characteristics of information system quality (Schnackenberg & Tomlinson, 2014). For example, transparency is defined as “the degree of completeness of information” (Vaccaro & Madsen, 2006); “access, comprehensiveness, relevance, quality, and reliability of information” (Vishwanath & Kaufmann, 2001); and “visibility and accessibility of information” (Bhaduri & Ha-Brookshire, 2011). However, the characteristics such as completeness, accessibility, and relevance, are frequently referred

to as qualities of the technical systems that deliver information and services (DeLone & McLean, 2003). This inconsistency in description can inhibit researcher investigation of the determinants and consequences of information transparency (Schnackenberg & Tomlinson, 2014).

Furthermore, in addition to being unclear about the characteristics, how information transparency is defined and how it is applied are also not consistent (Christensen & Cornelissen, 2015). For example, Y. Lu, Gupta, Ketter, and Heck (2014) defined transparency as the “degree of availability and accessibility of market information” (p.1). However, during their experiment, the only term the authors used to describe information transparency was disclosure, and reveal. Similarly, there are many newspapers, reports and pieces of research that mention the value of transparency and investigate it, without actually specifying what it means and how it applies to a specific context (Christensen & Cornelissen, 2015; Horne, 2012).

As well as the lack of consensus about the characteristics and what it is, the measuring of transparency is limited so far in the available research (da Cruz et al., 2015; Schnackenberg & Tomlinson, 2014). Transparency International (using CPI), Guillamón et al. (2011), Rodríguez Bolívar, Alcaide Muñoz, and López Hernández (2013) and others often focus on measuring how transparent the government or organisation is, but not on the individual’s perceptions of information transparency, which is the focus of this study. Prior research such as Eggert and Helm (2003), Humphry and Wong (2009), and Park and Blenkinsopp (2011) attempted to measure transparency as an individual’s perception, but their measurements of transparency were unidimensional. However, Lourenço and Serra (2014) suggested that the transparency concept is complicated and should be examined as a higher-order construct which, so far, has not been researched. In conclusion, there are limitations and inconsistencies when defining and operationalising the concept of information transparency. It, therefore, requires further attention in order to clarify what information transparency is before investigating the role of information transparency in e-Government usage.

1.2.3. The antecedents of information transparency in a computer-mediated environment

With decades of the literature discussing information transparency, this study is not the first concerning what its antecedents are. However, with the tremendous growth of information technologies, most studies focus on the social and political factors such as capitals, budget imbalance, and political ideology (Bushman, Piotroski, & Smith, 2004; Guillamón et al., 2011), and the literature has largely overlooked the factors relating to the technologies that support information transparency, particularly at a time that governments invest more in ICTs. This section will discuss how IT/IS enhances information transparency, and identifies the gaps in the literature.

While, to date, there has been no systematic investigation of the relationship between the factors relating to ICTs and information transparency, a few studies have provided some discussion that sheds a light on the area of investigation. For example, Eggert and Helm (2003), Piotrowski and Borry (2009), Henseler and Fassott (2010), Bannister and Connolly (2011) considered that the technologies and the Internet help to increase transparency by providing easy access to, and publishing large volumes of, information (Bertot, Jaeger, & Grimes, 2010; McIvor, McHugh, & Cadden, 2002; Meijer, 2009). Xavier (2008) states that should the company “publish comparable, adequate and up-to-date information in an easily accessible form and allowing third parties to use publicly available tariffs”, it will increase transparency in price. Armstrong (2011) emphasises the availability of information as the key factor to make government more transparent through e-Government. Further, UN - HABITAT and Transparency International (2004, p. 8) argue that not only access to information but also “timely, relevant, accurate and complete” information are important in promoting transparency. Therefore, characteristics of an information system such as completeness, timeliness, accessibility, reliability, availability, understandability, and relevance of information system quality are considered enablers of information transparency. According to DeLone and McLean (2003), these characteristics are collectively referred to as information quality, system quality, and service quality of an information system and can be considered determinants of information transparency. However, these information system quality antecedents have not, as yet, been empirically examined in relation to information transparency.

1.2.4. The importance of information transparency in citizens' intention to use e-Government

In contrast to the limited empirical attention on the relationships between antecedents and information transparency, several researchers have been studying the outcomes of information transparency, especially in terms of IT adoption behavioural intention. Al-Jabri and Roztocki (2015) found that information transparency is indirectly related to attitude and ERP adoption. Moreno and Molina (2014) examined information transparency in university policies and found that it is significant in the willingness to continue using e-services. In other studies, Eggert and Helm (2003), Miao and Mattila (2007), Dapko (2012), and Liu, Eisingerich, Auh, Merlo, and Chun (2015) explored the role of information transparency in business and found that information transparency has positive significant effects on customers' behavioural intentions.

Particularly in e-Government, the public has had a strong desire for information transparency (Piotrowski & Ryzin, 2007). However, there has been little investigation of the relationship between information transparency and e-Government adoption. The existing literature has been largely focused on IT/IS adoption theories without including contextualised factors of e-Government; so although there are fundamental findings on the use of e-Government services there are no clear explanations about why e-Government is adopted or rejected (Y. Kim & Crowston, 2011; Yildiz, 2007). Indeed, some studies suggest that information transparency may have a strong impact on intention to adopt e-Government since it plays an important role in citizens' perceptions (Dwivedi, Weerakkody, & Janssen, 2012; Venkatesh, Thong, Chan, & Hu, 2016; Warkentin, Gefen, Pavlou, & Rose, 2002).

The success of any information system does not depend on the initial adoption of the system but rather on the extent to which users use the system functions, once they have adopted it, so-called infusion or post-adoption (Scott, DeLone, & Golden, 2015; Shareef, Kumar, Kumar, & Dwivedi, 2011; Zmud & Apple, 1992). E-Government systems have had trillions of dollars invested in developing and maintaining the systems and in providing more services to citizens (United Nations, 2012). However, since the success of the e-Government system depends on how much citizens utilise the services that e-Government offers, the study proposes to investigate three levels of citizens' uses of e-Government. The three levels are: passive use (i.e. searching for general and policy information), active use (i.e. communication and transaction), and participatory use (i.e.

policy consultation and active participation). According to United Nations' reports on world e-Government, citizens often use at a lower level (e.g. searching for information) and not as often at the higher use levels (e.g. active use, participatory use). To ensure the success of e-Government systems it is important to improve the levels of use.

So, does information transparency play an important role in influencing these levels of use? Citizens always want to know about governmental information, processes, decisions and policies. If citizens perceive government as transparent through e-Government, they are more likely to use e-Government to obtain any information they need. When it comes to active use, in order to interact with e-Government, they need to understand the processes, how it works, and who is involved in the steps. Venkatesh et al. (2016) explained that if citizens are able to track the service process, they will be likely to file taxes online and conduct a transaction with e-Government. Hence, it seems that the more interaction required of citizens at each level, the more information transparency they will demand. In regard to participatory use, e-Government can provide a platform of government that offers transparent information and processes which demonstrates democracy and the accountability of government. By disclosing information about the decision- and policy-making process, it gives citizens the opportunity to learn about decisions and policies that will affect their lives. This openness can also allow citizens to have their say and to participate in the processes, either directly or indirectly (Gilley, 2009; Héritier, 2003). Hence, information transparency can encourage public participation in government decision- and policy-making processes (Kolstad & Wiig, 2009). Similarly, other scholars in e-Government suggest that transparency in policy-making is a great tool for government to engage citizens in meaningful and high-quality discussions and to better support a citizen-government partnership for shared governance in policy making (Chun & Cho, 2012; S. Kim & Lee, 2012; Reddick, 2011). In conclusion, information transparency seems to play an important role in all three levels of use. However, whether information transparency has significant effects on each of the three levels of e-Government use requires empirical investigation.

1.2.5. Theoretical Framework - Information System Success Model (ISSM)

The studies of e-Government often use theories from IT/IS adoption, such as Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Theory of Acceptance and Use of Technology (UTAUT), and Diffusion of Innovation Theory (DOI), to examine the determinants of intention to use e-Government (Al-Jabri & Roztock, 2015; Rana,

Dwivedi, & Williams, 2013). However, this study will employ a theory that provides a framework to explain the roles that information transparency has in e-Government uses. Based on the discussion of antecedents and consequences of information transparency, and with the aim of investigating the e-Government success it was associated with, the theory of Information System Success Model (ISSM), proposed by DeLone and McLean (1992), provides a useful framework with which to investigate these relationships for the following reasons.

The original ISSM was designed with six interrelated and interdependent categories of IT/IS success, which are information quality, system quality, information use, user satisfaction, individual impact and organisational impact (DeLone & McLean, 1992). After ten years of development in MIS research, the model was updated and service quality was added as another dimension alongside information quality and system quality (DeLone & McLean, 2003). Aspects of the model have also been used to examine the use of e-Government services (e.g. continued use) (Teo, Srivastava, & Jiang, 2009; Wangpipatwong, Chutimaskul, & Papasratorn, 2008).

In the previous discussion of antecedents of information transparency, information system quality can be a key determinant of information transparency. Further, information transparency is a key antecedent of intention to use e-Government, and it is also a key factor in ISSM theory. Therefore, ISSM theory will be used as a theoretical framework to both frame and investigate the role of information transparency in intention to use e-Government.

1.3. Scope of the study

As previously mentioned, information transparency is broadly multidisciplinary in nature, each discipline offering a unique perspective and understanding of the concept. Thus, this section will define the scope of the concept for this study.

Firstly, in this study, the term ‘transparency’ refers to information transparency and these terms will be used interchangeably. Information transparency in this study has three dimensions which will be explained in depth in Chapter 2. The three dimensions are data transparency, process transparency, and policy transparency. Data transparency includes information about the text, pictures, figures, and statistical reports; process transparency includes information about what steps are taken, who is involved at each step; and policy

transparency includes information about the reasons for final decisions (Bannister & Connolly, 2011).

Secondly, in this study information transparency is viewed and measured from an individual's perspective and so is distinct from an organisation's perspective such as Transparency International, which evaluates the level of transparency from a governmental perspective. In particular, this study emphasises the *citizen's* perception of information transparency through e-Government. Hence, information transparency is associated with the extent to which citizens can observe what is happening within government bodies, and the processes that take place, and what they perceive from e-Government will be reflected in their view of the transparency of government.

Thirdly, this study focuses on the citizens' intention to use e-Government which is categorised as passive use, active use and participatory use. Passive use refers to using e-Government for searching for information (i.e. general information and policy information), active use refers to using e-Government for communication and transactions, and participatory use refers to using e-Government for commenting on policies and government decisions, and proposing agendas. The citizens can engage with government through the uses of e-Government.

Lastly, in assessing these concepts, the study focuses on information transparency and e-Government in the context of New Zealand local government. Transparency International reports that, in the 2014 and 2015 results, New Zealand was ranked among the most transparent countries. New Zealand has 78 local authorities, 11 regional councils, and 67 territorial authorities. One of the priorities of government is to encourage people to engage actively with local government in the making of decisions on local issues, and to hold local government accountable to their community (Anonymous, 2014; Podder, 2013). Previous studies have shown that citizens interact more often with local government, rather than central government, and demand more transparency from local government (Deakins, Dillon, Al Namani, & Zhang, 2010; Piotrowski & Borry, 2009). In addition, citizens have a higher degree of frequency of visiting local e-Government websites than those of other levels of government, e.g. 57% of NZ respondents, 77% of the UK respondents, 90% of Omani respondents, and 93% of Chinese prefer to interact with their local governments through e-Government (Deakins et al., 2010). Given that a priority of government is in encouraging engagement in local government, and the high frequency of interaction with local government, this study focuses on citizens'

perceptions of information transparency in relation to e-Government services at the local level.

1.4. Aims and Research Questions

Despite the importance of understanding the role of information transparency in e-Government uses, the conceptualisation of information transparency is limited and inconsistent. There is also a lack of empirical investigation of the antecedents and outcomes of information transparency regarding e-Government uses. To help reduce this knowledge gap, the intent of this study is (1) to understand the information transparency concept in general and in the e-Government context; (2) to examine the information, system and service qualities that impact information transparency; (3) to examine the impact of information transparency on different levels of e-Government use.

Based on these aims, the following research questions are proposed:

- (1) To what extent do information quality, system quality, and service quality affect information transparency?
- (2) To what extent do information quality, system quality, and service quality affect satisfaction?
- (3) To what extent does information transparency affect intention to use e-Government (i.e. passive use, active use, and participatory use)?
- (4) To what extent does satisfaction affect the intention to use e-Government (i.e. passive use, active use, and participatory use)?

1.5. Methodology

Based on a review of the literature, a research model and twelve hypotheses are proposed. This study will empirically examine the proposed research model to evaluate the determinants of information transparency and the impact of information transparency on the different levels of e-Government use. A survey will be used as the method for data collection. The survey will be conducted in both an online forum and with paper questionnaires. The online social media forums of New Zealand will be selected from the official list published on the New Zealand local government website (<http://www.localcouncils.govt.nz/>). An invitation to take part in this study will be included with the online survey link and distributed on all of the recognised available

forums. The paper survey will be conducted in public places in both Auckland and Christchurch.

Partial least squares (PLS) is the method that will be used in analysing the data and evaluating the research models in this study and will follow the guidelines of PLS analysis by Chin (2010). Specifically, SmartPLS 3.0 will be used for examining the model. After assessing the statistical demographics and the data characteristics, there are two main steps used to analyse the data, which are assessing the measurement models and assessing the structural model. Testing the measurement models includes examining internal consistency, reliability, indicator reliability, and the convergent and discriminant validity of the instrument items. The structural model and hypotheses are assessed by evaluating the path coefficients and coefficient determinants. Path coefficients explain the strength of the relationship between two variables while the coefficient determinants explain the variance, and represent the power of prediction of the dependent variables.

These results will be discussed in relation to the underpinning research questions and the findings will then be compared with the existing literature about information transparency, e-Government adoption, and higher use intention.

1.6. Expected Contributions

The main expected academic and practical contributions will now be outlined. Firstly, the study will contribute to knowledge about the concept of information transparency. Since there is inconsistency when defining information transparency, this study reviews the literature on transparency and identifies a framework for both defining and operationalising the concept. This framework will help researchers and practitioners to understand the concept and to be able to apply it in a consistent manner to any study context. This will enable the building of a systematic and coherent understanding of information transparency and assist in conducting more in-depth investigations.

Secondly, the study can provide better measurement of information transparency. Previous studies have measured this construct as single-dimensional and, according to Lourenço and Serra (2014), information transparency should be evaluated as a higher-order construct; so, because information transparency is contextualised to e-Government, it is, therefore, operationalised with three dimensions for this study (i.e. data transparency, process transparency and policy transparency). These three dimensions contribute to the

main construct and enable the measurement and evaluation of information transparency as a second-order formative measurement model.

Thirdly, the study is the first to justify, examine and validate the antecedents of information transparency in a computer-mediated environment. Characteristics of information quality, system quality and service quality have been discussed conceptually in several studies but, as yet, they have not been examined systematically. These qualities, as determinants of information transparency, will contribute to the IS literature and transparency literature, particularly information transparency in a computer-mediated environment. It will distinguish between information transparency itself and the antecedents to information transparency which, to date, have not been consistently and conceptually separated in earlier research. Having a consistent definition will enable researchers to build a strong and coherent body of knowledge surrounding the concept of information transparency. It will also provide a strong platform for conducting future research on the determinants of information transparency.

Fourthly, the study is a pioneering attempt to examine the three levels of intention to use e-Government (i.e. passive use, active use and participatory use). Different levels of use have been discussed conceptually in many papers (Hiller & Belanger, 2001; Layne & Lee, 2001; Moon, 2002; Siau & Long, 2005). For example, Scott et al. (2015) examined the relationship of satisfaction and net benefits among three groups of users who use e-Government as passive users, active users, and participatory users. However, the study did not report the measurements of the three levels of use. In contrast, this study will provide a set of measurements of the three levels of use intention and prove their reliability and validity. They will then be useful for future research that investigates different levels of e-Government use.

Fifthly, this study will provide a mechanism for understanding the influence of information transparency and satisfaction on each of the three levels of intention to use e-Government. Prior research in information systems and in e-Government has been limited in its empirical investigation about users' intention to use (i.e. passive use, active use, and participatory use). Therefore, this study will address this gap in the literature and contribute to the understanding on the variety of effects of information transparency and satisfaction on the different levels of use.

In addition to the aforementioned contributions, this study expects to expose significant implications for practice in relation to information transparency and higher use. As such,

the implications are not limited to e-Government practices but could also apply to other contexts where information systems are used.

Firstly, the study will provide a definition for a general context and then another one for an e-Government context. These definitions will help governments and organisations understand what information transparency is, and assist them in making appropriate decisions and developing strategies to improve information transparency.

Secondly, information system qualities are suggested as being important for enhancing information transparency in a computer-mediated environment. This contributes to practice by proposing that government and other organisations pay attention to key aspects of information quality, system quality and service quality in order to enhance information transparency. For example, developers could be careful when developing and administering the system to ensure that information is presented in a clear and understandable format for users. However, depending on each system and the context, some qualities (e.g. information comprehensiveness) will be more important than others in regard to information transparency.

Thirdly, this study also contributes to government administration through highlighting the importance of information transparency and satisfaction to encourage citizens to use e-Government at higher levels. UN reports on e-Government have been urging governments to improve citizens' use of e-Government (United Nations, 2012, 2014). This study's findings will provide new insights to help in understanding the impact of information transparency and satisfaction on the three levels of use (i.e. passive use, active use and participatory use). The results will suggest that governments need to consider the role of information transparency and satisfaction in order to improve citizens' use of e-Government. This practical aspect also has implications for other types of information systems.

In conclusion, this study is expected to make a number of contributions to the current knowledge about information transparency and to the understanding of the different levels of use in IS, as well as in e-Government. The study will also provide practical insights for governments and for those organisations that consider the role of information transparency to be central to future goals and strategies.

1.7. Outline of Thesis

This thesis consists of seven chapters. The following gives a brief overview of each chapter.

Chapter 1 begins with the importance and significance of this study. It briefly discusses motivations and gaps in the literature and provides a theoretical background to the study. The aims and research questions are then stated and an explanation provided about the design of the study. Lastly, the expected theoretical and practical contributions to the literature are outlined.

Chapter 2 consists of a broad investigation of the literature on information transparency and e-Government use in order to answer the first research question. A framework is then proposed to be able to operationalise information transparency in general. The framework is then applied to information transparency in an e-Government context to provide a definition of the concept for this study and describe the scope of the study about information transparency, in particular.

Chapter 3 develops the research model and discusses the key theory (ISSM), and its relationship with information transparency that underpins the model. At the same time, this chapter will provide a comprehensive discussion of each hypothesis.

Chapter 4 focuses on the research design and includes the research approach and methodology. Measurements of each construct will be identified. Then a description of the pre-test, pilot study, and how the main survey is conducted, will be given. Partial Least Squares – structural equation modelling (PLS-SEM) technique, will be introduced and then used for analysis of the data.

Chapter 5 discusses the use of SmartPLS software to analyse the measurement models and the research model is part of this chapter. The statistical results of hypothesis and measurement model will then be presented.

Chapter 6 summarises the findings presented in Chapter 5 and discusses the results in relation to the research questions and prior research that was discussed in a review of the literature.

Chapter 7 summarises the thesis and discusses the theoretical and practical contributions that it makes. There is acknowledgment and discussion about the limitations of the study and some guidelines for future research.

2. CHAPTER TWO - LITERATURE REVIEW

2.1. Introduction

The focus of the study is the concept of “information transparency” and, therefore, this chapter’s main purpose is to provide a comprehensive understanding of information transparency. In order to do so, the chapter will give an overview of the literature on transparency and identify the limitations in prior studies regarding the concept. Then the discussion will shape the concept of information transparency based on a framework (i.e. observation, observer, observed). Based on the framework, the study provides the general definition of the information transparency concept and a more specific definition used in this study context. This chapter defines information transparency in e-Government context, and discusses the existing literature on the relationship between information transparency and intention to use e-Government. Lastly, the chapter also identifies possible antecedents and consequences of information transparency for this study context.

2.2. Overview of transparency

Transparency is a popular concept that has been discussed in many walks of life. For this literature review, the main search databases used were Google Scholar, AIS Library, ProQuest and Web of Science. The searches excluded topics related to physics, architecture, chemistry and psychology (visual, optical), because transparency as a term in these fields tends not to be related to information but rather related to subjects such as the texture of fabric, materials, colour or atoms. This study investigates the object of transparency as being “information”, whether it is information about an organisation or personnel, or about processes or results, etc. It is also the reason why this study adopts the term “information transparency”; however, in this section, the term transparency is used interchangeably with the term information transparency. The disciplines that the literature review found in the searches to be relevant to this study include politics, government, e-commerce, information technology, management, finance, accounting, communication and public health. However, this literature on transparency shows inconsistencies and limitations.

Definitions of transparency in the literature were found to be varied and inconsistent. Previous studies of transparency in different areas found similar issues when dealing with the concept (Christensen & Cornelissen, 2015; da Cruz et al., 2015; Dapko, 2012; Horne, 2012; Kaufmann & Bellver, 2005; Schnackenberg & Tomlinson, 2014). Christensen and Cornelissen (2015) recognised transparency as a “growing concern” in business organisations and institutions. Even though it has been mentioned and studied frequently, there is a lack of precision in the use of transparency. Dapko (2012) reviewed the literature on transparency across a number of disciplines (e.g. finance, accounting, management, etc.). She found that the meaning of the term “transparency” is “often inconsistent, sometimes vague, and mostly confused with other constructs”. Similarly, Horne (2012) reported the same findings when reviewing literature about transparency in nursing and health care. He observed that the concept is often associated with “quality, safety, reporting, policy, politics, and patients” and found the existing definitions were not appropriate to his study. Kaufmann and Bellver (2005) discussed transparency in the political market. They stated that there is “no commonly agreed definition of transparency”. da Cruz et al. (2015) investigated the notion of government transparency and found its measurements have limitations such as an assumption of equal weights for all indicators and an inaccurate depiction of the actual level of transparency. These limitations of information transparency conceptualisation, which were briefly discussed above, suggest a further investigation of the concept. Through a broad literature review, this study found the following inconsistencies and limitations that require further attention from scholars.

Firstly, the literature revealed a few different types of transparency such as price transparency, financial transparency, governmental transparency, market transparency, information transparency, trade-off transparency, computer-mediated transparency, firm transparency, and organisational transparency (as described in Table 2.1). Some of these types describe the same objects but use various terms and define them differently. For example, both Zhu (2002) and Ozcelik and Ozdemir (2008) studied “market transparency”, but one names the concept “market transparency” and defines it as the “degree of visibility and accessibility of information” (Zhu, 2002, p. 93), while the other refers to it as “information transparency” and defines it as the “level of current trade information revealed to the public” (Ozcelik & Ozdemir, 2008, p. 2). Despite the differences, both concepts emphasise the idea of visibility and openness of information to describe transparency. Eggert and Helm (2003) and Hultman and Axelsson (2007) both

investigate the role of transparent relationships in business; however Hultman and Axelsson (2007) called it “transparency” and defined it as “the ability to see through and to share information” (p.627), while Eggert and Helm (2003) defined it as “relationship transparency” that is “being informed about the relevant actions and properties of the other party” (p.103).

Secondly, as Table 2.1 shows, even within one type of transparency, there are variances in defining the construct. For example, in a group definition of “firm transparency”, while Vaccaro and Madsen (2006) define the term as “degree of completeness of information”, Dapko (2012) defines it as being “open and forthright” (i.e. letting customers know what is happening). So while the former emphasises the aspect of completeness of information, the other focuses on a very different aspect of information, i.e. openness and candidness of information. The other example is about “governmental transparency”. For example, while Park and Blenkinsopp (2011) and Fenster (2006) emphasised the “openness of information”, Abu-Shanab (2013) defined it as “open communication” and Bauhr and Grimes (2012) focused on “the availability and feasibility of information”.

Thirdly, besides inconsistent definitions among scholars, several studies examined transparency but did not define or describe the construct, which may confuse the audience about what they are investigating (e.g., Florini (2008), Neyland (2007), Bonsón and Flores (2010)). Additionally, there are mismatches between what authors define transparency to be and what they actually investigated when conceptualising or measuring it. Y. Lu et al. (2014) studied how information transparency affects sellers’ revenue in an auction. In their study, transparency is defined according to Zhu (2004) as the “degree of availability and accessibility of market information” (p.670). However, during their experiment, rather than emphasising availability and accessibility, the only term they used to describe transparent information was disclosure and reveal.

Fourthly, the concept of transparency is often aligned with quality constructs, which can confuse scholars during application and investigation of the concept (Dapko, 2012; Horne, 2012; Schnackenberg & Tomlinson, 2014). In the Oxford Dictionary and Thesaurus, transparency is defined as “being transparent, while the root word of transparent is defined as allowing light to pass through; clear and usually colourless; easily seen through; evident; obvious; easily understood; frank; open” (Jewell, 2002, p. 893). Similarly, some scholars define transparency in terms of openness, disclosure, to “look clearly”, and to “see through” (Dapko, 2012; Fenster, 2006; Hultman & Axelsson,

2007; Meijer, 2009; Mol, 2010; R. Oliver, 2004; Park & Blenkinsopp, 2011). However, other scholars relate transparency to quality characteristics such as completeness, adequacy, to be up-to-date, accessibility, timeliness, availability and reliability (Bhaduri & Ha-Brookshire, 2011; Michener & Bersch, 2011; Vaccaro & Madsen, 2006; Vishwanath & Kaufmann, 2001). These quality characteristics, however, are more aligned with aspects of information quality, system quality or service quality (DeLone & McLean, 2003). These enable transparency and do not directly capture the concept due to a lack of explanation of how the quality dimensions are associated with transparency. Many researchers have found it difficult to develop a systematic investigation regarding antecedents and consequences (Schnackenberg & Tomlinson, 2014).

Lastly, due to inconsistencies in conceptualising transparency, the measurements of the concept also face limitations (da Cruz et al., 2015; Lourenço & Serra, 2014; Schnackenberg & Tomlinson, 2014). Often transparency is measured from the perspective of the organisation, like in studies by Transparency International, Guillamón et al. (2011) and Rodríguez Bolívar et al. (2013). These studies measured the degree to which an organisation is transparent. However, this study focuses on the customers' or citizens' perspective, which means how much transparency the customers or citizens perceive through information they received from the organisation. There are very few studies measuring individuals' perceptions of transparency, but the measurements have not been able to cover all aspects of the concept and are often measured as a one-dimensional construct (da Cruz et al., 2015; Lourenço & Serra, 2014). For example, Eggert and Helm (2003) and Humphry and Wong (2009) measured the transparency of a few particular aspects of businesses (e.g. awareness of economic situation; organisational structure; technical abilities; research and development; new technologies; annual reports; and profiles of management staff). Park and Blenkinsopp (2011) provided transparency measurements that were adopted in later studies (S. Kim & Lee, 2012; Medina & Rufín, 2015). Their measurements are transparency in municipal public works projects, the process of municipalities' public works projects, progress and situation of public works projects, and completion of public works projects. They assumed these measurements to have equal weight for all indicators and an inaccurate depiction of the actual level of transparency (da Cruz et al., 2015; Lourenço & Serra, 2014). Also, these measurements captured a first-order reflective model while Lourenço and Serra (2014) suggested that transparency should be treated as a multi-dimensional construct because a

unidimensional construct “may no longer give an accurate picture of the transparency panorama”.

Table 2.1: Types and definitions of transparency in prior empirical studies

Type of transparency	Definition/Description	Reference
Computer-mediated transparency	“Computer-mediated transparency refers to the ability to look clearly through the windows of an institution through the use of computerised systems. Transparency through information technology is a “mediated transparency”.	(Meijer, 2009, p. 259)
Firm transparency	“...the degree of completeness of information, regarding their own business activities, provided by each company to the market, and the related role of ICT.”	(Vaccaro & Madsen, 2006, p. 145)
	“...the extent to which a stakeholder perceives a firm’s conduct is forthright and open regarding matters relevant to the stakeholder.”	(Dapko, 2012, p. 71)
Price transparency	“...to increase price transparency by obliging operators to publish comparable, adequate and up-to-date information in an easily accessible form and allowing third parties to use publicly available tariffs (e.g., for the purpose of selling or making available interactive guides) and national regulatory authorities ((NRAs) to make such guides available when these are not available on the market.”	(Xavier, 2008, pp. 6-7)
	The availability of information allows customers to search prices.	(Trenz & Veit, 2012)
	“the degree to which market participants know the prevailing prices and characteristics or attributes of goods or services on offer”.	(Clemons, 2002); (Soh et al., 2006, p. 706)
	“This type of price transparency provides consumers with the information they need to make an informed care decision.”	(Clarke, 2006)
Financial/fiscal transparency	“Transparency, as defined by the White House, involves the publication of information (in as real-time as possible) that demonstrates fiscal accountability in how, where, when, and by whom, the money is spent.”	(Helbig, Styrin, Canestraro, & Pardo, 2010, p. 61)
	“Disclosure of voluntary and compulsory information...”	(Álvarez, Sánchez, & Domínguez, 2008, p. 599)
	“Fiscal transparency requires the disclosure of all relevant fiscal information in a timely and systematic manner.”	(Matheson, 2002); (Guillamón et al., 2011, p. 391)
Market transparency	“Market transparency, in its most succinct form, refers to the level of current trade information revealed to the public by market makers.”	(Ozcelik & Ozdemir, 2008, p. 2)

Governmental transparency	“Transparency is the availability of information about an organization or actor allowing external actors to monitor the internal workings or performance of that organization.”	(Grimmelikhuijsen, 2010, 2011; 2012a, p. 55)
	“Transparency is generally defined as the open flow of information.”	(Park & Blenkinsopp, 2011, p. 256)
	“We therefore define transparency as the availability of, and feasibility for actors both internal and external to state operations to access and disseminate information relevant to evaluating institutions, both in terms of rules, operations as well as outcomes.”	(Bauhr & Grimes, 2012, p. 5)
	Transparency is roughly defined as “ disclosure of information.”	(Mol, 2010, p. 132)
	Governmental transparency is “defined broadly as a governing institution’s openness to the gaze of others.” “I use ‘transparency’ to refer to the openness of the federal and state executive branches to the public.”	(Fenster, 2006, p. 888)
	Governmental transparency refers to “the ability to find out what is going on inside government.”	(Piotrowski & Borry, 2009, p. 398)
	“Transparency is the open communication between citizens and governments.”	(Abu-Shanab, 2013, p. 85)
Information transparency	“Information transparency is the degree of visibility and accessibility of information.”	(Granados, Gupta, & Kauffman, 2010, p. 209; Y. Lu et al., 2014, p. 1; Schilhavy & Iyer, 2007, p. 3; Zhu, 2002, p. 93; 2004, p. 670)
	“Information transparency is the degree of availability and accessibility of information.”	
	“The five dimensions of transparency as access, comprehensiveness, relevance, quality, and reliability of information in the areas of banking/accounting policies.”	(Bhaduri & Ha-Brookshire, 2011, p. 137; Vishwanath & Kaufmann, 2001, p. 42)
	“Two broad principles – stewardship and usefulness – help simplify and balance the many considerations that are necessary to achieve greater government transparency and to realize the potential public value of government information.”	(Dawes, 2010, p. 382)
	“Information transparency as a transparency continuum that is a function of degree of information sufficiency and the degree of information diagnosticity ”.	(Miao & Mattila, 2007, p. 532)

	“By information transparency features we mean features that give consumers access to the information a firm has collected about them, and how that information is going to be used.”	(Awad & Krishnan, 2006, p. 14)
	“Information transparency is about the willingness of e-service marketers in providing service and company information to their customers.”	(Van Riel et al., 2001; (Humphry & Wong, 2009, p. 156)
	“Information transparency is reached when internal decision makers receive, at their desktop, the internal and external information necessary to make sound business decisions.”	(McManus, Holtzman, Lazarus, Anderberg, & Simon, 2006, p. 1029)
Trade-off transparency	“Trade-off transparency is clearly visible to online consumers, as it conveys the values of product attributes and the relationships among the product attributes, merchandising information that can influence users’ cognition and directly facilitate the shopping goal attainment.”	(Eroglu et al. 2003; Parboteeah et al. 2009; (Xu, Benbasat, & Cenfetelli, 2014, p. 382)
Organisational transparency	“...making information available is insufficient form of transparency for democratic decision making”.	(Neyland, 2007, p. 502)
Information sharing transparency	“Transparency of information sharing relationship refers to ‘what’ information is shared: production information, customer information, financial information, marketing and promotion information etc.”	(Krishnan, Kumar, & Dakshinamoorthy, 2007, p. 3)
Transparency regimes	“The witnessability of activities—the laying open of activities in a public forum—lies at the heart of what we call a transparency regime.”	(Knorr & Urs, 2001, p. 184)
Relationship transparency	“Relationship transparency can be defined as an individual’s subjective perception of being informed about the relevant actions and properties of the other party in the interaction.”	(Eggert & Helm, 2003, p. 103)
Internal and external transparency	“We define internal transparency to be an outcome of communication behaviours within an organization that reflects the degree to which employees have access to the information requisite for their responsibilities”	(Christopher & Darren, 2004)
Transparency	“Transparency is defined as the ability to see through and to share information that is not usually shared between two business partners.”	(Hultman & Axelsson, 2007, p. 627)
	Disclosing information.	(R. Oliver, 2004, pp. 3-4)
	“The U.S. Department of Health and Human Services defines transparency as a consumer comparison, between health care cost and health care quality, to make	(Ryan, Doster, Daily, & Lewis, 2011, p. 2)

	informed choices among clinicians and hospitals based on value (USDHHS, 2006)."	
	"Transparency, which is about explaining to the user why a recommendation is made, allows understanding the nature of a recommendation."	(Radmacher, 2008, p. 1)
	"Transparency is defined as the level in which the information that is available for external persons enables them to be informed about the decision-making process and assess the decisions made."	(Moreno & Molina, 2014, p. 2084)
	"The concept of transparency is linked to openness and is described as being both a relational characteristic as well as an environmental condition for organizational processes."	(McManus, Holtzman, Lazarus, Anderberg, & Jahansoozi, 2006, p. 943)
	"the opposite of secrecy ".	(Florini, 1998, p. 50; Gupta, 2010, p. 1)
	"The more available information and openness of decision-making, the more transparent the government entity is."	(Armstrong, 2011, p. 12)
	"There are many definitions of transparency but all of them hold the role of information accessibility at their core."	(Sol, 2013, p. 90)
	"Transparency is defined as visibility and accessibility of information especially concerning business practices."	(Bhaduri & Ha-Brookshire, 2011, p. 136)
	"Transparency initiatives in service delivery are relatively easy to define: any attempts (by states or citizens) to place information or processes that were previously opaque in the public domain, accessible for use by citizen groups, providers or policy makers."	(Joshi, 2013, p. 3)
	"Transparency is synonymous with open decision-making by governments."	(Ball, 2009, p. 293)
	"Transparency is the quality of having open information to the public."	(Cappelli, Cunha, Gonzalez-Baixauli, & Sampaio do Prado Leite, 2010, p. 298)
	"Transparency refers to the accessibility of the processes involved in decision making in addition to the outcome and to information itself."	(Mahoney & Webley, 2004, p. 4)
	"Transparency—the act of being open and honest about all things".	(Baum, 2005, p. 41)

	“Kaufmann and Kraay (2002) define transparency as the increased flow of timely and reliable economic, social, and political information, accessible to all relevant stakeholders.”	(Sol, 2013, p. 90)
	“Transparency as a political project typically expresses aims to enable effective participation in the policy process itself by means of effective access to the deliberative process and voice within it.”	(Whyte & Macintosh, 2001, p. 188)
	“Transparency is defined as the publicity of all the acts of government and its representatives to provide civil society with relevant information in a complete , timely , and easily accessible manner (e.g. online).”	(da Cruz et al., 2015, p. 7)
	“These original meanings bring us two dimensions of ‘transparency,’ visibility and inferability , which represent the degree to which information is complete and easily located (visible), and the extent to which it is usable and verifiable (inferable).”	(Michener & Bersch, 2011, p. 8)
	“Transparency satisfaction was operationalised as the level of “ reliability of the information provided by government websites.”	(Welch & Hinnant, 2003)
	“Transparency is defined as the extent to which the organisation provides relevant , timely and reliable information, in written and verbal form, to investors, regulators, and market intermediaries.”	(C. C. Williams, 2005, p. 361)

Note: the characteristics of transparency in the definitions are bold.

Besides the drawbacks in conceptualising transparency, there are a limited number of empirical studies on the antecedents and consequences of transparency as seen in Appendix 4. Although many antecedents and consequences have been discussed in conceptual studies, it would additionally be helpful to investigate and examine empirically the factors that relate to transparency. The synthesis in Appendix 4 further demonstrates that the existing literature focuses more on consequences of transparency than on the antecedents of transparency. The dominant dependent variables of transparency identified in conceptual and empirical studies include trust, accountability, corruption, satisfaction, and attitude/intention/behaviour (Ball, 2009; Bertot, Jaeger, & Grimes, 2010; Bhaduri & Ha-Brookshire, 2011; Dapko, 2012; Grimmlikhuijsen & Meijer, 2011; Joshi, 2013). Study domains include government, politics and e-commerce (e.g. marketing, supply chain).

Meanwhile, the key conceptual and empirical studies on independent variables of transparency focus on financial characteristics and political aspects. For example, political ideology, taxes and characteristics of the population have been shown to influence financial information transparency (Guillamón et al., 2011; Rodríguez Bolívar et al., 2013). In a study of a university's information transparency, key antecedents included complexity, internationality and profitability (Álvarez, Sánchez, & Domínguez, 2011). Some studies have also been concerned with the negative influence of privacy on transparency, which consequently reduces customers' intentions to reveal their identity or personal information (Awad & Krishnan, 2006; Bhaduri & Ha-Brookshire, 2011; Vaccaro & Madsen, 2006).

Although some antecedents of transparency were empirically examined such as demographics, political competition, number of habitants, they are very much context driven and most are unrelated to the IT/IS environment. However, this study focuses on information systems and technologies; therefore, its objective is to investigate the factors which are relevant to the information technology environment. There are arguments that the quality of the technological system (e.g. availability, accessibility) or services (e.g. responsiveness) may affect transparency (Miao & Mattila, 2007; Turilli & Floridi, 2009). However, those characteristics are often described in mixed discussions that confuse the definition of transparency and enablers of transparency. For example, while some define transparency as "the degree of availability and accessibility of information" (Schilhavy & Iyer, 2007; Zhu, 2002), Turilli and Floridi (2009) argue that the availability of information and the accessibility of the system enable transparency. Therefore, further

investigation and clarification of the impacts of information system qualities on transparency are needed.

The outcomes of transparency have also been referred to as a double-edged sword, which means that transparency can lead to negative as well as positive consequences. For example, it cannot be denied that a transparent government can reduce corruption, or increase trust and satisfaction with government (Park & Blenkinsopp, 2011). Likewise, a firm will gain more trust from customers for their products, and increase their sales and revenue by being transparent (Dapko, 2012). However, researchers also argue that the type of information and how much information is disclosed can lead to negative consequences such as losing trust (O'Neill, 2002), reducing auction price (Y. Lu et al., 2014), exposing privacy (Awad & Krishnan, 2006), and even creating wars (Finel & Lord, 1999). The effects of transparency, whether positive or negative, therefore depend on the situation, context, degree of information disclosure, types of information provided and how receivers perceive transparency.

According to Appendix 4, among the various empirical studies on outcomes of transparency, the e-commerce literature contributes the most empirical investigations using quantitative methods and mixed methods compared with other fields. While the government literature seems to talk often about transparency, there are only a few empirical studies published. For example, Park and Blenkinsopp (2011) studied the roles of transparency and trust in the relationship between governmental corruption and citizens' satisfaction with public services. Transparency and trust functioned as a moderator and mediator, respectively, in decreasing corruption and enhancing citizen satisfaction. S. Kim and Lee (2012) also investigated the role of transparency in South Korea (Seoul Metropolitan Government) and found that if citizens are satisfied with the policy participation through e-Government, they are more likely to assess the government as being transparent. Perceptions of transparency have been shown to have positive impacts on trust in government. For example, Grimmelikhuijsen (2012b) investigated the relationship between transparency and trust in government. His thesis found that transparency in the decision-making process has negative effects on competence, but has positive effects on perceived honesty of the government. Song and Lee (2016) studied the relationships between the use of government social media, perceived transparency and trust in government. Their findings revealed that citizens' use of government social media increases the perceived transparency and through transparency improves trust in government. Venkatesh et al. (2016) investigated transparency as mediators and

moderators of the effects of information quality on intentions to use e-Government. Throughout the examples of transparency studies in e-Government, there are two limitations: the lack of empirical studies on the role of transparency especially in e-Government, and the absence of theories and frameworks that underpin studies of transparency.

In conclusion, the literature review on transparency illustrates three main limitations. They are 1) inconsistent and limited conceptualisation of the concept of transparency; 2) lack of empirical investigation of the antecedents and consequences of transparency, including consideration of the factors relating to computer-mediated environment; and 3) inconsistent frameworks and lack of theories to drive studies of transparency. Next the discussion will seek to synthesise the findings from the literature and offer a conceptualisation of information transparency and its dimensions to underpin this study of information transparency.

2.3. Conceptualising information transparency

As discussed in the previous sections, the lack of a consistent and clear definition and conceptualisation of information transparency are key limitations of the prior literature. Therefore, this section focuses on defining and conceptualising the key term. Being aware of the different types of transparency (as noted in Table 2.1), this study focuses on the concept of information transparency as a type of transparency that identifies the key object of transparency as information. In this study, information transparency is used as a general term that describes the object of transparency as information relating to the context of study (e.g. market, government, organisation, or supply chain) and sometimes used interchangeably with the term transparency. This section also aims to define a concept framework of information transparency for the general context. Based on this framework, the study will apply the concept framework to the understanding of an e-Government context in order to scope the study as well as hone the concept of information transparency within the specific context.

There are a few frameworks that conceptualise information transparency in the literature. For example, Hultman and Axelsson (2007) studied transparency in marketing management literature and developed a framework with four components of information transparency. These included (1) types of transparency (technological, organisational, supply, cost); (2) degree of transparency (high, low); (3) direction of transparency (uni-directional, bi-directional, up-stream, down-stream); and (4) distribution of transparency (direct, indirect, horizontal, vertical). Types of transparency describe the information that is exchanged between a buyer and supplier or within an organisation. For example, cost transparency refers to “information on costs as well as prices and their flows”; and supply transparency refers to the “flows of products and materials between the buying firm and the supplying firm”. The degree of transparency can be completely transparent, translucent in some aspects, partially shared (opaque), or none of information being shared at all. The direction refers to the relationship between the buyer and the supplier. The distribution of transparency refers to the focal relationship (direct) or to a relationship that is connected (indirect) to the focal relationship.

Granados et al. (2010) developed a framework that provided an understanding of transparency in the marketing context. Their framework addresses which party discloses the information, which party receives the information, what information is being disclosed, and what describes the information as transparent. The party that provides

information can be any type of organisation (e.g. a business, non-profit organisation, consumer association or government entity). The recipients of information can be customers (B2C), citizens (G2C), government entities (G2G), or business (B2B). Referring to the question of what information is being disclosed, it could be information about the prices, product characteristics and quality, inventory available, cost of production and distribution, or transaction details. The action to make information transparent also can be related to the degree of transparency, which can be transparent, distorted, biased, or opaque.

R. Oliver (2004) has a similar approach to Granados et al. (2010). Oliver provided an approach to define information transparency that identifies three main components (i.e. the observer, the observed, and the observation). His book describes transparency as an observation between two parties: the observer and the observed. It identifies actions as sharing information or letting information be open. The observer refers to who is observing the transparency or receiving the information from the observed. The observed refers to who is observed by the observer and shares the information with the other party (i.e. the observer). I found his method of conceptualising transparency to be similar to the panoptical metaphor. Panopticon is an architectural design from the 18th century that allows people on the top of a building to watch other people (Wikipedia). Information transparency can be similarly understood as someone who is watching (the observer) others (the observed) doing “something” (the observation). However, the panopticon allows the observer to watch others without the observed being aware of being watched, hence the observed is not able also to watch the observer. Therefore, the panoptical metaphor describes only one dimension or direction of information transparency (downward) and an inactive observation of information transparency. However, the information transparency concept is much more complicated than that of a one-way observation.

In summary, the approach and frameworks of R. Oliver (2004), Granados et al. (2010), and Hultman and Axelsson (2007) together provide a more comprehensive understanding of the information transparency concept. Hence, this study will combine and apply these frameworks in proposing a concept framework of information transparency (as shown in Figure 2.1). This framework of information transparency can apply to any context. Particularly in this study, this framework is applied to the e-Government context in order to provide a clear scope of what information transparency is in the e-Government context.

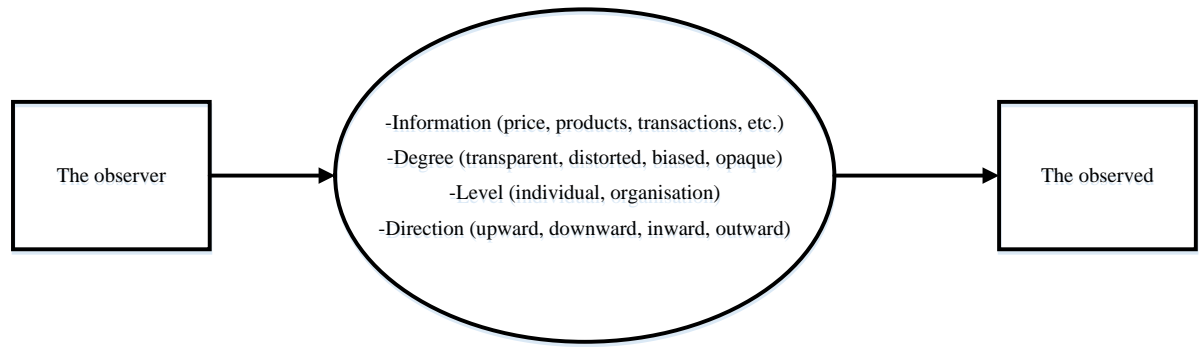


Figure 2.1: Information transparency framework

2.3.1. Who is watching and who is being watched?

The definition of information transparency has changed over time (R. Oliver, 2004). Since the emergence of the Internet and information technologies, a new era of communication, with the right to information and the right to know, has become easier to enable than ever before. Meijer (2009) discussed modern transparency as computer-mediated transparency. He argued that transparency is no longer face to face and confined to traditional ways to inform, share or provide information. Nowadays it has changed with enabling technologies like websites, forums, social media, email, etc. The one-way communication has changed to two-way or bi-directional such that the observer and the observed may have equal access to information. The two parties, which are the observer and the observed, can vary according to context, as do the dimensions and degree of information transparency. In terms of context, for example, the observed and the observer can be patients and doctors/clinic services (in health care); business partners (in supply chain, market); governments and citizens (in government, politics); stakeholders within an organisation or across organisations and outsiders (in business); firms and market participants/customers (in commerce); or individuals (e.g. relationships). Therefore, the observer and observed parties of information transparency can be categorised into two levels, the individual and the organisation, and their relationships can be described (see Table 2.2). At this stage, these relationships describe the observer and observed in a general context, and not with the context of technology or e-Government.

Table 2.2: The relationships between the observer and the observed

The observer	The observed
Individual	Individual
Individual	Organisation
Organisation	Individual
Organisation	Organisation

As can be seen, the roles of the observer and the observed can be interchanged. It depends on whose perspective you are studying. A business (organisation) can be observed by customers (individuals) as regards, for example, how their products are made, or whether they are green products. Customers (individuals) can be observed by a firm (organisation) as regards for example, the transactions that customers make with firms, and tracking personal information, etc. Individuals can also observe other individuals (e.g. participants in a forum) and organisations can observe each other (e.g. partners of organisation or supply chain). Heald (2006) also described four *directions* of information transparency: inward, downward, outward, and upward (p.27-28).

- “Transparency *upwards* can be conceived of in terms of hierarchical relationships or principal–agent analysis which underlies much of economic modelling. Transparency upwards means that the hierarchical superior or principal can observe the conduct, behaviour, and/or ‘results’ of the hierarchical subordinate or agent.
- Transparency *downwards* describes when the ‘ruled’ can observe the conduct, behaviour, and/or ‘results’ of their ‘rulers’. The rights of the ruled in relationship to their rulers figure prominently in democratic theory and practice, often under the umbrella of ‘accountability’.
- Transparency *outwards* occurs when a hierarchical subordinate or agent can observe what is happening ‘outside’ the organization. The ability to see outside is fundamental to an organization’s capacity to understand its habitat and to monitor the behaviour of its peers and/or competitors.
- Transparency *inwards* is when those outside can observe what is going on inside the organization.”

Christopher and Darren (2004) also discussed internal and external dimensions of information transparency. The external dimension refers to the direction of the information flow from inside the organisation to outside the organisation; the internal dimension refers to the flow of exchange of information within the organisation. They are

correspondences for organisation – organisation and individual – individual (employees), respectively. This dimension can also be referred to as inward and downward/upward. Information transparency has different meanings in different contexts (Horne, 2012). However, it is only different in relation to who the observer and the observed are; what information is being exchanged; and in what direction the observation is. Otherwise, the meaning of information transparency would be unchanged. Therefore, it is important to define the observer-observed relationship and the direction of the observation when defining information transparency.

2.3.2. What is observed?

Among many types of transparency studied in government and business fields, the object of investigation is consistently *information*. For example, the concept of firm transparency describes information about a firm/company (Dapko, 2012; Vaccaro & Madsen, 2006). Price transparency refers to information about “prices and characteristics or attributes of goods or services on offer” (Soh et al., 2006, p. 706). Financial transparency is about fiscal information (Guillamón et al., 2011). Market transparency is about “current trade information” on the market (Ozcelik & Ozdemir, 2008). Governmental transparency and organisational transparency are similar because they target information about the organisation or institution (Bauhr & Grimes, 2012; Neyland, 2007). Others mention “information in the areas of banking/accounting policies” (Vishwanath & Kaufmann, 2001, p. 42); “service and company information” (Humphry & Wong, 2009, p. 156); “the values of product attributes and the relationships among the product attributes, merchandising information” (Xu et al., 2014, p. 382); “the relevant actions and properties of the other party in the interaction” (Eggert & Helm, 2003); information about a “decision-making process” (Moreno & Molina, 2014); and “information especially concerning business practices” (Bhaduri & Ha-Brookshire, 2011). In different contexts and studies, information can be specified accordingly. Irrespective of what scholars refer to as transparency or how they define it, *information* is often the main object and the only *good* that transparency delivers. To make it more explicit that information is the main object that is delivered, this study adopts the term *information transparency* to identify the concept and object of transparency as it pertains to the context of this study.

The degree of information being disclosed has also been discussed in previous studies. There are two streams in this discussion. One describes the degree of information

transparency as high and low (Bannister & Connolly, 2011; Hultman & Axelsson, 2007). When the information being disclosed ranges from absolute to some aspects this is called a “high degree” of information transparency while, if information is not being disclosed at all, this is called a “low degree” of information transparency. However, between “some” and “absolute”, the extent of disclosure can be classified into different levels of transparency, which are described in other streams of research (Granados et al., 2010; Ozcelik & Ozdemir, 2008).

The second stream of discussion describes the degree of information transparency in terms of levels of transparency. For example, Ozcelik and Ozdemir (2008) refer to three levels of information transparency (i.e. opaque, semi-transparent, transparent), while Granados et al. (2010) refers to four levels (transparent, distorted, biased and opaque). In the three-level description in Ozcelik and Ozdemir (2008), *opaque* refers to when sellers only see information about their own transactions; *semi-transparency* refers to when sellers see price and trader identity for every transaction; while *transparent* refers to when sellers see the price, quantity and trader identity for every transaction. In order to illustrate and distinguish the four levels, Granados et al. (2010) define two types of information (i.e. product and price). For example, if all information is disclosed between two sellers in a market, it is referred to as *transparent*. If information is distorted (from not being truly presented) without being completely concealed, it is called *distorted*. *Biased* is when information about one seller is revealed but information about the other is concealed. When none of the information is disclosed, this is referred to as *opaque*. This approach can potentially provide greater insights into the types of information disclosed and who the parties are; however, it does not identify the direction of information transparency (i.e. which party discloses the information). Overall, these streams of literature do not provide sufficiently comprehensive frameworks for examining the degree of information transparency. While defining the degree of information transparency is not a key objective or goal of this research, defining the types of information disclosed and the parties involved may help improve prior models and inform the current study.

2.3.3. How to observe?

The definitions of information transparency in Table 2.1 collectively show that the verbs in each sentence refer to actions related to information transparency such as “publish, provide, reveal, access, find out, make, open, see through, share, inform, explain, allow, know, perceive, to be”. Even though they describe different actions linked to observation,

they have in common the characteristic of *voluntariness* of action (Etzioni, 2010). The *Oxford English Dictionary* defines the origin of the word “transparent” as coming from the Latin term “transporter” meaning to appear through or to shine through (Jewell, 2002, p. 893). The term “see through” in the definition by Hultman and Axelsson (2007) is similar to the dictionary’s definition in terms of the ability to see, i.e. visibility. Verbs such as “publish”, “reveal”, “open”, “share”, “inform”, “allow” and “provide” refer more specifically to making information open and to the act of disclosure, i.e. what information transparency is. Meanwhile, words such as “access” and “find out” are more related to how such information is made transparent. For example, in the ICT literature these latter terms often refer to the quality of the systems or technologies that support information transparency rather than describe aspects of information transparency itself.

The literature shows that information transparency is described using a mix of terms such as visibility, availability, accessibility, openness, disclosure, completeness, forthrightness, comparability, sufficiency, comprehensiveness, reliability, relevance, timeliness, usefulness, and being up-to-date (Miao & Mattila, 2007; Michener & Bersch, 2011; Vaccaro & Madsen, 2006; Vishwanath & Kaufmann, 2001). As discussed previously, however, it is the characteristics of *openness*, *visibility* and *disclosure* that more specifically describe the concept of information transparency (Heald, 2006) while others (e.g. accessibility, availability, relevance, timeliness, completeness) are more often used to describe qualities of information (e.g. relevance, completeness, etc.), of the system (e.g. the technologies themselves) and supporting services that enable information transparency. As such, these characteristics are recognised in this study as important enablers of information transparency, that is, characteristics of information quality, system quality, and service quality (DeLone & McLean, 2003). These enablers will be discussed in detail later on in the section on antecedents of information transparency.

2.3.4. Definition of information transparency

After discussing the three components in defining information transparency, i.e. observer, observed, and observation, this study offers the following definition:

Information transparency is defined as the openness, and visibility of information that the observed discloses to the observer.

2.4. E-Government

This study focuses on examining the role of information transparency in e-Government. Therefore, understanding the context will help to conceptualise information transparency and further investigate its roles in the context. The following discussion will describe what e-Government is and what e-Government use levels are. Following this and based on the literature and knowledge of the context, a definition of information transparency in e-Government is proposed.

2.4.1. Definition and background

The Internet and information communication technologies (ICTs) have the known advantage of delivering information more easily and faster; reducing costs of citizen engagement with governments; and improving interactions globally and collectively (Vicente & Novo, 2014). Governments all over the world have been adopting these technologies as part of a revolution of public administration called e-Government. Thus, we have the rapid emergence of e-Government, which refers to the use of ICTs to disseminate information to the public, provide several governmental functions and handle public administration processes (UN - HABITAT & Transparency International, 2004). Straub, Boudreau, and Gefen (2004) identified relationships in e-Government, such as government to government (G2G), government to citizens (G2C), government to business (G2B), government to civil society organisation (G2SC), and citizen to citizen (C2C). In each relationship, the purpose of services of e-Government is different. For example, the role of e-Government in G2G provides services that can work vertically (e.g. between different federal agencies) and horizontally between the components of government (e.g. among federal, state, local agencies). On the other hand, in a G2C relationship, e-Government enables the provision of government information and services to citizens including responses to individual requests for information, supporting two-way communication between a government body and its citizens (Hiller & Belanger, 2001).

E-Government has been described as a good tool for public administration, with governments investing trillions of dollars in developing and maintaining these systems (Bertot, Jaeger, & Grimes, 2010; United Nations, 2014). Therefore, the sustainability of the e-Government system is a key issue that requires attention (United Nations, 2012; Yildiz, 2007). In order to identify, monitor and benchmark the progress of e-Government development, scholars have proposed maturity models of e-Government (Podder, 2013).

The development of e-Government has been described as five stages including information dissemination, interaction, transaction, transformation, and political participation (Hiller & Belanger, 2001; Moon, 2002; Siau & Long, 2005). The first stage of e-Government development delivers static and basic information through websites (Layne & Lee, 2001). The interaction stage provides basic engines and email systems, including requests and responses between governments and users (Siau & Long, 2005). The transaction stage enables individuals and businesses to conduct online transactions with governments (e.g. licence applications, tax filing) (Moon, 2002; Siau & Long, 2005). The transformation stage integrates separate systems at different levels (vertical) and across different departments (horizontal) (Layne & Lee, 2001; Moon, 2002). The last stage, which is political participation, offers tools to support citizens' involvement in policy- and decision-making processes (Feeney & Welch, 2012; Hiller & Belanger, 2001). This stage is largely covered by a stream of literature in e-Government that is concerned with e-Participation.

2.4.2. E-Government use levels

The maturity model of e-Government with five stages is designed for governments to keep track of the progress of e-Government development. However, regarding the G2C relationship, the development of e-Government is evaluated by assessing the usage of e-Government by citizens. While e-Government offers services to citizens and businesses through four stages (information dissemination, interaction, transactions and participation), the citizens' uses of e-Government refer to the similar categories. Citizens are able to use e-Government to obtain services such as information searches, online government communications (e.g. queries, emails), transactions (e.g. e-filing, licence registration), and participate in policy and decision-making (i.e. searching for policy information, consultation and active participation with government). However, the integration stage is not applicable to the G2C relationship since the services at this stage are focused on interactions between governmental employees and governmental bodies. Therefore, the levels of citizens' e-Government use will largely focus on searching for information, communications, transactions and participation with e-Government. In order to group these interactions into more concise categories, Scott et al. (2015) proposed three levels of use, namely passive use (i.e. searching for information), active use (i.e. communication and transactions), and participatory use (i.e. consultation with citizens on policies and government decisions).

Regarding participatory use, there is a body of e-Government literature focused on discussing political participation through e-Government. The literature refers to participation in policy and in the decision making process through e-Government as e-Participation (OECD, 2001). Citizen participation or public participation has been described as "any voluntary action by citizens more or less directly aimed at influencing the management of collective affairs and public decision-making" (Verba, Schlozman, & Brady, 1995). Once citizens are involved in the process of decision-making, they can provide input and influence decision-making by their opinions and presence (Feeney & Welch, 2012). Yet, they will still depend on government officials at a certain level for decision outcomes (Woodford & Preston, 2013). Simple approaches to defining participation suggest that the interaction allows for the public's concerns, needs and values to be imposed on decision-making (Creighton, 2005). Overall, Tambouris, Liotas, and Tarabanis (2007) concluded that participation aims for "better decisions which affect

the life of citizens”. Sæbø, Rose, and Flak (2008) identified e-Participation as “ICT-supported participation in processes involved in government and governance”.

According to the OECD (2001), online participation involves three levels: information seeking, consultation and active participation. The information stage refers to a one-way relationship in which governments produce and deliver information for use by their citizens. It covers “passive” access to information upon demand by citizens (OECD, 2001, p. 3). The consultation stage refers to citizens providing feedback to governments on decisions or policies. Governments define the issues for consultation, set the questions and manage the process, while citizens are invited to contribute their views and opinions (OECD, 2001, p. 23). The active participation stage refers to a relationship based on partnership with government in which citizens actively use e-Government in defining the process and content of policy-making. It acknowledges equal standing for citizens in setting the agenda, proposing policy options and shaping the policy dialogue – although the responsibility for the final decision or policy formulation rests with government (OECD, 2001, p. 23).

In this study, the focus on citizens’ uses of e-Government will be considered to have three levels similar to those described by the OECD (2001) and Scott et al. (2015). They are (1) passive use, which includes searching for general information and searching for policy information (from e-Participation); (2) active use, which includes communication and transactions; and (3) participatory use, which includes consultation and active participation in policy and decision-making.

2.4.2.1. *Passive use*

The first stage of citizens’ use of e-Government involves looking for information related to governments. Providing information represents the most basic form of services of e-Government. It is essential for citizens to have free and ready access to general information regarding rates; property valuations; properties; building and resource consents; food, liquor, animal and health licensing; street permits; libraries; parks; community halls; cemeteries; waste and recycling; pets and diseases; storm water; or policy information such as council plans and strategies; policies and annual reports; political meeting details; agendas; and meeting minutes.

2.4.2.2. *Active use*

In the second stage, e-Government provides online services for citizens to be able to have two-way communication with the government as well as conduct online transactions.

Communication allows citizens to query the government, request services or submit complaints through online forms or through emails. These could be about incidents, such as the leaking of water pipes in residential areas, broken traffic signs, requests for rubbish collection, or booking leisure centres, etc. This level of e-Government use also allows citizens to pay taxes, fines, rates or fees electronically through government websites. In New Zealand, the common services include licence applications, pet registrations, and tax-filing.

2.4.2.3. Participatory use

At this stage, citizens are highly involved in decision- and policy-making processes. Here e-Government provides online forums or online surveys and opinions polls for citizens to participate and give comments on policies or government decisions. Even further, citizens can submit petitions or propose agendas for governments to consider. However, governments still make the final decisions.

2.4.3. Definition of information transparency in e-Government

Applying the framework of information transparency from Figure 2.1 to the current understanding of e-Government use levels above, I further define each component of information transparency (i.e. observer, observed and what is observed). Firstly, the actors of the observation depend on the context and the purpose of the study. This study focuses on the G2C relationship; therefore, the citizens (as *individuals*) are the observers who interact with e-Government (e.g. searching for information); and the government (as the *organisation*) is the observed, which plays the role as initiator and publisher of information (Medaglia, 2012; Sæbø et al., 2008).

Secondly, the study's objective is to investigate the citizens' perception of e-Government uses. Thus, the *observer* and the *observed* in the information transparency definition are the citizens and the government, respectively. The *direction* between citizens and government in their participation is referred to as *inward*, which refers to when citizens can observe what is going on inside the government organisation during their participation in the decision- and policy-making process (Grimmelikhuijsen, 2011; Hood & Heald, 2006; Piotrowski & Ryzin, 2007).

What is the *information* that citizens want to know from their usage of e-Government? Bannister and Connolly (2011) proposed three dimensions: *data*, *process* and *policy*. These three dimensions are relevant to each of the three stages of e-Government use. *Data*

refers to the data, figures and reports of government. At the first stage, citizens passively use e-Government in acquiring basic static information related to the government. This is the main foundation for later stages when citizens get involved at higher levels of use. If the data is not transparent, it is not likely that citizens can have the access needed to query or comment on policies. *Process* refers to steps in a process, which includes information about what steps are taken, who is involved in each step and what opinions or discussions are used for each step. This kind of information is very much relevant to support citizens' use at higher levels such as active use and participatory use. For example, if citizens want to register their pets, they need to know what steps they have to take, what documents they need to complete, how long the process takes, and who or which department or office handles their application. The third dimension is *policy*, which refers to the rationale for final decisions. This information is relevant mostly for participatory use. Here, citizens want to know what the decisions or policies of government are, and whether their comments and proposals are taken into account in the reasoning behind government decisions and policies.

In conclusion, drawing on the information transparency framework (in figure 2.1), ***information transparency in an e-Government context*** is defined as the openness, and visibility of information about data, process, and policy that the government discloses to citizens through e-Government.

2.5. Antecedents of information transparency

The previous section discussed what information transparency is in the context of the study. So, this section will now discuss what factors influence information transparency in e-Government, which involves the use of ICTs in order to provide information and deliver governmental services. In this environment, information transparency depends heavily on the quality of the information technology that supports it. Besides the information product itself, this includes the technological system and the services that it supports. Thus, antecedents of information transparency in the ICT context may differ from those identified in other studies that focus on a non-technological environment.

In prior literature, some studies empirically investigated determinants of financial information transparency (fiscal transparency) as described in Table 2.3. A number of studies focusing on financial transparency in local government found that socio-demographic, institutional, fiscal and economic factors often are associated with the level

of transparency. Other factors include population, political ideology, debts and financial condition (Guillamón et al., 2011; Piotrowski & Ryzin, 2007; Sol, 2013). Deimel, Frentrup, and Theuvsen (2008) studied the determinants of transparency in a food supply chain (in Germany) and found that transaction characteristics, the transaction process, transactors' behaviour and relationship quality significantly affect the level of transparency. Other studies like Dapko (2012) on firm transparency, Álvarez et al. (2011) on transparency in a university, and Awad and Krishnan (2006) on information transparency found that perceived firm reciprocity, customer effort, negative information, complexity of the organisation, internationality, profitability and privacy concern are significant antecedents of information transparency. However, these factors relate more to context-specific institutional and privacy aspects, and they do not consider the impacts of technological context. Notably, this study focuses on the ICTs that enable information transparency. This aspect has rarely been examined by scholars and even less so in relation to the e-Government context.

As information lies at the heart of the concept of information transparency, the action of how to disclose information is not just a technical problem. With significant developments in the Internet and advances in ICTs, information has never been so easy to find. With websites, blogs, forums, social networking, smart phones, laptops, etc., to be transparent is also not always an expensive or difficult task. Indeed, it is said that technologies have enhanced information transparency significantly (Jaeger & Bertot, 2010; R. Oliver, 2004).

McIvor et al. (2002) examined the Internet and technologies that potentially support transparency. They argued that the nature of the Internet allows "free flow" of information within organisations as well as interactions with other organisations. Moreover, technologies have changed ways of communicating and made the communication more responsive (McIvor et al., 2002; Meijer, 2009). Technologies provide enormous platforms, creating much more freedom to disclose information and share knowledge. For instance, Amazon allows vendors to sell their products and to broaden their customer reach. To do so successfully, their products and services have to be transparent in terms of price, materials and quality. They also receive feedback and questions from customers. Therefore, vendors can also have two-way conversations with their customers and improve their services.

Armstrong (2011), S. Kim and Lee (2012), and Miao and Mattila (2007) are among the few scholars investigating information transparency in a technical context. The study of S. Kim and Lee (2012) found *applications* and *responsiveness* in participation in policy- and decision-making through e-Government influence transparency in citizens' engagement in policy and decision-making processes. Their assessment of the applications referred to availability, effective functions, structure and design, which are more related to *system* (website) *quality* while responsiveness measures are more related to *service quality* in relation to an e-Participation website. Meanwhile, Armstrong (2011) found that public outreach and professionalism of a website are also significant. The factors of public outreach and professionalism relate to technical aspects of the website, which include the presence of audio/video on the website, a search engine, a section for press releases, and a section for community (non-government) information that describes what information should be on the website. Public *accessibility* of the website, referred to as public outreach in their study, is also a dimension of *system quality*. Miao and Mattila (2007) focused more on *information quality*. They found that *sufficiency* and *usefulness* of the information on a website have a positive impact on the level of transparency. These studies give a hint of what factors are important for information transparency, that is, information quality, system quality and service quality.

Looking into the conceptual literature, there are several discussions of information transparency that support what we have found in empirical studies. Turilli and Floridi (2009) stated "transparency depends on factors such as the availability of information, the conditions of its accessibility." Availability is often referred to as a quality of information, while accessibility is referred to as a system (technical) quality, such as Granados et al. (2010) mentioned the accessibility of the website interface. In another study Eggert and Helm (2003) found that the quality of information provided (i.e. relevance, availability) is more important than the quantity of information. In the meantime, making information available in a timely manner is also critical to improving transparency in a technical environment (Fenster, 2006; Wong & Welch, 2004).

In section 2.3, information transparency was defined in terms of "openness, visibility, and disclosure" being its key characteristics. However, other authors have linked other quality characteristics to information transparency such as availability, accessibility, completeness, sufficiency, comprehensiveness, reliability, relevance, timeliness, usefulness and being up-to-date (Miao & Mattila, 2007; Michener & Bersch, 2011; Vaccaro & Madsen, 2006; Vishwanath & Kaufmann, 2001). While many do not

distinguish these from information transparency, some studies describe them as enablers of information transparency. For example, Vaccaro and Madsen (2006) define firm transparency as the degree of *completeness* of information. Meanwhile, Michener and Bersch (2011) argue that if the information is more *complete*, easy to locate, verifiable and usable, we get better transparency. C. C. Williams (2005) defined *timely*, *relevant*, and reliable information as transparency, but UN-Habitat and Transparency International (2004) argue that information that is free to *access*, *timely*, *relevant*, *accurate* and *complete* can promote transparency. Xavier (2008) stated that publishing *comparable*, *adequate*, and *up-to-date* information in an easily accessible form will increase transparency.

In this study in particular, information transparency refers to the openness and visibility of information. Thus there is a clear separation of the elements of information transparency from the qualities of the ICTs that support or enable information transparency, including characteristics such as availability, accessibility, completeness, sufficiency, comprehensiveness, reliability, relevance, timeliness, usefulness and being up-to-date. These can be further categorised into three constructs of quality, i.e. information quality, system quality and service quality (DeLone & McLean, 2003).

Table 2.3: Antecedents of transparency in prior empirical literature

Context	Antecedents	Study
Financial transparency	<ul style="list-style-type: none"> • Political ideology • Age • Confidence in government leaders • Frequency contacting government • Access to government 	(Piotrowski & Ryzin, 2007)
Financial transparency	<ul style="list-style-type: none"> • Taxes per capita • Transfer per capita • Political ideology • Population 	(Guillamón et al., 2011)
Financial transparency	<ul style="list-style-type: none"> • Political competition • Population • Accumulation of debt 	Esteller and Polo-Otero (2008) cited in (Sol, 2013)
Financial transparency	<ul style="list-style-type: none"> • Socio-demographic variables: population, gender, age • Fiscal variables: debt, budget imbalance • Institutional variables: left majority, right majority, capital • Economic context variables: unemployment, economic activity, tourism 	(Sol, 2013)

Financial transparency	<ul style="list-style-type: none"> • Institutional factors: financial condition, inter-government grants, political competition • Environmental factors: size of government, municipal wealth 	(Rodríguez Bolívar et al., 2013)
Non-profit organisation transparency (fiscal)	<ul style="list-style-type: none"> • Debt • Contribution ratio • Education • Compensation ratio • Lobbying expenses 	(Behn, DeVries, & Lin, 2010)
Decision-making transparency Policy information transparency Policy outcome transparency	<ul style="list-style-type: none"> • (Institutional factors) • Political influence, left wing (decision making transparency) • Media attention, external group pressure (policy information transparency) • External group pressure, organisation capacity (policy outcome transparency) 	(Grimmelikhuijsen & Welch, 2012)
Financial transparency Governance transparency	<ul style="list-style-type: none"> • Political economy (financial transparency) • Country's legal regimes, political economy (governance transparency) 	(Bushman et al., 2004)
Supply chain transparency	<ul style="list-style-type: none"> • Supply chain characteristics: number of transaction partners, frequency of transactions • Transaction process: governance structure, specific investments, uncertainty and risk, risk control mechanisms • Transactor's behaviour: power distance, explicitness of information • Relationship quality: satisfaction with performance, trust, commitment 	(Deimel et al., 2008)
Transparency in e-Government	<ul style="list-style-type: none"> • Public outreach • Professionalism of the website 	(Armstrong, 2011)
Transparency in e-Participation	<ul style="list-style-type: none"> • Responsiveness • Applications 	(S. Kim & Lee, 2012)
Firm transparency	<ul style="list-style-type: none"> • Perceived firm reciprocity • Customer effort • Negative information 	(Dapko, 2012)
Information Transparency	<ul style="list-style-type: none"> • Sufficient information • Useful information 	(Miao & Mattila, 2007)
Information transparency	<ul style="list-style-type: none"> • Privacy concerns 	(Awad & Krishnan, 2006)
Transparency in universities	<ul style="list-style-type: none"> • Complexity • Internationality • Profitability 	(Álvarez et al., 2011)

2.6. Outcomes of information transparency

Since information transparency has significant impacts on framing people's perceptions, its outcomes can affect the decisions and behaviours of those engaging with e-Government. Table 2.4 summarises the empirical studies of information transparency and its outcomes, with the most common results being trust, satisfaction and intention/behaviour. The first associated construct or outcome of information transparency is trust. Some studies argue that information transparency may have a negative impact on trust in the case of abundant information or misinterpreted information (O'Neill, 2002; R. Oliver, 2004). However, most studies show that information transparency has a positive impact on trust in both commerce and government (Bannister & Connolly, 2011; Dapko, 2012; S. Kim & Lee, 2012; Park & Blenkinsopp, 2011; Vaccaro & Madsen, 2006). When citizens perceive an openness about operations and activities, especially in relation to government, they tend to trust the government (Park & Blenkinsopp, 2011). S. Kim and Lee (2012) found that if e-participants perceive the government as transparent, this positively impacts their trust in government. However, trust is a complicated construct. Tan and Sutherland (2004) synthesised the literature on online trust and found that trust can be better understood in terms of components of competence, benevolence, integrity and predictability. Hence, different dependent variables can have different impacts on each of the components of trust. Grimmelikhuijsen (2012b) studied transparency in policy-making and found that it has a positive impact on honesty but little impact on benevolence while competence was negatively associated with transparency. Due to 1) the complexity of the relationship between trust and transparency (Grimmelikhuijsen, 2012b) and 2) the main goals of the study which are investigating the relationships between information transparency and intention to use e-Government, this study will not consider trust.

As seen in Table 2.4, satisfaction is also potentially a key dependent variable of information transparency. In a study of purchasing managers in Germany (Eggert & Helm, 2003), transparency in the business relationship was found to increase information satisfaction. The study found that if vendors are "informed about the relevant actions and properties of the other party in the interaction", they tend to be more satisfied during transactions with other partners. Park and Blenkinsopp (2011) investigated the role of transparency in government and found it significantly improves citizen satisfaction.

Other outcomes of information transparency that appear in conceptual papers are accountability, democracy and corruption (Bertot, Jaeger, Munson, & Glaisyer, 2010; Fox, 2007; Joshi, 2013; Park & Blenkinsopp, 2011; Wong & Welch, 2004). However, this study aims to investigate the impacts of information transparency in the context of e-Government uses. Prior literature shows that there are empirical studies of the relationship, but these are mostly in the business and marketing areas. Miao and Mattila (2007) investigated customers' perceptions of price transparency and found that customers are more willing to pay if the price information is open. Awad and Krishnan (2006) found that customers who value information transparency are less likely to participate in personalisation and provide their personal information. Dapko (2012) studied the impacts of firm transparency on customers' intention to purchase products and found that transparency positively increases customers' intentions both directly and indirectly through trust. Similarly, Moreno and Molina (2014) found that trust is a mediator of the relationship between transparency and continuous use university services. Even though the arguments above are supported in the marketing literature, the government literature has not yet established the relationship between information transparency and intention to use e-Government. Recently, a study by Venkatesh et al. (2016) investigated information transparency in an e-Government context. They found information transparency was a mediator and moderator between information quality and intention to adopt e-Government. A few studies have also provided some support to suggest that information transparency has positive impacts on different levels of e-Government use, such as active use (Nam, 2014), interaction (Armstrong, 2011), and e-Government adoption (Rana et al., 2013).

Table 2.4: Outcomes of information transparency in prior empirical studies

Context	Outcomes of information transparency	Study
Business	<ul style="list-style-type: none"> • Trust • Confidence 	(Vaccaro & Madsen, 2006)
Business	<ul style="list-style-type: none"> • Process performance • Product performance 	(Basten & Pankratz, 2015)
Marketing	<ul style="list-style-type: none"> • Consumer scepticism • Trust • Attitude • Intention 	(Dapko, 2012)
Marketing	<ul style="list-style-type: none"> • Intention 	(Miao & Mattila, 2007)
Marketing	<ul style="list-style-type: none"> • Intention (to be profiled online) 	(Awad & Krishnan, 2006)
Marketing	<ul style="list-style-type: none"> • Satisfaction • Customers' values 	(Eggert & Helm, 2003)
Management	<ul style="list-style-type: none"> • Supply chain performance 	(Krishnan et al., 2007)
Health care	<ul style="list-style-type: none"> • Trust • Legitimacy 	(de Fine Licht, 2011)
Supply chain	<ul style="list-style-type: none"> • Trust • Satisfaction • Commitment 	(Su, Fang, & Young, 2011)
E-Commerce	<ul style="list-style-type: none"> • Price of auction 	(Y. Lu et al., 2014)
E-Commerce	<ul style="list-style-type: none"> • Perceived enjoyment • Product diagnostic 	(Xu et al., 2014)
E-Commerce	<ul style="list-style-type: none"> • Higher surplus 	(Ozcelik & Ozdemir, 2008)
E-Commerce	<ul style="list-style-type: none"> • Use sites 	(Trenz & Veit, 2012)
E-Commerce	<ul style="list-style-type: none"> • Product cost • Performance 	(Soh et al., 2006)
E-Commerce	<ul style="list-style-type: none"> • Uncertainty • Intention 	(Liu et al., 2015)
E-Government	<ul style="list-style-type: none"> • Trust • Continuous use 	(Moreno & Molina, 2014)
E-Government	<ul style="list-style-type: none"> • Trust • Intention 	(Venkatesh et al., 2016)
E-Government	<ul style="list-style-type: none"> • Trust 	(Song & Lee, 2016)
E-Government	<ul style="list-style-type: none"> • Trust 	(Medina & Rufin, 2015)
E-Government	<ul style="list-style-type: none"> • Corruption • Satisfaction • Trust 	(Park & Blenkinsopp, 2011)
E-Government	<ul style="list-style-type: none"> • Trust 	(S. Kim & Lee, 2012)

E-Government	<ul style="list-style-type: none"> • Trust 	(Grimmelikhuijsen, 2012b)
Information system	<ul style="list-style-type: none"> • Perceived usefulness • Perceived ease of use 	(Al-Jabri & Roztocki, 2015)

2.7. Summary

The literature review in this chapter has provided a broad synthesis of the existing literature on information transparency both in the general context and in e-Government. This chapter not only clarified the terminologies used to refer to information transparency and e-Participation but also developed a concept framework (Figure 2.1) to help clarify the definition and scope of information transparency in general, and as it applies to this study of information transparency in e-Government context. It is further recommended that studies that attempt to investigate the concept of information transparency should consider frameworks that identify who is the observer and the observed, and the direction, level and nature of information disclosed in the observation. Based on an understanding of e-Government and its use levels, this chapter also delivered a definition of information transparency in the e-Government context. Finally, the chapter identifies antecedents and outcomes of information transparency. While some work has been done on antecedents of information transparency, prior studies in the synthesis show little empirical research on the outcomes of information transparency for the studies in e-Government. The next chapter will discuss the related theory and proposed research model to examine the roles of information transparency in relation to the factors that enable information transparency (i.e. information quality, system quality, service quality), and key outcome variables (i.e. satisfaction with e-Government and of intentions to use e-Government).

3. CHAPTER THREE - RESEARCH MODEL & HYPOTHESES

3.1. Introduction

In the previous chapter, the limits of prior literature investigating the information transparency concept as well as citizens' intention to use e-Government were acknowledged. The chapter also provided conceptualised information transparency in the context of e-Government and the possible independent and dependent variables of information transparency for the context of this study. This chapter will now focus on the theoretical background that underpins the role of information transparency in intention to use e-Government. The concept of information transparency and the theory of the Information System Success Model (ISSM) are integrated to develop a research model that aims to identify what factors impact perceptions of information transparency, and how information transparency in turn influences e-Government use. Finally, hypotheses are developed to theorise the relationships between the selected constructs.

3.2. Theories

To date, there is no information transparency theory that can be applied in a technological context and provide a framework to investigate the role of information transparency in relation to e-Government use. Therefore, this study proposes to integrate information transparency with theory that will provide a fundamental framework for examining the research questions. Among the popular theories in IS research on acceptance and use are the Theory of Acceptance Model (TAM), Diffusion of Innovation (DOI) and Theory of Planned Behaviour (TPB). The prior research has found that these theories are not strong enough to investigate post-adoption behaviour when users have some experience with using e-Government services (Karahanna, Straub, & Chervany, 1999). For example, Liao, Palvia, and Chen (2009) investigated the model fit and power of prediction of continuous use intention and found that TAM had the least model fit and explanatory power compared with the Expectancy Confirmation Theory (ECT) and cognitive model. Karahanna et al. (1999) integrated DOI and TRA theories to compare the post-adoption of potential users. They found that the explanatory power of the theories reduced

significantly for participants who had previous experience. The research showed that to predict post-adoption use intention, there were other factors that were more important than factors from DOI and TRA theories. Further, Bhattacharjee and Premkumar (2004) investigated the changes between pre-adoption and post-adoption. They found that usefulness was more powerful in initial use than later stages, while disconfirmation and satisfaction were driving factors for usage intention. Finally, the authors suggested that the scholars should move from traditional static IT usage models (e.g., TAM, TPB) to other relevant models such as EDT and ISSM to understand the change in IT usage. The ECT and Extended Expectancy Confirmation Theory (EECT) focus on confirmation/disconfirmation and satisfaction. Meanwhile, the theory of ISSM by DeLone and McLean (2003) goes beyond satisfaction and provides fundamental elements to this study such as information quality, system quality, service quality and intention/use. This study aims to investigate both antecedents and consequences of information transparency. The later discussion will explain in detail how information quality, system quality and service quality are key antecedents of information transparency in computer-mediated environments. This study also aims to investigate the impacts of information transparency and satisfaction on the extended citizens' use of e-Government (i.e., passive use, active and participatory use). Therefore, this study chose ISSM as it provides a fundamental framework to investigate the roles of information transparency in intention to use e-Government.

3.2.1. Information System Success Model

From a synthesised study of the literature on information system success, DeLone and McLean (1992) identified six major precursors of system success. These are system quality, information quality, user satisfaction, use, individual impact and organisational impact. These findings and proposed model are called the ISSM that depicts the interrelationships of the six constructs as shown in Figure 3.1. This model is grounded in the works of Shannon and Weaver (1949) and Mason (1978). Shannon and Weaver (1949) defined the technical level of an IS as the quality of a system that provides information (i.e., system quality), the semantic level as the success of information conveying (i.e., information quality), and the effectiveness level as the effect of the information on the receiver (e.g., use, satisfaction, individual impact and organisational impact). On the other hand, Mason (1978) further divided the effectiveness level in

Shannon and Weaver (1949) into: (1) influence on the recipient (individual impact) and (2) influence on the system (organisational impact).

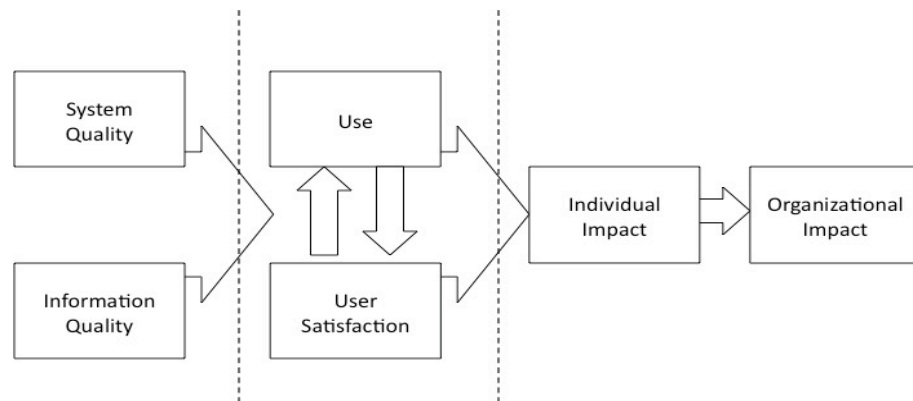


Figure 3.1: ISSM (DeLone & McLean, 1992)

Later, Seddon and Kiew (1996) and Rai, Lang, and Welker (2002) empirically examined and evaluated ISSM theory and found the model had a good fit and that the correlations were significant. Hundreds of studies have now employed this theory and applied it successfully in their study context. For example, Seddon and Kiew (1996) applied the ISSM theory in investigating the success of a university accounting system and found significant support for the model. Rai et al. (2002) also applied the theory to university IS success and found that all path coefficients were significant. McGill, Hobbs, and Klobas (2003) tested the ISSM theory in user-developed applications and validated the model with empirical analysis. Later, DeLone and McLean (2003) considered the recommendations from the literature and argued that, for the success of an IS department, not a single information system, “service quality may become the most importance variable” (p.18). Hence, they updated the model to include service quality alongside information quality and system quality, and the two impact variables were grouped as net benefits. The updated model is shown in Figure 3.2 below.

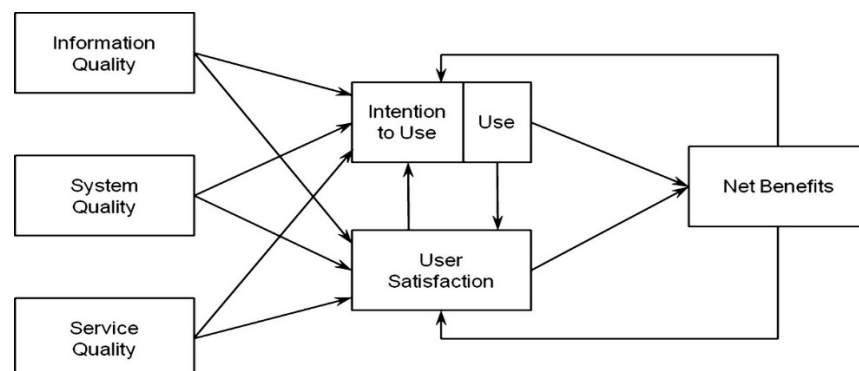


Figure 3.2: ISSM updated (DeLone & McLean, 2003)

There are three reasons why ISSM is considered suitable for this study. Firstly, the usage of e-Government as an information system includes searching for information (general), communication, transactions, policy and decision information provision, consultation, and active participation. Whether the users/citizens use the system, or to what extent they use it (e.g. to search for information or transactions, consultation or active participation) will be critically associated with the success of that information system. Since ISSM aims to examine factors related to IS use success, this aligns with a key outcome of this study in determining what factors impact the extent of use of e-Government, which is a key indicator of e-Government success. Secondly, this study focuses on citizen behaviours that include intention to use the IS (i.e. searching for information (general), communication, transactions, policy and decision information provision, consultation and active participation). Thirdly, the ISSM provides a fundamental framework with key constructs (information quality, system quality, service quality, satisfaction and intention) that this study hypothesises as key influences on information transparency. Section 2.6 in the literature review identified the possible antecedents of information transparency as including information quality, system quality, and service quality; and key possible dependent variables of information transparency as satisfaction, and intention/use.

Information quality, system quality and service quality, as defined in ISSM theory, include the following characteristics:

- Information quality refers to information content that is personalised, complete, relevant, easy to understand and secured.
- System quality refers to technical interfaces that are usable, available, reliable, adaptable and responsive (e.g. download time).
- Service quality refers to support services that are tangible, reliable, responsive, assurance, and empathetic.

However, the relevant characteristics that represent each quality for an information system can differ. For example, Jen and Chao (2008) used the ISSM to investigate mobile patient safety of Health Risk Reminders and Surveillance (HRRS) system success. They measured system quality in terms of ease of use, user-friendliness, accessibility and system response time; and information quality with accuracy, legibility and currency of information. Rai et al. (2002) applied ISSM and focused on measuring information quality using content, accuracy and format; and system quality with ease of use. Chien

and Tsaur (2007) investigated factors related to Enterprise Resource Planning (ERP) system success, and measured system quality in terms of being up-to-date, responsive and accurate; information quality in terms of content, accuracy, and format; and service quality in terms of responsiveness, reliability and assurance. Therefore, the characteristics of quality that a study adopts depends very much on the context of the study (Forsgren, Durcikova, Clay, & Wang, 2016). The characteristics of information quality, system quality and service quality that are employed in this study will be discussed in detail in the next section.

Beside empirical applications of ISSM in the business sector (Iivari, 2005; Landrum & Prybutok, 2004; Sabherwal, Jeyaraj, & Chowa, 2006), it has also been applied to e-Government. One of the earliest attempts to validate ISSM in an e-Government context was the Y. S. Wang and Y. W. Liao (2008) study. They collected data from 119 users of Taiwanese e-Government services. The results showed that information quality and service quality were positively related to use of e-Government services, but the relationship between system quality and use was not significant. Other relationships (e.g. use and satisfaction, use and net benefits, satisfaction and benefit) in the model showed significant results.

Studying the same context, Wangpipatwong, Chutimaskul, and Papasratorn (2009) examined the continuous use of e-Government services, using data collected from 614 users in Thailand. Instead of testing all six variables of the ISSM, they focused on the impact of the qualities on the continuous use of e-Government services. The findings showed positive relationships for information quality, system quality and service quality on continuous use. The more favourably the citizens perceived the qualities of the e-Government services, the more their usage increased. Among the characteristics of the qualities that were examined, usefulness, empathy, accuracy, assurance, and relevance had the strongest effects on continuous use.

Teo et al. (2009) also examined an integrated model of ISSM and trust in e-Government with 214 Singaporean e-Government services users. Their main dependent variable was intention to continue using e-Government services. The findings suggested that trust in e-Government positively impacts information quality, service quality, system quality, satisfaction and intention to continue using. However, the qualities had different effects on satisfaction and continuous use intention. For example, information quality was not significant to satisfaction, and system quality and service quality were not significant to

intention to continue using e-Government. How trust affects these qualities may be a reason for the different findings. The researchers suggested that future research should investigate alternative roles for trust in the ISSM model.

Khayun, Ractham, and Firpo (2012) investigated e-Government success factors by employing ISSM. Data collected with Thai e-Government users showed that trust in e-Government positively influences information quality, system quality and service quality, and that these qualities are enablers of satisfaction and use of the system. However, information quality was not significant regarding use, nor was system quality significant in relation to satisfaction.

In conclusion, ISSM appears to be a good fit for this study context. Although the concept of information transparency has not been investigated in conjunction with ISSM theory, prior studies suggest it as an appropriate theory for examining the relationships proposed in this study for the e-Government context. The next section will discuss which sets of characteristics of information quality, system quality and service quality will be examined in this study.

3.2.2. Qualities of an Information System

As discussed in Section 2.5 on the antecedents of information transparency, there are several characteristics of IS quality that may enable information transparency. These characteristics have been assembled from empirical and conceptual studies of information transparency and key studies of IS and e-Government success- and use-related factors (see Appendix 5).

Appendix 5 shows which characteristics of quality of an information system have been discussed and studied in previous literature in relation to information transparency, e-Government and information system success. Common characteristics include availability, accessibility, relevance, timeliness, reliability, completeness, accuracy and understandability. However, in many studies of information transparency, these were not distinguished as information quality, system quality or service quality. Nevertheless, based on prior literature (see Appendix 5) this study now categorises these as follows:

- Information quality: completeness, accuracy, understandability, timeliness, relevance, reliability;
- System quality: accessibility, availability, reliability;
- Service quality: reliability, empathy, responsiveness, assurance.

The following discussions will define each characteristic and explain the reasons for the selection of the characteristics for each group.

3.2.2.1. *Information Quality*

DeLone and McLean (1992) define information quality in general as “the quality of the information that the system produces” (p. 64). Wixom and Todd (2005), on the other hand, refer to information quality as different dimensions that determine the “user’s perception of the quality of the information included in the system” (p. 91). As can be seen from these definitions, information quality can be represented as one single concept that captures the quality of the information output as a whole (DeLone & McLean, 1992), or as one construct that is formed by its dimensions (Wixom & Todd, 2005).

For studies that focus on information quality dimensions, different dimensions are investigated according to the context. For example, DeLone and McLean (2003), in their review of IS studies, focused on personalised, completeness, relevance, ease of understanding and security as key characteristics of information quality. Other studies that have used ISSM theory identified a different set of characteristics for information quality. A study of health systems by Jen and Chao (2008) investigated information quality in terms of the following dimensions: accuracy, legibility and currency of information. Rai et al. (2002) measured information quality in a university system focusing on content, accuracy and format. Similarly, Chien and Tsaur (2007) studied information quality provided by ERP systems in health, finance and public sectors using content, accuracy and format. Wixom and Todd (2005) measured four dimensions of information quality which are completeness, accuracy, format and currency.

On the other hand, in e-Government studies, Wangpipatwong et al. (2009) investigated information quality characteristics as accuracy, timeliness, relevance, understandability and completeness. Y. S. Wang and Y. W. Liao (2008) focused on content and timeliness as two dimensions of information quality, while Teo et al. (2009) examined sufficiency, timeliness, accuracy, format, clarity and reliability. Almahamid and McAdams (2010) defined information quality as having the dimensions of accessibility, timeliness, relevancy, understandability, an appropriate amount, believability, objectivity, security, completeness, freedom from error and concision of representation.

As shown in the literature, each study employed a different set of characteristics to assess information quality, depending on the system that provided the information and the purpose of the study. Forsgren et al. (2016) suggested that information quality should be

measured as a second order construct and include context-specific characteristics. In this research, information quality is not only viewed as a motivator of satisfaction with e-Government, but also as an important antecedent of information transparency. Even though the prior studies of information transparency did not directly examine the influences of information characteristics on information transparency, the literature shows evidence of key characteristics of information quality that are associated with information transparency (e.g., completeness, relevance). The literature on information transparency, e-Government and IS further indicates that characteristics such as completeness, accuracy, understandability, timeliness, relevance and reliability are key dimensions of information quality for e-Government systems (Almahamid & McAdams, 2010; Teo et al., 2009; Wangpipatwong et al., 2009; Wixom & Todd, 2005). Each of these is discussed in more detail below.

Completeness is defined as the degree to which e-Government provides all necessary information (Wixom & Todd, 2005). The e-Government and IS literature are consistent in describing and examining completeness as an important characteristic of information quality (Almahamid, McAdams, Taher Al, & Mo'Taz, 2010; DeLone & McLean, 2003; Teo et al., 2009; Udo, Bagchi, & Kirs, 2012; Wangpipatwong et al., 2009; Wixom & Todd, 2005; Xu, Benbasat, & Cenfetelli, 2013). On the other hand, the information transparency literature lacks clarity on this concept. Some describe completeness as a characteristic of information quality and separable from information transparency, while others describe it as part of the transparency concept. In some studies, completeness is referred to within the transparency definition as the degree of completeness of information or the degree to which information is complete (Miao & Mattila, 2007; Michener & Bersch, 2011; Vaccaro & Madsen, 2006; Vishwanath & Kaufmann, 2001). Other studies suggest that, in order to increase transparency, there should be adequate information (Xavier, 2008), or a comprehensive quantity of information (Fenster, 2006), or sufficient information (Radmacher, 2008). Irrespective of the approach used, it is clear that completeness is an important quality of information which enables transparency.

Accuracy is defined as the degree to which e-Government provides information that is correct and free of error (Y. W. Lee, Strong, Kahn, & Wang, 2002; Wixom & Todd, 2005). Appendix 5 shows that accuracy is one of the most frequently used dimensions of information quality in the e-Government and IS literature (Almahamid et al., 2010; Colesca, 2009; S. Li & Lin, 2006; Teo et al., 2009; Wangpipatwong et al., 2009; Wixom & Todd, 2005; Xu et al., 2013). The information transparency literature also emphasises

that having “accurate information” enables transparency (Kaufmann & Bellver, 2005; Santana & Wood, 2009; UN - HABITAT & Transparency International, 2004). Thus, accuracy is included as a dimension of information quality in this study.

Understandability refers to whether the information that e-Government provides is clear and easy to comprehend (Y. W. Lee et al., 2002; Wangpipatwong et al., 2009). In the IS and e-Government literature, information quality is perceived when information is understandable, clear and easy to comprehend (Almahamid et al., 2010; C. C. Chen & Tseng, 2011; DeLone & McLean, 2003; Teo et al., 2009; Wangpipatwong et al., 2009). In the transparency literature, Radmacher (2008) suggested that transparency depends on how easy it is for users to understand the provided information. Miao and Mattila (2007) also specified that clear information is critical for improving the level of transparency. These discussions show that understandability is a significant dimension of information quality that is related to information transparency. Hence, it is included in this study as a dimension of information quality.

Timeliness as it is described in the transparency literature is a blurred concept (Sol, 2013; C. C. Williams, 2005). Some describe it as a characteristic of information quality. For example, C. C. Chen and Tseng (2011) examined timeliness as a dimension of information quality. Similarly, Teo and Wong (1998) used ISSM theory to examine timeliness as a dimension of quality. In addition, Guillamón et al. (2011), Wong and Welch (2004) and Fenster (2006) noted that the system should deliver information “in a timely manner” in order to increase transparency. On the other hand, most studies that focus on timeliness as a dimension of information quality argue that information itself needs to be timely and up-to-date (Kaufmann & Bellver, 2005; UN - HABITAT & Transparency International, 2004; C. C. Williams, 2005; Xavier, 2008). Other information systems and e-Government literature agree on this view of timeliness as a dimension of information quality (Almahamid et al., 2010; C. C. Chen & Tseng, 2011; DeLone & McLean, 2003; S. Li & Lin, 2006; Teo et al., 2009; Wangpipatwong et al., 2009; Wixom & Todd, 2005; Xu et al., 2013). Consistent with the literature, this study views timeliness as a quality of information that enables information transparency, and defines it in terms of information being current and timely (Wangpipatwong et al., 2009).

Relevance was referred to in the transparency literature as a trait of information quality. It is said that the information needs to be relevant to the needs of the user/interacting parties (Bauhr & Grimes, 2012; Eggert & Helm, 2003; Guillamón et al., 2011; Kaufmann

& Bellver, 2005; Sol, 2013; UN - HABITAT & Transparency International, 2004; C. C. Williams, 2005). The information system and e-Government literature includes relevance as a trait of information quality and it has been examined thoroughly (Almahamid et al., 2010; C. C. Chen & Tseng, 2011; Colesca, 2009; DeLone & McLean, 2003; Teo et al., 2009; Wangpipatwong et al., 2009). Consistent with these studies, this study defines relevance as information that corresponds to the need and is applicable for the task at hand (Wangpipatwong et al., 2009). Relevance is also included in this study as a dimension of information quality.

Reliability is often treated as an important dimension of information quality (DeLone & McLean, 1992; Goodhue, 1995; Y. W. Lee et al., 2002). It is also mentioned in the transparency literature as an enabler of information transparency. For example, Fox (2007) discussed how accessible and reliable policy information and institutional performances are important for institutions to be transparent. Vishwanath and Kaufmann (2001) explained that reliable information is a key characteristic of information quality that helps the organisation to be effective and avoid financial risks, and therefore transparency depends on information reliability. Concerning e-Government, Welch and Hinnant (2003) operationalised transparency in terms of the level of reliability of the information provided by government websites. Reliability has been consistently included as an information quality trait in several e-Government studies, such as Almahamid et al. (2010), Teo et al. (2009), Colesca (2009) and Yang, Cai, Zhou, and Zhou (2005). Consistent with these studies, this study included reliability as a key characteristic of information quality and it was defined as information that is reliable and dependable.

3.2.2.2. System Quality

The ISSM defines system quality as the quality of the processing system (i.e. technologies). In this study, system refers to the technologies (e.g. websites) that deliver the information and online services provided by e-Government. DeLone and McLean (2004) and H.-Y. Wang and Wang (2010) suggested that the key characteristics of the system should include usability, availability, reliability, adaptability and response time, while Wixom and Todd (2005) examined reliability, flexibility, integrity, accessibility and timeliness as traits of system quality. Forsgren et al. (2016) suggested that system quality should be measured as a second order construct and include context-specific characteristics. In this study, the characteristics of system quality that were selected were based on widespread use, representativeness and relevance to understanding system

quality and information transparency in the e-Government context. These are availability, accessibility and reliability. Each of these dimensions is discussed below.

Availability was frequently mentioned in the transparency literature in terms of the availability of information (Grimmelikhuijsen, 2012a; Trenz & Veit, 2012; Turilli & Floridi, 2009; Zhu, 2004), “having ... information available” (Van Der Molen, 2007) and “the quantity of information available” (Granados et al., 2010, p. 209). In the context of an information system, it could be interpreted as a system quality. For example, Rezgui, Ouzzani, Bouguettaya, and Medjahed (2002), Granados et al. (2010) and Xavier (2008) explained that the interface of the system should make information available or be able to publish information to increase transparency. Thus, this study suggests that information itself can be open only if the system (i.e. e-Government technologies) is available for use. In this study, availability as a system characteristic is defined as the extent to which the system is always available and ready to use.

Accessibility was emphasised in the transparency literature as an important factor to enable transparency. For example, Xavier (2008) mentioned that the organisation needs to “publish ... information in an easily accessible form” (p. 6); Awad and Krishnan (2006) found that websites should have “features that... give customers access to information” (p.14), UN - HABITAT and Transparency International (2004) argued that “the free access to information plays an important role in promoting transparency” (p.8). On the other hand, the IS literature recommends accessibility as a key dimension of system quality (DeLone & McLean, 1992). Particularly, Wixom and Todd (2005), Negash, Ryan, and Igbaria (2003) and Nelson, Todd, and Wixom (2005) found that accessibility was a significant determinant of system quality. Based on these findings, this study also posits that accessibility is a trait of system quality and key enabler for information transparency. In this study, accessibility refers to “the ease with which information can be accessed or extracted from the system” (Wixom & Todd, 2005, p. 90).

Reliability in this discussion refers to the dependability of system operations (Wixom & Todd, 2005). The transparency literature suggests that a reliable and credible system is critical for organisations to share information with other parties (Ball, 2009; Welch & Hinnant, 2003). The adoption literature also found that reliability is a critical trait of system quality. For example, DeLone and McLean (2003), in their updated theory of ISSM, included reliability as a characteristic of a successful information system. Nelson

et al. (2005) and Xu et al. (2013) both found reliability to be a significant dimension of system quality. Thus, this study includes reliability as a dimension of system quality.

3.2.2.3. Service Quality

The ISSM theory indicates that information quality and system quality are two independent factors in the success of information systems. However, the ISSM of DeLone and McLean was updated in 2003 after 10 years of application, with service quality added as one of the independent factors, along with information quality and system quality. The researchers argued that, for IS effectiveness, measuring the outcomes of a system should include information and services aspects. DeLone and McLean (2003) further suggested adopting SERVQUAL measurements to assess service quality but with careful modifications.

SERVQUAL, which was developed by Parasuraman (1988), has been well studied in retail research. Here, service quality refers to the quality of non-Internet-based customer interactions and experiences with companies (Parasuraman, Zeithaml, & Malhotra, 2005). However, since the Internet and technologies have flourished, the service satisfaction of customers now also depends on the interaction of customers with technology. Thus, Parasuraman et al. (2005) redefined service quality as “the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery” (p.217). Adopting it in the information system context, service quality is referred as “the overall support delivered by the service provider” (DeLone & McLean, 2003, p. 25) such as answering frequently asked questions, customised site intelligence, and order tracking (Rezgui et al., 2002). In IS, Kettinger, Lee, and Lee (1995, p. 571) defined it as “a comparison of customer expectations with actual service performance”. In information system management, DeLone and McLean (2003, p. 25) defined service quality as “the overall support delivered by the service provider, and applies regardless of whether this support is delivered by the IS department, a new organisational unit, or outsourced to an Internet service provider”. In this study, service quality is defined as the quality of personal support services (help services) provided to citizens as part of the e-government system. This can include frequently asked questions, and addressing complaints and questions.

The original dimensions of SERVQUAL are tangibles, reliability, responsiveness, empathy and assurance (Parasuraman, 1988) which are defined as follows:

- Tangibles: Physical facilities, equipment and appearance of personnel.
- Reliability: Ability to perform the promised service dependably and accurately.
- Responsiveness: Willingness to help customers and provide prompt service.
- Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence.
- Empathy: Caring, individualised attention the service provider gives its customers.

However, previous IS studies examining the dimensions of SERVQUAL suggested that the tangibles dimension be excluded since it consistently shows weak statistical results (e.g. low reliability) (Kettinger & Lee, 1994; Y. Li, Tan, & Xie, 2002; Pitt, Richard, & Bruce, 1995). Kettinger and Lee (1994) further discussed that the tangible quality of the service often refers to the interaction between customers and the personnel contact of the service firm. However, many services no longer involve traditional face-to-face contact, especially for online services through the Internet, and hence the tangible aspects of physical facilities are no longer very important in this context (Y. Li et al., 2002). Therefore, this study will exclude tangibles from the dimensions of service quality and focus on reliability, empathy, responsiveness and assurance in relation to e-Government service quality (Parasuraman et al., 2005; Xu et al., 2013). These are defined in this context as follows:

- Reliability: The ability to perform the promised services dependably.
- Empathy: Caring, individualised attention that the service provider gives to its citizens.
- Responsiveness: Willingness to help customers and provide prompt services.
- Assurance: Knowledge and courtesy of citizens and their ability to inspire the trust and confidence.

3.3. Research Model and Hypotheses

In order to examine the role of information transparency in relation to intention to use e-Government, this study proposes a conceptual model (see Figure 3.3) that integrates ISSM and the concept of information transparency. There are eight constructs in the model, namely: information quality, system quality, service quality, information transparency, satisfaction, passive use intention, active use intention and participatory use intention. Information quality, system quality and service quality are modelled as three independent variables of information transparency and satisfaction. Information transparency and satisfaction are modelled as determinants of the three levels of use intentions (i.e., passive use, active use and participatory). Each of these relationships and constructs will be discussed further in the following sections.

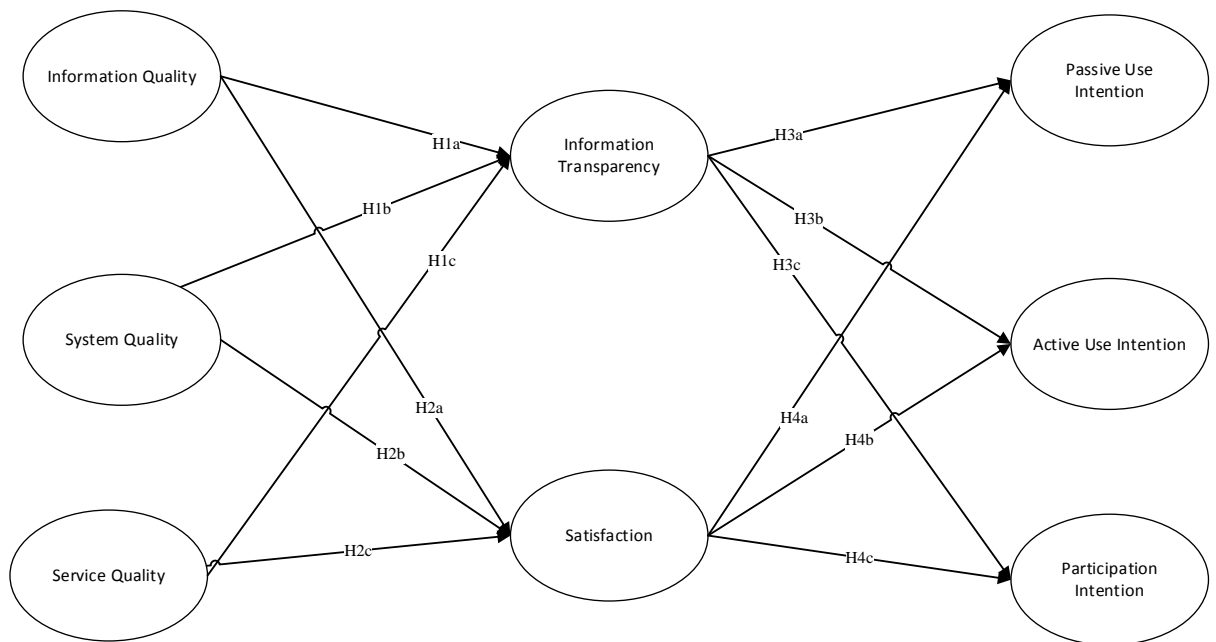


Figure 3.3: Research model

3.3.1. Information Quality, System Quality and Service Quality

In this section, the relationships between information quality, system quality, service quality and information transparency and satisfaction will be discussed. Following this, each of the hypotheses will be explained and justified.

3.3.1.1. Information system qualities and information transparency

Section 2.6 in Chapter 2 discussed the antecedents of information transparency in the IT/IS context. This discussion was based on a review of the extant literature on information transparency and pointed out that there is little empirical evidence about the relationships between proposed independent factors and information transparency. However, much of the literature described the relationships and provided sufficient arguments to shed light on the antecedents of information transparency. Based on the literature analysis, this study summarised the characteristics of quality that can possibly impact on information transparency. Section 3.2 identified information quality as including completeness, accuracy, understandability, timeliness, relevance, reliability; system quality including accessibility, availability and reliability; and service quality including reliability, empathy, responsiveness and assurance. This section will discuss how information quality, system quality and service quality influence information transparency.

Information plays a central part in determining information transparency. Therefore, in order to perceive information transparency in an IT/IS environment, information quality (an outcome of the IT/IS) is considered to be one of the most significant factors to promote the perception of information transparency. In fact, the literature points out several characteristics of information quality that enhance transparency (i.e. completeness, accuracy, understandability, timeliness, relevance and reliability). For example, UN - HABITAT and Transparency International (2004) stated that to promote transparency “information must be timely, relevant, accurate and complete for it to be used effectively.” Xavier (2008) suggested increasing price transparency by “publishing comparable, adequate and up-to-date information” (p.7). Kaufmann and Bellver (2005) also noted that “increasing transparency through accessible, relevant, and accurate information is necessary” (p.42). While S. Kim, Kim, and Lee (2009) stated that “more information delivered to citizens in a more timely fashion is expected to increase the transparency of government” (p.43). In one of the few empirical studies, Miao and Mattila (2007) examined and found a positive relationship between sufficient and useful

information and transparency. Based on these arguments, once users/citizens perceive the information provided to be of high quality, they are likely to perceive e-Government as more transparent. Hence, this study hypothesises that:

H1a: Information quality positively affects perceived information transparency.

Besides information quality, the quality of the technical system itself is important for enabling transparency. The e-Government system is the platform for government to deliver information and services to citizens and ensure information transparency. Indeed, Granados et al. (2010) and Xavier (2008) explained that the interface of the system should make information available and accessible and so increase transparency. Therefore, if the quality of the system is poor, such as being unstable to access, and with services being unavailable, it is less likely the information and services can be easily delivered to citizens and provide transparent information. Others argued that system quality is a key condition that promotes transparency. For example, UN - HABITAT and Transparency International (2004) argued that “the free access to information plays an important role in promoting transparency” (p.8). Sternstein (2010) also suggested that making information and services quick and easy to find is critical for increasing transparency. Significantly, S. Kim and Lee (2012) and Armstrong (2011) examined website accessibility and website presentation and found these to positively influence transparency. If citizens perceive the technical system that supports e-Government as being of high quality, this is likely to enhance their perception of e-Government as being transparent. Hence, this study hypothesises that:

H1b: System quality positively affects perceived information transparency.

For transparency, open communication is vital between citizens and government (Abu-Shanab, 2013; Christopher & Darren, 2004). The services of e-Government are provided to help citizens through e-Government websites, such as frequently asked questions, complaints and enquiries. Service quality therefore plays a key part in enhancing information transparency. Even though there are few studies investigating this relationship, S. Kim and Lee (2012) have shed light on this discussion by examining and showing responsiveness as one of the dimensions of service quality that positively impacts transparency in e-Government. If citizens view service quality as high, they are more likely to perceive e-Government as transparent. Hence, this study hypothesises that:

H1c: Service quality positively affects perceived information transparency.

3.3.1.2. *Information system qualities and satisfaction with e-Government*

Satisfaction refers to the users' feelings about prior use (Bhattacharjee, 2001a; R. L. Oliver, 1981). In the marketing and management fields, satisfaction refers to the core values that any organisation aims to achieve. There are a number of studies investigating antecedents of satisfaction (Churchill Jr & Surprenant, 1982). In the information systems field, theories of the Information Systems Continuance Model (ISCM), Cognitive Model of Satisfaction and ISSM treat satisfaction as central to their models (Bhattacharjee, 2001b; DeLone & McLean, 2003; R. Oliver, 1980). ISSM further introduced information quality, system quality and service quality as antecedents of satisfaction.

Several researchers in the information system field have adopted ISSM (DeLone & McLean, 1992, 2003) and examined information quality as an antecedent of satisfaction (H. W. Kim, Xu, & Koh, 2004; J. Kim, Hong, Min, & Lee, 2011; K. C. Lee & Chung, 2009; H.-F. Lin, 2007). However, results are mixed. H. W. Kim et al. (2004) found that information quality was not significant to satisfaction. However, J. Kim et al. (2011), K. C. Lee and Chung (2009) and H.-F. Lin (2007) found that information quality had significant impact on satisfaction at post-adoption.

Similarly, the literature on e-Government shows that the impact of information quality on satisfaction has been also mixed (Sun, Ju, & Chen, 2006; Teo et al., 2009; Y. S. Wang & Y. W. Liao, 2008). For example, Y. S. Wang and Y. W. Liao (2008), in their study of e-Government adoption using ISSM, found that the quality of information plays a significant part in the citizens' satisfaction with e-Government. Similarly, Sun et al. (2006) found that information quality has a significant impact on satisfaction with an e-official-document system deployed in Pingdong County in Taiwan. On the other hand, information quality was found insignificant in a study by Teo et al. (2009). Nevertheless, studies show in general that the information provided by e-Government is one of the most important resources for citizens; therefore, how citizens perceive information quality through e-Government can be associated with the level of their satisfaction with e-Government (Rana, Dwivedi, Williams, & Weerakkody, 2015; Teo et al., 2009). Hence, this study hypothesises that:

H2a: Information quality positively affects perceived satisfaction with e-Government.

DeLone and McLean (1992) suggested that quality of the system (e.g., accessibility, reliability of website) could impact satisfaction with an IS. For example, K. C. Lee and Chung (2009) and H.-F. Lin (2007) studied the relationship between system quality and

satisfaction with mobile banking and other online services and provided evidence of their statistical significance. Similarly, in e-Government, Y.-S. Wang and Y.-W. Liao (2008) found significant impacts of system quality on satisfaction with e-Government. In addition, Teo et al. (2009), Udo et al. (2012) and Rana et al. (2015) also found statistical evidence to support this relationship. On the other hand, J. Kim et al. (2011) examined ISSM theory in the post-adoption context and found that system quality was not significant to satisfaction. However, in general, system quality still has important influences on satisfaction. Therefore, this study hypothesises that:

H2b: System quality positively affects perceived satisfaction with e-Government.

The quality of the services provided, whether offline or online, is always an important factor for satisfaction (Parasuraman, 1988; Pitt et al., 1995; Taylor & Baker, 1994). Recognising its importance to the success of an information system, DeLone and McLean added service quality into ISSM theory in 2003. It is distinguished from the technological aspect of system quality and the semantic aspect of information quality (DeLone & McLean, 2003). Spreng and Mackoy (1996) investigated the impacts of service quality and satisfaction with services. They pointed out that these are different constructs and found that they have significant impacts on satisfaction. Similarly, Chenet, Dagger, and O'Sullivan (2010) and H.-F. Lin (2007) also found the relationship between service quality and satisfaction in the context of business relationships significant. Consistently, in the e-Government literature, service quality is often found to influence significantly satisfaction with e-Government services (Rana et al., 2015; Sun et al., 2006; Teo et al., 2009). The services considered included frequently asked questions, responses to complaints and enquiries on the websites. These studies suggest that the better the quality of the services that e-Government provides, the more satisfied the citizens are with e-Government. Hence, this study hypothesises that:

H2c: Service quality positively affects perceived satisfaction with e-Government.

3.3.2. Intention to Use e-Government

E-Government is a new platform for public administration that is closing the distance between government and citizens. It plays key roles in engaging in open information, communication and other services. To maximise the benefits of e-Government, it is important to enhance citizens' use of e-Government. Engagement with government

through e-Government has been defined and understood differently through two main streams of research in the literature. The first stream of literature is about the general adoption of e-Government. It may refer to use of e-Government through searching for information, communication, tax payments or transactions (Akkaya, Wolf, & Krcmar, 2012; Carter, Shaupp, Hobbs, & Campbell, 2011; Hujran, Aloudat, & Altarawneh, 2013; C.-T. Lu & Ting, 2013; Schaupp, Carter, & McBride, 2010; Shareef et al., 2011; Tella, 2012).

The other stream of the literature discusses e-Participation at a higher level in terms of searching for information, consultation and active participation in relation to decision- and policy-making (Chun & Cho, 2012; S. Kim & Lee, 2012; Macintosh, 2004; Medaglia, 2007; OECD, 2001; Sanford & Rose, 2007; Woodford & Preston, 2013). Other types of use of e-Government also include engaging with activities through social media such as a “like”, “comment” and “share” on Facebook (Bonsón, Royo, & Ratkai, 2015). The current study targets general platforms rather than just social media. In this study, use of e-Government is defined as any interaction or use of e-Government services by citizens, including passive use, active use and participatory use in decision- and policy-making (Scott et al., 2015). Each of these levels of use is described below.

Passive use refers to the first level of citizens’ use of e-Government that involves searching for information including general information, policies and decisions.

Searching for general information is the most basic form of e-Government use (Hiller & Belanger, 2001). Citizens can obtain information from official government websites or social media pages. The information can include a wide range of statistics, demographics, budgets, taxes, rates, housing plans, parking fees, local news, local festivals and so on (Cegarra-Navarro, Pachón, & Cegarra, 2012; Shareef et al., 2011).

Searching for policy and decision information is viewed as a one-way relationship in which government produces and delivers information for use by citizens. From the citizens’ perspective, it covers “passive” access to information on demand by citizens (OECD, 2001, p. 3).

Active use refers to the second level of e-Government use that involves communication and transactions through e-Government services.

Communication with government through websites or any online platform is defined in this study as a two-way communication. The communication allows citizens to query the

government, and request services or submit complaints through online forums or through email. These could be, for example, about incidents such as the leaking of water pipes in residential areas, broken traffic signs, or requests for rubbish collection and booking leisure centres (Andersen & Henriksen, 2006; Shareef et al., 2011).

Transactions, according to Hiller and Belanger (2001), refer to individuals' interactions with the government that focus on conducting transactions online using web-based self-service. Online transactions are one of the most sophisticated levels of e-Government that are widely available across most e-Government platforms. Examples include renewing licences, paying fines, applying for financial aid, passports, driving licences and vehicle registration (Cegarra-Navarro et al., 2012; Hiller & Belanger, 2001).

Participatory use refers to the third and highest level of e-Government use which involves consultation and active participation in policy- and decision-making processes.

Consultation is a two-way relationship in which citizens provide feedback on the decisions and policies to government. It focuses on the issue of citizens' views being sought and requires the provision of information. Governments define the issues for consultation, set the questions and manage the process, while citizens are invited to contribute their views and opinions (OECD, 2001, p. 23).

Active participation is a relationship based on partnership with government in which citizens actively engage in defining the process and content of policies. It acknowledges equal standing for citizens in setting the agenda, proposing policy options and shaping the policy dialogue, although the responsibility for the final decision or policy formulation rests with government (OECD, 2001, p. 23)

3.3.2.1. Information transparency and Intention to use e-Government

Information transparency has been discussed in terms of its importance in public and business administration, accountability, democracy and corruption (Bertot, Jaeger, Munson, et al., 2010; Fox, 2007; Joshi, 2013; Park & Blenkinsopp, 2011; Wong & Welch, 2004). In this study, the focus is on psychological perceptions of information transparency which impact on other psychological states of users/customers/citizens. Information transparency in this study comprises three dimensions that are data transparency, process transparency and policy transparency. *Data* refers to the data, figures and reports of government. *Process* refers to steps in the process, and includes information about what steps are taken, who is involved in each step and what opinions or discussions are used

for each step. The third dimension is *decision and policy* which refers to the rationale for final decisions.

Whether information transparency affects behaviours or not is the question that has recently received attention from academia. Prior literature shows there are empirical studies on the relationship between transparency and intention/use, but these are mostly in the business area. For example, Dapko (2012) studied the impacts of firm transparency on customers' intentions to purchase products and found that transparency positively increases customers' intentions directly. Similarly, in a study of public university services, Moreno and Molina (2014) found a positive relationship between transparency and continuous use services. In addition, Miao and Mattila (2007) investigated customers' perception of price transparency, and their findings indicated that the higher the customers' perception of price transparency, the more customers are willing to pay. In another study of firms' transparency performance, Liu et al. (2015) found that when a firm is transparent about its performance, customers are more likely to intend to purchase services and pay a price premium. These studies provide an empirical argument for the impacts of information transparency on intention to use and intention to continuous use in the business area.

Even though information transparency is an important concept in e-Government literature, it has not received much attention by way of empirical investigation. Recently, Venkatesh et al. (2016) examined the role of transparency in e-Government adoption and found that it mediated and moderated the relationship between information quality and intention to adopt e-Government. Few studies conceptually discussed the impacts of information transparency on e-Government adoption. They argued that e-Government adoption should be driven by more contextualised factors, i.e. transparency (Dwivedi et al., 2012; Y. Kim & Crowston, 2011; Yildiz, 2007). Altogether, the literature from both business and e-Government shows support for the relationship between information transparency and intention to use. However, this study does not investigate the impact on general intention to use, but focuses particularly on three levels of intention to use e-Government (i.e. passive use, active use and participatory use). As discussed, passive use includes searching for general information and searching for policy information; active use includes communication and transaction; and participatory use includes consultation and active participation.

The public often has a great demand for information, referring to the right to know (Piotrowski & Borry, 2009). When governments are transparent through the use of ICT tools, citizens know that they will be able to access information that they need (S. Kim et al., 2009). Therefore, once citizens perceive a government to be transparent, it encourages them to search for information that they want to know as the first level of use (e.g., rates, fees, reports, documents, decisions and policies). Furthermore, the literature also argues for the importance of information transparency on a higher level of use (i.e., active use including communication and transaction). For example, Venkatesh et al. (2016) explained that if citizens are unable to track the service process and are doubtful about the quality of the web, they will be less likely to file taxes online and conduct a transaction with e-Government. Armstrong (2011) found that an open communication between government and citizens helped to increase citizens' interaction with e-Government. Regarding participation in decision- and policy-making processes, several studies discussed the impact of information transparency. OECD (2001) stated that public participation in policy- and decision-making processes closely impacts on citizens' lives. Lack of understanding of what is going on with the decisions/policies and opportunities to have a voice in the decisions/policies leads to uncertainty and, therefore, citizens are less likely to use e-Government (S. Kim & Lee, 2012; Venkatesh et al., 2016). Chun and Cho (2012) argued that transparency in policy is a great tool to "promote citizen participation but also to use them in meaningful and high quality discussions to support a citizen-government partnership for shared governance in policy making" (p. 144) and suggested further research to empirically examine whether transparency actually enhances citizens' participation in policy and decision-making processes. Pina, Torres, and Royo (2010), Zissis and Lekkas (2011) and Nam (2014) made a similar suggestion for encouraging active participation through e-Government, saying that when citizens are aware of how the decision or policy is made, how they influence their lives, and what the process and procedure involve, they are likely to participate in the process. In fact, Reddick (2011) empirically examined the impact of transparency as a political antecedent factor of e-participation and found it was significant. Hence, when citizens perceive e-Government to be transparent, they are more likely to use e-Government. Therefore, this study hypothesises that:

H3a: Information transparency positively affects intention toward passive use of e-Government.

H3b: Information transparency positively affects intention toward active use of e-Government.

H3c: Information transparency positively affects intention toward participatory use of e-Government.

3.3.2.2. Satisfaction and Intention to Use e-Government

In the information systems literature, satisfaction is an important factor in adoption and post-adoption (Bhattacharjee, 2001b). One of the first studies on the relationship between satisfaction and intention is the marketing study of R. Oliver (1980). The study proposed a theory of expectation and disconfirmation (EDM). With empirical support, he found that satisfaction influences attitude and intention to purchase. Later, Bhattacharjee (2001b) proposed a theory for information system continuance. His expectation confirmation model (ECM) found that the IS continuous use was determined by satisfaction of the users. Furthermore, DeLone and McLean (2003) proposed ISSM and, in this theory, they emphasised satisfaction as one of the most important factors related to behavioural intention.

Along with these theories, there are several studies that have tested the relationship between satisfaction and behavioural intention in different contexts. For example, Liao, Chen, and Yen (2007) investigated the role of customer satisfaction and their intention toward e-service continuance. By integrating EDM and TPB, the authors empirically found that continuous intention was strongly associated with customer satisfaction. Similarly, S. C. Chen, Chen, and Chen (2009) also found that satisfaction significantly influenced intention to continue using self-service technologies. In addition, J. Kim et al. (2011) synthesised the literature on antecedents of application service continuance and found that satisfaction had the strongest effect on continuance intention. In the e-Government literature, Colesca and Dobrica (2008) investigated the determinants of e-Government adoption in a case study in Romania. Their findings showed that satisfaction had a strong influence on e-Government adoption. Teo et al. (2009) adopted ISSM and trust theories to examine the continuance intention regarding e-Government use and found a consistent result with the IS literature—that satisfaction has a positive influence on continuance intention. Alruwaie, El-Haddadeh, and Weerakkody (2012) also emphasised the role of citizens' satisfaction in continuance intention to use e-Government. Since the most basic e-Government usage is passive use, which refers to

searching for information relating to governments, this study believes that satisfaction will positively impact passive use intention.

Further, satisfaction is likely to encourage users toward deep use (Hsieh & Wang, 2007; W. Wang & Ou, 2013). Tennant, Mills, and Chin (2013) investigated post-adoption use of an IS and through a qualitative study found that satisfaction is a key intrinsic motivator of deep use. Further, Hsieh and Wang (2007) integrated the IS Continuance (ISC) Model and TAM into a research model to investigate extended use. Satisfaction is known to be a core value of ISC theory and, in this Hsieh and Wang study, it was found to be significant to extended use. Recently, W. Wang and Ou (2013), in a study of 240 ERP users, integrated the ISC model and IS commitment model. The findings were consistent with prior literature showing that satisfaction has significant influence on extended use. Deep use or extended use in the IS literature refers to using more functions available in information systems to support work (Hsieh & Wang, 2007). In the e-Government context, deep use or extended use is related to higher levels of e-Government use. For example, the e-Government system offers citizens more functions than just being an information platform—it provides functions for communication, transactions, and giving comments on governmental policies or active participation in the decision- and policy-making process. Therefore, this study considers active use and participatory use as deep uses of e-Government.

The e-Government literature has not investigated the relationship between satisfaction and deep use or extended use, but it has some empirical evidence to support a relationship between satisfaction and active use and participatory use. For instance, Saha, Nath, and Salehi-Sangari (2010) investigated e-Government services in Sweden and found that satisfaction with tax services had a positive influence on citizens' usage of this e-service. Similarly, Fu, Chao, and Farn (2004) investigated different types of taxpayers in Taiwan and found empirical support for satisfaction being strongly associated with usage intentions toward tax-filing methods. Tax filing services are a type of transaction with e-Government that is referred to as active use. Therefore, it is expected that the level of satisfaction will be associated with the willingness of citizens toward active use of e-Government.

S. Kim and Lee (2012) argued that, when citizens are satisfied with the quality of services in e-Participation programmes, this encourages citizens to view other participants' inputs, feedback and government responses. The study found that the greater the satisfaction with

the quality of e-Government services in policy and decision-making processes, the higher the perceptions of citizens toward proposing and providing quality inputs in e-Government participation. Reddick (2011) also found in focus group results that satisfaction is associated with the level of use of e-Government. Therefore, when citizens are satisfied with e-Government, they are more likely to use e-Government at higher levels. Hence, the study hypothesises that:

H4a: Satisfaction positively affects intention toward passive use of e-Government.

H4b: Satisfaction positively affects intention toward active use of e-Government.

H4c: Satisfaction positively affects intention toward participatory use of e-Government.

3.4. Summary

Chapter 3 discussed ISSM theory and how ISSM and information transparency are relevant and integrated in this study. The chapter also presented the research model and discussed the hypothesised relationships in the model. As summarised in Table 3.1, there are 12 hypotheses. The next chapter will discuss the research methodology and research design used to evaluate the research model, and test the hypotheses posed in this chapter and address the research questions presented in Chapter 1.

Table 3.1: Summary of hypotheses in the study

Hypotheses	
H1a	Information quality positively affects perceived information transparency.
H1b	System quality positively affects perceived information transparency.
H1c	Service quality positively affects perceived information transparency.
H2a	Information quality positively affects perceived satisfaction with e-Government.
H2b	System quality positively affects perceived satisfaction with e-Government.
H2c	Service quality positively affects perceived satisfaction with e-Government.
H3a	Information transparency positively affects intention toward passive use of e-Government.
H3b	Information transparency positively affects intention toward active use of e-Government.
H3c	Information transparency positively affects intention toward participatory use of e-Government.
H4b	Satisfaction with e-Government positively affects intention toward passive use of e-Government.
H4a	Satisfaction with e-Government positively affects intention toward active use of e-Government.
H4b	Satisfaction with e-Government positively affects intention toward participatory use of e-Government.

4. CHAPTER FOUR - RESEARCH METHODOLOGY

4.1. Introduction

The previous chapter discussed the role of information transparency in intention to use e-Government as well as antecedents in the context of information transparency in computer-mediated environments. A research model is proposed with twelve hypotheses. Chapter 4 will explain the research paradigm and research methodology that were used for this research. Based on the research approach, Chapter 4 will discuss the research process used to meet the research objectives; the method of collecting data; and the techniques used to analyse the data and test the validity of the research model. The following sections will describe instrument development including item selection, the pre-test, the pilot test and final measurements. From the prior literature and validated constructs, measurement items were chosen for developing the questionnaires. Then the pre-test with a small controlled sample was used to test the questionnaires and the results used to enhance the format, wording, and ease of understanding of the items. The pilot test refers to rehearsal instrument and checks the reliability and validity of the measurement items. Lastly, the main survey was conducted with the revised questionnaire.

4.2. Research Paradigm

Bryman (2008) defined a paradigm as “a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, [and] how results should be interpreted”. It is also described as “the basic belief systems or worldview that guides the investigator” (Guba & Lincoln, 1994, p. 105). There are two main paradigms: positivistic and phenomenological (Collis & Hussey, 2003). *Positivist* is referred to as quantitative, objectivist, scientific, experimentalist, or traditionalist, while *phenomenological* is referred to as qualitative, subjectivist, humanistic, or interpretivist.

Table 4.1: Guidelines of positivist and phenomenological paradigms, adopted from Bryman and Bell (2011); Collis and Hussey (2003)

Assumption	Question	Positivist	Phenomenological
Ontological	What is the nature of reality?	Reality is objective and singular, apart from the researcher	Reality is subjective and multiple as seen by participants in a study
Epistemological	What is the relationship of the researcher to that being researched?	Researcher is independent of that being researched	Researcher interacts with that being researched
Axiological	What is the role of values?	Value-free and unbiased	Value-laden and biased
Rhetorical	What is the language of research?	Formal Based on set of definitions Impersonal voice Use of accepted quantitative words	Informal Evolving decisions Personal voice Use of accepted qualitative words
Methodological	What is the process of research?	Deductive process Cause and effect Static design – categories isolated before study Context-free Generalisations leading to prediction, explanation and understanding Accurate and reliable through validity and reliability	Inductive process Mutual simultaneous shaping of factors Emerging design-categories identified during research process Context-bound Patterns, theories developed for understanding Accurate and reliable through verification

A *positivistic* paradigm as described in Table 4.1 is an approach that considers reality to be objective and apart from the researcher, and as a value-free and unbiased process (Collis & Hussey, 2003). Reality is constructed and measured by instruments that are based on the definition of constructs, using formal language and quantitative words (Fung & Lee, 1999). Positivism refers to methodological assumptions as a quantitative research approach that the reality can be discovered using rigorous empirical study (Creswell, 2009). Therefore, the paradigm follows the principle of deductivism as “the purpose of

theory is to generate hypotheses that can be tested, and that will thereby allow explanations of law to be assessed” (Bryman & Bell, 2011).

In a *phenomenological* paradigm, as described in Table 4.1, it is considered that reality is subjective and apart from a study, and a value-laden and biased process (Collis & Hussey, 2003). In contrast with positivism, phenomenological studies do not distance the researcher from the research subject. The researcher interacts with the researched, then determines what should count as facts (Collis & Hussey, 2003; Fung & Lee, 1999). This paradigm involves an inductive method that allows reality to be categorised, defines patterns and combines them to develop theories for better understanding. The reality is described by personal, informal language and based on definitions that evolve during a study (Fung & Lee, 1999). The methodological assumption for this paradigm refers to studies in which observations occur for a period of time or there is actual collaboration with the researched phenomenon, then the data is analysed to find the patterns to help explain the phenomenon (Collis & Hussey, 2003; Fung & Lee, 1999). Hence, the accuracy of information is determined by verification (Fung & Lee, 1999).

This study adopts the positivistic paradigm because of its best fit to this study’s nature. The objectives of this study are to examine the antecedents of information transparency and the relationship between information transparency perception and intentions to use e-Government systems. In order to achieve these objectives, the study adopts DeLone and McLean’s theory (ISSM), which provides the theoretical background to explain the phenomena regarding information transparency’s roles in e-Government use. Following the principles of the positivistic approach, empirical data were collected from the individual user by questionnaires which used formal language and quantitative words (Creswell, 2003). This study then tested a set of hypotheses and the theoretical model in order to determine the impacts on information transparency and citizens’ intention to use e-Government.

4.3. Research Methodology

The research methodology guides the procedures in a study to achieve objectives and answer questions (Fung & Lee, 1999). There are three main research methodologies: quantitative, qualitative and mixed methodologies. The quantitative methodology approaches use deductive logic research, which means that hypotheses are developed from theories and then tested using empirical data analytics. Therefore, this method

focuses on quantification in the collection and analysis of data, and thus, the reality is treated as objective to the researcher (Bryman & Bell, 2011). On the other hand, the qualitative methodology focuses on words rather than quantification in the collection and analysis of data; thus, the reality is emergent with the researcher. This method applies inductive logic research, which involves developing or generating theories from observation of empirical reality (Collis & Hussey, 2003). The mixed methodology combines both quantitative and qualitative approaches, and allows the collection of multiple types of data (numeric from quantitative methods and words from qualitative methods) (Collis & Hussey, 2003).

The choice of methodology depends mainly on whether an inductive or deductive approach is used (Bryman & Bell, 2011). This study proposed hypotheses from theories and existing research and used these to establish the relationships between antecedents (i.e. information quality, system quality, service quality) and information transparency, and between information transparency and different levels of e-Government use intentions. In addition, the study collected quantitative data and used statistical analysis to evaluate the hypotheses. Thus, this approach led the study to adopt a quantitative methodology.

4.4. Research Design

The research method, also called research design, describes a technique to collect data (Bryman & Bell, 2011, p. 41). The worldview and methodology used impact the research method (Collis & Hussey, 2003). In a quantitative methodology, there are two main research methods: surveys and experiments (Fung & Lee, 1999). Survey design provides guidance for collecting numeric data from a fraction of the population and using statistical methods to generalise findings, whereas experimental design focuses on manipulating independent variables and determining whether this manipulation influences an outcome (Fung & Lee, 1999).

The independent variables relevant in this study are clearly defined in Chapter 3. These are information quality, system quality, service quality, information transparency, satisfaction, and intention to use. Hence, there are no requirements for manipulating independent variables in this study. In addition, this study focuses on collecting the responses of people who have been using e-Government services. The purpose of the data is to generalise from a number of responses from citizens and predict the impacts of

information transparency on different levels of engaging with e-Government services. Therefore, the survey design is appropriate for this study.

4.4.1. Classification

There are two main approaches for a survey: exploratory and explanatory (Churchill Jr & Surprenant, 1982). Exploratory surveys aim to identify the concepts and basis for measurements so they do not require a model, while explanatory surveys aim to identify causal relationships between variables and to test hypotheses (Malhotra & Grover, 1998). This study is classified as explanatory, as the nature of the study emphasises developing and testing hypotheses based on theories, and interpreting positive or negative relationships in order to contribute to theory development (J. Kim et al., 2011). Surveys can also be designed to support cross-sectional or longitudinal approaches. A cross-sectional design collects data at one point in time from the sample chosen to represent the population while longitudinal design collects data at two or more points over time (J. Kim et al., 2011). The study looks at one point in time so naturally adopts a cross-sectional design.

4.4.2. Sample

The study focuses on the perceptions and behaviours of individuals who have been using local e-Government services and aims to generalise that information to examine hypotheses. Therefore, the unit of analysis is the individual (Lewis, Templeton, & Byrd, 2005). The sample of this study is citizens who have been using New Zealand e-Government services. For the purposes of this study, “citizens” refers to anyone who lives in New Zealand. The e-Government experiences are limited to local government (i.e. city councils, regional councils, district councils) and refer to any interaction with online government services.

Sampling design has several options. For example, random sampling is a technique of selecting respondents randomly from the population; systematic sampling selects every *n*th element in a population starting from a random point in the sample frame; and stratified sampling refers to a technique of clustering the population into meaningful segments then drawing respondents from each group. A convenience sample, one of the main types of non-probability sampling methods, is made up of people who are easy to reach.

Because the study focuses on individual use of e-Government services, a combination of convenient and random sampling was used for the sampling technique. The study attempted to randomly select citizens aged over 18 years old that use e-Government at any level, including passive use (i.e. searching for information in general or specific to policy); active use (i.e. communication and transactions); and participatory use (i.e. commenting on decisions and policies; actively participating in decision and policy making; or proposing the agendas for decision and policy making). Besides online forums, the researcher also approached people at public places where it was convenient to collect the responses (e.g. shopping malls, parks, libraries). Since the survey took around 15 to 20 minutes to complete, people in such convenient places were more likely willing to take the time to complete the questionnaire than simply stopping them on the street (Goldsmith & Litvin, 1999). When the researcher encountered refusals, they simply approached the next available person.

4.4.3. Data collection technique

In order to conduct the sampling techniques discussed above, two methods of collecting data were used: i.e. a web survey and paper survey. Often it is said that mixing survey methods does not give significantly different results from a single method's one. For example, the responses from paper surveys and web surveys may show small distinctions (R. L. Oliver, 1981). However, sampling issues such as non-response bias and measurement errors need to be evaluated. Web surveys are convenient and easy to use but may not obtain an effective response rate (Sax, Gilmartin, & Bryant, 2003). De Leeuw (2005) argued that mixing methods can have several advantages. For example, using one sample, one time period and one questionnaire but different persons and different modes can improve coverage, response rate, and reduce cost, nonresponse error, and mode effects on measurement (De Leeuw, 2005). Researchers need to be aware of the advantages and disadvantages of web surveys and conventional modes of administration. There are several techniques for collecting data such as face-to-face interviews, telephone interviews, postal questionnaires, email and the web. This study used web surveys and paper surveys, and their differences are described in Table 4.2.

According to Dillman (2000), mix-mode surveys can have advantages by compensating for the weaknesses of each method. As seen in Table 4.2, paper surveys are slower to administer, are prone to bias based on social desirability and increase the likelihood of data entry errors. However, web surveys can allow studies to overcome these weaknesses

by increasing the speed of administration, and minimising biases and errors. Nevertheless, paper surveys provide better response rates than web surveys and fewer non-responses, and require fewer technical involvements in designing the survey. Both methods are appropriate for long questionnaires, which this study requires.

Table 4.2: Differences between web surveys and paper surveys (Bryman & Bell, 2011, p. 663)

	Paper Surveys	Web Surveys
<i>Resource issues</i>		
• the cost of the mode of administration is relatively low	x	x
• the speed of the mode of administration is relatively fast	x	xxx
• the cost of handling a dispersed sample is relatively low	xxx	xxx
• the researcher requires minimal technique expertise for designing a questionnaire	xxx	x
<i>Sampling-related issues</i>		
• the mode of administration tends to produce a good response rate	xxx	x
• the researcher is able to control who responds	xxx	xx
• the mode of administration is accessible to all sample members	xxx	x
<i>Questionnaire issues</i>		
• the mode of administration is suitable for long questionnaires	xxx	xx
• the mode of administration is suitable for filter questions	xxx	xxx
• the mode of administration is less likely to result in non-response to some questions	xxx	xx
<i>Answering context issues</i>		
• the mode of administration gives respondents the opportunity to consult others for information	xx	xxx
• the mode of administration minimises the impact of interviewer's characteristics (gender, class, and ethnicity)	x	xxx
• the mode of administration minimises the impact of the social desirability effect	x	xxx
• the mode of administration reduces the likelihood of data entry errors by the researcher	x	xxx

Note: x-weak xx-moderate xxx-strong

The study identified a number of online forums to conduct the web survey such as Facebook pages, and YouTube channels of local governments in New Zealand including regional, district and city councils. Each forum's administrator was contacted and asked for permission to post a thread with the survey link on their pages. In most cases permission was granted. Some of the administrators posted the survey link on behalf of the researcher to increase the response rates. Others were posted directly by the researcher. The survey was developed on Qualtrics (www.qualtrics.com), which is a web-based survey platform, then the survey link was extracted from the Qualtrics website to pass on to potential respondents. The paper survey was conducted on university campuses and in public places such as libraries, squares, parks and shopping malls. All of these locations were in Auckland and Christchurch due to the size of the respective populations and convenience for data collection.

4.4.4. Ethics

All research that involves people needs to be approved by an ethics committee to make sure the research is conducted in an ethical manner. Therefore, this study gained ethical approval from the Auckland University of Technology Ethics Committee (AUTEC) before the survey was conducted (see Appendix 1). The approval was granted by AUTEC on 4th November 2014 (reference no. 14/365). This research was conducted based on the following principles of Treaty of Waitangi: partnership, participation and protection.

The participants were first briefly informed about the purpose of the study. Their participation in this study was voluntary and anonymous; therefore, they could withdraw from the survey. The completion of the survey was indicative of their agreement to participate in the investigation. Participants and their answers remained anonymous. Participants were not identified in this research in any manner. Data collected from this research is stored confidentially in a secure place and only made accessible to the researchers who are involved in this research. The data will be used for research purposes only.

4.5. Data Analysis

4.5.1. Partial Least Square Structural Equation Modelling (PLS-SEM)

Since this study used a theoretical model involving a network of independent variables and dependent variables such information transparency and intention to use, it required more complex analysis that went beyond simple regression computation. When it comes to the statistical analysis of multiple variables, there are several common methods such as cluster analysis, exploratory factor analysis, multidimensional scaling, and multiple regression as first generation techniques (Hair, Hult, Ringle, & Sarstedt, 2013). Structural equation modelling (SEM) is a more advanced generation of multivariate analysis, which tests hypotheses with structural theory about certain phenomena (Gefen, Straub, & Boudreau, 2000). Generally, the SEM approach has the following advantages: a) it models relationships among multiple predictors and criterion variables; b) it constructs unobservable latent variables; c) it models errors in measurements for observed variables, and d) it statistically tests prior substantive/theoretical and measurement assumptions against empirical data (Chin, 1998, p. 297).

There are two approaches to SEM: Covariance-Based SEM (CB-SEM) and Partial Least Square SEM (PLS-SEM) (Chin, 1998; Urbach & Ahlemann, 2010). These two choices are represented by different aspects of the research that were confirmatory and exploratory. Confirmatory research's goal is to test theories and concepts that are already established. Meanwhile, exploratory research examines the impacts of different independent variables on the dependent variable and explores which ones better predict the dependent variable.

The Covariance Based-SEM (CB-SEM) is primarily used to confirm or reject theories (confirmatory). This technique uses maximum likelihood to minimise the differences between the sample covariance and those predicted by the theoretical model. Then it runs a covariance matrix among the observed values using the estimated parameters (Chin, 1998; Hair, Sarstedt, Ringle, & Mena, 2012; Urbach & Ahlemann, 2010). If the structural model is correct in the sense of explaining the covariance of all indicators, the covariance-based procedure provides optimal estimations of model parameters (Chin, 1998, p. 301).

Instead of minimising the discrepancies between the estimated and sample covariance matrices, Partial Least Square-SEM (PLS-SEM) aims to minimise the variances of all the dependent variables (Hair et al., 2012; Urbach & Ahlemann, 2010). It estimates latent

variable scores as exact linear combinations of their associated manifest variables and treats them as perfect substitutes for the manifest variables (Hair et al., 2012). Therefore, PLS-SEM is primarily used to develop theories and explain the effects of independent variables on the dependent variables (Hair et al., 2013).

The choice of method depends on the nature of the research itself but also on the strengths of each method. As in the earlier discussion and described in Table 4.3, the goals of the two methods, PLS-SEM and CB-SEM, are different. PLS-SEM aims to predict dependent variables by evaluating the weights and effects of independent variables on the dependent variables, while CB-SEM aims to confirm and test theories. Therefore, they use different statistical strategies to achieve their goals. PLS-SEM estimates the path relationships/path coefficients by using ordinary least squares (OLS) and maximising the R^2 values of dependent variables (Hair & Ringle, 2011; Hair et al., 2012). The higher the R^2 values are, the better the independent variables explain the dependent variables. On the other hand, CB-SEM minimises the difference between the sample covariance and those predicted by the theoretical model to get overall model fits (Gefen et al., 2000; Urbach & Ahlemann, 2010).

Table 4.3: Rules of thumb for choosing between PLS-SEM and CB-SEM. Adapted from Hair et al. (2013, p. 19)

PLS-SEM	Use PLS-SEM when:
1.	The goal is predicting key target constructs or identifying key “driver” constructs.
2.	Formatively measured constructs are part of the structural model.
3.	The structural model is complex (many constructs and many indicators).
4.	The sample size is small and the data are non-normally distributed.
5.	The plan is to use latent variable scores in subsequent analyses.
CB-SEM	Use CB-SEM when:
1.	The goal is theory testing, theory confirmation, or the comparison of alternative theories.
2.	Error terms require additional specification, such as the covariance.
3.	The structural model has non-recursive relationships.
4.	The research requires a global goodness of fit criterion.

Another of PLS-SEM's strengths is its ability to handle structural models with formative and reflective constructs. The formative construct is formed by its measures/indicators while the reflective construct is manifested by its measures/indicators (Chin, 1998). If the structural model includes both reflective and formative constructs, the covariance-based method can handle formative measures but requires accounting for relatively complex and limiting specification rules (Hair & Ringle, 2011). The advantage of PLS-SEM is also a disadvantage because it allows analysis of both reflective and formative constructs, but it cannot examine the global goodness of fit. However, PLS-SEM can also work well when the sample size is small relative to the complexity of the model, while CB-SEM needs a minimum sample size of about 100-150, and assumes a normal distribution of the data and non-recursive relationships (Hair & Ringle, 2011; Urbach & Ahlemann, 2010).

Based on the guidelines in Table 4.3 and discussion above, this study used PLS-SEM as the statistical method to assess the research model and examine the hypotheses for the following reasons:

- The objective of this study was to examine “driver” constructs of information transparency as well as the impacts of information transparency on different levels of e-Government use. The theoretical background proposes the links between information transparency and other constructs based on ISSM theory from past research. These links with information transparency are not well established; for example, the relationships between information quality, system quality and service quality, and information transparency have not been fully explored in prior literature. Hence, this study was more exploratory in nature rather than confirmatory.
- The focus of the study was on predicting the impacts of information quality, system quality and service quality on information transparency in a computer-mediated environment and predicting the impact of information transparency on different e-Government use levels. Therefore, PLS-SEM is recommended when the research objective is theory development and prediction.
- The study employed both reflective and formative measurement models, which will be discussed in detail in the next section. The formative constructs included information quality, system quality, service quality, information transparency, and intention to use e-Government; and the reflective construct included satisfaction.

The software used for PLS-SEM analysis in this study was Smart-PLS 3.0 to analyse measurement and structural models. Resampling with bootstrapping to assess the significance of the relationships was conducted with 1,000 cases.

4.5.2. Reflective and Formative Constructs

One of the significant differences from CB-SEM is that PLS-SEM is able to handle both reflective and formative measurement models (Hair & Ringle, 2011). So this discussion will distinguish between the reflective and formation constructs, as well as highlight in the research model which are the formative constructs in order to emphasise why PLS-SEM was chosen.

The reflective construct models causality from the construct to its indicators as shown in the diagram below (Figure 4.1). This direction represents the indicators as manifested by the construct. Indicators of reflective constructs are affected by the same underlying construct and are parallel measures that co-vary to the extent that they measure the same underlying construct (Ravichandran & Rai, 2000). Therefore, they are interchangeable, and internal consistency is important for assessing the reliability of the construct (Hair et al., 2013). It also means that individual measures can be removed to improve construct validity without changing the meaning of the construct (Petter, Straub, & Rai, 2007).



Figure 4.1: Diagrams of reflective (left) and formative (right) constructs (Freeze & Raschke, 2007, p. 1483)

The formative construct models causality from the indicators to the construct as described in Figure 5.1. Therefore, the construct is the linear combination of indicators. PLS estimates the underlying construct and weights the indicators according to their relative importance in forming the construct (Ravichandran & Rai, 2000). Internal consistency is not important for formative constructs. Since the indicators in formative constructs are not interchangeable, each of the indicators influences its own aspect of the construct. By

deleting one of the indicators, the content validity will be affected (Hair et al., 2013; Petter et al., 2007).

Despite the differences between reflective and formative constructs, there is a thin line in defining whether the construct is reflective or formative (Cenfetelli & Bassellier, 2009; Petter et al., 2007). As such, the specification depends on the construct conceptualisation and the objective of the study (Hair et al., 2013).

4.5.3. Measurement and Structural Models

In SEM, the structural model is also called the inner model, which describes the relationships among latent variables. The measurement model is called the outer model, which describes the relationships between latent variables and their indicators/measures (Hair et al., 2014 p. 33). This allows the assessment of both models simultaneously, which is an advantage. Hence, the research model was assessed in two parts – an assessment of the measurement models and an assessment of the structural model.

Before assessing each of measurement models and structural model, it was necessary to assess nomological validity and content validity. **Nomological validity** refers to the tests of the relationships between the construct and its hypothesised antecedents and consequences (Lewis et al., 2005). Nomological validity is demonstrated if statistically significant paths are observed (Lewis et al., 2005). **Content validity** refers to the representativeness of measures and is often established through literature reviews and expert judges or panels (Straub, 1989; Straub et al., 2004). Each item of the construct should represent the construct and collectively they should cover the entire content domain of the construct. (Lewis et al., 2005; MacKenzie, Podsakoff, & Podsakoff, 2011). The validation does not distinguish the direction of the relationship between items and their corresponding construct, hence both formative and reflective constructs can be assessed by this technique (MacKenzie et al., 2011). The content validity is assessed using the literature review and pre-test.

a) Measurement Model

Assessment of the measurement models aims to evaluate the construct and content validity of the construct measures and check for measurement errors (Bagozzi, Yi, & Phillips, 1991). However, this depends on the nature of the constructs (i.e. formative or reflective). For *reflective measurement models*, there are four indicators that need to be

addressed: internal consistency (composite reliability), indicator reliability (indicator loading), convergent validity (average variance extracted), and discriminant validity.

Internal consistency measures reliability based on the inter-correlations of the indicators. Traditionally, Cronbach's alpha represents internal consistency (Cronbach, 1971). However, Cronbach's alpha assumes that all indicators have equal outer loadings and are sensitive to the number of indicators in the scale (Hair & Ringle, 2011). Therefore, Cronbach's alpha tends to underestimate the internal consistency reliability (Hair et al., 2013). PLS-SEM also reports on composite reliability, which is viewed as more robust than Cronbach's alpha and does not assume that all indicators have equal outer loadings. Below is its formula:

$$CR_i = \frac{(\sum_i l_i)^2}{(\sum_i l_i)^2 + \sum_i var(e_i)}$$

Where CR_i is composite reliability of construct i , l_i symbolises the standardised outer loading of the indicators, e_i is the measurement error of indicator variable i , and $var(e_i)$ denotes the variance of the measurement error, which is defined as $1 - l_i^2$ (Hair et al., 2013, p. 102).

Similar to Cronbach's alpha, composite reliability is interpreted from a range of 0 to 1. Exploratory research generally needs CR to be above 0.6. However, more advanced stages of research should have CR above 0.8 or 0.9 (Nunnally & Bernstein, 1994). Values that have CR below 0.6 should be reconsidered due to lack of reliability (Nunnally & Bernstein, 1994).

Indicator reliability is indicated by the outer loadings of the construct's measures. The loadings of indicators should explain at least 50% of the construct. The variance between a construct and an indicator is the square root of loading; so in order to have a square root of at least 0.5, the loading should be 0.708 ($\sqrt{0.5} = 0.708$). If any measure has a smaller loading than 0.7, it should be considered for removal. Generally, deleting items that have small loadings leads to higher composite reliability. However, removal of any measure should consider carefully how it could affect the internal consistency and convergent validity (Urbach & Ahlemann, 2010).

Convergent validity is assessed using the average variance extracted (AVE). Since the reliability of a reflective construct is about how much the indicators cover the construct's meaning, it is important to know how much the individual indicators load on their

underlying construct (Urbach & Ahlemann, 2010). AVE is, therefore, equivalent to the communality of a construct. An AVE value of 0.50 or higher indicates a sufficient degree of convergent validity, meaning that the latent variable explains more than half of its indicators' variance (Hair & Ringle, 2011). If the value of AVE is lower than 0.5, this shows that there is an error in the items measuring the construct.

Discriminant validity is the test of whether indicators of this construct load to other constructs or explain other constructs (Urbach & Ahlemann, 2010). There are two ways to check the discriminant validity in PLS, which are item-level cross-loading and Fornell-Larcker's criterion (Hair & Ringle, 2011). The item-level cross-loading test shows the correlation scores of all items. The loadings of items on their own constructs should be higher than the loadings of those items on other constructs. The Fornell-Larcker criterion compares the square root of AVE values with latent variable correlations. The indicator of good discriminant validity is that the square root of each construct's AVE should be greater than its highest correlation with other constructs. It shows that the latent variable shares more variance with its own indicators than with any other variables (Hair & Ringle, 2011).

For *formative measurement models*, there are three indicators that need to be assessed: convergent validity, collinearity and outer weights (Urbach & Ahlemann, 2010).

Convergent validity of a formative construct is different from that of a reflective construct because the convergence of the formative construct is reflected by relevant facets but not the common domain of the indicators. Therefore, convergent validity for a formative construct refers to the correlations of the formative construct to other measures of the same construct, also known as redundancy analysis (Chin, 1998, 2010). This means that the formative construct has adequate coverage of perception and strong convergence, and the R^2 value should be higher than 0.64. If the R^2 value is less than 0.64, the formative construct does not contribute sufficiently to its intended content.

Collinearity refers to high correlations between two formative indicators. The problems of high levels of collinearity are the effects on estimated weights of indicators and their statistical significance. One measure for collinearity in PLS is the variance inflation factor (VIF), which is defined as the reciprocal of the tolerance. The tolerance refers to the amount of variance of one formative indicator not explained by the other indicators in the same constructs. The accepted value of VIF is < 5 .

$$VIF_{x1} = 1/TOL_{x1}$$

After confirming acceptable collinearity values, it is necessary to check the significance and relevance of **outer weights**. The indicator is significantly relevant for a formative construct when its outer weight is above 0.5. However, literature also indicates that the significance level depends on the number of indicators for the formative construct. For example, if the construct has six indicators then its significance level is $1/\sqrt{6} = 0.40$. In a formative construct, there are likely to be one or two indicators that are not significant. Even so, if the indicators have non-significant impacts on the construct but have high loadings, they should be retained, as they are absolutely important and relevant to the construct.

Common method variance (CMV): Measurement errors can be avoided by assessing face validity in the pre-test, and content and construct validity in the pilot test. These errors have both random and systematic components (Bagozzi et al., 1991). Random errors affect observed relationships among variables, while systematic errors affect the correlations among constructs (Bagozzi & Yi, 1991). Hence, method variance, the main source of systematic error, can yield a misleading conclusion in a quantitative study (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

As Podsakoff et al. (2003) explained, the common method variance or common method bias happens when two constructs theoretically correlate, and they are measured by the same method. This leads to deflating the correlation between these two constructs. The causes of common method bias include common rater effects (e.g. consistency motif, implicit theory, social desirability, leniency biases, acquiescence biases, mood state, transient mood state); item characteristic effects (e.g. item social desirability, item demand characteristics, item ambiguity, common scale formats, common scale anchors, positive and negative item wording); item context effects (e.g. item priming effects, item embeddedness, context-induced mood, scale length, inter-mixing of items or constructs on the questionnaires), and measurement context effects (e.g. for predictor and criterion variables measured at the same point in time, or in the same location, or using the same medium).

In order to assess CMV, there are several techniques such as traditional multitrait-multimethod (MTMM), confirm factor analysis bases MTMM (CFA-MTMM), Harman's single-factor test, and the marker-variable technique (Malhotra, Kim, & Patil, 2006). The

traditional MTMM technique creates a matrix from measures of each variable using multiple methods. CMV exists when the average of monomethod-heterotrait (MH) correlations are greater than the heteromethod-heterotrait correlations. CFA-MTMM is more advanced than traditional methods in the way it estimates how similar or dissimilar the methods adopted in an MTMM study are. The single factor technique uses exploratory factor analysis (EFA) with an unrotated factor solution. CMV is detected when a single factor emerges from unrotated factor solutions, or the first factor explains the majority of the variance in the variables (Podsakoff et al., 2003). However, the more effective technique for detecting CMV in information system (IS) research is the marker-variable technique (Malhotra et al., 2006).

The marker variable technique was introduced by Lindell and Whitney (2001). A marker variable is chosen from the literature that is theoretically unrelated to the substantive variables in the study and added to the questionnaire (Lindell & Whitney, 2001; L. J. Williams, Hartman, & Cavazotte, 2010). The CMV does not exist if there is a nonzero correlation between the marker variable and substantive variables. It is important that the marker variable have no relationship with one or more variables because “the smallest correlation among the manifest variables provides a reasonable proxy for CMV” (Lindell & Whitney, 2001). This study used this technique and the single-factor test to assess CMV. Section 4.6 will discuss the chosen marker variable further.

b) Structural Model

After validating the measurement models, assessment of the structural model is the main part of analysis since the results from the assessment show evidence to validate the hypotheses and achieve the objectives of the study. PLS provides a coefficient of determination (R^2) and path coefficient for evaluating the explanatory power of the structural model.

For PLS, the main objective is prediction, which indicates how much the independent variables account for the variance in the dependent variables. Coefficients of determination (R^2) are the measure of the model's predictive accuracy and predicted values. R^2 values range from 0 to 1. The higher the R^2 value is, the better the dependent variable is explained. Chin (1998) considers values of approximately 0.670 as substantial, values around 0.333 as average, and values of 0.190 and lower as weak.

The second measure of the structural model in PLS is the **path coefficient**, which refers to the strength of the relationship between two latent variables. In PLS, the path coefficient depends on its standard error that is obtained by means of bootstrapping. Bootstrapping is the method that involves repeated random sampling with replacement from the original sample to create a bootstrap sample (Hair & Ringle, 2011). The bootstrap standard error between variable 1 and variable 2 (se_{12}) and the original path coefficient from the PLS algorithm (p_{12}) will produce a t-value representing the relationship between variable 1 and variable 2 using the formula below:

$$t = \frac{p_{12}}{se_{12}}$$

The t-value should be in the range of 1.65 (for significance level = 0.1), 1.96 (for significance level = 0.05), and 2.57 (for significance level = 0.01). In general, the path coefficients should exceed 0.10 to account for a meaningful impact within the model and be significant at least at the 0.05 level (Huber et al., 2007).

The assessment of measurement models and structural model is summarised in Table 4.4. After the structural model has been evaluated successfully, then the interpretation of the structural equation model can be conducted based on theoretical foundations (Urbach & Ahlemann, 2010).

Table 4.4: Assessment of measurement models and structural model

Measurement model				
Reflective			Formative	
Internal consistency (CR)		CR > 0.8	Indicator reliability (outer weights)	weights > $1/\sqrt{n}$
Indicator reliability (loadings)		loadings > 0.7	Convergent validity	R2 > 0.64
Convergent validity (AVE)		AVE > 0.5	Collinearity	VIF < 5
Discriminant validity		Cross loadings and Fornell and Larcke		
Structural model				
Coefficient of determination (R²)			0.67—substantial 0.333—moderate 0.190—weak	
Path coefficients			t= 1.65 (p=0.10) t=1.96 (p=0.05) t=2.57 (p=0.01)	

4.6. Instrument Development

This section discusses how the instruments were developed through four stages conceptualising the constructs, pre-test, pilot study and finalising the main measurement items (J. Kim et al., 2011; Lewis et al., 2005). The following subsections will provide the details and results for the four stages.

4.6.1. Construct conceptualisation

In the first step of instrument development, the study conceptualised the constructs and adapted the measurement items from previously validated constructs drawn from the prior literature. Based on the theoretical background discussed in Chapters 2 and 3, the constructs in this study were defined from existing literature or self-developed. Information quality, system quality and service quality were defined using the updated Information System Success Model theory of DeLone and McLean (2004). Their related characteristic constructs (e.g. completeness, timeliness, empathy, etc.) were defined using the literature on information systems, information transparency and e-Government. Satisfaction and intention were adapted from information system literature (Bhattacharjee, 2001a; Shareef et al., 2011); however, different levels of intention (e.g. the search for information, communication, transactions, consultation, and active participatory use) were self-developed using both existing general information systems and the literature on e-Government (Chun & Cho, 2012; Shareef et al., 2011). Definitions for information transparency and other types of transparency (i.e. data, process, policy) were drawn from several of the literature (Dapko, 2012; Grimmelikhuijsen, 2012b; Park & Blenkinsopp, 2011). In summary, the definitions of all constructs are represented in Table 4.5 with references.

Table 4.5: Construct Definitions

<u>Constructs</u>	<u>Dimensions</u>	<u>Definition</u>	<u>References</u>
Passive use intention	Intention to search for general information	The willingness to search for information related to local government websites	(Al-adawi, Yousafzai, & Pallister, 2005)
	Intention to search for policy information	The willingness to search for or acquire information on local government decisions, policies, strategies, legislation and plans	(Chun & Cho, 2012)
Active use intention	Intention to communicate	The willingness to contact or make query of local government	(Al-adawi et al., 2005; Shareef et al., 2011)
	Intention to transact	The willingness to submit applications, register pets, apply for food or alcohol licences, and pay fees	(Shareef et al., 2011)
Participatory use intention	Intention to comment on policy	The willingness to provide comments on local government decisions, policies, strategies, legislation and plans	(Chun & Cho, 2012)
	Intention to actively participate	The willingness to take an active part in local government planning, legislation, policy-setting and decision-making	(Chun & Cho, 2012)
Information Quality	Information quality (IQ)	The quality of the information provided by e-Government	(DeLone & McLean, 1992; Wixom & Todd, 2005)
	IQ- completeness	The degree to which e-Government provides all necessary information	(Wixom & Todd, 2005)
	IQ- accuracy	The citizens' perceptions that information is correct and free of errors	(Y. W. Lee et al., 2002; Wixom & Todd, 2005)
	IQ- understandability	The information is clear and easy to comprehend	(Y. W. Lee et al., 2002; Wangpipatwong et al., 2009)
	IQ- timeliness	The information is current and timely	(Wangpipatwong et al., 2009)
	IQ- relevance	The information corresponds to the need and is applicable for the task at hand	(Wangpipatwong et al., 2009)

	IQ- reliability	The information is reliable and dependable	(Teo et al., 2009; Wixom & Todd, 2005)
System quality	System quality (SQ)	The quality of the processing system of e-Government (e.g. websites)	(DeLone & McLean, 1992)
	SQ-accessibility	The ease with which information can be accessed or extracted from the system	(Wixom & Todd, 2005)
	SQ-availability	The ease with which the system is always available and ready to use	(DeLone & McLean, 2004; H.-Y. Wang & Wang, 2010)
	SQ-reliability	The dependability of system operation	(Wixom & Todd, 2005)
Service quality	Service quality (SrQ)	The quality of personal support services (help services) provided to citizens through e-government websites, such as frequently asked questions, complaints, enquiries	(DeLone & McLean, 2004; Wangpipatwong et al., 2009)
	SRQ- reliability	Ability to perform the promised services dependably	(Parasuraman et al., 2005)
	SRQ- empathy	Caring, individualised attention the service provider gives its citizens	(Parasuraman et al., 2005)
	SRQ-responsiveness	Willingness to help customers and provide prompt service	(Parasuraman et al., 2005)
	SRQ-assurance	Knowledge and courtesy of citizens and their ability to inspire trust and confidence	(Parasuraman et al., 2005)
Information transparency	Information transparency	Openness, visibility and disclosure of government information (data, process, policy) to citizens	(Dapko, 2012; Grimmelikhuijsen, 2012a; Park & Blenkinsopp, 2011)
	Data transparency	Openness, visibility and disclosure of facts and figures of government to citizens	(Park & Blenkinsopp, 2011)
	Process transparency	Openness, visibility and disclosure of steps of the workflow, actions, procedures, operations of government to citizens	(Park & Blenkinsopp, 2011)
	Policy transparency	Openness, visibility and disclosure of policies, decisions, and rationales behind policy decisions of government to citizens	(Park & Blenkinsopp, 2011)
Satisfaction	Satisfaction	Users' affection with or feelings about prior use	(Bhattacharjee, 2001a; R. L. Oliver, 1981)

As discussed in Section 4.5, in this study common method variance was assessed in part by using a marker variable. The marker variable was chosen based on existing literature and did not relate to any constructs in this study. Based on the criteria, *fashion consciousness* was selected. Fashion consciousness is defined as the degree of desire for up-to-date styles and frequent wardrobe changes (Shim & Gehrt, 1996). Based on the literature, fashion consciousness has no relationship with satisfaction of IS, or information transparency. Its measures were drawn from the literature (Shim & Gehrt, 1996) and included in questionnaires.

Most constructs were measured using multiple items (i.e. three or more items) and used a seven-point Likert scale ranging from 1-strongly disagree to 7-strongly agree. The participants were then asked to indicate the extent to which they agreed or disagreed with the statements in the questionnaires. The study adapted measurement items used in previous studies and carefully revised them to fit with the study context. Adapting the measurements from validated constructs in previous literature will provide content validity, and avoids problems with indicator and construct reliability (Bryman & Bell, 2011; J. Kim et al., 2011).

Three levels of intention to use e-Government and their dimensions were measured using nine items that were adapted from Scott et al. (2015); Venkatesh, Morris, Davis, and Davis (2003); Shareef et al. (2011); Al-adawi et al. (2005), and Chun and Cho (2012).

Information quality, system quality and their sub-dimensions were adapted mainly from Wixom and Todd (2005) and other literature such as Teo et al. (2009); Wangpipatwong et al. (2009); and Y. W. Lee et al. (2002). Service quality and its sub-dimensions were measured using items adapted from Parasuraman et al. (2005); DeLone and McLean (2004); and Xu et al. (2013). Measurement items of information transparency and its dimensions (data, process, policy) were developed based on Dapko (2012); Grimmelikhuijsen (2012a); and Park and Blenkinsopp (2011). In the literature, information quality, system quality and service quality has been operationalised as formative or reflective constructs. However, Forsgren et al. (2016), Cenfetelli and Bassellier (2009) and MacKenzie et al. (2011) assessed information quality, system quality and service quality as second order constructs (both reflective and formative) and all suggested that measuring these items as formative constructs gives better results. In addition, the results of a redundancy test (in Chapter 5) showed that these constructs have

a good level of convergent validity. Hence, the study will operationalise these three constructs as formative second order constructs.

There were six items measuring satisfaction with e-Government, and these were adapted from Bhattacharjee (2001a), and DeLone and McLean (2004). Two of them were measured using a seven-point Likert scale. The other four items were measured using 7-point semantic differential scales (e.g. anchored as dissatisfied-satisfied, unpleasant-pleasant, frustrated-contented, and disappointed-delighted).

The questionnaires were developed in both online (through Qualtrics) and paper forms. Both types of survey included participant information sheets approved by AUTECH. The surveys contained a filter question about whether the participants had ever used e-Government. In both surveys, if the participants answered “no”, the survey directed the respondents to demographic questions and the end of the survey. If the participants answered “yes” to the filter question, the survey led to the next section on e-Government use and then the demographic questions. The main questions focused on the participants’ experiences with using e-Government. The demographics were placed at the end of the survey to avoid cases where participants did not complete the survey before answering important questions related to the study (Andrews, Nonnecke, & Preece, 2003).

4.6.2. Pre-test

After generating the measurement items from previous literature and developing the questionnaires, a pre-test is desirable for getting field feedback from a highly controlled sample. The purpose of a pre-test is to check the relevance of instruments, the format, content, understandability, terminology, ease and speed of completion of questionnaires (Bryman & Bell, 2011; Lewis et al., 2005). This stage is critical for enhancing content validity using recommendations from the pre-test respondents.

In this study, the sample for the pre-test was recruited from IS experts, e-Government experts, and academic and non-academic respondents. The sample included two IS professors, three senior IS lecturers, two Auckland Council staff (one researcher and a project manager), and two citizens. They were asked to complete the survey and provide comments on the survey design, the items for each construct, preamble, and any aspect that needed clarification or had wording issues. The pre-test was conducted in June 2015.

The results suggested wording changes in some preambles. Some changes in the formatting of the survey were also suggested, such as highlighting the key words in the

preambles (e.g. e-Government system refers to **technologies** that governments use to deliver information and services) and moving the block of questions regarding intention to use to the beginning of the survey. It was also suggested to include examples in order to clarify the differences between the levels of use of e-Government (e.g. searching for information on local government decisions, policies, strategies and plans). Since the survey was quite long (with approximately 107 questions), the respondents in the pre-test suggested offering prizes when collecting the data.

4.6.3. Pilot Study

After the pre-test, a pilot study was needed for a “dress-rehearsal” of the instrument with a small sample (Bryman & Bell, 2011; Lewis et al., 2005). The main aim of the pilot study is to detect any further problems associated with the measurements and to assess the survey administration process. Results should be examined and adequate adjustments made to the instrument based on the observations of the participants (Lewis et al., 2005).

A pilot study was carried out to exercise the instruments, assess the measurement models and refine the instruments before the main survey. The survey was conducted in the same manner that the main survey would be conducted. The pilot took place in October 2015 using postgraduate and undergraduate students at AUT. The students received an invitation through email with an embedded hyperlink to the survey. The invitation briefly stated the purpose of the study and indicated the policies regarding confidentiality and anonymity of the information provided.

The pilot test collected 75 responses from persons who had experience with e-Government. Fifty-seven out of 75 cases were valid for analysing construct validity, the others being excluded because of incompleteness. Table 4.6 provides information about the respondents’ demographics. Among the 57 respondents, 59.6% were female and 40.4% were male. The largest age group of respondents was between 25 and 34 years old, which accounted for 71.9% of respondents. The highest education levels of the respondents were 71.9% for undergraduate degrees, 12.3% for postgraduate degrees and 15.8% for high school. As the wording of the education question was not clear, the results included some unexpected answers. Therefore, the question relating to education was reworded from “the highest education” to “the highest education that you have completed”. Of all respondents, 56.14% were New Zealand citizens, 29.82% held permanent residency and 14.04% of respondents held other types of visas (e.g. student visa, work visa).

Table 4.6: Demographic information of pilot study

<u>Demographic variable</u>	<u>Frequency</u>	<u>Percent</u>
<i>Gender:</i>		
Female	34	59.6%
Male	23	40.4%
<i>Age (years):</i>		
20-24	4	7.0%
25-29	25	43.9%
30-34	16	28.0%
35-44	2	3.5%
45-54	7	12.3%
55-64	3	5.3%
>65	0	0%
<i>Education:</i>		
High school diploma	9	15.8%
Undergraduate degree	41	71.9%
Postgraduate degree	7	12.3%
Others	0	0%
<i>Citizenship:</i>		
NZ Citizen	32	56.14%
NZ Permanent Resident	17	29.82%
Other	8	14.04%

The study also collected the respondents' usage of e-Government such as experience with and frequency of engaging with e-Government as described in Table 4.7. The results showed that most of the respondents had been using e-Government for one to less than three years (29.8%), for less than one month to less than a year (42.1%), and from three years to more than 10 years (28.1%) respectively. In terms of the frequency of e-Government use, 38.6% of the respondents used e-Government a few times a year, 28% of them used e-Government about once per month to 2-3 times a month, 5.3% about once a week, and 28.1% less than once a year to about once a year.

Table 4.7: Citizens' Use of e-Government in pilot study

<u>Demographic variable</u>	<u>Frequency</u>	<u>Percent</u>
<i>Experience:</i>		
Less than 1 month	5	8.8%
1 month to less than 6 months	9	15.8%
6 months to less than 1 year	10	17.5%
1 year to less than 3 years	17	29.8%
3 years to less than 5 years	5	8.8%
5 years to less than 10 years	6	10.5%
10 years or more	5	8.8%
<i>Frequency of use:</i>		
Less than once a year	11	19.3%
About once a year	5	8.8%
A few times a year	22	38.6%
About once a month	6	10.5%
2-3 times a month	10	17.5%
About once a week	3	5.3%
A few times a week	0	0%

SmartPLS 3.0 software was used in this pilot study to evaluate measurement models including validity and reliability of constructs of the study. The analysis was conducted for first-order constructs and then second-order constructs.

For the first-order model, all of the constructs in this study were reflective except for intentions. For reflective constructs, all the composite reliability values were higher than 0.8, indicator loadings were higher than 0.7, and convergent validity values of all constructs were higher than 0.6. The discriminant validity is presented in Table 4.8. The Fornell-Larcker test showed that all the square roots of AVE were higher than its highest correlations with other constructs except for values of correlations between IQCOM and IQRELE, and between SQRELI and SQAVAI. However, these were dimensions of information quality and system quality. At the second-order construct, they are formative dimensions. In addition, these characteristics were defined in Chapter 3 as conceptually important dimensions of information quality and system quality. Hence, this study will retain these dimensions.

Since the feedback from the pre-test and pilot study emphasised the length of the questionnaire, the study reduced the number of items for each construct to a maximum of

three items. The reduction of scales depends on the loading scores of the items to their constructs. SPSS was used to conduct the test for how the reliability of a construct changes when any item is deleted. The study deleted items that reduced the reliability score. These following constructs and their reliability were influenced by the reduction: IQUNDER, IQRELI, SRQRES, SRQRELI, SRQEMP, INTSEAR, INTCOMMU, INTTRAN, INTSEARPOL, INTCOMME and INTACTIVE, with one item removed for each construct. The resulting CRs were high (CR >0.8, AVE >0.6, which exceeded recommended thresholds). There were two items removed from TRANSPROC, SAT and FC. The modified constructs retained good reliability and validity scores. The removed items reduced the survey length by 21.5% (or 23 questions).

For the formative constructs such as passive use intention, active use intention and participatory use intention, the study evaluated their collinearity, construct validity and indicator validity. The passive use intention construct was formed by two indicators: intention to search for general information and intention to search for policy information. The active use intention construct was formed by two indicators: intention to communicate with e-Government and intention to conduct a transaction with e-Government. The participatory use intention construct was formed by two indicators: intention to provide comments on decisions and policies, and active participation in the decision- and policy-making process. The results of analysis of the pilot data showed that collinearity of these indicators was not a problem ($VIF < 5$). Their weights were relatively high (> 0.4). Except for intention to transact and intention to actively participate, no indicators were excluded since they were theoretically important to the main construct (Petter et al., 2007). For the second-order models, information transparency, information quality, system quality and service quality were formative in nature. The transparency construct was formed by data transparency, process transparency and policy transparency. Some of their weights were not significant; however, their loadings were very high, so these items were retained as they contributed to information transparency, which satisfied the test of content validity (Cenfetelli & Bassellier, 2009).

In conclusion, all construct tests of reliability and validity of the measures were satisfactory. Through successive stages of conceptualisation, development and refinement, the measurement results were good enough to move to the actual data collection phase. Based on the suggestions of the respondents, some further modifications to the layout of the questionnaire were made as well as some minor changes such as

reducing the number of items of some constructs. The questionnaires were presented in Appendix 6.

Table 4.8: Fornell-Larcker Table

	IQ	IQACC	IQCOM	IQRELE	IQRELI	IQTIME	IQUNDER	SAT	SQ	SQACCESS	SQAVAI	SQRELI
IQ	0.95											
IQACC	0.50	0.92										
IQCOM	0.49	0.67	0.90									
IQRELE	0.57	0.68	0.85	0.85								
IQRELI	0.66	0.83	0.65	0.73	0.88							
IQTIME	0.54	0.57	0.61	0.66	0.54	0.91						
IQUNDER	0.50	0.53	0.68	0.80	0.63	0.58	0.93					
SAT	0.40	0.40	0.40	0.57	0.48	0.35	0.50	0.89				
SQ	0.68	0.66	0.71	0.79	0.73	0.68	0.69	0.42	0.95			
SQACCESS	0.57	0.54	0.56	0.72	0.59	0.64	0.73	0.40	0.75	0.88		
SQAVAI	0.51	0.63	0.51	0.61	0.71	0.52	0.50	0.42	0.70	0.78	0.93	
SQRELI	0.64	0.61	0.67	0.81	0.71	0.61	0.76	0.42	0.82	0.92	0.79	0.88
SRQ	0.60	0.43	0.50	0.53	0.48	0.58	0.38	0.30	0.62	0.49	0.44	0.51
SRQASSU	0.49	0.49	0.46	0.58	0.52	0.64	0.56	0.25	0.57	0.57	0.41	0.53
SRQEMP	0.42	0.33	0.38	0.40	0.41	0.48	0.39	0.26	0.39	0.30	0.24	0.36
SRQRELI	0.45	0.42	0.41	0.47	0.44	0.54	0.41	0.24	0.46	0.47	0.41	0.48
SRQRES	0.47	0.37	0.41	0.51	0.45	0.54	0.47	0.29	0.39	0.39	0.27	0.41
TRANS	0.38	0.38	0.37	0.46	0.38	0.47	0.40	0.46	0.45	0.36	0.33	0.34
TRANSDATA	0.35	0.39	0.37	0.46	0.34	0.49	0.40	0.44	0.45	0.36	0.29	0.34
TRANSPOL	0.38	0.33	0.36	0.39	0.36	0.40	0.36	0.40	0.42	0.27	0.25	0.26
TRANSPROC	0.33	0.33	0.29	0.41	0.36	0.41	0.35	0.42	0.38	0.36	0.35	0.33
ACTIVE USE INTENTION	0.11	0.32	0.27	0.33	0.24	0.24	0.23	0.08	0.29	0.29	0.23	0.34
PARTICIPATORY USE INTENTION	0.30	0.25	0.11	0.34	0.23	0.24	0.34	0.29	0.23	0.32	0.15	0.31
PASSIVE USE INTENTION	0.13	0.27	0.35	0.44	0.27	0.12	0.36	0.25	0.20	0.36	0.27	0.38

	SRQ	SRQASSU	SRQEMP	SRQRELI	SRQRES	TRANS	TRANS DATA	TRANS POL	TRANS PROC	ACTIVE USE INTENTION	PARTICIPATORY USE INTENTION	PASSIVE USE INTENTION
SRQ	0.95											
SRQASSU	0.76	0.92										
SRQEMP	0.73	0.72	0.93									
SRQRELI	0.78	0.81	0.81	0.90								
SRQRES	0.76	0.84	0.78	0.74	0.92							
TRANS	0.61	0.59	0.52	0.58	0.61	0.83						
TRANS DATA	0.61	0.57	0.47	0.57	0.56	0.95	0.93					
TRANS POL	0.55	0.55	0.58	0.49	0.61	0.87	0.72	0.85				
TRANS PROC	0.53	0.50	0.42	0.55	0.52	0.95	0.88	0.73	0.92			
ACTIVE USE INTENTION	0.33	0.27	0.25	0.22	0.29	0.31	0.31	0.27	0.27			
PARTICIPATORY USE INTENTION	0.35	0.37	0.33	0.42	0.39	0.49	0.49	0.32	0.52	0.38		
PASSIVE USE INTENTION	0.10	0.20	-0.05	0.13	0.18	0.03	0.00	0.00	0.07	0.38	0.19	

4.7. Final Survey

The main survey was conducted online and on paper, and the same format and structure for the questionnaire were used. The survey was divided into five sections: intention to use e-Government, information transparency, quality of e-Government, satisfaction with e-Government and demographics. The first section briefly introduced the purpose of the research, the approximate time for completion, assurance of confidentiality and anonymity, and prize information. It also explained the basic concepts of the study (i.e. information transparency and e-Government definitions, local government examples, and different types of use).

Included on the same page, a filter question asked whether the respondents had previously used e-Government. For the web-based survey, Qualtrics was used, which is specialist software for designing surveys and allows the user to set up a logical sequence to the survey. The filter question was “Have you ever used e-Government (i.e. local government websites, forums, or other online services) to search for information, communicate with local government, conduct a transaction, provide comments on or take an active part in local government planning, policy-setting, and decision-making?” If the answer were “No”, the respondent would be directed to the demographic questions to complete. If the answer were “Yes”, the survey would direct the respondent to the main survey questions and then the demographic questions. For the paper-based survey, all information and the format were the same as in the web-based survey. However, after the filter question, there was a note that stated: “If you have not used e-Government at all, you will be asked to complete demographic questions. Please go to Page 8.” (i.e. the demographic question page).

In the main section, the questionnaire was divided into five parts that focused on the intention to use e-Government (part A), information transparency in e-Government (part B), quality of e-Government (part C), satisfaction with e-Government (part D), and demographics (part E). All the questions used a seven-point Likert scale, ranging from 1 (“strongly disagree”) to 7 (“strongly agree”), except for satisfaction items, which were in semantic format. For the web-based survey, the website had a function to require respondents to answer all the questions. However, for the paper survey respondents completed the survey by themselves without any control. Once they completed the survey, they returned them to the researcher. Because of the limited control for the paper survey, some questions were not completed (i.e. some missing data).

The last section included demographic questions for statistical purposes. These questions were in regard to gender, age, education and citizenship. At the end of the survey, if the respondents wished to enter the prize draw, there was a separate link for collecting their email. This data was stored separately from the survey data.

The main data collection was conducted from November 2015 to January 2016. Invitations were posted on more than 200 official online pages for city, district and region councils in New Zealand. After three weeks, invitations were re-posted on online channels such as Facebook, LinkedIn, Twitter, and YouTube. Besides posting on online channels, data was also collected by distributing paper surveys in shopping malls and other public places in Auckland and Christchurch. The citizens were approached and asked if they wanted to participate in the research survey, which would take approximately 20 minutes.

4.8. Summary

This chapter described the research paradigm, methodology and research design. The study followed positivism and adopted a quantitative methodology. Therefore, the data was designed to be collected using both web- and paper-based surveys. Measurement development in this study was conducted through a conceptual stage, pre-test stage and pilot stage. The technique for data analysis was partial least squares, using SmartPLS 3.0. The development and refinement measurement items were conducted, and the statistical results were satisfactory in terms of the validity and the reliability of constructs. Finally, how the survey was formatted and administrated for actual data collection was described. The following chapter will report the characteristics of the collected data and analyses of both measurement models and structural models.

5. CHAPTER FIVE - DATA ANALYSIS

5.1. Introduction

This chapter describes the procedure for evaluating the empirical data that was collected in the main survey and testing of the research model and the hypotheses. This chapter follows the widely accepted structure for reporting the results of PLS analysis proposed by Chin (2010). The chapter will first provide descriptive statistics of the data and discuss the screening of the data for missing data, normality and common method bias. This stage prepared the data for the next phases of analysis. The assessment of the measurement models at first- and second-order levels examined internal consistency, reliability, convergent validity and discriminant validity of instrument items. The assessment of the structural model was conducted by evaluating the coefficient of determination and path coefficients. Altogether these analyses allowed for validating the relationships between items and constructs, and testing the hypotheses.

5.2. Data preparation

The data for this study was combined from two sources: a web survey and a self-administered paper survey. The web survey responses were downloaded and coded into an appropriate format for processing. The web survey was conducted on more than 200 local government online forums. However, the posts on online forums were not able to record how many page visits were made to the posts. Therefore, this study is unable to provide a response rate for the web survey. In total, the web survey collected 94 responses of which 53 people had previously used e-Government. The paper survey responses were entered manually into a database with the online data. The number of responses collected through the paper survey was 205. This survey was conducted in a random and convenient manner because the researcher distributed the surveys in public places such as shopping malls, libraries, and parks in Auckland and Christchurch. These places were convenient for the researcher to approach people and also allowed respondents to have enough time to complete the survey on the spot. This way, the respondents were more willing to take the time to complete the questionnaire than had they simply been stopped on the street (Goldsmith & Litvin, 1999). In addition, at these places, the researcher approached random people and would move to the next available person when refusals were

encountered. Hence, there were no responses received from non-users and a response rate through this channel were not displayed.

A total of 258 cases were recorded in an Excel file. All the responses that did not pass the filter question regarding use were excluded from the database. The data screening process also excluded cases that had more than 10% of data missing (Schlomer, Bauman, & Card, 2010). There were 24 cases missing more than ten responses, which were removed. The study also assessed the standard deviation of case responses to screen out serial responses. This was done because serial responses could cause response bias (Podsakoff et al., 2003). The study assessed the standard deviation at less than or equal to 0.5 and found that none of the cases exceeded the threshold suggesting that all responses were retained. After the preliminary scrutiny, there were 234 usable cases remaining with less than 1% of data missing. The final dataset was loaded into SPSS v.22 for generating descriptive statistical reports and further analyses.

5.3. Descriptive Statistics for the Respondents

5.3.1. Descriptive Statistics

The demographic data that the study collected from the responses were in regard to age, gender, education and citizenship. Table 5.1, which summarises the results, shows that out of 234 participants, 53.8% were female and 45.3% were male. The age groups ranged from 20-24 years old (23.1%), 25-29 years old (19.2%), 35-44 years old (18.8%), 45-54 years old (14.1%), and 30-34 years old (9.4%). The number of participants who were younger than 20 years old or older than 55 years old were few in the study (<5%). For the highest level of education completed, most of the participants had an undergraduate degree (46.6%); 21.8% had a postgraduate degree and 20.9% had a high school qualification. As regards citizenship, 68.8% of 234 participants held New Zealand citizenship, 13.7% had a permanent resident visa, and 15.8% had other visa types (work visa, student visa).

Table 5.1: Descriptive Statistics

<u>Demographic variables</u>	<u>Frequency</u>	<u>Percent</u>
<i>Gender:</i>		
Female	126	53.8%
Male	106	45.3%
Missing	2	0.9%
<i>Age (years):</i>		
< 20	8	3.4%
20-24	54	23.1%
25-29	45	19.2%
30-34	22	9.4%
35-44	44	18.8%
45-54	33	14.1%
55-64	16	6.8%
> 65	10	4.3%
Missing	2	0.9%
<i>Education:</i>		
Primary school	0	0%
High school	53	22.6%
Undergraduate degree	109	46.6%
Postgraduate degree	51	21.8%
Other	17	7.3%
Missing	4	1.7%
<i>Citizenship:</i>		
NZ Citizen	161	68.8%
Permanent resident	32	13.7%
Other	37	15.8%
Missing	4	1.7%

Table 5.2 describes the experience in using e-Government among the sample population: 47.1% of the population had used e-Government for 1-5 years, while 30.3% had used e-Government for less than one month to less than one year, and 22.3 % had used it for 3-5 years. Only 5.1% of the population had ten years or more of experience with e-Government. Regarding usage frequency, the majority of respondents used e-Government a few times a year (28.6%), while 18.4% of respondents used e-Government

about once a month, and 17.9% used it about once a year. Less than 10% of respondents used it less than once a year (7.3%), or once to a few times a week (7.3%).

Table 5.2: Descriptive statistics of user's experience with e-Government and frequency of use

<u>Demographic variables</u>	<u>Frequency</u>	<u>Percent</u>
<i>Experience:</i>		
Less than 1 month	25	10.7%
1 month to less than 6 months	20	8.5%
6 months to less than 1 year	26	11.1%
1 year to less than 3 years	58	24.8%
3 years to less than 5 years	53	22.3%
5 years to less than 10 years	39	16.7%
10 years or more	12	5.1%
Missing	1	0.4%
<i>Frequency of use:</i>		
Less than once a year	17	7.3%
About once a year	42	17.9%
A few times a year	67	28.6%
About once a month	43	18.4%
2-3 times a month	25	10.7%
About once a week	22	9.4%
A few times a week	17	7.3%
Missing	1	0.4%

5.3.2. Descriptive Statistics of Instruments

Using the statistical software SPSS v.22, the mean, standard deviation, minimum value and maximum value of each indicator were examined. Table 5.3 summarises the descriptive statistics for all indicators.

Table 5.3: Descriptive statistics of instruments

Constructs	Items	N	Minimum	Maximum	Mean	Standard Deviation
PASSIVE USE INTENTION	INTSEAR	228	1.0	7.0	5.82	1.31
	INTSEARPOL	225	1.0	7.0	5.70	1.30
ACTIVE USE INTENTION	INTCOMMU	226	1.0	7.0	5.51	1.40
	INTTRAN	224	1.0	7.0	5.34	1.62
PARTICIPATORY USE INTENTION	INTCOMME	222	1.0	7.0	5.12	1.65
	INTACTIVE	219	1.0	7.0	4.97	1.61
DATA TRANSPARENCY	TRANSDATA01	234	1.0	7.0	4.58	1.30
	TRANSDATA02	234	1.0	7.0	4.40	1.39
	TRANSDATA03	234	1.0	7.0	4.33	1.33
	TRANSDATA04	233	1.0	7.0	4.46	1.30
PROCESS TRANSPARENCY	TRANSPROC01	233	1.0	7.0	4.49	1.25
	TRANSPROC02	232	1.0	7.0	4.37	1.35
	TRANSPROC03	233	1.0	7.0	4.47	1.26
	TRANSPROC04	232	1.0	7.0	4.31	1.33
POLICY TRANSPARENCY	TRANSPOL01	232	1.0	7.0	4.16	1.38
	TRANSPOL02	232	1.0	7.0	4.14	1.40
	TRANSPOL03	233	1.0	7.0	4.05	1.36
	TRANSPOL04	233	1.0	7.0	4.11	1.41
TRANSPARENCY	TRANS01	233	1.0	7.0	4.80	1.30
	TRANS02	233	1.0	7.0	4.38	1.34
	TRANS03	233	1.0	7.0	4.41	1.36
	TRANS04	233	1.0	7.0	4.57	1.32
COMPLETENESS	IQCOM01	233	1.0	7.0	4.25	1.40
	IQCOM02	234	1.0	7.0	4.48	1.33
	IQCOM03	232	1.0	7.0	4.00	1.56
ACCURACY	IQACCU01	231	1.0	7.0	4.64	1.33
	IQACCU02	233	1.0	7.0	4.22	1.47
	IQACCU03	230	1.0	7.0	4.50	1.36
UNDERSTANDABILITY	IQUNDER01	234	1.0	7.0	4.64	1.40
	IQUNDER02	234	1.0	7.0	4.55	1.40
	IQUNDER03	234	1.0	7.0	4.47	1.44
TIMELINESS	IQTIMELY01	233	1.0	7.0	4.69	1.35
	IQTIMELY02	227	1.0	7.0	4.59	1.33
	IQTIMELY03	234	1.0	7.0	4.48	1.37
RELEVANCE	IQRELE01	234	1.0	7.0	4.74	1.26
	IQRELE02	223	1.0	7.0	4.79	1.30
	IQRELE03	232	1.0	7.0	4.72	1.27
RELIABILITY (IQ)	IQRELI01	234	1.0	7.0	4.69	1.33

	IQRELI02	233	1.0	7.0	4.77	1.36
	IQRELI03	233	1.0	7.0	4.72	1.46
INFORMATION QUALITY	IQ01	232	1.0	7.0	4.71	1.33
	IQ02	231	1.0	7.0	4.62	1.42
	IQ03	230	1.0	7.0	4.58	1.47
ACCESSIBILITY	SQACCESS01	234	1.0	7.0	5.24	1.27
	SQACCESS02	233	1.0	7.0	5.23	1.28
	SQACCESS03	234	1.0	7.0	5.18	1.28
RELIABILITY (SQ)	SQRELI01	234	1.0	7.0	5.00	1.30
	SQRELI02	234	1.0	7.0	5.11	1.27
	SQRELI03	233	1.0	7.0	5.09	1.23
AVAILABILITY	SQAVAI01	234	1.0	7.0	5.16	1.36
	SQAVAI02	234	1.0	7.0	5.19	1.32
	SQAVAI03	233	1.0	7.0	5.22	1.27
SYSTEM QUALITY	SQ01	234	1.0	7.0	4.89	1.30
	SQ02	234	1.0	7.0	4.86	1.30
	SQ03	234	1.0	7.0	4.82	1.35
RESPONSIVENESS	SRQRES01	234	1.0	7.0	4.57	1.37
	SRQRES02	234	1.0	7.0	4.34	1.41
	SRQRES03	233	1.0	7.0	4.41	1.36
ASSURANCE	SRQASSU01	234	1.0	7.0	4.45	1.38
	SRQASSU02	234	1.0	7.0	4.60	1.37
	SRQASSU03	234	1.0	7.0	4.53	1.37
RELIABILITY (SRQ)	SRQRELI01	234	1.0	7.0	4.55	1.39
	SRQRELI02	231	1.0	7.0	4.68	1.38
	SRQRELI03	232	1.0	7.0	4.59	1.37
EMPATHY	SRQEMP01	234	1.0	7.0	4.33	1.47
	SRQEMP02	232	1.0	7.0	4.41	1.37
	SRQEMP03	232	1.0	7.0	4.36	1.45
SERVICE QUALITY	SRQ01	234	1.0	7.0	4.80	1.37
	SRQ02	232	1.0	7.0	4.39	1.38
	SRQ03	232	1.0	7.0	4.58	1.40
SATISFACTION	SAT01	228	1.0	7.0	4.96	1.31
	SAT02	220	1.0	7.0	4.83	1.23
	SAT03	225	1.0	7.0	4.80	1.36
	SAT04	219	1.0	7.0	4.64	1.25

5.3.3. Verifying Data Characteristics

5.3.3.1. *Missing data*

In the preparation stage, the study removed cases with more than 10% missing data. In order to do that, each case in the dataset was counted for missing values. Then the study removed the cases that had more than 10% of variable values (around 10 answers) missing. However, some cases still had missing data. The data was input to SPSS v.22 and a Missing Values Analysis (MVA) was conducted. To address the remaining missing values, SmartPLS can place mean value to the missing values if they are less than 5% (Hair et al., 2013). The results are presented in Appendix 7. Each of the indicators was assessed in terms of the mean, standard deviation and percentage of missing values of that indicator. According to the report of missing values in Appendix 7, none of the indicators has a critical level of missing values.

5.3.3.2. *Data normality*

Data normality was tested by evaluating skewness and kurtosis. The skewness measures the symmetry of distribution and kurtosis refers to the flatness of the distribution. The acceptable thresholds for skewness and kurtosis are from -1-1 and from -3-3, respectively (Hair, Black, Babin, Anderson, & Tatham, 2006; Jondeau & Rockinger, 2003). The results of the skewness and kurtosis tests show that the data is slightly skewed toward the left of the distribution (< -1) for intention to search for general information, intention to communicate, intention to transact and intention to search for policy information, but no problems were raised in the kurtosis test. This suggests a slightly non-normal distribution for intention. However, even though the data is skewed and has a slightly non-normal distribution, unlike CB-SEM the PLS method makes no distribution assumptions and will operate analysis to support this situation.

5.3.3.3. *Common method variance*

Method variance is one of the main sources of measurement error that could threaten the validity of data and observed relationships between measures of different constructs (Podsakoff et al., 2003). It often happens in social and behavioural studies using self-report techniques such as questionnaires, surveys and interviews (Malhotra et al., 2006). Common method variance (CMV) could be drawn from several possible sources such as social desirability, context-induced mood, scale length, etc. (Podsakoff et al., 2003). Therefore, Podsakoff et al. (2003) recommended a number of remedies to control CMV

at the design stage before the data collection and statistical remedies to detect CMV after collecting data.

Before applying any statistical remedies, the study followed the suggestions on controlling CMV at the design stage (Podsakoff et al., 2003; Reio, 2010). First of all, as seen in Appendix 6, the measurements of variables in this study were obtained from different sources. All the responses of the survey were anonymous and confidential as mentioned in the ethical statement (Appendix 2). Finally, the survey was designed in six blocks, with each block having specific instructions and clear definitions of key terms.

In order to detect issues of CMV, a range of statistical remedies are recommended. However, the two most common methods used in IS literature are a) Harman's single-factor test and b) partial correlation analysis (marker-variable approach) (Malhotra et al., 2006; Reio, 2010). This study used both methods to detect issues with CMV.

Harman's single-factor test

Harman's single-factor test is the most widely used method across disciplines to detect CMV issues. This test refers to exploratory factor analysis in SPSS and examines "the unrotated factor solution to determine the number of factors that are necessary to account for the variance in the variables" (Podsakoff et al., 2003, p. 886). The common method bias is present when either a) a single factor will emerge from the factor analysis or b) one general factor will account for the majority of the covariance among the measures (no less than 50%) (Podsakoff et al., 2003). For this study, Harman's one-factor test showed that the most covariance explained by a single factor was 36.4%. This result did not raise concern about common method biases in the dataset. However, Podsakoff et al. (2003) suggested that this test does not provide sufficiently strong evidence for CMV since the lack of one dominant factor does not mean that the data are not contaminated by method variance.

Marker-variable approach

The latent marker-variable approach was proposed by Lindell and Whitney (2001) to address the weaknesses of Harman's single-factor test. This approach requires implementing a marker variable that theoretically should not relate to any variables in the study (Malhotra et al., 2006). The current study used "fashion consciousness" as the marker variable. Three items for the marker variable were included in the questionnaires.

Using PLS, Rönkkö and Ylitalo (2011) suggested testing the mean correlation between the marker items and the study items. They proposed several steps to assess CMV in PLS using a marker variable. The CMV is potentially an issue if the square root of the mean correlations between the marker variable items with other items of the study is more than 0.05 (Rönkkö & Ylitalo, 2011). If the results cross the threshold, it is suggested that one run the baseline model and the model including the marker variable in PLS. Comparing the path coefficients of both models will help in better detecting common method variance and predicting whether the results of the study will be unreliable.

This study first assessed the mean correlation of the marker variable items with other study construct items (correlation matrix is in Table 5.5). The mean correlation of the marker variable items and study items was 0.19. The square root of the mean was 0.44. Since the results crossed the threshold of 0.05, it is likely that method bias impacted the results. In the next step, the study conducted a bootstrap test for the baseline model and the model with the marker variables. The results showed that there were slight differences in path coefficients and R^2 values between the two models. However, the significant relationships did not change when the model included the marker variable (as described in Table 5.4). In addition, the marker variable was not significantly related to any other variables in the model. These suggest that although CMV was present, it did not have a significant impact on the data, and so is unlikely to be a significant threat to the integrity of this research.

Table 5.4: Research model analysis results with and without a marker variable

Path coefficients	Baseline model (without marker variable)	CMV test mode (with maker variable)
<i>Major Variables of interest</i>		
IQ -> TRANS	0.498***	0.487 ***
SQ -> TRANS	0.037 n.s.	0.029 n.s.
SRQ -> TRANS	0.242***	0.236***
IQ -> SAT	0.262***	0.260***
SQ -> SAT	0.161 **	0.159 **
SRQ -> SAT	0.380***	0.378***
TRANS -> INTPASSIVE	0.188 n.s.	0.170 n.s.
TRANS -> INTACTIVE	0.095 n.s.	0.085 n.s.
TRANS -> INTPARTI	0.197 **	0.182 **
SAT -> INTPASSIVE	0.148 n.s.	0.127 n.s.
SAT -> INTACTIVE	0.300***	0.292***
SAT -> INTPARTI	0.303***	0.286***
<i>R²</i>		
TRANS	0.495	0.498
SAT	0.543	0.543
INTPASSIVE	0.086	0.095
INTACTIVE	0.129	0.131
INTPARTI	0.193	0.199
<i>Marker variable</i>		
Marker Variable -> TRANS	-	0.058 n.s.
Marker Variable -> SAT	-	0.016 n.s.
Marker Variable -> INTPASSIVE	-	0.100 n.s.
Marker Variable -> INTACTIVE	-	0.044 n.s.
Marker Variable -> INTPARTI	-	0.083 n.s.

Note:

n.s. = Not significant

* p < 0.1

** p < 0.05

*** p < .01

IQ - information quality; SQ - system quality; SRQ – service quality; TRANS – information transparency; SAT – satisfaction; INTPASSIVE; – intention to passively use; INTACTIVE – intention to actively use; INTPARTI – intention to participate

Table 5.5: Item correlations between CMV items and the study items

	INTACTIVE	INTCOMME	INTCOMMU	INTSEAR	INTSEARPOL	INTTRAN		
FC01	0.18	0.06	0.06	0.14	0.10	0.11		
FC02	0.13	0.05	0.09	0.09	0.04	0.05		
FC03	0.24	0.16	0.17	0.19	0.17	0.11		
	SAT01	SAT02	SAT03	SAT04	TRANSDATA	TRANSPOL	TRANSPRO	
FC01	0.20	0.22	0.16	0.29	0.24	0.29	0.24	
FC02	0.15	0.19	0.14	0.17	0.18	0.10	0.14	
FC03	0.22	0.21	0.27	0.20	0.21	0.23	0.26	
	IQACC	IQCOM	IQRELE	IQRELI	IQTIME	IQUNDER		
FC01	0.22	0.31	0.30	0.28	0.25	0.29		
FC02	0.08	0.15	0.15	0.17	0.14	0.15		
FC03								
	SQACCESS	SQAVAI	SQRELI	SRQASSU	SRQEMP	SRQRELI	SRQRES	
FC01	0.25	0.16	0.25	0.24	0.27	0.25	0.23	
FC02	0.14	0.07	0.18	0.12	0.14	0.14	0.13	
FC03	0.29	0.25	0.29	0.30	0.30	0.28	0.28	

Note: IQ - information quality; SQ - system quality; SRQ – service quality; TRANS – information transparency; SAT – satisfaction; INTPASSIVE – intention to passively use; INTACTIVE – intention to actively use; INTPARTI – intention to participate

5.3.3.4. *Control variables*

Control variables in this study included age, education, gender and citizenship. According to a study by Dwivedi and Williams (2008), age, gender and education are demographic factors that may promote e-Government adoption. This study also included the citizenship of participants as a control variable. This indicated whether the participants were New Zealand citizens, had New Zealand permanent residency or had another type of status, e.g. work visa or student visa. It is expected that interactions with local online government may be more interactive among people who have responsibilities or long-term commitments or involvements with the community than those who are temporarily living in New Zealand (e.g. student visa, work visa).

The assessment of the impacts of the control variables was conducted by testing the relationships between the control variables and the dependent variables (intentions) (J. Lee, Kim, & Ahn, 2011). The results showed no differences between structural models with or without the control variables (as described in Table 5.6). This suggests that the hypotheses are significant despite the presence of the control variables. In addition, age, gender, education and citizenship had no significant impacts on intentions (e.g. passive use, active use or participatory use) in this study.

Table 5.6: Research model analysis with and without control variables

Path coefficients	Baseline model (without control variables)	Research mode (with control variables)
<i>Major paths of interest</i>		
IQ -> TRANS	0.498***	0.497***
SQ -> TRANS	0.037 n.s.	0.036 n.s.
SRQ -> TRANS	0.242***	0.243***
IQ -> SAT	0.262***	0.262***
SQ -> SAT	0.161 **	0.161 **
SRQ -> SAT	0.380***	0.380***
TRANS -> INTPASSIVE	0.188 n.s.	0.194 n.s.
TRANS -> INTACTIVE	0.095 n.s.	0.068 n.s.
TRANS -> INTPARTI	0.197 **	0.196 **
SAT -> INTPASSIVE	0.148 n.s.	0.138 n.s.
SAT -> INTACTIVE	0.300***	0.285***
SAT -> INTPARTI	0.303***	0.284***
<i>Control variables</i>		
gender -> INTPASSIVE	-	-0.061 n.s.
gender -> INTACTIVE	-	-0.034 n.s.
gender -> INTPARTI	-	0.028 n.s.
age -> INTPASSIVE	-	0.083 n.s.
age -> INTACTIVE	-	-0.058 n.s.
age -> INTPARTI	-	-0.044 n.s.
education -> INTPASSIVE	-	0.026 n.s.
education -> INTACTIVE	-	-0.011 n.s.
education -> INTPARTI	-	0.029 n.s.
residency -> INTPASSIVE	-	-0.068 n.s.
residency -> INTACTIVE	-	0.038 n.s.
residency -> INTPARTI	-	-0.015 n.s.

Note:

n.s. = Not significant

* $p < .10$.

** $p < .05$.

*** $p < .01$.

IQ - information quality; SQ - system quality; SRQ – service quality; TRANS – information transparency; SAT – satisfaction; INTPASSIVE – intention to passively use; INTACTIVE – intention to actively use; INTPARTI – intention to participate

5.4. Measurement Model Assessment

After assessing the characteristics of the dataset, the study conducted an evaluation of the measurement models. There were two main parts of the evaluation, which included first assessing the reflective and formative first-order measurement models, and then assessing the second-order measurement models. This stage was important for testing the measurement reliability and validity before evaluating the structural model.

5.4.1. First-Order Measurement Model

5.4.1.1. *Internal consistency reliability*

As discussed in the previous chapters, information quality was formed by six dimensions (i.e. reliability, completeness, timeliness, understandability, accuracy and relevance); system quality was formed by three dimensions (i.e. availability, accessibility and reliability); service quality was formed by four dimensions (i.e. empathy, assurance, reliability and responsiveness); and information transparency was formed by three dimensions (i.e. data transparency, process transparency and policy transparency). These first-order constructs along with satisfaction were modelled as reflective. The first indicator that was assessed was the internal consistency of the construct, which is considered satisfactory when the composite reliability is above 0.8 or 0.9 (Nunnally & Bernstein, 1994). According to the summaries in Table 8, all constructs had satisfactory values of composite reliability (above 0.9).

5.4.1.2. *Indicator reliability*

The outer loadings reflect the indicator reliability, which requires that each item explain at least 50% of the construct. Table 5.7 shows that all loadings for the indicators had values higher than 0.8, satisfying this test of reliability.

Table 5.7: Descriptive and reliability statistics of construct and measurements

Construct	Item	Mean	Standard Deviation	Indicator Loading	T-statistics
DATA TRANSPARENCY CR= 0.95	TRANSDATA01	4.58	1.30	0.90	52.63
	TRANSDATA02	4.40	1.39	0.90	40.74
	TRANSDATA03	4.33	1.33	0.94	74.10
	TRANSDATA04	4.46	1.30	0.90	42.08
PROCESS TRANSPARENCY CR= 0.95	TRANSPROC01	4.49	1.25	0.90	55.49
	TRANSPROC02	4.37	1.35	0.89	36.43
	TRANSPROC03	4.47	1.26	0.92	66.49
	TRANSPROC04	4.31	1.33	0.91	64.05
POLICY TRANSPARENCY CR= 0.95	TRANSPOL01	4.16	1.38	0.90	53.72
	TRANSPOL02	4.14	1.40	0.88	30.17
	TRANSPOL03	4.05	1.36	0.94	88.49
	TRANSPOL04	4.11	1.41	0.93	67.34
TRANSPARENCY CR= 0.95	TRANS01	4.80	1.30	0.91	63.27
	TRANS02	4.38	1.34	0.89	41.96
	TRANS03	4.41	1.36	0.93	77.82
	TRANS04	4.57	1.32	0.93	68.14
COMPLETENESS CR= 0.93	IQCOM01	4.25	1.40	0.91	80.25
	IQCOM02	4.48	1.33	0.90	42.85
	IQCOM03	4.00	1.56	0.88	49.89
ACCURACY CR= 0.94	IQACC01	4.64	1.33	0.91	57.82
	IQACC02	4.22	1.47	0.90	58.36
	IQACC03	4.50	1.36	0.94	112.44
UNDERSTANDABILITY CR= 0.97	IQUUNDER01	4.64	1.40	0.95	134.75
	IQUUNDER02	4.55	1.40	0.96	140.43
	IQUUNDER03	4.47	1.44	0.95	141.57
TIMELINESS CR= 0.95	IQTIMELY01	4.69	1.35	0.92	61.99
	IQTIMELY02	4.59	1.33	0.94	79.77
	IQTIMELY03	4.48	1.37	0.93	97.45
RELEVANCE CR= 0.96	IQRELE01	4.74	1.26	0.91	65.99
	IQRELE02	4.79	1.30	0.95	112.21
	IQRELE03	4.72	1.27	0.96	120.30
RELIABILITY (IQ) CR= 0.96	IQRELI01	4.69	1.33	0.92	58.24
	IQRELI02	4.77	1.36	0.96	129.34
	IQRELI03	4.72	1.46	0.95	107.41
INFORMATION QUALITY CR= 0.97	IQ01	4.71	1.33	0.95	57.82
	IQ02	4.62	1.42	0.97	58.36
	IQ03	4.58	1.47	0.95	112.44
ACCESSIBILITY	SQACCESS01	5.24	1.27	0.89	44.33

CR= 0.94	SQACCESS02	5.23	1.28	0.93	58.21
	SQACCESS03	5.18	1.28	0.93	64.93
RELIABILITY (SQ) CR= 0.95	SQRELI01	5.00	1.30	0.92	64.19
	SQRELI02	5.11	1.27	0.94	80.10
	SQRELI03	5.09	1.23	0.95	108.26
AVAILABILITY CR= 0.96	SQAVAI01	5.16	1.36	0.93	72.26
	SQAVAI02	5.19	1.32	0.95	106.86
	SQAVAI03	5.22	1.27	0.93	59.15
SYSTEM QUALITY CR= 0.98	SQ01	4.89	1.30	0.96	135.21
	SQ02	4.86	1.30	0.98	222.18
	SQ03	4.82	1.35	0.97	163.70
RESPONSIVENESS CR= 0.96	SRQRES01	4.57	1.37	0.92	68.19
	SRQRES02	4.34	1.41	0.96	141.66
	SRQRES03	4.41	1.36	0.94	103.69
ASSURANCE CR= 0.96	SRQASSU01	4.45	1.38	0.93	61.44
	SRQASSU02	4.60	1.37	0.95	103.63
	SRQASSU03	4.53	1.37	0.93	72.87
RELIABILITY (SRQ) CR= 0.96	SRQRELI01	4.55	1.39	0.92	69.11
	SRQRELI02	4.68	1.38	0.95	133.78
	SRQRELI03	4.59	1.37	0.94	97.18
EMPATHY CR= 0.95	SRQEMP01	4.33	1.47	0.93	70.89
	SRQEMP02	4.41	1.37	0.94	96.14
	SRQEMP03	4.36	1.45	0.94	92.94
SERVICE QUALITY CR= 0.97	SRQ01	4.80	1.37	0.95	120.75
	SRQ02	4.39	1.38	0.96	137.22
	SRQ03	4.58	1.40	0.97	182.92
SATISFACTION CR= 0.95	SAT01	4.96	1.31	0.92	63.58
	SAT02	4.83	1.23	0.94	95.26
	SAT03	4.80	1.36	0.90	54.81
	SAT04	4.64	1.25	0.91	58.58

5.4.1.3. Convergent validity

The average variance extracted (AVE) measures convergent validity. The AVE value indicates how much the indicators cover the construct's meaning; this is equivalent to the communality of a construct (Urbach & Ahlemann, 2010), and should be higher than 0.5 (Hair & Ringle, 2011). Table 5.8 shows that the AVE values of all constructs were higher than 0.8, which exceeded the threshold and showed adequate convergent validity.

Table 5.8: Convergent validity statistics of constructs

Constructs	AVE	Constructs	AVE
IQ	0.92	SRQ	0.92
IQACC	0.84	SRQASSU	0.88
IQCOM	0.80	SRQEMP	0.87
IQRELE	0.88	SRQRELI	0.89
IQRELI	0.89	SRQRES	0.88
IQTIME	0.87	SAT	0.84
IQUnder	0.91	TRANS	0.84
SQ	0.94	TRANSDATA	0.83
SQACCESS	0.85	TRANSPOL	0.83
SQAVAI	0.88	TRANSPRO	0.82
SQRELI	0.87		

Note: IQ – information quality; SQ – system quality; SRQ – service quality; TRANS – information transparency; SAT – satisfaction; INTPASSIVE – intention to passively use; INTACTIVE – intention to actively use; INTPARTI – intention to participate

5.4.1.4. Discriminant validity

As discussed in Chapter 4 (Section 4.5), the discriminant validity is evaluated by assessing the Fornell-Larcker criterion and item-level cross-loading. These tests aim to check whether items for one construct explain other constructs in the study (Hair & Ringle, 2011). The Fornell-Larcker criterion presents the square root of each construct's AVE and the latent variable correlations (Table 5.9). The item-level cross-loadings show the correlation scores of all items (Appendix 8). For the Fornell-Larcker criterion, all the square roots of each construct's AVE values were higher than their correlations with other constructs. The cross-loading table in Appendix 8 also shows that most of the items are loading to their construct more than other constructs and the differences between cross-loadings were greater than 0.1. For example, SQACCESS03 loads to SQACCESS as 0.93, and SQAVAI as 0.84, and the difference in loadings is 0.9; SQAVAI03 loads to SAQVAI as 0.93, SQACCESS as 0.85, and SQRELI as 0.84. The differences in loadings are 0.8 and 0.9, respectively.

The study further analysed the cross-loadings of items by squaring each item cross-loading, as this gives “a more intuitive interpretation since it represents the percentage overlap between an item and any construct” (Chin, 2010, p. 674). The results showed all items loaded more on their own construct than on others, satisfying this test for discriminant validity.

Table 5.9: Fornell-Larcker Table

	IQ	IQACC	IQCOM	IQRELE	IQRELI	IQTIME	IQUNDER	SAT	SQ	SQACCESS	SQAVAI	SQRELI	SRQ
TRANSPRO	0.60	0.56	0.60	0.50	0.56	0.54	0.51	0.48	0.53	0.40	0.39	0.38	0.58
TRANSPOL	0.56	0.54	0.55	0.51	0.54	0.52	0.49	0.43	0.51	0.41	0.38	0.41	0.55
TRANSDATA	0.62	0.55	0.61	0.49	0.56	0.50	0.49	0.52	0.54	0.42	0.44	0.43	0.52
TRANS	0.67	0.64	0.66	0.61	0.63	0.61	0.58	0.49	0.54	0.42	0.42	0.41	0.55
SRQRES	0.59	0.51	0.53	0.50	0.52	0.50	0.51	0.63	0.65	0.52	0.51	0.53	0.81
SQRELI	0.71	0.56	0.57	0.56	0.62	0.54	0.53	0.66	0.75	0.56	0.59	0.60	0.90
SRQEMP	0.62	0.47	0.54	0.50	0.54	0.49	0.51	0.62	0.66	0.50	0.54	0.54	0.86
SRQASSU	0.67	0.56	0.61	0.56	0.61	0.55	0.55	0.66	0.69	0.53	0.55	0.56	0.85
SRQ	0.73	0.56	0.60	0.56	0.63	0.55	0.53	0.69	0.76	0.57	0.59	0.60	0.96
SQRELI	0.59	0.49	0.45	0.50	0.55	0.53	0.51	0.55	0.74	0.88	0.90	0.93	
SQAVAI	0.60	0.51	0.47	0.51	0.54	0.55	0.51	0.52	0.73	0.87	0.94		
SQACCESS	0.60	0.46	0.47	0.55	0.53	0.55	0.56	0.54	0.71	0.92			
SQ	0.77	0.62	0.65	0.62	0.67	0.63	0.59	0.68	0.97				
SAT	0.69	0.56	0.61	0.56	0.58	0.51	0.48	0.91					
IQUNDER	0.68	0.69	0.73	0.73	0.69	0.75	0.95						
IQTIME	0.71	0.72	0.72	0.75	0.73	0.93							
IQRELI	0.83	0.81	0.79	0.82	0.94								
IQRELE	0.79	0.70	0.75	0.94									
IQCOM	0.78	0.80	0.90										
IQACC	0.73	0.92											
IQ	0.96												

SRQASSU	SRQEMP	SRQRELI	SRQRES	TRANS	TRANSDATA	TRANSPOL	TRANSPRO
0.52	0.54	0.52	0.51	0.71	0.75	0.74	0.91
0.55	0.52	0.52	0.53	0.70	0.67	0.91	
0.49	0.44	0.48	0.47	0.73	0.91		
0.54	0.50	0.53	0.53	0.91			
0.92	0.80	0.85	0.94				
0.89	0.89	0.94					
0.84	0.93						
0.94							

5.4.1.5. Formative constructs of intentions

This study included three levels of use intentions: passive use intention, active use intention and participatory intention. These three intentions were defined using formative measurement models. The passive use intention was formed by two indicators, i.e. intention to search for general information, and intention to search for policy information. The active use intention was formed by two indicators, i.e. intention to communicate and intention to transact. The participatory intention was formed by two indicators, i.e. intention to comment on policies and decisions, and intention to actively participate in making policies and decisions.

Table 5.10: Indicator reliability statistical report for intentions of three levels of use

Construct	Item	Loading	Weight	VIF	T-statistics	p-value
PASSIVE USE INTENTION	INTSEAR	0.928	0.682	1.435	2.317	0.024**
	INTSEARPOL	0.882	0.447	1.435	1.387	0.161n.s.
ACTIVE USE INTENTION	INTCOMMU	0.925	0.719	1.295	2.876	0.003**
	INTTRAN	0.775	0.432	1.295	1.614	0.115n.s.
PARTICIPATORY USE INTENTION	INTCOMME	0.827	0.397	1.588	2.182	0.026**
	INTACTIVE	0.949	0.708	1.588	4.506	0.000***

Note: n.s. = Not significant * $p < .10$. ** $p < .05$. *** $p < .001$.

The study first assessed collinearity between the formative indicators. According to Table 5.10, the VIF values of all items are less than 5, which does not exceed the threshold (Hair et al., 2013). This suggests that multicollinearity is not an issue for this study. After that, the study assessed the item weights in relation to the latent construct. As seen in Table 5.10, the items for passive use intention, active use intention and participatory use intention had strong weights in relation to their constructs. However, the intention to search for policy information (INTSEARPOL=0.447) had a smaller weight than the other item (INTSEAR=0.682) on the main construct of passive use. While this is not significant, it is important for content validity and also has strong loading. So it was not dropped from the measurement model. A similar decision was made for the intention to transact (INTTRAN=0.432), which had a smaller weight (not significant) compared with the intention to communicate with e-Government (INTCOMMU=0.719) on the construct of active use intention. The intention to comment on policies and decisions (INTCOMME=0.397) also had a smaller weight than the intention to actively participate (INTACTIVE=0.708) on the construct of participatory use intention, but both were significant. The study conducted further assessment by testing the significance of the

items to their constructs. The results in Table 5.10 show that items INTSEARPOL and INTTRAN were not significant to their own constructs (i.e. passive use intention and active use intention, respectively). However, they exhibited strong loadings, so they are interpreted as absolutely important to the constructs (Cenfetelli & Bassellier, 2009).

5.4.2. Second-Order Measurement Model

In this study, there were four constructs that required second-order formative measurement model analysis: information quality, system quality, service quality and information transparency. Information quality had six first-order factors (completeness, accuracy, timeliness, understandability, relevance and reliability); system quality had three first-order factors (availability, accessibility and reliability); service quality had four first-order factors (empathy, responsiveness, assurance and reliability); and information transparency had three first-order factors (data transparency, process transparency and policy transparency). In the previous section, the study assessed the first-order constructs including information quality, system quality, service quality and information transparency, in order to be able to test the convergent validity as formative second-order measurement models.

The previous section evaluated the first-order measurement models of information quality (IQ), completeness (IQCOM), accuracy (IQACC), timeliness (IQTIME), understandability (IQUNDER), relevance (IQRELE), reliability (IQRELI), system quality (SQ), availability (SQAVAI), accessibility (SQACCESS), reliability (SQRELI), service quality (SRQ), empathy (SRQEMP), responsiveness (SRQRES), assurance (SRQASSU), reliability (SRQRELI), information transparency (TRANS), data transparency (TRANSDATA), process transparency (TRANSPRO) and policy transparency (TRANSPOL). The results of the analyses showed that all the constructs had good reliability and validity. This allowed the study to proceed with evaluating the second-order measurement models for information quality, system quality, service quality and information transparency. In order to evaluate the validity of the items and sub-constructs of formative constructs, Chin (1998) suggested testing convergent validity, multicollinearity and item weights.

5.4.2.1. Convergent validity

Convergent validity for formative constructs is measured using redundancy analysis. The redundancy test indicates the extent to which the formative construct has adequate

coverage of perception and strong convergence. The coefficient determinant between the formative construct and reflective counterpart should be higher than 0.64, and the path coefficient should be higher than 0.8 (Chin, 2010). Since the study had separate measurements (using reflective indicators) for information quality, system quality, service quality and information transparency, the study was able to conduct redundancy test for these constructs.

Table 5.11 reports the results of coefficient determinants and path coefficients for the relationships between the formative and reflective constructs for information quality, system quality, service quality and information transparency. All the path coefficients were higher than or equal to 0.8 and had high significances ($p < 0.001$). The determinant coefficient (R^2) of the reflective constructs is also presented in Table 5.11. As can be seen, the determinant coefficient for system quality was slightly less than 0.64, at 0.63. However, the formative measure of system quality covered more than 50% of the reflective construct and had a high path coefficient. Those demonstrated sufficient convergent validity to allow the analysis to proceed.

Table 5.11: Redundancy analysis statistics report

Construct	R^2	Path Coefficient
IQ	0.75	0.89 ($p < 0.001$)
SQ	0.57	0.76 ($p < 0.001$)
SRQ	0.84	0.92 ($p < 0.001$)
TRANS	0.63	0.80 ($p < 0.001$)

5.4.2.2. Multicollinearity

Collinearity refers to high correlations between two formative indicators. A measure for collinearity in PLS is the variance inflation factor (VIF), which is defined as the reciprocal of the tolerance; the accepted value of VIF is less than 10 (Diamantopoulos, Riefler, & Roth, 2008; Götz, Liehr-Gobbers, & Krafft, 2010; Hair et al., 2006). The VIFs of the indicators for the second-order constructs of information quality, system quality, service quality and information transparency shown in Table 5.12 suggest that there was no major overlap between the indicators, so there was no need to remove an indicator.

Table 5.12: Statistical report on formative measurements

Construct	Item	Loading	Weight	VIF	T-statistics	p-value
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Information Quality (IQ)	IQACC	0.889	0.153	3.791	0.153	0.203
	IQCOM	0.958	0.497	3.841	3.846	0.000
	IQRELE	0.851	0.087	3.870	0.770	0.441
	IQRELI	0.907	0.224	4.622	1.671	0.095
	IQTIME	0.826	0.116	3.138	0.815	0.415
	IQUNDER	0.788	0.019	2.886	0.140	0.889
System Quality (SQ)	SQACCESS	0.961	0.406	5.191	1.864	0.063
	SQAVAI	0.940	0.179	6.006	0.818	0.414
	SQRELI	0.972	0.454	6.381	1.874	0.061
Service Quality (SRQ)	SRQASSU	0.970	0.407	9.185	2.243	0.025
	SRQEMP	0.924	0.195	5.073	1.366	0.172
	SRQRELI	0.962	0.328	7.001	1.668	0.096
	SRQRES	0.931	0.117	7.152	0.704	0.481
Information Transparency (TRANS)	TRANSDATA	0.887	0.332	2.451	2.452	0.014
	TRANSPROC	0.951	0.519	2.370	3.424	0.001
	TRANSPOL	0.854	0.248	2.982	2.298	0.022

5.4.2.3. Indicator weights

For formative measurement assessment, the weight of the indicator demonstrates the contributions of that indicator to the main construct. There were six formative indicators for the information quality construct. Only two indicators IQCOM and IQRELI had significant weights (0.497 and 0.3224, respectively) and significantly correlated with the main construct (3.846 and 1.671, respective). The indicators IQACC, IQRELE, IQTIME and IQUNDER had small weights in relation to their construct. For reflective indicators, if the indicators have small loadings, these indicators are removed without consideration. However, formative measurements are developed based on theoretical models and removing any indicator should be considered carefully. Cenfetelli and Bassellier (2009) further recommend that if the indicators have small weights but high loadings, they will still have strong bivariate relationships with their constructs. As seen in Table 5.12, the loadings of IQACC, IQRELE, IQTIME, and IQUNDER were 0.889, 0.851, 0.826, and 0.788, respectively, suggesting a strong relationship with information quality. These were therefore retained.

System quality indicators SQACCESS and SQRELI had significant weights (0.406 and 0.454, respectively) and significant bivariate relationships with their construct (1.864 and 1.874, respectively). However, the item SQAVAI had a low weight and correlation with system quality but a high loading (0.940). Similarly, service quality indicators SRQASSU

and SRQRELI had high weights (0.407 and 0.328, respectively) and significant correlations with the service quality construct (2.243 and 1.668, respectively). The other items for service quality had low weights but high loadings (SRQEMP=0.924 and SRQRES=0.931). Hence SQAVAI, SRQEMP, SRQRES remained as part of their respective measurement models (Cenfetelli & Bassellier, 2009).

Information transparency had the most consistent results in relation to indicator reliability. Data transparency, process transparency and policy transparency had weights of 0.332, 0.519 and 0.248, respectively on the main construct. They also had significant correlations to information transparency, which were 2.452, 3.424 and 2.298, respectively. In conclusion, all the statistical results showed the second-order measurement models of information quality, system quality, service quality and information transparency were sufficiently valid for analysis of the structural model.

5.5. Structural Model Assessment

In the previous section, the statistical results showed that the measurement models had satisfactory reliability and validity. The following sections are about assessing the validity of the structural model and testing the hypotheses of the study. As discussed in Chapter 4, the validity of the structural model was assessed using the coefficient of determination and path coefficients.

5.5.1. Coefficient of determination

The coefficient of determination (R^2) in PLS indicates how much the exogenous variables explain the endogenous variables. The higher the value of R^2 , the stronger the predictive ability of the structural model. Chin (1998) considers values of approximately 0.670 as substantial, values around 0.333 as average, and values of 0.190 and lower as weak. In this study, SmartPLS provided the PLS algorithm function that was used to produce the R^2 values for this study as shown in Table 5.13.

According to Table 5.13, information quality, system quality, and service quality are able to explain a significant amount of variation observed in information transparency ($R^2 = 0.498$). The same set of independent variables explains 0.543 of satisfaction. Regarding the levels of intentions to use, information transparency and satisfaction explain a greater proportion of the variance observed as citizens use e-Government at higher levels. The

coefficients of determination for passive use intention, active use intention and participatory use intention were 0.086, 0.129 and 0.194, respectively.

Table 5.13: Coefficients of determination of constructs

Constructs	R ²
INTPASSIVE	0.086
INTACTIVE	0.129
INTPARTI	0.194
TRANS	0.498
SAT	0.543

Note: INTPASSIVE – passive use intention; INTACTIVE – active use intention; INTPARTI – intention to participate; TRANS – information transparency; SAT – satisfaction

5.5.2. Path coefficients

Path coefficients refer to the strength of the relationship between two latent variables in the structural model. Assessing the strengths of the paths between independent variables and dependent variables allows the researcher to confirm or disconfirm the hypotheses (Urbach & Ahlemann, 2010). In PLS, the coefficient depends on the standard error that is obtained by using bootstrapping (Hair & Ringle, 2011). The t-value should be in the range of 1.65 (significant level = 0.1), 1.96 (significant level= 0.05), and 2.57 (significant level =0.01).

The study used the SmartPLS algorithm to obtain path coefficients and bootstrapping with 1,000 resamples to obtain the t-statistics and p-values. Table 5.14 lists the path coefficients, observed t-statistics and significance levels for all hypothesised paths. Using the results from the path assessment, the acceptance or rejection of the proposed hypotheses was determined. The results are also shown in a structural model in Figure 5.1.

The study proposed twelve hypotheses, and eight of them were statistically supported. The first three hypotheses posit that information quality (H1a), system quality (H1b) and service quality (H1c) have positive influences on information transparency. Two of them (H1a and H1c) were supported. Information quality and service quality had strong path coefficients to information transparency ($\beta=0.488$, $t=7.026$, $p<0.001$; and $\beta=0.259$, and $t=3.143$, $p<0.01$ respectively). The system quality and information transparency

relationship was not significant ($\beta=0.026$, $t=0.352$); as such Hypothesis H1b, that system quality has positive influence on information transparency, was not supported.

Information quality, system quality and service quality all had significant path coefficients in relation to satisfaction with e-Government. The results in Table 5.14 show that Hypotheses H2a, H2b and H2c were supported statistically. Information quality and service quality had stronger impacts on satisfaction ($\beta=0.289$, $t=4.269$, $p<0.001$ and $\beta=0.393$, $t=5.005$, $p<0.001$ respectively) than system quality did ($\beta=0.163$, $t=2.141$, $p<0.05$).

Both information transparency and satisfaction were assessed for their impacts on three levels of e-Government use intention. Firstly, Hypotheses H3a and H3b, which posit that information transparency positively influences passive use intention and active use intention, were rejected due to their insignificant impacts ($\beta=0.191$, $t=1.585$ and $\beta=0.107$, $t=0.992$ respectively). However, the link between information transparency and participatory use intention had a strong path coefficient ($\beta=0.208$, $t=2.441$, $p<0.05$). This result supports Hypothesis H3c, which posits that information transparency has a positive impact on participatory use intention.

The results in Table 5.14 also show that the hypotheses H4b and H4c were supported. In particular, satisfaction had strong impacts on both active use intention ($\beta=0.294$, $t=3.499$, $p<0.001$) and participatory use intention ($\beta=0.99$, $t=3.566$, $p<0.001$). However, the relationship between satisfaction and passive use intention was not significant ($\beta=0.147$, $t=1.312$). Hypothesis H4a, which states that satisfaction positively influences passive use intention, therefore was rejected.

Table 5.14: Structural model results

Hypothesis	Path Coefficient	T-Statistics	P-Values	Supported
H1a: information quality → information transparency	0.488	7.026	0.000***	Yes
H1b: system quality → information transparency	0.026	0.352	0.725n.s.	No
H1c: service quality → information transparency	0.259	3.143	0.002**	Yes
H2a: information quality → satisfaction	0.289	4.269	0.000***	Yes
H2b: system quality → satisfaction	0.163	2.141	0.033**	Yes
H2c: service quality → satisfaction	0.393	5.005	0.000***	Yes
H3a: information transparency → passive use intention	0.191	1.585	0.113n.s.	No
H3b: information transparency → active use intention	0.107	0.992	0.322n.s.	No
H3c: information transparency → participatory use intention	0.208	2.441	0.015**	Yes
H4a: satisfaction → passive use intention	0.147	1.312	0.190n.s.	No
H4b: satisfaction → active use intention	0.294	3.499	0.000***	Yes
H4c: satisfaction → participatory use intention	0.299	3.566	0.000***	Yes

Note: n.s. = not significant * $p \leq 0.10$. ** $p \leq 0.05$. *** $p \leq .001$.

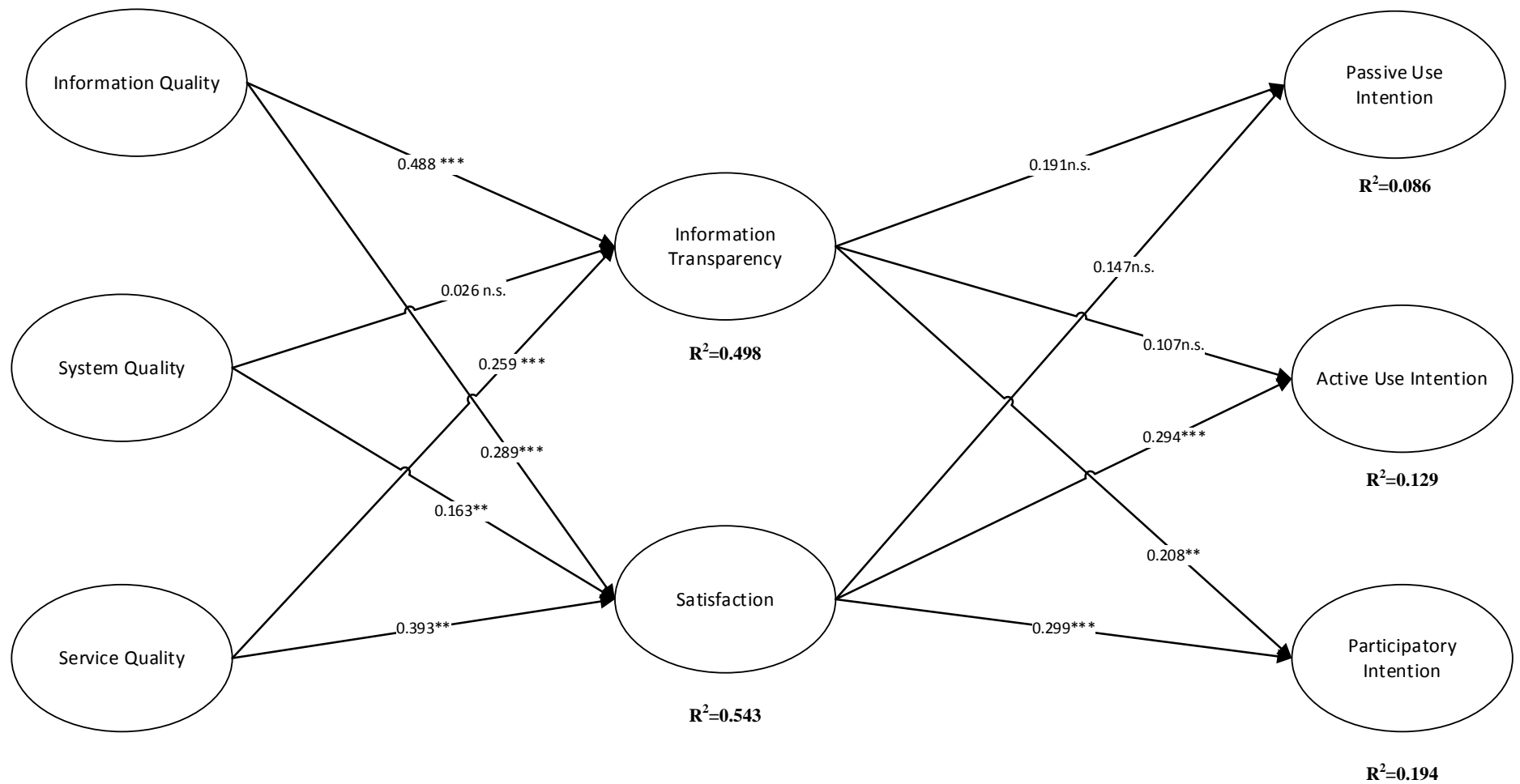


Figure 5.1: Research Model Results

Note: n.s. = not significant * $p \leq 0.10$. ** $p \leq 0.05$. *** $p \leq .001$.

5.6. Summary

Chapter 5 presented the process for preparing and analysing the data. At the stage of assessing the dataset, the study examined the descriptive statistics, missing values, normality and method bias. The final dataset of 234 responses was slightly skewed on items measuring intentions, so the data is not entirely normally distributed. However, since PLS makes no assumptions about the distribution, it was fine to proceed to the next steps of the data analysis. The study then evaluated common method bias, which was one of the critical issues that could influence the results. Using Harman's single-factor test and the marker variable approach, the study found no serious threat related to common method bias.

After validating the quality of the data, the study conducted an assessment of the measurement models at the first-order and second-order levels using SmartPLS. For the first-order measurement model, all constructs were reflective except for items measuring intention constructs. The reflective constructs showed high reliability (both CR and Cronbach's $\alpha > 0.7$) and convergent validity (>0.5). Also, all items were shown to have a good level of discriminant validity as shown through Fornell-Larcke criterion and item cross-loading results. The formative constructs of passive use intention, active use intention and participatory use intention were also validated. All items had satisfactory weights and significance levels in relation to their constructs except the intention to search for policy information and intention to transact. However, they were retained since they were conceptually important to the main constructs. The collinearity of the items was assessed and the results did not raise any concerns.

The formative second-order measurement models of information quality, system quality, service quality and information transparency were examined by convergent validity, collinearity and indicator validity. The redundancy analysis results disclosed that the formative constructs contributed sufficiently to their intended content. Also collinearity of all items satisfied the requirements. Item weights of information transparency measurements were all significant, whereas there were only two items of information quality, two items of system quality, and three items of service quality that had significant weights. However, they were retained due to their conceptual contributions to the main constructs.

Finally, the assessment of the structural model was conducted using SmartPLS with a focus on the coefficient of determination and path coefficients. The results showed that the independent variables explained 0.498 of the variance observed for information transparency, 0.543 for satisfaction, 0.086 for passive use intention, 0.129 for active use intention and 0.194 of participatory use intention. The PLS bootstrap with 1,000 samples showed support for eight out of the twelve hypotheses in the study.

6. CHAPTER SIX - DISCUSSION

6.1. Introduction

In previous discussions, the research model and hypotheses were proposed in order to answer the research questions that were presented in Chapter 3. After the data collection, the analysis that was discussed in Chapter 5 provided the statistical results which were used to confirm or disconfirm the hypotheses. This chapter will summarise the results of the hypotheses and discuss them in relation to the research questions. The chapter will also discuss the findings in terms of consistency, contradictions, and new insights in comparison with current literature.

6.2. Summary of main findings

Chapter 3 proposed a theoretical framework integrating ISSM theory with the concept of information transparency. It was argued that information quality, system quality, and service quality not only predict satisfaction but also information transparency. The theoretical framework also proposed that satisfaction and information transparency can influence the intention to use e-Government in terms of passive use, active use and participatory use.

The findings from the statistical analyses provided evidence that the three aspects of quality have positive impacts on satisfaction. However, only information quality and service quality were significant in relation to information transparency. In terms of predicting the three levels of use it was found that information transparency has a positive impact on participatory use intention, whereas satisfaction has positive effects on active use and participatory use intention. The results for each of the hypotheses and research questions are summarised in Table 6.1. Of the twelve, eight of the hypotheses were supported by empirical testing and four were not supported: H1b, H3a, H3b, H4a.

Table 6.1: Summary of research questions and hypotheses results

Hypothesis		Support
To what extent does information quality, system quality, and service quality affect information transparency?		
H1a	Information quality positively affects perceived information transparency	Yes
H1b	System quality positively affects perceived information transparency	No
H1c	Service quality positively affects perceived information transparency	Yes
To what extent does information quality, system quality, and service quality affect satisfaction?		
H2a	Information quality positively affects perceived satisfaction with e-Government	Yes
H2b	System quality positively affects perceived satisfaction with e-Government	Yes
H2c	Service quality positively affects perceived satisfaction with e-Government	Yes
To what extent does information transparency affect the intention to use e-Government (i.e. passive use, active use and participatory use)?		
H3a	Information transparency positively affects intention toward passive use e-Government	No
H3b	Information transparency positively affects intention toward active use e-Government	No
H3c	Information transparency positively affects intention toward participatory use in e-Government	Yes
To what extent does satisfaction affect the intention to use e-Government (i.e. passive use, active use and participatory use)?		
H4a	Satisfaction positively affects intention toward passive use e-Government	No
H4b	Satisfaction positively affects intention toward active use e-Government	Yes
H4c	Satisfaction positively affects intention toward participatory use in e-Government	Yes

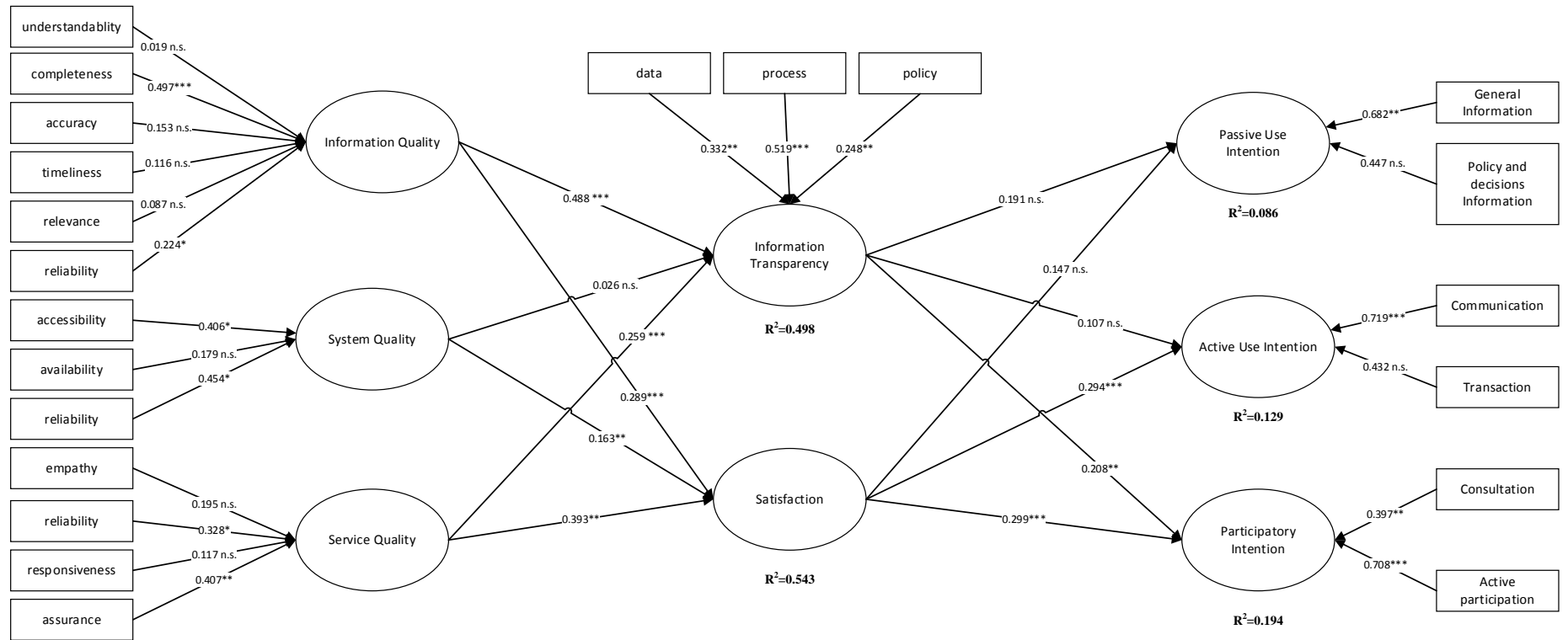


Figure 6.1: Research Model Results with Constructs' Dimensions

Note: n.s. = not significant * p <= 0.10. ** p <= 0.05. *** p <= .001.

6.3. Discussion of main findings

This section will discuss the results presented in Table 6.1 and Figure 6.1. Following discussion of the results in relation to the research questions, the findings are then compared with the literature to ascertain the similarities, differences, and the new insights as they relate to the research model.

6.3.1. What is information transparency both in general and in an e-Government context?

The study proposes a framework of information transparency which helps to identify the important components such as the observer, the observed, the direction of observation, the object of the observation, the degree of information transparency and how the information is being observed. The first element of the concept is the observer and the observed. This can be an individual or an organisation. The relationship is interchangeable. For example, a business firm (organisation) can be observed by customers (individuals) as to how the products are produced, or whether the organisation produces green products. Also customers (individuals) can be observed by the firm (organisation), for example in regard to the transactions made with the firm, and by the tracking of personal information.

The second element is the direction of the observation which can be inward, downward, outward and upward. Upward and downward refer to the relationships between hierarchical subordinates whereas outward and inward refer to relationships between the organisation and those outside the organisation. The third element of the concept is the object of the observation. The literature review identifies that, despite the many types of transparency that have been classified, the common object of the concept is “*information*”. This can be information, for example, about price, finance, government and services of companies. The fourth element refers to the degree of information being disclosed which determines the degree of transparency which can be opaque, semi-transparent or transparent.

The fifth, and final, element refers to how the information is observed. A review of the literature identified that words such as “open, visible, disclose” are often used to describe how the information is observed. Therefore, the study defines *information transparency* as “*the observed making information open, and visible, disclosing it to the observer*”.

Applied to an e-Government context, *information transparency is defined as “openness and visibility of information about data, process, and policy that the government discloses to the citizens through e-Government”*.

The framework and the guidelines used to define information transparency provide insights into what information transparency is, and can be applicable to any context. It provides a complete picture of information transparency in contrast with earlier literature which reveals limitations and inconsistencies in the information transparency concept (Christensen & Cornelissen, 2015; da Cruz et al., 2015; Dapko, 2012; Horne, 2012; Kaufmann & Bellver, 2005; Schnackenberg & Tomlinson, 2014).

Firstly, this proposed framework suggests that scholars define information transparency by clarifying the characteristics of “open”, “visible”, “disclose”. This distinguishes information transparency from other literature in which scholars refer to information transparency in terms of relevance, completeness and timeliness as being the characteristics of the quality of an information system. Furthermore, the current framework adds pieces that are missing in earlier frameworks proposed in the literature. For example, R. Oliver (2004) only identified two elements associated with information transparency, that is the observer and observed, and the observation. Heald (2006) only identified the direction of the observation. Granados et al. (2010) described the most important elements as the parties in the observation, the information exchanged, and the degree of transparency. However, those authors defined the characteristics of information transparency in terms of the availability of information, and accessibility of the interface, but did not focus on how the information is observed – that is, the characteristics of information transparency. This research framework also includes the parties in the observation as well as the object of observation, neither of which has been discussed in a general context prior to this work.

This study also provides new insights into the measuring and understanding of information transparency, in the e-Government context, by testing and using empirical analysis as a second-order, formative measurement model of information transparency. A higher-order measurement model was created, comprising the three, first-order constructs of data, process and policy. The literature suggests that if a construct is too complex for a unidimensional approach, such as information transparency, it is better to represent it as a higher-order construct (da Cruz et al., 2015; Lourenço & Serra, 2014; MacKenzie et al., 2011; Ruiz, Gremler, Washburn, & Carrión, 2008). In fact, the results

revealed that the three dimensions of information transparency, that is data transparency, process transparency and policy transparency, are all significant and have a relatively high weighting in relation to information transparency. In addition, these three dimensions explain a relatively large proportion of the variance observed for information transparency (0.63). Hence, information related to the data, figures, and facts, steps and procedures of the process, and the rationale for policies and decisions by government play an important role in influencing citizens' perception of transparency. This finding is consistent with the conceptual study by Bannister and Connolly (2011) which defined the three facets of information transparency (i.e. data, process and policy), and the study of Lourenço and Serra (2014) and da Cruz et al. (2015) which suggested measuring information transparency as being a higher-order construct.

6.3.2. To what extent do information quality, system quality, and service quality affect information transparency?

The rapid growth of information communication technologies (ICTs) has been tremendous support in the disclosure and sharing of information. It is believed that this growth has therefore enhanced information transparency (Jaeger & Bertot, 2010; Meijer, 2009; R. Oliver, 2004). This study examined the impact of the three components of information system quality (i.e. information quality, system quality and service quality) on information transparency when citizens use e-Government. It was found that the three antecedents, together, explained a significant amount of variance in information transparency ($R^2=0.498$). This result provides new insights about information transparency by providing the first empirical evidence of information system quality as being a key antecedent of information transparency. The study also provides additional empirical evidence to confirm the difference between the information transparency's characteristics and the characteristics of an information system.

Some of the early literature discussed the concept of information system quality characteristics, such as relevance, availability, timeliness, etc. as potentially having an effect on information transparency (Eggert & Helm, 2003; Granados et al., 2010; Turilli & Floridi, 2009) but few studies had examined the characteristics of information system quality empirically. For example, S. Kim and Lee (2012) found that *applications* and *responsiveness* quality in e-Participation influence transparency in citizens' engagement in policy and decision making processes. Armstrong (2011) found that it is the *accessibility* and *presentation* of a website that are significant in transparency whereas

Miao and Mattila (2007) found that it is the *sufficiency* and *usefulness* of information on the website that positively determine the level of transparency. It can therefore be claimed that the findings of this study are consistent with the earlier literature.

The fact that all three qualities of an information system have a significant impact on information transparency confirms that the characteristics of information transparency are related to the characteristics of information system quality. However, several studies confuse these two characteristics. For example, Zhu (2004) defined transparency as the “degree of availability and accessibility of market information”, while Vishwanath and Kaufmann (2001, p. 42) discuss “the five dimensions of transparency as access, comprehensiveness, relevance, quality, and reliability of information in the areas of banking/accounting policies”. Consequently, this study’s finding is not consistent with the findings of these prior studies.

Of the three aspects of quality, information quality in particular has a significant impact when predicting information transparency, with $\beta = 0.488$, $t = 7.026$, $p \leq 0.001$. It is also the strongest predictor. So hypothesis H1a, which states that information quality positively impacts perceived information transparency, is supported. This finding provides new insight in understanding how ICTs enhance information transparency. It suggests that the quality of information provided by an IT/IS is the most important factor in determining information transparency.

Although transparency has been identified as being of different types, such as price transparency, product transparency, and supply chain transparency, the “*information*” is the common “good” that transparency delivers. Even though the literature does not state that information quality is an important determinant of information transparency, and has not tested it as a high level construct, most of the literature identifies the characteristics of information quality, such as completeness, accuracy and timeliness, as enhancing transparency. For example, UN - HABITAT and Transparency International (2004) state that to promote transparency, “information must be timely, relevant, accurate and complete for it to be used effectively”; Xavier (2008) states that “...to increase price transparency ... [it is needed to] publish comparable, adequate and up-to-date information”; Kaufmann and Bellver (2005) argue that “increasing transparency through accessible, relevant, and accurate information is necessary”; and S. Kim et al. (2009) suggest that “more information delivered to citizens in a more timely fashion is expected to increase the transparency of government”.

It was found that system quality does not have a significant impact on information transparency ($\beta = 0.026$, $t = 0.352$), which rejects hypothesis H1b. Although system quality has not been empirically tested in regard to information transparency in prior studies, this result seems inconsistent with some of the conceptual studies. For example, Armstrong (2011) and many other authors argue that accessibility and availability of information are most important for promoting transparency. Armstrong (2011) demonstrated empirically that it is accessibility to e-Government websites that has significant effect on transparency. In addition, Granados et al. (2010) and Xavier (2008) explain that it is the system interface that should make information accessible and available in order to increase transparency. A possible explanation for the contradiction between this study and other earlier research is that the e-Government system and the Internet are now mature in their development so system quality is no longer a concern for users when they interact with e-Government (Y. S. Wang & Liao, 2006). In fact, there might be other characteristics of system quality, such as timeliness and ease of use, that impact on information transparency and which this study has not explored,

Service quality has a positive significant impact on information transparency ($\beta = 0.259$, $t = 3.143$, $p \leq 0.05$). The result confirms the hypothesis H1c and this finding provides new insight in understanding that the quality of IT/IS services is critical in enhancing information transparency. This relationship has not been examined in the literature; however, it is consistent with previous conceptual studies where it is argued that the services responsible for the provision of important communications between government and citizens are critical for the citizens to perceive e-Government as being transparent (Abu-Shanab, 2013; Christopher & Darren, 2004).

Information quality has six dimensions which are completeness, accuracy, understandability, timeliness, relevance, and reliability. *System quality* has three dimensions which are accessibility, availability, and reliability. *Service quality* has four dimensions which are empathy, responsiveness, assurance, and reliability.

Information quality has two significant indicators which are completeness and reliability ($t = 3.846$, $p \leq 0.001$ and $t = 1.671$, $p \leq 0.1$ respectively). Although relevance, accuracy, timeliness, and understandability do not provide additional explanatory power to information quality, they are still important dimensions of information quality due to their high loadings (Cenfetelli & Bassellier, 2009). In system quality both accessibility and reliability are significant ($t = 1.864$, $p \leq 0.1$ and $t = 1.874$, $p \leq 0.1$ respectively) but not so

availability ($t = 0.818$). Assurance and reliability are significant for service quality ($t = 0.243$, $p \leq 0.05$ and $t = 1.668$, $p \leq 0.1$ respectively) but responsiveness and empathy are not significant ($t = 0.704$ and $t = 1.366$ respectively). As with information quality, the dimensions of system quality and service quality, which do not have high weight on the main construct but have high loadings and correlations to the main construct and, as such, have absolute importance to the main construct (Cenfetelli & Bassellier, 2009).

This study investigated measurement models that are contextualised to e-Government and it was found that the New Zealand e-Government context greatly affected the results. Hence, while some of the characteristics of quality of an information system are not significant in this context they may be significant in contexts where there is an information system with a different level of maturity (Forsgren et al., 2016).

In terms of the research question, this study confirms hypotheses H1a and H1c that information quality and service quality are important factors that have a significant impact on citizens' perception of information transparency.

6.3.3. To what extent do information quality, system quality, and service quality affect satisfaction with e-Government?

The ISSM theory of DeLone and McLean (1992) proposes that information quality, system quality and service quality are the key factors that influence the user's satisfaction with the information system. The relationship to satisfaction has been investigated in both the information system domain and e-Government domain, and this study also examined the relationship.

It was found that all three factors significantly contributed to satisfaction with e-Government $R^2 = 0.543$. This total explained variance in satisfaction with e-Government (0.543) is comparable to what is reported in the literature about the IS domain as well as in the e-Government domain. For example, in the IS literature the total variance in satisfaction explained by information quality, system quality and service quality is 0.47 according to H. W. Kim et al. (2004), 0.565 in K. C. Lee and Chung (2009), and 0.61 in H.-F. Lin (2007). In the e-Government literature, the total variance in satisfaction with e-Government is 0.42 in Teo et al. (2009), 0.47 in Rana et al. (2015), and 0.7 in Y. S. Wang and Liao (2006). This study's finding of 0.543 suggests that information quality, system quality and service quality are key factors in determining satisfaction with e-Government.

This study has also found that information quality, in particular, is one of the most significant factors impacting on satisfaction ($\beta = 0.289$, $t = 4.269$, $p \leq 0.001$), which validates hypothesis H2a. Although some of the literature has findings not consistent with this result, such as H. W. Kim et al. (2004) and Teo et al. (2009), the majority of other studies demonstrate consistency with this study's finding. For example, DeLone and McLean (1992), J. Kim et al. (2011), K. C. Lee and Chung (2009) and H.-F. Lin (2007) all found that information quality had significant effects on satisfaction on post-adoption. In e-Government, Y. S. Wang and Liao (2006) and Sun et al. (2006) also found this relationship significant. Based on consistent results, the conclusion can be drawn that information quality has a strong impact on satisfaction with e-Government.

The results indicate that system quality also has a significant impact on satisfaction ($\beta = 0.163$, $t = 2.141$, $p \leq 0.05$). This finding supports hypothesis H2b which states that system quality positively impacts perceived satisfaction with e-Government. Only a few studies' findings are inconsistent with this result (Gotoh, 2009; J. Kim et al., 2011), but the majority of studies have found that system quality has a strong effect on satisfaction with e-Government. The relationship between system quality and satisfaction was found to be significant in the studies (K. C. Lee & Chung, 2009; H.-F. Lin, 2007; Rana et al., 2015; Teo et al., 2009; Udo et al., 2012). Of the three independent factors of satisfaction, system quality has the least effect on satisfaction, although it is still significant. This is a finding that is also consistent with the studies conducted by Rana et al. (2015) and K. C. Lee and Chung (2009).

Service quality has significant impact on satisfaction with e-Government, which supports hypothesis H2c ($\beta = 0.393$, $t = 5.005$, $p \leq 0.001$). The relationship between service quality and satisfaction has been consistent in the e-commerce literature (Chenet et al., 2010; H.-F. Lin, 2007; Spreng & Mackoy, 1996). It has also been consistently found that the better the quality of e-Government service, the more satisfied the citizens are with e-Government (Rana et al., 2015; Sun et al., 2006; Teo et al., 2009). In conclusion, satisfaction with e-Government is significantly determined by information quality, system quality and service quality of e-Government. These findings support hypotheses H2a, H2b and H2c. It was mentioned in the literature that information transparency and satisfaction have a significant relationship (Park & Blenkinsopp, 2011). However, this study tested the relationship and the results showed that, in this study, this relationship is not significant and the relationship does not change the significance of existing relationships.

6.3.4. To what extent does information transparency affect the intention to use e-Government (i.e. passive use, active use and participatory use)?

Researchers have been investigating what factors influence e-Government adoption and repeated use/continuous use of e-Government services (Akkaya et al., 2012; C.-T. Lu & Ting, 2013; H.-J. Wang & Lo, 2013; Xiao, 2011). The success of an information system does not depend on initial use or continuous use but, more importantly, on how much users exploit the full potential and functions of an information system (Zmud & Apple, 1992). In an IS domain, this refers to the last stage of IT/IS implementation – deep use. It indicates a point at which users use the full potential of the innovation's features/functionality to support a higher level of the individual's work (Cooper & Zmud, 1990). In the e-Government domain, beyond simple uses such as information provision, citizens are encouraged to use e-Government at higher levels (United Nations, 2012, 2014). In regard to different levels of use, the study proposed three levels of e-Government use, which are passive use (the search for general and policy information), active use (communication and transactions), and participatory use (consultation and active participation).

This study provides the first comprehensive measurement model of the three levels of e-Government use. In contrast to prior studies, this study provides complete dimensions for each of level of a citizen's use of e-Government. For example, Shareef et al. (2011) investigated two types of use which are: intention to search for information, and intention to communicate. Reddick (2005) investigated two types of use: searching for information, and conducting transactions. Y. C. Chen and Dimitrova (2006) investigated three types of use: searching for policy and decision information, transaction, and policy input. Teo et al. (2009) investigated two types of users rather than usage: passive use (i.e. searching for information), and active use (i.e. communication and transactions). Scott et al. (2015) investigated not only passive use (the search for information), and active use (transaction and communication), but also participatory use (consultation). By drawing on this prior research, the measurement model of e-Government use in this study includes three levels of use: passive use, which includes searching for general and policy information; active use, which includes communication and transactions; and participatory use, which includes consultation and active participation in policy and decision-making.

The study examined the intention to use e-Government at the three levels. And, in general, all three intentions (passive use, active use and participatory use) have satisfactorily

reliable and validated measurement models. The important findings suggest that citizens engaging with e-Government presents a multifaceted phenomenon and that each level of use has its own dynamics (Y. C. Chen & Dimitrova, 2006; Shareef et al., 2011). The passive use intention was measured in terms of intention to search for general information and intention to search for policy information. The results of the measurement model show that intention to search for general information is significant to passive use intention ($t = 2.317$, $p \leq 0.05$). However, intention to search for policy information does not have a significant effect on passive use intention ($t=1.387$). Among the three levels of use, searching for information is the most basic form of use which does not require much interaction with e-Government. Searching for policies and decision information could be interpreted as searching for other information. So intention to search for policy information, found as not being significant, might need to be more clearly distinguished from the intention to search for general information.

At the second level of use, citizens show more interaction with e-Government by providing personal information while they communicate or conduct a transaction. The active use intention was measured in terms of intention to communicate and intention to transact. The results from the measurement model show that intention to communicate is significant in relation to active use intention ($t=2.876$, $p \leq 0.05$) but intention to transact was not significant ($t=1.614$). The study context could have influenced why intention to transact is not heavily weighted in relation to active use. In this study, the citizens may not be aware of the transaction functions of e-Government, or they do not conduct transactions as often as their communication with e-Government (Podder, 2013).

The participatory use intention was measured by intention to provide comments on policies and decisions, and intention to actively participate in the policy and decision-making. The assessment of the measurement model shows that both dimensions are significant for participatory use intention ($t=2.182$, $p \leq 0.05$ for intention to provide comments, and $t=4.506$, $p \leq 0.001$ for intention to active participate). This finding is consistent with conceptual studies relating to e-Participation (Macintosh & Whyte, 2008; Sæbø et al., 2008) and suggests that providing comments on decision and policy, and active participation in the decision- and policy-making process (such as proposing policies) are both important when determining the participatory use level.

This research also examined the impact of information transparency on the three levels of use intention: passive use, active use, and participatory use. The results give new

insight into what is known about both information transparency and IS/e-Government adoption. Unlike the study of Venkatesh et al. (2016), which found information transparency to be a mediator and moderator between information quality and intention to adopt, the findings of this study suggest that information transparency has a direct positive influence on behavioural intention. This finding is consistent with the conceptual studies of e-Government (Dwivedi et al., 2012; Venkatesh et al., 2016; Warkentin et al., 2002), and the empirical studies of business (Dapko, 2012; Liu et al., 2015; Moreno & Molina, 2014). However, the results reveal that there is a more complex aspect to this relationship.

Among the three levels of e-Government use, information transparency has a positive impact on the highest level of use intention which is participation ($\beta = 0.208$, $t = 2.441$, $p \leq 0.05$) but not on the lower levels ($\beta = 0.191$, $t = 1.585$ and $\beta = 0.107$, $t = 0.992$ for passive use and active use respectively). This reveals that information transparency plays a more important part when citizens use e-Government in the decision- and policy-making process than other types of use such as searching information, communication or transaction. In IS research, there are factors that only matter in a high level of use but are not important in a low level of use. For example, Hester (2011) compared antecedents of infusion and usage and found that voluntariness, and trialability are significant to infusion, but not to usage. In addition, perceived usefulness (PU), and perceived ease of use (PEOU), become less or even non-significant in post-adoption than pre-adoption usage (Almahamid et al., 2010).

Furthermore, at the passive use level, acquiring information from e-Government does not require much interaction with e-Government and so citizens who adopt e-Government at this stage could simply be impacted by their perceived ability of use and perceived benefits (Y. C. Chen & Dimitrova, 2006) which could be more important to them than perceived information transparency. At the active use level, citizens who use e-Government to communicate and conduct transactions with government require an account and to provide personal information (Shareef et al., 2011). Therefore, information being transparent might again not be the most important factor that promotes the lower levels of use of passive use and active use. It could be information quality and perceived trust that have greater significant impact on active use (Y. C. Chen & Dimitrova, 2006; Reddick, 2004; Shareef et al., 2011).

At the participatory use level, citizens participate in shaping the decisions and policies of local government. The literature of e-Participation pays much attention to the importance of transparency (Chun & Cho, 2012; S. Kim & Lee, 2012) and the Reddick (2011) empirical study demonstrates the significant impact of transparency on e-participation. Other studies also conceptually support the relationship, such as Chun and Cho (2012), Pina et al. (2010), Zissis and Lekkas (2011) and Nam (2014). Further, transparency also improves the democracy and accountability of government because if the government is willing to share and disclose information about the decision- and policy-making process, citizens will have the opportunity to be informed about those decisions and policies and how they will be affected. Having an open process allows citizens to have a say and participate in those processes, whether it's directly or indirectly (Gilley, 2009; H  ritier, 2003; Kolstad & Wiig, 2009). Hence, this is consistent with the literature and shows that it is important for citizens to have transparent information about the governmental process of decision- and policy-making, and the content and direction of final policy making and decisions.

In conclusion, the study confirms the hypothesis H3c, but there is no strong evidence to support hypotheses H3a and H3b. Information transparency has a significant positive effect on intention to participate, but not on passive use and the active use intention.

6.3.5. To what extent does satisfaction affect the intention to use e-Government (i.e. passive use, active use and participatory use)?

Satisfaction is an important factor in post-adoption and is treated as a core factor in the Information System Continuance model (ISC) (Bhattacharjee, 2001b) as well as the Information System Success Model (ISSM) (DeLone & McLean, 1992). Therefore, satisfaction has often been adopted in earlier research models when investigating higher level of use (e.g. innovate IT, extended use) and suggests satisfaction is an important factor for IT/IS implementation (Hsieh & Wang, 2007; J. Kim et al., 2011; W. Wang, Butler, Hsieh, & Hsu, 2008). Regarding e-Government post-adoption, scholars suggest that satisfaction with e-Government can also positively enhance the willingness to continue to use e-Government services (Alruwaie et al., 2012; Teo et al., 2009; Udo et al., 2012; Xiao, 2011). The findings of this study are consistent with the findings of previous research as they demonstrate that satisfaction has a significant impact on higher levels of use intention.

Particularly, satisfaction has a significant effect on active use intention ($\beta = 0.294$, $t = 3.499$, $p \leq 0.001$). This relationship has not been examined previously; however, it is relatively consistent with previous studies on tax-filing in e-Government and extended use in IS. For instance, Fu et al. (2004) and Saha et al. (2010) investigated taxpayer behaviours and found empirical support for the proposition that satisfaction is strongly associated with usage intentions toward tax-filing. W. Wang et al. (2008) investigated factors that influence innovative IT use by adopting ISC theory. They found that satisfaction had a strong effect on innovative IT use. In addition, Hsieh and Wang (2007) found that satisfaction is significant to deep use. Hence, citizens' satisfaction with the services provided by e-Government encourages them to use e-Government more actively (i.e. communicate or conduct a transaction).

Satisfaction has significant effects on participatory use intention ($\beta = 0.299$, $t = 3.566$, $p \leq 0.001$). Similar to the relationship above with deep use and extended use, this finding is consistent with the IS literature and e-Government literature. W. Wang et al. (2008) and Hsieh and Wang (2007) found satisfaction is significant to infusion stages which is a high level of IS use. Further, S. Kim and Lee (2012) found that citizen satisfaction with services quality in e-participation programs is positively related to participation in policy and decision-making processes such as providing feedback on policies.

Satisfaction, however, does not have a significant impact on passive use intention ($\beta = 0.147$, $t = 1.312$) and although prior studies have not examined the impact of satisfaction on particular use level, such as passive use, the literature does show that satisfaction is significant to adoption intention (Bhattacharjee, 2001b; Teo et al., 2009). It is assumed that satisfaction can have a positive impact on passive use such as searching for information, which is a basic form of adoption of e-Government. However, this study's finding offers a different view of the relationship in that satisfaction has no significant impact on passive use, and so contradicts what is written in the literature. Even so, this result suggests that the basic form of usage (i.e. searching for information) should not be assumed as being general adoption. In this study, it is found that satisfaction is not an important factor of passive use, but other factors, such as ease of use or usefulness, might be important in passive use (Y. C. Chen & Dimitrova, 2006; Shareef et al., 2011). Hence, it is suggested that research in information systems and in e-Government should investigate the antecedents of different levels of use to be able to better understand the adoption mechanism.

Finally, information transparency and satisfaction explained 0.086 of the variance observed for passive use intention, 0.129 for active use intention and 0.194 for participatory use intention. These results are not as strong as in previous studies. For example, the Shareef et al. (2011) study predicted 0.304 of information provision and 0.348 of communication. Reddick (2004) study predicted 0.48 for information provision and 0.26 for transaction. The Y. C. Chen and Dimitrova (2006) study predicted 0.587 of willingness to search information, 0.585 of willingness to make transactions online, and 0.591 of willingness to have public policy input. However, in each of these studies a large number of determinants of different levels of use were investigated: six to eight antecedents for each use level (Shareef et al., 2011); twelve antecedents for each use level (Reddick, 2004); and thirteen antecedents for each use level (Y. C. Chen & Dimitrova, 2006). Hence, this study's results suggest that information transparency and satisfaction are strong determinants of higher levels of use. However, there are other factors that could further explain passive use, active use and participatory use intentions. In conclusion, this study provides new insight into understanding the role of information transparency and satisfaction on the different levels of use. Information transparency has significant impact on the highest use intention – participatory use - and satisfaction has significant impact on both active use and participatory use intentions.

6.4. Summary

Chapter 6 discussed the findings from the analysis as presented in the previous chapter for four research questions and twelve hypotheses. The results were compared with the literature and then the consistencies and inconsistencies were discussed. In regard to the antecedents of information transparency, it was found that information quality and service quality have a significant effect but that system quality does not. Examining the outcomes of information transparency it was found that participatory use intention has a significant relationship with information transparency. Therefore, hypotheses H1a, H1c and H3c are supported and hypotheses H1b, H3a and H3b are rejected. In regard to satisfaction, all three types of quality are significant to satisfaction, so hypotheses H2a, H2b and H2c are confirmed. Satisfaction has a strong relationship with active use intention and participatory use intention, but not with passive use. Therefore, hypotheses H4b and H4c are validated and hypothesis H4a is rejected.

7. CHAPTER SEVEN - CONCLUSION

7.1. Introduction

This chapter provides a summary of the six chapters and includes a summary of how the research questions are answered in this study. Based on the findings, the theoretical and practical contributions are presented. This chapter also discusses the limitations of the study and proposes guidelines for future research. (Rezgui et al., 2002)

7.2. Summary of the Research

The first chapter provided the foundation for the study. At the beginning, the study explained the importance of information transparency in a wide range of fields. A review of the literature identified the need for more empirical studies in conceptualising information transparency in a computer-mediated environment through the use of definitions, measurements, antecedents and consequences. The discussion provided the rationale for understanding that information transparency is important when citizens use e-Government (Meijer, 2012). The study is therefore motivated by the need for more empirical research on the role of information transparency in citizens' use of e-Government (Dwivedi et al., 2012; Venkatesh et al., 2016; Warkentin et al., 2002). The purpose is to conceptualise information transparency and examine the antecedents of information transparency in a computer-mediated environment, and to assess the impact of information transparency on citizens' intention to use e-Government at different levels.

Within the context of the study, information transparency is defined as “the openness, and visibility of information about data, process, and policy that the government discloses to citizens through e-Government” and describes information transparency as having three dimensions: data transparency, process transparency and policy transparency. By clearly defining information transparency, it was possible to distinguish two streams of conceptual literature. One stream discusses the antecedents of information transparency and the other stream focuses on information transparency itself, including its dimensions. The antecedent factors refer to the quality characteristics of an e-Government system and include aspects such as reliability, completeness, availability and accessibility that are later categorised as information quality, system quality, and service quality. Based on the discussion, the study proposed a theoretical framework, integrating ISSM with the

concept of information transparency. Regarding the dependent variables, the study examines three levels of a citizen's intention to use e-Government, that is, passive use, active use and participatory use. To explore this four research questions are proposed:

- (1) To what extent do information quality, system quality and service quality affect information transparency?
- (2) To what extent do information quality, system quality, and service quality affect satisfaction?
- (3) To what extent does information transparency affect the intention to use e-Government (i.e. passive use, active use, and participatory use)?
- (4) To what extent does satisfaction affect the intention to use e-Government (i.e. passive use, active use, and participatory use)?

The review of the concept of information transparency identifies key inconsistencies and limitations in the literature that relate to defining the concept, identifying what information transparency is in general, and how it is defined specifically in the context of this study. This study uses the term *information transparency* as a reference to transparency in general, and not as used in fields such as biology, physics, architecture, chemistry and optical psychology. The review of the literature on antecedents and consequences of information transparency provides further evidence and the rationale for the relationship between information system qualities (information quality, system quality and service quality), information transparency and intention to use. The aforementioned discussions provided the foundation for the proposed theoretical framework and hypotheses.

The proposed research model integrates ISSM theory with information transparency. The purpose of the framework is to answer the research questions and fill the gaps identified in the literature review. The characteristics of information quality, system quality and service quality are based on prior research about information transparency and information systems. Twelve key hypotheses were proposed with the purpose of exploring the role of information transparency at different levels of e-Government use intention.

To evaluate the research model, a positivist paradigm and quantitative method were adopted. The data collection was supported by a survey. The measurements of the constructs in this study were adopted from existing studies and modified so they were appropriate for the context of the study. In this study, structural equation modelling-

partial least squares (SEM-PLS) technique is used to assess the measurement model and analyse relationships between constructs in the structural model. A pre-test and a pilot survey were conducted to refine the instruments before collection of the main data. Both online and paper-based surveys were used to support the data collection. Invitations to participate in the study were posted on more than 200 official online pages of cities, districts and regions in New Zealand, and also distributed by hand in shopping malls and other public places in Auckland and Christchurch. The responses were treated as confidential and anonymous, to adhere to the guidelines of Auckland University of Technology Ethics Committee (AUTEC).

In total, 234 usable surveys were collected. The data was analysed in terms of assessing (1) the measurement model and (2) the structural model. The results of the tests of the measurement model determined that the instruments are both reliable and valid. The results demonstrated support for eight of the twelve hypotheses (i.e. H1a, H1c, H2a, H2b, H2c, H3c, H4b, H4c);. The four hypotheses not supported are H1b, H3a, H3b, and H4a.

What is information transparency (in general and in e-Government context)?

The first step of the study was to examine literature on information transparency and to clarify what information transparency is, both in a general context and in the specific context of e-Government. A broad literature review of transparency was conducted in order to synthesise the main aspects of the concept. The study adapted the approach of R. Oliver (2004) to the study context to answer three questions regarding who, what and how observations are made. For the “who” question, the observer and observed parties of information transparency can be categorised into two levels - individual and organisational. The observation direction between the observer and the observed parties can be inward, outward, downward and upward (Heald, 2006). For the “what” question, the study found that “*information*” is the main object and the only “goods” that transparency delivers between the observer and the observed. The degree of information transparency depends on the amount of information being disclosed (Bannister & Connolly, 2011; Hultman & Axelsson, 2007). For the “how” question, the study found the common themes in the discussion about information transparency to be “*openness, visibility, and disclosure*”. Based on these three findings, the study defined information transparency as concerning the observed making information open, visible, and disclosed to the observer.

To define information transparency in the context of e-Government, a further literature review was conducted in order to understand both the context and how the context impacts understanding about information transparency. The study followed the guidelines proposed by the framework and identified specific responses to the questions. For the “who” question, the study identified the observer as being citizens and the observed as being the government. In regard to the “what” question, three types of information are identified as important to information transparency in e-Government. They are data, process, and policy. *Data* refers to the data, figures and reports of government. *Process* refers to the steps in the process, and includes information about what steps are taken, who is involved in each step, and what opinions or discussions are used for each step. *Policy* refers to the rationale for final decisions. For the “how” question, the study found the key characteristics of information of governments as regards disclosure, visibility, and openness through an e-Government system. This study defined *information transparency* in an e-Government context as the government making information about data, process and decisions open and visible, and disclosing it to citizens through information system technologies. Based on the empirical analysis of the dimensions of information transparency, process transparency has a stronger effect on information transparency ($\beta = 0.951$, $p < 0.001$) than either data transparency or policy transparency. Process, data and policy transparency together explained 0.63 of the variance observed for information transparency.

Research Question 1: To what extent do information quality, system quality, and service quality affect information transparency?

The empirical analysis showed that the aspects of information quality, system quality, and service quality together explained a significant part of information transparency ($R^2 = 0.498$). Of the three factors of quality, it is information quality and service quality that have significant impact when predicting information transparency ($\beta = 0.488$, $t = 7.026$, $p \leq 0.001$; $\beta = 0.259$, $t = 3.143$, $p \leq 0.05$ respectively). System quality does not have a strong influence on information transparency. So hypotheses H1a and H1c are supported and hypothesis H1b is rejected.

Information quality has two significant indicators, which are completeness and reliability ($t = 3.846$, $p \leq 0.001$ and $t = 1.671$, $p \leq 0.1$ respectively). But relevance, accuracy, timeliness and understandability are not strongly weighted in relation to information quality. Accessibility and reliability are both significant for system quality ($t = 1.864$,

$p \leq 0.1$ and $t = 1.874$, $p \leq 0.1$ respectively) but not availability. For service quality, assurance and reliability are significant ($t = 0.243$, $p \leq 0.05$ and $t = 1.668$, $p \leq 0.1$ respectively) but responsiveness and empathy are not significant. However, all the dimensions are retained due to their absolute importance to the main constructs and their theoretical conceptual contribution to the constructs.

Research Question 2: To what extent do information quality, system quality, and service quality affect satisfaction with e-Government?

This study found that information quality, system quality and service quality significantly contribute to satisfaction and explain 0.543 of the variance observed for satisfaction. In particular, it was found that service quality and information quality have a stronger impact on satisfaction ($\beta = 0.393$, $t = 5.005$, $p \leq 0.001$; and $\beta = 0.289$, $t = 4.269$, $p \leq 0.001$ respectively) than system quality ($\beta = 0.163$, $t = 2.141$, $p \leq 0.05$). This means that all three hypotheses H2a, H2b, H2c are supported.

Research Question 3: To what extent does information transparency affect the intention to use e-Government (i.e. passive use, active use, and participatory use)?

The analysis results show that information transparency has a significant impact on intention to participate which is defined, for this study, as the highest level of use with e-Government ($\beta = 0.208$, $t = 2.441$, $p \leq 0.05$). Information transparency has insignificant impacts on the other two levels of passive use intention and active use intention. So, the hypothesis H3c is supported but hypotheses H3a and H3b are rejected.

Research Question 4: To what extent does satisfaction affect the intention to use e-Government (i.e. passive use, active use, and participatory use)?

The empirical results show that satisfaction has a significant effect on participatory use intention and active use intention ($\beta = 0.299$, $t = 3.566$, $p \leq 0.001$; and $\beta = 0.294$, $t = 3.499$, $p \leq 0.001$ respectively) but no significance with passive use intention. So hypotheses H4b and H4c are supported and hypothesis H4a is rejected. Finally, information transparency and satisfaction explain 0.086 of the variance observed for passive use intention, 0.129 for active use intention and 0.194 for participatory use intention.

In regard to the dimensions of the three levels of e-Government use, the results demonstrate that, in general, all three intentions - passive use, active use and participatory use - satisfy both the reliability and validity measurement models. The intention to search for information is significant in regard to passive use intention ($t = 2.317$, $p \leq 0.05$) but

not for the intention to search for policy information. Regarding active use, only the intention to communicate is significant for active use intention ($t=2.876$, $p \leq 0.05$), but the intention to transact is not significant. Both dimensions of intention to provide comments ($t=2.182$, $p \leq 0.05$) and intention for active participation ($t=4.506$, $p \leq 0.001$) are significant in regard to participatory use intention.

7.3. Theoretical Contributions

This thesis makes several significant contributions to knowledge about information transparency in general, and also to knowledge about the different levels of e-Government use. The following sections will present in detail the academic contribution.

Academic Contribution 1

The understanding of information transparency is enhanced by extending the discussion of previous studies to develop an information transparency framework. Prior studies have proposed a few frameworks for the investigation of information transparency. However, each of the frameworks describes only part of the information transparency concept. For example, R. Oliver (2004) identified two elements which are the observer and observed, and the observation. Heald (2006) identified the direction of the observation. Granados et al. (2010) described the parties in the observation, the information exchanged, and the degree of transparency. This study is comprehensive and proposes guidelines that include: the observer, the observed, the direction of observation, the object of the observation, the degree of information transparency, and how the information is being observed, so that a complete picture of information transparency is provided. Using this framework and its guidelines, the study is able to define information transparency in an e-Government context. This framework and its guidelines can be used in future studies so that information transparency is defined appropriately and consistently in any context.

In addition, this study adds to the understanding of information transparency in an e-Government context by defining the dimensions of information transparency that were discussed, but not empirically investigated, by Bannister and Connolly (2011). Data refers to the basic information such as figures, and reports of government. Process refers to the actual steps in the process, and includes information about what steps are taken, who is involved in each step, and what opinions or discussions are used for each of the steps. Decision and policy refer to the rationale for final decisions. While other studies measured information transparency, they did not distinguish the type of information that is

transparent (i.e. data, process, and policy). Information provided by e-Government is particularly diverse as, for example, there is information about fees and fines, about reports of council budgets, about the process of applications and registrations, and about policies and decisions relating to communities. Hence, each of these dimensions is important for complete understanding of the meaning of information transparency through e-Government. As the empirical results of this study demonstrate, all three of the dimensions are significant to the construct and so form a major contribution in the understanding of information transparency.

Another key contribution of this framework is to be able to distinguish the characteristics of information transparency from the characteristics of information system quality by successfully showing that information system quality (i.e. information quality, system quality and service quality) is distinct from information transparency and thus promotes information transparency. This finding clarifies some of the confusion in the studies about information transparency. For example, some scholars define information transparency as “the degree of completeness of information, regarding their own business activities, provided by each company to the market, and the related role of ICT” (Vaccaro & Madsen, 2006), or “the five dimensions of transparency as access, comprehensiveness, relevance, quality, and reliability of information in the areas of banking/accounting policies.” (Vishwanath & Kaufmann, 2001). In this study, information transparency is referred to as being “openness, visibility, and disclosure”. This clarification sheds a light for future investigation and discussion about information transparency.

Academic Contribution 2

This study contributes to the literature about information transparency and e-Government by proposing and modelling information transparency as a second-order construct and testing it in an e-Government context. Information transparency was measured by the three dimensions of data, process, and policy, as a second-order formative construct. Data transparency refers to the facts and figures supplied by government to its citizens; process transparency refers to steps in the workflow, and the actions, procedures and operations of government; policy transparency refers to policy, decisions, and the rationale supporting the policy decisions of government (Bannister & Connolly, 2011). The results show that information related to the data, figures, and facts, the steps and procedures of the process, and the rationale for the policies and decisions of government all play important roles in forming citizens’ perception of transparency. Lourenço and Serra

(2014) suggest that information transparency should not be measured as a single dimensional model which has been evident in earlier literature about information transparency. In addition, the measures of reliability and validity in information transparency have not been well reported. For example, Eggert and Helm (2003) did not report about the reliability and validity of the transparency construct. With regard to e-Government, Park and Blenkinsopp (2011) provide transparency measurements of government that have been adopted in later studies (S. Kim & Lee, 2012; Medina & Rufín, 2015). They measured municipalities' public works projects, the process of municipalities' public works projects, progress and situation of public works projects, and completion of public works projects. However, these measurements are not enough to clarify what is meant by the information transparency concept.

Academic Contribution 3

This study provides a theoretical framework for investigating the role of information transparency in an IT/IS environment by integrating the concept with ISSM theory. This theory in particular provides the framework of a fundamental information system quality and behavioural intention. The integrated research model provided explains a large variance observed for information transparency and provides the first empirical examination that demonstrates that information quality and service quality significantly influence information transparency. Furthermore, the study identifies that information transparency is an important determinant of intention to participate in policy- and decision-making through e-Government. Government literature has not previously examined this relationship even though transparency has been emphasised as being important in citizens' perception (Chun & Cho, 2012; S. Kim & Lee, 2012; Venkatesh et al., 2016). Hence, both these findings suggest that ISSM is a useful and meaningful theory that can be used for investigating the role of information transparency in an IT/IS context.

Academic Contribution 4

The determinants of information transparency have been discussed in prior literature. However, the determinants mostly relate to social aspects such as the population of a city, and demographics, or political aspects such as a left-leaning mayor, and capital expenditure (Behn et al., 2010; Grimmeliikhuijsen & Welch, 2012; Guillamón et al., 2011; Rodríguez Bolívar et al., 2013; Sol, 2013). This study adopted ISSM theory and found that information quality and service quality are key determinants of information transparency in the e-Government environment. This finding adds value to the

information transparency literature by emphasising the importance of the quality of information and services in relation to information transparency. Although system quality is not significant in regard to information transparency, future research should further investigate these antecedents as, in a different context, they might have a different impact on information transparency.

Academic Contribution 5

The study also adds value to e-Government post-adoption literature, through examination of the three use levels of passive use, active use and participatory use, and how citizens engage with government through different levels of using e-Government. Passive use includes searching for general information and searching for policy and decision information; active use includes communication and transaction; participatory use includes consultation and active participation (Macintosh, 2004; Scott et al., 2015). This model of measuring the different levels of e-Government use contributes to understanding the dynamic of a citizen's adoption which then determines the success of an e-Government system (Shareef et al., 2011). The results of the study suggest that information transparency has significant impact on the highest level of use, which is participatory use intention, while satisfaction has significant impact on both active use intention and participatory use intention. Since information transparency has not been investigated in regard to infusion in either IS or e-Government literature, these empirical findings bridge the gap in understanding the role of information transparency in the dynamics of adoption behaviours. Despite satisfaction being researched in IS infusion (Hsieh & Wang, 2007; W. Wang et al., 2008), to date it has not been explored in e-Government infusion. The finding of significant impact of satisfaction on higher levels of e-Government use (i.e. active use and participatory use intentions) suggests the importance of satisfaction in both IS and e-Government infusion. In conclusion, a key contribution of this study is to show that, at different levels of use, information transparency and satisfaction impacts can vary.

Academic Contribution 6

The results validate the second-order formative measurement models of information quality, system quality, and services quality. Information quality is comprised of completeness, accuracy, understandability, timeliness, relevance, and reliability. System quality is comprised of accessibility, availability, and reliability. Service quality is comprised of reliability, empathy, responsiveness, and assurance. E-government

literature has previously adopted ISSM theory in the investigation of adoption of e-Government. However, measurements of information quality, system quality and service quality were often conceptualised as first-order measurement models or combined into one single quality construct (Barnes & Vidgen, 2006; F. Lin, Fofanah, & Liang, 2011; Prybutok, Zhang, & Ryan, 2008; Teo et al., 2009; Y. S. Wang & Liao, 2006). Meanwhile, the authors of ISSM theory, DeLone and McLean (2003), suggest measuring them as multi-dimensional constructs. IS researchers also suggest measuring information quality, system quality and service quality as a second-order construct (Forsgren et al., 2016). Hence, the findings of this study provide a better understanding of the dimensions of information quality, system quality and service quality in an e-Government context. After considering the importance of each dimension found in the literature, it was deemed that not all dimensions of these constructs were relevant in this particular context. As the context may influence results, it is suggested that future researchers should determine whether the current findings are relevant in the context of another country.

7.4. Practical Contributions

In addition to the theoretical contribution, the findings also have significant implications for practice, both in relation to information transparency and higher levels of use. The implications are not only for e-Government but could also apply to other information system contexts. The discussion below presents the contribution for practice in a different context.

Firstly, guidelines are provided so that government and other organisations understand what information transparency is in a computer-mediated environment. Information transparency is simply referred to as disclosing information and making information visible to other parties. Information transparency has several components: 1) which party or who will observe the information (e.g. citizens observe how transparent government is); 2) which party or who is being observed (e.g. government); and 3) what is observed or what type of information is sought (e.g. fiscal information, internal company information, product information, or decision-making process). Based on these three main components, the organisation can understand what information transparency involves and what can help when making decisions, or identifying strategies to improve information transparency.

Secondly, particularly in e-Government, it is suggested that information transparency in the relationship between government and citizens is defined as the government making information about data, process, and decisions open and visible, when disclosing it to citizens. The significance of the three dimensions of information transparency is that if governments have a goal to be transparent, they must strategically disclose information about governmental figures, statistical reports, steps/status of the process, and the rationale behind decisions and policies. As many reports state that citizens often do not see their government as transparent (Piotrowski & Borry, 2009), this study's findings help to identify what is important for improving the perception of information transparency.

Thirdly, the quality of the information system, such as information quality and service quality, is significantly important for enhancing information transparency in a computer-mediated environment. This finding suggests that governments and any organisations which have the goal to be more transparent should pay attention to improving information quality and service quality. These two qualities can be inbuilt during the process of designing websites, and publishing information on the websites, through rigorous testing.

Fourthly, and in particular, the dimensions of information quality, system quality, and service quality can provide, to the designers of system administration tools, guidance about the characteristics that are important to citizens and customers. For example, complete and reliable information are significant indicators of information quality. This implies that agencies should check information carefully before publishing it on the websites or other services. System quality has two significant aspects which are accessibility and reliability. These results suggest that care should be taken when developing a system and websites should be rigorously tested several times prior to being accessed by the public to ensure the website is accessible in different regions. Finally, assured and reliable services are significant aspects of service quality. Agencies should be knowledgeable and confident when helping citizens and answering their queries, and should perform and provide reliable service.

Fifthly, this study makes a significant contribution to government administration. UN reports on e-Government have been urging the governments of all countries to improve citizens' use levels with e-Government (United Nations, 2012, 2014). This study provides guidelines to help improve levels of use of e-Government, especially at the higher levels. For example, in order to improve citizens' communications and ability to conduct transactions with e-Government, governments should focus on improving citizens'

satisfaction with their experience when using e-Government. To do this, government agencies should ensure the quality of information, system, and service. If the government wants citizens to participate in decision-making and policy development, they need to understand that information transparency and satisfaction play critical roles in improving citizens' willingness to give feedback, propose ideas, and interact with government in the process. This practical aspect could also be relevant to other information systems.

7.5. Limitations and Future Research

Although it contributes to academic knowledge and practices, it is acknowledged that there are limitations in this study. This section will identify those limitations and outline suggestions for future research.

The first limitation is that the responses to the survey were collected based on convenience sampling. The local government online forums in New Zealand, such as Facebook, YouTube and Twitter, were used to post the survey invitation but these platforms do not provide options to monitor how many people viewed the invitation. As well as the online survey, a paper-based survey was also conducted. This method allowed for responses to be collected quickly. However, by approaching people in public places, the study was not able 1) to target the population that uses each or all use levels or 2) to keep track of the response rate. Therefore, the chosen methods of collection made it difficult to obtain a response rate and so can result in bias (Calder, Phillips, & Tybout, 1981; Kitchenham & Pfleeger, 2002). Future research should target certain groups of users, such as those people who make submissions to councils, to eliminate or minimise these limitations.

The second limitation is that the study focused on e-Government use by citizens who engaged with local government in New Zealand. The context of the study was defined quite clearly and specifically. New Zealand has e-Government systems and Internet resources that are well developed (Podder, 2013) so the availability and accessibility of these systems are not an issue. Therefore, the system quality in this context may not have been of significance to information transparency. However, in those countries with less developed e-Government systems and a less reliable or accessible Internet, the system quality may significantly impact accessibility and availability, which are important characteristics that influence information transparency (Bauhr & Grimes, 2012; Bhaduri & Ha-Brookshire, 2011; Gupta & Granados, 2010; Kaufmann & Bellver, 2005).

Further, New Zealand is a country with two layers of government administration which are local and central government. This study did not evaluate citizens' perceptions about their experience with central government. Thus, future research should perhaps investigate the higher level of e-Government (i.e. central government) in New Zealand as well as in other countries, such as the U.S.A's federal government and state governments.

The third acknowledged limitation is that the dimensions of information quality, system quality and service quality were examined based on a synthesis of studies that mainly focused on information transparency. A number of characteristics of quality were identified, such as accessibility, availability, completeness, accuracy, understandability, timeliness, relevance and reliability. These were categorised into characteristics of information quality, system quality, and service quality. For example, information quality includes six dimensions: completeness, accuracy, understandability, timeliness, relevance, reliability; system quality includes three dimensions: accessibility, availability, reliability; and service quality includes four dimensions: reliability, empathy, responsiveness, assurance. The choices of dimensions for information quality, system quality and service quality have two limitations which are 1) being highly dependent on the study context (e.g. countries with different e-Government maturity) and 2) some of the characteristics might be more relevant to system quality and information quality but were not measured in this study due to the length of the survey. Therefore, future researchers should take care when applying the same dimensions of information quality, system quality and service quality used in this study, to another study. As Forsgren et al. (2016) suggests, researchers need to consider the characteristics that are relevant to the context. Hence, future researchers may need to examine other dimensions of information quality, system quality and service quality to ensure that they are pertinent to the context.

Fourthly, the literature suggests that trust and satisfaction are potentially both antecedents and outcomes of information transparency (Deimel et al., 2008; Eggert & Helm, 2003; Park & Blenkinsopp, 2011). However, this study did not assess the relationships between information transparency and trust due to the complexity of the relationship. The study also did not examine the relationship between information transparency and satisfaction due to the scope of the study. Hence, future studies should consider investigating these relationships in depth.

Fifthly, the scope of this study is focused on the role of information transparency in citizens' intention to use e-Government. The findings show that the variance observed for

three levels of use were not very high (0.086 for passive use, 0.129 for active use and 0.194 for participatory use intention). Although the study controlled for demographics (such as age, gender, and citizenship), these did not have a significant impact on intentions. Therefore, if predicting the levels of use intention is to be the focus of a future study, investigating antecedents, other than satisfaction and information transparency, should be considered. Also, future research could examine relationships of the antecedents with the different use types rather than with intentions. For example, Shareef et al. (2011) adopted seven antecedents: perceived awareness, perceived usefulness, perceived security, perceived ability of use, perceived benefits, perceived uncertainty, and perceived trust, to predict passive use (information provision) and active use (interaction or communication). Reddick (2004) examined passive use (information provision) and active use (transaction) antecedents such as demographics, trust in federal government, trust in state government, trust in local government, ability to get information, ability to get positive outcome and frequency of use. Meanwhile, Y. C. Chen and Dimitrova (2006) examined antecedents of *intentions* of passive use (information provision), active use (transaction) and participatory use (policy input), including political involvement, community involvement, utilisation of information channels, perceived benefits, perceived difficulties, availability, competitions, and demographics. Even though their coefficient determinants are higher than the current study, all of them considered demographics as independent variables and most of them predicted use, not intentions.

7.6. Concluding Remarks

This study identified and evaluated the role of information transparency in citizens' e-Government use. To achieve this goal, a survey was adopted to gather responses from New Zealand citizens who have been using e-Government at the local level. An extensive literature review on information transparency and e-Government use was conducted to understand the main concept of the study and motivations for the study. The literature review also provided a theoretical background, by adopting ISSM theory, in order to examine the role of information transparency. Twelve research questions and a research model were proposed.

The research model explained 0.489 of the variance observed for information transparency in a computer-mediated environment, 0.543 for citizens' satisfaction with e-Government, 0.086 for passive use intention, 0.129 for active use intention and 0.194

for participatory use intention. Additionally, eight out of the twelve hypotheses in the research model were found to be significant and in the direction proposed by this study.

Based on the research findings, information transparency was found to be influenced mostly by information quality and service quality of e-Government. Citizens' level of satisfaction with e-Government is found to be influenced by all three qualities of the information system: information quality, system quality, and service quality. In regard to the different levels of use, information transparency has a positive impact on participatory use intention, but not on the lower use levels, while satisfaction has a positive impact on active use intention and participatory use intention, but not on passive use intention.

Since this study is the first attempt to empirically explore the role of information transparency at different levels of e-Government use, there have been limitations with regard to the method of data collection and the context. Nonetheless, these limitations provide an opportunity for future research. Despite the limitations, the study provides significant theoretical and practical contributions. From a theoretical view point, the study provides a framework to explain information transparency in a computer-mediated environment and its influences on different levels of e-Government use. Furthermore, the study provides guidelines to help with the operationalisation of information transparency in any research context, and also has practical implications. There is now guidance available for government, and other organisations, wanting to improve information transparency, to better understand the concept of information transparency and its antecedents and consequences.

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APPENDIX 1

Ethics Application Approval



MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: Felix Tan

From: Kate O'Connor Executive Secretary, AUTEC

Date: 4 November 2014

Subject: 14/365 The role of information transparency in citizens' intention to use e-government services.

Dear Felix

Thank you for submitting your application for ethical review to the Auckland University of Technology Ethics Committee (AUTEC). I am pleased to confirm that the Chair and I have approved your ethics application for three years until 3 November 2017.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 3 November 2017;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 3 November 2017 or on completion of the project;

It is a condition of approval that AUTECH is notified of any adverse events or if the research does not commence. AUTECH approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTECH grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,

A handwritten signature in black ink, appearing to read 'K O'Connor', written in a cursive style.

Kate O'Connor

Executive Secretary

Auckland University of Technology Ethics Committee

APPENDIX 2

Participant Information Sheet



Date Information Sheet Produced:

13/10/14

Project Title

The role of information transparency in citizens' intention to use e-Government

An Invitation

Greetings, my name is Phuong Tran. I am a doctoral student in the Business and Law Faculty at the Auckland University of Technology, under supervision of Professor Felix Tan and Associate Professor Annette Mills. I would like to invite you to participate in my research on the role of information transparency in citizens' use of e-Government services. Your participation in this study is voluntary and will take approximately 20 minutes of your time. You are not obligated to participate in this study and able to leave the survey any time before completion.

What is the purpose of this research?

The purpose of this research is to examine the role of information transparency in citizens' use of e-Government services. Information transparency in this study refers to the openness, visibility and disclosure of information by government in relation to the facts and figures of government, its processes and activities, and its policies. How citizens perceive information transparency may affect their use of e-Government services as well as their trust and satisfaction with these services. This research is conducted to obtain my Doctor of Philosophy degree in Business Information Systems. The findings of this study will be presented in my thesis, conference papers and journal articles.

How was I identified and why am I being invited to participate in this research?

An advertisement will be posted on Auckland City Council social media websites. Those who are interested and eligible to participate will be invited to complete this survey. You are identified as potential participants because you have been taken part in local e-Government forums of Auckland Council (<https://www.facebook.com/aklcouncil?fref=ts> and <https://twitter.com/AklCouncil>).

What will happen in this research?

You will be asked to complete a short anonymous survey. The questions relate to your experiences with using local e-Government services. It will take you about 20 minutes to complete the survey. If you feel at any point that you do not wish to continue answering the survey, you are free to leave the survey. Your responses are used for statistical analysis. The findings based on your responses will be used to produce a thesis and related conference papers and journal articles.

What are the discomforts and risks?

There are no significant discomforts and risks in participating in completing questionnaires. Your participation is anonymous and voluntary.

How will these discomforts and risks be alleviated?

If you feel discomfort, you may choose to discontinue your participation at any time.

What are the benefits?

Your responses will provide empirical data to help us understand how information transparency impacts citizens' intention to use e-Government. Therefore, your participation and responses will help me to complete my research and obtain a Doctor of Philosophy Degree. Moreover, the findings from this study will provide insightful look on how information transparency impacts citizens' use of e-Government services and how e-Government quality effects to citizens' perception of information transparency. Thus, government can improve its online system and deliver better services to citizens. In addition, the findings of this study potentially contribute to knowledge of information transparency in e-Government field as well as in Information System field.

How will my privacy be protected?

Your participation is voluntary, your responses are anonymous. Therefore, your privacy is completely protected. Once the research survey is completed, all the information that you provide will be securely stored in the researcher's office at the Auckland University of Technology. Only the researchers who are involved in this research will be able to access to the data. All data will be destroyed after six years. You will not be identified in any outputs of this research.

What are the costs of participating in this research?

There is no cost for you to participate in this research, except for approximately 20 minutes of your time.

What opportunity do I have to consider this invitation?

You will be given time to go through this information sheet prior to your decision on whether to accept this invitation to participate in this research. If you would like to make further enquiries, you can contact the researcher via the contact details provided below. You can decline this invitation if you do not feel like participating in this research. You are free to leave the survey any time before the completion. The survey will be closed 3 months after announcement. You will not have access once the survey is closed.

How do I agree to participate in this research?

Completion of the survey will be taken as indicating your consent to participate in this research.

Will I receive feedback on the results of this research?

A summary of the research findings will be posted in Auckland Council forums with permission for you to access. In addition, a hard copy of the research findings will be stored in and made available to you through the AUT University Library – City Campus.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Felix Tan, ftan@aut.ac.nz, 921 9999 ext 9487

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Researcher Contact Details:

Phuong Tran, haphtran@aut.ac.nz, 921 9999 ext 5917

Project Supervisor Contact Details:

Professor Felix Tan, ftan@aut.ac.nz, 921 9999 ext 9487

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, AUTEK Reference number *type the reference number*.

APPENDIX 3



SURVEY QUESTIONNAIRE

You are invited to participate in a study on **the role of information transparency in citizens' intention to use e-Government at the local government level**. By citizens, we mean anyone who lives in New Zealand. This survey will take about 10 minutes. Completion of this survey confirms your consent and willingness to participate in this study. Your responses will be confidential and anonymous. This study has been reviewed and approved by the Faculty of Business and Law and the Auckland University of Technology Ethics Committee.

*** Random prize draws ***

Random prize draws will take place on 30th January, 2016 and the winners will be notified by email. See the end of the survey for prize draw entry terms and conditions. If you have any questions about this survey, please contact: Hai Phuong Tran, Faculty of Business and Law and the Auckland University of Technology, Auckland. Email: haphtran@aut.ac.nz.

General Instructions

This questionnaire is for **persons who have used e-Government** (i.e. local government websites, forums, or other online services) to engage with local government (e.g. search for information, communicate with local government, conduct a transaction, provide comments on or take an active part in local government planning, policy-setting and decision-making).

Please answer all questions honestly and to the best of your knowledge. If you find it difficult to determine your exact answer, please give your best estimate. Some questions may appear very similar. This is intentional to ensure greater statistical reliability and accuracy. We would therefore appreciate it if you would answer all questions.

Key terms and definitions:

- **Information transparency** refers to when a government makes information about its data, processes, policies and decisions, open and visible, disclosing it to its citizens.
 - **Local government** refers to city and/or district councils in New Zealand.
 - **e-Government** refers to local government websites, forums or other online services.
 - **Use of e-Government** may include:
 - Searching for information e.g. about rates, housing, licenses, parking, policies, plans, news, and events on local government websites.
 - Communication with local government, e.g. using "Contact us" on local government websites or social media forums to communicate with the local government.
 - Transactions, e.g. submitting resource consent applications, registering pets, and paying rates through local government websites.
 - Providing comments on local government decisions, policies, strategies, legislation, and plans (e.g. city/district annual plans, bylaws, libraries, local parks, housing plans, transport plans) through local government websites.
 - Taking an active part in local government planning, policy-setting, and decision-making (e.g. city/district annual plans, bylaws, libraries, local parks, housing plans, transport plans) through local government websites.
1. **Have you ever used e-Government** (i.e. local government websites, forums, or other online services) to search for information, communicate with local government, conduct a transaction, provide comments on or take an active part in local government planning, policy-setting and decision-making?

☐ Yes ☐ No

(If you have not used e-Government at all, you will be asked to complete the Demographic questions only. Please go to PAGE 8)

Part A: Intention to use e-Government

In this section, we would like to ask about **your intention to use e-Government** whenever you engage with local government (e.g. to search for information, communicate with local government, conduct a transaction, or provide comments on or take an active part in local government planning, policy-setting and decision-making).

REMINDER: In this survey, the term e-Government refers to local government websites, forums or other online services.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. If I search for information related to local government...							
... I intend to use e-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. If I communicate with, contact or query local government...							
... I intend to use e-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If I do a transaction with local government...							
... I intend to use e-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. If I search for information on local government decisions, policies, strategies, legislation, and plans...							
... I intend to use e-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If I provide comments on local government decisions, policies, strategies, legislation, and plans...							
... I intend to use e-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. If I take an active part in local government planning, policy-setting, and decision-making...							
... I intend to use e-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part B: Use of e-Government

In this section, we would like to ask about your **actual use** of e-Government to search for information, communicate with local government, conduct a transaction, or provide comments on or take an active part in local government planning, policy-setting and decision-making.

REMINDER: In this survey, the term “e-Government” refers to local government websites, forums or other online services.

1. **How long have you been using e-Government?**

<input type="checkbox"/> Less than 1 month	<input type="checkbox"/> 3 years to less than 5 years
<input type="checkbox"/> 1 month to less than 6 months	<input type="checkbox"/> 5 years to less than 10 years
<input type="checkbox"/> 6 months to less than 1 year	<input type="checkbox"/> 10 years or more
<input type="checkbox"/> 1 year to less than 3 years	
2. **On average, how often do you use e-Government?**

<input type="checkbox"/> Less than once a year	<input type="checkbox"/> 2-3 times a month
<input type="checkbox"/> About once a year	<input type="checkbox"/> About once a week
<input type="checkbox"/> A few times a year	<input type="checkbox"/> A few times a week
<input type="checkbox"/> About once a month	
3. **On average, how often do you use e-Government ...**

	Not at all	About once a year or less	A few times a year	About once a month	2-3 times a month	About once a week	A few times a week
...to search for information related to local government?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to communicate with, contact or query local government?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to do a transaction with local government?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to search for information on local government decisions, policies, strategies, and plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to provide comments on local government decisions, policies, strategies, and plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to take an active part in local government planning, policy-setting, and decision-making?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part C: Information Transparency in e-Government

In this section, we would like to ask for your opinions about information transparency in e-Government.

REMINDER: Information transparency refers to when a government makes information about its data, processes, policies and decisions, open and visible, disclosing it to its citizens.

The following set of questions relates to the transparency of local government data, that is the facts and figures of local government (e.g. how rate dollars are spent, annual reports on local government activities)		Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1.	e-Government makes the facts and figures of local government visible to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	e-Government enables full disclosure of the facts and figures of local government to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	e-Government makes the facts and figures of local government transparent to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	e-Government makes the facts and figures of local government open to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The following set of questions relates to the transparency of local government operations and processes (i.e. actions and procedures of local government). This includes information about what steps or actions are taken, and who are involved in each step.		Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
5.	e-Government makes the operations of local government visible to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	e-Government enables full disclosure of the actions and procedures of local government to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	e-Government makes the operations of local government open to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	e-Government makes the actions and procedures of local government transparent to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The following set of questions relates to transparency of local government policies and decisions (e.g. reasons for policies or decisions)		Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
9.	e-Government makes the reasons behind the local government policies visible to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	e-Government enables full disclosure of the rationale for the local government decisions to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	e-Government makes the reasons for the local government policies transparent to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. e-Government makes the reasons behind the local government decisions open to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The following set of questions relates to e-Government transparency, in general	Strongly	Disagree	Some what	Neutral	Some what	Agree	Strongly
13. e-Government makes information visible to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. e-Government enables full disclosure of information to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. e-Government makes information transparent to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. e-Government makes information open to citizens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part D: Quality of e-Government

In this section, we would like to ask for your opinions about the quality of e-Government.

The following set of questions relates to your opinions about the information that is provided by e-Government.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. The information provided by e-Government...							
...is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is comprehensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is free of error	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is all that I need	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is current	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is easy to comprehend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is up-to-date	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is timely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is relevant to my needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is reliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...useful for meeting my needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is applicable to my needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is trustworthy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...can be relied upon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. In general, e-Government provides me with high quality information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Overall, I would give the information from e-Government high marks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Overall, I would give the information provided by e-Government a high rating in terms of quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following set of questions relates to your opinions about the e-Government system. This is the technology (e.g. websites) that delivers the information and online services provided by e-Government. For these questions please focus on the technology that supports e-government.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. The e-Government system ...							
...is readily accessible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...operations are reliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is always available for use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is easy to access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...performs dependably	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is available to use whenever it is needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

...is very accessible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...functions reliably	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...is readily available for use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
2. In terms of system quality, I would rate the e-Government system highly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Overall, the e-Government system is of high quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Overall, I would give the quality of the e-Government system a high rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The following set of questions relates to your opinions about the e-Government <u>help services</u> (e.g. online communication, online help documents, FAQs, and other help services provided to support and help citizens to use e-Government).							
5. The help services provided by e-Government...	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
... are responsive to enquiries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... are competent in solving problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... are quick in responding to any requests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... have sufficient knowledge to answer requests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... provide quick responses to enquiries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... have the ability to solve problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... are dependable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... are empathetic to the needs of individuals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... performs reliably	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... caters to individual needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... can be relied upon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... have the individual's interests at heart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Overall, the level of help service quality I receive from e-Government is good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Overall, the level of help service quality I receive from e-Government is excellent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Overall, the level of help service quality I receive from e-Government is high	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part E: Satisfaction with e-Government

In this section, we would like to ask about your satisfaction with e-Government.

1. Overall, I am _____ with using e-Government.

Very Dissatisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very Satisfied
Very Displeased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very Pleased
Very Frustrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very Contented
Very Disappointed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very Delighted

General Questions

We appreciate your patience to help us answer the following set of questions. They refer to fashion consciousness. The exact answer is not important to us – but it is required for statistical calibration of the earlier questions. So please answer these questions based on your “gut” feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. I keep my wardrobe up-to-date with the changing fashions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. To get variety, I shop at different stores and choose different brands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. It's fun to buy something new and exciting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part F: Demographics

Please provide the following information about yourself. The information will be used for statistical purposes and you will not be identified in any manner.

1. Gender

☐ Female ☐ Male ☐ Other

2. Your age group

<input type="checkbox"/> Under 20 years	<input type="checkbox"/> 35 to 44 years
<input type="checkbox"/> 20 to 24 years	<input type="checkbox"/> 45 to 54 years
<input type="checkbox"/> 25 to 29 years	<input type="checkbox"/> 55 to 64 years
<input type="checkbox"/> 30 to 34 years	<input type="checkbox"/> 65 years or older

3. Highest level of education

☐ Primary School
☐ Secondary School
☐ High School
☐ Undergraduate Degree
☐ Postgraduate Degree
☐ Other (please specify) _____

4. New Zealand Citizenship/Residency Status

☐ Citizen ☐ Other (please specify) _____
☐ Permanent Resident _____

Thank You for Your Participation

Please contact Hai Phuong Tran at haphtran@aut.ac.nz if you have any further questions

APPENDIX 4

Summary of transparency antecedents and consequences in prior literature

Sources	Methodology	Field	Antecedents	Consequences
(Grimmelikhuijsen & Meijer, 2011)	case study	government		trust in government (moderator: prior knowledge and predisposition to trust)
(Finel & Lord, 1999)	case study	political		defusing international crises by illuminating other states' peaceful intentions and ameliorating the security dilemma
(Vaccaro & Madsen, 2006)	case study	business	customers, competitors, investors, security, privacy	trust
(Bannister & Connolly, 2011)	conceptual	government	public right to know, cost and risk, rights of public servants	
(Gupta, 2010)	conceptual	government		inform and empower
(Neyland, 2007)	conceptual	case study		
(Joshi, 2013)	conceptual	government		accountability, empowerment
(Florini, 2008)	conceptual	political		
(Schauer, 2011)	conceptual	general		
(Santana & Wood, 2009)	conceptual	general		
(Bhaduri & Ha-Brookshire, 2011)	qualitative	marketing	consumer value, price/quality, prior knowledge, trust/distrust	attitude and intention
(Michener & Bersch, 2011)	conceptual	general		

(Ball, 2009)	conceptual	political		reduce corruption, increase public disclosure, create trust
(Fox, 2007)	conceptual	political		accountability, shame
(UN - HABITAT & Transparency International, 2004)	conceptual	government		corruption
(Cordella, 2007)	conceptual	government	trust	
(Turilli & Floridi, 2009)	conceptual	business	availability, accessibility,	
(Hood & Heald, 2006)	conceptual	government		
(Cameron & Vorauer, 2008)	conceptual	relationship	self-awareness, motivation, characteristics of the relationship	bias, conflict, miscommunication, hurt feelings
(Fenster, 2006)	conceptual	government		negative (threaten health and safety of public, raise fiscal costs, hidden government decision making); and positive (informed public, responsive government, functional society)
(R. Oliver, 2004)	conceptual	general		
(Hammond, 2001)	conceptual	government		
(Bertot, Jaeger, & Grimes, 2010)	conceptual	government		democracy, prevent corruption, informed decision making, trust in government
(Granados et al., 2010)	conceptual	business		
(Helbig et al., 2010)	conceptual	government		
(Mol, 2010)	conceptual	government		empower, democracy
(Christopher & Darren, 2004)	interview	business	communication	

(Dapko, 2012)	Mix (survey + interview)	marketing	consumer effort, reciprocity information perceived as firm damaging	consumer scepticism, trust, attitude, intention
(Wehmeier & Raaz, 2012)	qualitative	public relations		
(Bonsón, Torres, Royo, & Flores, 2012)	quantitative	government	E-government in cities, Internet penetration, E- government use by citizens, E-commerce use by citizens, central E-government	
(Scholtes, 2012)	qualitative	government		
(Leite & Cappelli, 2010)	qualitative	Information system		
(Dawes, 2010)	qualitative	government		
(de Fine Licht, 2011)	qualitative	decision making		trust and legitimacy
(Hultman & Axelsson, 2007)	qualitative	marketing		
(Knorr & Urs, 2001)	quantitative	management		
(Xavier, 2008)	quantitative	business		
(Piotrowski & Ryzin, 2007)	quantitative	government		demand for transparency
(Su et al., 2011)	quantitative	supply chain		trust, satisfaction, commitment
(Miao & Mattila, 2007)	quantitative	marketing	sufficient and useful information	attitude toward purchasing
(Durnev & Errunza, 2009)	quantitative	business		
(Awad & Krishnan, 2006)	quantitative	marketing	demographics, previous online privacy invasion, privacy concern, importance of privacy policies	intention to be profiled online for personalised service, for personalised advertising
(Park & Blenkinsopp, 2011)	quantitative	government		citizen satisfaction, corruption (mediator are transparency and trust)

(Bauhr & Grimes, 2012)	quantitative	government		
(Wong & Welch, 2004)	regression	government	sense of mission, role of the state	accountability
(Eggert & Helm, 2003)	quantitative	marketing		customer satisfaction (intention) and customer value, intention to purchase
(Welch & Hinnant, 2003)	quantitative	Internet use		
(C. C. Williams, 2005)	qualitative	organisation	dyadic and group level trust	
(Y. Lu et al., 2014)	experiment	e-business		price of auctions
(Trenz & Veit, 2012)	quantitative	e-commerce		purchase decision of low-priced products
(Ozcelik & Ozdemir, 2008)	quantitative	e-commerce		mean prices, market efficiency, rents earned by buyer and seller
(Xu et al., 2014)	experiment + quantitative	e-commerce		perceived enjoyment and product diagnosticity
(Zhu & Zhou, 2007)	quantitative	business, supply chain		Benefit for one side and loss for other side
(Schilhavy & Iyer, 2007)	conceptual	e-commerce		reputation and trust
(Soh et al., 2006)	quantitative	e-commerce		product cost and performance
(Krishnan et al., 2007)	quantitative	management		supply chain performance
(Ryan et al., 2011)	case study	health		
(Radmacher, 2008)	quantitative	e-commerce	sufficient	
(Fisher, Lee, & Richardson, 2003)	quantitative	e-commerce		adoption of dynamic communication techniques in different countries
(Sternstein, 2010)	conceptual	government	quick and easy to find information about services	Continuous use, trust in government, satisfaction

(Moreno & Molina, 2014)	quantitative	university		trust, continuous use
(Nam, 2014)	quantitative	government		active use
(McManus, Holtzman, Lazarus, Anderberg, & Jahansoozi, 2006)	qualitative	business		trust, accountability
(Jaeger & Bertot, 2010)	conceptual	government		participation, engagement
(Armstrong, 2011)	quantitative	government	public outreach and professionalism	interaction
(Álvarez et al., 2008)	mix (content analysis + survey)	business		use of communication channel
(Álvarez et al., 2011)	mix (content analysis + survey)	university	complexity, internationality and profitability	
(Humphry & Wong, 2009)	quantitative			assurance, pay attention to customer privacy
(S. Kim & Lee, 2012)	quantitative		user development, perceived influence on decision making, ease of use, responsiveness	satisfaction, trust
(Guillamón et al., 2011)	quantitative		political ideology, taxes, population	
(Sol, 2013)	quantitative		political competition, number of inhabitants, accumulation of debt, political ideology	
(Rodríguez Bolívar et al., 2013)	quantitative		financial condition, inter-governmental grants, political competition, size of government organisations, municipal wealth	
(Eggert & Helm, 2003)	quantitative	supply chain		satisfaction, customer value, intention

APPENDIX 5

Paper	Availability	Accessibility	Relevance/ informativ e/ usefulness	Timelines s/currenc y/ up-to- date	Reliability/ credibility/ validity/ believabilit y	Completeness/ adequate/ sufficiency/ comprehensivene ss	Accuracy/ free of error	Understandabil ity/ clear
(Finel & Lord, 1999)	x				x			
(Welch & Hinnant, 2003)					x			
(Eggert & Helm, 2003)			x					
(Wong & Welch, 2004)			x	x				
(Hood & Heald, 2006)	x	x						
(Fenster, 2006)				x		x		
(Awad & Krishnan, 2006)		x						
(Vaccaro & Madsen, 2006)						x		
(Neyland, 2007)	x	x						
(Fox, 2007)		x						
(Hultman & Axelsson, 2007)		x						
(Piotrowski & Borry, 2009)								
(Piotrowski & Ryzin, 2007)					x		x	
(Miao & Mattila, 2007)						x		X (diagnostic)
(Xavier, 2008)		x		x		x		

(Santana & Wood, 2009)		x			x			x
(Ball, 2009)	x				x			
(Turilli & Floridi, 2009)	x	x						
(Granados et al., 2010)	x	x						
(Cappelli, Sampaio do Prado Leite, & Oliveira, 2007)		x	x					x
(Dawes, 2010)		x	x	x		x		
(Schauer, 2011)	x	x						
(Grimmelikhuijsen, 2012b)	x							
(Bhaduri & Ha-Brookshire, 2011)		x	x		x	x		
(Wehmeier & Raaz, 2012)	x	x						
(Bauhr & Grimes, 2012)	x	x	x					
(Kaufmann & Bellver, 2005)	x		x					
(Udo et al., 2012)				x		x	x	
(Almahamid & McAdams, 2010)		x	x	x	x	x	x	x
(Teo et al., 2009)			x	x	x	x	x	x

(Colesca, 2009)			x		x		x	
(Wangpipatwong et al., 2009)			x	x		x	x	x
(DeLone & McLean, 2003)			x			x		x
(S. Li & Lin, 2006)				x		x	x	
(C. C. Chen & Tseng, 2011)			x	x		x		x
(Xu et al., 2013)				x		x	x	
(Wixom & Todd, 2005)				x		x	x	
(Yang et al., 2005)			x		x	x	x	

APPENDIX 6

Measurement items

<u>Construct</u>	<u>Items</u>	<u>References</u>
Intention to search for general information (INTSEAR)	If I search or acquire information related to local government, I intend to use e-Government ... I predict I would use e-Government * ... I plan to use e-Government *	(Al-adawi et al., 2005; Davis, 1989; Venkatesh et al., 2003)
Intention to communicate (INTCOMMU)	If I communicate with, contact or query local government, I intend to use e-Government ... I predict I would use e-Government * ... I plan to use e-Government *	(Al-adawi et al., 2005; Davis, 1989; Shareef et al., 2011; Venkatesh et al., 2003)
Intention to transact (INTTRAN)	If I do a transaction with local government, I intend to use e-Government ... I predict I would use e-Government * ... I plan to use e-Government *	(Davis, 1989; Shareef et al., 2011; Venkatesh et al., 2003)
Intention to search for policy information (INTSEARPOL)	If I search for or acquire information on local government decisions, policies, strategies, legislations, and plans, I intend to use e-Government ... I predict I would use e-Government * ... I plan to use e-Government *	(Chun & Cho, 2012; Davis, 1989; Venkatesh et al., 2003)
Intention to comment on policy (INTCOMME)	If I provide comments on local government decisions, policies, strategies, legislations, and plans, I intend to use e-Government ... I predict I would use e-Government * ... I plan to use e-Government *	(Chun & Cho, 2012; Davis, 1989; Venkatesh et al., 2003)

Intention to actively participate (INTACTIVE)	If I take an active part in local government planning, legislation, policy-setting, and decision-making, I intend to use e-Government ... I predict I would use e-Government * ... I plan to use e-Government *	(Chun & Cho, 2012; Davis, 1989; Venkatesh et al., 2003)
Experience (EXP)	How long have you been using e-Government?	(DeLone & McLean, 1992)
Frequency (FRE)	On average, how often do you use e-Government?	(DeLone & McLean, 1992)
Information quality (IQ)	In terms of information quality, I would rate the information provided by e-Government highly. Overall, the information provided by e-Government is of high quality. Overall, I would give the quality of information provided by e-Government a high rating.	(Wixom & Todd, 2005)
IQ- completeness (IQCOM)	The information provided by e-Government is complete. The information provided by e-Government is comprehensive. The information provided by e-Government is all that I need.	(Wixom & Todd, 2005)
IQ- accuracy (IQACC)	The information provided by e-Government is accurate. The information provided by e-Government is free of error. The information provided by e-Government is correct.	(Teo et al., 2009; Wixom & Todd, 2005)
IQ- understandability (IQUNDER)	The information provided by e-Government is easy to understand. The information provided by e-Government is easy to comprehend. The information provided by e-Government is understandable. * The information provided by e-Government is clear.	(Y. W. Lee et al., 2002; Teo et al., 2009; Wangpipatwong et al., 2009)
IQ- timeliness (IQTIME)	The information provided by e-Government is current. The information provided by e-Government is up-to-date. The information provided by e-Government is always in time. * The information provided by e-Government is timely.	(Y. W. Lee et al., 2002; Teo et al., 2009; Wangpipatwong et al., 2009)
IQ- relevance (IQRELE)	The information provided by e-Government is relevant to my needs. The information provided by e-Government is useful for meeting my needs. The information provided by e-Government is applicable to my needs.	(Wangpipatwong et al., 2009)
IQ- reliability (IQRELI)	The information provided by e-Government is reliable. The information provided by e-Government is trustworthy.	(Teo et al., 2009; Wixom & Todd, 2005)

	<p>The information provided by e-Government can be relied upon.</p> <p>The information that e-Government provides is dependable.*</p>	
System quality (SQ)	<p>In terms of quality, I would rate the e-Government system highly.</p> <p>Overall, the e-Government system is of high quality.</p> <p>Overall, I would give the quality of the e-Government system a high rating.</p>	(Wixom & Todd, 2005)
SQ-accessibility (SQACCESS)	<p>The e-Government system is readily accessible.</p> <p>The e-Government system is easy to access.</p> <p>The e-Government system is very accessible.</p>	(Wixom & Todd, 2005)
SQ-availability (SQAVAI)	<p>The e-Government system is always available for use.</p> <p>The e-Government system is always available to use whenever it is needed.</p> <p>The e-Government system is readily available for use.</p>	(DeLone & McLean, 2004; H.-Y. Wang & Wang, 2010)
SQ-reliability (SQRELI)	<p>The e-Government system operations are reliable.</p> <p>The e-Government system performs dependably.</p> <p>The e-Government system functions reliably.</p>	(Wixom & Todd, 2005)
Service quality (SRQ)	<p>In terms of quality, I would rate e-Government help services highly.</p> <p>Overall, the help services provided by e-Government are of high quality.</p> <p>Overall, I would give the help services provided by e-Government a high rating.</p>	(DeLone & McLean, 2004; Xu et al., 2013)
SRQ- reliability (SRQREL)	<p>The help services provided by e-Government are dependable.</p> <p>The help services provided by e-Government perform reliably.</p> <p>The help services provided by e-Government can be relied upon.</p> <p>The help services provided by e-Government perform reliably. *</p>	(Orgeron & Goodman, 2011; Parasuraman et al., 2005; Teo et al., 2009)
SRQ- empathy (SRQEMP)	<p>The help services provided by e-Government are empathic to the needs of individuals.</p> <p>The help services provided by e-Government cater individual needs.</p> <p>The help services provided by e-Government have individual's interest at heart.</p> <p>The help services provided by e-Government show care regarding individual needs. *</p>	(Parasuraman et al., 2005; Teo et al., 2009)
SRQ-responsiveness (SRQRES)	<p>The help services provided by e-Government are responsive to enquiries.</p> <p>The help services provided by e-Government are quick in responding to any requests.</p> <p>The help services provided by e-Government provide quick responses to enquiries.</p>	(Parasuraman et al., 2005; Teo et al., 2009)

	The help services provided by e-Government give prompt responses to requests. *	
SRQ-assurance (SRQASSU)	The help services provided by e-Government are comprtent in solving problems. The help services provided by e-Government have sufficient knowledge to answer requests. The help services provided by e-Government have ability to solve problems.	(Parasuraman et al., 2005; Teo et al., 2009)
Information transparency (TRANS)	e-Government enables the open flow of information to citizens. e-Government makes information visible to citizens. e-Government enables full disclosure of information to citizens. e-Government makes information transparent to citizens.	(Dapko, 2012; Grimmelikhuijsen, 2012a; Park & Blenkinsopp, 2011)
Data transparency (TRANSDATA)	e-Government makes the facts and figures of local government visible to citizens. e-Government enables full disclosure of the facts and figures of local government to citizens. e-Government makes the facts and figures of local government transparent to citizens. e-Government enables the open flow of the facts and figures of local government to citizens.	(Dapko, 2012; Grimmelikhuijsen, 2012a; Park & Blenkinsopp, 2011)
Process transparency (TRANSPROC)	e-Government makes the operations of local Government visible to citizens. e-Government makes the actions and procedures of local government transparent to citizens. e-Government enables full disclosure of the actions and procedures of local government to citizens. e-Government makes the operations of local government open to citizens. e-Government makes the processes of local government transparent to citizens. * e-Government enables full disclosure of operations of local government to citizens. *	(Dapko, 2012; Grimmelikhuijsen, 2012a; Park & Blenkinsopp, 2011)
Policy transparency (TRANSPOL)	e-Government makes the rationale behind the policies of local government visible to citizens. e-Government makes the reasons for the policies of local government transparent to citizens. e-Government makes the reasoning behind the decisions of local government open to citizens. e-Government enables full disclosure of the rationale for the decisions of local government to citizens.	(Dapko, 2012; Grimmelikhuijsen, 2012a; Park & Blenkinsopp, 2011)
Satisfaction (SAT)	Overall, I am ... with using e-Government. (dissatisfied – satisfied; displeased – pleased; frustrated – contented; disappointed – delighted)	(Bhattacharjee, 2001a)
Fashion consciousness (FC)	I keep my wardrobe up-to-date with the changing fashions. To get variety, I shop at different stores and choose different brands. It's fun to buy something new and exciting. I usually have one or more outfits of every newest style. *	(Shim & Gehrt, 1996; Sprotles & Kendall, 1986)

	Fashionable, attractive styling is very important to me. *	
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*represents deleted items

APPENDIX 7

Missing values

Items	N	Mean	Standard Deviation	Missing		Items	N	Mean	Standard Deviation	Missing	
				Count	Percent					Count	Percent
INTSEAR	228	5.82	1.31	6	2.6	IQCOM01	233	4.25	1.40	1	.4
INTSEARPOL	226	5.70	1.30	8	3.4	IQCOM02	234	4.48	1.33	0	.0
INTCOMMU	224	5.51	1.40	10	4.3	IQCOM03	232	4.00	1.56	2	.9
INTTRAN	225	5.34	1.62	9	3.8	IQACC01	231	4.64	1.33	3	1.3
INTCOMME	222	5.12	1.65	12	5.1	IQACC02	233	4.22	1.47	1	.4
INTACTIVE	219	4.97	1.61	15	6.4	IQACC03	230	4.50	1.36	4	1.7
TRANSDATA01	234	4.58	1.30	0	.0	IQUNDER01	234	4.64	1.40	0	.0
TRANSDATA02	234	4.40	1.39	0	.0	IQUNDER02	234	4.55	1.40	0	.0
TRANSDATA03	234	4.33	1.33	0	.0	IQUNDER03	234	4.47	1.44	0	.0
TRANSDATA04	233	4.46	1.30	1	.4	IQTIMELY01	233	4.69	1.35	1	.4
TRANSPROC01	233	4.49	1.25	1	.4	IQTIMELY02	227	4.59	1.33	7	3.0
TRANSPROC02	232	4.37	1.35	2	.9	IQTIMELY03	234	4.48	1.37	0	.0
TRANSPROC03	233	4.47	1.26	1	.4	IQRELE01	234	4.74	1.26	0	.0
TRANSPROC04	232	4.31	1.33	2	.9	IQRELE02	223	4.79	1.30	11	4.7
TRANSPOL01	232	4.16	1.38	2	.9	IQRELE03	232	4.72	1.27	2	.9
TRANSPOL02	232	4.14	1.40	2	.9	IQRELI01	234	4.69	1.33	0	.0
TRANSPOL03	233	4.05	1.36	1	.4	IQRELI02	233	4.77	1.36	1	.4
TRANSPOL04	233	4.11	1.41	1	.4	IQRELI03	233	4.72	1.46	1	.4
TRANS01	233	4.80	1.30	1	.4	IQ01	232	4.71	1.33	2	.9
TRANS02	233	4.38	1.34	1	.4	IQ02	231	4.62	1.42	3	1.3
TRANS03	233	4.41	1.36	1	.4	IQ03	230	4.58	1.47	4	1.7

TRANS04	233	4.57	1.32	1	.4						
SQACCESS01	234	5.24	1.27	0	.0	SRQRES01	234	4.57	1.37	0	.0
SQACCESS02	233	5.23	1.28	1	.4	SRQRES02	234	4.34	1.41	0	.0
SQACCESS03	234	5.18	1.28	0	.0	SRQRES03	233	4.41	1.36	1	.4
SQRELIAB01	234	5.00	1.30	0	.0	SRQASSU01	234	4.45	1.38	0	.0
SQRELIAB02	234	5.11	1.27	0	.0	SRQASSU02	234	4.60	1.37	0	.0
SQRELIAB03	233	5.09	1.23	1	.4	SRQASSU03	234	4.53	1.37	0	.0
SQAVAI01	234	5.16	1.36	0	.0	SRQRELI01	234	4.55	1.39	0	.0
SQAVAI02	234	5.19	1.32	0	.0	SRQRELI02	231	4.68	1.38	3	1.3
SQAVAI03	233	5.22	1.27	1	.4	SRQRELI03	232	4.59	1.37	2	.9
SQ01	234	4.89	1.30	0	.0	SRQEMP01	234	4.33	1.47	0	.0
SQ02	234	4.86	1.30	0	.0	SRQEMP02	232	4.41	1.37	2	.9
SQ03	234	4.82	1.35	0	.0	SRQEMP03	232	4.36	1.45	2	.9
SATY01	228	4.96	1.31	6	2.6	SRQ01	234	4.80	1.37	0	.0
SAT02	220	4.83	1.23	14	6.0	SRQ02	232	4.39	1.38	2	.9
SAT03	225	4.80	1.36	9	3.8	SRQ03	232	4.58	1.40	2	.9
SAT04	219	4.64	1.25	15	6.4						

APPENDIX 8

Cross-loadings

	IQ	IQ AC C	IQ CO M	IQ RE LE	IQR ELI	IQT IME	IQUN DER	SAT	SQ	SQ AC CE SS	SQA VAI	SQR ELI	SR Q	SRQ ASS U	SRQ EMP	SRQR ELI	SRQ RES	TR AN S	TRAN SDAT A	TRA NSP OL	TRA NSP RO
IQ01	0.95	0.70	0.74	0.77	0.80	0.68	0.64	0.65	0.72	0.59	0.56	0.56	0.66	0.63	0.57	0.67	0.56	0.61	0.58	0.48	0.54
IQ02	0.97	0.71	0.78	0.78	0.80	0.70	0.68	0.66	0.75	0.58	0.58	0.56	0.71	0.66	0.62	0.68	0.59	0.68	0.60	0.58	0.60
IQ03	0.95	0.68	0.74	0.71	0.78	0.65	0.62	0.67	0.74	0.59	0.58	0.58	0.72	0.65	0.61	0.68	0.57	0.63	0.59	0.55	0.56
IQACCU01	0.67	0.91	0.73	0.64	0.74	0.65	0.60	0.51	0.58	0.49	0.47	0.50	0.47	0.47	0.41	0.50	0.45	0.60	0.52	0.46	0.50
IQACCU02	0.61	0.90	0.71	0.62	0.68	0.63	0.61	0.46	0.50	0.40	0.38	0.43	0.45	0.37	0.42	0.42	0.42	0.52	0.45	0.44	0.45
IQACCU03	0.72	0.94	0.77	0.68	0.80	0.69	0.68	0.57	0.61	0.51	0.48	0.60	0.60	0.52	0.60	0.53	0.64	0.54	0.58	0.57	0.57
IQCOM01	0.72	0.71	0.92	0.70	0.72	0.65	0.67	0.56	0.60	0.40	0.39	0.54	0.52	0.48	0.51	0.46	0.61	0.57	0.52	0.55	0.55
IQCOM02	0.70	0.74	0.90	0.63	0.71	0.65	0.63	0.50	0.57	0.45	0.40	0.54	0.57	0.49	0.51	0.46	0.62	0.56	0.52	0.56	0.56
IQCOM03	0.68	0.71	0.88	0.68	0.69	0.64	0.65	0.58	0.58	0.42	0.42	0.54	0.55	0.49	0.51	0.50	0.53	0.50	0.46	0.49	0.49
IQRELE01	0.70	0.63	0.67	0.91	0.74	0.71	0.67	0.50	0.57	0.45	0.45	0.49	0.49	0.46	0.49	0.46	0.56	0.44	0.49	0.48	0.48
IQRELE02	0.76	0.67	0.73	0.95	0.77	0.70	0.70	0.54	0.59	0.47	0.45	0.56	0.56	0.48	0.55	0.50	0.57	0.47	0.47	0.46	0.46
IQRELE03	0.76	0.69	0.71	0.96	0.80	0.71	0.68	0.54	0.58	0.50	0.49	0.54	0.53	0.48	0.55	0.46	0.59	0.48	0.49	0.48	0.48
IQRELI01	0.76	0.77	0.74	0.6	0.92	0.72	0.66	0.56	0.68	0.55	0.56	0.60	0.59	0.53	0.61	0.50	0.59	0.53	0.51	0.52	0.52
IQRELI02	0.77	0.76	0.72	0.7	0.96	0.67	0.64	0.51	0.60	0.48	0.48	0.61	0.57	0.52	0.59	0.48	0.59	0.52	0.50	0.54	0.54
IQRELI03	0.81	0.76	0.76	0.79	0.95	0.68	0.65	0.57	0.62	0.51	0.50	0.58	0.57	0.49	0.55	0.48	0.60	0.53	0.50	0.53	0.53
IQTIMELY01	0.63	0.66	0.65	0.70	0.66	0.92	0.69	0.47	0.61	0.53	0.54	0.49	0.47	0.42	0.49	0.44	0.52	0.42	0.41	0.46	0.46

IQTIMELY02	0.6 2	0.6 4	0.6 2	0.6 5	0.66	0.94	0.64	0.44	0.5 5	0.4 7	0.47	0.46	0.48	0.50	0.44	0.48	0.45	0.55	0.45	0.49	0.48
IQTIMELY03	0.7 2	0.6 9	0.7 3	0.7 3	0.72	0.93	0.74	0.49	0.6 1	0.5 1	0.52	0.49	0.55	0.55	0.51	0.53	0.49	0.62	0.51	0.55	0.56
IQUNDER01	0.5 9	0.6 0	0.6 5	0.6 7	0.61	0.67	0.95	0.43	0.5 5	0.5 3	0.48	0.48	0.47	0.49	0.48	0.48	0.46	0.52	0.43	0.45	0.47
IQUNDER02	0.6 4	0.6 5	0.7 0	0.6 9	0.64	0.69	0.96	0.47	0.5 6	0.5 3	0.46	0.46	0.52	0.53	0.50	0.52	0.50	0.55	0.47	0.47	0.50
IQUNDER03	0.6 9	0.7 1	0.7 2	0.7 2	0.71	0.77	0.95	0.48	0.5 7	0.5 3	0.52	0.51	0.51	0.54	0.47	0.51	0.50	0.58	0.49	0.48	0.50
SAT01	0.6 4	0.5 3	0.5 4	0.5 2	0.54	0.47	0.46	0.92	0.6 6	0.5 5	0.54	0.57	0.65	0.64	0.58	0.63	0.62	0.47	0.49	0.43	0.47
SAT02	0.6 3	0.5 0	0.5 7	0.4 9	0.51	0.46	0.42	0.94	0.6 1	0.5 1	0.49	0.52	0.61	0.59	0.53	0.57	0.56	0.45	0.51	0.39	0.45
SAT03	0.6 1	0.5 1	0.5 2	0.4 9	0.52	0.46	0.44	0.90	0.6 0	0.4 4	0.44	0.46	0.64	0.60	0.57	0.62	0.57	0.44	0.43	0.36	0.43
SAT04	0.6 3	0.5 1	0.5 9	0.5 6	0.55	0.46	0.45	0.90	0.6 0	0.4 7	0.44	0.46	0.61	0.58	0.57	0.59	0.55	0.42	0.46	0.38	0.43
SQ01	0.7 4	0.6 1	0.6 4	0.5 9	0.64	0.61	0.57	0.67	0.9 6	0.7 0	0.70	0.73	0.72	0.66	0.62	0.71	0.63	0.52	0.53	0.49	0.53
SQ02	0.7 4	0.5 8	0.6 2	0.5 9	0.64	0.62	0.57	0.64	0.9 8	0.7 0	0.71	0.73	0.74	0.67	0.64	0.74	0.64	0.52	0.52	0.51	0.51
SQ03	0.7 6	0.6 1	0.6 5	0.6 2	0.68	0.62	0.59	0.67	0.9 7	0.6 6	0.70	0.71	0.76	0.68	0.65	0.75	0.64	0.52	0.52	0.50	0.50
SQACCESS01	0.5 4	0.4 1	0.4 1	0.5 0	0.50	0.49	0.51	0.46	0.6 3	0.8 9	0.75	0.80	0.50	0.48	0.45	0.51	0.46	0.37	0.35	0.38	0.35
SQACCESS02	0.5 5	0.4 3	0.4 4	0.5 2	0.47	0.50	0.53	0.52	0.6 5	0.9 3	0.81	0.79	0.53	0.50	0.47	0.52	0.51	0.40	0.40	0.37	0.38
SQACCESS03	0.5 7	0.4 4	0.4 3	0.5 0	0.49	0.52	0.50	0.50	0.6 6	0.9 3	0.84	0.83	0.53	0.49	0.45	0.52	0.47	0.40	0.40	0.38	0.37
SQAVAI01	0.5 1	0.4 5	0.4 3	0.4 4	0.48	0.52	0.47	0.45	0.6 5	0.8 0	0.93	0.83	0.52	0.49	0.46	0.52	0.45	0.35	0.36	0.32	0.32
SQAVAI02	0.5 8	0.5 1	0.4 6	0.5 0	0.53	0.51	0.48	0.52	0.6 9	0.8 1	0.95	0.85	0.56	0.55	0.51	0.57	0.50	0.41	0.44	0.36	0.38
SQAVAI03	0.6 0	0.4 7	0.4 4	0.4 8	0.52	0.51	0.49	0.50	0.7 0	0.8 5	0.93	0.84	0.58	0.52	0.54	0.57	0.49	0.43	0.44	0.39	0.40
SQRELI01	0.5 7	0.4 9	0.4 5	0.5 1	0.53	0.53	0.52	0.50	0.6 8	0.8 2	0.81	0.91	0.56	0.55	0.52	0.57	0.51	0.42	0.38	0.44	0.41
SQRELI02	0.5 3	0.4 3	0.4 1	0.4 4	0.49	0.47	0.43	0.52	0.6 9	0.8 2	0.84	0.94	0.54	0.51	0.47	0.55	0.48	0.36	0.40	0.34	0.33
SQRELI03	0.5 5	0.4 5	0.4 0	0.4 5	0.50	0.49	0.47	0.52	0.7 0	0.8 2	0.86	0.94	0.58	0.52	0.50	0.57	0.49	0.38	0.42	0.38	0.33
SRQ01	0.6 9	0.5 2	0.5 4	0.5 3	0.59	0.51	0.49	0.64	0.7 3	0.5 6	0.59	0.59	0.95	0.81	0.81	0.88	0.77	0.55	0.48	0.51	0.54

SRQ02	0.6 8	0.5 5	0.5 9	0.5 4	0.61	0.54	0.51	0.65	0.7 1	0.5 1	0.53	0.55	0.96	0.83	0.83	0.85	0.78	0.51	0.51	0.53	0.57
SRQ03	0.7 2	0.5 5	0.5 9	0.5 6	0.61	0.53	0.51	0.69	0.7 4	0.5 5	0.57	0.58	0.97	0.82	0.84	0.86	0.77	0.53	0.50	0.53	0.57
SRQASSU01	0.6 1	0.5 1	0.5 6	0.5 2	0.55	0.47	0.49	0.63	0.6 1	0.4 9	0.51	0.52	0.77	0.93	0.75	0.80	0.89	0.52	0.48	0.50	0.51
SRQASSU02	0.6 3	0.4 9	0.5 6	0.5 3	0.56	0.51	0.51	0.62	0.6 6	0.4 9	0.51	0.52	0.81	0.95	0.82	0.84	0.87	0.48	0.44	0.50	0.48
SRQASSU03	0.6 6	0.5 6	0.6 0	0.5 4	0.61	0.56	0.54	0.61	0.6 8	0.5 1	0.54	0.55	0.81	0.93	0.80	0.85	0.84	0.52	0.45	0.54	0.48
SRQEMP01	0.5 6	0.4 2	0.5 0	0.4 3	0.48	0.44	0.46	0.57	0.6 0	0.4 3	0.45	0.45	0.81	0.80	0.93	0.81	0.79	0.47	0.44	0.48	0.52
SRQEMP02	0.5 8	0.4 2	0.4 6	0.4 8	0.49	0.44	0.43	0.58	0.6 4	0.5 1	0.56	0.56	0.80	0.78	0.94	0.86	0.75	0.47	0.38	0.49	0.46
SRQEMP03	0.6 1	0.4 9	0.5 6	0.5 0	0.55	0.50	0.53	0.58	0.6 1	0.4 5	0.51	0.49	0.80	0.78	0.94	0.82	0.71	0.47	0.41	0.48	0.53
SRQRELI01	0.6 6	0.5 3	0.5 3	0.5 1	0.55	0.47	0.47	0.62	0.6 9	0.5 1	0.55	0.54	0.85	0.85	0.81	0.92	0.84	0.49	0.45	0.47	0.44
SRQRELI02	0.6 7	0.5 1	0.5 3	0.5 4	0.58	0.53	0.53	0.60	0.7 2	0.5 3	0.55	0.56	0.85	0.82	0.85	0.95	0.78	0.49	0.44	0.50	0.51
SRQRELI03	0.6 7	0.5 2	0.5 4	0.5 5	0.61	0.53	0.49	0.64	0.7 2	0.5 4	0.56	0.60	0.86	0.83	0.85	0.94	0.79	0.52	0.47	0.51	0.53
SRQRES01	0.5 6	0.4 8	0.5 0	0.5 0	0.50	0.48	0.50	0.60	0.6 2	0.5 2	0.51	0.52	0.74	0.86	0.74	0.80	0.92	0.52	0.47	0.51	0.51
SRQRES02	0.5 5	0.4 8	0.4 9	0.4 4	0.47	0.43	0.46	0.60	0.6 2	0.4 7	0.48	0.51	0.76	0.88	0.76	0.80	0.95	0.48	0.42	0.50	0.46
SRQRES03	0.5 7	0.4 8	0.5 0	0.4 8	0.48	0.49	0.49	0.57	0.5 9	0.4 9	0.45	0.47	0.77	0.86	0.77	0.81	0.94	0.50	0.43	0.48	0.47
TRANS01	0.6 1	0.5 7	0.5 6	0.5 7	0.58	0.52	0.55	0.42	0.4 7	0.4 3	0.39	0.40	0.48	0.47	0.41	0.47	0.46	0.91	0.64	0.63	0.65
TRANS02	0.5 9	0.5 8	0.5 6	0.5 1	0.55	0.52	0.50	0.42	0.4 9	0.3 7	0.42	0.41	0.52	0.50	0.48	0.50	0.50	0.89	0.68	0.62	0.63
TRANS03	0.6 2	0.6 0	0.6 4	0.5 6	0.59	0.58	0.52	0.45	0.4 9	0.3 7	0.36	0.34	0.51	0.52	0.48	0.49	0.51	0.93	0.70	0.69	0.68
TRANS04	0.6 3	0.6 0	0.6 5	0.5 9	0.59	0.59	0.55	0.49	0.5 2	0.3 8	0.37	0.37	0.52	0.50	0.46	0.48	0.48	0.92	0.67	0.63	0.65
TRANSDATA01	0.5 6	0.5 3	0.5 3	0.4 5	0.49	0.45	0.45	0.45	0.4 9	0.4 1	0.42	0.42	0.46	0.41	0.36	0.42	0.41	0.65	0.91	0.56	0.64
TRANSDATA02	0.5 4	0.4 6	0.5 0	0.4 4	0.47	0.41	0.42	0.46	0.4 8	0.3 8	0.40	0.40	0.47	0.43	0.40	0.44	0.43	0.66	0.90	0.61	0.71
TRANSDATA03	0.5 8	0.5 6	0.6 2	0.4 7	0.57	0.51	0.48	0.50	0.5 0	0.3 7	0.38	0.39	0.48	0.49	0.42	0.45	0.46	0.69	0.94	0.68	0.70
TRANSDATA04	0.5 6	0.4 6	0.5 5	0.4 4	0.50	0.45	0.42	0.47	0.5 0	0.3 6	0.40	0.35	0.48	0.44	0.41	0.43	0.41	0.67	0.89	0.59	0.68

TRANSPOL01	0.4 7	0.4 5	0.4 9	0.4 3	0.45	0.45	0.46	0.37	0.4 2	0.3 5	0.32	0.35	0.45	0.47	0.45	0.45	0.47	0.60	0.62	0.91	0.65
TRANSPOL02	0.4 9	0.5 0	0.4 6	0.4 4	0.47	0.41	0.40	0.35	0.4 6	0.3 5	0.32	0.35	0.50	0.45	0.46	0.47	0.46	0.66	0.59	0.88	0.68
TRANSPOL03	0.5 6	0.5 4	0.5 7	0.5 2	0.55	0.55	0.48	0.42	0.5 1	0.4 1	0.38	0.41	0.54	0.57	0.51	0.51	0.53	0.67	0.61	0.94	0.70
TRANSPOL04	0.5 2	0.4 8	0.5 0	0.4 6	0.49	0.49	0.44	0.41	0.4 8	0.3 9	0.37	0.39	0.50	0.51	0.46	0.48	0.48	0.63	0.62	0.93	0.66
TRANSPROC01	0.5 5	0.5 1	0.5 3	0.4 6	0.51	0.48	0.46	0.45	0.4 8	0.4 1	0.39	0.38	0.52	0.48	0.45	0.47	0.47	0.64	0.66	0.67	0.90
TRANSPROC02	0.5 2	0.5 0	0.4 9	0.4 2	0.48	0.44	0.43	0.43	0.4 6	0.3 7	0.35	0.35	0.54	0.45	0.51	0.50	0.46	0.63	0.66	0.66	0.89
TRANSPROC03	0.5 4	0.5 1	0.5 6	0.4 7	0.52	0.51	0.50	0.45	0.5 0	0.3 6	0.35	0.35	0.53	0.47	0.47	0.45	0.45	0.67	0.71	0.67	0.92
TRANSPROC04	0.5 4	0.5 0	0.5 7	0.4 8	0.50	0.53	0.46	0.43	0.4 7	0.3 2	0.32	0.31	0.52	0.49	0.52	0.47	0.46	0.66	0.69	0.69	0.91