THE UNIVERSITY OF NEWCASTLE, AUSTRALIA

Social Media in e-Government
An Empirical Study of Adoption Factors and Consequences

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DECLARATION

This dissertation contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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ABSTRACT

Information and communications technology (ICT) has been offering enormous opportunities for individuals, business and society to enhance efficiency. There is increasing attention paid to the adoption and use of ICT in various disciplines from researchers, for example in e-Government. By learning from the successful cases of ICT utilization on the public sectors of developed countries, developing countries could also investigate the technology more and utilize the potential from it in the development in their own public services. Past studies that have researched the contribution of ICT to e-Government are rather limited in terms of the distinct of technology and scope of the studies. Therefore, it is crucial to understand the adoption factors and consequences of ICT in e-Government services, especially when social media has become a disruptive agent and has penetrated across the world. This research will be examining the diffusion of ICT in e-Government, with respect to the typical stages from adoption to post-adoption in analysing the actual adoption factors and its consequences.

This study has employed a quantitative method research approach. Its framework is developed through an extensive literature review and is refined by results from the survey analysis. The research model is composed of 13 reflective constructs. Partial least square (PLS)-based structural equation modelling is employed to test a data set of 473 out of 512 valid respondents from the theoretical model. Survey data were collected through a structured questionnaire that was issued to members from five renowned ICT organisations in Hong Kong. The structural equation modelling utilises a
two-step procedure for data analysis. Prior to an estimation of the structural model, the measurement model examines the construct validity, which is convergent and the discriminant validity of the study.

The study found that perceived usefulness, trust and compatibility are important antecedents of attitudes towards using social media in e-Government. In addition to attitude, subjective norms and perceived behavioural control both contribute significantly to the intentions of citizens to use social media. The findings also revealed that the constructs are notably impacting the level of trust and transparency of e-Government services and the government in general.

The result suggested that the HKSAR Government is encouraged to study citizens’ adoption factors, in order to move away from the current low penetration of social media in e-Government services, and to increase the level of trust in and transparency of the government.
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CHAPTER 1: INTRODUCTION

1.1 OVERVIEW

As we step into the 21st century, Information and communications technology (ICT) is becoming a dominant part of our daily lives, where its rapid expansion creates new opportunities that serve individuals, businesses and societies. Not only are technologies nowadays enhancing productivity, they also have a significant power to improve communications flexibly and efficiently (Crow & Muthuswamy, 2014).

Among a wide-range of communication applications in ICT, Internet-based technology came as a shock to traditional communications and to the operation processes of business, and to an extent it is beginning to influence the commercial and public services offered by government. Statistics shows that Facebook has 1.39 billion monthly active users as of December 31, 2014 (Facebook, 2014), which brings to our attention the rise of social media, as it unlocks a timely two-way communication platform that enables users to express their opinions in an efficient way (Vance, 2012).

It is agreed that society has developed a growing dependence on social media after the last few years of rapid development, which has lead more countries’ governments to take this technology into consideration when developing their public services (Bertot, Jaeger, Munson, & Glaisyer, 2010).
In past decades, researchers have been investigating the use of information and communication technology (ICT) at individual and organisational levels (Agarwal & Prasad, 1997; Fred D Davis, Bagozzi, & Warshaw, 1989; Kendall, Tung, Chua, Ng, & Tan, 2001; Mathieson, 1991; Tan & Teo, 2000; S. Taylor & P. A. Todd, 1995; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003), and the primary focus of much of this research has been to identify the factors determining the adoption and diffusion of ICT. It is suggested that delivery of public services through ICT is expected to be responsive, citizen-centric and socially inclusive and that governments across different countries are gradually adapting electronic services to their citizens in order to enhance convenience and efficiency (UN, 2012).

In this sense, electronic government (e-Government) is the adoption of information and communication technologies (ICT) in government services (Ozkan & Kanat, 2011) which has proved to be more responsive to citizens’ needs (OECD, 2005), and utilising it can increase both accountability and accessibility of information to citizens (Carter & Bélanger, 2005). The transformation from traditional public services to e-Government services has numerous benefits, including cost-effective service delivery, administrative cost reductions, a single integrated view of citizens across all government services, and faster adaptation to meet citizens’ needs. Due to the emergence of Web 2.0 technologies, the development of e-Government services has migrated from websites to social media in recent years (Dixon, 2010).
1.2 RESEARCH AND PRACTICE BACKGROUND

E-Government today has proved to be an adequate approach in a variety of domains (UN, 2012). As one of the largest organizations, the European Commission took their first steps to establish a government to government (G2G) platform (http://epractice.eu) that served for e-Government, e-Inclusion and e-Health professionals. Another significant example can be observed from the department of commerce in the United States, which has developed an International Trade Administration website to facilitate the government to business transaction (G2B) (www.trade.gov). Equally, the department of homeland security in the United States has a government to citizens (G2C) online platform that provides immigration services (www.uscis.gov).

The adaptation of citizens towards e-Government services is assumed not only to enhance their functional goals (UN, 2012a), through government representatives’ active responses given to citizens (Morgeson, VanAmburg, & Mithas, 2011; Welch, Hinnant, & Moon, 2005; West, 2004), but beyond that government services can also improve through the enhancement of accountability, levels of trust and the transparency of services delivered to citizens (Moon, 2003; UN, 2012).

Consequently, activation of citizens’ engagement and motivation in adapting to e-Government services are gaining more attention as it is convincing more professional bodies to develop and utilise a greater influence in the society (Bélanger & Carter, 2008; Denhardt & Denhardt, 2011).
Witnessing social media’s development in recent years, attention has been paid to implementation from government websites, social networking and blogging, which allow governments to establish bottom-up online communities (Yi, Oh, & Kim, 2013). The most widely used platforms are YouTube (Ramos-Muñoz, Prados-Garzon, Ameigeiras, Navarro-Ortiz, & López-Soler, 2014), Twitter (Hale, 2014), and Facebook (Rauniar, Rawski, Yang, & Johnson, 2014).

Exploring the active community after governments’ implementation in e-service, it is claimed that citizens are increasingly willing to share information and interact with government departments and their representatives via social media (Kavanaugh et al., 2012). For example, 31% of adults use social media platforms to keep informed of government activities in the United States (A. Smith, 2010). This leads to more governments and their officials proposing the utilization of social media as a favourable platform to improve services and communications with citizens (Bertot, Jaeger, & Grimes, 2012). According to the United Nations e-Government Survey in 2012, 40% of the Member States have provided social media platforms in government agencies, suggesting a rise in adopting social media, such as creating Facebook applications or blogs in e-Government (UN, 2012).

In Hong Kong, the former Chief Executive of the Hong Kong Special Administrative Region (HKSAR) has also adopted social media such as Facebook and blogs to exchange views with citizens. However, the use of social media is not yet a mandatory requirement and policy within their operation. Government departments use social media as a point of presence rather than a driving agent towards true communication.
Stephen Mak, former Deputy Government Chief Information Officer, once stated that the intensive usage of social media – at an official level by HKSAR government – to engage stakeholders is still under consideration (Hicks, 2010). After that, the situation improved as the financial secretary was appointed to lead an “E-Government Steering Committee” with the objective of allowing government to engage with citizens on the internet, and to collect public opinions more actively. Yet the result was still criticized by the Audit Commission (2013), as the rate of penetration was relatively low, with only 15 out of 76 (20%) of the government agencies using social media. In comparison, the report written by the Audit Commission found that overseas governments have been using social media to a greater penetration level. Fully 96% of both federal agencies in the United States government and local councils in the United Kingdom were already using social media for news and information distribution and other e-Government services.

Other recent studies also remarked on the importance of adopting social media in e-Government services. Scholars started to explore potentials in social media that can be implemented in e-Government (Brainard & McNutt, 2010; Cho & Park, 2012; Chun, Shulman, Sandoval, & Hovy, 2010; Lim & Park, 2011), while some studies have examined the use of social media in e-Government (John C. Bertot, Paul T. Jaeger, & Justin M. Grimes, 2010; Brainard & McNutt, 2010; Effing, van Hillegersberg, & Huibers, 2011; Fourie, 2012), some developed e-Government models from the technical perspective of using social media (Taylor et al., 2014) to the extent of its impact on behavioral values. To draw attention to the impact of using social media in e-Government, the driving agent of all efforts spent to implement social media in e-
Government services is the belief that administration costs could be reduced, public services could be improved, and citizens’ perception on the transparency and trust towards the government could increase (UN, 2012). This is consistent with findings where values including transparency (John Carlo Bertot, Paul T Jaeger, & Justin M Grimes, 2010; Bertot, Jaeger, & Grimes, 2012; Bonsón, Torres, Royo, & Flores, 2012); trust (Dombrowski, Hayes, Mazmanian, & Voida, 2014; Sivarajah, Irani, & Jones, 2014; Song & Lee, 2013; Warren, Sulaiman, & Jaafar, 2014); efficiency (Lampe, Zube, Lee, Park, & Johnston, 2014; Snead & Wright, 2014; Venkatesh, Sykes, & Venkatraman, 2014; Zafar & Naseer, 2014); anti-corruption (John C. Bertot et al., 2010; Jha & Sarangi, 2014; Neupane, Soar, & Vaidya, 2014); and citizen participation (Bryer & Zavattaro, 2011; Neely, 2014; Zavattaro & Sementelli, 2014) are supporting positive consequences through the use of social media in e-Government. Other studies focus on the type of social media that is adopted in e-Government, including Facebook (Soon & Soh, 2014); Twitter (Khan, Yoon, Kim, & Park, 2014); YouTube (Khan & Vong, 2014) and LinkedIn (Li & Feeney, 2014). At present, it is noticed that studies are focusing more attention on the adoption factors of website usage in e-Government (Armstrong, 2011; Becker, 2003; Tan, Benbasat, & Cenfetelli, 2008; H.-J. Wang & Lo, 2010), while more initiatives in social media are adopted by governments for the purpose of advancement in public administration in recent years, which brings both cost-efficiencies and citizen engagement in e-decision-making and co-creation of public policies (UN, 2014). In particular, prior research on the deployment of e-Government to the public has examined a number of government websites (Cullen & Houghton, 2000), online tax-filing (Carter & Bélanger, 2005; Hung, Chang, & Yu, 2006; Y.-S. Wang,
Moreover, it is noticed that recent studies are focusing more attention on the adoption factors of website usage in e-Government, such as website design (Armstrong, 2011), website usability (Becker, 2003), web services quality (Tan et al., 2008); and factors influencing behavioural intention and attitude toward government websites (H.-J. Wang & Lo, 2010).

As more initiatives on social media are adopted by various governments for the purpose of advancement in public administration in recent years – generating cost efficiencies and engaging citizens directly in e-decision-making and co-creation of public policy (UN, 2014) – more studies aim to examine social media in e-Government, such as government use in social media (Hicks, 2010), anti-corruption (John C. Bertot, Paul T. Jaeger, & Justin M. Grimes, 2010), transparency (Bonsón, Torres, Royo, & Flores, 2012), accountability (Bertot, Jaeger, & Grimes, 2012), crowdsourcing (John Carlo Bertot, Paul T Jaeger, & Justin M Grimes, 2010), democracy, (Ellison & Hardey, 2014), and public administration (Bryer & Zavattaro, 2011).

Through the study of adoption factors in e-Government (Table 2.4), it is found that “trust” is a common element to the success of deploying e-Government services. However, the impact and consequence of citizens’ adoption of e-Government services delivered through social media have not been explored, especially with regard to the trust and transparency of the Government and e-Government. Moreover, previous empirical studies are all focused on local context, and do not cover Hong Kong in their research.
As a result, the objective of this study is to obtain a holistic research perspective from the aspects of the adoption factors of social media in e-Government and the resulting consequences with regard to citizens’ and governments’ benefits. In order to facilitate an informal communication platform that cannot be ignored in current technologized society. As an important international city, Hong Kong has been criticized for the low penetration of social media in e-Government services (Audit Commission, 2013). Furthermore, very limited research has been conducted into e-Government in Hong Kong, which indicates a significant research gap. Although antecedents were previously examined in other countries, their applicability to the HKSAR government is uncertain. Besides, those recent studies were only focused on the adoption factors and paid no attention to the consequences of using social media in e-Government services.

1.3 RESEARCH SIGNIFICANCE

Given that social media is aggressively growing and there are areas yet to be discovered within the field, this research constitutes an extensive study of the ICT adoption-diffusion process and its effects on e-Government performance regarding citizens’ trust and transparency perceptions. This follows previous studies that have lacked information about social media or new media. Although ‘trust’ and ‘transparency’ have been studied in recent researches, the focus has only been on the adoption factors of delivering e-Government services. However, according to the United Nations E-Government Survey 2014 (UN, 2014), it is found that governments are faced with 3 major challenges, which are i) more inclusive and higher quality services to increase holistic government capacities; ii) more open, transparent,
accountable and effective public governance; and iii) responsiveness to increased citizen demand for enhanced participation building greater trust in government. By extending traditional innovation diffusion theories and implementing them to new research areas in order to examine the adoption factors and consequences of social media in e-Government, this new study is needed to develop the research model such that it includes:

(1) Trust in e-Government Services - the study of the impact of and consequences to Trust in e-Government services if citizens intend to use e-Government services

(2) Trust in Government in General – the study of the impact of and consequences to Trust in Government if citizens intend to use e-Government services

(3) E-Government Transparency – the study of impact of and consequences to the Transparency of e-Government services if citizens intend to use e-Government services

(4) Transparency Level of Government in General – the study of the impact of and consequences to the Transparency level of Government if citizens intend to use e-Government services

Through the investigation into these qualities, government can therefore gain insights that will assist them to increase their chances of developing a positive e-participation strategic plan, because citizens’ adoption factors are vital information for governments to learn to become better listeners and be a more agile agent of sustainable
development (UN, 2014). Within the formulation of the theoretical framework, two specific objectives of the study are to investigate:

(1) The factors that affect citizens’ adoption of social media in e-Government services and

(2) The impacts of social media in existing e-Government services in terms of citizens’ perceptions of trust and transparency of the government and its services.

To investigate the factors and impacts of this matter, this research constitutes a quantitative study, leading towards a more comprehensive research model with new constructs and measurement procedures. A carefully designed web survey is circulated to validate the anticipated model. Then the significance of this research is then explored through the contribution of the theory and its practice.
CHAPTER 2: CONCEPTUAL FOUNDATIONS
AND HYPOTHESIS DEVELOPMENT

2.1 OVERVIEW

This chapter focuses on reviewing the existing literature in both theoretical and empirical studies, in order to illustrate the adoption-diffusion process in information and communications technology (ICT) for e-Government services. Following which, a comprehensive model will be developed after various theoretical frameworks of ICT adoption in e-Government are critically reviewed. This will continue to employ individual behavioural factors by looking into e-Government services use on social media and its consequential effects on trust and transparency. The ensuing sections will serve a number of purposes; section 2.2 will be introducing the diffusion and adoption process; while related theoretical frameworks will be reviewed in section 2.3; reviews on empirical studies will be found in section 2.4, and the hypotheses of the study model will be discussed in section 2.5.

2.2 ADOPTION-DIFFUSION PROCESS

As the research is taking diffusion as one of the key processes that lead target users to adopt e-Government services, it is understood that adoption of technology needs to go through different stages. Rogers (1995) discussed sequences that start with innovation and knowledge, and ends with implementation and confirmation. Where technology meets with his ideas, it usually comes in five phases: knowledge,
persuasion, decision, implementation and confirmation. Each of these phases are adopted as diffusion occurs, to justify the applicability of the adoption-diffusion process in technological innovation.

While a macro-view of the adoption and diffusion of technology is justified, researchers have come up with different process patterns as it is discerned that the studies are based on individuals’ understanding on technology, which are accounted for in terms of an individual’s knowledge, personality, perceptions and motivation. Knowing that micro-views are explored in each previous study, the position of this study also discusses the perspectives of individuals’ adoption-diffusion process in e-Government services. The influence of technology has been growing within the market to meet specific needs of individuals, groups or communities. It finds that governments are also motivated to apply technology in their services as it satisfies their needs in reducing corruption (Bertot et al., 2010), increasing efficiency (Hu, Pan, Lin, Kang, & Best, 2014), enhancing trust (Kim & Lee, 2011) and transparency of governance. Past studies have also investigated the adoption and diffusion of technology through the use of websites in demonstrating public administration. However, social media has not been well covered as a significant agent to generate adoption-diffusion factors and technological effects to governments. Therefore, an integrated framework will be developed in extending the scope of existing adoption-diffusion theories to the use governments make of social media and addressed their performances in terms of trust and transparency in this study. The following section will start with identification of relevant theories on adoption, diffusion, e-Government and social media, to outline the theoretical framework and investigate the ICT
2.3 THEORETICAL FRAMEWORK

This research reviews the behaviour in adoption-diffusion of ICT, and extends the scope of existing adoption-diffusion theories through accounting for the performance of e-Government; its investigation is developed by using various theoretical frameworks which are applicable to the adoption and diffusion of ICT, theories including diffusion of innovations (DOI) (Rogers, 1962); the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975); theory of planned behaviour (TPB) (Ajzen, 1991); and technology acceptance model (TAM) (Davis Jr, 1986).

2.3.1 Diffusion of Innovations (DOI) Theory (Rogers, 1962)

The diffusion of innovation (DOI) theory (Rogers, 1962) explains how innovative products and services diffuse in a society, it also explains the process of diffusion of an innovation and the factors investigated in different phases during the process, in which are included knowledge, persuasion, decision, implementation and confirmation stages. According to Rogers (1983), consumers will be exposed to an innovation’s existence and acknowledge the knowledge in the ‘knowledge’ stage; then they will come to the ‘persuasion’ stage that forms a favourable or unfavourable attitude towards the innovation; once they form a positive attitude in the ‘decision’ stage, the ‘implementation’ stage starts. Finally, an innovation may be confirmed, or may undergo changes, or may be rejected during the ‘implementation’ stage.
Among the five stages, the ‘persuasion’ stage is considered the most important in this study as it explains the behaviour of potential adopters in gathering information from the ‘knowledge’ stage. Rogers (1995) highlights five attributes of innovation to be perceived by an individual or organization, which are relative advantage, compatibility, complexity, trialability and observability, these characteristics are said to be applicable to 49-87% of the variance in an innovation adoption (Rogers, 1995). It finds that not only previous studies (Shih, Dedrick, & Kraemer, 2005) have proved the impacts of the perceived innovation characteristics suggested by Rogers (1983, 1995, 2003) on the adoption rate of an innovation, there is also a list of empirical studies that support Rogers’s (1983, 1995, 2003) model as shown in Table 2.1.
The above section has covered the influence of relative advantages, where compatibility, complexity, trialability and observability are empirically proven. As a result, the DOI theory (Rogers, 1962) is considered as a theoretical framework, part of which will be integrated into this research (cf. 2.5), in examining the adoption rate of technological innovation.

### 2.3.2 Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975)

The theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) was developed to measure behavioural intention. This theory has also been assessed to have a strong ability to predict the goals and activities of an explicit choice among alternatives (Sheppard, Hartwick, & Warshaw, 1988).
Attitudes (ATT) and subjective norms (SNs which means an individual’s perception to particular behaviour, which is influenced by the judgement of others such as friends, spouses and parents) are two unique factors that contribute to behavioural intention (BI) in explaining actual behaviour. The TRA has been widely used in examining consumers’ behavioural intention as well as addressing the causes of actual consumers’ behaviour in consumption-related issues (Chang, 1998; Crawley & Coe, 1990). Moreover, this theory has also been used in testing technologies and has spanned in various subject areas, for example, e-commerce (Vijayasarathy, 2004), e-banking (Shih, Dedrick, & Kraemer, 2005) and internet information management (Celuch, Taylor, & Goodwin, 2004).

Previous studies have supported TRA by studying individual behavioural intention and actual usage behaviour with regard to the adoption of technologies. They revealed significant effects in *attitude* towards *intention* (Chang, 1998; Crawley & Coe, 1990; Davis, 1989; Ramayah, Yusoff, Jamaludin, & Ibrahim, 2009; Taylor & Todd, 1995) and also *subjective norms* (Crawley & Coe, 1990; Ramayah et al., 2009; S. Taylor & P. A. Todd, 1995; Venkatesh & Davis, 2000) have contributed to behavioural intention.
In addition, the theory was further reviewed and modified on the antecedents of behavioural intention to add more variables, for instance, the theory of planned behaviour (TPB) (Ajzen, 1985, 1991) is an extension of the TRA that includes a new variable called *perceived behavioural control*.

### 2.3.3 Theory of Planned Behaviour (TPB) (Ajzen, 1985)

The theory of planned behaviour (TPB) is an extension of the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), which is developed by Icek Ajzen (Ajzen, 1985, 1991). This theory addresses the limitation from the original model in the way in which it manages behaviours over people’s incompleteness of volitional control (Ajzen, 1985, 1991), thus achieving a higher predictive validity. In order to strengthen the predictability, Ajzen (1985) added one additional construct on the framework, *perceived behavioural control*, to predict behavioural intention and behaviour. By definition, perceived behavioural control is “people’s perception of ease or difficulty of performing the behaviour of interest” (Ajzen, 1991); behaviour can be affected by a number of external factors such as organizational or environmental factors.

![Figure 2.3: Theory of Planned Behaviour (TPB)](image-url)
Recent studies have supported the effectiveness and applicability of the theory of planned behaviour in examining individual behaviour towards an innovation by revealing the significant effects on *attitude* towards *intention* (Chang, 1998; Davis et al., 1989; Rhodes & Courneya, 2003; Taylor & Todd, 1995), *subjective norms* (Taylor & Todd, 1995; Venkatesh & Davis, 2000) and *perceived behavioural control* (Cheung, Chang, & Lai, 2000; Jiang, Hsu, Klein, & Lin, 2000; E. Jones, Sundaram, & Chin, 2002; S. Taylor & P. A. Todd, 1995) in conducting behavioural intention. The TPB will be the basis for the research model presented in section 2.5.

### 2.3.4 Technology Acceptance Model (TAM) (Davis Jr, 1986)

Davis (1986) developed the technology acceptance model (TAM) to predict behaviour in IT usage. It is an adaptation from the theory of reasoned action (TRA) and states that behavioural attention in using technology is determined by two beliefs: *perceived usefulness* and *perceived ease of use* – constructs which are used in the research model here as well (cf. 2.5). Perceived usefulness refers to the examination of the extrinsic characteristics of information technology that can achieve task-oriented outcomes, for example, to understand the probability of prospective users in using a specific application for enhancing job performances in an organizational context. On the other hand, perceived ease of use focuses on the examination of the intrinsic characteristics of information technology, such that ease of use, ease of learning and flexibility of the interface can measure the degree of expectation from the prospective users (Davis et al., 1989).
Furthermore, various external variables such as social influence, experience, diversity of technology, culture, trust, relevance, voluntariness and computer self-efficacy have been added in the context of the TAM in different sets in order to understand different insights of technology acceptance (Agarwal & Prasad, 1999; Davis et al., 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000; Yoon, 2009).

The TAM (Davis Jr, 1986) has been one of the most popular research models adapted in examining systems’ usage behaviour over the last two decades, it carries the most dominant theoretical model in studying individuals’ acceptability towards information system (Lee, Kozar, & Larsen, 2003). The fundamental components of TAM, perceived usefulness and perceived ease of use have been further enforced to have significant effects on behavioural intention (Chau & Hu, 2002; Davis, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000; Yoon, 2009).

2.3.5 Review of the existing theories

The theoretical frameworks that study ICT diffusion can be categorized based on their focus, scope and structures. Since DOI theory (Rogers, 1983), TRA (Fishbein & Ajzen, 1975), TPB (Ajzen, 1985), and TAM (Davis Jr, 1986) is focused on the behavioural
intentions of prospective users to adopt an innovation. The perceptions of adopters can be reflected in perceived innovation by DOI theory (Davis Jr, 1986), the attitude factor through TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1985) and with both perceived usefulness and ease of use from TAM (Davis Jr, 1986).

The above discussion of different adoption models illustrates that it is necessary to synthesise theories (the DOI, TRA, TPB, TAM) and develop a comprehensive theoretical framework in order to look into the adoption-diffusion process of ICT in public administration. While recent research from Hung, Chang, & Yu (2006) has successfully proven the theoretical frameworks of users’ acceptance in e-Government services, the theoretical framework will be adapted along with new constructs in this research to anticipate the impact of behavioural intention in both e-Government services and government in general for their trust and transparency.

2.4 REVIEW OF EMPIRICAL STUDIES

This section will highlight the empirical findings that explore the research gap in the existing literature, and establish a foundation for developing an integrated theoretical framework in examining the adoption-diffusion process of social media in e-Government.

2.4.1 Public governance and the emergence of electronic services

According to the United Nations, public governance refers to the process of managing a society through executing under values set by government, private sectors, citizens
and other stakeholders (UN, 2012). The key role of a government is to provide stable economic and political environment – through formal and informal management means – in which policies should be delivered with transparency and supported by legitimate regulatory frameworks. This could be reflected through interactivities between government and community when citizens claim their entitled benefits and when government’s bureaucratic events take place (Rose, 2005). Good governance can be observed in the perception of this management and a resulting higher per capita income (UN, 2007).

Economically, the Internet has been creating new business opportunities for products and services, such as iTunes – which is developed by Apple Inc. – leading to a music download market. Social media platforms such as Facebook and Twitter have also created new marketing opportunities to generate revenue (Wind, 2014). This bloom of new developments not only affects the business sectors, but extends to the public sector, in which the Internet opens up more opportunities for development and inserts greater influence on public administration, hence the presence of “e-Government” has been rising in many countries in the last decade (Nam, 2014). It shows that public administration has been pushed to migrate to a more transparent, citizen centric way to communicate. From Netchaeva’s (2002) research, as e-Government has transferred government activities to the Internet in serving as a medium for information exchange among citizens and the government agencies; which has lead governments to actively explore the use of e-Government services and applications. For instance, Taiwan launched e-taxation (Hung et al., 2006), while Poland launched e-registration (Ziemb & Obłak, 2014); the Inland Revenue Division of the Government of the Commonwealth
of Dominica has developed an e-filing platform for taxpayers to file and pay tax online (www.dominica.gov.dm) and Singapore has developed Application for Passport On-line Electronic System (APPLES) under its e-citizen platform (www.ecitizen.gov.sg). All of these e-services allow citizens to interact with governments ubiquitously.

The impact of new technologies in delivering public services and citizens’ feedback has been debated by politicians, recent researches have examined the advantages of using e-Government services, with improvements in public outreach to deliver the services, it has brought influence to views of citizens on government and their confidence in the effectiveness of service delivery (Bélanger & Carter, 2008; Bertot et al., 2010; Carter & Bélanger, 2005; Fang, 2002; Hu et al., 2014; West, 2004; Zaidi, Siva, & Marir, 2014).

Social media, which belongs to the 2nd generation of the Internet (Web 2.0), has been contributing significant changes to communications. Internet users enjoy sharing and giving comments to their friends and the public communities, the popularity of social media have recently encouraged governments to adopt this new type of communications to interact with the citizens. Countries like Jordan have established an e-Government Facebook page, its page fan base has engaged a significant number of citizens – especially male citizens between 25 and 34 (Khasawneh & Abu-Shanab, 2013). Before further discussion on social media and its impact on e-Government, it is necessary to provide a detailed explanation of e-Government in the following sections in order to map out a clearer picture.
2.4.2 e-Government

There are various definitions and interpretations of ‘e-Government’, which include online public services offered by the government, deployment of information technology especially via the Internet, to provision of public services, supporting operations and engaging citizens; those activities can be in the form of filings, making payments and obtaining information (Palvia & Sharma, 2007).

The WorldBank, in 2012, has defined e-Government as “the use by government agencies of information technologies, such as Wide Area Networks, the Internet and mobile computing that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.”

In addition, according to the United Nations (www.unpan.org) (UN, 2012), e-Government refers to the utilization of the Internet to deliver government information and public services to citizens; while Gartner Group’s (Gartner, 2013) defines it as the continuous optimization of service delivery, constituency participation and governance through the transformation of relationships internally and externally through new media and the Internet. Nevertheless, there is no universal synchronized concept or definition of e-Government, some definitions are rather loose with multiple meanings,
representing the diverse views of researchers. For instance, Fountain (2001) uses the term ‘virtual state’ or ‘digital government’ in place of ‘e-Government’. Duffy (2000); Means & Schneider (2000) suggest the study of e-Government should include the relationship between governments and stakeholders such as businesses, other governments, citizens and suppliers; while Brown & Brudney (2001) take a narrower approach in which they define e-Government as the use of web-based applications to enhance access and delivery of government information only (Brown & Brudney, 2001).

Generally e-Government can be classified into four dimensions: e-services refers to the electronic delivery of government services and information; e-administration manages data repositories and records through computerization; e-commerce serves the monetary exchange of goods and services to citizens from government through electronic means; and e-management means the improvement of government management through ICT adoption (UN, 2007). Furthermore, some governments have adopted more electronic participation (e-participation) applications, which includes virtual discussion rooms, electronic juries, electronic polls or online forums. Furthermore, researchers (Belanger & Hiller, 2006; Palvia & Sharma, 2007; Raghuvansh, 2014) classified the e-Government services that are available in according to different levels of participation, namely ‘Government to Citizen’ (G2C), ‘Government to Business’ (G2B), ‘Government to Employee’ (G2E), and ‘Government to Government’ (G2G).
Government to Citizen (G2C): This platform allows the government to provide online access to information and services to citizens, where they are enabled to access the government services at any time and from anywhere. The objective of it is to make the public services more citizen-friendly and convenient.

Government to Business (G2B): e-Government platform provides a higher transparency of business environment, where businesses such as suppliers can conduct e-procurements and auctions for government supplies. It also provides a 24-hour non-stop servicing platform for business corporations to access government services.

Government to Employee (G2E): Government serves as an employer like other organizations, and would have interactions with its employees regularly on this platform, it provides a two-way process between the government and its employees in an efficient way, while the process usually has an internal portal under an intranet environment. The objective of G2E is to increase the internal process efficiency and transparency. The platform enables the government to become a paperless office by replacing paper with electronic documents. The e-Government also enables public servants to access and retrieve records and files anytime and from anywhere, which facilitates those employees who may not have physical access to the office environment, thus it speeds up processes and eventually enhances efficiency and effectiveness.

Government to Government (G2G): Through this platform, all departments of a government can be connected and integrated through the development of an intranet,
which enhances the flow of information and services within government departments, as well as different functional areas of the government. The objective of it is to increase efficiency and effectiveness of internal communications, performance and output from the government; for instance, a paperless office environment can be developed in the long run.

Given that there are different definitions and phenomena of ‘e-Government’, this study is taking the common point of which citizens, business and government departments are utilizing the Internet to improve public services.

The following Internet-based e-Government services are commonly adopted in many countries:

Table 2.2: Examples of e-Government services in different countries

<table>
<thead>
<tr>
<th>e-Government Services</th>
<th>Country</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>website / portal site</td>
<td>Singapore</td>
<td><a href="http://www.egov.gov.sg">www.egov.gov.sg</a></td>
</tr>
<tr>
<td>news and announcement</td>
<td>Hong Kong</td>
<td><a href="http://www.gov.hk">www.gov.hk</a></td>
</tr>
<tr>
<td>online consultation and petition channels</td>
<td>Australia</td>
<td><a href="http://www.gov.au">www.gov.au</a></td>
</tr>
<tr>
<td>online public forum</td>
<td>Canada</td>
<td><a href="http://www.canada.ca">www.canada.ca</a></td>
</tr>
<tr>
<td>e-forms for download and online submission</td>
<td>United States</td>
<td><a href="http://www.state.gov">www.state.gov</a></td>
</tr>
<tr>
<td>online government bookstores</td>
<td>Taiwan</td>
<td><a href="http://www.gov.tw">www.gov.tw</a></td>
</tr>
<tr>
<td>access to laws and ordinance</td>
<td>India</td>
<td><a href="http://www.india.gov.in">www.india.gov.in</a></td>
</tr>
</tbody>
</table>

Although the adoption of social media has different critics, it is a fact that more governments are adopting social media to deliver their public policies, as it is believed
that social media can serve as a tool for public relations and education to promote
government’s policies and services (Newman, 2009). Social media technologies have
also demonstrated their usefulness in intra-government collaboration (G2G), while
different government departments can share their plans and achieve better results,
some departments make use of social media to share their information to the public
and engage the participation of more users (Mossberger & Wu, 2012; Zhang & Chia,
2006). For example, government agencies in the United States are making use of
social media technologies to collect information from citizens and provide emergency
updates to the public such as hurricane alerts, missing children notices and other
public safety incidents, and this kinds of vital information would be collectively stored
and shared among agencies (Chavez, Repas, Stefaniak, & Association, 2010). Likewise,
incidences such as the Haiti earthquake, hurricane Katrina, and tsunami in Indonesia
have encouraged greater use of social media to raise public awareness, support and
fund-raising (www.mysecurecyberspace.com). In the United Kingdom, social media
have provided a boost to election campaigns and resulted in a closer connection
between candidates and voters (Gibson, 2009).

According to the United Nations e-Government Survey 2012 (UN, 2012), it was found
that social media platforms as Facebook and Twitter are increasingly adopted by
governments as a consultation vehicle, serving as a cost effective mechanism for
government to disseminate information to citizens; identifying a significant increase –
from 16 to 38 – in the number of countries that have encouraged their government
officials to adopt these types of social media platforms when responding to their
citizens. The use of online discussion fora has grown from 32 to 78 counties, while
using e-consultations has increased from 8 in 2010 to 17 in 2012. Table 2.3 demonstrates the use of social media platforms in government e-decision making (UN, 2012).

**Table 2.3 : Social Media tools used in governments’ e-decision making**


<table>
<thead>
<tr>
<th>Social Media tool</th>
<th>Number of countries</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government officials respond to citizen input</td>
<td>38</td>
<td>20</td>
</tr>
<tr>
<td>Government officials moderate e-consultations</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Online bulletin boards</td>
<td>76</td>
<td>39</td>
</tr>
<tr>
<td>Online discussion forums</td>
<td>78</td>
<td>40</td>
</tr>
<tr>
<td>Online petitions</td>
<td>42</td>
<td>22</td>
</tr>
<tr>
<td>Online voting</td>
<td>18</td>
<td>9</td>
</tr>
</tbody>
</table>

Currently there is no standardized assessment or comprehensive theoretical framework to evaluate the performance of e-Government’s development. Only a few global assessment indexes are available to assess, measure and rank e-Government’s performance across countries, each of these indexes has its own main focus and support from different theoretical background as briefly discussed below.

**2.4.3 E-Government’s Performance Indexes**

**United Nations e-Government Development Index (EGDI)**
This index comprises 3 sub-indexes, which are; (1) human capital index which reviews the literacy level of the users so as to evaluate the readiness of the society (UN, 2012a); (2) online service index (another supplementary index named e-participation index), which is based on the online service index and has been added to evaluate the citizen participation and engagement through online service (UN, 2012). This focuses on the evaluation and performance of consultation, decision making, information sharing and citizen e-participation of the e-Government services (UN, 2012); and (3) telecommunication infrastructure index, which measures the penetration of all telecommunication related services, include fixed-line telephone, mobile, Internet and household broadband services of each country. These sub-indexes are equally weighted and calculated in the ranking in the United Nations member states.

Overall, the EGDI online service index reviews the performance of information, transactional and connecting services of e-Government portals (UN, 2010).

**Waseda University International e-Government Ranking**

There is another e-Government assessment developed by Waseda University, Japan ([http://www.e-gov.waseda.ac.jp/ranking.htm](http://www.e-gov.waseda.ac.jp/ranking.htm)). They started the international e-Government ranking in 2004 and evaluations are conducted under seven main categories with 30 sub-indicators. Compared with the United Nations EGDI, the evalutive elements developed by Waseda University are more comprehensive, which include ICT infrastructure and preparation, website, e-Government policy, government establishment, promotion and application review. Moreover, they also anticipate upcoming trends of e-Government developments and activities (Waseda, 2012).
ACSI e-Government Satisfaction Index (ACSI)

Since customer satisfaction is said to be important to every sector (Nepal, Sherchan, & Bouguettaya, 2014), this also applies to the government of other countries. For example, the government of the United States has commissioned the University of Michigan to conduct a research project called “The American Customer Satisfaction Index” (www.theacsi.org), the objective being to evaluate the performance of the United States’ federal government and its agencies online and offline services from the perspective of citizens. The feedback is based on a few key satisfaction components that include (1) navigation, (2) functionality, (3) search, and (4) look and feel (ACSI, 2013).

Rutgers e-Government Performance Index (Rutgers Index)

Another assessment is the Rutgers Index, adopted in 2009 with the objective of reviewing the performance of e-Government in selected cities with a large population and high internet penetration, which suggested a higher e-Government capability (Holzer & Manoharan, 2007). The key measurement areas of the index are based on the research of Moon (2002).

The above discussion, illustrates that the current e-Government performance indexes are focusing either on the infrastructures, readiness of the technologies or level of satisfaction of the system. The indexes are designed from a government perspective rather than the citizens’ perspective, and therefore the intention of using e-Government services has not been discussed, as the surveys cannot tackle the reasons
citizens have for using e-Government services, and the perceptions they develop towards the government regarding to trust and transparency, which can change through the use of e-Government services.

2.4.4 Benefits and Challenges of e-Government

To start with the benefits earned from e-Government, first of all it provides a faster and more convenient way for citizens to access and interchange their information, for instance, to notify of a change of correspondence address, or alternatively, businesses in India are allowed to submit tenders through government’s e-tendering system to save up process and delivery time (https://govtprocurement.delhi.gov.in/nicgep/app).

Another example can be found in Bahrain where public information about road construction projects can be accessed by the public, which demonstrates a higher level of government transparency (http://www.ega.gov.bh). While there is also a lack of studies to determine the actual relationship between e-Government and its transparency (e-transparency) (Song & Lee, 2013), it is said that a transparent government should allow citizens to monitor the performance of government more easily through an increase in the availability of information (Neely, 2014). From the perspective of public administration, transparency runs parallel to the disclosure of information publically, and it can enable citizens to strengthen their belief and support through clearer observation of government performance (Hollyer, Rosendorff, & Vreeland, 2014), such approaches in making information more open, free, and easily accessible help to ensure that the government is held accountable for its administration (Golbeck, Grimes, & Rogers, 2010). According to Kim and Lee’s
research (2012), e-participants’ assessment of government transparency has become more favourable as they perceive their influence towards government decision-making is growing stronger under the use of e-participation, and also assessment of government transparency is closely related to the trust of government through activities on e-participation (Kim & Lee, 2011). Moreover, it is argued that government needs to understand the kind of electronic services that citizens need, so they can provide appropriate design and implementation, as scholars have proved that citizens are likely to e-participate when e-applications are well designed and effective (Kim & Lee, 2011; Parasuraman, Zeithaml, & Malhotra, 2005).

E-Government has been developed not only to demonstrate higher transparency in governance, but also to aim at building trust and citizen satisfaction. From the perspective of technology adoption-diffusion theory, trust is one of the variables in TAM (Davis Jr, 1986), and has been supported by recent research that trust creates positive relationships with behavioural intention (Belanche, Casaló, Flavián, & Schepers, 2014; Hsu, Chuang, & Hsu, 2014; Rauniar et al., 2014). Trust is classified as an attitude (Jones & George, 1998), and is an important issue in e-Government. The engagement of citizens in evaluating government performance is positively associated with trust (Kim & Lee, 2011); while Kweit and Kweit (2007) suggest that a more democratic and citizen-centric formation of e-Government will raise public trust in government. This scenario is not only identified in East Asian countries, Della Porta (2000) finds that trust in government in Germany, France and Italy are negatively associated with the degree of perceived corruption (Della Porta, 2000), Sternstein (2010) also finds that citizens in the U.S. are more willing to access government
websites, as well as recommending them to their friends while expressing more trust in their government agency if the e-Government services are transparent. Thus, this indicates a positive relationship between trust and transparency in e-Government (Kweit & Kweit, 2007; Sternstein, 2010).

As it is clear that e-Government can bring more benefits, citizen trust has been studied as a core concern in public administration due to its decline in the last few decades (Denhardt & Denhardt, 2011). Researchers are showing more interest in studying the usage of e-Government which helps restore trust through making the government more efficient, accountable, transparent and responsive (Holzer, Melitskin, Rho, & Schwester, 2004; Moon, 2002; Smith, 2010; Warkentin, Gefen, Pavlou, & Rose, 2002; West, 2004), and it allows more interaction between citizens and government (Holzer et al., 2004). Researchers have identified that as citizens have higher trust of government than the private sector when handling personal information, they are more willing to support and interact with government agencies through electronic services (Chang & Kannon, 2008). In the research of Holzer et al. (2004), it is found that public agencies have successfully facilitated open dialogue between citizens and government through the Internet. For example, the United States government (www.regulations.gov), the United Kingdom CitizenSpace (http://www.ukonline.gov.uk/citizenspace/citizenspace/fs/en), and the United States Environmental Protection Agency (http://www.network-deomcracy.org/epa-pip/) are some of the well-established e-Government services. Scholars also support that governments should regard citizens as the most important stakeholders in the e-
Government e-services, the role of ICT serving to enable an improvement of the trust relationship between citizens and the government (Smith, 2010).

In addition, scholars have suggested that the perception citizens have on government’s economic and political performance will influence the degree to which it is trusted (Donovan & Bowler, 2004; Mishler & Rose, 2001); while another group of scholars suggests other factors such as values of citizens, changing behaviours, political culture and institutional context are more important in determining the level of public trust in government (Andrain & Smith, 2006; Christensen & Lægreid, 2005).

Summing up from the aspects outlined above, trust towards the government is a benefit that can stem from using e-Government services; on the other hand, it also poses a new challenge, as trust is necessary to use e-Government services.

Although studies showed that e-Government has progressed significantly, the literature indicates significant gaps in understanding the relationships between the adoption factors for citizens of e-participation and its consequential implications, which include citizens’ engagement, voluntary involvement in public administration and support in the public decisions made by online applications (Kim & Lee, 2011), and the effects of e-Government on citizens’ trust on e-Government services and the government in general.

The emerging discussion of the benefits from e-Government services is undoubtedly accompanied by challenges and criticism. It is assumed that the digital divide gap will widen (Bélanger & Carter, 2009), meaning certain groups in society, such as those who
live in poverty, the disabled and the computer illiterate, will be unable to access information through the Internet and will therefore have fewer opportunities to use the corresponding online services. The issue will inevitably generate greater concern when more e-Government services are implemented in the community (Bélanger & Carter, 2009; Becker, 2003).

Another criticism of e-Government services is the rise of privacy issues and concerns, as the services involve collection of individuals’ data online. From the practice in the commercial world, serious privacy concerns often outweigh the benefits. Therefore, government should ensure the storage and processing of data collection are technically safe, alongside taking appropriate action in dealing with privacy, which should be imposed to strengthen customer trust and reduce their perceived risk in using e-Government services (Belanger & Hiller, 2006).

From an implementation perspective, although more governments across countries have been investing in e-Government initiatives, not all of these implementations were successful. A recent study on e-Government projects (Heeks, 2008) finds that only 15% of the project implementation cases found in developing countries are successful, indicating a high failure rate corresponding to higher financial costs, and more serious damage to trust, credibility and the morale of the government (Hung et al., 2006; Ozkan & Kanat, 2011). One of the major reasons for the failure was the low adoption by citizens. Even in mature e-Government developed country like the United States, projects still come with the difficulty of balancing the power distribution between the
federal, state and local governments (Doty & Erdelez, 2002; Jaeger, 2002; Jaeger & Thompson, 2003).

As a result, there is a need to study the key successful adoption factors before the implementation of e-Government services. This study will take the adoption factors into account when implementing social media in e-Government services.

To conclude with the benefits and challenges in the development of e-Government services; the benefits are that citizens can access government services anytime and anywhere, the government’s activities involve higher engagement with citizens that will strengthen the trust and result in higher transparency in the community. Through the government to employee’s intranet platform, environmental protection initiatives can be achieved such as a paperless office, and efficiency on service delivery are enabled by improved data analytics. For the challenges in the development in e-Government, the digital divide will become a serious issue to those low computer-literacy countries; and privacy issues become a concern as more data are collected and processed online. Also, the rise of expenditure in e-Government developments will become a financial burden to developing countries. As more e-Government projects are implemented as a country develops, there is a risk that the failure of these projects will produce a loss of trust and confidence in the performance of the government. To encounter a higher frequency in approaching disruptive technologies, the study of social media is important in e-Governments, in order to monitor the ongoing benefits earned from e-Governments and ensure the services can be delivered without potential challenges. Hence, this study is to investigate the adoption factors of social
media in e-Government and its consequential effect on trust and the transparency of government.

### 2.4.5 Social media and its impact on e-Government

In recent years, Internet technologies played an increasingly important role in many disciplines (Fettweis, 2014), and social media has become one of the most disruptive technologies and has created a paradigm shift in communications (Gillespie, Boczkowski, & Foot, 2014; Olson, 2014). According to PewResearch (www.pewinternet.org), 81% of Americans are Internet users (ITU, 2013), with a 73% engagement rate in using social media (ITU, 2013). With the use of social media, it can help e-Government by improving information sharing for citizens, as well as enhancing collaboration and engaging constituents.

Social media is considered as part of Web 2.0 platform (Mainka, Hartmann, Stock, & Peters, 2014; Stevens, 2014), characterized by relational networking, online content creation, user-generated content (Kes-Erkul & Erkul, 2009) and referred to as an interactive communications platform among people where they can create, share and exchange information and ideas in online communities and online social networks. According to Kaplan and Haenlein (2010), it can also be defined as a group of internet-based applications that provide features for users to host their creations and exchange user-generated content, while social media is also considered a major platform for communication. One of the key benefits of social media is that it can foster two-way communicative interaction in a non-hierarchical and non-threatening manner (Zavattaro & Sementelli, 2014). According to Social Media Update 2013 (PewResearch,
2013), 42% of adults are online and using multiple social networking sites, among which the top two popular social media platforms are Facebook and LinkedIn (PewResearch, 2013).

Social media technologies can be presented in various forms, such as forums (e.g. MacRumors – www.macrumors.com), microblogs (e.g. Twitter - www.twitter.com), blogs (e.g. Wordpress – wordpress.org), wikis (e.g. Wikipedia - www.wikipedia.org), social network (e.g. Facebook – www.facebook.com), podcasts (e.g. Slideshare – www.slideshare.net), and video sharing sites (e.g. YouTube – www.youtube.com). Each social media platform offers different tools for users to share their views, ideas and information, with text messages, articles, photos, and videos are the most common user-generated content. With the emergence of smartphones that provides access to Internet, it has stimulated even more users to user social media, a survey conducted in 2012 (Brenner, 2012) found that 40% of the mobile phone users owned social media applications, of which 28% would use the applications on daily basis. Another study suggested that Facebook had more than 1 billion global users in 2012, which was about 14.5% of the world population, among which could be found 70% of the online population from the United States, 25% from South Korea, and 5% from Ireland (Vance, 2012).

The emergence of social media in recent years has been strongly adopted by society as an interactive content platform that is created by users through social interactions, where it enables users to generate their own content and share in a very efficient and effective way. Internet users can immediately receive, respond and publish their views
in a real time environment (Bertot et al., 2010; Mangold & Faulds, 2009). This new type of social communication has united different sectors of people across countries; it also reshapes the patterns of online communication and collaboration, as well as the way of collecting and distributing information (Hoegg, Martignoni, Meckel, & Stanojevska-Slabeva, 2006).

Recent research discussed on the paradigm shift that social media could create in communication, which it relates to public administration and services. Social media can assist government to become more responsive, accessible, responsible, efficient and effective than before (Veit & Huntgeburth, 2014), it could also establish an interactive and transparent communication channel between the government and the public. From the perspective of government, the adoption of social media could encourage the public to offer their comments and views on government policies and the quality of services (Mangold & Faulds, 2009), for example, a developed country such as the United States has made use of social media to reach disadvantaged groups (UN, 2012), while a developing country such as Nepal has delivered e-Government services through Facebook and successfully received positive responses, thus stimulated more citizens to engage in providing feedback on government policies (UN, 2012). Moreover, practitioners and scholars also believed that social media helps in collecting large amounts of data which will be supportive for big data analysis by open government (UN, 2012). In addition, there is research that suggests the demand for traditional media channels such as radios, televisions, magazines and newspapers has been declining. Media consumers are suggested to be moving towards social media channels since the cost of accessing information is lower (Mangold & Faulds, 2009).
Among various types of social media platform, Facebook, YouTube and Twitter are always on the top ten most used social media platforms worldwide (Fan & Gordon, 2014). More than 1,300,000,000 users have registered on Facebook (www.facebook.com) in the world (http://www.statisticbrain.com/facebook-statistics/), as it provides features for contents, video and photo sharing (Zimmer, 2012). Governments also utilise Facebook as a social media agent to promote their agencies and enhance public awareness. For example, the Prime Minister in Singapore, Lee Hsien Loong established his Facebook Fan page to communicate with his citizens (https://www.facebook.com/leehsienloong), though he has successfully engaged over 323,000 followers and provided timely government activity updates. Another social media site – YouTube – is a predominant video sharing site where users are free to contribute their content that has also been the most successful video search engine on the Internet, with more than 1,000,000,000 monthly unique users visit (http://www.youtube.com/yt/press/statistics.html). By way of example, the United States government has adopted YouTube as one of its official channels for all government agencies (www.gsa.gov). Lastly, Twitter is one of the most popular social media platforms in the United States, with over 460,000 new accounts created every day, the platform is classified as a micro-blogging tool, where users can form 140 characters status updates, send instant messages to other users, taking advantages of viral delivery of information (Bonsón et al., 2012). For example, the Business and Industry Portal of the Queensland government in Australia is adopting Twitter to market business (http://www.business.qld.gov.au/business/running/marketing/online-marketing/using-twitter-to-market-your-business/who-uses-twitter). Despite the
assumed benefits, it is reminded that social media as a technology is facing challenges discussed in previous section, such as the digital divide, and the cost of employing social media for governments.

Data privacy is becoming more relevant to the impact of social media on e-Government, since social media platforms carry a number of individual data such as e-mail, mobile phone contact, company information, date-of-birth, and even family members’ information. All these kinds of information may go public if users are unaware of the importance of establishing a better privacy policy and control, or when the platforms do not maintain a good management practices (Kleinberg, 2007).

Trustworthiness is another criticism of social media. As users might receive various different aspects of same piece of information, the reliability of the information can be challenged, because it is difficult to identify the truth (Memmi, 2014). Reuters Institute Digital News Report (Reuters, 2013) commented on the trustworthiness of news on social media, finding it to be comparatively lower than from other sources, as it is found that about 27% of respondents have reservations concerning the accuracy of the content of blogs. In addition, the popular use of social media can cause information overload, users could receive the same information repeatedly from different friends and sources (Memmi, 2014), which would distract users’ focus from assessing more important information.

As social media provides the freedom for users to generate comments or content with discriminatory, spamming, out-of-focus or even personal attacks (Godwin, Campbell, Levy, & Bounds, 2008), this may create another issue, that of cyberbullying
(www.stopbullying.gov), where people are harmed or harassed in a deliberate, repeated, and hostile manner through the use of information technology, victims from cyberbullying might lose trust in people as well as social media more generally (Keller, 2013).

2.4.6 The use of social media in e-Government in Hong Kong

In Hong Kong, the government has launched a website called “MyGovHK” in order to access to public services (Yeo, 2011). Social media in e-Government services was not in place until the former Chief Executive Mr. Donald Tsang of the Hong Kong Special Administrative Region (HKSAR) started using blogs to express his views to citizens. During the early stages, the use of social media in government services was not mandatory and government bureaus and departments developed social media in their own way, for example, the Hong Kong Government’s Efficiency Unit (EU) had the freedom to commission a project to redesign its ‘Youth Portal’ with social media elements (McHugh, 2011). In an interview (InformationDaily.com, 2011) with Mr. Stephen Mak, Hong Kong’s former Deputy Government Chief Information Officer said, “HKSAR departments are using social media merely as points of presence rather than true communication vehicles”, stating that an intensive use of social media at an official level to engage stakeholders is still under consideration in the HKSAR government (Hicks, 2010). The situation improved when the e-Government Steering Committee was established and chaired by the Financial Secretary, the objective was to ‘e-engage’ citizens in public policies making and public services delivering (Audit Commission, 2013). However, it was discovered by the Audit Commission that only 15
out of 76 major government bureaus / departments were using social media, in which 8 departments were using Facebook, 7 departments were using Twitter, and 10 departments were using YouTube, which was much lower than expected (Audit Commission, 2013).

2.5 Summarizing Overview of Previous Research on Adoption Factors of e-Government and Research Gap

Table 2.4 lists the previous research on adoption factors in e-Government, it shows that most researchers have examined the factors in affecting citizens’ usage in e-Government services. In sum, it found that “trust” is the most common factor, which could be further divided into two perspectives, which are trust in the government (Abu-Shanab & Al-Azzam, 2012; Aladwani, 2013; Chan et al., 2010; Kim & Lee, 2011; Liu & Zhou, 2010; Park & Blenkinsopp, 2011; Shareef, Kumar, Kumar, & Dwivedi, 2011; Welch, Hinnant, & Moon, 2005), and trust in the internet (Abu-Shanab & Al-Azzam, 2012; Bélanger & Carter, 2008; Carter, 2008). Although the models studied vary from one researcher to another, the main indicator is still how to encourage citizens to adopt e-Government services. Other common variables and constructs are perceived usefulness (Carter, 2008; Carter & Bélanger, 2005; Carter & Weerakkody, 2008; Hung et al., 2006; Liu & Zhou, 2010; H.-J. Wang & Lo, 2013), and perceived ease of use (Carter & Belanger, 2004; Gilbert et al., 2004; Hung et al., 2006; Liu & Zhou, 2010; H.-J. Wang & Lo, 2013). Most researchers studied the adoption model with only a few major contexts such as government online tax and filing system (Hung et al., 2006), government websites (Hung et al., 2006; Lean, Zailani, Ramayah, & Fernando, 2009; Liu
& Zhou, 2010; Shareef et al., 2011), barriers to use (Bélanger & Carter, 2008; Gilbert et al., 2004), citizen satisfaction (Aladwani, 2013; Chan et al., 2010; Park & Blenkinsopp, 2011; Welch et al., 2005), and country specific (Abu-Shanab & Al-Azzam, 2012; AlAwadhi & Morris, 2008; Azam, 2007; Kim & Lee, 2011; Lean et al., 2009; Tung & Rieck, 2005; H.-J. Wang & Lo, 2013). Although there is prior research on social media in government, the focus is only exploring the trust model of e-Government services (Liu & Zhou, 2010; Song & Lee, 2013); however, research focus on studying both adoption factors and the consequences of using e-Government services from the perspective of citizens, especially under the social media context has not been thoroughly examined. Moreover, the studied geographical area has not previously been Hong Kong. In order to fill in the research gap, there is a need to explore the relationship of both the adoption factors and the related consequences and then to apply this analysis to Hong Kong.
<table>
<thead>
<tr>
<th>Name of Study</th>
<th>Authors &amp; Year</th>
<th>Context of the Study</th>
<th>Methods</th>
<th>Variables / Constructs</th>
<th>Hypothesized Relationships</th>
<th>Confirmed Relationships</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determinants of user acceptance of the e-Government services: The case of</td>
<td>Hung, Chang &amp; Yu (2006)</td>
<td>Identifies the factors that determine the publics' acceptance of e-Government</td>
<td>Structured Equation Modelling</td>
<td>Perceived Usefulness (PU), Perceived ease of use (PEOU), Perceived risk (PR),</td>
<td>PU -&gt; Attitude / PEOU -&gt; Attitude / PR -&gt; Attitude / Trust -&gt; Attitude / Personal innovativeness -&gt; Attitude / Compatibility -&gt; Attitude / External influence -&gt; Subjective norms / Interpersonal influence -&gt; Subjective norms / Self-efficacy -&gt; Perceived behaviour control / Facilitating condition -&gt; Perceived behavioural control / Attitude -&gt; Intention / Subjective norms -&gt; Intention / Perceived behavioural control -&gt; Intention</td>
<td>All supported (except Personal innovativeness -&gt; Attitude)</td>
<td>Provide useful recommendation to development of practice and policy making in e-government, which are customer oriented and evidence based</td>
</tr>
<tr>
<td>online tax filing and payment system</td>
<td></td>
<td>services</td>
<td>(SEM)</td>
<td>Compatibility, External influences, Interpersonal influence, Self-efficacy, Facilitating condition, Attitude, Subjective norms, Perceived behaviour control, Intention</td>
<td></td>
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</tr>
<tr>
<td>E-government diffusion: a comparison of adoption constructs</td>
<td>Carter (2008)</td>
<td>Comparison of popular adoption constructs to identify the most influential</td>
<td>Regression Analysis</td>
<td>Perceived Usefulness (PU), Perceived ease of use (PEOU), Trust of the internet (TRUS_I), Trust of the government (TRUS_S), Computer self-efficacy (CSE), Previous e-government transaction (EGOV TRANS), Intention to use</td>
<td>PU -&gt; Intention to use e-government service / PEOU -&gt; Intention to use e-government service / TRUS_I -&gt; Intention to use e-government service / TRUS_S -&gt; Intention to use e-government service / CSE -&gt; Intention to use e-government service / EGOV TRANS -&gt; Intention to use e-government service</td>
<td>Supported</td>
<td>Integration of a technology acceptance model, trust and previous e-government experience work together to explain a large percentage of variance in intention to use e-government</td>
</tr>
<tr>
<td></td>
<td>Factors influencing intention to use e-government services among citizens in Malaysia</td>
<td>Lean, Zailani, Ramayah &amp; Fernando (2009)</td>
<td>Investigates the factors that influencing the intention to use e-government service among Malaysians</td>
<td>Regression Analysis</td>
<td>Perceived strength of online privacy, Perceived strength of online non-repudiation, Perceived strength of online authentication, Trust, Perceived usefulness (PU), Complexity, Relative Advantage, Image, Culture, Intention to use e-government service</td>
<td>Perceived strength of online privacy -&gt; citizen's trust to use e-government service / Perceived strength of online non-repudiation -&gt; citizen's trust to use e-government services / Perceived strength of online authentication -&gt; citizen's trust to use e-government services / Trust -&gt; Intention to use e-government services / PU -&gt; Intention to use e-government services / Perceived complexity -&gt; Intention to use e-government services / Perceived relative advantage -&gt; Intention to use e-government services / Perceived image -&gt; Intention to use e-government services</td>
<td>Supported</td>
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<td>4</td>
<td>Trust and risk in e-government adoption</td>
<td>Bélanger &amp; Carter (2008)</td>
<td>Analyzes the impact of trust and risk perceptions on one's willingness to use e-government services</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Disposition to trust (DT), Trust of the Internet (TOI), Trust of the Government (TOG), Perceived risk (PR), Intention to use (USE)</td>
<td>TOI -&gt; USE / TOG -&gt; USE / DT -&gt; TOI / DT -&gt; TOG / PR -&gt; USE / TOI -&gt; PR / TOG -&gt; PR</td>
<td>All supported</td>
</tr>
<tr>
<td>5</td>
<td>The Influence of Perceived Characteristics of Innovating on e-Government Adoption</td>
<td>Bélanger &amp; Carter (2004)</td>
<td>The study uses Moore and Benbasat's (1991) perceived characteristics of innovating constructs to identify factors that influence citizen adoption of e-Government initiatives</td>
<td>Regression Analysis</td>
<td>Relative advantage, Image, Compatibility, Ease of use, Intention to use</td>
<td>Perceived relative advantage -&gt; Intention to use e-Government service / Perceived image -&gt; Intention to use e-Government service / Perceived compatibility -&gt; Intention to use e-Government service / Perceived ease of use -&gt; Intention to use e-Government service</td>
<td>All supported (except Ease of use)</td>
</tr>
<tr>
<td>6</td>
<td>Barriers and Benefits in the adoption of e-government</td>
<td>Gilbert, Balestrini &amp; Littleboy (2004)</td>
<td>The study investigates the factors related to decision making when people consider and evaluate the usage of an online e-government delivery mechanism</td>
<td>Regression Analysis</td>
<td>Avoid personal interaction, Control, Convenience, Cost, Personalization, Time, Confidentiality, Ease to Use, Enjoyable, Reliable, Safe, Visual appeal, Perceived relative benefits, Perceived barriers, Willingness to use</td>
<td>Avoid personal interaction -&gt; Perceived relative benefits / Control -&gt; Perceived relative benefits / Convenience -&gt; Perceived relative benefits / Personalization -&gt; Perceived relative benefits / Time -&gt; Perceived relative benefits / Confidentiality -&gt; Perceived barriers / Easy to use -&gt; Perceived barriers / Enjoyable -&gt; Perceived barriers / Reliable -&gt; Perceived barriers / Safe -&gt; Perceived barriers / Visual appeal -&gt; Perceived barriers / Perceived relative benefits -&gt; Willingness to use</td>
<td>All support (except avoid personal interaction)</td>
</tr>
<tr>
<td>7</td>
<td>Internet adoption and usage in Bangladesh</td>
<td>Azam (2007)</td>
<td>The study explores the effects of different factors influencing the adoption of Internet in Bangladesh</td>
<td>Regression Analysis</td>
<td>Innovation, Relative advantage, Compatibility, Complexity, Trialability, Observability</td>
<td>Adoption of Internet in Bangladesh -&gt; Perceived relative advantage of using Internet / Adoption of Internet in Bangladesh -&gt; Perceived compatibility of using Internet / Peoples in Bangladesh adopt Internet -&gt; Less Complexity / Peoples in Bangladesh will adopt Internet -&gt; Convince about its reality / Peoples in Bangladesh will adopt internet -&gt; Easily observable</td>
<td>All supported</td>
</tr>
<tr>
<td>8</td>
<td>E-Participation, Transparency and Trust in Seoul Metropolitan Government</td>
<td>Kim &amp; Lee (2011)</td>
<td>The study analyses how the impact of electronic participation (e-participation) on trust in local government is facilitated by several dimensions of the e-participation process: 1) satisfaction with e-participation applications; 2) satisfaction with government responsiveness; 3) e-participants' development through the participation; 4) perceived influence on decision-making; and 5) assessment of government transparency.</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Satisfaction with e-Participation applications, Satisfaction with Government responsiveness, e-Participants' development, Influence on Decision-making, Assessment of Government transparency, e-Participants' trust in Government</td>
<td>Satisfaction with e-Participation applications -&gt; e-Participants' development / Satisfaction with Government responsiveness -&gt; e-participants' development / e-participants' development -&gt; Assessment of government transparency / Influence on Decision-making -&gt; Assessment of Government transparency / Assessment of Government transparency -&gt; e-Participants' trust in Government</td>
<td>All Supported</td>
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<tr>
<td>9</td>
<td>Can Social Media restore citizen trust in government</td>
<td>Song &amp; Lee (2013)</td>
<td>The purpose of this research is to further the discussion of the e-government-trust linkage by extending prior trust models of e-government through the integration of new types of citizen-government interactions enabled by social media.</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Use of information services, Use of transaction services, Use of social media in government, e-Satisfaction, e-Transparency, Trust in government</td>
<td>Use of information services -&gt; e-Satisfaction / Use of transaction services -&gt; e-Satisfaction / Use of social media in government -&gt; e-Transparency / e-Satisfaction -&gt; Trust in government / e-Transparency -&gt; Trust in government</td>
<td>All Supported</td>
</tr>
<tr>
<td>10</td>
<td>A citizen trust for e-government</td>
<td>Liu &amp; Zhou (2010)</td>
<td>The study aims to establish an e-government trust model from the behavioural perspectives of citizen</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Citizen expectation, Citizen satisfaction, Perceived usefulness (PU), Perceived ease of use (PEOU), Perceived security (PS), Perceived risk (PR), Citizen trust</td>
<td>Citizen expectation -&gt; Citizen trust / Citizen satisfaction -&gt; Citizen trust / PU -&gt; Citizen trust / PU -&gt; Citizen trust / PEOU -&gt; Citizen trust / PS -&gt; Citizen trust / PR -&gt; Citizen trust</td>
<td>All supported</td>
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<tr>
<td>11</td>
<td>A contingency model of citizens’ attitude toward e-government use</td>
<td>Aladwani (2013)</td>
<td>The study explores the contingency effects of citizens’ demographic and relationship quality characteristics on the connection between e-government attitudes (as measured by satisfaction) and e-government acceptance (as measured by visit frequency and number of transactions)</td>
<td>Regression Analysis</td>
<td>Attitudes toward e-government use, Age, gender, and education, E-government trust and value, Exploration use, Transaction use</td>
<td>Attitudes toward e-government use -&gt; Exploration use / Attitudes toward e-government use -&gt; Transaction use / Age, gender and education -&gt; E-government trust and value</td>
<td>All supported</td>
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<td>ID</td>
<td>Title</td>
<td>Authors</td>
<td>Methodology</td>
<td>Variables</td>
<td>Results</td>
<td>Findings</td>
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<td>13</td>
<td>Determinants of citizens' intent to use government websites in Taiwan</td>
<td>Wang &amp; Lo (2013)</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Trust in Internet, Trust in government, Self-efficacy, Facilitating conditions, Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude, Intention to use e-government website</td>
<td>Trust in Internet -&gt; Intention to use / Trust in government -&gt; Intention to use / Self-efficacy -&gt; Intention to use / Facilitating conditions -&gt; Intention to use / PU -&gt; Intention to use / PEOU -&gt; Intention to use / Attitude -&gt; Intention to use</td>
<td>All supported</td>
<td></td>
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<td>14</td>
<td>The roles of transparency and trust in the relationship between corruption and citizen satisfaction</td>
<td>Park &amp; Blenkinsopp (2011)</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Transparency, Corruption, Trust, Satisfaction</td>
<td>Transparency -&gt; Satisfaction / Transparency -&gt; Trust / Transparency -&gt; Corruption / Corruption -&gt; Trust / Corruption -&gt; Satisfaction / Trust -&gt; Satisfaction</td>
<td>All supported</td>
<td></td>
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<td>15</td>
<td>The Use of the UTAUT Model in the Adoption of E-government Services in Kuwait</td>
<td>AlAwadi &amp; Morris (2008)</td>
<td>Regression Analysis</td>
<td>Performance expectancy, Effort expectancy, Peer influence, Facilitating conditions, Gender, Academic course, Internet experience Behavioural intention, Use behaviour</td>
<td>Performance expectancy -&gt; Behavioural intentions (moderated by gender, academic course, internet experience) / Effort expectancy -&gt; Behavioural intentions (moderated by gender, academic course, internet experience) / Peer influence -&gt; Behavioural intentions (moderated by gender) / Behavioural intention -&gt; Use behaviour / Facilitating conditions -&gt; Use behaviour (moderated by academic course, internet experience)</td>
<td>Only performance expectancy, effort expectancy, peer influence and facilitating conditions were supported</td>
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<td>16</td>
<td>Does managerial orientation matter? The adoption of reinventing government and e-government at the municipal level</td>
<td>Moon &amp; Norris (2005)</td>
<td>This study explored the effect of managerial innovativeness in municipal government on the adoption of e-government, and also examined the association between the adoption of e-government and its outcome</td>
<td>Regression Analysis</td>
<td>Adoption of Municipal E-Government, Government capacity, Institutional variable, Effectiveness of E-Government</td>
<td>Adoption of Municipal E-Government (website, intranet, longevity, strategic plan, online services) -&gt; Effectiveness of E-Government (administrative change, efficiency, revenue generation) / Institutional variable (form of government, size) -&gt; Effectiveness of E-Government (administrative change, efficiency, revenue generation) / Government capacity (technological, financial, political) -&gt; Effectiveness of E-Government (administrative change, efficiency, revenue generation)</td>
<td>All supported</td>
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<td>17</td>
<td>e-Government Adoption Model (GAM) : Differing service maturity levels</td>
<td>Shareef, Kumar, Kumar &amp; Dwivedi (2011)</td>
<td>This research aimed to discover the critical factors that enable citizens to adopt e-government at different stages of service maturity</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Perceived awareness (PA), Computer-self efficacy (CSE), Availability of resources (AOR), Perceived ability to use (PATU), Perceived compatibility (PC), Perceived functional benefit (PFB), Perceived image (PI), Perceived information quality (PIQ), Perceived service response (PSR), Multilingual option (MLO), Perceived trust (PT), Perceived uncertainty (PU), Perceived security (PS), Perceived privacy (PP)</td>
<td>PA -&gt; Adoption / CSE -&gt; Adoption / AOR -&gt; Adoption / PATU -&gt; Adoption / PC -&gt; Adoption / PFB -&gt; Adoption / PI -&gt; Adoption / PIQ -&gt; Adoption / PSR -&gt; Adoption / MLO -&gt; Adoption / PT -&gt; Adoption / PU -&gt; Trust / PS -&gt; Trust / PP -&gt; Trust</td>
<td>PA, PATU, PFB, PIQ, PI were supported</td>
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<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
<td>Research Question</td>
<td>Methodology</td>
<td>Findings/Results</td>
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<td>18</td>
<td>Adoption of electronic government services among business organizations in Singapore</td>
<td>Lai &amp; Rieck (2005)</td>
<td>This paper examined factors influencing adoption of electronic government services among business organizations in Singapore</td>
<td>Structured Equation Modelling (SEM)</td>
<td>Perceived benefits, Higher management readiness, Sensitivity to cost, External pressure, Social influence, Adoption Perceived benefits -&gt; Adoption / Higher management readiness -&gt; Adoption / Sensitivity to cost -&gt; Adoption / External pressure -&gt; Adoption / Social influence -&gt; Adoption All approved (except sensitivity to cost) The result demonstrated a significant positive relationship between perceived benefits, external pressure, and social influence and the firms’ decision to adopt e-Government services.</td>
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<td>19</td>
<td>Linking Citizens Satisfaction with E-Government and Trust in Government</td>
<td>Welch, Hinnant &amp; Moon (2004)</td>
<td>This article asked how internet use, citizen satisfaction with e-government, and citizen trust in government are interrelated</td>
<td>Regression Analysis</td>
<td>Trust in government, Government website use, e-Government satisfaction, Government website satisfaction, Satisfaction with Government, Internet Use, Transaction satisfaction, Transparency satisfaction, Interactivity satisfaction Satisfaction / Trust -&gt; Interactivity / Satisfaction / Trust -&gt; Transparency / Satisfaction / Trust -&gt; Transaction All approved The findings indicated that government website use was positively associated with e-government satisfaction and website satisfaction. E-government satisfaction was positively associated with trust in government. E-Government strategies - transaction, transparency, and interactivity were important factors that directly affect e-government satisfaction and indirectly affected trust.</td>
<td></td>
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<td>20</td>
<td>Modeling Citizen Satisfaction with Mandatory Adoption of an E-Government Technology</td>
<td>Chan, Thong, Venkatesh, Brown Hu &amp; Tam (2010)</td>
<td>This study explored the antecedents and consequences of mandatory adoption of technologies in e-government</td>
<td>Partial Least Squares (PLS)</td>
<td>Awareness, Compatibility, Self-efficacy, Flexibility, Avoidance of Personal Interaction, Trust, Convenience, Assistance, Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Satisfaction</td>
<td>Performance expectancy -&gt; Satisfaction / Effort expectancy -&gt; Satisfaction / Social influence -&gt; Satisfaction / Facilitating conditions -&gt; Satisfaction / Awareness -&gt; Social influence / Perceived compatibility -&gt; Performance expectancy / Self-efficacy -&gt; Performance expectancy / Self-efficacy -&gt; Facilitating conditions / Flexibility -&gt; Performance expectancy / Avoidance of personal interaction -&gt; Performance expectancy / Trust -&gt; Performance expectancy / Convenience -&gt; Effort expectancy / Convenience -&gt; Facilitating conditions / Assistance -&gt; Effort expectancy / Assistance -&gt; Facilitating conditions</td>
<td>All supported (except social influence has no significant effect on citizens' satisfaction)</td>
</tr>
</tbody>
</table>
2.6 RESEARCH MODEL AND HYPOTHESES

Based on the above literature review, a research model (Figure 2.1) has been constructed to obtain the research objectives. The key research question is: “Can social media be employed in existing e-Government services as an effective means to enhance not only the trust of citizens in government but also the transparency of government? – and how should it be implemented”. The research model, including twelve research hypotheses (H1-H12), is illustrated through the following figure.

Figure 2.5 : Research Model

The model is adapted from a study on the determinants of user acceptance of e-Government services (Hung et al., 2006), which is based on the Theory of Planned
Behaviour (TPB) (Ajzen, 1991), a theoretical framework developed to understand and predict human behaviour, for example, the acceptance and use of new technologies.

Taking into account recent discussions on the level of affection made from social media and e-Government services to citizens’ faith in the trustworthiness and transparency of government (John C. Bertot et al., 2010; Bertot, Jaeger, & Grimes, 2012; Bertot, Jaeger, & Hansen, 2012; Hicks, 2010; Kaplan & Haenlein, 2010), the present study is extending Hung, Chang, and Yu’s (2006) work, to investigate the factors that have driven the adoption of social media in e-Government services and the effects of the use of e-Government services on citizens’ perceptions of the government’s transparency and trustworthiness.

The hypotheses to be investigated are presented in the following tables, substantiated by findings in published scholarly papers.

<table>
<thead>
<tr>
<th>EXISTING MODEL</th>
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<tbody>
<tr>
<td><strong>Antecedent Construct</strong></td>
</tr>
<tr>
<td>Perceived Usefulness</td>
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<td>Perceived Ease of Use</td>
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<td>Perceived Risk</td>
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<td>Trust</td>
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<td>Compatibility</td>
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</table>
## EXISTING MODEL

<table>
<thead>
<tr>
<th>Antecedent Construct</th>
<th>Influenced Constructs</th>
<th>References</th>
<th>Hypothesis</th>
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## EXTENSION TO EXISTING MODEL

<table>
<thead>
<tr>
<th>Antecedent Construct</th>
<th>Influenced Constructs</th>
<th>References</th>
<th>Hypothesis</th>
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</table>
As mentioned, this research is an extension of the research of Hung, Chang, & Yu (2006), H1 to H8 have already been studied and confirmed in the research of Hung, Chang, & Yu (2006). Hung, Chang, & Yu (2006)’s study was to investigate the usage of websites in e-Government services, this research is extending to provide a more holistic picture of the causes and effects of e-Government services with the inclusion of the latest technology such as social media, the model will be extended as follows:

i) to another technology of e-Government service context (i.e. social media);

ii) the consequences of the citizens’ use of social media, more specifically as outlined above, it is important to know the effects of participation on citizens’ level of trust and transparency.

There are limited studies on the effects of citizens’ levels of trust and transparency through e-participation on both e-Government services and the government that can be assessed (Bannister & Connolly, 2011; Bonsón et al., 2012; Kes-Erkul & Erkul, 2009; Kim & Lee, 2011, 2012). With regards to Kim and Lee’s (2011) research, e-participant development and government transparency are positively correlated, while government transparency and the effect on e-trust in government is also positively correlated (Kim & Lee, 2011), all this research serves as a good foundation to support this study.

Based on the theories adapted, the following hypotheses are developed:

THEORY OF TECHNOLOGY ACCEPTANCE MODEL (TAM):
Relevant components of the TAM are used as drivers for the attitude constructs illustrated through the hypotheses H1 – H5.

**H1. There is a positive relationship between perceived usefulness and attitudes in using social media for e-Government services.**

According to Davis (1989), perceived usefulness (PU) is the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). Under this hypothesis, this research will investigate whether an individuals’ perception of the usefulness of social media in e-Government services has a positive influence on an individuals’ attitude towards it.

**H2. There is a positive relationship between perceived ease of use and attitudes in using social media for e-Government services**

Perceived ease of use (PEOU) is the degree in which a person believes that using a particular system can be free from effort (Davis, 1989). The model was extended by Rogers (1995) to affirm that perceived ease of use represents the degree to which an innovation is received without any difficulty in understanding (Rogers, 1995). In this hypothesis, the research will investigate whether a respondents’ attitude towards social media in e-Government is positively influenced when services are easy to use or learn.

**H3. There is a negative relationship between perceived risk and attitude in using social media for e-Government services.**
Bauer (1960) was the first author to focus on the perceived risk (PR) construct. He defined this as an outcome of the level of uncertainty and seriousness (Bauer, 1960). This hypothesis is to understand whether the negative feeling and concern of respondents in using social media on e-Government services could cause negative influence on an individuals’ attitude towards the use of social media in e-Government services.

**H4. There is a positive relationship between trust towards social media and attitudes in using social media for e-Government services**

The value of trust has been widely discussed in the literature, similar to perceived usefulness (PU) and perceived ease of use (PEOU), which have been hypothesized in a great deal of research. This hypothesis explores the extent to which trust towards social media positively influences attitudes towards the use of social media in e-Government (Gefen, Karahanna, & Straub, 2003).

**H5. There is a positive relationship between compatibility and attitude in using social media for e-Government services**

Rogers (1995) suggests that compatibility refers to the extent to which innovation coincides with an adopter’s prior experience (Rogers, 1995). This hypothesis tests the extent to which compatibility has a significant impact on attitudes towards e-Government services (Chau & Hu, 2001; Gatignon & Robertson, 1985; Tung, 2007).

**THEORY OF PLANNED BEHAVIOUR (TPB) : H6 – H8**
To explain citizens who intend to participate in e-Government services delivered through social media, the model is based on the TPB, which is illustrated through intended e-participation and its direct antecedent driver constructs; attitude, subjective norms, and perceived behaviour, leading to hypotheses H6-H8:

**H6. There is a positive relationship between attitude to intended e-participation of citizens and using social media for e-Government services**

The construct of attitude appeared after the first established model of Technology Acceptance Model (TAM), it serves to mediate variables between predictor variables, such as Perceived Ease of Use (PEOU), and behavioural intention (Nistor & Heymann, 2010). The hypothesis would test the positive attitude towards social media of respondents against their attitude to using social media in e-Government services.

**H7. There is a positive relationship between subjective norms and intended e-participation of citizens**

Subjective norms refer to the influence of people in a social environment with behavioural intentions (Fishbein & Ajzen, 1975). Under this hypothesis, the researcher aims at understanding the peer pressure on respondents in using social media, and motivation to use social media in e-Government services.

**H8. There is a positive relationship between perceived behavioural control and intended e-participation of citizens.**

Similar to construct subjective norms, perceived behavioural control is also a key element adapted from the Theory of Planned Behaviour (TPB) model. Ajzen (1991) believed that perceived behaviour control is determined by accessibility control
beliefs. This construct studies and individual’s perceived ease or difficulty in performing particular behaviours due to restrictions such as technical or financial restrictions. This hypothesis is intended to understand the view of respondents in managing social media and other relevant resources such as hardware.

**EXTENSION TO EXISTING MODEL(S) : (H9-H12)**

Studies have found a positive correlation between levels of e-Government and levels of trust (Morgeson et al., 2011; Welch et al., 2005). Welch’s (2005) study also supports the significance and positivity of the adoption of e-Government associated with website satisfaction and the positive relationship with trust in the government. Since all the studies were done based on website adoption, it is important to study the relationship between e-participation of citizens and the trust of e-Government services through social media. Moreover, recent studies have proved that the trust of government and citizens’ evaluation of government performance is positively associated (Chang & Chu, 2006; Kim, 2010; Mishler & Rose, 2001; Orren, 1997). More studies emphasized that public trust in government can be gained through citizen-centred governance (Kweit & Kweit, 2007; Vigoda-Gadot, 2007). As a result, this research will assisting in understanding the impact of e-participation of citizens in social media on the levels of trust in government in general and e-Government services.

Kim and Lee’s (2011) research has successfully proved that citizens’ e-participation can create a significant and positive relationship to government transparency, it has discussed that the transparency of the government and participatory governance were
improved under the implementation of e-participation programs as mechanisms for two-way communication. As social media strengthens two-way communications through user-generated contents and sharing, a newly developed construct in this research aims to study the possibility of social media becoming a better alternative or companion to websites in enhancing the trust and transparency of the government through e-Government services.

This research is proposing that e-participation of citizens through social media will have a positive relationship to e-Government services and government in general in terms of trust and transparency. In recent studies, scholars have shown that when e-participants received quality responses and feedback from government they are likely to appreciate useful policy information, thus facilitating an improved understanding of government agencies along with higher transparency (Blackburn & Bruce, 1995; Sabatier, 1988; Yankelovich, 1991). Government could gain more support from citizens through this form of interaction and a shared understanding with each other (Moon & Sproull, 2008). And e-participation comes with citizen monitoring, which puts pressure on the government to ensure its commitment to openness, integrity and transparency (Yang & Holzer, 2006).

From the perspective of public administration, Roberts (2004) believed that it is inevitable that social media could help gain stronger participation, ownership and empowerment among citizens, establish better rapport, and build greater support through their positive engagement, thus delivering a positive assessment to government transparency (Roberts, 2004). However, according to the best knowledge
of the author, an understanding of the impact of social media to e-Government, through which citizens’ assess government performance through active participation and delivery in e-Government services, resulting in stronger public trust and perceived transparency to the government has not yet been investigated (Kweit & Kweit, 2007; Vigoda-Gadot, 2007). As a result, the hypotheses H9 – H12 are developed as follows:

**H9. There is a positive relationship between intended e-participation of citizens and trust perceptions towards e-Government services.**

**H10. There is a positive relationship between intended e-participation of citizens and trust perceptions towards government in general.**

**H11. There is a positive relationship between intended e-participation of citizens and e-Government transparency perceptions.**

**H12. There is a positive relationship between intended e-participation of citizens and transparency perceptions towards the government in general.**
CHAPTER 3: RESEARCH DESIGN

3.1 OVERVIEW

The variation in research methods and designs results from the different types of data. While researchers will have their own preferences in choosing research methodology, it is agreed that research questions should be the determinant of the appropriate method and design. Because this research investigates the factors and consequences of the diffusion-adoption process of social media in e-Government, a different quantitative approach of will be tailored through research questions and objectives of the topic (Gast & Ledford, 2014).

The structure of quantitative research can be described in five major phases: strategy, conceptual framework, subject matter, data collection and analysis. Researchers seek to investigate by collection of numerical data, followed by statistical analysis (Abbuhl, Gass, & Mackey, 2014). In order to facilitate the analysis, a large number of participants are needed and researchers will need to advance the design before conducting data collection (Abbuhl et al., 2014).

This chapter will define the design of the current research framework, in which the effectiveness of social media in e-Government will be examined quantitatively. This will be followed by a description of the research participants from five associations in Hong Kong; with an explanation of the survey instruments and identification of the
method of data collection and data analysis, then a procedure for verifying the reliability and validity of the survey instrument for the research will be undertaken. As this research requires ethical approval, its implications will also be discussed, concluding with a summary of the limitations of the research.

## 3.2 RESEARCH METHODOLOGY

Although the former Chief Executive of the HKSAR has started using his own social media platforms to share views with the citizens, the HKSAR government still has not officially adopted the use of social media. Therefore, this research project is intended to study the current usage of social media in e-Government services and factors that enhance adoption and associated consequences. It is proved the social media provides participants an online platform to present self-disclosure and self-presentation through collaboration (Kaplan & Haenlein, 2010), applications such as Facebook and blogs are commonly used. Citizens can also comment and share their opinions on the same platform, aligning values more closely within a hierarchical structure of governmental organization and spreading to citizens individually. Consequently, it is valuable to understand people’s thoughts on the use of social media in the existing e-Government, to maximise the beneficial effects of further using social media in e-Government services, as well as understanding the key factors that drive the adoption.

Before detailing the quantitative research in this paper, we need to understand that research can be conducted under qualitative or quantitative research in general, while Bryan and Bell (2011) have suggested that there is no certainty of deciding the best
research methodology to the study, a list of the main areas of common contrasts between qualitative and quantitative research follow (Table 3.1):

Table 3.1 Difference between Quantitative Research and Qualitative Research

<table>
<thead>
<tr>
<th>QUANTITATIVE RESEARCH</th>
<th>QUALITATIVE RESEARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ apply measurement procedures to social life</td>
<td>▪ using words in the presentation of analyses of society</td>
</tr>
<tr>
<td>▪ point of view from researchers</td>
<td>▪ point of view from participants</td>
</tr>
<tr>
<td>▪ researchers are uninvolved with their subjects, lack of relationship with the subjects of an investigation</td>
<td>▪ seeks close involvement with the people being investigated</td>
</tr>
<tr>
<td>▪ researchers bring a set of concepts to bear on the research instruments</td>
<td>▪ theoretical elaboration emerge out of data collection</td>
</tr>
<tr>
<td>▪ emphasis on relationships between variables. Change and connections between events over time tend not to surface</td>
<td>▪ depict as attuned to the unfolding of events over time and to the interconnections between the actions of participants of social setting</td>
</tr>
<tr>
<td>▪ highly structured on the investigation so as to examine the precise concepts and issues</td>
<td>▪ invariably structured so as to achieve the actor’s meanings and of concepts emerging out of data collection is enhanced</td>
</tr>
<tr>
<td>▪ researchers want their findings to be generalizable to the relevant population</td>
<td>▪ researchers seek an understanding of behaviour, values, beliefs, in the terms of the context in which the research is conducted</td>
</tr>
</tbody>
</table>

Source: (Bryman & Bell, 2011)

Qualitative research is usually undertaken in forms of words through interviews, observations or documents. These data serve as the primary source of data in respect of social science disciplines (Weitzman & Miles, 1995). Researchers use qualitative research methods to study natural phenomena within a social context, in order to explore the deeper significance of the phenomena as ascribed by subjects (Lach, 2014). Also, they focus on evidence found in documents, arguments, and the like rather than
numbers, which entails the generation of theories rather than testing of conceptual framework (Guthrie, Petty, Yongvanich, & Ricceri, 2004).

Quantitative research refers to studies that are utilise experiments, computerized models and mathematical models. Researchers convert these attributes of events and observations into symbols, and the results are summarized with direct numerical expressions or functional forms (Lupia & Elman, 2014).

Nonetheless, quantitative research has been criticised for its designs, where it is often argued that the measurement process between different developments and concepts may simply reveal underlying assumptions, producing a situation where testing its validity does not actually address the research problem (Bryman, 1984; Bryman & Bell, 2011; Lach, 2014). Moreover, the reliance on instruments and procedures is also an important issue as it hinders the connection between research and everyday life as it heavily relies on administering research instruments to subjects (Bryman & Bell, 2011).

While qualitative research is relatively popular among research projects, it has been criticized that the results might be impressionistic and subjective. There is a danger that findings may simply reflect the subjective and intuitive values of the researcher. Furthermore qualitative research is difficult to replicate under comparatively unstructured procedures, while the observation of participants can only really be conducted with a small number of individuals, and findings can be less convincing when generalized (Bryman & Bell, 2011). Lastly, the main reason that qualitative research is not appropriate for this research study is that the process of qualitative
data analysis cannot consider ‘transparency’ as a standard of measurement for the research findings (Bryman & Burgess, 1994).

By comparison, quantitative and qualitative researches have contributed much research over the years, while facing criticisms along the way; however, it is understood that both research approaches are difficult to distinguish when different kinds of criticisms have reflected on critical points that have been proffered.

Linking back to the current empirical research that studies citizens’ behaviour on social media to e-Government services, it is necessary to have a sufficiently large and representative sample as the target group, so again, quantitative research is more appropriate as the items and scales can be developed to operationalize the research hypotheses and to develop a research questionnaire, then allocate to a representative sample of targeted population. The performance will be interpreted by applying appropriate statistical tests before proceeding to develop a conceptual model (Planing, 2014).

Other reasons to select quantitative research is because it usually involves hypotheses testing based on theoretical statements, the effects of which are measured by variables (Zaidi et al., 2014). While this research on e-Government service is mostly descriptive (Hair, Anderson, Tatham, & Black, 2006), Hair (2006) supported the idea that the most popular methods involve descriptive, exploratory and casual elements, so behavioural elements where transparency, efficiency, anti-corruption and citizen participation can be applied and measured.
Although the theoretical framework of this study is been developed and supported by an extensive literature review, the significance of this research is obtained through the extensive design of new factors of social media adoption-diffusion process in e-Government and the execution of quantitative research is a vital part in this study, as its degree and magnitude of hypothesized relationships between variables and constructs can be explored. Based on the theoretical framework discussed in Chapter 2, numbers of hypotheses are developed for possible acceptance or rejection that would help to explore both the situation and implications (Anderson, 1973).

In conclusion, this study considers quantitative research to be the most appropriate since it is seeking empirically testable on assumptions, hypotheses and methods used. Also, quantitative methods have been widely used in recent e-Government researches, the modelling strategy will rely on a set of equations; each one will be quantifying a relevant aspect of relationships between e-Government policy, public administration affairs and the external environment (Picci, 2006).

3.3 RESEARCH METHODS

3.3.1 Data and Methods

Significant progress has been made in statistical analysis in recent years. The introduction of partial least squares (PLS) is based on structural equation modelling (SEM) which provides a strong capability to handle a large number of latent variables on a single platform (Wynne W Chin, 2010). According to Wold (1974, 1980, 1982), PLS is a technique based on SEM that maximizes the explained variance of endogenous
constructs (Fornell & Bookstein, 1982). Since the construction of such a comprehensive research model that can support a full range of variables at cultural, environmental, organizational and individual levels, offering robust research to understand more about technology adoption behaviour from social media.

Structured Equation Modelling (SEM) is selected for this research as it assists in identifying relationships in social science research (Hair, Hult, Ringle, & Sarstedt, 2014). It has also been gaining in popularity for testing complete theories and concepts (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014), as well as becoming compatible for multiple regression analysis (Hair, Sarstedt, Ringle, & Mena, 2012) and applicable to exploratory research (Hair et al., 2014). This method also enables researchers to further examine interrelated dependent relationships between sets of constructs, with several variables accounting simultaneously for measurement error (Sarstedt, Ringle, Smith, Reams, & Hair Jr, 2014).

As PLS-SEM calculates multiple regression analysis that delivers a high value for exploratory research (Hair et al., 2014; Hair, Ringle, & Sarstedt, 2011), it has been used in other disciplinary research including marketing (Hair et al., 2012), accounting (Lee, Petter, Fayard, & Robinson, 2011), operations management (Peng & Lai, 2012), strategic management (Hair, Sarstedt, Pieper & Ringle, 2012) and management information systems (Ringle, Sarstedt, & Straub, 2012). Over years, PLS-SEM has become a widely accepted method and fully matured based on numerous publications and coverage of review (Hair et al., 2014).
In addition to PLS-SEM, covariance-based approach (CB-SEM) is another popular method based on SEM that focuses on confirming theories by determining the fitness of a model by using estimates from the covariance matrix on the sample data, yet the popularity of usage is not as great as PLS-SEM.

In order to choose the best modeling method for this research, it is necessary to compare the differences between PLS-SEM and CB-SEM. Chin and Newsted (1999) (Wynne W Chin & Newsted, 1999) have constructed a table (Table 3.2) to summarise the significance of these differences (Sarstedt, Ringle, & Hair, 2014).

Table 3.2: Comparison of PLS-SEM and CB-SEM (Chin & Newsted, 1999)

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>PLS-SEM</th>
<th>CB-SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Prediction oriented</td>
<td>Parameter oriented</td>
</tr>
<tr>
<td>Approach</td>
<td>Variance based</td>
<td>Covariance based</td>
</tr>
<tr>
<td>Assumptions</td>
<td>Predictor specification (nonparametric)</td>
<td>Typically multivariate normal distribution and independent observations (parametric)</td>
</tr>
<tr>
<td>Parameter estimates</td>
<td>Consistent as indicators and sample size increase (i.e., consistency at large)</td>
<td>Consistent</td>
</tr>
<tr>
<td>Latent variable scores</td>
<td>Explicitly estimated</td>
<td>Indeterminate</td>
</tr>
<tr>
<td>Epistemic relationship between a latent variable and its measures</td>
<td>Can be modelled in either formative or reflective mode</td>
<td>Typically only with reflective indicators</td>
</tr>
<tr>
<td>Implications</td>
<td>Optimal for prediction accuracy</td>
<td>Optimal for parameter accuracy</td>
</tr>
<tr>
<td>Model complexity</td>
<td>Large complexity (e.g., 100 constructs and 1000 indicators)</td>
<td>Small to moderate complexity (e.g., less than 100 indicators)</td>
</tr>
<tr>
<td>Sample size</td>
<td>Power analysis based on the portion of the model with the largest number predictors. Recommendations for the minimum number of observations range from 30 to 100 cases</td>
<td>Ideally based on power analysis of specific model. Recommendations for the minimum number of observations generally range from 200 to 800</td>
</tr>
</tbody>
</table>
As adoption factors are investigated in this research, where behavioural values are highly emphasized, it is decided that the PLS-SEM algorithm will be used in the data analysis because it is proved that it can generate strong results even when it is with non-normal data (Ringle, Sarstedt, & Mooi, 2010). Besides, PLS-SEM is considered as an appropriate method when the sample size is relatively small with only around 500 participants (Hair et al., 2012); the current study has a sample size of 473. It is also suggested to be good for managing a complex model (Hair et al., 2012) and well suited to the domain of technology research (Barclay, Higgins, & Thompson, 1995).

### 3.3.2 Questionnaire Design

Based on the hypotheses on the adoption factors of social media in e-Government which was developed in the previous stage, a questionnaire was designed to collect data which was adapted from recent e-Government relevant research. Sufficient modifications have been undertaken to ensure clarity of expression for interviewees. A total of 70 questions and 13 constructs are included in the questionnaire to tackle the research. The questionnaire can be found in Appendix A.

The survey questions (questions 15 to 51) are adopted from Hung et al. (2006), and are further extended and designed with appropriate support from the literature in regards to the transparency and trust level of e-Government in the use of social media. The data will be statistically tested to identify the cause-and-effect relationships under the use of PLS-SEM in order to estimate the parameters of the proposed model.
In the study, factors and hypotheses are proposed based on the studies in the last section, the questionnaire consists of five constructs from the Technology Acceptance Model (TAM) model (Carter & Bélanger, 2005; Hung et al., 2006; Warkentin et al., 2002), and the research studies and relevant hypotheses can be found in Table 2.4 (H1-H5).

When developing constructs, two types of measuring specifications were considered. Formative measures represent instances that indicate who caused the construct, and reflective measures are based on a measurement model specification in which it is assumed that the indicators are caused by the underlying constructs (Hair et al., 2014).

Scaling techniques are commonly used to assess variations during data collection of subjective measures, which yields the highest level of information feasibility in a given situation and allows the use of a great variety of statistical analyses. The Likert scale is chosen for scaling in this survey as it is widely used in a variety of research disciplines such as psychology, sociology and business (Matell & Jacoby, 1971). Its ease of administration and construction can minimize any confusion created through the survey process. However, the disadvantage of the Likert scale is that it takes longer to complete than other itemized rating scales, since respondents have to read each statement before rating (Munshi, 2014), and it only provides respondents with a platform that allows them to reflect views of a phenomenon through their agreement or disagreement on a scale (Aaker, Kumar, & Day, 2007).

According to Munshi (2014), a 7-point scale was convincing in generating a lower measurement error and higher precision when compared to a 5-point scale (Munshi,
2014). Therefore, a 7-level Likert scale is adopted in the questionnaire under the former construct - “Perceived Usefulness”, where 1 is equivalent to “Extremely Unlikely” and 7 is equivalent to “Extremely Likely”. Other antecedent constructs including “Perceived Ease of Use”, “Perceived Risk”, “Trust” and “Compatibility”, are similarly scaled where 1 is equivalent to “Strongly Disagree” and 7 is equivalent to “Strongly Agree” (Bryman & Bell, 2011; Hung et al., 2006).

Another part of the questionnaire consists of three constructs from the Theory of Reasoned Action (TRA) model (Hung et al., 2006; Ozkan & Kanat, 2011), which is listed on Table 2.4 as the research studies and relevant hypotheses H6-H8. A 7-level Likert-scale is adopted in the questionnaire as the measurement, under the antecedent constructs “Attitude”, “Subjective Norms” and “Perceived Behaviour Control”, where 1 is equivalent to “Strongly Disagree” and 7 is equivalent to “Strongly Agree” (Bryman & Bell, 2011; Hung et al., 2006).

The last part of the survey questions (questions 52 to 69) are newly developed to investigate the effect of e-participation of citizens for the trust and transparency of both the e-Government services and the government in general.

3.3.3 Research Participants

Since ICT practitioners have better knowledge and experience in adopting and managing technologies, therefore, the designed survey has been explicitly sent to the following ICT associations with their endorsement to distribute to their members:
Hon. Charles Mok, Legislative Councillor (ICT) (www.charlesmok.hk): The member base consists of over 8,000 legitimate voters, which were well proven by the HKSAR government

Hong Kong Computer Society (www.hkcs.org.hk): The largest and oldest ICT professional body in Hong Kong with over 3,000 members

Internet Society (HK Chapter) (www.isoc.hk): A local chapter of the international ICT organization – Internet Society, members are individuals who are interested and engaged in ICT affairs

HK Wireless Technology Industry Association (www.hkwitia.org): ICT trade association with all wireless technology related developers as members

HK Retail Technology Industry Association (www.hkrtia.org): ICT trade association with all retail technology related developers as members

The web survey lasted for four weeks from 1st November to 2nd December 2013. In total the sample size reached 512, including 39 which were missing data, giving 92% valid responses (473 respondents). The result is adequate to proceed to partial least squares (PLS)-based data analysis. Details of the research results will be discussed in Chapter 4.

3.3.4 Research Instrument and Data Collection

As discussed in section 3.4.3, respondents of the research are based on five organizations from the ICT industry, the selection is targeting their industry status in
gaining a more insightful result for future strategy planning. Letters of support were
received from their chairpersons to ensure the formality of the research. Upon
receiving the consent of the respondents, the survey provided an information
statement from the University of Newcastle, Australia in explaining the purpose and
instructions of the survey, in order to be fully ethical and efficient in receiving a
satisfactory response (cf. 3.2.4).

To test the model and related hypotheses in accordance with the Australian *National
Statement on Ethical Conduct* in Human Research, computer literate persons of age 18
or above are invited to complete an online survey, and the survey was distributed
through an online platform called Survey Monkey


The advantages of using an electronic survey are to ease implementation and manage
large-scale data collection with minimal administration (Braithwaite, Emery, Lusignan,
& Sutton, 2003). It can also establish the status of computer literacy of the participants
automatically. The survey questions are provided in Appendix A.

### 3.3.5 Ethical Considerations

In accordance with the Australian *National Statement on Ethical Conduct* in Human
Research, all research that is undertaken by people who are not staff or students of
the University of Newcastle, are required to get approval from the University’s Human
Research Ethics Committee (HREC) before commencement. Therefore, an approval to
conduct the research was obtained from HREC (Approval Number H2013-0320 –
Appendix B). Key ethical issues on voluntarism, privacy, and research status are taken in detailed consideration.

With regards to voluntarism, an information statement of the research was distributed to the members of the Information and Communication Technology professional bodies from the five targeted organizations, which consists of details of the research purpose, requirements and rights of the participants, in the email invitation of the survey. The Participant Information Statement has clearly stated that participation is entirely voluntary based and participants can withdraw any time until they submitted a completed questionnaire. The statement is also displayed on the front page of the survey and participants are required to confirm before they further proceed to the survey. Since it is an anonymous survey, individual consent is implied at the completion and the turn in stage of the questionnaire.

Regarding privacy, no personal information is collected and collected data are stored securely and can only be accessed by the researchers if consent is given, otherwise, except as required by law.

3.3.6 Data Analysis Methods – SEM

With support from the above discussion, the PLS technique is considered to be the best data analysis tool for the study, as it functions to conduct analysis through SmartPLS 2.0 (Sarstedt, Ringle, & Hair, 2014). The result will be discussed in Chapter 4.

Under the structural equation modelling (SEM), a two-step procedure is involved to assess the measurement model, followed by the structural model estimation. Model
estimation will then deliver empirical measures of the relationships between the indicators and the constructs ‘measurement models’, and with the constructs ‘structural model’, where the behavioural change of citizens’ use of e-Government and their trust and transparency can be observed.

**Step 1 : Assessment of the Measurement Models**

The measurement model manages the relationships between the constructs, observed variables and the constructs that are measured by observed variables. The measurement model involves the assessment of the construct validity, convergent validity and discriminant validity of the reflective constructs (Barclay et al., 1995).

**Step 2 : Assessment of the Structural Model**

This structural model refers to the relationships between the constructs under a structured related framework or path diagram. The PLS presents the degree of contribution of the constructs, that assists the researcher to test the hypotheses according to the theoretical framework (Hair et al., 2014).

While model assessment focuses on the measurement models, the assessment of PLS-SEM enables researcher to evaluate the validity and reliability of the construct measures.

**3.3.7 Validity and Reliability**

According to PLS-SEM, it is necessary to consider two types of measurement specification when developing constructs – reflective and formative measurement
models. The reflective measurement model measures the effects of underlying construct while formative measurement model assesses the causes of the constructs that accounted to indicators (Hair et al., 2014). In this research, only reflective measurement models will be used.

Assessment of the Measurement Model

**Assessment of reflective measurement models**: The assessment of the reliability of reflective measurement models have several evaluation criteria, such as indicator reliability, average variance extracted (AVE), and internal consistency (Joseph F Hair et al., 2012).

**Assessment of formative measurement models**: In comparison to reflective measurement model, the formative measurement model provides relatively fewer criteria, such as convergent validity, collinearity among indicators, significance and relevance of outer weights (Hair et al., 2014).

Assessment of the Structural Model

Under the PLS-SEM, the structural model is used to examine the degree and magnitude of the relationships between exogenous and endogenous variables, estimated path coefficients of t-statistics, standard errors, and R² examines the hypothesized relationships. The strength and direction of the relationships will be indicated through the path coefficients, while the significance of the influence will be reflected through t-statistics and standard errors, and R² value will provides the amount of variance (Hair et al., 2014).
To generate t-statistics and standard errors in this study, a bootstrapping procedure is adopted (Chin, 1998), that the calculation of t-statistics is similar to the traditional t-test, thus reflecting the significance of paths between constructs (Barclay et al., 1995).

This study has used 512 samples for procedure affirmation in order to achieve a confident estimation, the bootstrapping procedure reproduced samples with replacements from the original sample set and continues to generate samples until the specified number as required for the analysis.

3.4 SUMMARY

In this chapter, the research methods of the study are illustrated. The approach of quantitative research based on a web survey is selected for data collection and analysis. Along with the design and structure of the questionnaire, the tests of reliability and validity of the measures, and the methods of data analysis and hypotheses testing are discussed in detail. Therefore, we can focus on the findings and discuss the implications for management and future research in the following chapter.
CHAPTER 4: DATA ANALYSIS

4.1 OVERVIEW

The result of the quantitative data analysis procedures and performances will be presented in this chapter, which includes the structural model that used partial least squares (PLS)-based structural equation modelling (SEM) under SmartPLS Version 2.0. The validation of the measurement model including factor loadings, $t$-statistics, and the reliability of constructs will be demonstrated accordingly.

The assessment on the structural model will be commenced after the measurement model is evaluated and adjusted. Estimation on path coefficients, $t$-statistics, and $R^2$ values will be listed in determining degrees and magnitudes of the effects of variables and explanations of the model, followed by a summary of the findings of the testing on the hypotheses.

4.2 OVERVIEW OF SURVEY AND DATA EXAMINATION

The study analyses 512 responses that are collected from members of five organizations in the ICT industry. The valid response rate is 92.4% (473 respondents). Partial least squares (PLS)-based structural equation modelling (SEM) is adopted as the analytical tool for the estimates. The sample size is considered to be adequate in

The overall complexity of the structural model has minimal influence on the sample size requirements for PLS-SEM, as the algorithm does not compute all relationships in the structural model at the same time (Hair et al., 2014). Two recent studies evaluate the performance PLS-SEM with small sample sizes (Chin & Newsted, 1999; Wold, 1982). Another study supports the idea that PLS-SEM can provide higher levels of statistical power with small sample sizes or complex model structures when compared with the covariance-based structural equation model (CB-SEM) (Hair et al., 2014).

According to Hair (1998), a sample size of 200 is a suggested estimate for any multivariate analysis when using covariance-based structural equation model (CB-SEM) (Hair, Anderson, Tatham, & William, 1998). However, both Gefen, Straub & Boudreau (2000) and Chin (1998) suggest that sample size should be at least ten times the number of items within the most complex formative operationalization in both the structural and the measurement model.

For this study, the construct ‘attitude’ is the most complex formative operationalized in five driver constructs, with 512 sample units of data analyses, it is adequate for a PLS estimation according to previous suggestions (Gefen, Straub & Boudreau, 2000; Chin, 1998).

Respondents in this study are members from five renowned ICT organizations in its industry. The Hong Kong Computer Society (HKCS), Internet Society (ISOC), and The
Legislative Councillor (IT) Charles Mok’s Office’s members are individual based, while members of the Hong Kong Retail Technology Industry Association (RTIA) and the Wireless Technology Industry (WTIA) are company based, therefore, a wide variety of ICT practitioners in terms of job roles and positions are covered. Respondents are all Internet users with proficient knowledge of managing information technologies such as social media. (See Table 4.1, 4.2 and 4.3).

Table 4.1 displays the characteristics of respondents’ background information, while basic analysis will firstly be presented including age, gender, marriage status, education, frequency of using social media, level of proficiency, purpose of using social media, selection of social media platform, engagement level on social media and experience in using e-Government services.

RESPONDENTS’ PROFILE

Age

Among 473 respondents, the average age is 36.48 with a standard deviation of 7.88. The median is 38; showing that respondents have mature character and working experience. The age range starts from late 20s to mid-40s where fresh IT workers are neglected because the respondents are drawn from ICT professional bodies, it is only to be expected that youngsters aged in their early 20s might not be eligible to join their membership.

Gender
The gender of respondents is nearly a 2:1 ratio of male to female, with 63.2% responses from 299 males and 36.8% responses from 174 females. Since it is known that most of the ICT practitioners in Hong Kong are male (VTC, 2012), it is logical that the majority responses are from male users.

Marriage Status

Among the respondents, 60% are married and the remaining minority are single. It is reasonable to have a result of more married status spending more hours in using social media, which matches with other studies (PewResearch, 2014).

Education

From the responses, over 96.6% are well educated, with 48.8% with a Bachelor degree and 47.8% with a Master degree or above. The results reflect the survey methodology, which invited members from ICT professional bodies.

Frequency of using social media

From the responses, respondents use social media every day, with their daily usage of 6.33, and average access to social media is 7.57 times per day. The responses are reasonable as their level of usage is in keeping with business and personal levels, which assumes they are connected with social media all the time.

Level of Proficiency

Around 65% respondents believed that they are capable of managing social media; the result is reasonable due to their continuous high usage in social media per day.
Purpose in using Social Media

Almost 80% respondents who use social media for both business and personal use, the remaining 20% are majorly for personal use. One major reason for the result is that ICT professional bodies depend on social media in their work, so it is reasonable for them to engage at a high level with social media in both contexts.

Selection of social media platform

More than 70% of the respondents have access to Facebook, 50% of them have access to LinkedIn and 38.7% to YouTube. The result matched the results of other research (Fan & Gordon, 2014), which finds that Facebook remains the most popular social media platform in Hong Kong and the world. Moreover, Twitter ranked the lowest type of social media platform among the respondents’ feedback, which can be explained by geographical cultural practice that most of Hong Kong social media users prefer using WeChat instead of Twitter (GlobalWebIndex, 2014).

Engagement level on social media

Over 65% of the respondents believed that they are highly engaged in using social media, this is a reasonable feedback as they are major practitioners of the ICT industry who are early adopters in using new communication technologies such as social media.

Experience in using e-Government services

96% of the respondents have experience in using e-Government services.

Table 4.1: Demographic characteristics of the survey participants (N=473)
Table 4.2 shows the characteristics of using online services. It finds social media is popularly used for both personal and business purpose. Among social media platforms that are commonly used, Facebook has a dominant usage of 86.2%, which aligned with related research such as the study of Digital Media in Hong Kong conducted by the Singapore Management University (https://wiki.smu.edu.sg/digitalmediaasia/Digital_Media_in_Hong_Kong). The second popular social media platform is LinkedIn. One reason for its popularity is because LinkedIn have established an office in Hong Kong in 2012 (http://www1.investhk.gov.hk/wp-content/uploads/2012/11/2012.11-linkedin-en.pdf). Similar to Facebook, YouTube is ranked at the top three most popular social media by researches at all time (http://www.socialnetworkingwatch.com/international-social-netw.html). Moreover,
71.9 % (65.3% + 6.6%) of the respondents believed they are ‘quite intensive’ in using social media.

96% of the respondents have experienced in using e-Government services, noted that weather forecasting and transportation status are the most popular public online services at a rate of 84.6% (79.4%+5.2%) and 58.6% (53.4%+5.2%) participation respectively.

Lastly, 60% of respondents installed the “GovHK” applications, reflecting a low penetration of e-Government services in social media, which reflects the situation discovered by the Audit Commission Report 2013 about the HKSAR (Audit Commission, 2013).
Table 4.2: Characteristics of using online services for the survey participants (N=473)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose in using social media (N=473)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>102</td>
<td>21.6</td>
</tr>
<tr>
<td>Business</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Both</td>
<td>370</td>
<td>78.2</td>
</tr>
<tr>
<td><strong>Accounts for using social media (N=473)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>333</td>
<td>70.4</td>
</tr>
<tr>
<td>Twitter</td>
<td>32</td>
<td>6.7</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>236</td>
<td>49.8</td>
</tr>
<tr>
<td>YouTube</td>
<td>183</td>
<td>38.6</td>
</tr>
<tr>
<td>Blog</td>
<td>87</td>
<td>18.3</td>
</tr>
<tr>
<td>All of the above</td>
<td>75</td>
<td>15.8</td>
</tr>
<tr>
<td>Other types of accounts</td>
<td>21</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Intensity of using social media (Valid n=473)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely Intensive</td>
<td>31</td>
<td>6.6</td>
</tr>
<tr>
<td>Quite Intensive</td>
<td>309</td>
<td>65.3</td>
</tr>
<tr>
<td>Slightly Intensive</td>
<td>85</td>
<td>18</td>
</tr>
<tr>
<td>Neither</td>
<td>22</td>
<td>4.6</td>
</tr>
<tr>
<td>Slightly Unintensive</td>
<td>11</td>
<td>2.3</td>
</tr>
<tr>
<td>Quite Unintensive</td>
<td>10</td>
<td>2.1</td>
</tr>
<tr>
<td>Extremely Unintensive</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Experience in using e-Government services (Valid n=473)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>454</td>
<td>96.0</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Using experience of e-Government services with: (N=473)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxation</td>
<td>129</td>
<td>27.2</td>
</tr>
<tr>
<td>Library</td>
<td>107</td>
<td>22.6</td>
</tr>
<tr>
<td>License renewal</td>
<td>44</td>
<td>9.3</td>
</tr>
<tr>
<td>Weather forecasting</td>
<td>376</td>
<td>79.4</td>
</tr>
<tr>
<td>Transportation status</td>
<td>253</td>
<td>53.4</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>186</td>
<td>39.3</td>
</tr>
<tr>
<td>All of the above</td>
<td>25</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Installed GovHK on social media platform (Valid n=473)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>280</td>
<td>59.2</td>
</tr>
<tr>
<td>No</td>
<td>193</td>
<td>40.8</td>
</tr>
</tbody>
</table>
Table 4.3 : Combination of using online services for the survey participants (N=473)

<table>
<thead>
<tr>
<th>Most using social media (about 10%) in the following accounts combination (Valid n=473)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>All types of accounts</td>
<td>82</td>
<td>17.3</td>
</tr>
<tr>
<td>Facebook &amp; LinkedIn</td>
<td>94</td>
<td>19.9</td>
</tr>
<tr>
<td>Facebook &amp; YouTube</td>
<td>61</td>
<td>12.9</td>
</tr>
<tr>
<td>Facebook, LinkedIn, &amp; YouTube</td>
<td>52</td>
<td>11.0</td>
</tr>
<tr>
<td>Only Facebook</td>
<td>44</td>
<td>9.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Most using e-Government services (about 10%) with following combination (Valid n=473)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather forecasting, Transportation status, &amp; Leisure activities</td>
<td>97</td>
<td>21.8</td>
</tr>
<tr>
<td>Weather forecasting &amp; Transportation status</td>
<td>67</td>
<td>15.1</td>
</tr>
<tr>
<td>Only Weather forecasting</td>
<td>48</td>
<td>10.8</td>
</tr>
</tbody>
</table>

4.2.1 Data Examination

Prior to data analysis, a screening of data for outline checking and missing values is very important. An extensive data cleanup process is undertaken and the data is reviewed line by line to look for potential errors caused by irrational or missing data (Alreck & Settle, 1995; Bryman & Bell, 2011). Missing data are often a problem in research, as it occurs when a respondent purposely or unintentionally fails to answer one or more questions. The observation will be removed when the amount of missing data exceeds 15%.

As the study is using SmartPLS 2.0 (Ringle, Wende, & Will, 2005) as the analytical tool, this offers two ways to handle missing values in general. First, the SmartPLS works to remove all cases from the analysis that include missing values (case wise deletion), which might come out with two issues in that it might systemically delete a certain group of respondents, or the number of observations in the data set will be dramatically reduced. Alternatively, the SmartPLS offers another function where the missing values of an indicator variable is replaced by mean of valid values of that
indicator, but the mean value replacement might decrease the variability in the data and might reduce the possibility of finding meaningful relationship, so, it is strongly recommended to ensure low levels of missing data (Hair et al., 2014).

There are 39 responses out of 512 (7.6%) where missing data were found. The researcher has taken the mean value replacement approach to settle the missing data issue.

The model is composed of 13 reflective constructs to examine the effect of predictors for the endogenous variables of the study; namely perceived usefulness, perceived ease of use, perceived risk, trust, compatibility, attitude, subjective norms, perceived behaviour, intended e-participation of citizens, e-Government transparency, transparency of e-Government services, trust in government in general, and trust in e-Government services.

4.2.2 Reflective and Formative Measures

One of the recent advancements of structural equation modelling (SEM) is the use of formative and reflective constructs, it finds that the selection takes place according to a few major rationales, they can include conceptual criteria for determining whether constructs should be specified as formative or reflective constructs (Edwards & Bagozzi, 2000), inadequate software (Chin, 1998; Gefen et al., 2000) and knowledge, (Jarvis, MacKenzie, & Podsakoff, 2003) to support the estimation of formative constructs. The introduction of PLS-based structural equation modelling (SEM) provides an analytical tool that suits both reflective and formative constructs. In
recent years, development of the software has made it capable of handling both types of constructs in order that researchers may develop reflective and formative constructs. However, it still suggests difficulties in anticipating the nature of an indicator as reflective or formative (Hair et al., 2014).

The reflective model refers to the measures that represent the effects of an underlying construct. (Hair et al., 2014). The reflective items are highly correlated as they represent a construct of reflections or manifestations. While variation in a construct could lead to a simultaneous variation in its indicators (Bollen, 1998), indicators associated with a particular construct should be highly correlated with each other and individual items should be interchangeable (Hair et al., 2014). For example, an individual change in perceived ease of use construct in the study model, resulting in corresponding changes in each manifest indicator of perceived ease of use and so it will be identified as a reflective construct.

On the other hand, the formative measurement model is entirely opposite to the characteristic of a reflective indicator, based on the assumption that indicators cause the construct, indicators are not interchangeable, and each indicator of a formative construct captures a specific aspect of the construct’s domain (Hair et al., 2014). The formative items show a direct causal relationship from the item to the latent variable (Diamantopoulos & Winklhofer, 2001), they are not correlated and measure in different dimensions of the latent variable (Chin, 1998).

As a result, Diamantopoulos (2006) raises a concern over the circumstance that all possible cause related to the formatively measured latent variable are accounted to
the indicators by practice (Diamantopoulos, 2006), thus the establishment of acceptable level on measurement validity ahead of the analysis on the structural relationships is vital in the PLS-SEM studies, including formative measures, as the measures help determine the significance of the indicators that represent the entire domain of the content domain (Hair et al., 2014). In addition, modelling reflective or formative constructs requires theoretical justification (Diamantopoulos & Siguaw, 2006; Jarvis et al., 2003), however, it may be difficult to explore the theoretical interpretation of a construct.

4.3 MODEL ASSESSMENT

4.3.1 Assessment of the Measurement Model

The model consists of 13 constructs, with all constructs containing reflective items or indicators. Reliability and validity are important for the assessment of the measurement model. With regards to the assessment of reflective measurement models, a few common approaches including composite reliability are involved to evaluate internal consistency, individual indicator reliability and average variance extracted (AVE), taking into account an evaluation of convergent validity. Furthermore, Fornell-Larcker (1981) and cross loadings are used to assess discriminant validity.

In the evaluation of PLS-SEM result, a two-step approach needs to be conducted. First, evaluate the quality of the measurement models and the structural model, both types of measurement model on reflective and formative have their own types of evaluation
criteria, but since the study model only includes reflective items and constructs, the assessment focuses on its reliability and validity (Hair et al., 2014).

Satisfactory outcomes on the measurement model are prerequisites to evaluating the relationships in the structural model by testing the significance between path coefficients and coefficient of determination (R² value).

The objective of reflective measurement model assessment is to ensure the reliability and validity of the construct measures to provide support for the suitability of their inclusion in the path model. The key assessment criteria include reliability, composite reliability, convergent validity and discriminant validity, requirements will be met when reflective constructs are fit for PLS-SEM (Hair et al., 2014).

As the study is analysed by SmartPLS software, all relevant results for the evaluation of the measurement models will be provided through appropriate tables and figures to illustrate the PLS-SEM results.

### 4.3.2 Internal Consistency

In general, the first criterion to be evaluated is internal consistency, it is measured through the calculation of composite reliability (CR) (Fornell & Larcker, 1981), which is considered to be excellent in managing the traditional measures of consistency such as Cronbach’s alpha (Hanlon, 2001). Then Cronbach’s alpha provides an estimate on the reliability based on the inter-correlations of the observed indicator variables, it assumes all the indicators have equal outer loadings on the construct, in another words, all indicators are equally reliable.
The composite reliability varies between 0 and 1, in which a higher value indicates a higher level of reliability and vice versa, similar to Cronbach’s alpha, 0.60 to 0.70 are acceptable degree in exploratory research (Hair et al., 2014), and for a coefficient value over 0.70 in the estimates of composite reliability will be reliable for further analysis (Barclay et al., 1995; Hair et al., 2011). As shown in Table 4.3, all constructs met this criterion. The reflective construct of perceived behavioural control has the lowest internal consistency of 0.8744 while intended e-participation of citizens has the highest value of 0.9775. All of the remaining constructs have an internal consistency of minimum 0.8, which is considered as satisfactory. As yet, Nunally and Bernstein (1994) (Nunnally & Bernstein, 1994) suggests that values above 0.90 (and definitely >0.95) are not desirable because this indicates that all the indicator variables are measuring the same phenomenon and is therefore unlikely to be a valid measure of the construct (Hair et al., 2014).

4.3.3 Convergent Validity

Convergent validity is the extent to which the measure correlates positively with other measures or indicators of the same construct (Hair et al., 2014), the assessment of convergent validity is a basic and essential part of the assessment of the model. Fornell & Larcker, (1981) suggest the psychometric properties of the measurement model are assessed through the evaluation of reliability, convergent validity and discriminant validity; while reliability of the constructs is evaluated by composite reliability and Cronbach’s alpha, the magnitude and significance of standard path loadings are used to examine the construct validity.
To establish convergent validity, researchers have considered the outer loadings of the indicators, as well as average variance extracted (AVE), it is a common measure to establish convergent validity at the construct level, defined as the grand mean value of the squared loadings of the indicators associated with construct, hence the AVE is equivalent to communality of a construct, AVE valued 0.50 or higher indicates that the construct explains more than half of the variance of its indicators. In contrast, an AVE of less than 0.50 indicates more error remains in the items than the variance explained by the construct (Hair et al., 2014). In addition, Fornell & Larcker (1981) also specify on a minimum of 0.5 that average variance extracted (AVE) should be valued in convergent validity.

As shown in Table 4.3, the variable perceived behavioural control appeared with the lowest AVE score of 0.6357 while variable perceived risk appeared with the highest AVE score of 0.9445, indicating a very satisfactory convergent validity for all reflective constructs.

4.3.4 Item Reliability

Item reliability assess the loadings for each individual item, Table 4.3 indicates the correlation of the items with their respective constructs. According to Nunnally (1994), low loading items would decrease the correlation among items in the construct. Item reliability also measures the level of random error for each construct; the lower the item loading, the higher the level of random error, thus, this procedure is essential to locate and eliminate items in a particular construct which could increase its level of random error (Nunnally, 1994). Moreover, high item loadings represented
the reliability of the measure of the latent variable, Hair et al. (1998) suggests that loadings value 0.3 will be significant, and more significant when it comes to 0.4, and very significant when it is 0.5; Chin (1998) believes item loadings should be above 0.5, while Carmines & Zeller (1979) suggest maintaining 0.7 as the reliability limit whilst Barclay et al. (1995) suggested 0.707 as the minimum limit.

Based on the above literature, a minimum value of 0.5 is considered to measure the convergent validity of the measurement model; hence all constructs are satisfactory and fulfilled the minimum requirements at a level of above 0.7.
Table 4.4: Psychometric Properties for Reflective Constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Loading</th>
<th>CR</th>
<th>AVE</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness</td>
<td>USEFULNESS_1</td>
<td>0.9252</td>
<td>0.9626</td>
<td>0.8654</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>USEFULNESS_2</td>
<td>0.9439</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USEFULNESS_3</td>
<td>0.9445</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USEFULNESS_4</td>
<td>0.907</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>EASE_OF_USE_1</td>
<td>0.858</td>
<td>0.9347</td>
<td>0.8269</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>EASE_OF_USE_2</td>
<td>0.9393</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EASE_OF_USE_3</td>
<td>0.9286</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived risk</td>
<td>PER_RISK_1</td>
<td>0.9505</td>
<td>0.9715</td>
<td>0.9445</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>PER_RISK_3</td>
<td>0.9717</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>TRUST_SMEDIA_1</td>
<td>0.9297</td>
<td>0.9267</td>
<td>0.8634</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>TRUST_SMEDIA_2</td>
<td>0.9287</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Compatibility</td>
<td>COMPATIBILITY_1</td>
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<td>0.979</td>
<td>0.9395</td>
<td>0</td>
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<tr>
<td></td>
<td>COMPATIBILITY_2</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>COMPATIBILITY_3</td>
<td>0.9769</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>ATTITUDE_1</td>
<td>0.8013</td>
<td>0.942</td>
<td>0.7306</td>
<td>0.6232</td>
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<tr>
<td></td>
<td>ATTITUDE_2</td>
<td>0.8276</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>ATTITUDE_3</td>
<td>0.8236</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATTITUDE_4</td>
<td>0.8815</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATTITUDE_6</td>
<td>0.8971</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>ATTITUDE_7</td>
<td>0.8925</td>
<td></td>
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</tr>
<tr>
<td>Subjective norms</td>
<td>SUB_NORMS_1</td>
<td>0.8773</td>
<td>0.9279</td>
<td>0.6829</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>SUB_NORMS_2</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>SUB_NORMS_3</td>
<td>0.8507</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>SUB_NORMS_4</td>
<td>0.7301</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUB_NORMS_5</td>
<td>0.7916</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUB_NORMS_6</td>
<td>0.8187</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived behavioural control</td>
<td>BEV_CNTL_2</td>
<td>0.8312</td>
<td>0.8744</td>
<td>0.6357</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>BEV_CNTL_3</td>
<td>0.8217</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEV_CNTL_4</td>
<td>0.7989</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEV_CNTL_5</td>
<td>0.7338</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intended e-participation of citizens</td>
<td>E_PART_1</td>
<td>0.9463</td>
<td>0.9775</td>
<td>0.8614</td>
<td>0.7931</td>
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4.3.5 Discriminant Validity

Regardless of the assessment of the measurement model, discriminant validity exists in evaluations where constructs diverged from one another, where a construct is truly distinct from other constructs by empirical standards, and every valid construct is unique and captures phenomena, which have not represented by other constructs in the model. Two measures of discriminant validity, cross loadings and Fornell-Larcker’s criterion (square root of the AVE) are widely used (Barclay et al., 1995; Hair et al., 2014).

When accessing cross loadings from the indicators, an indicator’s outer loading on the associated construct should be greater than all of its loadings on other constructs. The presence of cross loadings exceeds indicators’ outer loadings represents a discriminant validity problem (Hair et al., 2014).

Another approach is the criterion made by Fornell-Larcker, which is a more conservative approach in assessing discriminant validity. It compares the square root of the AVE values to the latent variable correlations (Hair et al., 2014). According to Igbaria, Guimaraes, & Davis (1995), a model is accepted as discriminant validity if the square root of the AVE of a construct is larger than its correlation with other constructs. On the other hand, Barclay et al. (1995) comment that the constructs could be a discriminant when the loading of items within a construct is greater than any other item within the same column.

4.3.5.1 Discriminant validity at construct level
According to Fornell & Larcker (1981), constructs are considered to have adequate discriminant validity when the square root of the AVE is greater than the inter-construct correlations.

Table 4.4 presents the square root of AVE and the inter-construct correlations. The inter-construct correlations are present in off-diagonals while the values for the square root of the AVE placed as the main diagonal in the matrix in italic font. The correlations of latent variables in off-diagonal elements need to be less than or equal to the italic font in order to prove discriminant validity among the reflective constructs (Barclay et al., 1995; Gefen et al., 2000; Hair et al., 2011). As a result, while the italic diagonal values are greater than the off-diagonal correlation values in their corresponding rows and columns, the measurement model meets the criterion for discriminant validity, and prove an adequate discriminant validity among the study constructs to allow the structural model estimation to proceed with no item required to be deleted from the model.

4.3.5.2 Discriminant validity at item level

The study also provides assessment of discriminant validity at item level, in comparing the loadings and cross-loadings of the measures. The loading of items within a construct as shown in the columns should be greater than the loading of any other item in order to prove discriminant validity among the constructs (Barclay et al., 1995). In Table 4.5, the loadings and cross-loadings of items and constructs have showed in the cross-loading matrix, demonstrates a high correlation between constructs and
relevant measurement items, as shown in italic and bold figures, which are significantly higher than the items in the same column with other constructs.

In conclusion, the model has demonstrated both convergent and discriminant validity very well.
Table 4.5: Correlation Matrix for Reflective Constructs

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Legend:
- ATT: Attitude
- COMP: Compatibility
- EGT: E-Govt Transparency
- IEPOC: Intended E-Participation of Citizens
- PBC: Perceived Behavioural Control
- PEOU: Perceived Ease of Use
- PR: Perceived Risk
- PU: Perceived Usefulness
- SN: Subjective Norms
- TRAOGIG: Transparency on Govt in General
- TRUST: Trust on Social Media
- TOEGS: Trust on E-Govt Services
- TRUOGIG: Trust on Govt in General
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**LEGEND:**

- ATT: ATTITUDE
- PBC: PERCEIVED BEHAVIOURAL CONTROL
- SN: SUBJECTIVE NORMS
- COMP: COMPATIBILITY
- PEOU: PERCEIVED EASE OF USE
- TRAOOGIG: TRANSPARENCY ON GOVT IN GENERAL
- EGT: E-GOV'T TRANSPARENCY
- PR: PERCEIVED RISK
- TRUST: TRUST ON SOCIAL MEDIA
- IEPOC: INTENDED E-PARTICIPATION OF CITIZENS
- PU: PERCEIVED USEFULNESS
- TOEGS: TRUST ON E-GOV'T SERVICES
- TRUOGIG: TRUST ON GOVT IN GENERAL
4.4 STRUCTURAL MODEL

Once it is confirmed that the construct measures are reliable and valid, the next step is to assess the result from the structural model, which assists in describing the relationships between latent variables. The variances are associated with endogenous variables that determine explanatory power of the proposed model.

It is important to understand that PLS-SEM fits the model to obtain the best parameter estimates to the sample data by maximizing the explained variance of endogenous latent variables. The path coefficients and $t$-values are calculated to address the effects of the constructs and their underlying relationships according to the proposed theoretical framework. The hypothesised relationships between the constructs could be calculated by two methods, namely ‘bootstrap’ (Gefen et al., 2000). ‘Bootstrap’ is widely used in the PLS framework as it produces $t$-value and $R^2$ value, according to Hair (2014), it means a large number of subsamples are drawn from the original sample with replacement, that each observation draws at random from the sampling population, and return to the sampling population before the next observation is drawn. The number of bootstrap samples should be high and have at least equal numbers of valid observations in the data set. As a rule of thumb, 5,000 bootstrap samples are recommended (Hair et al., 2014).

The bootstrapping technique is used to calculate the $t$-statistics, similar to the traditional $t$-test uses in interpreting the significance of the paths between study constructs (Barclay et al., 1995). Moreover, the $R^2$ value indicates the explanatory
power of exogenous variables within a model in multiple regression analysis, since the value estimates variance associate with endogenous construct, the proposed overall model can be evaluated. In addition, lambda y represents the loadings for all measured variables (Byrne, Shavelson, & Muthén, 1989), and PLS has the advantages in assessing the path loadings and structural relationships between the study constructs for reflective and formative constructs (Chin & Newsted, 1999; Hanlon, 2001).

4.4.1 Nomological Validity

The coefficient of determination ($R^2$ value) is the most widely used measure to evaluate structural model (Hair et al., 2014), the model’s predictive accuracy in the coefficient is calculated as the squared correlation between a specific endogenous construct’s actual and predicted values. The $R^2$ value ranges from 0 to 1 with higher levels indicates a higher levels of predictive accuracy, although Falk & Miller (1992) propose that minimum $R^2$ should be 0.10, there is no standard to justify an acceptable $R^2$ value, as it depends on the model complexity and research discipline.

4.4.2 Tests of Hypotheses

As shown in Table 4.7, the results depict significant effects of perceived usefulness on attitude ($\gamma = 0.1937$, $t=2.3333$, $R^2=0$). Therefore, Hypothesis $H_1$ is supported.

Hypothesis $H_2$ is developed in assessing the influence of perceived ease of use on attitude ($\gamma = 0.0712$, $t=0.7829$, $R^2=0$). As a result, the Hypothesis $H_2$ is rejected.
Perceived risk is hypothesized to have no correlations with attitude, while the effect of perceived risk on attitude is $\gamma = 0.0045$, $t=1.5762$, $R^2=0$. Therefore, the Hypothesis $H_3$ is supported.

Hypothesis $H_4$ shows that trust has a positive relationship on attitude ($\gamma = 0.4096$, $t=6.0908$, $R^2=0$).

The effects of compatibility on attitude are postulate in Hypothesis $H_5$. The results depict a positive and significant effect of compatibility on attitude ($\gamma = 0.1908$, $t=2.4505$, $R^2=0$).

As postulate in Hypothesis $H_6$, the study results show that attitude has significant effects on intended e-participation of citizens ($\gamma = 0.5505$, $t=11.6267$, $R^2=0.7931$). Thus, the relationship between attitude and intended e-participation of citizens as postulated in Hypothesis $H_6$ is accepted.

Hypothesis $H_7$ is developed to assess the influence of subjective norms on intended e-participation of citizens ($\gamma = 0.2931$, $t=6.2727$, $R^2=0$). As a result, the Hypothesis $H_7$ is accepted.

The effects of perceived behavioural control on intended e-participation of citizens are postulated in Hypothesis $H_8$. The results depict a positive and significant effect of perceived behavioural control on intended e-participation of citizens ($\gamma = 0.1325$, $t=3.8314$, $R^2=0$).

As postulate in Hypothesis $H_9$, the study that intended e-participation of citizens has significant effects on trust on e-Government services ($\gamma = 0.8596$, $t=33.4123$, $R^2=0$).
Thus, the relationship between intended e-participation of citizens and trust in e-Government services in Hypothesis H9 is accepted.

Hypothesis H10 is developed to assess the influence on intended e-participation of citizens on trust in government in general ($\gamma = 0.8276, t=32.9549, R^2=0.7931$). As a result, the Hypothesis H10 is accepted.

The effects of intended e-participation of citizens on e-Government transparency are postulated in Hypothesis H11. The results depict a positive and significant effect of intended e-participation of citizens on e-Government transparency ($\gamma = 0.833, t=33.9521, R^2=0.7931$).

As postulated in Hypothesis H12, the study results show that intended e-participation of citizens has significant effects on transparency of government in general ($\gamma = 0.7866, t=26.2945, R^2=0.7931$). Thus, the relationship between intended e-participation of citizens and transparency on government in general in Hypothesis H12 is accepted.
Figure 4.1: Results of the Structural Model
Table 4.7: The Comprehensive Model Estimates

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4.6 FINDINGS

4.6.1 Hypothesis $H_1$ (Perceived usefulness -> Attitude)

The theory of TAM (Technology Acceptance Model) (Davis, 1989) defines as the perceived degree that an individual believes in using a specific service or system to improve his or her task performance. TAM is based on the Theory of Reasoned Action (TRA) developed by Fishbein & Ajzen (1975). In the last decade, both theories have considered the perceived usefulness construct as one of the important theories to determine individual acceptance and the use of information technologies (Keil, Beranek, & Konsynski, 1995; Malhotra & Galletta, 1999), and it is confirmed that the construct can predict individual level of acceptance of information technologies (Adams, Nelson, & Todd, 1992; Chin & Todd, 1995; Doll, Hendrickson & Deng, 1998; Moon & Kim, 2001).

Based on the notion of the TRA and TAM supported by previous studies, it is anticipated that perceived usefulness has a direct and positive influence on attitude (Hung et al., 2006; Porter & Donthu, 2006; Saadé & Bahli, 2005). The findings reveal that perceived usefulness ($\gamma = 0.1937$) is directly related to attitude, which is consistent with previous studies (Hung et al., 2006; Van der Heijden, 2003), aligned with the notion of the Theory of Reasoned Action (TRA) and the Technology Acceptance Model (TAM).

As mentioned, this study is adopted from Hung et al.’s (2006) research, perceived usefulness is shown to have a positive relationship with attitude, the current result
shares the same hypothesis, indicating that respondents agree that e-Government services in Hong Kong can extend to the use of social media such as Facebook, LinkedIn and YouTube. They believe the use of social media in e-Government services can enhance their productivity, for instance, weather checking from the observatory through social media is agreed to be time saving and convenient. In summary, the more useful the e-Government services through social media are perceived, the better the attitude towards using the services, thus the HKSAR Government should explore more adoption of appropriate e-Government services through social media platforms, to gain wider usage and stronger support from the public.

In the meantime, government officials and relevant policy makers might also find this information useful to support the increased establishment of social media in existing e-Government services (UN, 2012).

4.6.2 Hypothesis $H_2$ (Perceived ease of use -> Attitude)

Same with perceived usefulness, perceived ease of use is another construct that is well proven in both Technology Acceptance Model (TAM) (Davis, 1989) and the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). According to Davis (1989), the perceived ease of use refers to the degree that a person believes that using a particular system can be effortless. This construct is well demonstrated in recent research (Tractinsky, Katz & Ikar, 2000; Heijden, 2003). In addition, Hung et al. (2006) has also proved perceived ease of use can provide positive relationship with attitude.
However, *perceived ease of use* was found to have no influential effect on *attitude* in this study, as the result is ($\gamma = 0.0712$, $t=0.7829$, $R^2=0$), showing that respondents feel very happy to learn and comfortable when using social media in e-Government services, and its availability does not affect their selection to services, this can be explained by respondents’ high proficiency level in managing technology and high intensity in using social media.

### 4.6.3 Hypothesis $H_3$ (Perceived risk -> Attitude)

Bauer (1960) starts raising this construct in the TAM theory, and discusses the combination and seriousness which might affect the relationship with attitude; it is also defined as a user’s subjective expectation of suffering, which would cause a loss in pursuit of a desired outcome (Warkentin et al., 2002), moreover, recent studies have explored the role of perceived risk in e-commerce (Gefen et al., 2003), for example, Chiu, Wang, Fang, & Huang (2014) proves that a higher level of perceived risk would negatively affect intention to repeat purchase. As perceived risk is a multidimensional construct, it has been reviewed by researchers from different backgrounds, Chiu, Wang, Fang and Huang (2014) have focused on four dimensions in financial loss, product performance, privacy and product delivery (Chiu et al., 2014), where Moutinho (1987) proposes five categories for perceiving risk as functional, physical, financial, social and psychological (Moutinho, 1987).

In this study, the perceived risk does not focus on any category but tests the respondents views on it when e-Government services is delivered through social media, the result shows that there is no influence between *perceived risk* and *attitude*.
(γ = 0.045, t=1.5762, R²=0), which means respondents will not be affected by any risk concern when using e-Government services through social media. This might be a motivation for the government officials to plan for their upcoming e-Government services.

4.6.4 Hypothesis \( H_4 (\text{Trust} \rightarrow \text{Attitude}) \)

Trust is widely discussed in literatures, similar to perceived usefulness (PU) and perceived ease of use (PEOU), trust is hypothesized in many researches (Gefen et al., 2003). In recent researches on e-Government, it is shown that trust would have a positive relationship to attitude as well as intention to use (Bélanger & Carter, 2008; Kim & Lee, 2012). Citizens need to have confidence in the government, to enable technologies and trust to generate confidence (Belanger, Hiller, & Smith, 2002).

Although Wang & Emurian (2005) believes it is difficult to define trust and identify construct elements, but Warkentin et al. (2002) proves that trust in an organization and government are crucial enablers to e-Government services adoption. Moreover, Belanger (2002) discuss technology adoption theories that are widely accepted such as TAM, DOI, suggesting trust is an important construct in adoption research, consequently they focused in attitude towards technology or citizens’ trust in government (Belanger et al., 2002).

In this study, the hypothesis is tested that whether respondents perceived social media in general and social media as part of e-Government services to be trustworthy. The test result was positive with (γ = 0.4096, t=6.0908, R²=0), which means respondents
are in favour of and believe in using social media when applied to e-Government services. The result is also aligned with the adapted research (Hung et al., 2006).

4.6.5 Hypothesis \( H_5 \) (Compatibility -> Attitude)

According to Diffusion of Innovation (DOI), Rogers (1995) defines compatibility as an innovation seen to be compatible with existing values, beliefs, experiences and needs of adopters. As social media is an emerging technology, an appropriate use of this technology can create a lot of innovations, it finds that perceived compatibility is closely associated with increased intentions to adopt e-Government initiatives. For example, citizens who are regular Internet users expect to adopt the innovation for government interaction (Carter & Bélanger, 2005). Moreover, Oh, Ahn and Kim (2003) also finds that compatibility has a positive relationship with attitudes and improvement of compatible experience that could assist in users’ adoption attitude.

The hypothesis \( H_5 \) shows a positive relationship between compatibility and attitude (\( \gamma = 0.1908, t=2.4505, R^2=0 \)), the use of social media in e-Government services is consistent with the findings in the adopted research (Hung et al., 2006), indicating that more users perceive social media as part of e-Government services to be compatible, and it improves the attitude towards using the service. This finding provides a clear direction to the HKSAR government when designing the e-Government services using social media platforms.
4.6.6 Hypothesis $H_6$ (Attitude -> Intended e-participation of citizens)

The theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) defines attitude as determined by people’s beliefs in performing the behaviour multiplied by an evaluation of the results. Another theoretical framework – theory of planned behaviour (TPB) (Ajzen, 1991) – is widely used in predicting and explaining human behaviour, constructs such as attitude, subjective norm and perceived behavioural control can be interpreted as attitude in a technology role, subjective norm in organizational members and social system roles, while perceived behavioural control in individual role. Furthermore, attitude explained the feeling of a person’s favourability, and linked behaviour to a certain outcome (Wu & Chen, 2005).

Recent e-Government research prove that attitude has a close relationship with the intention to use (Ajzen, 1991; Bertot et al., 2010; Fishbein & Ajzen, 1975; Nistor & Heymann, 2010; Oh et al., 2003; Ozkan & Kanat, 2011; Triandis, 1979), where positive attitude from citizens will result in stronger support for e-Government services.

The aim of hypothesis $H_6$ is to understand the views of respondents towards the use of social media as well as the adoption of it in e-Government services. The study result shows that attitude has significant effects on intended e-participation of citizens ($y = 0.5505$, $t=11.6267$, $R^2=0.6232$), aligned with the adopted research (Hung et al., 2006). The result indicates that the more positive the attitude received from respondents, the stronger was the intention to engage in e-participation.
4.6.7 Hypothesis \( H_7 \) (Subjective Norms -> Intended e-participation of citizens)

Similar to attitude and perceived behavioural control, subject norm is one of the key components in the theory of planned behaviour (TPB), it refers to the perceived social pressure of whether to perform the behaviour or whether an individual’s perception that others approve on one’s performing a given behaviour (Ajzen, 1991). Moreover, Ajzen (1991) indicates the effect of subjective norm on Internet application as the best; while Tan & Teo (2000) finds that there is no influence of subjective norm to the adoption in Internet banking, and Bhattacherjee (2000) suggests that subjective norm should include interpersonal and external influence. Based on these perspectives, the development of this study has covered peer influence of respondents and external factors such as news report.

The aim of the Hypothesis \( H_7 \) is developed to assess the influence of subjective norms on intended e-participation of citizens \((y = 0.291, t=6.2727, R^2=0)\). As a result, the Hypothesis \( H_7 \) is accepted, and echoed in the study results of the adopted research (Hung et al., 2006). The result indicates that the view of respondents towards e-participation will be affected by media as well as peer groups.

4.6.8 Hypothesis \( H_8 \) (Perceived behavioural control -> Intended e-participation of citizens)

According to Ajzen (1991), perceived behavioural control refers to people’s perception of ease or difficulty in performing the behaviour of interest, this construct associates
with other constructs such as attitude and subjective norms to facilitate the performance of behaviour, and it is a key element from the theory of planned behaviour (TPB) (Ajzen, 1991). In addition, it also means that the actual usage behaviour will be affected by the perception of users towards their capability of control and the essential resources required for adopting the technology (Chu, Hsiao, Lee, & Chen, 2004).

The study of this hypothesis is to understand whether the respondents have sufficient control in managing social media in terms of their perceived capability and resources. Depicting a positive and significant effect of perceived behavioural control on intended e-participation of citizens ($\beta = 0.1325$, $t=3.8314$, $R^2=0$), the result serves as a message to the government that the information technology literacy of citizens affects who is able to manage social media as well as e-Government services. Consideration should be given for more advanced e-Government that can be delivered through social media. In addition, the result also aligns with the adopted research (Hung et al., 2006).

4.6.9 Hypothesis $H_9$ (Intended e-participation of citizens -> Trust in e-Government services)

In recent e-Government research, authors suggest that an active engagement of citizens will result in more trustworthy and transparent government (Adeshara, Juric, Kuljis, & Paul, 2004; Bélanger & Carter, 2008; Basu, 2004; Bertot et al., 2010; Bertot, Jaeger, & Grimes, 2012; Bonsón et al., 2012). While another group of authors suggests that the adoption of technologies through behavioural constructs under technology adoption models, such as TAM, TRA and TPB (Bélanger & Carter, 2008; Bertot et al.,
2010; Liao, Chen, & Yen, 2007; Ozkan & Kanat, 2011; Yuen, 2009; Wu & Chen, 2005). However, there is only sparse research that studies other aspects of the connection between citizens’ trust level and e-Government services.

With regards to hypotheses \( H_1 - H_8 \), the results align with the adopted research (Hung et al., 2006) where they illustrate adoption factors for citizens to engage with e-Government services. For hypothesis \( H_9 \), the study investigates the relationship between the intended e-participation of citizens and trust in e-Government services, the result shows that intended e-participation of citizens has a positive and significant relationship on trust in e-Government services \( (\gamma = 0.8596, t=33.4123, R^2=0.7931) \), which explains that when citizens intend to engage with e-Government services, the trust in e-Government services will be enhanced.

4.6.10 Hypothesis \( H_{10} \) (Intended e-participation of citizens -> Trust in government in general)

As discussed in Hypothesis \( H_9 \), scholars study on the positive relationship between citizens’ trust in government through e-participation (Tolbert & Mossberger, 2006; Zavattaro & Sementelli, 2014) and on reduced internal bureaucracy (Welch & Pandey, 2007). For example, citizens are more willing to access government information through its website. In recent e-Government development, websites are the only electronic platform available in e-Government services (Moon, Lee & Roh, 2014), since the growing popularity of social media, more information indicates that governments are willing to extend their e-Government services to social media as they believe trust in the government can be enhanced (Mainka et al., 2014; UN, 2012a). Through the
advantages that can be captured by social media, citizens should have stronger participation in e-Government services (Zafar & Naseer, 2014) and result in more collaboration (Box, 1998).

In order to acquire a comprehensive view of citizens’ e-participation, a study of the trust in government in general is essential. The development of Hypothesis H10 is to assess the influence of intended e-participation of citizens on trust in government in general ($y = 0.8276$, $t=32.9549$, $R^2=0.7931$). From the result, it finds that the intended e-participation of citizens can create positive and significant relations of trust in government in general. When citizens participate in e-Government services, their trust will be enhanced not only in its services (cf. H9), but also to the trust in government in general. This indicates an important message to the HKSAR government, where the degree of e-participation of citizens will create an improvement in the trust in government, that will positively enhance on citizens’ e-participation, and generating stronger trust in the government and vice versa.

4.6.11 Hypothesis H11 (Intended e-participation of citizens -> e-Government transparency)

In addition to trust, transparency is another issue that is popularly discussed in recent e-Government research (Bertot, Jaeger, & Grimes, 2010; Bertot et al., 2010; Bertot, Jaeger, & Grimes, 2012; Bonsón et al., 2012). The authors discovered that e-Government services create higher transparency and result in better governance (Batorski & Hadden, 2010; Zafar & Naseer, 2014). For example, in the Punjab district in Pakistan, the government created a web portal “Punjab Portal” which aims to reduce
corruption by facilitating complaints against corrupt officers (http://www.punjab.gov.pk/). However, there is not much research which studies the effects of intended e-participation of citizens on e-Government transparency, which considers the thoughts of citizens on e-Government transparency when they intend to participate in e-Government services through social media, and this is yet to be investigated.

As a result, the result of Hypothesis $H_{11}$ depicts a positive and significant effect of intended e-participation of citizens on e-Government transparency ($\gamma = 0.833$, $t=33.9521$, $R^2=0.7931$), whereby citizens expect a higher level of transparency when engaging with e-Government services through social media. As the diffusion of social media is agile, an important note for the HKSAR government to consider is the type of social media to be adopted and the way interactive communications with citizens take place, for the possibility of different selections create the need for a detailed strategic social media policy in the future.

4.6.12 Hypothesis $H_{12}$ (Intended e-participation of citizens -> Transparency on government in general)

Similar to Hypotheses $H_9$ and $H_{10}$, the study of the intended e-participation of citizens should not be limited to e-Government transparency only. It is also important to study the relationship between the intended e-participation of citizens through the use of social media in e-Government and transparency of government in general, as both aspects are inter-connected.
As postulated in Hypothesis $H_{12}$, the study results show that the intended e-participation of citizens has significant effects on transparency of government in general ($\eta = 0.7866$, $t=26.2945$, $R^2=0.7931$). Similar to Hypothesis $H_{11}$, the respondents indicate their concern with the government in general when they engage in using e-Government services through social media. This result provides a significant illustration to the HKSAR government that citizens expect that their participation through social media in e-Government services can increase the level of transparency of the government in general.

### 4.7 SUMMARY

The results of a quantitative analysis about the survey conducted in Hong Kong in studying the effectiveness of social media in e-Government services and factors that enhance its adoption has been discussed. The study employs PLS-based structural equation modelling (SEM), analysing data from 512 respondents to a web survey. The nature of the study and the latent variables under reflective study is justified by PLS technique as the main analytical tool. The procedures of data collection, data screening and data analysis are elaborated in detail.

The analysis of the data by PLS was performed under two stages: assessment of the measurement model and structural model estimation, they are assessed through internal consistency, convergent validity and discriminant validity from the constructs. The internal consistency is evaluated by Cronbach’s alpha, which is interpreted as acceptable when it reaches to 0.60 to 0.70 in exploratory research. The convergent validity of the reflective indicators is examined under item loadings, composite
reliability and average variance extracted (AVE). In addition, the square root of AVE and cross-loading matrix for items are to determine the construct level discriminant validity. The hypotheses of the study are tested by estimating the structural model, the magnitude and degree of the estimates are examined by weight from path coefficient and t-statistics from critical ratio while nomological validity is calculated by \( R^2 \). Except for Hypothesis \( H_2 \), all the other eleven hypotheses (\( H_1, H_3 \) to \( H_{12} \)) are accepted. The implications of these results and will be discussed in Chapter 5.
CHAPTER 5: CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

5.1 OVERVIEW

As the research has been finalized in Chapter 4 where twelve hypothesis have been successfully established from the examination of the results of the research study and questionnaire, it is necessary to emphasize the present contribution of this study field. In particular it is important to note the limitations encountered and the future research directions suggested by the conclusions for advising researchers who want to further explore e-Government. In this chapter, the entire research process and outcomes will first be summarized in section 5.2. Followed by section 5.3 focusing on the theoretical and practical contributions of the research; the final section highlights the limitations of this research and outlines directions for future research.

5.2 RESEARCH SUMMARY

In summarizing the initial goals of this research project where the effectiveness of social media and factors that can enhance the public’s adoption of e-Government services, previous studies were reviewed on the growing importance of adopting social media in e-Government services because the potential benefits can feedback in to improved government in the aspects of efficiency, effectiveness, trust and transparency. Governments across continents have started introducing online public services since the development of websites became popular in late 1990s, for instance,
the development of web portals that allows citizens access to public information and provide feedback. And recent researches even highlighted the direct relationship between the utilization of e-Government services and consequent improvements in the image of government as this platform enhances the efficiency and effectiveness of government services, which results in the public placing more trust in their government. Some governments also rely on e-Government portals to lower the corruption rate, as the portal reveals more information publicly and in such a way that is easy to access, consequently increasing the level of government transparency.

The emergence of social media such as Facebook, LinkedIn, YouTube and Twitter have been challenging traditional communication mechanisms across the world, and the study of this increasingly dominant new culture has been spreading in other academic disciplinary such as marketing. As communications become interactive in real time, respondents are more willing to share and contribute their views, and enjoy contributing to the process of creating content to enrich social media platforms and disseminate information instantly to a massive audience. With these advantages, governments in Singapore, Korea, and international institutions like the United Nations (UN, 2012a), started implementing social media services to their existing e-Government services. More researchers (Bertot, Jaeger, & Hansen, 2012; Bonsón et al., 2012; Erik, 2011; Hicks, 2010; Hrdinová, Helbig, & Peters, 2010; Paul T Jaeger, Bertot, & Shilton, 2012; Khasawneh & Abu-Shanab, 2013; Song & Lee, 2013) studied the impact of social media adoption in existing government policies and found that these initiatives can deliver positive benefits to the perception of governance. Throughout this study, not only the diffusion-adoption factors of using social media in e-
Government services were sought, but further research on its impacts and consequences was conducted. The research results are adding valuable information to existing academic studies on the trust and transparency that e-Government could gain from the use of social media, and that is vital evidence for governmental organizations that plan to deliver similar e-services in the future.

In Hong Kong, the former Chief Executive Mr. Donald Tsang started to use social media in early 2012 to deliver occasional greeting messages, and the government has established a committee to focus on social media in e-Government initiatives. However, the Hong Kong government was also criticized by the Audit Commission (2013) such that the penetration level of adopting social media in e-Government was far behind in comparison to overseas countries such as Singapore, the United States and the United Kingdom. Furthermore, it is suggested that the HKSAR government needs to engage the public with a better social media strategy in order to gain a larger penetration of e-Government services.

The theoretical framework of the research is discussed in Chapter 2, through the combination of technology adoption-diffusion theories, namely the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975); diffusion of innovation (DOI) (Rogers, 1995); the theory of planned behaviour (TPB) (Fishbein & Ajzen, 1975); the technology acceptance model (TAM) (Davis Jr, 1986); and unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003), along with which the initial research model was refined from Hung, Chang, & Yu (2006)’s research into users’ acceptance of the e-taxation system in Taiwan (Hung et al., 2006). Together they were contextualized.
under a web survey. Further observations on the hypotheses were then developed into a comprehensive research model.

The methodology of this study was conducted through a quantitative research approach as discussed in Chapter 3. Before the survey was distributed, there was also a process of development in the survey instrument, questionnaire and survey design, data collection and model estimation as explained in Chapter 4. Respondents of the survey were invited from members of five renowned ICT organisations in the industry, in which 512 responses were gathered in total. A partial least squares (PLS)-based structural equation modelling (SEM) technique was selected to analyse the quantitative data, performed through software SmartPLS 2.0.

The analysis revealed the adoption of social media in e-Government services in Hong Kong is affected by the constructs subject norms and perceived behavioural control, while the construct attitude is affected by three antecedent constructs which included perceived usefulness, trust and compatibility. It was found that the antecedent construct perceived ease of use was not supported, perceived risk also has no influence on the construct attitude. Comprising all these findings, seven hypotheses adapted from Hung, Chang, & Yu (2006)’s study (Hung et al., 2006) including perceived usefulness, perceived risk, trust, compatibility, attitude, subjective norms, and perceived behavioural control were approved like other prior researches. The addition of four new hypotheses on top of the original construct model were also claimed with statistical significance, which were the relationship between intended e-participation of citizens and trust on e-Government services; intended e-participation of citizens and
trust on government in general; intended e-participation of citizens and e-Government transparency and intended e-participation of citizens and transparency on government in general. The results indicated that when citizens intend to participate in e-Government services through social media, they have a strengthened positive impression of both the government and e-Government services from the perspectives of trust and transparency.

5.3 CONTRIBUTION OF THE RESEARCH

The contribution of the current research goes beyond other research, which did not study the outcomes of using website for e-Government services. This study has explicitly studied the adoption factors of using social media in e-Government and the reaction of citizens to their government when they were engaged with public services through social media. Under a quantitative research approach, the figures will be of significance for decision makers of the government when planning the delivery of their e-Government services.

The overall design of the study is distinctive in that it aims to understand more about the adoption issues of social media in e-Government in Hong Kong. Hong Kong is a metropolis which has developed a strong foundation of ICT infrastructure in recent years and its highly ranked infrastructures and acclaimed technology adoption should provide an effective platform for social media developments in e-Government.

Furthermore, the trigger point of the study was the report of the Audit Commission (Audit Commission, 2013) in 2013, which was strongly critical of the development of social media for e-Government services, declaring that it was far below that of other
countries. This gave an insight and motivation for research to investigate the issue, as it is a new area where more research is needed to contribute more suggestions about the adoption factors in using social media in Hong Kong in any contexts including e-Government services.

5.3.1 Theoretical Contribution

This study was initiated to examine the adoption factors of using social media in e-Government services, and it extended from addressing the technology adoption-diffusion phenomena to the analysis of the effect of social media diffusion on e-Government on the level of trust and transparency. To examine social media diffusion processes in e-Government, its antecedents and consequences, responses were gathered from a group of citizens who participated in e-services and e-Government services before, their opinions were reviewed and the implications drawn back to existing technology diffusion theoretical frameworks in order to validate the hypotheses.

In summary, this study has reviewed the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975); diffusion of innovation (DOI) theory (Rogers, 1995); theory of planned behaviour (TPB) (Fishbein & Ajzen, 1975), technology acceptance model (TAM) (Davis Jr, 1986). The result of this synthesis has supported the construction of a comprehensive model, which has extended the area of study to the process of the diffusion of social media in which it impacts on e-Government services and government in general. The behavioural perspective of ICT diffusion phenomena have been addressed in existing theories focussed on intended outcome, but limited
research studied the post-behaviour and consequences after the intended outcomes are realised. This research model was then developed to review existing literature that has undergone empirical study from quantitative analysis.

As the hypotheses suggested from the beginning, the research is aimed at studying the behavioural values of trust and transparency of e-Government services and government in general, in which these values are directly affected by citizens’ e-participation through social media platforms. The predictions were validated through the analysis of survey data where the original and updated predictions were implied in respect of the existing theoretical models, creating a more comprehensive and unique aspect from which to address ICT diffusion in public administration. The major theoretical contribution of the study is that it focuses on social media, which can ensure there is seamless academic support for these latest emerging technologies, without leaving the research field at risk of greater divergence.

As discussed, this research model has gathered most of the variables for elements of technology adoption-diffusion from previous literature, yet a number of new variables were outlined in this quantitative survey. These variables offer better context-specific insights while informing the first research to examine the phenomena of technology diffusion from the aspect of public administration. The significance of this study is clearly demonstrated bringing together previous research with the new relationship of intended e-participation of citizens, where social media has the beneficial effect of encouraging more e-Government services to be implemented in the future.
The theoretical framework stands out because of its holistic approach when looking at the antecedents of ICT diffusion, it allows the study to offer an opportunity to review the entire process of technology diffusion and its effect on public administration from the social media perspective. This comprehensive model suggests the appropriateness of analysing the diffusion of ICT through social media to electronic public services, taking account of its effects on trust and transparency. This framework can contribute to more testing of similar phenomena in countries or administrations other than Hong Kong which have developed or are considering developing e-Government services through social media.

5.3.2 Practical Contribution

As previous studies have mainly investigated the causes and effects of online government services, from a technological aspect, they are mainly collecting data from web-based user experiences and highlighting the causes and effects from the use of websites. This study of social media within e-Government becomes valuable in capturing the emergence of social technologies - social media, and the increasingly popularity of e-Government services in many countries. The study not only provides an update on citizens’ ideas on social media in e-Government, but also deepens knowledge and understanding of the relationship between adoption of social media in e-Government and the consequences on the trust and transparency for both e-Government and government in general.

From the perspective of government, this study indicates the importance of creating values through e-Government services to their citizens; the results suggest that social
media in e-Government services is positively helping to generate higher trust from citizens and to provide stronger transparency in governance.

Since Hong Kong is regarded as a forerunner in information and communication technologies by various international management consultants, such as Accenture, Boston Consulting Group, and McKinsey & Company, it has also been regarded as one of the top players in the world in the development of e-Government in the first ten years in the 21st century (Ho, 2007). However, the global e-Government ranking has continued to drop in the last few years (Obi, 2012). Therefore, this study is intended to support and serve as a guideline to the HKSAR government when reviewing their social media policies, to deliver better governance through use of e-government and to increase trust from – and transparency for – citizens in Hong Kong.

In 1998 the ‘Digital 21 Strategy’ was established by the HKSAR government, raising high hopes for the development of e-Government initiatives. It served as an economic strategy and policy planning framework from which to review ICT initiatives for the government, and to be a regulator of a sustainable ‘technology hub’. The ‘Digital 21 Strategy Paper’ was re-published in 2001, 2004, 2008 and 2014 respectively, each paper incorporating new and different elements of e-Government initiatives. For instance, e-Government initiatives were to focus on sustainable electronic services for citizens in 2004; and its initiatives were to enable next generation access to online public services, while e-Government strategies have been taking place for years, there were no policies or strategies related to the use of social media in e-Government. As government agencies did not have a holistic view in managing social media in their
existing and upcoming e-Government services, the latest version of the ‘Digital 21
2014 Strategy Paper’ published in September 2013 was criticised by the Audit
Commission in 2013 for Hong Kong’s low social media penetration in e-Government
(Audit Commission, 2013).

In the long term, this study can provide insights and serve as a guideline for any
government to achieve a better and stronger linkage with citizens through social
media.

5.4 LIMITATIONS OF THE STUDY

Despite the substantial contribution towards the adoption factors of social media in e-
Government and on the impact of trust and transparency, there are some limitations
to the study’s assessment criteria. First, as the study analysed the aggregate effects of
adoption factors to explore the use of social media in e-Government and its
relationship to trust and transparency, which assists in drawing policy inferences for
managing practical issues for the HKSAR government and other governments in the
development of their social media strategies. The study, however, focused on early
technology adopters, which targets respondents from the ICT field instead of the
entire community, making it a limitation of the study.

Secondly, the current sample size of 512 could still be considered too small to be
definitive for the research area, although future studies could involve larger sampling
sizes to reflect a more objective view; also, the study is analysed from users’
perspective, a more comprehensive analysis can be established with more qualitative measures for analysing government agencies.

Finally, the data of this study was collected at a single point of time, thus the impact assessment of antecedent factors on the diffusion of social media may expose a timing constraint in explaining a changing environment for trust and transparency through the use of e-Government.

To sum up, this study has assessed the ICT adoption and diffusion phenomena by introducing social media to emerging technology and government strategies for gaining trust and transparency, yet fast-moving technology development may oblige the development of more criteria and hence reveal limitations of the study over the longer term, affecting time validity, sample size and quality of this research.

5.5 FUTURE RESEARCH DIRECTIONS

Through the observation of the limitations of this study, potential directions reveal themselves for new research to further investigate the adoption-diffusion of ICT in e-Government. First, future research initiatives can validate this theoretical foundation by comparing their aggregated results with the adoption behaviour of newly emerging ICT applications. This will help to develop new policies and strategies for fostering the usage and growth of ICT applications in e-Government in the hope of ensuring a positive impact for future e-Government services and for the ICT industry.

Secondly, although future studies can analyse a wider field of adoption factors, it helps to better understand the previous factors that lead to the intention of citizens’ e-
participation, providing further insights and deepening knowledge of the process and consequences of diffusion-adoption factors. Furthermore, the study of social media could be extended to a few more perspectives; as adoption behaviour changes over time, former constructs and constructs for ICT adoption can be studied to achieve a wider scope of convergence; also, as disruptive technologies occur more frequently, this study of social media can be explored in a wider aspect – such as mobile technologies and marketing communications (Mangold & Faulds, 2009) – in order to expand the ICT adoption and diffusion models; there are more areas where the effect of ICT diffusion awaits exploration in addition to trust and transparency factors, for instance, future studies can explore the relationship between intention of e-participation of citizens on the efficiency and effectiveness, since there is a growing interest in Mobile Government (M-Government), it might therefore be an appropriate time to pay attention to the mobile government model in e-Government.

5.6 CONCLUSION

The modelling approach employed in this study is based on previous studies of social media in e-Government. Since previous work did not provide the full scope of study for ICT adoption-diffusion models, the lack of any explanation for the relationship between adoption factors of using social media in e-Government and the consequential effect created interest from this researcher. In filling the research gap, this study has addressed these questions, in particular (1) what are the adoption factors for the use of social media in e-Government; and (2) how does the e-participation of citizens contribute to the trust and transparency of e-Government.
services and the government in general. The solution is to investigate from constructs that have been studied previously, such as TRA, TAM, and TPB models, which are valid for this study of social media in e-Government. This study forecasts strong and significant effects of *perceived usefulness*, *trust* and *compatibility* on the construct *attitude*. In addition, this study forecasts a strong and positive impact between *attitude*, *subjective norm* and *perceived behavioural control*. More importantly, the influence of *intended e-participation of citizens* is found to be ‘very strong’ on *e-Government transparency*, *transparency of government in general*, *trust in e-Government in general*, and *trust in government in general*.

The findings have also provided new indications in the research area, that a full scope of ICT adoption-diffusion model should be fully explored from the adoption factors to the effect of diffusion. It establishes an exceptional foundation for researchers to conduct future research on other disruptive technologies in e-Government and even m-Government.

This study has several implications to the HKSAR Government, from the structural model where it clearly indicates that the current use of social media in e-Government services has provided positive feedback to trust and transparency of government, encouraging future direct or indirect efforts for the strategic planning and incorporation of social media development in government policies. This study can serves as a guideline or directional paper for the HKSAR and other governments who are reviewing or considering reviewing their social media policies. The government could therefore build more holistic e-Government applications through social media, with higher penetration and usage from the public, after which the government will
become more efficient, delivering policies more effectively through improved transparency, thus the result will be a more reputable government through the enhancement of trust from the citizens.
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APPENDIX A

QUESTIONNAIRE
Social Media in e-government – An Empirical Study of Adoption Factors and Consequences

Participant Information Statement

Social Media in e-Government – An Empirical Study of Adoption Factors and Consequences

You are invited to participate in the research project identified above, which is being conducted by Joseph Leung Wai Fung, for his Doctor of Business Administration dissertation supervised by Prof. Dr. Dennis Alsholt at the Newcastle Business School, Faculty of Business and Law, The University of Newcastle, Australia.

Why is the research being done?
The purpose of the research is to study the effectiveness of social media in e-government and what factors will enhance its adoption. It will add to the continuing improvement of the governance process for the public not only in Hong Kong but also elsewhere in the world.

Social media such as Facebook, microblogs, Twitter and YouTube have been widely used to share audiovisual information and views with friends and the public. With their far-reaching abilities social media are currently utilized by governments and politicians to provide (service) information about decisions and action plans for discussion with citizens. For example, in Hong Kong, the government has utilized social media in land tax and licensing processes, as well as projects relating to public transport. Social media empower users to share and form communities to monitor the performance of public institutions. The key contribution of this study will be to enhance our understanding of social media that may be used to support e-government services. Its findings could provide information for both public entities and government departments to consider enhancing the use of social media in their services to the public.

Who can participate in the research?
Participants who are computer literate, are 18 years or above, and have knowledge of and experience in using the internet are eligible to participate in the survey.

What choice do I have?
Participation in this research is entirely your choice and on a voluntary basis. Completion and return of the survey is deemed to imply your consent to participate. Whether or not you decide to participate, your decision will not disadvantage you in any way.

If you do decide to participate, due to the anonymous nature of the survey, you cannot withdraw your completed survey once it has been submitted.

What would I be asked to do?
If you agree to participate, you will be asked to complete an online questionnaire.

It is an anonymous survey and you do not need to disclose your identity or any personal information in the survey. If you would like to receive a summary of the research, please email the researcher, Joseph Leung, at wai fung.leung@uni.edu.au.

How much time will it take?
The survey can be completed in 15 minutes. This is a one-off survey and no other participation is required.

What are the risks and benefits of participating?
There is no risk or direct benefit for any individual participant. It is hoped the research will lead to a better understanding of the impact of social media in e-government services.

How will my privacy be protected?
As the data collected in this research is anonymous, no individual respondent will be identified. Access to the survey will be via the link provided in this Information Statement, and thus no link can be established between your email address and your completed survey. Information from individual questionnaires will be aggregated for analysis. The data will be stored in password-protected computers accessible only to the researchers except as required by law and will be disposed of in accordance with the University of Newcastle's policy and procedures for the disposal of confidential material. Data will be stored for a minimum of five years prior to being disposed.
Social Media in e-government – An Empirical Study of Adoption Factors and Consequences

How will the information collected be used?
The information collected will be used in a quantitative analysis. This study constitutes part of the requirements of the Doctor of Business Administration program at the University of Newcastle, Australia. An executive summary of the research results can be requested by emailing the researcher upon completion of the project.

What do I need to do to participate?
Please read this Information Statement and be sure you understand its contents before you participate. If there is anything you do not understand, or if you have questions, please contact the researcher at wallung.leung@unsw.edu.au. Once you have read and understood the statement and wish to proceed, please click on the link https://www.surveymonkey.com/r/Socialmedia_e-government and complete the questionnaire.

Further Information
If you would like further information, please contact Joseph Leung Wai Fung (email: wallung.leung@unsw.edu.au) or Prof. Dr. Dennis Ahrholt (email: Dennis.Ahrholt@newcastle.edu.au).

Thank you for considering this invitation.

Complaints about this research
This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2015-0509.

Should you have concerns about your rights as a participant in this research, or a complaint about the manner in which the research is conducted, you may pass it on to the researcher Joseph Leung Wai Fung (email: wallung.leung@unsw.edu.au), or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan, NSW 2308, Australia, telephone (02) 49216333, email: Human-Ethics@newcastle.edu.au.

*1. Agreed to proceed?

[Blank]

Background

Social media such as social networks (e.g., Facebook) or microblogs (e.g., Twitter) or presentation sites (e.g., YouTube) are used in many areas. People share audiovisual information and their views with friends and the public. Recently, some governments and politicians have also started using social media.

Government could provide audiovisual information about views, decisions and actions. To begin a discussion with citizens, government could use social media to inform the public about processes such as land records or applications for licenses and provide (interactive) support through tax declarations or in monitoring road traffic etc. On the other hand social media could empower citizens with a platform from which to speak to the government and to each other, forming communities to monitor government performance.

Since it is important to know, whether it is worthwhile to pursue using social media in existing e-government services, please spend a few minutes to fill in the following web survey. All your views will be treated as strictly anonymous and confidential.

Please remember to answer every question in the survey. Thank you for your participation.

PERSONAL PARTICULAR

*2. Gender

[Male] [Female]
### 3. Marriage Status
- Single
- Married
- Cohabitation

### 4. Age

### 5. Education
- Primary School
- Secondary School
- Bachelor Degree
- Master Degree or above

### 6. Profession

### 7. How many times do you use social media such as social network (e.g., Facebook), or microblogs (e.g., Twitter) or presentation sites (e.g., YouTube) per week?
- Days in the week
- Times per day

### 8. Please list your level of proficiency with social media.

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<thead>
<tr>
<th></th>
<th>1 (Novice)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Proficient)</th>
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</table>

### 9. What is your purpose in using social media?
- Personal
- Business
- Both

### 10. Which of the following social media accounts do you use? (You may select more than 1 choice)
- Facebook
- LinkedIn
- Blog
- Twitter
- YouTube
- All of the above
- Other (please specify)

### 11. How would you rate the intensity of using social media in your daily life?
- Extremely Intensive
- Quite Intensive
- Slightly Intensive
- Neither
- Slightly Unintensive
- Quite Unintensive
- Extremely Unintensive

### 12. Do you have experience in using e-government services in Hong Kong?
- Yes
- No
**Social Media in e-government – An Empirical Study of Adoption Factors and Consequences**

**13. Which of the following e-government services do you have experience with?**

- [ ] Taxation
- [ ] Weather forecasting
- [ ] All of the above
- [ ] Library
- [ ] Transportation status
- [ ] License renewal
- [ ] Leisure activities (e.g., tennis court bookings)
- [ ] Other (please specify):

**14. Have you installed GovHK (mobile application of HKSAR government services) on your social media platform?**

- [ ] Yes
- [ ] No

**USEFULNESS**

**15. If e-government services were delivered through social media, my ability to assess government information would be improved.**

- [ ] Extremely likely
- [ ] Quite likely
- [ ] Slightly likely
- [ ] Neither
- [ ] Slightly unlikely
- [ ] Quite unlikely
- [ ] Extremely unlikely

**16. If e-government services were delivered through social media, I would be more productive in assessing government information.**

- [ ] Extremely likely
- [ ] Quite likely
- [ ] Slightly likely
- [ ] Neither
- [ ] Slightly unlikely
- [ ] Quite unlikely
- [ ] Extremely unlikely

**17. If e-government services were delivered through social media, my effectiveness in assessing government information would be enhanced.**

- [ ] Extremely likely
- [ ] Quite likely
- [ ] Slightly likely
- [ ] Neither
- [ ] Slightly unlikely
- [ ] Quite unlikely
- [ ] Extremely unlikely

**18. I think using social media in e-government services would be useful to assessing government information.**

- [ ] Extremely likely
- [ ] Quite likely
- [ ] Slightly likely
- [ ] Neither
- [ ] Slightly unlikely
- [ ] Quite unlikely
- [ ] Extremely unlikely

**EASE OF USE**

**19. Learning to use social media in e-government services would be easy for me.**

- [ ] Extremely likely
- [ ] Quite likely
- [ ] Slightly likely
- [ ] Neither
- [ ] Slightly unlikely
- [ ] Quite unlikely
- [ ] Extremely unlikely
<table>
<thead>
<tr>
<th><strong>Social Media in e-government – An Empirical Study of Adoption Factors and Consequences</strong></th>
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<tbody>
<tr>
<td><strong>20. I feel comfortable with the idea of e-government services being delivered through social media.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
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<tr>
<td><strong>21. It would be easy for me to become skilful at using e-government services if social media could be used in e-government services.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
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<tr>
<td><strong>COMPATIBILITY</strong></td>
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<td><strong>22. If social media were used in e-government services, this would fit well with the way I work.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
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<td></td>
</tr>
<tr>
<td><strong>23. It would fit into my workstyle if social media could be delivered in e-government services.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>24. If social media could be installed in e-government services, it would be compatible with the way I work.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>TRUST IN SOCIAL MEDIA</strong></td>
</tr>
<tr>
<td><strong>25. I trust social media if they were delivered as part of e-government services.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>26. I trust social media in general.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>PERCEIVED RISK</strong></td>
</tr>
<tr>
<td><strong>27. Given my previous usage experience, I am concerned about using social media in e-government services.</strong></td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>
Social Media in e-government – An Empirical Study of Adoption Factors and Consequences

28. When all is said and done, I feel that the use of social media in e-government services poses problems to me that I just don’t need.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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SUBJECTIVE NORMS

29. I guess my peers would encourage me to use social media in e-government services if the systems are available.

<table>
<thead>
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<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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30. People whom I know think that using social media in e-government services is a good idea.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

31. People whom I know influence me to try out social media applications.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

32. I read news reports that social media have been successfully used in many applications.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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33. The popular press depict a positive sentiment towards using social media.

<table>
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<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

34. Mass media reports influence me to try out social media.

<table>
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<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

BEHAVIOUR CONTROL

35. I would be able to use social media if delivered in e-government services.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

36. I would be able to manage social media even if there is no one around to help me.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<td>Question</td>
<td>Scale</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td><strong>37. The resources required to use social media are available to me.</strong></td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Slightly agree</td>
<td>Neither</td>
<td>Slightly disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>38. I have access to hardware, software, and services which are needed to use social media.</strong></td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Slightly agree</td>
<td>Neither</td>
<td>Slightly disagree</td>
<td>Disagree</td>
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<tr>
<td>** ATTITUDE **</td>
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<tr>
<td><strong>39. How is your attitude towards social media?</strong></td>
<td>Good</td>
<td>Neutral</td>
<td>Bad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>40. How is your attitude towards social media?</strong></td>
<td>Positive</td>
<td>Neutral</td>
<td>Negative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>41. How is your attitude towards social media?</strong></td>
<td>Favourable</td>
<td>Neutral</td>
<td>Unfavourable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>42. Using social media in e-government services would be a good idea.</strong></td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Slightly agree</td>
<td>Neither</td>
<td>Slightly disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>43. I like the idea of using social media in e-government services.</strong></td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Slightly agree</td>
<td>Neither</td>
<td>Slightly disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td><strong>44. Using social media in e-government services would be a pleasant experience.</strong></td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Slightly agree</td>
<td>Neither</td>
<td>Slightly disagree</td>
<td>Disagree</td>
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<tr>
<td>** INTENDED E-PARTICIPATION OF CITIZENS **</td>
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<tr>
<td><strong>45. I intend to use social media if available for e-government services.</strong></td>
<td>Extremely likely</td>
<td>Quite likely</td>
<td>Slightly likely</td>
<td>Neither</td>
<td>Slightly unlikely</td>
<td>Quite unlikely</td>
</tr>
<tr>
<td><strong>46. It is likely that I will use social media in e-government services.</strong></td>
<td>Extremely likely</td>
<td>Quite likely</td>
<td>Slightly likely</td>
<td>Neither</td>
<td>Slightly unlikely</td>
<td>Quite unlikely</td>
</tr>
</tbody>
</table>
**Social Media in e-government – An Empirical Study of Adoption Factors and Consequences**

*47. I expect to use social media in e-government services.*

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>Quite likely</th>
<th>Slightly likely</th>
<th>Neither</th>
<th>Slightly unlikely</th>
<th>Quite unlikely</th>
<th>Extremely unlikely</th>
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</table>

*48. I intend to use social media for e-government services, since I think my views on the government, electronically submitted via social media, could contribute to community development.*

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>Quite likely</th>
<th>Slightly likely</th>
<th>Neither</th>
<th>Slightly unlikely</th>
<th>Quite unlikely</th>
<th>Extremely unlikely</th>
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</table>

*49. I intend to use social media if available for e-government services, since I could understand more about community developments through my participation in e-government via social media.*

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>Quite likely</th>
<th>Slightly likely</th>
<th>Neither</th>
<th>Slightly unlikely</th>
<th>Quite unlikely</th>
<th>Extremely unlikely</th>
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</tbody>
</table>

*50. I intend to use social media if available for e-government services, since social media could help me to share my views with other participants.*

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>Quite likely</th>
<th>Slightly likely</th>
<th>Neither</th>
<th>Slightly unlikely</th>
<th>Quite unlikely</th>
<th>Extremely unlikely</th>
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</tr>
</tbody>
</table>

*51. I am comfortable sharing my views on e-government services through social media.*

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
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</tbody>
</table>

**TRUST IN E-GOVERNMENT SERVICES**

*52. I think, the use of social media in governmental services by myself and other citizens would enhance my trust in e-government services.*

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
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</tbody>
</table>

*53. Through my use of social media in e-government services, I think I could have two-way communications with the government, and that would enhance my trust in e-government services.*

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</tbody>
</table>

*54. The e-government services will be more trustworthy, if my and citizens’ views could be successfully delivered through social media.*

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</tbody>
</table>

Page 8
Social Media in e-government – An Empirical Study of Adoption Factors and Consequences

**55. I would have more trust in e-government services if social media were adopted.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

**TRUST IN GOVERNMENT IN GENERAL**

**56. I think, the use of social media in governmental services by myself and other citizens would enhance my trust in government in general.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

**57. Through my use of social media in governmental services, I think I could have two-way communications with the government, and that would enhance my trust in government in general.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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**58. The government in general will be more trustworthy, if my and citizens’ views could be successfully delivered through social media.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
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</table>

**59. I gain more trust in the government in general if social media could be adopted in governmental services.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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**E-GOVERNMENT TRANSPARENCY**

**60. I think the use of social media in governmental services by myself and other citizens could improve government accountability.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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**61. I think the reliability of information obtained from the government could be enhanced through the use of social media in governmental services by myself and other citizens.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
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**62. I think the information delivery of the government could be accelerated through the use of social media in governmental services by myself and other citizens.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>
## Social Media in e-government – An Empirical Study of Adoption Factors and Consequences

**63. I think social media could assist in collecting views to enhance the performance of e-government services.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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### TRANSPARENCY OF GOVERNMENT IN GENERAL

**64. I think government transparency in general would be enhanced through the use of social media in governmental services by myself and other citizens.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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**65. Citizens’ engagement in social media would make the government less corrupt.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

**66. Through the use of social media, I think I could have two-way communications with the government, and that will enhance the transparency of government in general.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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</table>

**67. I think the use of social media in e-government services by myself and other citizens would enable us to obtain up-to-date and transparent information about government developments and activities.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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**68. I think social media could enhance the visibility of the government in general.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
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**69. I think participants in social media could monitor the performance of government in general, and in return there would be a higher transparency of government performance.**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree</th>
<th>Neither</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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70. Do you have any other comments on this topic?

An executive summary of the research results can be requested by emailing the researcher upon completion of the project. If you would like further information, please contact Joseph Leung Wai Fung (email: waifung.leung@uon.edu.au) or Dr. Dennis Ahnoldt (email: Dennis.Ahnoldt@newcastle.edu.au)
APPENDIX B

ETHICS APPROVAL
HUMAN RESEARCH ETHICS COMMITTEE

Notification of Expedited Approval

To Chief Investigator or Project Supervisor:  Mr Dennis Ahlholdt
Co-Investigators / Research Students:  Mr Wai Fung Leung
Date:  06 Nov 2013
Reference No:  H.2013.0320
Date of Initial Approval:  06 Nov 2013

Thank you for your Response to Conditional Approval submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under Expedited review by the Chair/Deputy Chair.

I am pleased to advise that the decision on your submission is Approved effective 06 Nov 2013.

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Approval will remain valid subject to the submission, and satisfactory assessment, of annual progress reports. If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal Certificate of Approval will be available upon request. Your approval number is H.2013.0320.

If the research requires the use of an Information Statement, ensure this number is inserted at the relevant point in the Complaints paragraph prior to distribution to potential participants. You may then proceed with the research.

For Noting:

1. Participant Information Statement:
   a. Please ensure the version number and the date is added underneath the title of the project. Please ensure both of these are updated each time a new version is submitted for ethics approval.
   b. It has been noted that a response to the following were provided within the response letter, however it appears that is was not updated within the Participant Information Statement. Please address the following within the section "Who can participate in the research?" of the Participant Information Statement.
   i. Please amend and explain how recruitment is being done and the organisation that the participants are affiliated to and that they have consented to the project.
   ii. Please also advise how the general public can be involved in the research.

2. Please send the revised Participant Information Statement to human.ethics@newcastle.edu.au.
Conditions of Approval

This approval has been granted subject to you complying with the requirements for Monitoring of Progress, Reporting of Adverse Events, and Variations to the Approved Protocol as detailed below.

PLEASE NOTE:
In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, or a Renewal of approval, you will apply to the External HREC for approval in the first instance and then Register that approval with the University’s HREC.

- Monitoring of Progress

Other than above, the University is obliged to monitor the progress of research projects involving human participants to ensure that they are conducted according to the protocol as approved by the HREC. A progress report is required on an annual basis. Continuation of your HREC approval for this project is conditional upon receipt, and satisfactory assessment, of annual progress reports. You will be advised when a report is due.

- Reporting of Adverse Events

1. It is the responsibility of the person first named on this Approval Advice to report adverse events.
2. Adverse events, however minor, must be recorded by the investigator as observed by the investigator or as volunteered by a participant in the research. Full details are to be documented, whether or not the investigator, or his/her deputies, consider the event to be related to the research substance or procedure.
3. Serious or unforeseen adverse events that occur during the research or within six (6) months of completion of the research, must be reported by the person first named on the Approval Advice to the (HREC) by way of the Adverse Event Report form (via RIMS at https://rims.newcastle.edu.au/login.esp) within 72 hours of the occurrence of the event or the investigator receiving advice of the event.
4. Serious adverse events are defined as:
   - Causing death, life threatening or serious disability.
   - Causing or prolonging hospitalisation.
   - Overdoses, cancers, congenital abnormalities, tissue damage, whether or not they are judged to be caused by the investigational agent or procedure.
   - Causing psycho-social and/or financial harm. This covers everything from perceived invasion of privacy, breach of confidentiality, or the diminution of social reputation, to the creation of psychological stress and trauma.
   - Any other event which might affect the continued ethical acceptability of the project.
5. Reports of adverse events must include:
   - Participant's study identification number;
   - date of birth;
   - date of entry into the study;
   - treatment arm (if applicable);
   - date of event;
   - details of event;
   - the investigator's opinion as to whether the event is related to the research procedures; and
   - action taken in response to the event.
6. Adverse events which do not fall within the definition of serious or unexpected, including those reported from other sites involved in the research, are to be reported in detail at the time of the annual progress report to the HREC.

- Variations to approved protocol

If you wish to change, or deviate from, the approved protocol, you will need to submit an Application for Variation to Approved Human Research (via RMS at https://rims.newcastle.edu.au/login.asp). Variations may include, but are not limited to, changes or additions to investigations, study design, study population, number of participants, methods of recruitment, or participant information/consent documentation. Variations must be approved by the (HREC) before they are implemented except when registering an approval of a variation from an external HREC which has been designated the lead HREC, in which case you may proceed as soon as you receive an acknowledgement of your Registration.

Linkage of ethics approval to a new Grant

HREC approvals cannot be assigned to a new grant or award (ie those that were not identified on the application for ethics approval) without confirmation of the approval from the Human Research Ethics Officer on behalf of the HREC.

Best wishes for a successful project.

Professor Allyson Hollbrook  
Chair, Human Research Ethics Committee

For communications and enquiries:
Human Research Ethics Administration

Research Services  
Research Integrity Unit  
The Chancellery  
The University of Newcastle  
Callaghan NSW 2308  
T +61 2 492 17894  
F +61 2 492 17164  
Human-Ethics@newcastle.edu.au


Linked University of Newcastle administered funding:

<table>
<thead>
<tr>
<th>Funding body</th>
<th>Funding project title</th>
<th>First named investigator</th>
<th>Grant Ref</th>
</tr>
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