

Curtin Graduate School of Business

**Toward A Comprehensive Conceptualization of Digital Divide
And Its Impact on e-Government System Success:
Evidence from Local Governments in Indonesia**

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**This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University**

April 2014

Declaration

To the best of my knowledge and belief, this dissertation contains no material previously published by any other except where due acknowledgment has been made.

This dissertation contains no material which has been accepted for the award of any other degree or diploma in any university

Arief Rahman

8 April 2014

Dedication

*This dissertation is dedicated to my wife, Dwi Amalia,
my daughters, Putri Aida Rahman and Adinda Tazkia Rahman,
for all of their support, encouragement, and love...*

Acknowledgments

In the name of Allah, the Almighty, the Most Merciful...

Surely there is ease after hardship

There is ease after hardship (Qur'an 94:5-6)

My work and this thesis have benefited greatly from the contributions of many. I wish to take this opportunity to express my sincere gratitude to my supervisors, Professor Mohammed Quaddus and Associate Professor Jeremy Galbreath, for the inspiration and guidance. I am greatly indebted for all suggestions, motivations and comments that made me complete my study within the targeted time.

My Ph.D journey in Curtin University would not have been possible without scholarship from DIKTI (Directorate General of Higher Degree, Ministry of Education, Republic of Indonesia). Hence, I would like to express my gratitude to them for giving the invaluable opportunity. The journey would also impossible without supports from Universitas Islam Indonesia.

Appreciations must also be extended to all of the respondents in this research, the officers in Badan Pelayanan Perijinan Terpadu, Tulungagung Regency, especially Mrs. Lilik Wijayanti, and the officers in Bidang Komunikasi dan Informatika, Sleman Regency, especially Mr. Eka Suryo Prihantoro and Mr. Wimbo Prasajo. I would also like to thank my research assistants, Ari Santoso, Rindah Dwi Novianti, Dian Wahyu, and Lulu Sylvianie for their hard works. Well done mates!

This piece of work would not have been possible without the unconditional support from my family. My heartfelt appreciation goes to my beloved wife, Dwi Amalia, and my daughters, Putri Aida Rahman and Adinda Tazkia Rahman, for their love,

pray and encouragement. I am grateful to my late father, Mohammad Yahed, and my mother, Masturiah Yahed, my father in law, Adib Muchtar and my mother in law, Azimah Adib. Their unlimited love and support has strengthened me during my journey. My brother's and my sisters' unequalled love is also appreciated beyond description.

Abstract

Citizens are substantial stakeholders in every e-government system, thus their willingness to use and ability to access the system are critical. Unequal access and ICT usage, which is known as digital divide, however has been identified as one of the major obstacles to the implementation of e-government system. As digital divide inhibits citizen's acceptance to e-government, it should be overcome despite the lack of deep theoretical understanding on this issue. This research aimed to investigate the digital divide and its direct impact on e-government system success of local governments in Indonesia as well as indirect impact through the mediation role of trust. In order to get a comprehensive understanding of digital divide, this study introduced a new type of digital divide, the innovativeness divide.

The research problems were approached by applying two-stage sequential mixed method research approach comprising of both qualitative and quantitative studies. In the first phase, an initial research model was proposed based on a literature review. Semi-structured interview with twelve users of e-government systems was then conducted to explore and enhance this initial research model. Data collected in this phase was analysed with a two-stage content analysis approach and the initial model was then amended based on the findings. As a result, a comprehensive research model with sixteen hypotheses was proposed for examination in the second phase.

In the second phase, quantitative method was applied. A questionnaire was developed based on findings in the first phase. A pilot study was conducted to refine the questionnaire, which was then distributed in a national survey resulting in 237 useable responses. Data collected in this phase was analysed using Partial Least Square based Structural Equation Modelling.

The results of quantitative analysis confirmed thirteen hypotheses. All direct influences of the variables of digital divide on e-government system success were supported. The mediating effects of trust in e-government in the relationship between capability divide and e-government system success as well as in the relationship between innovativeness divide and e-government system success were supported, but was rejected in the relationship between access divide and e-government system success. Furthermore, the results supported the moderating effects of demographic variables of age, residential place and education.

This research has both theoretical and practical contributions. It contributes to the developments of literature on digital divide and e-government by providing a more comprehensive framework, and also to the implementation of e-government by local governments and the improvement of e-Government Readiness Index of Indonesia.

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Chapter One: Introduction

1.1. Overview

E-Government refers to the use of information and communication technology (ICT) which enhances access to and delivery of all facets of government services and operations for the benefit of citizens, business, employees and other stakeholders (Srivastava and Teo 2007). Most countries in the world have implemented e-government, but its success rate in developing/transitional countries is only 15% (Heeks 2008b). The critical factor determining the success of e-government is users' acceptance (Evans and Yen 2005).

However, economic and social disparity in the world today is leading to what is known as the digital divide, or digital inequality. The digital divide refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels, with regard to the opportunities to access information and communication technology (ICT) and the opportunity to use them in a wide variety of activities (OECD 2001). Despite the lack of empirical evidence (Pascual 2003; UN 2005), the digital divide is acknowledged to be one of the main obstacles to the success of the e-government system

This research examines the impact of the digital divide on the success of e-government systems in the local government at Indonesia. In doing so, this study applies two-stage mixed methods research, where a field study is conducted in the first stage and data is collected from interviews. The data is then analysed and compared with the available literature to build a comprehensive research model. This model is then examined using the Partial Least Squares approach to Structural Equation Modeling in the second stage, where data is collected via survey.

This thesis begins with an introduction to the issues under study and the research objectives. It is followed by an extensive literature review and a detailed outline of research methodologies. The data collected in the field study is analysed and the results presented along with the development of the hypotheses and instruments used for the survey. The results of the quantitative data analysis on 237 respondents participating in the survey are presented, followed by interpretation and discussion. The thesis concludes with a summary of the study and its limitations, along with suggestions for future research.

1.2. Research Background

The phenomenon of the digital divide has been one of the most popular topics for many researchers and policy makers since the late 1990s, as all countries worldwide have experienced the divide to some extent. Even in well-developed countries as the United States, the problem of the digital divide, or digital inequality, is still evident (Mossberger, Tolbert, and McNeal 2008; Hsieh, Rai, and Keil 2008; Venkatesh and Morris 2000). Considering the importance of information and communication technology (ICT) in today's world, attempts have been made to understand and explain this phenomenon. Initially, the digital divide was defined as the inequality between those who have access to ICT and those who do not (De Haan 2004; DiMaggio, Hargittai, Neuman, et al. 2001). Policy makers in many countries then used this definition as a basis for increasing public access to computers and basic ICTs in schools and public places. In the US, former President Bill Clinton proposed a tax incentive to businesses to donate computers to poor schools and communities (Lacey 2000). Some worldwide corporations also initiated a home-computer benefit for their employees who did not have computers (Atewell 2001).

Despite the policies and efforts to close the access gap, the UN has indicated that the digital divide has not diminished; in fact it is growing wider (UN 2010). Some

scholars have argued that the understanding of the digital divide at that time was not comprehensive enough, and it led to insufficient policies. In light of this, Dewan and Riggins (2005) suggested that there are two orders of digital divide; the first order refers to the access divide, while the second order refers to the ability divide, which is an inequality in ability to use ICT among those who already have access. Furthermore, Wei et al. (2011) asserted that there is a third order of digital divide, the outcome divide, which is an inequality of the outcomes of exploiting ICT resulting from the first and second order digital divides. Regardless of the differences around defining the digital divide, it is clear that a comprehensive understanding of the issue is needed.

1.3. E-Government in Indonesia

The Government of Indonesia comprises a central government and 497 local governments (regencies and municipalities). Since 1999, Indonesia has entered a decentralisation era, in which regencies and municipalities have become the key administrative units responsible for the provision of most government services (Amri 2000). Laws 22/1999 and 25/1999 provide regulatory frameworks for decentralisation. In accordance with these laws, local government plays a significant role in Indonesia's public administration.

E-Government in Indonesia has been established since 2001 through Presidential Directive No. 6/2001 (Harijadi and Satriya 2000; Haryono and Widiwardono 2010). The objectives of e-government in Indonesia are to improve democratic process, enhance accountability and transparency, and enable the transformation towards an information society (Furuholt and Wahid 2008). Currently, there are approximately 450 websites managed by local governments throughout Indonesia (Wahid 2008). Local government in Indonesia has implemented some forms of e-government systems, most of which are in the form of the electronic systems used for its internal processes (G2G - Government to Government). Moreover, many

local governments, departments and government agencies have produced websites in order to interact with their stakeholders (G2C - Government to Citizens and G2B - Government to Businesses).

Another form of e-government commonly found in Indonesia is the one-stop service, also known to some organisations as the 'one-roof service'. One-stop service is an integrated service provided by an umbrella organisation, which operates on top of functional government agencies in order to improve the convenience and satisfaction of users (Ho 2002). One-stop service is a gateway for the government to provide information and services to citizens and businesses. It coordinates with functional departments and government agencies to deliver public services. Since 2003, some local governments have established one-stop service centres, although the range of services delivered varies from one local government to another. The driver in the one-stop service is basically the simplification of the bureaucratic process by providing for the various needs of citizens and other stakeholders (Ho 2002). According to the survey of e-government readiness by the United Nations, Indonesia's ranks and e-government indices reflect an unsuccessful implementation of e-government in the country in comparison to other countries (illustrated in Table 1.1). It is evident that Indonesia requires a strategic policy in order to improve the quality of e-government, and underlying this must be a readiness to implement e-government.

The implementation of e-government in Indonesia is facing some challenges (Harjadi 2004), which include: lack of financial resources, low quality of human resources, low ICT penetration and lack of regulation and culture. Furthermore, a study by Hwang and Syamsuddin revealed some other main obstacles to the development of e-government in Indonesia, particularly at the local government level, where there exists technical difficulties, the digital divide, and the absence of willingness to use e-government systems by citizens and government employees alike (Hwang and Syamsudin 2008).

Table 1.1: United Nations survey on e-government readiness
(Selected Countries and Region)

Countries	2005*		2008**		2010***		2012****	
	Rank	Index	Rank	Index	Rank	Index	Rank	Index
Indonesia	96	0.382	106	0.411	109	0.403	97	0.495
Australia	6	0.868	8	0.811	8	0.786	12	0.839
USA	1	0.906	4	0.864	2	0.851	5	0.869
Malaysia	43	0.571	34	0.606	32	0.610	40	0.670
Thailand	46	0.552	64	0.503	76	0.465	92	0.509
Vietnam	105	0.364	91	0.456	90	0.445	83	0.522
South Eastern Asia Average		0.439		0.429		0.425		0.479
World Average		0.427		0.451		0.441		0.488

Source:

*(UN 2005); **(UN 2008); *(UN 2010); **** (UN 2012)

1.4. Focus of the Research

Norris (2001) believes that the digital divide reflects social inequality. Therefore, to understand the digital divide, the issue requires contextualising. In developing countries, where most social and cultural aspects are unequal, the perspective taken on the digital divide requires expansion. In order to obtain a comprehensive understanding of the issue, this research categorises the digital divide into five types, being: *access divide* (disparity of access to ICT), *economic divide* (disparity in access to ICT associated with economic conditions), *demographic divide* (differences in individual characteristics of the population such as age and place of residence - which affects access to ICT); *capability divide* (inequality of ability to use ICT); and *innovativeness divide* (disparities between individual willingness to change and try out new information technology).

DeLone and McLean had developed a model to examine information system success (DeLone and McLean 1992), which was later updated (DeLone and McLean 2003). This model has been validated in the area of e-commerce, where it was originally developed (Gelderman 1998; Lee and Chung 2009) and in the area of e-

government (Wang and Liao 2008; Teo, Srivastava, and Jiang 2009). Based on the study by Ruttan (1996), the model is robust and outperformed the other IS success model. Therefore this study adopts this model to measure IS success (especially, e-government system success).

The updated model indicates that information systems (IS) success depends on IS quality (information quality, system quality and service quality), which influences system usage and user satisfaction, and in turn benefits the user. Thus, the framework by DeLone and McLean basically consists of two parts, one is the quality of the product (System Quality, Information Quality and Service Quality) and the other is the effectiveness or influence of the product (Use, User Satisfaction, and Impact or Net Benefit) (Mason 1978). Moreover, DeLone and McLean state that 'use', 'user satisfaction' and 'benefit' are the important indicators of system success; some researchers have previously used them individually to measure system success (DeLone and McLean 1992).

Previous researchers have also modified the DeLone and McLean model to accord with the focus of their research. Lee and Chung (2009) has modified the model to incorporate Trust in their research. Floropoulos et al. (2010) has also modified the model in order to include Perceived Usefulness. The research undertaken here applies the DeLone and McLean framework with an emphasis on the effectiveness or influence of the system, as system success cannot be claimed if the system doesn't influence its users despite its good quality. Hence, this research modifies the original model by focusing on usage, user satisfaction, and benefit as indicators of system success, excluding the quality of the system itself, as it is beyond the control of the user.

In the area of information and communication technology, the quality or attribute of trust is seen as an important factor in ICT use (Vance, Elie-Dit-Cosaque, and Straub 2008; McKnight and Chervany 2002; Teo, Srivastava, and Jiang 2009). The cognitive process in the formation of trust has been shown to positively influence an individual's intention to use e-commerce (Gefen, Karahanna, and Straub 2003;

McKnight and Chervany 2002). With the e-government system in particular, the trust of a citizen is believed to be important in the use of e-government, especially when use of the system is voluntary (Warkentin et al. 2002; Teo, Srivastava, and Jiang 2009). In the context of the e-government system, trust in e-government refers to the “belief that the e-government system can be used to get the desired outcome satisfactorily” (Teo, Srivastava, and Jiang 2009). Teo, Srivastava, and Jiang (2009) found that trust in e-government influences e-government quality (information, system and service) significantly.

This study examines the impact of the digital divide on the success of e-government both directly and indirectly, through the mediating role of trust in e-government. In doing so, the focus of this research is examining interactive and voluntary G2C and G2B systems provided by local government in Indonesia. The reasons for using trust in e-government as a mediating variable are three-fold: firstly, from a sociological perspective, trust is an important factor on which various sets of expectations converge in order to reduce social complexity (Gefen 2000; Lewis and Weigert 1985). Secondly, trust has been recognised as acting as a mediating variable in many disciplines, including behavioural intention in management (Cropanzano and Mitchell 2005; Vlachos et al. 2009), and marketing and consumer loyalty (Morgan and Hunt 1994; Sirdeshmukh, Singh, and Sabol 2002). Thirdly, a citizen’s trust in e-government system is an important contributing factor in the success of e-government (Teo, Srivastava, and Jiang 2009). In a voluntary e-government system, the building of citizen trust is often considered as a key success factor (Warkentin et al. 2002).

1.5. Research Questions and Objectives

As discussed earlier, empirical evidence on the impact of the digital divide on the success of e-government systems is currently lacking. Despite of its popularity among researchers, the issue of the digital divide itself is not yet understood

comprehensively, as evidenced by the limitations and gaps in the literature on the digital divide. Apart from the digital divide, the mediating role of trust in e-government success has been identified, although, as yet it has not been validated. Hence, this paper aims to answer two main research questions, which are:

Q.1: What is the impact of the digital divide on e-government system success in Indonesian local government?

Q.2: Does trust in e-government mediate in the relationship between the digital divide and e-government system success in Indonesian local government?

Based on the research questions above, the objectives of this research are as follows:

1. To examine the impact of the digital divide on e-government system success in Indonesian local government.
2. To investigate the relationships between the digital divide constructs.
3. To investigate the mediating role of trust in e-government in the impact of the digital divide on e-government system success in Indonesian local government.
4. To assess the moderating impact of the demographic and economic divide on e-government system success in Indonesian local government.

1.6. Significance of the Research

The development of e-government is one of the biggest trends in public sector management (McKinnon 2005); however, extensive research on this issue has not been conducted. This research aims to provide empirical evidence and hence contributes significantly to the understanding of e-government and the role of the digital divide in e-government. In doing so, the study will: Firstly, provide evidence of the impact of the digital divide on e-government system success in developing

countries, particularly Indonesia. Since empirical evidence on the influence of digital divide on e-government system success is currently lacking, the results of this research will contribute to IS research. For practical implications, this study provides basis for policy formulation to improve e-government readiness.

Secondly, on the theoretical side, this study will categorise five types of the digital divide in order to understand and conceptualise it in a more comprehensive manner. By understanding the issue of digital divide more comprehensively, the policy makers will be able to develop and implement comprehensive strategies to resolve it. The model on digital divide in this study extends the previous model by Dewan and Riggins (2005) and Wei et al. (2011), which also aims to contribute to the theoretical understanding of this issue.

Thirdly, the study will bring in 'trust in e-government' as a mediating variable affecting the impact of the digital divide on e-government system success. In terms of the contributions to research development, this study is significant since the concept of trust has been discussed within many disciplines, including psychology, sociology, economics, and organization theory. This has resulted in a body of research that is widely divergent and at times contradictory (Goldfinch 2007; Kelton, Fleischmann, and Wallace 2007). In the area of information systems, trust has also been discussed, resulting in disagreements among researchers as to whether discussing trust is either necessary or appropriate (Gefen, Benbasat, and Pavlou 2008). By examining the mediating role of trust in e-government in the influence of digital divide on e-government system success; this study aims to provide an insight for research in information systems. The findings aim to enrich the theoretical understanding of trust in e-government in particular, and in the IT area in general. The comprehensive understanding of the concept of the digital divide and the role of 'trust in e-government' contributed by this research is expected to assist in the formulation of strategies and policies to close the digital divide. For local governments in developing countries in particular, the outcome of

this research should prove significant in the formulation of strategic policies for the successful implementation of e-government.

1.7. Organisation of the Thesis

The thesis is organised and presented in eight chapters, as described in Figure 1.1. Following Chapter One; the introductory chapter, Chapter Two presents a literature review as the underlying foundation of this research. The literature review provides a theoretical framework for the research; reviews relevant research associated with this study, identifies the gaps in the existing literature and finally, proposes a tentative research model. A range of books, journal articles, proceedings, websites and newspaper articles are reviewed in Chapter Two.

The research paradigm and method are discussed in detail in Chapter Three. The stages of the research and the methods applied in each stage are covered in this chapter. Furthermore, Chapter Three describes how qualitative as well as quantitative methods were used in data collection and how content analysis was applied in the exploratory qualitative stage and illustrates structural equation modeling in the confirmatory quantitative stage. Rationales for the choice of methods are given.

Chapter Four describes in detail the field study that was conducted to examine the tentative research model. This field study involved interviews with e-government users in Indonesia. The description of the process of the field study is then followed by data analysis with content analysis, using both inductive and deductive approaches. A comprehensive research model is developed based on the result, which is then examined using the quantitative method in Chapter Five.

Following the development of the comprehensive research model in Chapter Four, relationships among constructs are hypothesised in Chapter Five. Chapter Five describes the development of the hypotheses and discusses the justification for

each hypothesis; whether that be from previous research and literature or the findings from the field studies. The hypotheses were used to develop a questionnaire (tested for reliability and validity) for the quantitative stage.

Chapter Six provides a detailed description of the quantitative stage, with information being gathered via a survey of Indonesian local government. The Partial Least Square (PLS) approach, based on Structural Equation Modelling (SEM) was used to analyse the survey data. Included in Chapter Six are details of the data examination, model assessment and hypothesis testing.

Chapter Seven basically explains the research findings from the survey data analysis based on theoretical and practical perspectives. The findings are discussed and comments given about the implications of the findings for theory development and practice.

Table 1.2: Organisation of the thesis

Structure	Description	Aim
Chapter One	<u>Introduction</u> Defines the research problems	To provide research questions and objectives
Chapter Two	<u>Literature Review</u> Provides the theoretical background, reviews previous research and identifies gaps in the literature	To propose a tentative research model
Chapter Three	<u>Research Design</u> Provides a detailed research design	To describe and justify the chosen research design
Chapter Four	<u>Field Study and Comprehensive Research Model</u> Presents the process and results of the field study	To propose a comprehensive research model
Chapter Five	<u>Hypotheses and Questionnaire Development</u> Presents the hypotheses of the comprehensive research model and the questionnaire design	To provide the hypotheses of the research and questionnaire development
Chapter Six	<u>Data Analysis Using Partial Least Square (PLS) Based Structural Equation Modeling (SEM)</u> Provides a detailed survey method followed by data analysis using PLS Graph	To analyse the findings to confirm the model and hypotheses

Chapter Seven	<u>Discussion and Implications</u> Presents an in-depth discussion based on data analysis	To provide interpretation of the findings and the implications for the literature as well as the actual practice
Chapter Eight	<u>Conclusion and Future Directions</u> Overview of the research	To present the summary of the research, its limitations and contributions of the research

Finally, Chapter Eight highlights the summary of the research and its significant contributions. Research limitations and future research direction are also presented in Chapter Eight.

A list of references and appendices used as supporting evidence are provided at the end of the thesis.

1.8. Summary

This chapter provides the background of the relevant issues in order to clarify and underline the importance of the current research. Based on the existing literature, the chapter addresses the research gap in the studies of digital divide and e-government. Since the research is undertaken in Indonesia, a brief overview of e-government implementation in Indonesia was described. The overview was then followed by the description of the research focus and research questions and objectives, as well as the significance of this research. Finally, the last section presents the organisation of the thesis in order to provide a structured picture of this study.

Chapter Two: Literature Review

*“Today, many people could not imagine daily life without the use of increasingly sophisticated information and communication technologies (ICTs), from television and radio to the mobile telephone and the Internet. Yet for millions of people in the world’s poorest countries, there remains a digital divide excluding them from the benefits of ICTs”
(Annan 2004)*

2.1. Introduction

Information and communication technology (ICT) is acknowledged to be one of the key factors for economic and social development and cohesion. A research by James and Ziebell (2003), for instance, found that a project in Central Western Victoria, Australia was substantially transforming the community. The project, which established what so called Community Enterprise Centers (CEC), aims to revitalize the community through education and improvement of business profile using ICT network. The results were impressive in the sense that it strengthens communication and cohesion within the community, which in turn improve the economic level and learning culture of the community. Similar results were found by Jaggi (2003), Lehr et al. (2006), Pigg (2011), and Moshiri and Nikpoor (2011), who investigated the impact of broadband and ICT in general on economic development.

In broader context, ICT is also considered as catalysts for the social, economic and cultural transformation of communities. Some studies show that ICT contributes to the community as well as individual capacity building. Shearman (2003) argues that ICTs are *“...enabling individuals and groups within local communities to engage with and benefit from the information or knowledge economy, but also in developing their capacity...”* (p. 13). As an example, ICT has significant roles in poverty eradication strategy in Kenya (Ndeta 2003). ICT through Learning and Development Kenya (LDK) was utilized to improve education, agriculture and microcredit. Apart

from that, ICT was also used to help the youths from the slum area to access information so that they can stay in touch with the other groups of society. By an organization named SIDAREC (Slums Information Development & Resource Centers), ICT was very useful to support their programs in community service, such as counseling against HIV/AIDS, drug abuse and prostitution. Furthermore, Warschauer (2003b); UN (2005) argued that ICT contributes to social equality and inclusion of those who are marginalized. ICT helps to solve problems caused by lack of mobility, physical disabilities or social discrimination.

For private and public organizations, ICT and internet in particular trigger a revolution in ways to operate business and manage organizations. The revolution introduced efficiency in operations, many opportunities in delivering service and flexibilities in responding the market (UNCTAD 2010; Gurstein 2003). As a result, dramatic changes can be seen in customer relationship systems and supply chain systems. New services, such as e-commerce, e-banking and e-government have been generated by ICT.

ICT also plays crucial roles in reinventing government and improving the quality of democracy. Some projects have been implemented, such as in Sweden (Ranerup 1999), South Africa (Benjamin 1999), United States of America (Brown 1999; Wolfe 1999), Ecuador (Salazar 1999), Jamaica (Brown and Thompson 2011), and other countries across the world. Although some projects may not be as successful as expected because of their complexities, but the researchers found that to some extent ICTs elevate the quality of communication between governments and their citizens, improve the accountability and help the improvement of public administration. Those are the basic reasons for some international organizations, such as UN and OECD strongly suggest the implementation of e-government systems to their members.

As the relationships between ICT and development studies gain more and more attention, research on this theme also has emerged since late of 1990s (Heeks 2008a, 2009). This field is known as Development Informatics, Community

Informatics or ICT4D (ICT for Development), which will be discussed in the following section.

2.2. Development Informatics, Community Informatics and ICT4D

Although some scholars made distinctions between ‘development informatics’, ‘community informatics’ and ‘ICT4D’ (and some other scholars also mentioned ‘social informatics’), the difference between them is not always clear (Johanson 2011a). The only difference is in the subject of the informatics. A research on the impact of the uses of internet by a certain community would be an example of ‘community informatics’; an examination of the social values of internet would be an example of ‘social informatics; and a study which investigate the benefits of ICT for marginalized people would fit into the category of ‘development informatics’. All of them actually refer to the relationships between ICT and development studies (Heeks 2007).

The increase use of ICT, particularly internet, and the introduction of the Millennium Development Goals (MDGs) by United Nations resulted in the emergence of research in development informatics and ICT4D (Heeks 2008a). Development informatics or community informatics is the application of ICT to empower and develop community process (Gurstein 2007). Furthermore, Gurstein (2007) argues that it is an emerging framework for approaching information systems from the perspective of community in the development of strategies to manage their community use and applications.

Figure 2.1 describes that the development of ICT is only the first step of informatics lifecycle. The development must be followed by ICT adoption and use; and finally the impact could be enjoyed by its users. ICT adoption and use thus attract concern

of researchers in the field of information systems. Many theories and competing models in ICT adoption have been yielded.



Figure 2.1 Informatics Lifecycle Stage of Applicability
(Source: Heeks 2007, p. 2)

2.3. ICT Adoption

Among theories and models in ICT adoption, there are at least 4 prominent models. They are: the Theory of Reasoned Action, the Technology Acceptance Model, the Theory of Planned Behaviour, and the Innovation Diffusion Theory. Following sections discuss each of the theory.

2.3.1. Theory of Reasoned Action (TRA)

This theory is one of the most influential theories of human behavior and has been used to predict a wide range of behavior, including in ICTs adoption. Drawn from social psychology, this theory assumes that individuals are rational and use the information available to them (Ajzen and Fishbein 1980). TRA argues that intention of individual determines actual behavior, because basically people usually do what they intend to do. The intention itself is a function of two determinants; they are personal in nature and social influence. The personal variable is termed *attitude toward behavior*, refers to the individual's judgment that performing a certain behavior is good or bad. On the other hand, social influence or *subjective norm* is the individual's perception of the social pressures put on him/her to perform or not perform the behavior.

As illustrated in Figure 2.2, *attitudes toward behavior* and *subjective norm* are determined by beliefs. Attitudes are a function of *beliefs and evaluations*. An

individual who believes that conducting a certain behavior will lead to mostly positive outcome will hold a favorable attitude conducting the behavior, and vice versa. However, subjective norm is determined by other kind of beliefs, which are *normative beliefs*. An individual who believes that most referents with whom he/she is motivated to comply think he/she should conduct the behavior will receive social pressure to do so.

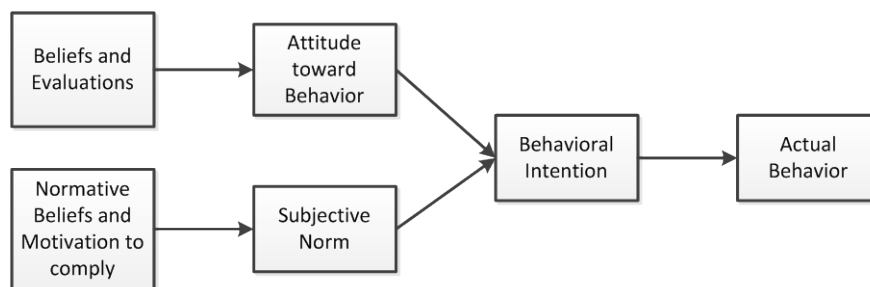


Figure 2.2 Theory of Reasoned Action

TRA has been used as a fundamental theory to develop other models, such as Technology Acceptance Model and Theory of Planned Behavior. TRA has also been validated by many researchers in predicting general behavior as well as in ICT adoption in particular. Among those are: Sheppard, Hartwick, and Warshaw (1988), Warshaw (1980), Thompson, Higgins, and Howell (1991), Peace, Galletta, and Thong (2003), and Quaddus and Hofmeyer (2007).

However, some researchers have criticized TRA model and suggested improvements. Bagozzi, Baumgartner, and Yi (1992) conducted a study about moderating variables of the TRA and noted that the model does not take into account the concept of favourable attitudes and 'subjective norms' leading to intentions to act. Bagozzi (1992) also engaged a research which found that 'attitudes' and 'subjective norms' are not strong determinant for 'intention' and the 'intention' is not adequate determinant for 'actual action'. Similarly, a study by Shimp and Kavas (1984) examined eight behavioral models found that the TRA model is only able to predict part of the actual adoption of behavior, despite that

TRA resulted in the best goodness-of-fit among other models. Another study by Charng, Piliavin, and Callero (1988) found a flaw in the TRA. Although the model has been validated to test wide variety of behaviors, there is little evidence to show that TRA is useful to predict repeating behaviors, such as repeat behavior of blood donors or continuation of smoking. In terms of the robustness of the TRA, Thompson and Thompson (1996) and Bagozzi (1992) found that substantial factors have been omitted from the TRA. They noted that TRA does not take into account situations where behavior is not completely under the individual's control.

2.3. 2. Technology Acceptance Model (TAM)

Based on TRA and literatures in psychology, Davis et al. introduced Technology Acceptance Model (TAM) (Davis, Bagozzi, and Warshaw 1989, 1992). TAM aims to explain the determinants of computer acceptance, by tracing the influence of external variables on internal beliefs, attitudes and intentions (Figure 2.3). Davis argues that two particular beliefs, *perceived usefulness* and *perceived ease of use*, are of substantial relevance for ICTs acceptance behaviors (Davis 1989).

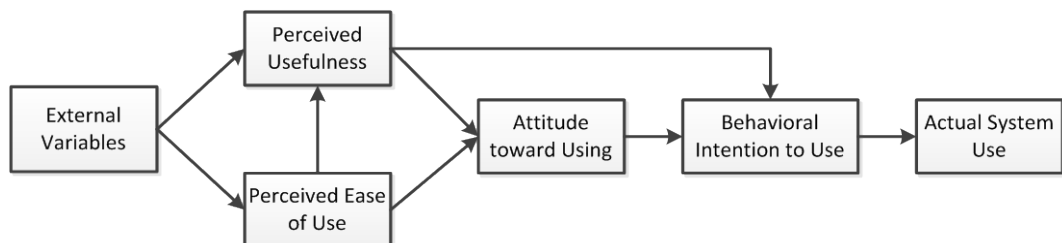


Figure 2.3 Technology Acceptance Model

Both TRA and TAM models postulate that ICT usage is determined by *behavioral intention*. However, TAM views behavioral intention is jointly determined by the individual's *attitude toward using* the ICTs and *perceived usefulness*. TAM excludes *subjective norm* as a determinant of behavioral intention. Indeed, the *external variables* are the bridge between all of the variables represented in TAM and the various individual differences and constraints (Davis, Bagozzi, and Warshaw 1989).

TAM is a robust model, which has been modified and tested by some researchers. Venkatesh and Davis (2000) proposed an extension of TAM and called the model as TAM2. Other researchers, such as Straub, Limayem, and Karahanna-Evaristo (1995), Chau (1996), Hu et al. (1999), Cheng (2011), and Escobar-Rodriguez, Monge-Lozano, and Romero-Alonso (2012) validated and extended TAM.

In his research, Mathieson (1991) discusses some flaws of TAM. There could be some other factors besides ease of use and usefulness that determine intention, such as accessibility, which is not part of the model. Furthermore, TAM does not explicitly include any social factors in the model, although they are important in the behavioral research. Unlike Ajzen (1991) who differentiates between internal control factors (refers to characteristics of the individual) and external factors (include time, opportunity and cooperation of others), TAM does not considered external control explicitly.

2.3.3. Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB) is an extension of Theory of Reasoned Action. This theory was introduced by Ajzen (1991). As also posits by TRA, a focus variable in the TPB is the person's intention to perform certain behavior. The intentions indicate the willing to try and represent how much effort persons are willing to exert in performing the behavior. Similar to TRA, TPB also argues that *attitudes toward behavior* and *subjective norm* as the determinants of intention.

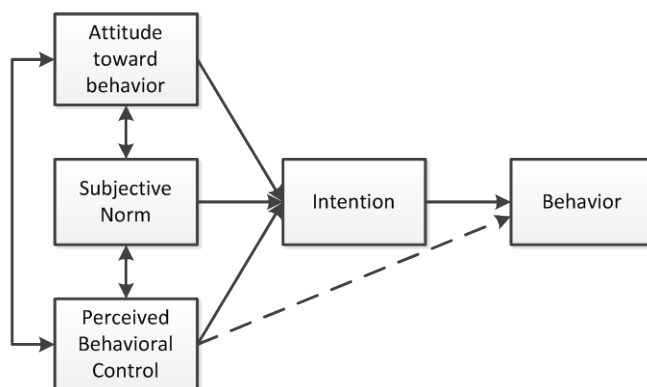


Figure 2.4 Theory of Planned Behavior

However, as depicted by Figure 2.4, TPB adds a factor of 'perceived behavioral control' as a determinant of behavioral intention. Ajzen (1991p. 183) defines 'perceived behavioral control' as "*people's perception of the ease or difficulty of performing the behavior of interest*". 'Perceived behavioral control' is similar to the Bandura's concept of 'perceived self-efficacy' (Bandura 1977). TPB states that person's behavior is influenced by his/her confidence in their ability to perform it (i.e., by perceived behavioral control). Furthermore, the TPB considers the variable of self-efficacy or perceived behavioral control within a more general framework of the relations among other variables, beliefs, attitudes, intentions, and behavior.

Ajzen (1991) argues that although the perceived behavioral control is a key point in the TPB, it is only achievable if the behavior is under volitional control or when the individual has freedom to choose whether or not to perform the behavior. In fact, performance of most behaviors involves some elements of non-motivational factors, thus 'perceived behavioral control' and 'actual control' are not the same.

TPB has been widely used to investigate behavior in many areas. In the behavior of ICT adoption, TPB has been used by researchers such as: Taylor and Todd (1995a), Mathieson (1991), Guinea and Markus (2009), Bulguru, Cavusoglu, and Benbasat (2010), and Lee and Rao (2012). TPB has also been decomposed and extended by Taylor and Todd (1995b) and Pavlou and Fygenson (2006).

Criticisms of the TPB come from many researchers. Ajzen (1991), the author itself, admits that at the time of publication, the strength of correlation between the constructs was not as strong as desired in terms of global measures. Beedell and Rehman (2000) and Bagozzi and Kimmel (1995) pointed out that 'perceived behavioral control' fails to predict both 'intention' and 'behavior', and the 'subjective norms' does not contribute to 'intention'. Those researchers concluded that the model is incomplete for predicting behavior. Therefore some researchers have added some constructs in the model, such as habit, moral obligation and self-

identity (Burton 2004); constructs related to past behaviors (Bagozzi and Kimmel 1995; East 1993).

2.3. 4. Diffusion of Innovation (DI)

Rogers (2003p.5) defines diffusion as *“the process in which an innovation is communicated through certain channels over time among the members of a social system”*. The process, which a person (or an organization) passes through from obtaining initial knowledge of an innovation to confirmation of the decision, is described in Figure 2.5 below. The process involves series of choices and actions over time. The behavior also involves uncertainty that is inherent in determining about a new choice to an idea previously in existence. Compared to other types of decision making, this innovation diffusion is distinct in the sense that it includes perceived newness of an innovation and the uncertainty associated with the newness.

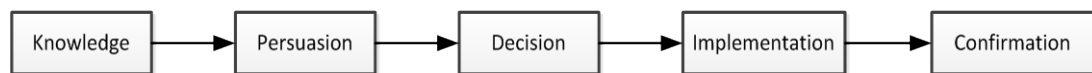


Figure 2.5 Diffusion of Innovation Model

The model consists of five stages, started with ‘knowledge’, when a person is exposed to an existence of innovation and its functions. It is then followed by ‘persuasion’, when the person determines a favourable or an unfavourable attitude towards the innovation. ‘Decision’ or activities that lead to a choice to adopt or reject the innovation would be made by the person. After deciding, the person then ‘implements’ or puts a new idea into use. The process is ended by a ‘confirmation’, when the person seeks reinforcement of the decision that already made. If the person exposed to conflicting message about the innovation, he/she may reverse this previous decision.

In the Diffusion of Innovations process, communication is substantial, as posited by Rogers (1995) that *“communication is a process in which participants create and*

share information with one another in order to reach a mutual understanding" (p. 5-6). There is a great deal of literature which highlighted the importance of communication or information networks to support Diffusion of Innovation. Wilkening (1950) noted the role of mass media as conduits for information diffusion. Chiffoleau (2005), on the other hand, suggests that the most important means to transfer the information is peer relationships.

Diffusion of Innovation has been criticized in terms of the variation found in the speed of adoption of technologies (Fisher et al. 2000), its application in developing countries (Ruttan 1996), and its different application to individuals and firms (Jensen 2001; Hausman 2005). However, the model has been applied by many researchers in broad variety of innovations (Quaddus and Xu 2005; Abdulai and Huffman 2005; Forte-Gardner et al. 2004; Hategekimana and Trant 2002).

2.3.5. Unified Theory of Acceptance and Use of Technology (UTAUT)

Based on review of the eight previous models in ICT acceptance, Venkatesh et al. (2003) formulate a unified model, which integrates factors across the previous models. The unified model, known as Unified Theory of Acceptance and Use of Technology (UTAUT), includes four determinants of intention and usage and four moderators of key relationships, as depicted in Figure 2.6. The variables used in the UTAUT similar to variables in the previous models, although different labels. *Performance expectancy* is comparable to variable of perceived usefulness, while *effort expectancy* similar to perceived ease of use in TAM. *Social influence* has a same definition as subjective norm in TPB and TRA. *Facilitating conditions* captures concepts of perceived behavioral control in TPB.

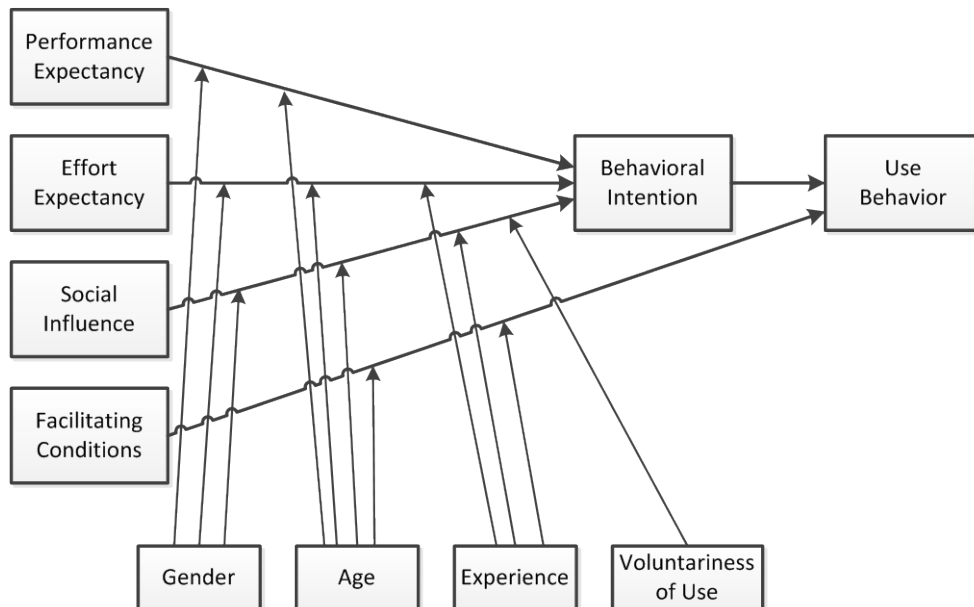


Figure 2.6. Unified Theory of Acceptance and Use of Technology

The purpose of UTAUT is to understand system usage as a dependent variable (Venkatesh et al. 2003). Venkatesh et al. (2003) admitted that the measures for UTAUT are still in the preliminary stage and should be developed and validated through research in the future. The model has been criticized to be more focusing on intention to use than on actual use (van Dijk, Peters, and Ebbers 2008). Datta (2010, p.5) also pointed out that the *“reference frame of UTAUT has been captive to individuals and organizations in the developing world”*.

Despite some criticism on the model, the results showed that UTAUT did better in explaining the variance in usage intention (adjusted R^2 of 70%) compared to all of the individual models which were used in developing this model (Venkatesh et al. 2003). The comprehensiveness, validity and reliability of the UTAUT model have encouraged researchers to extend and validate it in the context of e-government service adoption (eg. Carter et al. 2011; Wang and Shih 2009; van Dijk, Peters, and Ebbers 2008) as well as e-commerce adoption (eg. Keong et al. 2012; Venkatesh, Thong, and Xu 2012; Datta 2010; AbuShanab and Pearson 2007).

The theories and models reviewed above show that ICT adoption is one of the most important topics in information systems research. As mentioned before that the ICT adoption is the first step of informatics lifecycle stage of applicability and will lead to the impact that could be enjoyed by its users (Figure 2.1). However, many observers in international government and non-government organizations, including the various agencies of the United Nations, World Bank, OECD (Organization of Economic Cooperation and Development), and UNCTAD (United Nations Conference on Trade and Development), among other organizations, have recognized through their research reports that the ICT has not been evenly adopted globally. This issue has been known as digital divide or digital inequality. It has been one of the most fruitful topics for many researchers and policy makers since the late 1990s.

2.4. Digital Divide

Digital divide occurs at two levels, international level and national level. At the international level, the gap is obvious. A composite telecommunication index released by United Nations illustrates the gap (Table 2.1), particularly in terms of telecommunication infrastructure. The indicators are internet users/100 inhabitants, personal computer/100 inhabitants, telephone cellular subscribers/100 inhabitants, main telephone lines/100 inhabitants, and fixed broadband users/100 inhabitants. To compare telecommunication infrastructure, some countries have been selected and presented in the table. The countries presented in the Table 2.1 represent developed countries, developing countries, as well as least developed countries. All of the indicators convince us that there is a wide divide among countries. In 2012, 95% citizens of Iceland have access to internet, while in Liberia, only 0.07% of its citizens connected to internet (UN 2012). Moreover, there are still 15 countries without fixed broadband connection at all; most of them are African countries. Africa seems struggle in providing ICTs infrastructure, while Europe is the most connected region in contrast. The figures based on economic groups

underline the wide gap between those of developed countries and those of least developed countries. There are as much as 97.55% people in LDCs live without any PC at home (UN 2010). Indeed, research by Dewan, Ganley, and Kraemer (2005) and Billon, Marco, and Lera-Lopez (2009) also found the inequalities across countries of ICT use as the impact of inequalities in terms of economic, demographic and in terms of ICT infrastructures.

At the national level, some studies revealed the digital divide in most countries across the world. Even within the developed countries, such as United States or United Kingdom, the problem of digital divide or digital inequality is inevitable. Mossberger, Tolbert, and Gilbert (2006); Hargittai (2006); Venkatesh and Morris (2000) and Mossberger, Tolbert, and McNeal (2008) investigated the inequality of ICT use in USA and found that some demographic factors, such as gender, race and residential place determining the ICT use. In UK, a study by Kuk (2003) revealed gap between regions of high and low household internet access. In developing country Warschauer (2003a), for example, examined the digital divide in Egypt and concluded that the gap is the result of educational problems.

2.4.1. Definition of Digital Divide

The definition of digital divide has been evolved as the reflection of the attempts to understand this issue more comprehensively. Initially, digital divide was defined as the 'inequality between those who had access to ICT and those who had not' (De Haan 2004; DiMaggio, Hargittai, Neuman, et al. 2001), particularly in terms of ICT infrastructure. NTIA (National Telecommunications and Information Administration) of the US Department of Commerce for instance, in its first report of digital divide noted that telephone penetration was the most common indicator of the nation's success in achieving universal service (NTIA 1995).

Table 2.2 lists previous research on digital divide. The list shows that most of researchers use access to ICT as the main variable. Although the definition of access varies from one researcher to another, the main indicator is still ICT infrastructure.

As the awareness on the complexity of the issue of digital divide rises, several researchers (eg. Bertot 2003; Warschauer 2003b; Kauffman and Techatassanasoontorn 2005) suggest that the typical definition of digital divide that is commonly used—which points to ICT access gaps—is too narrow. As a consequence, there are some recognition that broader definitions and approaches that may be used to look into these issues from a number of different perspectives might be more appropriate to extend our understanding beyond the idea of an access gap.

Bertot (2003) argues that the digital divide, especially on the Internet, should be considered along some dimensions, including the breadth and quality of access to ICT, the availability of effective telecommunication infrastructures, the presence of parallel economic growth, and information literacy. Similarly, DiMaggio and Hargittai (2001) suggest that research should move on from the dichotomous measure of the digital divide as “haves” and “have-nots” to study differences among people with access to ICT.

Table 2.1. Telecommunication Infrastructure of Selected Countries, Regional Groups and Economic Groups

Source: UN (2008, 2010, 2012)

Country	Internet/100 persons			PCs/100 persons			Cellular subscribers/ 100 persons			Main Tel lines/100 persons			Broadband/ 100 persons		
	2008	2010	2012	2008	2010	2012	2008	2010	2012	2008	2010	2012	2008	2010	2012
Australia	75.12	71.89	76.00	76.61	60.29	n/a	97.02	104.96	101.04	48.81	44.46	38.89	19.15	24.39	23.19
USA	69.10	74.00	79.00	76.22	78.67	n/a	77.40	86.79	89.86	57.15	51.33	48.70	19.31	25.35	26.34
United Kingdom	56.03	79.62	85.00	76.52	80.23	n/a	116.39	123.41	130.25	56.16	54.24	53.71	21.71	28.21	31.38
Saudi Arabia	18.66	30.55	41.00	12.82	68.25	n/a	78.05	142.85	187.86	15.68	16.27	15.18	0.87	4.16	5.45
Ecuador	11.54	9.71	24.00	6.55	12.95	n/a	63.23	86.01	102.18	13.07	14.17	14.42	0.20	0.26	1.36
Indonesia	7.18	11.13	9.10	1.47	2.03	n/a	28.30	61.83	91.72	6.57	13.36	15.83	0.05	0.13	0.79
India	5.44	6.95	7.50	1.54	3.18	n/a	14.83	29.36	61.42	3.64	3.21	2.87	0.21	0.45	0.90
Bangladesh	0.31	0.32	3.70	2.42	2.25	n/a	13.25	27.90	46.17	0.79	0.84	0.61	0.00	0.03	0.04
Liberia	0.03	0.55	0.07	n/a	n/a	n/a	4.87	19.30	39.34	0.21	0.06	0.15	0.00	0.00	0.00
Ethiopia	0.21	0.45	0.75	0.39	0.68	n/a	1.09	3.93	7.86	0.91	1.13	1.10	0.00	0.00	0.00
Somalia	1.11	1.12	1.16	0.91	0.90	n/a	6.08	6.87	6.95	1.22	1.15	1.07	0.00	0.00	0.00
<i>Regional Groups:</i>															
Africa	n/a	6.57	9.85	n/a	3.44	n/a	n/a	38.02	56.45	n/a	3.86	3.93	n/a	0.58	0.66
America	n/a	30.78	36.63	n/a	15.04	n/a	n/a	86.86	107.53	n/a	21.83	21.26	n/a	6.94	9.08
Asia	n/a	21.59	29.33	n/a	14.99	n/a	n/a	70.75	91.64	n/a	15.62	15.06	n/a	5.15	5.41
Europe	n/a	53.15	66.01	n/a	38.90	n/a	n/a	113.24	119.52	n/a	42.31	40.40	n/a	18.86	23.63
Oceania	n/a	20.28	21.26	n/a	15.21	n/a	n/a	38.32	59.06	n/a	16.29	17.22	n/a	5.24	4.41
<i>Economic Groups:</i>															
Developed countries	n/a	57.99	67.45	n/a	46.14	n/a	n/a	112.04	117.24	n/a	43.75	40.69	n/a	21.08	23.92
Developing countries other than LDCs	n/a	22.84	28.62	n/a	12.08	n/a	n/a	77.74	98.11	n/a	17.43	16.11	n/a	4.29	5.24
Least developed countries (LDCs)	n/a	4.47	5.75	n/a	2.45	n/a	n/a	25.70	40.04	n/a	2.35	2.13	n/a	0.44	0.23

As the implication of narrow understanding on the issue of digital divide, policy makers in many countries have been using it as the basis of their policy. Governments in many countries increase public access to computers and basic ICTs in schools and other public places. In US, former President Bill Clinton proposed a US\$2.3 billion tax incentive for businesses, which donate computers to poor schools and communities, sponsor the establishment of technology centers in poor neighborhood and provide internet training (Lacey 2000). Some corporations worldwide also initiated a home-computer benefit for their employees who did not own computers (Atewell 2001). As part of the attempts to narrow the digital divide, Bill and Melinda Gates Foundation supports the access to computer and internet service in US and some developing countries (Foundation 2012).

Table 2.1 shows that gaps exist from time to time, even in term of ICT infrastructures. The United Nations indicates that the digital divide is not diminishing rather it is growing wider (UN 2010). Some scholars argue that this was a result of incomprehensive understanding of digital divide which led to insufficient policy. The World Bank, the United Nations and other international organizations endorsed the development of a set of indicators to measure the extent of the digital divide across countries over time. Kauffman and Techatassanasoontorn (2005)

Warschauer's note on a competition of an "Information Age Town" in Ireland provides us a good example of the insufficient policy (Warschauer 2003b, pp.2-4). In 1997, there was a competition held by Ireland's national telecommunication company. In order to narrow the gap of ICT use, the company would provide US\$22 million fund to implement a proposal of what an Information Age Town should be

in a competition basis. Ennis, a small town, came out as a winner and gave an internet-ready PC to every family in town. The town also provided ISDN line, website and other sophisticated technologies to all businesses. Unfortunately, many people didn't know how to operate the equipment, some other didn't want to use internet as they see that internet deprived them to socializing. As a result, many computers reportedly sold on the black market and the aims of the program couldn't be achieved (Warschauer 2003b).

Table 2.2: Previous Research on Digital Divide

Research	Variables	Location	Key findings
(Kuk 2002)	Internet access	United Kingdom	Quality of local government websites in regions of low household internet access is poorer than in regions of high internet access.
(van Dijk and Hacker 2003)	Age; gender; education; ethnic group;	Netherlands	Age and gender determine PC possession.
(Quibra et al. 2003)	Income; population size; education; ICT infrastructures	Asian countries	Income, education and infrastructures are determinants of ICT adoption.
(Oyelaran-Oyeyinka and Lal 2005)	GDP per capita; ICT infrastructures; human capital	Sub-saharan countries	High correlation between ICT infrastructure and GDP per capita. ICT infrastructures significantly influence internet diffusion.
(Mariscal 2005)	GDP per capita; urban population; privatization; autonomous regulator; IT penetration	Latin-American countries	All of the independent variables are significantly impacting IT penetration.
(Dewan, Ganley, and Kraemer 2005)	Economic; demographic; environmental; IT penetration	Cross country	National income is positively associated with IT penetration. There are differences of demographic and economic effects.
(Hargittai 2006)	Age; education; income; internet experience	USA	Education is significantly influencing one's likelihood to make mistakes.
(Mossberger, Tolbert, and Gilbert 2006)	Income; education; race; place of residence	USA	Disparities among ethnic groups are due to place effects rather than race. Concentrated poverty important for computer and internet access.
(Stern, Adams, and Elsasser 2009)	Access divide; proficiency divide; demographic	USA	There is access divide based on county type. Proficiency is influenced by type of connection.
(Billon, Marco, and Lera-Lopez 2009)	ICT infrastructures; GDP per capita; population	Cross country	In developed countries, GDP and education are the important factors influencing ICT adoption, while age and urban population are influencing ICT adoption in developing countries.
(Agarwal, Animesh, and Prasad 2009)	Gender; age; education; race; housing density	USA	All of the independent variables influence internet use. By controlling individual and regional characteristics, peer effects have stronger influence.

(Dewan, Ganley, and Kraemer 2009)	ICT infrastructures	Cross country	Co-diffusion effects between PC and internet are complementary. Impacts of PCs on internet diffusion are stronger in developing countries than developed countries.
(Hsieh, Rai, and Keil 2008, 2011)	Household income; education level; age; gender; ethnic group	USA	Internet PC ownership and personal network exposure in social-economically advantaged group are more significantly influencing continued use intention.
(Belanger and Carter 2009)	Access; computer and internet skill; gender	USA	Income, education, age, internet usage and online information search are significant predictors of e-government use.
(Schleife 2010)	County type; age; gender; education; occupational status; income	Germany	Education, age, income and county type are the most important determinants of internet use.
(Wei et al. 2010)	Digital access divide; digital capability divide; digital outcome divide	Singapore	Digital access divide impacts computer self-efficacy. Gender also significantly influencing computer self-efficacy.
(Sipior, Ward, and Connolly 2011)	Age; education level; employment status; household income; internet experience	USA	Education, employment and income and perceived ease of use are the most significant factors for t-government use.

Despite calls from several researchers to recognize the broader definition of the digital divide beyond the “haves” and “have-nots” dichotomy, much of the existing research examines the issue through the simplistic perspective of technology access. This is helpful for a first-cut understanding of the digital divide associated with a particular technology, but further studies are needed to provide deeper understanding. Scholars believe that this will occur through the application of multidimensional definitions of the digital divide. Norris (2001), for example, argues that understanding on the issue of digital divide should be put on the social inequality context.

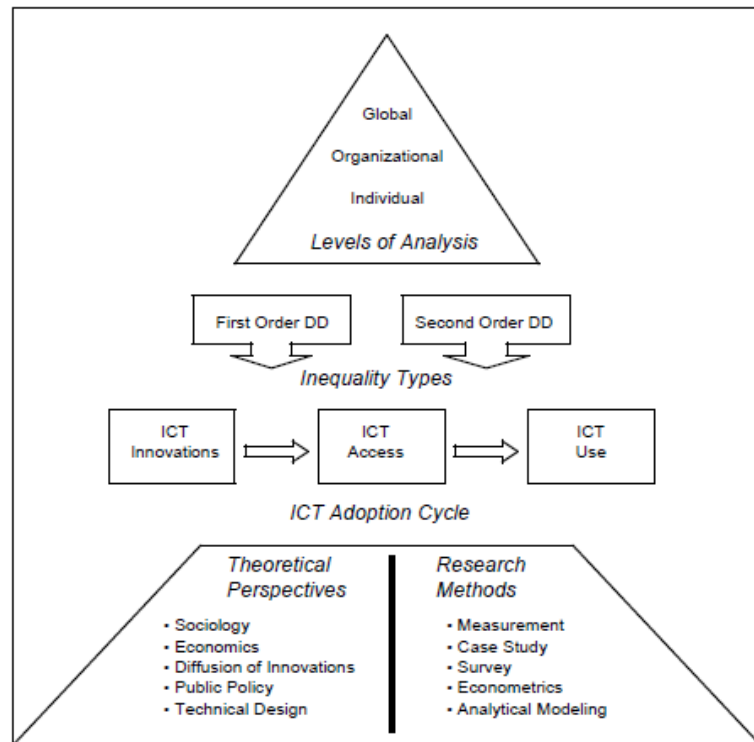


Figure 2.7 Conceptual framework for research in digital divide

Source: (Dewan and Riggins 2005, p. 302)

Dewan and Riggins (2005) advance the understanding of digital divide by suggesting two orders of digital divide. As new ICT innovations are publicly launched, individuals would adopt them at varying rates. This leads to inequality in the level of access. Furthermore, there is variation among the adopters in the ability to use the innovations effectively. Accordingly, there are two types of inequality, one in access to ICTs and the other in the ability to use the ICTs. Those inequalities are corresponding to the first order and second order digital divides, respectively, as shown in Figure 2.7. The second order divide starts to become more important, as the majority of the participants in some social system have obtained access to a technology (Dewan and Riggins 2005).

Wei et.al. (2011) introduce a third order of digital divide, by extending the framework of Dewan and Riggins (2005), the outcome divide. It refers to inequality of outcomes of exploiting ICT, resulted from the first and second order of digital divide (Figure 2.8). Wei et al. (2011) argue that the access to and use of ICT at homes and at schools (or so called digital access divide) impact computer self-efficacy, the central factor pertaining to the digital capability divide for individuals. In turn, computer self-efficacy affects learning outcomes of individuals, which represent digital outcome divide. Further, this framework could be examined at the level of individual, organization, as well as global.

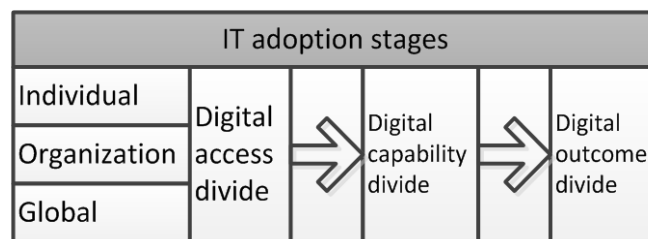


Figure 2.8 Three levels digital divide framework

Source: (Wei et al. 2011, p.3)

This research explored and investigated digital divide beyond access and demographic factors. In this research, digital divide was defined as an *“inequality between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and their use for a wide variety of activities”* (OECD 2001, p.5). It is a comprehensive definition covering all important elements of digital divide, which are demographic factors, socio-economic levels, access to ICTs and the use of ICTs. Based on the definition and a consideration that previous research in digital divide predominantly focused on inequality of access (Table 2.2),

this research will attempt to fill the gap in digital divide studies. This research proposes a more comprehensive investigation of digital divide by categorising it into five levels, namely demographic divide, economic divide, access divide, capability divide and innovativeness divide.

2.4.2. Demographic Divide

Demographic factors have been recognized by previous research as important factors determining ICT adoption or usage. Residential place has been investigated by Mossberger, Tolbert, and Gilbert (2006) who found that it is one of the important factors in Internet use. Research by Mariscal (2005), Kuk (2003), and Stern, Adams, and Elsasser (2009) also confirm the importance of residential place. Venkatesh and Morris (2000) examined the role of gender in the technology adoption, and found the significant difference between men and women. Wei et al. (2011), Agarwal, Animesh, and Prasad (2009), and Schleife (2010) have also studied the role of gender in Internet use. Agarwal, Animesh, and Prasad (2009), Hargittai (2006), and Schleife (2010) investigated the impact of age in Internet use in Germany and concluded that age is one of the influencing factors. On the other hand, the role of education in technology adoption have been examined by Jung, Qiu, and Kim (2001); Mossberger, Tolbert, and Gilbert (2006).

2.4.3. Economic Divide

Socio-economic factors are believed as internal and external resources that together shape experiences, opportunities and even ways in which the world is viewed (Williams 1990). Socio-economic factors also substantially bring about a synergy of social and economic forces to individuals and resources contained in

their surrounding environments (Hsieh, Rai, and Keil 2008). Hence, socio-economic has been associated with behavioral patterns in many fields, including psychology and information systems. In the field of information systems, prior researchers found that socio-economic circumstances influenced the ICT use (Agarwal, Animesh, and Prasad 2009; Schleife 2010; Mossberger, Tolbert, and Gilbert 2006) and that economic condition was the most important factor to widen the opportunity for accessing the ICTs (Dewan, Ganley, and Kraemer 2005; Quibra et al. 2003).

2.4.4. Access Divide

Access divide represents the physical access to information and communication technology (Quibra et al. 2003). As mentioned earlier, most of the researches in digital divide focused on access divide as the dependent variable to ICT use (Table 2.1). Those who have examined access divide and its influence on ICT use suggested that the access to ICT was a key factor of ICT use. According to the framework provided by Dewan and Riggins (2005), access divide is considered as the first order of digital divide, because access to ICT is the primary requirement to ICT use. Dewan and Riggins (2005) and Wei et al. (2011) also found that access divide had significantly influenced capability in utilising ICT.

2.4.5. Capability Divide Based on Social Cognitive Theory

Digital capability divide is derived from social cognitive theory (Bandura 1977), which argues that individual possesses a self-belief system. Furthermore, Bandura (1977, 2001) argues that the system allows each individual to control his/her cognitive processes, feelings, motivation and behavior, with self-efficacy being the

core of the system. Self-efficacy refers to an individual's belief in his or her capability to perform a specific task, which may not necessarily reflect actual competence.

Although Bandura originally developed the self-efficacy theory for treating severe phobic, researchers in other areas including information systems have used the concept widely. In the area of information systems, computer self-efficacy has been examined by previous research (Marakas, Yi, and Johnson 1998; Compeau, Higgins, and Huff 1999; Wei et al. 2011). The results suggested that self-efficacy was a strong predictor of behavior and attitudes. Based on Dewan and Riggins' framework and Social Cognitive Theory, Wei et al. (2011) developed a more comprehensive model for digital divide to include capability divide. Capability divide is then considered as the second order of digital divide (Dewan and Riggins 2005; Wei et al. 2011).

2.4.6. Innovativeness Divide Based on Personal Innovativeness

With regards to attitude toward new technology, Dijk and Hacker (2003) admitted that information *want-not* was a more important problem than information *have-not*. As new technological innovation is introduced, potential users will consider perceived benefits as well as perceived risks or costs. Technological innovations will be adopted if the benefits earned by its users exceed the risks or costs (Ellen, Bearden, and Sharma 1991). Rogers (1995) believes that innovators and early adopters were individuals who were able to cope with high level of risks and uncertainty. On the other hand, Hofstede (1983, 2009) found that in Indonesia as well as most Asian countries, levels of 'uncertainty avoidance' index, the society's

tolerance for uncertainty and ambiguity, were generally high. Consequently, majority of Indonesians did not easily accept any changes and innovations.

The innovativeness divide refers to the willingness to change and try out any new information technology (Hurt, Joseph, and Cook 1977; Agarwal and Prasad 1998). Innovation, by its nature, is associated with greater risks and uncertainty (Kirton 1976). In this research, Personal Innovativeness was used to explain the influence of innovativeness divide on IT usage. Rogers (1995) argued that individuals were categorized as ‘innovative’, if they were early to adopt an innovation and ‘non-innovative’ if they adopted later. Based on the research by Midgley and Dowling (1978) and Flynn and Goldsmith (1993), Agarwal and Prasad (1998) suggested that personal innovativeness was an important construct in the acceptance of information technology innovations.

To summarize the types of digital divide, which are examined in the current research, Table 2.3 presents the criteria for each type of digital divide.

Table 2.3: Criteria for each type of digital divide

Digital Divide	Criteria
Demographic Divide	Gender, age, place of residence, and education
Economic Divide	Socio-economic circumstances
Access Divide	Physical access to information and communication technology
Capability	Individual's belief in his or her capability to utilise ICT
Innovativeness Divide	Willingness to change and try out any new information technology

This research intends to explore the phenomenon of digital divide in e-government context, based on two reasons: *first*, digital divide is one of the serious problems in implementing e-government systems (Harijadi 2004; Hwang and Syamsuddin 2008;

UN 2010). Unlike e-commerce, where the businesses are allowed to choose customers, e-government systems are developed to serve the entire population (Carter and Belanger 2005). Therefore, the existence of digital divide is a big challenge for e-government. *Second*, understanding of this issue is important for government in order to develop ‘citizen-centered’ e-government systems and improve citizens’ readiness for e-government.

2.5. E-Government Systems

Table 2.4 presents e-Government Readiness Index of Indonesia in comparison with some Asian countries (UN 2005, 2008, 2010). The indices and ranks of Indonesia do not show a significant progress, which indicate that Indonesia’s e-government systems face substantial problems.

Table 2.4: UN e-Government Readiness Index of some Asian countries

Countries/Region	2005		2008		2010	
	Rank	Index	Rank	Index	Rank	Index
Republic of Korea	5	0.873	6	0.832	1	0.879
Singapore	7	0.850	23	0.701	11	0.748
Malaysia	43	0.571	34	0.606	32	0.610
Vietnam	105	0.364	91	0.456	90	0.445
Indonesia	96	0.382	106	0.411	109	0.403

The Readiness Index is a composite measurement of the capacity and willingness of countries to use e-government for ICT-led development. Along with an assessment of the website development patterns in a country, the e-government readiness index incorporates the infrastructure and educational levels, to reflect how a country is using information technologies to promote access and inclusion of its

citizens. In 2010, the index is extended by incorporating e-participation to reflect the emphasis on interactive and transactional services (UN 2010). Although the index does not measure the usage of e-government systems by the citizens, the e-participation index indicates how useful the services in e-government are for the citizens. Thus the poor Readiness Index reflects unsuccessful (use and benefit) e-government.

E-Government refers to the use of information and communication technology (ICTs) to enhance the access to and delivery of all facets of government services and operations for the benefit of citizens, business, employees and other stakeholders (Srivastava and Teo 2007). E-government system is an important tool for human development and for the achievement of development goals, such as Millennium Development Goals (MDGs) (UN 2010). Therefore, all countries are encouraged to implement e-government system.

2.5.1. Reinventing Government Paradigm

The e-government initiative can be traced back to the paradigm of New Public Management or Reinventing Government. The paradigm, which started in the late 1980s, is an effort to reorient the focus of government operations from an inward-looking approach to an outward-looking one by emphasizing the concerns and needs of end users. The new paradigm is a critics to the previous paradigm which also known as Weberian paradigm.

Weberian model of organization focuses on internal and managerial concerns and emphasizes departmentalization, specialization and standardization of the production process (Weber 1947; Schachter 1995). Officials who perform similar

functions are grouped and organized into the same administrative unit or department. Each unit is responsible for understanding its clients, assessing the demand for its services, delivering those services, and setting administrative goals for planning and evaluation purposes. To ensure that departmental plans are consistent with each other and fiscally feasible, the budget office, city manager's or mayor's office, and the city council are responsible for centralized control and coordination. However, the Weberian bureaucracy is often criticized for its rigidity, inefficiency, and incapability to serve "human clients," who have preferences and feelings (Bozeman 2000). A simple example of these drawbacks is the fact that a newcomer to a city may have to fill out many forms for different departments, even though the forms ask for similar information, such as name, address, and household characteristics.

In the reinventing Government or New Public Management paradigm, Osborne and Gaebler (1992) proposed that citizens should be regarded and treated as customers, suggesting that the delivery of government services should be redesigned with a customer focus. Mintzberg (1996) even argues that citizens have rights that go far beyond those of customers or even clients, although citizens have obligations in the same time. The paradigm also emphasizes the principles of "catalytic government" and "community-ownership." Public officials are challenged to think about how to empower citizens to take ownership of community problems. The approach urges officials to partner with citizen groups and nonprofit organizations to identify solutions and deliver public services effectively.

2.5.2. Role of ICT in Reinventing Government

A major obstacle to the reinventing government reform is the burden of transaction costs imposed on public officials and citizens. Government officials may find citizen engagement time consuming and costly. Given the time pressure they already face in the daily operation of government, networking with citizens and proactively soliciting public input seem an unnecessary and unwanted burden. Citizens also may be reluctant to participate in the decision-making process of the government. Attending meetings, writing formal feedback, and responding to surveys about public services may require a time commitment that many citizens are not willing to give regularly.

In addressing those challenges, information and communication technology (ICT) has played an increasingly important role in public administration (Heeks 1999). Before the Internet emerged in the late 1980s, some governments were already actively pursuing information technology to improve operating efficiency and to enhance internal communication (King 1982; Norris and Kraemer 1996; Brown 1999). However, the focus of e-government in this era was primarily internal and managerial. The introduction of the Internet and the World Wide Web marked a new stage in information technology usage by shifting the focus of governance to its external relationship with citizens (Seneviratne 1999). Technology certainly plays an important role in fostering the change.

Early adopters of Internet technology applications in public organizations tended to automate existing business processes, with little redesign or innovation. It didn't attempt to integrate and redesign the business as a whole in order to make it truly

web-centric. Burn and Robins (2003, p.26) state, “e-government is not just about putting forms and services online. It provides the opportunity to rethink how the government provides services and how it links them in a way that is tailored to the users’ needs”. The failure of many dot.coms should alert governments to the risk that e-government initiatives may also go wrong. Consequently, “government must develop a far more sophisticated view of the people it is there to serve and devolve real power to regions and localities as an integral part of its approach to e-government and provide more freedom of information” (Burn and Robins 2003, p.26). If the governments can achieve this new conception of their role, then there is the potential for e-government to transform fundamental relationship between government and citizen. There are many opportunities for e-government applications, whether they involve the provision of information, handling complaints and queries electronically, processing applications for permits/licenses electronically, paying taxes, duties, and fees electronically.

2.5.3. Benefits of e-Government

E-government system is believed to have some benefits. La Porte, Demchak, and Jong (2002) and Vigoda (2000) argue that e-government facilitates citizens access to government and policy information individually and contact responsible officials. The access promotes better accountability of public officials to citizens and in turn restores public confidence in government (Thomas 1998). More information delivered in a more timely fashion to citizens is expected to increase transparency of government, empowering citizens to more closely monitor government performance. Enhanced interactivity is also expected to improve government

accountability as it makes government more responsive to the needs and demands of individual citizens (Wong and Welch 2004).

Srivastava and Teo (2007) found that e-government implementation in 99 countries has significant impact on efficiency, national performance and national business competitiveness. Similar findings are also concluded by previous research about the impact of e-government in helping improve service delivery (Al-Kibsi et al. 2001; Haldenwang 2004; West 2004), in reducing corruption (Cho and Choi 2004; Wong and Welch 2004; Haldenwang 2004), in improving national performance (Barua, Kriebel, and Mukhopadhyay 1995), and in the long run also contributing in the process of democratization (West 2004; Haldenwang 2004; Evans-Cowley and Conroy 2004). Hence, considering its benefits, e-government is seen as no longer an option but a necessity for all countries aiming for better governance (Gupta and Jana 2003).

Despite the positive impacts of e-government, e-government initiatives actually have mostly fallen short of their potential. This issue is even more visible in the context of developing countries, where only about 15 percent of all e-government initiatives have been successful in attaining their major goals without any significant undesirable outcomes (Heeks 2008b). Stakeholders and leadership play the primary role in making e-government a success (Luk 2009). Technology plays a supportive role, but important, although it cannot work in isolation. Section 2.5.6 will discuss about the challenges for e-government further.

2.5.4. Stages of e-Government Development

Layne and Lee (2001) posit four stages of e-government development model (as illustrated in Figure 2.9). In stage one of cataloging; government focuses on the efforts to develop a website, which its content most limited to online presentations of government information. Government starts to focus on integrating the internal systems to online interfaces and allowing its citizens to transact with government through online systems in the stage two. This stage is known as 'transaction-based' e-government, and at this stage, e-government efforts consists of putting live database links to online interfaces, so that, for example, citizens may renew their licenses and pay fines on-line.

By having similar agencies across different levels of governments and by having different agencies with different functionality connect to each other, citizens will see the government as an integrated information base. Citizen can contact one point of government and complete any level of governmental transaction. From the viewpoint of all levels of government, this could eliminate redundancies and inconsistencies in their information bases for citizens. This integration may happen in two ways: vertical and horizontal. Vertical integration refers to local, provincial or states and national or federal governments connected for different functions or services of government. In an ideal situation where systems are vertically integrated, once a citizen filed for a business license at the city government, this information would be propagated to the state's business licensing system and to the central government to obtain an employer identification number. In contrast, horizontal integration is defined as integration across different functions and services at the same level of government.

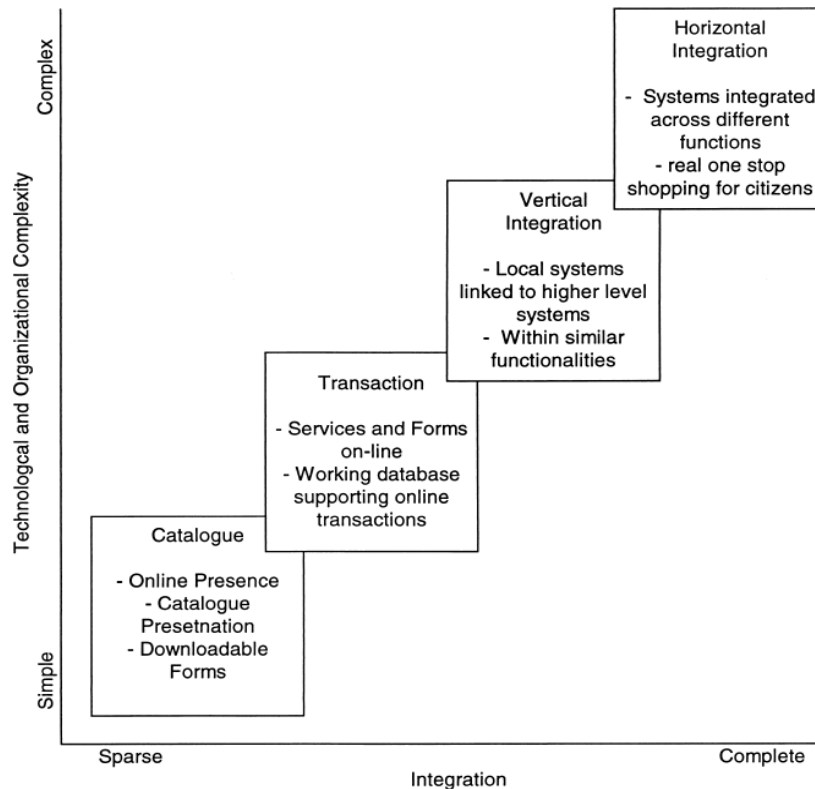


Figure 2.9 Dimensions and Stages of e-Government Development

Source: Layne and Lee (2001, p.124)

e-Government services are basically categorized into four types, namely Government to Citizens (G2C), Government to Business (G2B) and Government to Government (G2G) (Evans and Yen 2005). G2C service focuses on the ability of the government and citizen to communicate information to each other in an efficient and electronic manner. The citizen greatly benefits from these government communications. The G2B systems allow the government and business practice to communicate each other. The goal of this service is to make available online regulations for agencies and increasing electronic tax capabilities for business. Another goal is to consolidate trade information for export and import data. This service also helps the government obtain data necessary in decision making. The G2G service strives to improve the efficiency of delivery when transacting

information within itself or with other governments. This allows the government to communicate efficiently by eliminating redundancy and duplication. This also has benefits in terms of crime detection and homeland security.

The emergence of the internet also facilitates the growth of a 'one-stop service center' model because a government web site can itself serve as a convenient and cost-effective platform for centralized service provision (Ho 2002). Businesses, residents, visitors, and intergovernmental liaisons easily can access public information and services related to their specific needs simply by clicking on different web links in the city web site. They can also contact government officials directly through email or online request forms to give feedback about specific issues. A one-stop service center is an umbrella organization that operates on top of existing functional departments and is intended to maximize the convenience and satisfaction of users through service integration. As the gateway for specific client groups such as businesses, residents, or visitors, the center collects information about user demand for inquiries and service assistance and processes the information centrally. It then coordinates with functional departments.

2.5.5. Trust in e-Government

Web site is much more than an information technology (IT) interface. Different types of risks and uncertainties prevail in online transactions (Teo and Liu 2006). Hence, trust is a substantial key for retaining website users through the establishment and improvement of an interactive, multisession, online relationship (Gefen, Karahanna, and Straub 2003). Past literature has identified trust to be one of the crucial enablers of e-commerce transactions (Gefen, Benbasat, and Pavlou

2008; Pennington, Wilcox, and Grover 2003; Pavlou and Gefen 2004) and e-loyalty (Cyr 2008). In the context of e-government, the role of trust for usage of websites is even more important as citizens using e-government Web sites are unlikely to find alternative websites serving the same purpose. In the absence of sufficient trust in e-government systems, users may be motivated to revert to the traditional offline means of interaction with the government. Therefore, building citizen trust is often considered as a key factor for the successful implementation of e-government websites (Teo, Srivastava, and Jiang 2009; Warkentin et al. 2002).

The early psychology and sociology studies on trust defined it as a set of beliefs that other people would fulfil their expected favorable commitments (Gefen, Straub, and Boudreau 2000). Recent business research has taken a comparable stand, defining trust as the expectation that other individuals or companies will behave ethically (Hosmer 1995), dependably (Kumar 1996), and will fulfil their expected commitments (Rotter 1971; Schurr and Ozanne 1985). Trust in e-government in this study is defined as belief that the e-government system can be used to get the desired outcome satisfactorily (Teo, Srivastava, and Jiang 2009).

2.5.6. Challenges for e-Government Implementation

Applying e-government system is not simply transferring the system from one country to another-mostly from developed to developing country as additional efforts are needed in implementing e-government system in a developing country (Schuppan 2009). It is suggested that the cause of the unsuccessful implementation of e-government is associated with practices and cultures (Marche and McNiven 2003), as well as the inherent difficulties associated with integrating operational

procedures and information systems, which may not be computer-based, among individual government agencies, departments and bureau. Specific barriers associated with the e-government initialization process are many, including issues of citizen privacy and security, inadequately skilled citizens and government employees, and the tendency for e-government to replicate traditional government, (Marche and McNiven 2003). Finally there is the issue digital divide in society is still a huge one, although the empirical evidence on its impact on e-government systems success is currently lacking. As the primary stakeholder in e-government systems, citizens play a substantial role in e-government success (Davison, Wagner, and Ma 2005). Citizens' usage of e-government is vital for e-government success. Table 2.5 presents previous studies about the success factors for e-government initiatives. The list reflects the complexity of e-government implementation.

Table 2.5 also reveals that most of the studies are technologies focused. Others have examined manager's attitude and behavior, organizational diversity, multiple goals, resistance to change, turf and conflict, autonomy of agencies, laws and regulations, intergovernmental relationships, and political pressures. There is a lack of studies that examine citizen's perceptions on and use of e-government or the 'demand side' (Gauld, Goldfinch, and Horsburgh 2010). Much of the research on e-government seems forgetting that individuals do not simply adopt technology as it becomes available, but may resist its use or undermine its purported benefits (Fountain 2001). Hence, this research will attempt to fill the gap in e-government research and integrate all five digital divide constructs and trust construct into one framework.

In some cases, e-government projects experience user failure because the citizens as the main users do not use the systems, in spite of the systems are successful in terms of technological and project development (Goldfinch 2007). Therefore, their perception on e-government is substantial and is going to be used as the indicator of e-government system success in this research.

Table 2.5: Previous research on e-government success factors

Category	Factors	Authors
Information and data	Information and data quality	Dawes (1996); Redman (1998); Ballou and Tayi (1999); Burbridge (2002); Prybutok, Zhang, and Ryan (2008)
	Dynamic information needs	Brown and Brudney (2003)
	Usability	Davis (1989); Mahler and Regan (2002)
	Security issues	Moon (2002); Holden, Norris, and Fletcher (2003); Roy (2003)
	Technological incompatibility	Dawes (1996); Chengalur-Smith and Duchessi (1999); Brown (2001); Burbridge (2002); Holden, Norris, and Fletcher (2003)
	Technology complexity	Chengalur-Smith and Duchessi (1999); West and Berman (2001)
	Technical skills and experience	Brown (2001); Ho (2002); Moon (2002); Holden, Norris, and Fletcher (2003)
	Technology newness	Ho (2002); Roy (2003)
	Project size	McFarlan (1981); Barki, Rivard, and Talbot (1993)
Organizational & management	Manager's attitudes and behavior	Heintze and Bretschneider (2000); Gagnon (2001); Prybutok, Zhang, and Ryan (2008); Luk (2009)
	Users or organizational diversity	McFarlan (1981); Brown and Brudney (2003); Roy (2003)
	Multiple or conflicting goals	Brown (2003); Kim and Kim (2003)
	Resistance to change	Burbridge (2002); Ho (2002); Edmiston (2003)
	Turf and conflicts	Barki, Rivard, and Talbot (1993); Dawes (1996); Burbridge (2002); Edmiston (2003); Roy (2003)
	Autonomy of agencies	Dawes (1996); Landsbergen Jr. and Wolken Jr. (2001)
Legal and regulatory	Restrictive laws and regulations	Chengalur-Smith and Duchessi (1999); Mahler and Regan (2002)
	Intergovernmental relationships	Landsbergen Jr. and Wolken Jr.

		(2001); Burbridge (2002); Rocheleau (2000); Luk (2009)
	Policy and political pressures	Heintze and Bretschneider (2000); Mahler and Regan (2002); Brown and Brudney (2003); Roy (2003)
	Privacy concerns	Moon (2002); Edmiston (2003); Holden, Norris, and Fletcher (2003)
Institutional and environmental	Environmental context (social, economic, demographic)	La Porte, Demchak, and Jong (2002); Warkentin et al. (2002); Vathanopas, Krittayaphongphun, and Klomsiri (2008); Gauld, Goldfinch, and Horsburgh (2010)

Adapted and expanded from Gil-Garcia and Pardo (2005).

2. 6. Information System Success

Information system (IS) success and its determinants have been considered critical to the field of information systems (Willis 2007; DeLone and McLean 1992, 2003; Hategekimana and Trant 2002; Ahmad et al. 2013; Ruttan 1996). Researchers have been measuring IS success at different levels, including the technical level, the semantic level, and the effectiveness level (Carter et al. 2011). Furthermore, Carter et al. (2011) define the technical level as the accuracy and efficiency of the system which produces the information, the semantic level as the success of the information in conveying the intended meaning, and the effectiveness level as the effect of the information on the receiver. By adapting communication theory, Mason (1978) labels the effectiveness level as influence level. The information system creates information which is communicated to the recipient who is then influenced by the information. In this sense, information flows through a series of stages from its production through its use or consumption to its influence on individual and/or organizational performance. Furthermore, Mason (1978) suggests

that there may need to be separate success measures for each of the levels of information.

Based on prior studies on IS success, DeLone and McLean (1992) developed a model, which is known as DeLone and McLean IS Success (D&M Model). As depicted by Figure 2.10, System Quality and Information Quality individually as well as jointly influence both Use and User Satisfaction. Furthermore, the amount of Use will influence the degree of User Satisfaction, as well as the reverse. Use and User satisfaction are the antecedents of Individual Impact, which finally affects the Organizational Impact.

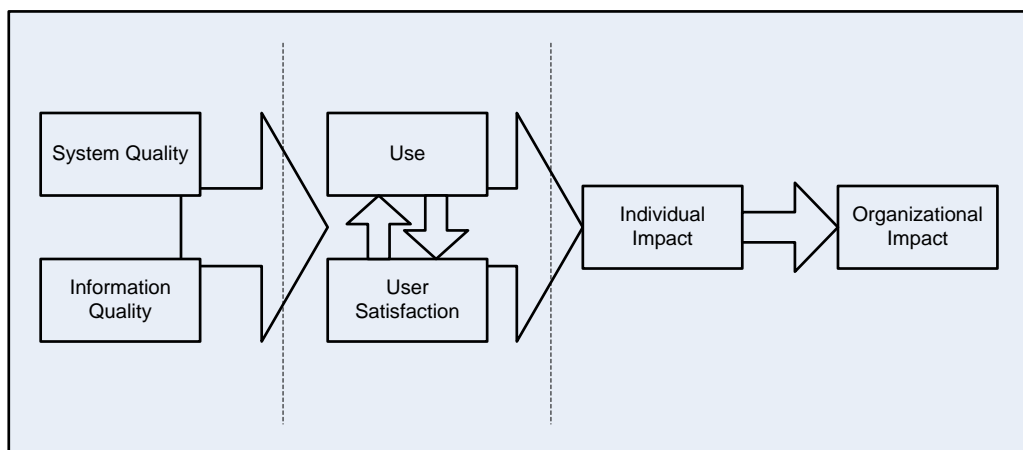


Figure 2.10 D&M IS Success Model
(DeLone and McLean 1992, p.87)

The model has been validated and examined by hundreds of research. Based on critics and suggestions, DeLone and McLean then updated the model in (2003) in order to develop a more parsimonious model. The updated model is illustrated in Figure 2.11. Unlike in the previous model, in the updated model; quality has three dimensions, which are Information Quality, System Quality, and Service Quality.

Furthermore, the updated model distinguishes between Intention to Use as an attitude and Use as a behavior. However, DeLone and McLean (2003) admit that many researchers may choose to stay with Use, since the links between attitude and behavior are difficult to measure. As also argued in the previous model, Use and User Satisfaction are closely interrelated, positive experience with Use will lead to greater user satisfaction in a causal sense. Finally, as a result of this Use and User Satisfaction, certain Net Benefits will occur.

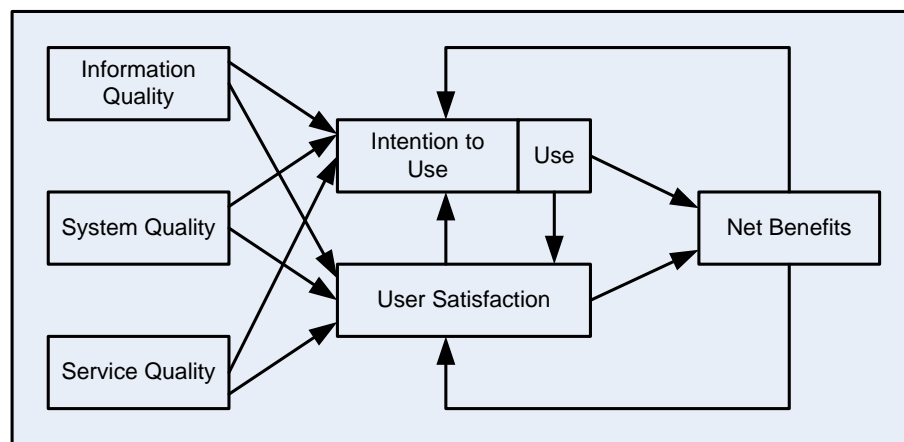


Figure 2.11 Updated D&M IS Success Model
(DeLone and McLean 2003, p.24)

D&M IS Success Model is not the only model to measure the IS success. Hategekimana and Trant (2002) for example, proposed a well-known respecifications of the D&M IS Model. However, based on the comparison between D&M Model and Seddon's Model by Ruttan (1996), The D&M Model stood up reasonably well and outperformed the Seddon Model. Therefore, this study adopts the D&M Model.

The D&M Model has also been modified and expanded by some studies in accordance with the focus of their research. Lee and Chung (2009) modified the

model by incorporated Trust in the model. Similarly, Floropoulos et al. (2010) included Perceived Usefulness to measure the IS success. In order to incorporate Intensity to IT investment, and four separate dimensions of IT impact, Venkatesh, Thong, and Xu (2012) has modified the D&M Model as well. Other studies have also been expanding and modifying the D&M Model, such as AbuShanab and Pearson (2007), Loo, Yeow, and Chong (2009), and Keong et al. (2012). Considering the focus of the study, which is to examine the effectiveness of the systems, hence this research also modified D&M Model. To measure IS success, this study used the following variables: e-Government Use, User Satisfaction, and Benefits of e-Government.

The review of relevant literature presented in the previous sections provides foundation to develop an initial research model. Section 2.7 presents and discusses the initial model. The model will guide development of the field study detailed in Chapter Four.

2.7. Initial Research Model

This study is conducted with the objectives of examining the impact of digital divide on e-government system success (Section 1.5, page 8). Hence, by reviewing previous theories and empirical studies, this current research proposes five types of digital divide, namely demographic divide, economic divide, access divide, capability divide, and innovativeness divide on e-government system success, which is represented by e-government use, user satisfaction and benefits of e-

government. Figure 2.12 describes the initial research model for the current research.

As shown in the model, the e-government system success is directly influenced by four variables digital divide – *Economic Divide* (Agarwal, Animesh, and Prasad 2009; Schleife 2010; Mossberger, Tolbert, and Gilbert 2006), *Access Divide* (Dewan, Ganley, and Kraemer 2005; Wei et al. 2011), *Capability Divide* (Marakas, Yi, and Johnson 1998; Compeau, Higgins, and Huff 1999; Wei et al. 2011), and *Innovativeness Divide* (Midgley and Dowling 1978; Flynn and Goldsmith 1993; Agarwal and Prasad 1998). The research also investigates the moderating effect of demographic divide, which is represented by residential place (Mossberger, Tolbert, and Gilbert 2006), (Mariscal 2005), (Kuk 2003), (Stern, Adams, and Elsasser 2009); gender (Venkatesh and Morris 2000), (Wei et al. 2011), (Agarwal, Animesh, and Prasad 2009), (Schleife 2010); age (Agarwal, Animesh, and Prasad 2009), (Hargittai 2006), (Schleife 2010); and education (Jung, Qiu, and Kim 2001; Mossberger, Tolbert, and Gilbert 2006).

In addition, the research investigates the relationships among the variables of digital divide in such way that *Economic Divide* influences *Access Divide* (Dewan, Ganley, and Kraemer 2005; Quibra et al. 2003), *Access Divide* influences *Capability Divide* (Dewan and Riggins 2005; Wei et al. 2011), and finally *Capability Divide* influences *Innovativeness Divide* (Burkhardt and Brass 1990; Ellen, Bearden, and Sharma 1991).

Considering the importance of trust in e-government in e-government system success, and also the role of trust in reducing social complexity (Gefen 2000; Lewis

and Weigert 1985), this study expects the mediating role of *Trust in e-Government* in the impact of *Digital Divide* on *e-Government System Success*. Previous studies found that *Trust in e-Government* is an important factor for *e-Government Use* (Warkentin et al. 2002; Teo, Srivastava, and Jiang 2009). On the other hand, other research also concluded that trust in technologies is influenced by socio-economic factors, personality variables and self-efficacy (Cole 1973).

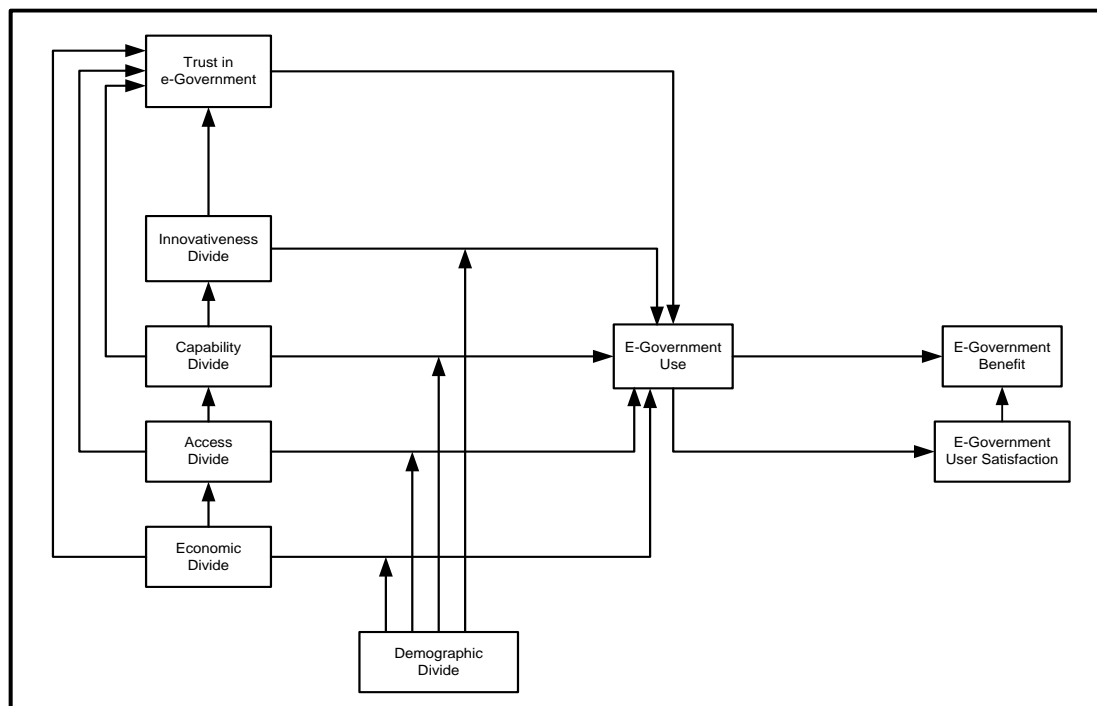


Figure 2.12 Initial Research Model

Compared to previous models in digital divide research whereby most of the models and studies focus on access divide, demographic divide and economic divide, this current study has extended the analysis. Five levels of digital divide and trust in e-government as well as the e-government systems success are examined simultaneously in order to understand the issue of digital divide more comprehensively and its impact on e-government system success. The initial model

is hence insightful in such theory building framework to explain the phenomenon of digital divide.

2.8. Summary

This chapter has provided a comprehensive review of relevant literature as underlying theoretical foundation for the current research. The main literatures are discussed to provide justification of selected constructs. In summary, this chapter has covered the theories in development informatics explaining the benefits of information and communication technology for humans, especially for marginalized people. This was followed by a discussion of theories in ICT adoption. The existence of several theories in ICT adoption reflects the importance and hence, big concern from researchers. However, the ICT adoption is facing a significant issue, which is known as digital divide.

The issue of digital divide is getting more attention from researchers, international organizations and policy makers. The understanding on the issue itself is also evolving as the awareness in the complexity of digital divide rises. This research is proposing more comprehensive factors of digital divide in order to understand it better. Each of the factors has been discussed. The discussion on Digital Divide was then followed by a literature review on e-government. The review was started from a discussion on the history of e-government initiatives, the benefits of e-government, the stages of e-government implementation, challenges for e-government initiatives, and the importance of trust in e-government.

In the final part, the initial research model that describes the relationship of all factors is presented. In conclusion, the model presents a more comprehensive understanding of digital divide and its impact on e-government system success. The initial model will be explored and examined further in this research.

Chapter Three: Research Design

3.1. Introduction

This chapter describes the design of this research. In doing so, researcher used a framework by Crotty (1998) as illustrated in Figure 3.1. Crotty suggests that there are four major elements in developing a research design. At the highest level is the issue of philosophical assumptions or a paradigm, which mainly explains the epistemology and ontology behind the research. The philosophical assumptions then relate to the use of theoretical lens that the researcher use. This theoretical lens, in turn, determines the methodology used. Finally, the methodology incorporates the methods, which refer to the procedures used to obtain, analyze and interpret the data.

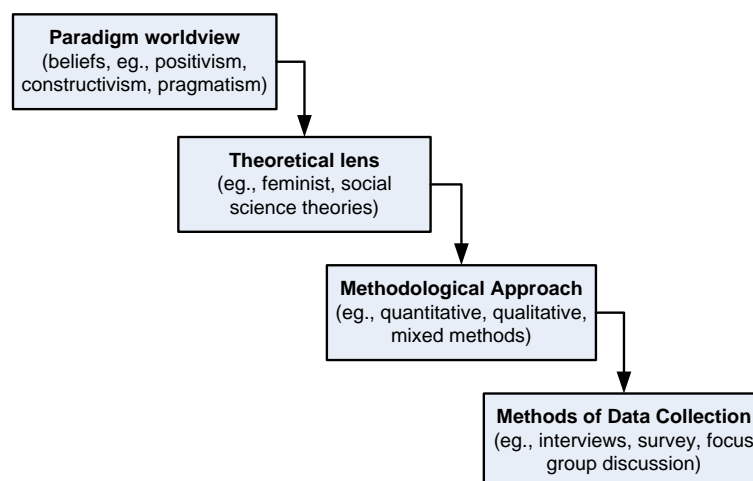


Figure 3.1 Levels for Developing a Research Study

Source: Adapted from (Crotty 1998, p. 4)

This chapter is divided into 5 sections, in following manner: introduction; research paradigm, which discusses the epistemology behind the study; methodological approach or a research design; research methods, which describes the phases of this study and the steps of data collection and analyses; and finally, conclusion of this chapter. Since the theoretical lens was already explained in Chapter Two in terms of various theoretical models and concepts, this chapter would not present it again.

3.2. Research Paradigm

A paradigm (also known as ‘worldview’) is a set of generalizations, beliefs, and values of a community of specialists (Kuhn 1970). Guba and Lincoln (1994) define paradigm as “...*the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways*” (p. 105). While Morgan (2007) referred to paradigm as “*systems of beliefs and practices that influence how researchers select both the questions they study and methods that they use to study them*” (p.49). Thus, a paradigm reflects research questions, design, and data collection in research.

In the world of research, there are many paradigms although the major paradigms are positivism (which then modified as post positivism) and constructivism. There have been long debates between those two major paradigms, especially in social and behavioral science (Sechrest and Sidani 1995; Onwuegbuzie and Leech 2005). The differences between both paradigms are actually from the ontological level until the rhetorical level (Creswell and Clark 2011) as presented in Table 3.1.

Table 3.1: Differences between Positivism and Constructivism.

Paradigm elements	Postpositivism	Constructivism
Ontology	Singular reality (eg., researchers reject or fail to reject hypotheses)	Multiple realities (eg., researchers provide quotes to illustrate different perspectives)
Epistemology	Distance and impartiality (eg., researchers objectively collect data on instruments)	Closeness (eg., researchers visit participants at their sites to collect data)
Axiology	Unbiased (eg., researchers use checks to eliminate bias)	Biased (eg., researchers actively talk about their biases and interpretations)
Methodology	Deductive (eg., researchers test an a-priori theory)	Inductive (eg., researchers start with participants' views and build 'up' to patterns, theories, and generalizations)
Rhetoric	Formal style (eg., researchers use agreed-on definitions of variables)	Informal style (eg, researchers write in a literary, informal style)

(Source: Creswell and Plano Clark 2011., p. 42)

In order to determine the paradigm for this research, the research objectives and context were revisited. This research is investigating the behavior of individuals; therefore it is very subjective issue. Each individual has their own experience and perspective. Moreover, the issue of digital divide is relatively a new problem (Attewell 2001) and this study is going to conceptualize it more comprehensively. It is very challenging to conduct a research to understand a behavior of individuals and at the same time, attempt to generalize the findings. Researcher needs to carefully explore and capture this complex phenomenon and provides meaningful explanations.

Based on the above reasons, this research applied positivism paradigms where researchers are independent of the object of research (Krauss 2005). Researchers should be emotionally detached and uninvolved with the object of research and

should be eliminate their biases. Positivists believe that social research should be objective and time and context-free generalization, and the cause of social scientific outcomes can be determined validly and reliably (Johnson and Onwuegbuzie 2004). Positivism is closely linked to empirical science and its proponents have always great lovers of science, because scientific knowledge is accurate and certain (Crotty 1998).

Although this paradigm is generally associated with the use of quantitative methodology, the current study will also collect and analyse qualitative data to explore and enhance the understanding of the object of the research. The qualitative method based on the constructivism interpretive paradigm because the informants' perspective is given importance (Willis 2007). The use of both quantitative and qualitative data collection in a single study is known as a mixed method research, which will be discussed more comprehensively in the next section.

3.3. Research Methodology

One of the basic considerations in choosing positivism paradigm is the methodology that was going to be applied in this research. Following the long debate on the level of paradigm, there have been long debates on methodological level: quantitative on one side and qualitative on the other side. From the paradigm wars, three perspectives have evolved. They are purists, situationalists and pragmatists (Rossman and Wilson 1985; Onwuegbuzie and Leech 2005).

There is general consensus that positivism dominates the information systems field (Mingers 2001; Trauth and Jessup 2000; Wu 2012). Orlikowski and Baroudi (1991) investigated 155 articles published in top ranked information systems journals between 1985 and 1989 and concluded that 96.8% research applied quantitative methodology, and left only 3.2% applied qualitative methodology. Similar research was conducted by Chen and Hirschheim (2004), and found that 81% of research in information systems were empirical positivistic studies.

Despite of its dominance, applying only a quantitative study using close-ended questionnaire raise the problem of effectiveness. Although that methodology provides advantages in collecting large numbers of data and easiness in recording and statistical analyses, it increases the likelihood of researcher bias (Converse and Presser 1986b). It may limit respondents' freedom in answering the questionnaire, trap them into responding based on answers provided and omit the real perspectives or actions. As a result, those studies have found that self-reported use intention might not lead to actual use (Manfredo and Shelby 1988). Some scholars even blame on the continual use of statistical significance testing for the slow progress of social sciences (Meehl 1978).

However, using a qualitative methodology alone would not free of problem. There is always a question about generalization of data, because limited number of people involved in interviews or focus group discussion or other qualitative methods. Furthermore, users such as policy makers, practitioners and others demand forms of what so called 'sophisticated' evidence, which are difficult to fulfil by those methods (Creswell and Clark 2011). In the same time we understand that qualitative approach provides detail understanding of an issue, because it arises out

of researching few individuals and exploring their views in great depth. Thus, each method actually offers advantages and in the same time also has its limitations.

In light of the above mentioned issues, this research applied mixed methods. Mixed methods research has been known as the third methodological movement or the third research community (Teddlie and Tashakkori 2009) as an alternative to the dichotomy of qualitative and quantitative methodologies. The history of mixed methods research actually started with researchers who believe that both quantitative and qualitative methods are useful as they address the research questions. Mixed methods researchers believe that combining both methods would compensate their weaknesses and would provide cohesive and comprehensive outcomes (Greene, Caracelli, and Graham 1989; Hohenthal 2006). However, in the field of information systems in particular, mixed method is still under-utilized (Wu 2012). Thus, applying a mixed methods research would be a contribution for research in information systems.

In its early development, this method was used largely by cultural anthropologists and sociologists (Johnson, Onwuegbuzie, and Turner 2007). This method then known as 'multiple operationalism' or 'mixed methods'. In implementing the mixed methods, this study uses the definition by Tashakkori and Teddlie (2003), "*type of research design in which quantitative and qualitative approaches are used in type of questions, research methods, data collection, and analysis procedures, or in inferences*".

Creswell and Clark (2011) explained six major mixed methods research designs. They are convergent parallel design, explanatory sequential design, exploratory

sequential design, embedded design, transformative design, and multiphase design. The decision of the most appropriate design for this research was again based on the research questions and objectives. As stated earlier in Chapter One (page 8) that this research is exploring the impacts of digital divide on e-government system success in Indonesian local governments. Based on the discussion on theoretical framework in Chapter Two, researcher proposed an initial research model (Figure 2.10). In order to test the applicability of the initial model, a qualitative approach based on field study of semi-structured interview was conducted. The field study was important to explore and refine the initial model, which then examined through quantitative approach based on survey (detail of research methods will be discussed in the next section). Based on the brief description of the methods and research objective, this research employed *exploratory sequential design* with the quantitative approach (*instrument-development variant*) as the major method. Figure 3.2 describes the design of this research. This design is best suited to explore a phenomenon in depth (Morgan 1998; Creswell 2003).

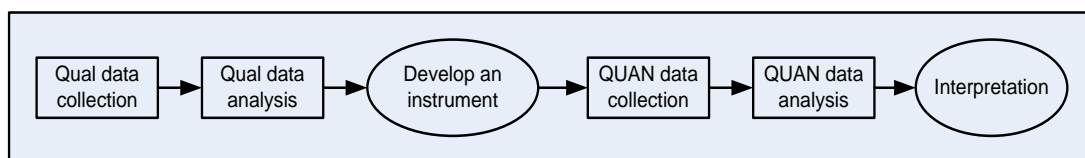


Figure 3.2 Diagram of Exploratory Design
(Source: Creswell and Plano Clark 2011, p. 124)

3.4. Research Methods

Figure 3.3 describes the methods of this research. It began with extensive literature review to identify the issues and gaps in the phenomenon of digital divide.

Researcher identified potential key variables and developed an initial research model. The initial research model then was explored and enhanced using qualitative method. Qualitative method is suitable in exploring and capturing reality in detail, especially when the experiences of the actors are important (Chan and Ngai 2007). A field study by conducting one-on-one, face-to-face semi-structured interview was carried out. The objectives of the interview were: (1) to explore concepts and procedures that might not be recognized in the existing literature yet; and (2) to evaluate the worthiness of the concepts identified in the literature review. After being transcribed and translated into English, the results then analyzed using content analysis. As a result, researcher refined the model and developed a comprehensive research model.

Based on the comprehensive research model, hypotheses were proposed to justify the relationships among constructs. Items for each construct were also identified and a questionnaire was designed. To ensure the applicability and understandability of the questionnaire, researcher carried out pilot study. And finally, national survey was conducted involving 237 respondents in Indonesia. Data of the survey was analyzed using SEM (Structural Equation Model) based on PLS (Partial Least Square). Therefore, this research basically employed three basic steps of data collection, which are field study, pilot study and national survey. Detail of each step is explained in the following sections.

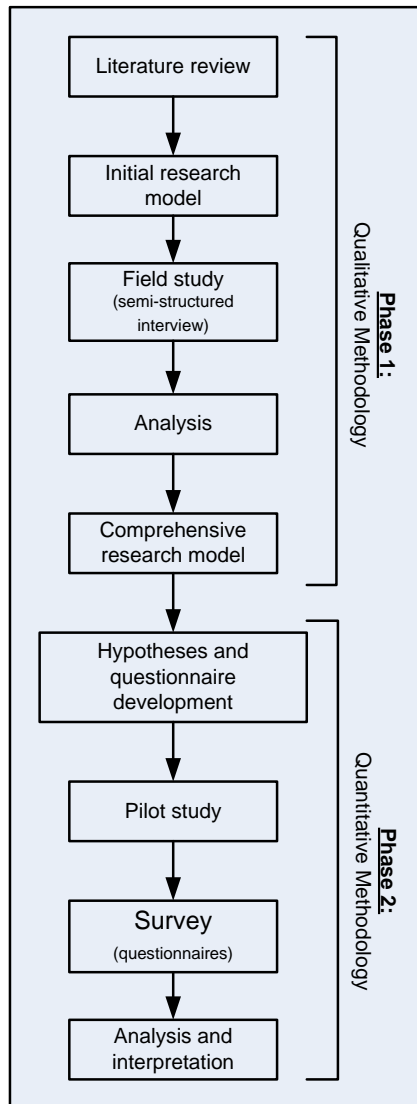


Figure 3.3 Research Methods

3.4.1. Qualitative Field Study

A. Sample Selection

This research was conducted in Sleman regency and Tulungagung regency in Indonesia (see Appendix 6 to be aware of where those two regencies are located). Two sampling strategies were applied; stratified random sampling in Sleman regency and snowball sampling in Tulungagung Regency. Stratified random sampling was prioritized to ensure that the demographic characteristics (gender

and residential place) were represented. In Sleman regency, researcher acquired e-government users' data list from the government. Based on the list, the users were divided into subgroups by the demographic characteristics (gender and place of residence), and then members of each subgroup were contacted randomly by phone to participate in an interview. Unfortunately, researchers could not get a list of e-government users due to technical difficulties in Tulungagung Regency. Instead, the One-Stop Service Bureau (BPPT) gave one user's identity, and then with the assistance of this user, researcher contacted four other users. This snowball sampling strategy is popular among researchers when it is difficult to reach populations (Berg 2004). Most of the cases in which snowball sampling has been used are characterized by less than optimal research conditions, as researcher found in this study, where other methodologies are not applicable (Cohen and Arieli 2011)

B. Data Collection

Researchers applied qualitative method by conducting one-to-one and face-to-face semi-structured interviews with 12 informants who previously used e-government systems in Indonesia. The research took place in two regions (Sleman regency and Tulungagung regency). Preliminary study revealed that by 2011 there were four local governments in Indonesia, namely Sleman regency, Tulungagung regency, Pemalang regency, and Tangerang regency, providing interactive online service directly to citizens or business within their voluntary e-government systems, which enable citizens and business to log in and make some transactions with the government online. However, the interactive e-government systems in the regencies of Pemalang and Tangerang had just started in 2011, thus there was no

user yet. Hence this research is conducted in two regencies, which are Sleman and Tulungagung. E-Government systems in those regencies are similar and in the stage of 'transaction' according to Layne and Lee (2001). In those two regencies, the e-government systems provide services for business as well as citizens registrations. Most of the users used the systems to register permission to build or renovate homes. Prior to the data collection, researcher obtained an ethical approval from the Human Research Ethics Committee (Protocol Approval GSB 01-11 attached in Appendix 2) as required by Curtin University.

C. Data Analysis

After being transcribed and translated into English, the interview data was managed using NVivo8. Researchers applied *modus operandi* approach, which refers to the analysis the same factors from multiple instances (Chan and Ngai 2007)(further explanation on the approach is described in Chapter Four). During developing all of the variables, this research followed both theoretical replication as well as literal replication (Chan and Ngai 2007). Theoretical replication refers to the selection of cases because they produce contrasting results for predictable reasons, while literal replication refers to the selection of cases based on their similarities and they support the theoretical explanation. The findings then were compared to the initial research model to be refined as a comprehensive research model (see Chapter Four for details).

3.4.2. Hypotheses and Questionnaire Development

A questionnaire was designed based on the comprehensive research model to test the relationship among constructs. The dimensions in the questionnaire were based

on the previous research and the Likert scale was used to measure all of them. In order to avoid central tendency error of the respondents, this research adopted six-point scale as suggested by Matell and Jacoby (1972). Central tendency error is observed when respondent answer a middle answer 'neutral' or 'neither agree or disagree' without really meaning it. Chapter Five explains further about the questionnaire development.

3.4.3. Pilot Study

For the pilot study, the questionnaires were distributed to two groups of sample, researchers (3 persons are PhD student and researchers in Islamic University of Indonesia) and potential respondents (5 persons) by adopting convenient sampling method. The reason for involving researchers was to get comments and suggestions in terms of research perspective. The potential respondents were obtained from the list of e-government users provided by government of Sleman regency. From the potential respondents, researcher expected valuable response in terms of the applicability and understandability of the terms used. They were asked for their review and suggestions. This procedure was conducted continuously until agreements were made.

Data analysis in the pilot study was done using descriptive statistics. It allows evaluation for the main survey. Based on the feedback from the respondents, there was no modification needed to the questionnaire. The analysis is presented in Chapter Six.

3.4.4. Quantitative Survey

A. Sample Selection

For the survey, the unit analysis is individual. The samples are citizens who have experience in using e-government systems or the users. Considering the research objectives, the researcher set the criteria for the e-government systems used in this study, which are, *first*, G2C (Government to Citizens) systems or G2B (Government to Business) systems provided by local governments in Indonesia. *Second*, the systems are interactive, which means the systems enable the citizens to access the systems through online or internet. Referring to the stages of e-government development by Layne and Lee (2001), the e-government systems required in this research are at least in the stage of 'Transaction'. *Third*, the systems should be voluntary as well, or in other words citizens have other alternative than accessing the systems via internet (eg., traditional offline). Because this study is investigating variable of trust in e-government and citizen's willingness to try out the systems, thus voluntary system is required. In the absence of sufficient trust in e-government and willingness, users may be motivated to revert to the traditional offline means of interaction with the government (Teo, Srivastava, and Jiang 2009). As mentioned before in the qualitative survey, only two e-government systems fulfil the above criteria. They are e-government systems in Tulungagung Regency and Sleman Regency. Therefore this study took place in those two regencies.

B. Data Collection

Samples should be sufficient and representative (Tashakkori and Teddlie 1998; Cavana, Sekaran, and Delahaye 2001). By using sufficient and representative

samples, results are more likely to be valid, externally as well as internally. In quantitative research, the issue of external validity is not limited to generalizability to the population, but also includes generalizability to situations other than the one that has been researched (Tashakkori and Teddlie 1998). On the other hand, internal validity refers to the confidence that changes in the dependent variable can be attributed to the independent variables rather than to other potential causal variables (Tashakkori and Teddlie 1998).

Prior to the survey, researcher was granted an ethical approval by Human Research Ethic Committee through Protocol Approval GSB 11-11 (Appendix 3) as required. For this study, data of users was obtained from both local governments, Tulungagung regency and Sleman regency. Following formal inquiry and procedure in both regencies, researcher could obtain data of users within year of 2010 until the mid of 2012 in Sleman regency, while in Tulungagung regency the data was the users within year of 2011 until midyear of 2012. Based on the lists provided by both regencies, the total e-government users are 668 persons. Considering the number of population, hence researcher conducted personally administered survey in the data collection. Personally administered survey refers to face-to-face survey with the respondents (Frazer and Lawley 2000). However, not all of the users provide telephone number. Based on the telephone number provided by the users, researcher and some research assistants contacted them and ask them to participate in the survey. For those who were willing to participate in the survey, then research assistants brought the questionnaire to them and ask them to complete the questionnaire by themselves. As suggested by Frazer and Lawley (2000), this survey method offers a very high response rate compare to other

methods. As a result, 354 copies of questionnaires were distributed, of which 251 were retrieved. A review then was undertaken to seek out errors in the form of invalid data, including missing values or incomplete responses and finally 237 responses were usable in this research. Therefore the effective response rate in this study is 35.5%.

C. Data Analysis

In this research, the analysis is divided into three parts. *First*, the analyses of the influence of the digital divide on the e-government systems success as well as the relationships among variables of digital divide. *Second*, the multi-group analysis examining the moderating effect based on demographic and economic factors. *Third*, the mediating roles of trust in e-government between the influences of digital divide on e-government systems success. The analysis was conducted using the Partial Least Square – Structural Equation Modeling (PLS- SEM), based on the consideration of small sample size in this research and the research design applied in this current study, which is exploratory research (Hair et al. 2012). SEM itself is “...a method for representing, estimating, and testing a theoretical network of mostly linear relations between variables...” (Rigdon 1998).

Two-stage procedures were undertaken in the PLS analysis; measurement model assessment and structural model assessment. Details of the analysis are explained in Chapter Six. As a summary, Table 3.2 presents the analyses using PLS technique, as suggested by Barclay, Higgins, and Thompson (1995).

Table 3.2: Two-stage approach of PLS analyses

Stage	Data Examination	Analyses
1	Measurement model assessment	a. Item reliability b. Internal consistency c. Discriminant validity
2	Structural model assessment	a. Amount of variance explained (R^2) b. Path coefficient (β) c. Statistical significance of t-values

In the first stage, the focus was to assess the relationships between the observed variables and the constructs (Igbaria, Guimaraes, and Davis 1995), to ensure that the items which represent the observed variables, measure the constructs. The assessment in the first stage involved the calculations of loadings that indicate the strength of the measures. Table 3.3 describes the procedures undertaken in the first stage of the measurement model assessment.

Table 3.3: Measurement model assessment procedure and requirements

Measurement	Acceptable value
1. Convergent Validity	
a. Item reliability	Item loading ≥ 0.7
b. Internal consistency	
i. Composite Reliability	Calculated value ≥ 0.7
ii. Average Variance Extracted (AVE)	Calculated value ≥ 0.5
2. Discriminant Validity	
a. Construct level	Square root of AVE of construct > correlation between the construct and other construct
b. Item level	Item loadings of construct > all other cross-item loadings of the construct

In assessing the convergent validity, the first step is to examine the item reliability. Item reliability refers to an analysis of estimating the amount of variance in each individual item's measure that is due to the construct (Barclay, Higgins, and Thompson 1995). Item reliability tests how strong each item related to their

respective construct, which is frequently referred to as simple correlations. The calculated correlation leads to an item loading, which provides an indication of the item's strength. Since all of the items in this research are reflective items, hence item reliability can be assessed by evaluating the loading score in PLS.

Although researchers have different opinion in regard with the acceptable value of the item loading, but the rule-of-thumb is that the higher the item loading the better it would represent the construct. Most researchers suggest that most of the loadings should at least 0.6 and ideally 0.7 or above (Chin 1998). Some scholars believe that the items with extremely low loadings should be carefully reviewed, especially if the items have been taken from strong theoretical foundation (Nunnally and Bernstein 1994). In such circumstances, some errors such as incorrect wording in the questionnaire, misunderstanding by the respondents, or using inappropriate items to measure constructs might be the causes (Hulland 1999).

Beside item reliability, it is also important to examine internal consistency in order to assess convergent validity. Internal consistency refers to the measure of reliability of the constructs (Fornell and Larcker 1981). Although many quantitative researchers have been using Cronbach's alpha as an indicator for internal consistency, Chin and Gopal (1995) argue that Cronbach's alpha represents a lower-bound indicator of internal consistency because of its parallel measures. Thus, they suggest using composite reliability formula by Werts, Linn, and Joreskog (1974). Composite reliability is considered to be more general and more superior than Cronbach's alpha, because it is not influenced by the number of items in the scale.

The value of the composite reliability can be calculated using the following formula (Barclay, Higgins, and Thompson 1995; Chin 1998):

$$\rho_c = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum \text{Var}(\varepsilon_i)}$$

Where,

λ_i = component loading to an indicator; and

$\text{Var}(\varepsilon_i) = 1 - \lambda_i^2$, the unique/error variance.

As suggested by Nunnally and Bernstein (1994) and Barclay, Higgins, and Thompson (1995), the threshold of 0.7 is considered as the minimum value for composite reliability to establish a convergent validity of the measurement model.

In addition to composite reliability, Average Variance Extracted (AVE) is also common indicator to assess internal consistency for reflective constructs (Fornell and Larcker 1981). AVE represents the average variance extracted of a construct by its corresponding items and assesses the amount of variance that is captured by an underlying factor in relation to the amount of variance due to measurement error. AVE indicates the variance shared between a construct and its measures. The formula for obtaining AVE is as follow (Chin 1998):

$$AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \text{Var}(\varepsilon_i)}$$

Where,

λ_i = factor component loading to an indicator; and

$$\text{Var}(\epsilon_i) = 1 - \lambda_i^2.$$

In term of the minimum value, scholars suggest that a construct should achieve a value greater than equal to 0.5 for AVE to achieve adequate reliability (Nunnally and Bernstein 1994; Fornell and Larcker 1981).

To assess the discriminant validity of the measurement model, the square root of AVE is compared to the inter-construct correlations. The discriminant validity itself, refers to the degree to which constructs differ with each other within the same model (Hulland 1999). Discriminant validity at the construct level is considered adequate when the AVE for one's construct is greater than their shared variance (Fornell and Larcker 1981; Chin 1998).

In the item level, discriminant validity was assessed by examining cross loading for each item and comparing across all constructs, and is presented in a form of cross-loading matrix. The cross-loading analysis measures the correlation of an item with respect to all of the constructs within the model (Chin 1998). An item has strong discriminant validity when it has higher loading value on the construct it intends to measure, than on other constructs. To produce the analysis, researcher has to manually calculate the output produced by the PLS Graph software using other statistical software package, namely SPSS.

While the second stage concerned with the relationships that exist between the paths in the model (Igbaria, Guimaraes, and Davis 1995). By using the software of PLS graph, researcher calculated the estimated path coefficient for each path in the

model. The results indicate the strength and direction of the theoretical relationship. The assessment process covers examining the explanatory power of the independent variables (R^2), the path coefficient and the value of t-statistics (Barclay, Higgins, and Thompson 1995).

The R^2 values were examined to assess the predictive power of the proposed research model (Barclay, Higgins, and Thompson 1995). It represents the extent of the independent constructs explain the dependent constructs. The interpretation of it is similar to regression model (Fornell and Larcker 1981). The R^2 indicates the amount of variance in the construct which is explained by its corresponding independent constructs. It is produced by the bootstrap process and the values of 0.75, 0.50 or 0.25 for endogenous latent variables in the structural model can be described as substantial, moderate, or weak, respectively (Hair, Ringle, and Sarstedt 2011).

To evaluate the relationship of the construct as hypothesized in this research, examinations of path coefficient (β) and the t-value were undertaken. Those β and t-statistics were obtained from the bootstrapping process. Bootstrapping itself represents nonparametric test for estimating the precision of the PLS estimates (Chin 1998). Through bootstrap procedure, N samples sets are created in order to obtain N estimates for each parameter in the PLS model.

Finally, whether the impact of a particular independent Latent variable (LV) on a dependent LV has substantive impact or not can be explored by examining the f^2 (Chin 1998). The f^2 value of 0.02, 0.15, or 0.35 is considered has a small, medium, or

large effect at the structural level, respectively (Cohen 1988). The value of f^2 can be calculated by the following formula (Chin 1998):

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}}$$

Where,

$R^2_{\text{included}} = R^2$ provided on the dependent LV when the independent LV is used

$R^2_{\text{excluded}} = R^2$ provided on the dependent LV when the dependent LV is omitted

Figure 3.4. summarizes the research methods that have been undertaken in this study. Researcher conducted literature review, which was presented in Chapter Two, as the starting step in order to provide theoretical background of this research. The literature review also aimed to identify the research gaps in the previous research and existing literature, from which the researcher developed research questions, objectives and initial research model. Furthermore, in order to explore and enhance the initial research model, a field study has been undertaken. From the semi-structured interviews, researcher analyzed the data using content analysis. Based on the findings, comparisons with the initial model have been made and comprehensive research model was proposed. Chapter Four described the process and findings in detail.

In the next step, researcher developed hypotheses to examine the relationships among variables. For the measurement tool, a questionnaire was developed based

on previous research and the findings in the field study. In order to test the questionnaire, a pilot study was undertaken by distributing the questionnaire to the researchers and potential respondents. As a result, questionnaire was finalized and ready to be distributed to the respondents. Chapter Five presented those processes.

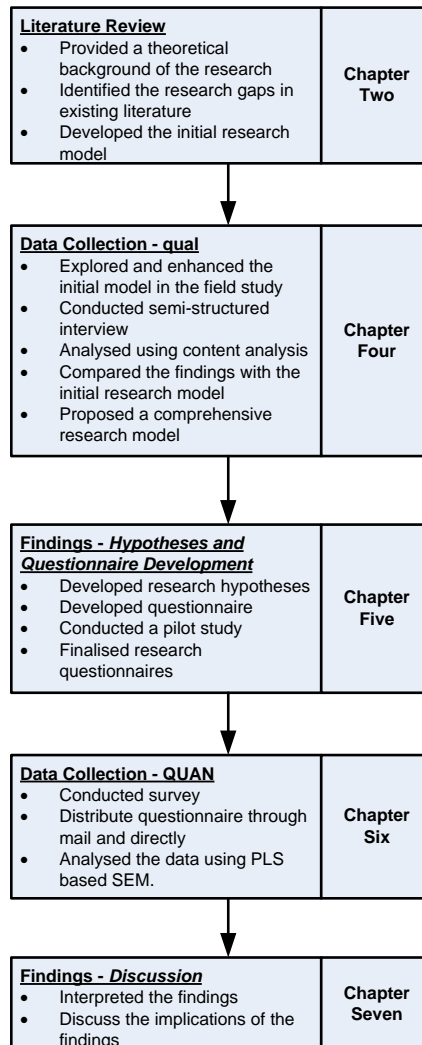


Figure 3.4 Summary of Research Methods

As the main research, quantitative data was collected through survey by mail and directly to the respondents. The data was then analyzed using PLS based SEM. All of

these processes were detailed in Chapter Six. Finally, the findings based on the quantitative data analysis were interpreted and researcher discussed the implications of the findings for theoretical development and for practice, as described in Chapter Seven.

3.5. Summary

The discussion on the paradigm started this chapter and followed by underlying justifications in using positivism paradigm for this research. However, mixed methods with the exploratory sequential design were chosen as the platform in conducting this research. The design started with a qualitative study by conducting semi-structured interview and followed by quantitative research as the major method by using PLS based SEM.

Chapter Four: Field Study and Comprehensive Research Model¹

4.1. Introduction

As discussed in Chapter Three, the mixed method approach was adopted in this research. In this stage, a qualitative research analysis was conducted through a field study. This chapter presents the analyses of the data generated from the field study. The qualitative approach was primarily performed to fine-tune the tentative research model proposed earlier (Figure 2.12). The field study was also required in

¹ Part of this chapter has been presented at the following conferences:

Rahman A., Quaddus, M. (2012), "Qualitative investigation of digital divide: Toward a comprehensive framework" in *the Australasian Conference on Information Systems (ACIS)*, Melbourne, Australia, 3-5 December 2012.

Rahman, A., Quaddus, M., and Galbreath, J., (2012) "The impacts of digital divide on e-government usage: A qualitative research" (2012). *CONF-IRM 2012, Vienna, Austria, 21-23 May 2012, Proceedings*. Paper 75. <http://aisel.aisnet.org/confirm2012/75>

Rahman A. (2012), "Enhancing the social cognitive model in digital divide", in *the Curtin Business School Doctoral Colloquium*, Perth, Australia, 28-29 August 2012 (*peer reviewed*).

order to ensure the validity and relevance of the model, since the research was conducted in Indonesia and most related theories are written from a Western perspective. The field study also aimed to explore the dimensions of each construct in the research. The qualitative approach was conducted through semi-structured interviews with 12 users of e-government in Indonesia.

The findings of the field study were analysed using content analysis. Based on the analysis, a field study model was developed and comparisons made with the initial proposed research model. As a result, a comprehensive research model was developed and presented in the final part of this chapter.

4.2. Interview Questionnaire Development

In order to cover the three main topics in this research, the interview questionnaire was designed using 7 questions (A full set of interview guides can be found in Appendix 1). The first topic investigates the success of the e-government system. To this end, three questions were prepared (Table 4.1). Question 1 asks whether the interviewees are the users of the e-government system and if so why. It also asks about the influence of informant's economic conditions on the use of e-government system. Question 2 explores the satisfaction of the interviewees with the e-government system. Question 3 relates to the benefits of the e-government system to interviewees.

The second topic in the research covers the impact of the digital divide on the success of e-government. There are three questions, which examine this topic. In

each question, there are two kinds of probe-questions, probes for exploring the dimensionality of the particular digital divide and probes for understanding the influence of the digital divide on the success of the e-government system. Questions 4, 5 and 6 investigate the access divide, the capability divide and the innovativeness divide respectively. To enhance the dimensionality of each construct, the informants were asked whether they had any other comments to make regarding each particular construct.

The third topic inquired into the mediating effect of trust on the success of the e-government system. To examine this, a question (Question 7) was posed about the influence of trust in the e-government system with regard to its success. This question consisted of probes of dimensionality of trust in the e-government system and probes relating to the relationship of trust in the e-government system and other constructs.

Table 4.1: Questions in field study

Topics	Question Number	Brief Description of Questions
E-Government System Success	1	<ul style="list-style-type: none"> ▪ Users' experience in using e-government system ▪ Reasons of using e-government system ▪ The influence of economic condition on the use of e-government system
	2	<ul style="list-style-type: none"> ▪ Users' satisfaction of e-government system
	3	<ul style="list-style-type: none"> ▪ Benefits of e-government system
Influence of Digital Divide on e-Government System Success	4	<ul style="list-style-type: none"> ▪ Dimensions of access divide ▪ The influence of access divide on capability divide ▪ The influence of economic divide on access divide ▪ The influence of access divide on trust in e-government system ▪ The influence of access divide on the use of e-government system
	5	<ul style="list-style-type: none"> ▪ Dimensions of capability divide ▪ The influence of capability divide on innovativeness divide ▪ The influence of capability divide on trust in e-government system ▪ The influence of capability divide on the use of e-government system

	6	<ul style="list-style-type: none"> ▪ Dimensions of innovativeness divide ▪ The influence of innovativeness divide on trust in e-government system ▪ The influence of innovativeness divide on the use of e-government system
Mediating Effect of Trust in e-Government System	7	<ul style="list-style-type: none"> ▪ Dimensions of trust in e-government system ▪ The influence of trust in e-government system on the use of e-government system ▪ The influence of economic divide on the trust in e-government system

It was a requirement of Curtin University that the Human Research Ethics Committee examined and approved the interview guide prior to use. The Committee granted approval on the guide through Protocol Approval number GSB 01-11, attached in Appendix 2.

Prior to the field study, to test the comprehensibility and applicability of the questions to the participants and to estimate the duration of the interviews, two participants were engaged in a review. One interviewee was a potential participant in the field study and the other was a researcher at a local university. Based on their feedback, all of the questions were deemed comprehensible, with the exception of a probe in question 6, which was: *“Do you think that the One-stop service is sincere and genuine?”* This probe was removed in order to avoid any misunderstanding and/or unexpected responses from the informants. No other issues were raised and the estimated duration of a single interview was between 45-60 minutes.

The pilot study found to be a valuable experience. The researcher felt that the sequence of the questions should not follow the interview guidance. Rather, questions should be asked about the dimensions of the constructs and this would be followed by questions about the relationships between the constructs. The

reasoning was due to the fact that the informants might not clearly understand the concept of the constructs. By asking questions about dimensions of the constructs, it would be easier for informants to understand each construct. The informants might then respond more easily to questions about the relationships between constructs. The final interviews were conducted with 12 users of the Indonesian e-government system.

Since the interviews take place in Indonesia and the interviewees are Indonesian, the interviews are conducted in Bahasa Indonesia. The questions are translated into Bahasa Indonesia by the researcher prior to the period of data collection. Back translation approach is used in translating the questionnaire, when translators interpret a document previously translated into English back to the original language (Indonesian) and compared. Plain language is used and any jargon or difficult word is avoided.

4.3. Sample Selection and Data Collection

A preliminary study has revealed that up until 2011 there were four local governments in Indonesia, which provide online services directly to citizens in their e-government systems. In other words, their e-government systems enable citizens to log into the systems and perform some transactions with the government through the online system. The local governments under study were to be the governments of the Sleman Regency, the Tulungagung Regency, the Tangerang Regency and the Pematang Regency. Upon further investigation it seemed that the interactive e-government systems in the Tangerang Regency and the Pematang

Regency had only been set up as recently as 2011, limiting access to users. The field study had therefore to limit itself to the Sleman Regency and the Tulungagung Regency.

The field study applied two methods of sample selection. In the Sleman Regency, the researcher applied a stratified random sampling method, as suggested by Berg (2004). This method was chosen due to the need to ensure that the sample represented the demographic characteristics (gender and residential place) of the location. In the Sleman Regency, data regarding e-government users was obtained from the government by requesting the data through a formal procedure. From the data, the users were divided into subgroups (strata), being the demographic groups. Each group was then approached randomly via telephone to request their participation in the interview. Seven users in the Sleman Regency were interviewed.

In the Tulungagung Regency, due to technical difficulties, data on e-government users was unavailable. The officer in the One-Stop Service Bureau (Badan Pelayanan Perijinan Terpadu-BPPT) was able to give only one name of an e-government user. With the assistance of this user, 4 other users were found, in line with the Snowball Sampling method. As suggested by Berg (2004), this method is popular among researchers seeking difficult-to-reach populations. Once interview permission was granted, date, time and venue of the interview was arranged, with regard to the most suitable conditions for the interviewees. Those who accepted were also given an outline of the course the interview would take.

Prior to the interview, an information sheet was shown to the participants as part of the ice-breaking procedure to dispel any hesitancy and make the participants more comfortable for the interview. The participants were also asked permission to be recorded during interviews. Notes were taken throughout the interviews. After the interviews, the recordings were transcribed verbatim immediately. As the interviews were in Indonesian, the transcripts were then translated into English. In order to maintain accuracy, other researchers were asked to recheck the transcripts and translations and some corrections on the translations were made.

4.4. Data Analysis

A two-step content analysis, namely deductive and inductive, was carried out to analyse the data of the semi-structured interviews (Siltaoja 2006; Berg 2004). The process of the data analysis is presented in Figure 4.1. Content analysis is considered the most appropriate way to determine the relationship among the concept (Flick 2007), the interview data and the theoretical framework in order to fulfil the objectives of the field study. The field study researcher utilised the NVivo 9 software program to help manage the data. NVivo is able to record, search and explore patterns of data and ideas (Richards 1999).

At the inductive stage, themes, sub-themes, and concepts explaining variables, factors, and measurement scales are explored. This is followed by induction of the explored factors and variables into a single framework, which is then compared to the initial research model (Figure 2.10, presented in Chapter Two). In comparing the models, theoretical replication as well as literal replication (Chan and Ngai

2007) is carried out. Theoretical replication is conducted by contrasting the differences in cases between the informants; while literal replication shows where the similarities in cases exist.

In the data coding, using NVivo, the data was reviewed and examined on an individual informant basis. Based on the findings, individual research models were then developed (Appendix 4). These research models are fundamental to the contextualisation of the individual findings. The models were then compared to one other and a further model was developed to represent the overall findings of the field study.

Following inductive analysis, the initial research model and the model of field study were compared and reviewed. This step was undertaken to examine the significant constructs and their dimensionalities. The findings in the field study were then revisited to determine the most significant constructs that represent antecedent factors along with the relationships between variables. Based on the literature review and the field study, the dimensions of the constructs were then finalised and justified.

The following sections explain the findings of the process.

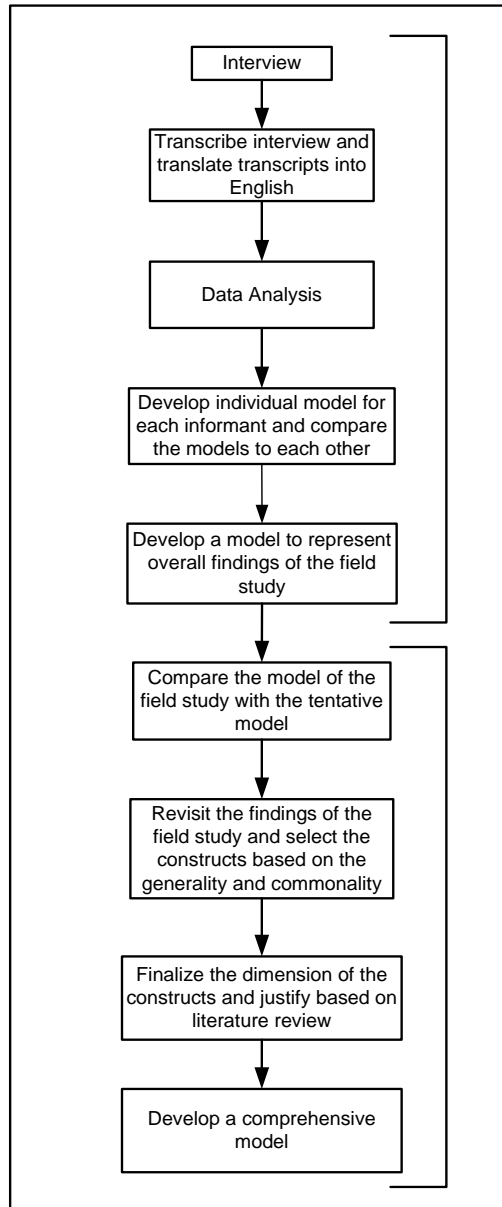


Figure 4.1. Data analysis process

4.5. Inductive Analysis: Findings of Antecedents Factors

4.5.1. Influence of the Economic Divide on E-Government Use

Most of the informants (12 of 14) stated that economic conditions do not influence e-government users (See Table 4.2). Participants in the field study mostly believe that an Internet connection nowadays is not problematic in terms of accessibility. For example, informant 5 and informant 8 made the following statements:

“I think people at all levels of income might access the online service provided by the government. In fact, with the online system, I don’t have to pay transportation costs. I mean the government actually provides a cheaper service via the online system. People just don’t understand the benefits of the online system.” (Inf.5)

“I don’t think that personal economic circumstances influence the usage of the e-government online system, as nowadays we can easily find Internet facilities in shopping centres, restaurants and other public areas. We can access the Internet for free. Although I frequently find people just access the Internet to check their email, chat and social network, I think the government should promote its online facilities, like e-government, to broader society. Once people know that they are able to process their registration or license via the internet, I believe they will choose this kind of facility instead of the traditional system.” (Inf.8)

However, three participants (Inf.7, Inf.8 and Inf.12) suggested that e-government use is influenced by economic conditions to some degree. Informant 7 felt that

economic conditions had a weak influence on e-government use, as described in his statement:

“Yes obviously it costs to access the e-government online system, well maybe there is a correlation with one’s personal economic circumstances but I don’t think that is really significant.” (Inf.7)

While informant 8 and informant 12 stated:

“As we have an adequate income, we are able to have all the facilities including the Internet. I believe if more people have an Internet connection, they will use the e-government system, because it makes everyone’s business easier and simpler” (Inf.8)

“I believe that some people feel that an Internet connection is still expensive and that they have a lot of basic needs to be fulfilled first. They might not even think about an internet connection and e-government.” (Inf.12)

Based on the content analysis of the influence of the economic divide on e-government use, Table 4.2 shows the response of each informant to the link. The findings from the field study do not support the relationship between those variables.

Table 4.2: Link between the economic divide and e-government use

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
ED → EU	x	x	x	x	x	x	✓	✓	x	x	x	✓	3

Note: ED = Economic Divide; EU = E-Government Use; ✓ = agree; x = disagree

4.5.2. Influence of the Access Divide on E-Government Use

With regard to the influence of the access divide on e-government use, all of the informants (N=12) agreed that access is a vital factor. According to the informants, access is the prerequisite for citizens to use the e-government system. Informant 9 and informant 3 emphasised this:

“Yes I believe that Internet access is important for e-government use. How can you use the system if you cannot access it? I believe that many citizens are actually keen to use the OSSOS (One-Stop Service Online System), because it is easier, cheaper and simpler...” (Inf.9)

“I find the online system very useful, with it I don’t have to go to out and visit various agencies. I don’t like bureaucracy because it’s difficult. Therefore I will use the online system whenever it’s possible and available. To do that I need to be able to access to the system.” (Inf.3)

Table 4.3 provides the responses from each individual participant based on content analysis. The responses confirm that the access divide is one of the key determinants in e-government use. Hence, a relationship between those variable can be expected.

Table 4.3: Link between access divide and e-government use

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
AD → EU	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: AD = Access Divide; EU = E-Government Use; ✓ = agree; ✗ = disagree

In term of dimensions of access divide, there are three dimensions used to describe the access divide. All of the informants agreed with the first dimension (easiness) and the third (comfort), although only half of the informants (6 informants) agreed regarding the second dimension (place). Table 4.4 demonstrates the responses of each informant towards each dimension of the access divide.

Table 4.4: Dimensionality of access divide

Dimensionality	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
Easiness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Place	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✓	6
Comfort in Access	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: ✓ = agree; ✗ = disagree

With regard to the dimension of 'easiness', informant 6 and informant 7 were of following opinion:

“Actually it is quite easy: in terms of finding the website, it’s easy, in terms of operating the online system, that’s easy too. You just go to the web, then click and follow the menus.” (Inf.6)

“When I used it for the first time, I didn’t find any problems. I could access the system easily. I was even able to do the registration at night (after office hours), and basically I can use the system any time I want.

Overall I think the system is easy for me to use. It's just like using other websites." (Inf.7)

Regarding the dimension of 'comfort', informants 2 and 3 suggested that the online system was more comfortable "...compared to manual system". Furthermore, 6 informants agreed that 'place of residence limits access to online system'. Informant 2, who lives in a remote area, stated "...it is more difficult in mountainous area, like my area". Informant 11 also found the same issue:

"It is difficult to access the OSSOS in my village as it is a 'black spot', but when I go to the neighbouring area, the Internet kiosks are like mushrooms, they're just everywhere."

The other 6 informants however, believed that place of residence is not an issue nowadays. They believe that Internet connections are fairly easily accessible in some public areas. Informant 9 and informant 10 argue:

"...In term of internet access, I can access the internet from my house. Now it's easy to get Internet access. In the shopping centres, in the restaurants, it's possible for us to connect to the Internet through the WiFi system. Even at my restaurant, I was able to install a WiFi service. I tell you; nowadays people prefer to go to a restaurant with a WiFi service than one which does not have it..." (Inf.9)

"...Internet kiosks are everywhere now. Even in some remote areas, we can find Internet kiosks. In the restaurants and shopping centres we are able to access the Internet for free." (Inf.10)

4.6. Influence of the Capability Divide on E-Government Use

Content analysis of the semi-structured interviews shows that all of the informants consider capability as the key determinant in e-government use. Table 4.5 represents individual agreement on this aspect. Informants believe that a comprehensive ability to operate an online system is required for e-government use. Informant 1 strongly suggests, *“Capability is a must. Without it, citizen cannot use e-government”*. While informant 11 stated, *“I think technology literate is the most important factor”*. Thus, the relationship between the capability divide and e-government use, as proposed by the initial model, was supported by the findings in the field study.

Table 4.5: Link between capability divide and e-government use

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
CD → EU	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: CD = Capability Divide; EU = E-Government Use; ✓ = agree; ✗ = disagree

The responses to the dimensions of the capability divide also describe strong agreement on each dimension. All informants agreed on the first, third and fourth dimensions, whereas none of the informants found any difficulty with operating an online system or with IT in general (dimension 2). Table 4.6 represents each response regarding the dimensions of the capability divide.

Table 4.6: Dimensionality of capability divide

Dimensionality	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
Confidence	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Difficulty	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	0
Comfort in Using	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Ability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: ✓ = agree; ✗ = disagree

The informants in the field study appeared to be familiar with information and communication technology (ICT). They reported feeling confident and comfortable with using ICTs, although some of the informants only use ICTs insofar as they need to in order to support their business. Informant 3, for example, is a lecturer in the field of information systems. He mentioned:

“I’m a lecturer at the college (college of information systems). I use ICT in my everyday life basically. Computer, Internet, telephone, software, I use them every day. Capability in using these is a must for me. I don’t find any difficulty in using ICT. In fact, it helps me. I feel comfortable using the gadgets. Sometimes, if I leave one of my gadgets at home accidentally, I feel nervous. Something is missing, you know...”

Informant 7 on the other hand, stated:

“I run a business in computer maintenance and trade, although at first, computers were just a hobby. But now I always update the latest developments. I follow it all in the computer magazines, on the Internet, via my colleagues, etc. Every day, I find something new about computers

and ICTs. That's why I like this business. But I need to learn more. Learning about things we like is exciting."

4.6.1. Influence of the Innovativeness Divide on E-Government Use

The initial model proposed a relationship between the innovativeness divide and e-government use (Figure 2.10) and the findings of the field study offer some level of support of the potential relationship. Among the informants, 10 informants suggested a link between the innovativeness divide and e-government use. From Table 4.7, it can be seen that the innovativeness divide is considered by most of the informants as one important factor influencing e-government use. Informant 10 answered:

"Yes, it can be one of the factors I believe, but I have seen many people capable of operating a computer and using websites, but they just utilise it all narrowly. Many people just use the Internet to check email and do social networking. Basically it's more just for fun. I suspect they are hesitant in utilising the computer further, say for online transactions, for example."

Informant 11 also stated:

"As I mentioned before, I ended up using this service by accident. I mean, because I was curious, I just browsed the Internet and found that this online system was already available. Because I get to explore new websites and ICTs in general, I just feel confident in filling in forms and following the online procedures..."

Table 4.7: Link between innovativeness divide and e-government use

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
ID → EU	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗	10

Note: ID = Innovativeness Divide; EU = E-Government Use; ✓ = agree; ✗ = disagree

Based on the content analysis, all of the informants (N=12) appeared curious regarding new ICTs. They would seek a way to try new ICTs if they heard about them. Furthermore, the majority of the informants (10 informants) liked to experiment with new ICTs. Informant 11, for example, reported:

“Because I’m a photographer, if I hear of new software or a gadget via the Internet or my colleagues, I always look for a way to try it. I like to go to exhibitions, because at the exhibitions I can try out a new gadget or some software. Then if I need it and I can afford it, then I’ll buy it.”

Most of the informants (7 informants) do not hesitate to try new ICTs. On the other hand, 5 informants are hesitant, citing fears of viruses, data theft and hackers as articulated by Informant 12, *“I am afraid someone steal or misuse my personal data”*. Informant 1 also expresses his concern, *“I’m afraid of fake website”*. Furthermore, in term of ‘first mover’; most of the participants (8 participants) were reluctant to be first movers. Most of them heard about new ICT from their peers, as uttered by Informant 3, *“Usually I try new ICT based on a recommendation, from an expert or my colleague”*. Table 4.8 presents the responses of each participant on the dimensionality of the innovativeness divide.

Table 4.8: Dimensionality of innovativeness divide

Dimensionality	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
Curiosity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
First mover	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	4
Hesitancy	✓	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓	5
Experiment	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	10

Note: ✓ = agree; ✗ = disagree

4.6.2. Influence of Trust in E-Government on E-Government Use

Based on the content analysis, all of the participants (N=12) demonstrated that trust in e-government influences the usage of e-government. Table 4.9 describes the relationship between these variables, according to the informants. Trust in e-government appears to be a factor in determining e-government use. It influences the decision to use e-government. Therefore, the relationship between these variables can be expected, as proposed in the initial model. Informant 10 stated that:

“I trust the website, because the web address lets me know that the site is a government website. I won’t use any website if I don’t trust it, especially if it requires my personal data.”

Similarly, informant 7 and 9 stated:

“I can say that because we trust the online system we are ok to use the system, just like when trust a product in general. Once you trust it, you use it.” (Inf.7)

“...I think trust is important factor in using online services, such as e-commerce and e-government. Without any trust, people wouldn’t use an online system. They’d be afraid that the website’s fake; you know nowadays the websites of some banks are counterfeited and if we enter our PIN or password our money could be stolen.” (Inf.9)

Table 4.9: Link between trust in e-government and e-government use

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
T → EU	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: T = Trust in E-Government; EU = E-Government Use ; ✓ = agree; ✗ = disagree

In term of dimensionality, content analysis of the data demonstrates five dimensions to describe ‘trust in e-government’. Table 4.10 presents the findings of these dimensions. All dimensions were confirmed by most of the informants. For dimension ‘care’ in particular, 11 informants agreed that e-government cares for its citizens’ needs. Participant 12 confirmed, *“I can say that the e-government online system accommodates the public need. Citizens need a simple, cheap and quick process...”*. However, for the dimension of ‘competent and effective’, only one informant disagreed with it. This particular informant (Inf. 6) stated:

“The e-government system was created on the basis of the assumption that everyone has an IMB (Ijin Mendirikan Bangunan/Registration to Build). The question is, is it true? The system is too complicated for me and it’s not effective”

On the other hand, the other 11 informants agreed that the system is effective and competent. Informant 3 for example, mentions:

“I believe the system is effective in serving citizens’ needs. And because it is provided by the Office of the One-Stop Service by the government of Sleman, I also believe that it is competent.”

With regard to the stability and predictability of the e-government system, there were 3 participants who did not agree. They felt that they could not find any information with regard to the time and costs needed to finish the registration. They commented that the system was unpredictable and unstable. Informant 2 complained:

“It’s difficult to predict time and money used. I keep wondering about the money that I might have to come up with. We may be asked to pay again and again, who knows?”

However the other 9 informants confirmed confidence in the stability and predictability of the e-government system. They found the information regarding the requirements of the process, and based on their experience there was not a great deal of deviation from the information. Therefore they might predict the process of registrations.

Table 4.10: Dimensionality of trust in e-government

Dimensionality	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
Truthful and honest	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	9
Competent and Effective	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	11
Care	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	11
Stable and predictable	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	9
Committed	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	8

Note : ✓ = agree; ✗ = disagree

4.6.3. Relationships among the Variables in the Digital Divide

The initial model in this paper proposed that the economic divide influences the access divide, while the access divide influences the capability divide, and ultimately, the innovativeness divide is influenced by the capability divide (Figure 2.10). Based on the content analysis, links between the access divide; capability divide and innovativeness divide appear to be supported by the participants. However, the influence of the economic divide on the access divide appears to be supported by only half of the informants (N=6). Table 4.11 shows the relationships between variables in the digital divide as perceived by each informant.

Table 4.11: Link of variables in digital divide

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
ED → AD	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✗	✓	6
AC → CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
CD → ID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: ED = Economic Divide; AD = Access Divide; CD = Capability Divide; ID = Innovativeness Divide; ✓ = agree; ✗ = disagree

For the relationship between the economic divide and access in particular, 6 informants confirmed that the economic divide influences the access divide. Most of them believed that many people are still struggling with basic needs; regardless of the fact that the cost of accessing ICT is getting cheaper nowadays. Accessing ICT is not a priority for those people. Informant 3 states, *“The cost of accessing the Internet is much cheaper now. Despite this I will only access the Internet more when my personal economic circumstances improve”*. Similarly, informant 9 believed:

“...when their personal economic circumstances improve, there will be more people who will access the online system more. It costs to connect to the Internet, for sure. For people with low levels of income, they first must fulfill their basic needs, that’s what’s most important to them. It is for me too. I’ll access the internet more when my income level increases.”

The other 6 informants suggested that the economic divide does not have a link with access divide. The differences were based on the argument that the cost of accessing the Internet is getting cheaper, and they believe that it is not a significant issue anymore. Informant 5 for example, states that: *“...Anyone at any level of income can access the internet, and the e-government system. I don’t see any connection with one’s financial situation.”* Participant 12 similarly comments: *“It’s possible to find free Internet access in public spaces. I don’t think income-level is an issue.”*

Furthermore, the participants suggested that there is a link between the access divide and the capability divide. They believe that the more intensely they access

ICT, the more they become familiar with ICT and their capability in using ICT will increase. Participant 7 states: *"I learnt the computer and how to use the Internet by myself. I just browse the Internet and I also try out software. The more frequently I use the gadgets and the software, the more capable I become"*. Participant 4 also argues: *"I believe so. How can we capable of using ICT if we don't have access to it?"*

In terms of the link between capability divide and innovativeness divide, all of the informants (N=12) demonstrated support for such a link. Most of the participants believed that in trying new ICTs, they needed to have some ability. Participant 11 stated: *"I need at least basic capability when I try a new gadget or software. Otherwise, I won't try them"*, while informant 1 said: *"I usually find out about new software before I try it. I read a book about it or find something on the Internet"*. Based on the content analysis, the relationship among the variables of the digital divide is as expected in the initial model.

4.6.4. Influence of the Digital Divide on Trust in E-Government

The initial proposed model pointed to links between the digital divide and trust in e-government (Figure 2.12). However, the field study found that a link between the economic divide and trust in e-government might be weak. Alternatively, a possible links between the capability divide and trust in e-government, and between the innovativeness divide and trust in e-government were uncovered by all of the informants (N=12). Eleven of the 12 informants also suggested that there might be a link between the access divide and trust in e-government. Table 4.12 summarizes the findings of the field study.

With regard to the possible link between the economic divide and trust in e-government, most of the participants appeared to be unclear about such a link. Informant 5 stated: *“I don’t understand the link between the two. As for me, my trust is not based on my economic circumstances.”* However informants 7 and 12 believed that one’s personal economic circumstances affect one’s belief to trust in any kind of technology. Informant 12 is of the opinion:

“I believe that those who are at lower levels of the economic spectrum tend to have a lower level of trust in government, and that includes e-government. Although I can’t see a direct relationship, I believe somehow they are related. In e-government and e-commerce in particular, I think people don’t want to use them because they don’t trust them. They tend to prefer the traditional system, where they can meet with the customer service officer personally.”

Table 4.12: Link of digital divide and trust in e-government

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
ED → T	x	x	x	x	x	x	✓	x	x	x	x	✓	2
AC → T	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	11
CD → T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
ID → T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12

Note: ED = Economic Divide; AD = Access Divide; CD = Capability Divide; ID = Innovativeness Divide; T = Trust in E-Government; ✓ = agree; x = disagree

As presented in Table 4.12, 11 participants suggested the influence of access divide is important to trust in e-government. Participant 9 commented: *“I will trust a system that is easy and comfortable to access”*. While participant 12 argued:

“I believe that every system is developed to make our business easier. When I feel comfortable in using a system, I put more trust more in it. On the other hand, when a system is difficult and too complex for me, I’m hesitant to use it. I think complexity might be a cause of corruption.”

In terms of the influence of the capability divide and the innovativeness divide on trust in e-government, all of the informants demonstrated that this link is likely important. Most informants argued that in trusting a system, they need to understand and to be capable of using it. Informant 10 stated: *“...I trust in a system that I’m capable of using. Without any understanding and capability, I’d feel anxious.”*

Based on the content analysis, all of the informants demonstrated a proclivity to believe that innovativeness divide is linked to trust in e-government. Informants believe that a willingness to try new ICT is one of the important factors in trust in e-government. Informant 5, for example, answered:

“I like to try new gadgets and software. And I like to browse the Internet. On the Internet we can find anything, through Google or other search engines. By browsing and constantly trying new things, I can maybe understand and distinguish between trustworthy and untrustworthy websites.” (Inf.5)

Similarly, informant 12 stated:

“Based on my experience in trying and exploring ICTs, I now have a better understanding and awareness of new ICTs. So I should be able to tell if information about new ICTs is honest.” (Inf.12)

It is evident from the field study that there is general agreement and synergy with the proposed initial model (Figure 2.12). Only the link between the economic divide and trust in e-government demonstrated some lack of confirmation.

4.6.5. E-Government System Success

The variables of ‘e-government system success’ as proposed in the initial model are ‘e-government use’, ‘e-government user satisfaction’ and ‘benefit of e-government’ (Figure 2.10). These variables are derived from an established model (DeLone and McLean 2003). Hence the objectives of the field study are to investigate the dimensionalities of each variable. The dimensions of each variable and the responses of each individual informant on each dimension are described in Table 4.13 below.

Table 4.13: Dimensionality of e-government system success

Variable	Dimensionality	Informant												Freq
		1	2	3	4	5	6	7	8	9	10	11	12	
E-govt use	Use	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
User satisfaction	Satisfaction	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
	Expectation	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	9
Benefit	Cost efficient	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
	Time efficient	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	10
	Simpler process	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	9

Note: ✓ = agree; ✗ = disagree

Table 4.14 shows the amount of times each individual informant has used the e-government system. Eight of the informants were first-time users, while the other 4 had used the system more than once. Among the informants, there were 5 informants whose registrations were not finished yet². For one informant (Inf.6), there was a possibility of ineligibility for registration, due to his failure to provide the requested documents.

Most of the informants (N=9) appeared satisfied with the system, and 8 informants stated that the systems met their expectations. Most of the participants expected a simpler process from the new system as compared with the traditional system, and more efficiency in term of costs and time. Informant 9 said:

“...it is simpler in term of process, and costs less. You know, when we have business with the government, we expect it to be a difficult process. Bureaucratic processes, you know... (expression of dislike). However I found this service very easy and simple.”

² Most informants used the e-government systems to register home renovation/building. Before they build or renovate their home, they must get permission from the local government. Those 5 informants were applying the permission but the processes were not done yet.

Table 4.14: E-government usage by each informant

Informant	Region	Number of use
Inf.1	Sleman Regency	1
Inf.2		1
Inf.3		1
Inf.4		2
Inf.5		1
Inf.6		1
Inf.7		2
Inf.8	Tulungagung Regency	10
Inf.9		1
Inf.10		1
Inf.11		1
Inf.12		3

However, participants 2 and 3 did not complete the use of the system due to their experiences of technical failures where they have to repeat the process manually. Interestingly, although participant 6 was satisfied with the system, he felt that the system does not serve customers as expected. For example, he expects simplicity in term of the ability of the system to receive scanned documents, which was not available.

With regard to the benefits of the e-government system, all of the informants (N=12) suggested that the online system saved them money. Informant 4 commented: *“Yes, I don’t have to pay for transport”*. Informant 6 also argued:

“Actually the costs will not be any problem for businessmen like me, as long as the costs are reasonable and predictable. And I think the costs of the e-government system in Sleman are reasonable and as stated on

their website. Business needs certainty you know, to calculate cost and profit”

Most of the informants also found the system saves time. Informant 8 stated: *“I can do the registrations whenever I want to do. Even in the middle of the night”*.

Furthermore, informant 5 stated:

“Because it’s a One-Stop Service, it accommodates our need to process registrations through one office. In the traditional service, we had to go to various departments. The one-stop service saves time. Moreover, it’s an online system and it’s much better than the traditional system.”

The e-government system also benefits its users by providing a simpler process. In the Sleman regency, users must fill in the form through the online system, and submit the required documents to the Office of the One-Stop Service. In the Tulungagung Regency, after filling in the form, the users must prepare the required documents. An officer from the Office of the One-Stop Service collects the required documents from the users. As mentioned previously, informant 6 expected the system to accept the required documents by scanning and uploading them to the system. However, the system at that time was not accepting documents in that format. Informants 2 and 3 had to repeat the process all over again due to a technical failure. This caused some frustration and these informants felt that the system was too complicated.

Beside the three benefits of cost efficiency, time efficiency and simplicity of process, 6 informants (Inf.4, Inf.5, Inf.8, Inf.9, Inf.10, Inf.12) mentioned *‘transparency’* as one of the benefits they received from the e-government system.

They felt that they would be able to find information about costs, time and steps in the process of registration on the government's website. Hence, they found the system more transparent.

4.6.6. Influence of Gender, Residential Place and Age on E-Government Use

In the initial model, the 'Demographic Divide' was proposed as the moderating variable between the Digital Divide and E-Government System Success. Demographic factors such as residential place, gender and age will be investigated in the second stage of this research (quantitative research). In the field study, residential place, gender and age were not included as variables in the list of interview questions. However, in determining the informants in the field study, efforts were made to accommodate a range of demographic groups. Table 4.15 describes the characteristics of informants based on their demographic groups.

According to the informants resident in the city area, access to the Internet and e-government online system was not a problem; they felt that they could easily access the Internet. However, for the informants who lived in remote areas, finding an Internet connection was more difficult. Informant 11 was resident in a mountainous area and his village was located in a 'black' or 'blank spot', where telephone signals had not yet reached the area due to lack of infrastructure development. Informant 11 had to go to another location or to his office in the city area to find an Internet connection. On the other hand, informant 6 who also lived in a remote area did not experience any difficulties in finding an Internet connection. This informant also felt that residential place did not limit his access to the One-Stop Service Online System.

Table 4.15: Characteristics of informants based on demographic groups

Informant	Region	Residential Place	Age Group	Gender
Inf.1	Sleman Regency	City Area	40 – 50	Male
Inf.2		Remote Area	30 – 40	Female
Inf.3		Remote Area	30 – 40	Male
Inf.4		City Area	40 – 50	Male
Inf.5		City Area	30 – 40	Male
Inf.6		Remote Area	30 – 40	Male
Inf.7		City Area	20 – 30	Male
Inf.8	Tulungagung Regency	City Area	30 – 40	Male
Inf.9		City Area	30 – 40	Male
Inf.10		City Area	20 – 30	Male
Inf.11		Remote Area	30 – 40	Male
Inf.12		City Area	40 – 50	Male

In terms of age groups, it was observed that most of the informants (N=7) were in the range of 30-40 years old. Informants 1 and 12 revealed that their children assisted them in using the e-government system. All of the informants in the age group of 40-50 reported no difficulties in term of access, capability and innovativeness.

One of the interesting findings in the field study was the influence of gender on e-government use. Although efforts were made to find female informants for the field study, only 1 informant participated. Five female potential informants were contacted; however 4 of them declined to participate in the field study. They stated that although the registrations for e-government were under their name, it was actually their husbands used the system. This finding reveals that gender is one of the influential factors in e-government use.

4.6.7. Findings regarding Other Relevant Factors

As mentioned earlier, the main objective of this field study is to fine-tune the initial model. In addition, the applicability of the model was also assessed. Other related variables and dimensions in the research came up unexpectedly but only served to enhance the explanatory power of the research model. Based on the content analysis, some interesting findings were discovered via the informants.

Informants 5 and 7 commented on the variable '*Perceived Ease of Use*', although from differing viewpoints. Informant 5 mentioned '*Perceived Ease of Use*' as the mediating variable between the '*Capability Divide*' and '*E-government Use*'. He stated:

"Increasing my capability in using a particular system, I believe, will increase my understanding of it. And if I think that the system is easy to use, then I might use it."

On the other hand, Informant 7 mentioned '*Perceived Ease of Use*' as the moderating variable between the '*Access Divide*' and '*E-government Use*'. He argued: *"If my access to IT gets easier, my preference to use the e-government system will also increase, as long as I believe that I am able to use it."*

Another noteworthy variable for informants was '*Perceived Usefulness*'. Informant 1 mentioned '*Perceived Usefulness*' as the moderating variable between the '*Access Divide*' and '*E-government Use*'. Informant 1 commented:

“An increase in my access to IT will in turn influence my usage of the e-government, that’s what I believe. However, if the system or IT is not useful to me, I won’t use it even if I have better access.”

Since each of the two informants mentioned the variables 'Perceived Ease of Use' and Perceived Usefulness' and they commented on them in different ways; it was decided to omit these variables (as per Flick 2007) to remove any uncertainty.

4.7. The Field Study Model

Based on the content analysis, individual models were developed to illustrate the findings that come from each informant in the field study. There were 12 models produced, and these can be found in Appendix 5. Comparison among the models was made in order to develop the field study model. Figure 4.2 was developed as a result of the comparisons and combinations.

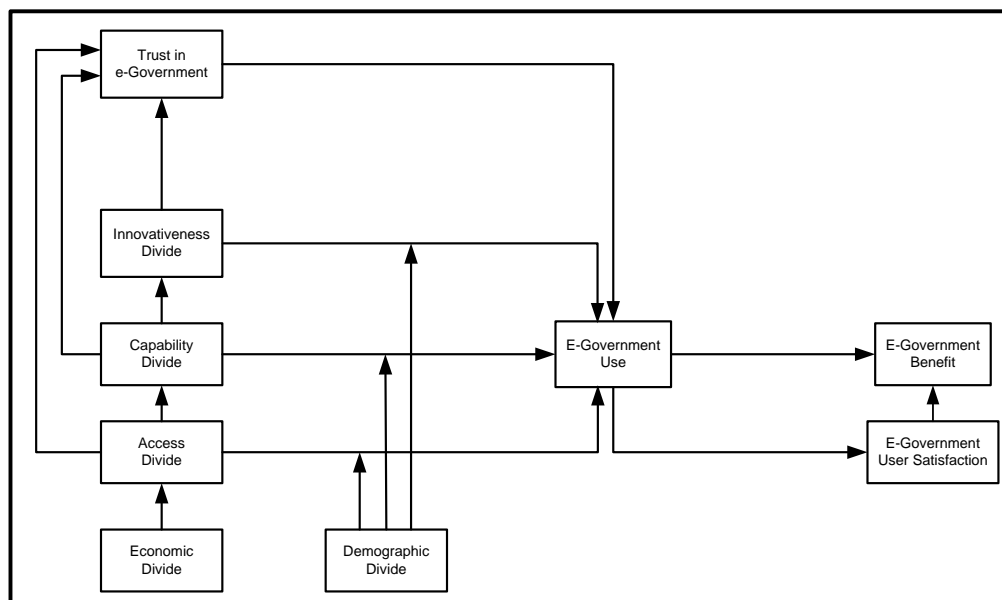


Figure 4.2. Field Study Model

4.8. Deductive Analysis: Review of the Findings of the Field Study

In this phase, three steps were undertaken to review the initial model and the findings of the field study. The first step involved a comparison between the initial model and the field study model. As a result of the first step, the influence of antecedent factors and the moderating factors of the Demographic Divide could be verified. In addition, the possible links between the variables of the digital divide were also discussed.

Findings from the field study were then revisited and reviewed in the second step. In comparing the initial model and the field study model, the focus was centred on the differences between the two models. Therefore, the analysis focused on the least significant antecedent constructs, and the additional construct, which was mentioned by participants.

Based on the data in the field study, the links between the '*economic divide*' and '*e-government use*' and between the '*economic divide*' and '*trust in e-government*' were questioned by most of the informants in terms of influence. As shown in Table 4.2 and Table 4.12, only 3 informants perceived any level of influence between '*economic divide*' and '*e-government use*', and 2 informants perceived any level of influence between '*economic divide*' and '*trust in e-government*'. Hence, these two variables appear to have the least importance in the research model according to the field study.

The constructs and dimensions resulting from the second step were then reviewed with regard to the existing literature in the third step. This step was undertaken to

ensure that the selected constructs were adequate and competent, based on the existing theory along with empirical research.

4.8.1. Findings regarding the Economic Divide, E-Government Use and Trust in E-Government

Referring to the findings from the inductive analysis, links between ‘*economic divide*’ and ‘*e-government use*’ and ‘*trust in e-government*’ were perceived by most of the informants. Therefore those particular links have a basis for inclusion in the model following the existing literature and the findings of the field study. Alternatively, table 4.16 shows the response of each individual informant on of the perception of the links between ‘*economic divide*’ and ‘*e-government use*’ and ‘*trust in e-government*’.

Table 4.16: Link of economic divide, e-government use and trust in e-government

Variable	Informant												Freq
	1	2	3	4	5	6	7	8	9	10	11	12	
EC → EU	x	x	x	x	x	x	✓	✓	x	x	x	✓	3
ED → T	x	x	x	x	x	x	✓	x	x	x	x	✓	2

Note: ED = Economic Divide; EU = E-Government Use; T = Trust in E-Government; ✓ = agree; x = disagree

Since the two links above were generally not perceived by most of the informants, literature and previous research was then revisited (see the following section). Despite the fact that most of the variables and links in the initial research model were supported by literature, as discussed in Chapter Two, the literature and previous research produced mixed results. Therefore the links may be changed based on the findings in the field study and literature.

4.8.2. Relationships among Variables – the Economic Divide, e-Government Use and Trust in e-Government

In terms of the link between ‘*economic divide*’ and ‘*e-government use*’, there has been a large body of research into this, although the results are mixed. Socio-economic factors have been associated with behavioural patterns in many fields, including those in the area of information systems. Previous research has found that socioeconomic conditions influence acceptance of technology (Hsieh, Rai, and Keil 2008; Agarwal, Animesh, and Prasad 2009; Schleife 2010). Furthermore, Norris (2001), Mossberger, Tolbert, and Gilbert (2006), Mossberger, Tolbert, and McNeal (2008) have examined the impact of the economic divide on internet use in particular. Norris (2001), who investigated the Internet use in certain countries in terms of unit analysis, concluded that Internet penetration had a strong correlation to economic development. In addition, Mossberger, Tolbert, and Gilbert (2006) found that in the US, personal economic circumstances are one of the significant factors influencing internet use.

Moreover, the variable, ‘*economic condition*’ has also been put to use in different roles. Some researchers use it as an antecedent factor (eg. Mossberger, Tolbert, and Gilbert 2006; Norris 2001; Agarwal, Animesh, and Prasad 2009; Schleife 2010; Quibra et al. 2003), while others have used it as a moderator variable (eg. Hsieh, Rai, and Keil 2008, 2011; Jung, Qiu, and Kim 2001).

On the other hand, ideas around the link between the ‘*economic divide*’ and ‘*trust in e-government*’ have been initially developed based on the sociological approach (Lewis and Weigert 1985). Moreover, Lewis and Weigert (1985) argue that trust is essential in a society in order to reduce complexity. Trust plays a significant role as

generalised expectancy in a heterogeneous society. Despite the lack of literature and of empirical research in the area of information systems exploring the relationship between economic circumstances and trust, Cole (1973), revealed that socioeconomic factors significantly influence political trust. Furthermore, Gefen, Karahanna, and Straub (2003), argue that levels of trust may be assessed by economic analysis, and shaped by rational and calculative assessment, such as cost/benefit. Therefore, the economic circumstances of the “trusting” individual are important in this view.

Despite the arguments above, empirical research has produced inconsistent findings on the relationship between economic circumstances and trust. Research by Cole (1973), found that economic circumstances do not influence an individual’s trust in government. This finding concurs with research by Campbell (1962, p. 14) which concludes that “trust depends on something other than simple socioeconomic status”.

Having considered the lack of literature justifying the direct impact of economic circumstances on trust in e-government, along with the disagreement of most of the informants in the field study carried out; the role of the Economic Divide in this research was altered. The Economic Divide, represented by household income, was adjusted to perform the role of a moderator variable on the impact of the Digital Divide on the success of the e-Government system. Previous studies (eg. Hsieh, Rai, and Keil 2008, 2011) similarly examined household income as moderator variable.

4.9. The Comprehensive Research Model

Based on the literature and the field study, the section presented here proposes a comprehensive research model, illustrated in Figure 4.3.

The comprehensive model argues that the Digital Divide (this research examined the Access Divide, the Capability Divide and the Innovativeness Divide as independent variables and the Demographic Divide and the Economic Divide as moderating variables) has a significant impact on the success of the e-Government System. The dependent variable is represented by e-Government Use, User Satisfaction and ultimately, the Benefits of e-Government (DeLone and McLean 2003). In addition, this study also investigated the relationships between variables in the Digital Divide from the point of view that access to ICT influences the ability to utilise ICT and in turn, ability has a significant impact on willingness to try new ICT.

Furthermore, this research proposed that trust in e-Government has a mediating role to play in the impact of the Digital Divide on the success of the e-Government system. In the other words, trust is an important factor in improving e-government success in an unequal or divided society.

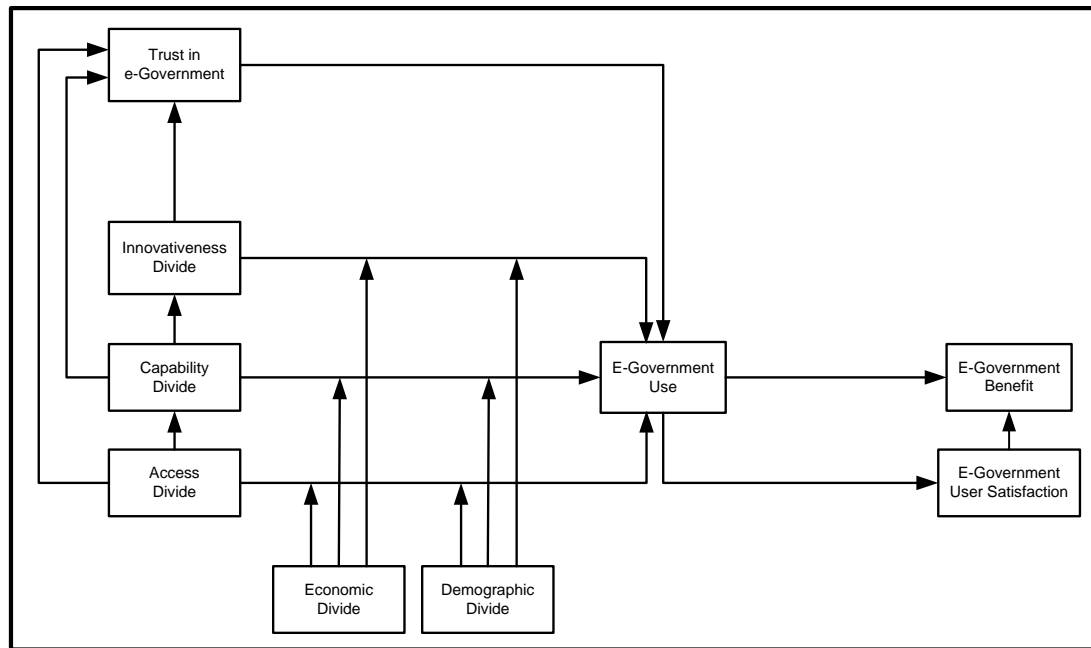


Figure 4.3. Comprehensive Research Model

4.10. Summary

This chapter presented the findings of the field study and proposed a research model. Qualitative data was generated from 12 interviews with e-government system users. The main objective of this field study was to test the applicability of the initial research model proposed earlier along with exploring the dimensionality of related constructs.

The content analysis technique, consisting of inductive and deductive stages was undertaken to analyse the data. Moreover, theoretical and lateral replications were employed in the deductive stage. Factors, variables, some measures and the links among variables were explored based on the literature. Based on the analysis, a combined model, which integrated all the variables from each interview, was developed. The model was then compared to the initial model, which was derived

from the literature review, to propose the comprehensive research model. In the next chapter (Chapter Five), hypotheses are developed from this comprehensive research model, and these are then examined with the quantitative approach in Chapter Six.

Chapter Five: Hypotheses and Questionnaire Development

5.1. Introduction

Chapter Four discussed the field study which was conducted to fine tune the initial research model and develop it into a comprehensive research model in the context of Indonesia. As shown in the model (Figure 4.3), a more comprehensive framework on the digital divide is offered by this study. As highlighted before, this research investigates the influence of the digital divide on the success of e-government systems. The current study also examines the mediating role of ‘trust in e-government’.

Referring to the research model below (Figure 5.1), this chapter discusses the development of hypotheses, which are justified by the relevant literature. The hypotheses describe the relationships among the constructs as proposed in the model.

The development of the questionnaire as the survey instrument in order to test the hypotheses is also presented following the hypotheses development. Structure and format of the questionnaire is explained in this chapter. The measurement items are supported by previous studies as well as the results from the field study. The questionnaire is presented in Appendix 4.

5.2. Hypotheses Development

5.2.1. Hypotheses Related to the Digital Divide

In this research, the digital divide is defined as an inequality between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and their use for a wide variety of activities (OECD 2001). Based on the definition, a more comprehensive understanding of the digital divide is proposed by three categories: namely the access divide, the capability divide and the innovativeness divide.

A. Access Divide

As previously discussed in Chapter 2 (Literature Review), most of the previous research into the digital divide focused on the access divide as the dependent variable in ICT use (Rahman and Quaddus 2012), although operational definitions of “access” vary from study to study. Some researchers refer to “access” as an individual possessing the means to connect to the internet (eg. Ferro, Helbig, and Gil-Garcia 2011; Attewell 2001; Wei et al. 2011; James 2007, 2004; Corrocher and Ordanini 2002). Other researchers use the term “access” as a synonym for use, drivers of access and choice whether an individual had the means to connect to the Internet or not (eg. Mossberger, Tolbert, and Gilbert 2006; Norris 2001; Mossberger, Tolbert, and McNeal 2008).

However, those who have examined the access divide and its influence on ICT use suggest that access to ICT was a key factor in ICT use. This current research refers the access divide to physical access to ICT.

B. Capability Divide

Chapter Literature Review was discussed the Capability Divide and Social Cognitive Theory. However this section is discussing them more detail and in relation with variables in the research model.

Based on Dewan and Riggins' framework and Social Cognitive Theory, Wei et al. (2011) developed a more comprehensive model for the digital divide to include the capability divide. The capability divide is then considered as the second order of the digital divide (Dewan and Riggins 2005; Wei et al. 2011). The digital capability divide itself is resulted from social cognitive theory (Bandura 1977), which argues that an individual possesses a self-belief system. This system allows each individual to control his/her cognitive processes, feelings, motivation and behavior (Bandura 1977), with self-efficacy being the key to the system. Self-efficacy may not necessarily reflect their actual competence.

In the area of information systems, computer self-efficacy (CSE) has been examined in previous research (Marakas, Yi, and Johnson 1998; Compeau, Higgins, and Huff 1999; Wei et al. 2011; Warschauer 2003b), which suggested that self-efficacy has a significant influence on behaviour and attitudes.

The literature is confirmed by the findings in the field study. All of the informants agreed in the relationship between the two variables, as articulated by informant 11, *"I think technology literacy is the most important factor"*.

C. *Innovativeness Divide*

As mentioned in Chapter Two, the innovativeness divide refers to the willingness to change and try out any new information technology (Hurt, Joseph, and Cook 1977; Agarwal and Prasad 1998). Innovation, is closely related to greater risks and uncertainty (Kirton 1976). As new technological innovations are introduced, potential users will consider perceived benefits as well as perceived risks or costs. Technological innovations will be adopted if the benefits earned by its users exceed the risks or costs (Ellen, Bearden, and Sharma 1991). Similarly, Rogers (1995) believed that innovators and early adopters were individuals who were able to cope with high levels of risk and uncertainty. With regard to attitudes toward new technology, Dijk and Hacker (2003) admitted that information *want-not* was a more important problem than information *have-not*. Hofstede (1983, 2009) found that in Indonesia as well as in most Asian countries, levels of the 'uncertainty avoidance' index, a society's tolerance for uncertainty and ambiguity, were generally high. Consequently, Indonesians and Asians in general did not easily accept any changes and innovations.

Personal Innovativeness was utilized to explain the influence of the innovativeness divide on IT usage. Research by Midgley and Dowling (1978) and Flynn and Goldsmith (1993), Agarwal and Prasad (1998) concluded that personal innovativeness is a significant predictor of the acceptance of information technology innovations. Similar findings also generated by a study by Yi, Fiedler, and Park (2006). The influence of the innovativeness divide on e-government use is also supported by the informants (10 out of 12 informants) in the field study.

Referring to the findings of the literature and the field study, the hypotheses that describe the interrelationship between the variables have been developed as follows:

Hypothesis 1 (a). Access Divide positively influences e-Government use.

Hypothesis 1 (b). Capability Divide positively influences e-Government use.

Hypothesis 1 (c). Innovativeness Divide positively influences e-Government use.

In addition, CSE is influenced by access to ICT. Wei et al. (2011) assert that the availability of IT resources provides the foundation from which individuals acquire CSE. Previous studies also show that access to ICT is a determinant of computer self-efficacy (Gripenberg 2011; Wei et al. 2011; Bertot 2003). Gripenberg (2011) suggests that the availability of computer access may increase the learning and development of IT skills, especially when the support persons are also available. Similarly, Wei et al. (2011) concluded that access divide among students is significantly influencing computer self-efficacy of students.

The participants in the field study also confirmed the positive influence of the access divide on the capability divide. They believe that the more intensively they access ICT, the more familiar they will become with ICT and therefore their capability in using ICT will increase. The following hypothesis is hence proposed:

Hypothesis 2 (a). Access Divide positively influences Capability Divide.

Self-efficacy is based on self-judgment of an individual's own performance capability in specific settings. This subjective evaluation of ability to perform the required tasks is determined by the individual's interactions with and feedback from the environment (Bandura 1977). Even when a given alternative is acknowledged as better, feelings of low self-efficacy often lead individuals to choose the alternatives they can handle rather than the one that is "better" or "best" (Seltzer 1983). In other words, individuals attempt to avoid or minimise discomfort. Thus, when faced with a change, which the person feels less capable of handling, s/he may resist due to feelings of incapability or discomfort, which may arise from the anticipated change.

Previous studies which have examined the influence of self-efficacy on willingness to change or try new IT include Burkhardt and Brass (1990) found that self-efficacy is closely related to willingness to early adopt new technology. Ellen, Bearden, and Sharma (1991) also suggest that greater self-efficacy would be associated with less resistance to the technological innovations. In line with those studies, all of the participants in the field study believed that in trying new ICTs, they needed to be capable of them. Informant 1 says, *"I usually find out about new software before I try it. I read a book or find it on Internet"*.

Based on above discussion, following hypothesis is proposed:

Hypothesis 2 (b). Capability Divide positively influences Innovativeness Divide.

5.2.2. Hypotheses Related to e-Government Systems Success

DeLone and McLean developed a model to examine information system success (1992), which was then updated (2003). The model has been validated in the area of e-commerce where it was originally developed (eg. Gelderman 1998; Lee and Chung 2009) as well as in the area of e-government (eg. Wang and Liao 2008; Teo, Srivastava, and Jiang 2009). The updated model indicates that IS success depends on IS quality (information quality, system quality and service quality). These qualities influence system usage and user satisfaction, and in turn benefit users.

The framework by DeLone and McLean basically consists of two parts, one is the quality of the product (System Quality, Information Quality and Service Quality) and the other is the effectiveness or influence of the product (Use, User Satisfaction, and Impact or Net Benefit) (Mason 1978). This research will use this framework with an emphasis on the effectiveness or influence of the system, as system success cannot be claimed if the system doesn't influence its user despite its good quality. DeLone and McLean also admitted that 'use', 'user satisfaction' and 'benefit' are the important indicators of system success, and these indicators have previously been used on an individual basis by some researchers to measure system success (DeLone and McLean 1992).

This research will focus on usage, user satisfaction, and benefit as indicators of system success, excluding the quality of the system as it is beyond the control of the users. Previous researchers have also modified the DeLone and McLean Model in accordance with the focus of the research (Lee and Chung 2009; Floropoulos et al. 2010).

The use of information systems has often been the measure of MIS success (Zmud 1979; DeLone and McLean 2003). The broad concept of use can be measured from many perspectives. However, many scholars (eg. Lucas 1978; Kim and Lee 1986; Wang and Liao 2008) suggest that in a voluntary system, “actual use” is the most appropriate to measure IS success. Furthermore, DeLone and McLean (2003) “use” and “user satisfaction” are interrelated. In a process sense “user satisfaction” must be preceded by “use”, while in a causal sense positive experience with “use” will lead to greater “user satisfaction”. As a result of the “use” and “user satisfaction”, “net benefit” will occur (DeLone and McLean 2003). A research by Wang and Liao (2008) on e-government system success concluded that citizens perceive benefit of the system because they have used the system and satisfied with it.

Due to DeLone and McLean’s framework and the findings from the previous studies, the sequential process of e-government systems success is expected as follows:

Hypothesis 3 (a). e-Government use positively influences user satisfaction.

Hypothesis 3 (b). e-Government use positively influences benefits of e-Government.

Hypothesis 3 (c). User satisfaction positively influences benefits of e-Government.

5.2.3. Hypothesis Related to Trust in e-Government

Trust is basically a social and psychological phenomenon (Kelton, Fleischmann, and Wallace 2007). In the area of information and communication technology, trust is

believed to be an important factor in ICT use (Vance, Elie-Dit-Cosaque, and Straub 2008; McKnight and Chervany 2002; Teo, Srivastava, and Jiang 2009). The cognitive process of trust formation has been shown to positively influence an individual's intention to use e-commerce (eg. Gefen, Karahanna, and Straub 2003; McKnight and Chervany 2002) and e-government (eg. Warkentin et al. 2002; Teo, Srivastava, and Jiang 2009).

Many scholars have defined 'trust' with a particular emphasis on the psychological aspect. Some argue that 'trust' is "willingness to depend" (Gefen, Straub, and Boudreau 2000; Gefen, Karahanna, and Straub 2003). In the context of the e-government system, trust in e-government refers to the "belief that the e-government system can be used to get the desired outcome satisfactorily" (Teo, Srivastava, and Jiang 2009).

An e-government system is a surrogate or a proxy for the government that provides public services to citizens and businesses through traditional channels (Teo, Srivastava, and Jiang 2009). Therefore, if a government shows sincere care for its citizens and is able to effectively conduct its services, citizens are more likely to believe that the e-government systems developed and maintained by the government will be able to serve their needs. In countries such as Indonesia where the trust in government fluctuates (LSI 2010), it is interesting to examine the influence of 'trust in e-government' on 'e-government system success'. Moreover, the findings in the field study also support the link between trust in e-government and e-government use, as articulated by Informant 9 for example, "*...I think trust is important factor in using online services, such as e-commerce and e-government. Without any trust, people wouldn't use the online system...*"

On the other hand, trust is constructed by cognitive processes, emotional bonds and behavioural enactment. These three basic modes of human social experience are interpenetrating and work together in constructing trust (Lewis and Weigert 1985). Previous studies in political science suggest that trust is influenced by socioeconomic factors, personality variables and self-efficacy (Cole 1973).

This research will investigate the mediating role of 'trust in e-government' in the relationship between the digital divide and e-government system success. A construct may be said to function as a mediator to the extent that it accounts for the relation between the independent and dependent variables (Baron and Kenny 1986). The reasons are: *first*, trust is a substantial sociological factor on which converge various sets of expectations in order to reduce social differences (Lewis and Weigert 1985). *Second*, trust in the e-government system from the citizen is a vital factor for the success of e-government system (Teo, Srivastava, and Jiang 2009; Pavlou 2003; Warkentin et al. 2002). And *third*, trust has been recognised as a mediating variable in many areas, including behavioural intention in management (Cropanzano and Mitchell 2005; Vlachos et al. 2009), marketing and consumer loyalty (Bontis, Booker, and Serenko 2007; Sirdeshmukh, Singh, and Sabol 2002; Morgan and Hunt 1994).

In their study, Vlachos et al. (2009) found that trust fully mediates the relationship between stakeholder-driven attribution and recommendation and partially mediates the relationship between stakeholder-driven attribution and patronage intentions. Morgan and Hunt (1994) also concluded that trust is a key mediating construct in the successful relationship marketing.

Based on the discussion above, the following hypotheses are posited:

Hypothesis 4 (a). Trust in e-Government has a mediating effect on the relationship between the Access Divide and e-Government use.

Hypothesis 4 (b). Trust in e-Government has a mediating effect on the relationship between the Capability Divide and e-Government use.

Hypothesis 4 (c). Trust in e-Government has a mediating effect on the relationship between the Innovativeness Divide and e-Government use.

5.2.4. Hypotheses Related to Demographic Divide and Economic Divide

Differential behavioural patterns in fields such as sociology, marketing, psychology have been associated with socio-economic inequality. Socio-economic characteristics instigate a synergy of social and economic forces from infrastructure to individuals and resources in the surrounding environment (Borstein and Bradley 2003). Furthermore, Borstein and Bradley (2003) state that education background, income, and other life factors also tend to correlate and be distributed unequally across the socioeconomic continuum in a such pattern that proves unfavourable to the socio-economically disadvantaged. As a consequence, these inequalities have been interpreted as internal and external resources, or constraints, that together, shape experiences and opportunities, living and working conditions, place in society, and even ways in which the world is viewed (Williams 1990).

In the field of information systems, the influence of socio-economic inequality on system acceptance has also been explored and investigated. As a matter of fact,

research into the digital divide has been dominated by studies on socio-economic inequalities, such as gender (eg. Venkatesh and Morris 2000; Agarwal, Animesh, and Prasad 2009; Schleife 2010; Wei et al. 2011); age (eg. Agarwal, Animesh, and Prasad 2009; Hargittai 2006; Schleife 2010; Morris and Venkatesh 2000); residential place (eg. Mossberger, Tolbert, and Gilbert 2006; Mariscal 2005; Kuk 2003; Stern, Adams, and Elsasser 2009); and income and educational attainment (eg. Hsieh, Rai, and Keil 2008, 2011). In this research, demographics and the economic divide will be used as moderating variables as suggested by previous research. The moderating effect of gender, age, place of residence, education and income are discussed in each of the following section.

A. Gender

Gender is potentially critical to our understanding of user acceptance because it plays an important role in determining how users make decisions about using new technology (Venkatesh and Morris 2000). From a psychological stand point, Bem and Allen (1974) found that gender difference influences decision making processes through the differences in schematic processing by men and women. Bem (1981) argues that men and women encode and process information using different socially constructed cognitive structures, which in turn, help determine and direct an individual's perception. As a result, individuals tend to make decisions, which reflect biases inherent in the individual's perceptions.

In the studies on technology adoption, it has been found that women typically show a higher level of computer anxiety (Rosen and Maguire 1990; Igbaria and Chakrabarti 1990) and lower computer aptitude (Fetler 1985). As a consequence, gender difference plays significant role as a moderating variable in Internet use.

Agarwal, Animesh, and Prasad (2009) examined the moderating role of gender and concluded that men are somewhat less likely to use Internet. Similarly, Venkatesh and Morris (2000) found in their longitudinal study that men and women are different with respect to technology adoption both in the long and short term. While in term of computer self-efficacy, Fetler (1985) who studied the difference between sixth and twelfth grade boys and girls, concluded that boys outperformed girls in every area of computer literacy. In addition, Fetler also found that the girls have less opportunity to interact with computer than the boys. Similar results also found by Wei et al. (2011).

B. Age

There is large body of research on socio-cognitive changes among individuals based on age. In the area of psychology, a great deal of research focuses on understanding the differences in abilities, traits, or performance outcomes (eg. Rhodes 1983; Czaja and Sharit 1993; Sharit and Czaja 1994; Myers and Conner 1992). Age affects influencing attitudes caused by a number of factors, including social role (psychosocial) changes and biological changes (Rhodes 1983). Furthermore, Rhodes (1983p. 329) explains that psychosocial aging consists of *“systematic changes in personality, needs, expectations, and behaviour as well as performance in a sequence of socially prescribed roles and accumulation of experiences”*. Biological ageing is characterised by changes in anatomical as well as psychological states that naturally occur with age, such as changes in sensorimotor performance, visual acuity, reaction time and so on.

Confirming the studies in psychology, a study by Czaja and Sharit (1993) shows that age has an impact on the performance of computer-based tasks. Similar research

was also conducted by Morris and Venkatesh (2000). By examining the effect of age on the use of technology in the workplace directly and indirectly as a moderator variable, the results indicated that in the short-term, age acts as a moderating role instead of acting as an independent variable. Bucy (2000) suggests that age, together with income, education, and family structure are important determinants of internet use. His research indicated that older respondents are disadvantaged in terms of internet use. Similar results were also reported by Hindman (2000), Loges and Jung (2001), Mills and Whitacre (2003), van Dijk and Hacker (2003).

C. Place of Residence

Disparity in access to and use of computers and the Internet is based on geographical factors as well. Studies by Newburger (2001) and Mills and Whitacre (2003) concluded that an access and use gap existed in the USA between metropolitan and non-metropolitan areas. Similar research into the differences in internet use in rural and urban areas were conducted by Hindman (2000), Nicholas (2003), and Schleife (2010). The rural geographical disadvantage has not yet been eliminated by the existence of the Internet. Nicholas (2003) and Schleife (2010) concluded that the patterns of development exacerbated rural disadvantage. However, Hindman (2000) and Mills and Whitacre (2003) found different results where the place of residence appears to be less of a constraint than other factors, such as income, age and education.

Despite inconsistent conclusions on the significance of place of residence regarding internet and computer use, unlike the residents in cities or metropolitan areas, residents in rural or non-metropolitan regions do not have the same variety of learning and observation possibilities (e.g., free public internet access and internet

cafés). Moreover, rural areas also have lower income levels and less financial resources compared to cities due to higher rural unemployment rates. This further decreases the possibilities of adopting the internet for people living in these regions (Schleife 2010).

D. Education and Income

Norris (2001) suggests that the digital divide relates to entrenched societal inequalities. Acknowledging the existence of various forms of social inequalities, DiMaggio, Hargittai, Celeste, et al. (2001) underlined the need for a theoretical understanding of the behavioural differences between people in different socioeconomic circumstances and, more importantly, whether these differences diminish if every individual has easy and autonomous access to technology. This emphasis is reasonable, as income and education have been found to play an important role in explaining the use and non-use of ICT (eg. Jung, Qiu, and Kim 2001; Hsieh, Rai, and Keil 2008, 2011; Mossberger, Tolbert, and Gilbert 2006).

As mentioned previously, an individual's socioeconomic status is associated with both the internal capacities and external resources that jointly shape behaviour. Unfortunately, educational achievement together with other life factors, such as, income level, employment status, and feelings of self-control and self-esteem, correlate with one another and tend to be lower for the socio-economically disadvantaged (Williams 1990). Furthermore, the inequalities in internal and external capitals between the socio-economically advantaged and the socio-economically disadvantaged impact upon life opportunities, living and working conditions, social ranking, and even world views (Williams 1990). In the meantime,

the capital, or resources required to use digital technology seems to be unequally distributed between these two groups (De Haan 2004; Kvasny and Keil 2006).

Consumer research suggests that individuals with different backgrounds may have distinct dispositions towards and expectations of a technology and may actually use it differently (Tsikriktsis 2004). Individuals tend to perceive a resource as having a higher value if that resource matches their distinctive needs and background (Sirgy et al. 2001). In fact, people with different backgrounds and needs perceive differential values to be derived from their use of similar information technologies (Au, Ngai, and Cheng 2008).

Research has shown that lower income and education groups have significantly lower online access. Even among individuals with material access to online resources, computer skills differ (van Dijk 2006). In the case of skill access as well, some socio-economic factors are predictors of the digital divide. For example, age, education level, and time spent online are predictors of users' skills. Mossberger, Tolbert, and Gilbert (2006) also found that respondents residing in poorer areas, with lower household income and educational attainment, are statistically less likely to use the Internet.

In examining the impacts of education and income, some studies used both of them as one single factor (eg. Hsieh, Rai, and Keil 2008, 2011) but most of the research examined them separately (Mossberger, Tolbert, and Gilbert 2006; van Dijk 2006; Schleife 2010). Thus the current research examines the impact of education and income as two separate variables. A respondent's education is representative of the demographic divide together with gender, age group and place of residence, while household income represents the economic divide.

Following the discussion on demographics (gender, age, residential place and education) as well as economic circumstances (income), the following hypotheses have been developed:

Hypothesis 5 (a). Gender has a moderating effect on the relationship between the Digital Divide and e-Government System Success.

Hypothesis 5 (b). Age group has a moderating effect on the relationship between the Digital Divide and e-Government System Success.

Hypothesis 5 (c). Place of residence has a moderating effect on the relationship between the Digital Divide and e-Government System Success.

Hypothesis 5 (d). Education has a moderating effect on the relationship between the Digital Divide and e-Government System Success.

Hypothesis 5 (e). Income has a moderating effect on the relationship between the Digital Divide and e-Government System Success.

5.3. Summary of Hypotheses Development

Overall there are 5 hypotheses describing 16 relationships based on the comprehensive research model proposed earlier. Table 5.1 presents all hypotheses. Supplementing Table 5.1, Figure 5.1 illustrates the hypotheses in the comprehensive research model.

Table 5.1: Summary of hypotheses statements

Construct	Link	H#	Hypotheses Statement
Digital Divide	AD → EU	H1a	Access Divide positively influences e-Government Use
	CD → EU	H1b	Capability Divide positively influences e-Government Use
	ID → EU	H1c	Innovativeness Divide positively influences e-Government Use
	AD → CD	H2a	Access Divide positively influences Capability Divide
	CD → ID	H2b	Capability Divide positively influences Innovativeness Divide
e-Government Systems Success	EU → US	H3a	e-Government Use positively influences User Satisfaction
	EU → BE	H3b	e-Government Use positively influences Benefits of e-Government
	US → BE	H3c	User Satisfaction positively influences Benefits of e-Government
Trust in e-Government	AD → T → EU	H4a	Trust in e-Government has a mediating effect on the relationship between Access Divide and e-Government Use
	CD → T → EU	H4b	Trust in e-Government has a mediating effect on the relationship between Capability Divide and e-Government Use
	ID → T → EU	H4c	Trust in e-Government has a mediating effect on the relationship between Innovativeness Divide and e-Government Use
Demographic Divide and Economic Divide	Gender*DD → ESS	H5a	Gender has a moderating effect on the relationship between Digital Divide and e-Government System Success
	Age*DD → ESS	H5b	Age Group has a moderating effect on the relationship between Digital Divide and e-Government System Success
	Place*DD → ESS	H5c	Place of Residence has a moderating effect on the relationship between Digital Divide and e-Government System Success
	Education*DD → ESS	H5d	Education has a moderating effect on the relationship between Digital Divide and e-Government System Success
	Income*DD → ESS	H5e	Income has a moderating effect on the relationship between Digital Divide and e-Government System Success

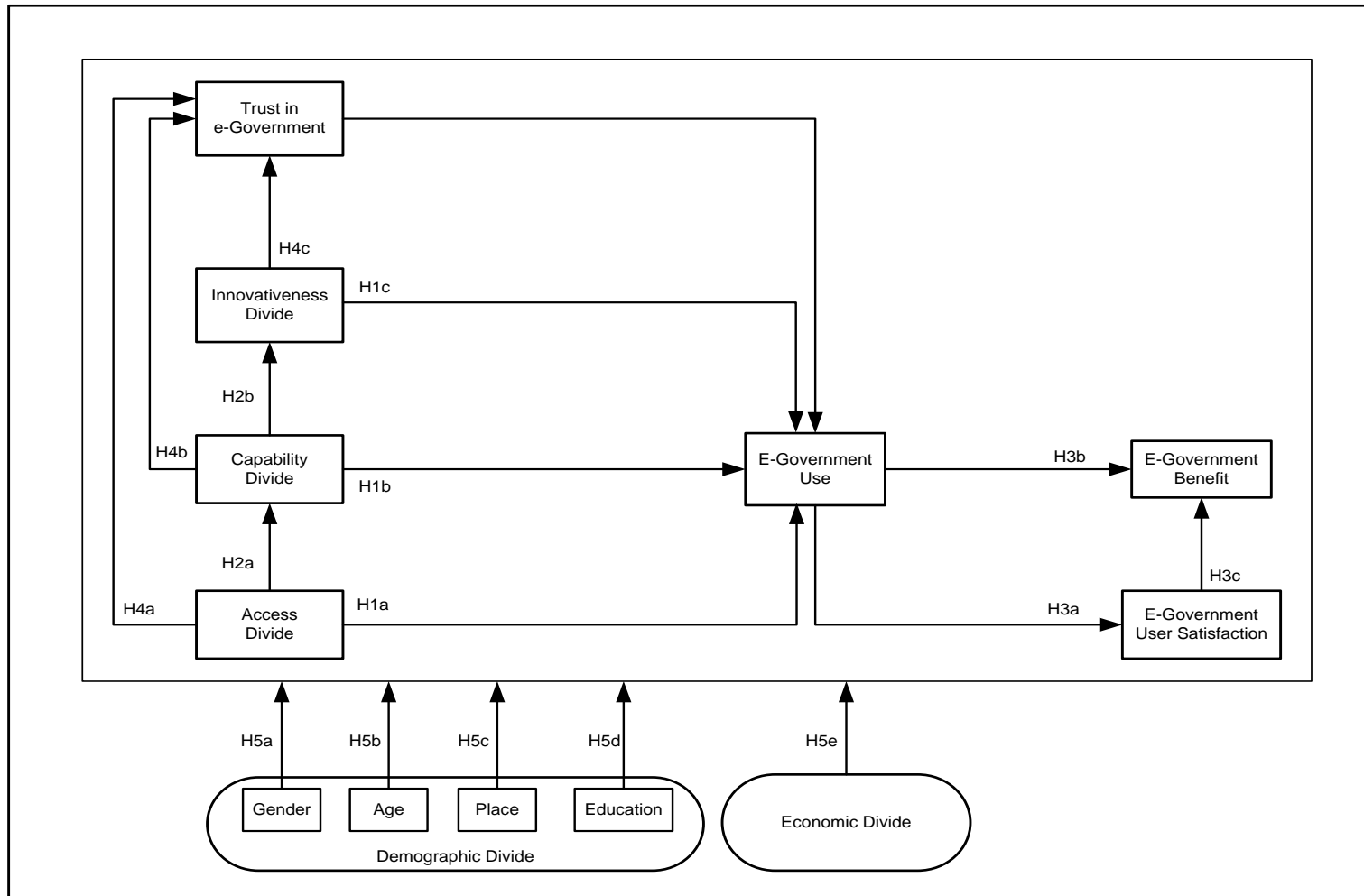


Figure 5.1 The hypotheses research model

5.4. Questionnaire Development

5.4.1. Overview of the Questionnaire

A questionnaire was developed based on previous research and the relevant literature in order to conduct the survey for this study (see Appendix 3). Its structure was designed in a format, which the respondents found easy to understand and answer, and to avoid response bias. As suggested by Polgar and Thomas (2008) and Rattray and Jones (2007), the questionnaire contained the following components:

A. Introduction

The statement in the introduction described the topic of the research briefly, the objectives of the research and information for the respondents. The information included the approximate time it should take to complete the questionnaire, a statement that the participation was voluntary, and that the information was confidential and anonymous. The researcher in attendance also provided general instructions on how to answer the questions, followed by brief definitions of some key terms.

B. Demographic information

The demographic information was positioned at the beginning, in the initial questions, as these questions were thought to be the easiest to answer and that they would serve as a warm-up to the questions that followed.

C. Factual questions

Following the demographic questions were the factual questions or the questions, which required direct answers, for example, "Do you have computer at home?" These questions were thought to be easier to answer than the perception or opinion questions. This type of question was positioned early in the questionnaire to serve as an additional warm-up for respondents.

D. Perception questions

This part was the main part of the questionnaire, and required the views or opinions of the respondents on the statements provided.

E. Closing statements

The closing statements in the questionnaire thanked the respondents for their participation and it contained a statement that the questionnaire had been approved by Curtin University Human Research Ethics Committee. Their contact number, email and postal address were provided for the respondents who required verification of the approval.

The questions in the questionnaire were formatted as closed-response questions, which refer to the type of questions followed by the provision of a predetermined list of response choices (Polgar and Thomas 2008). This format of questions is easily encoded, and more meaningful for comparison purposes as the answers tend to be less variable and take less time to collect responses, although it is noted that the choices may serve to 'lead' the respondents (Frazer and Lawley 2000). The questions provided options for answers and required the respondent to tick the box, which corresponded to the most appropriate response in the '*demographic questions*' and '*factual questions*'.

In the '*perception questions*', the response format was a six point 'forced' choice. The respondent was required to indicate the extent to which he/she agreed or disagreed by circling a number on a scale of 1 (Strongly disagree) to 6 (Strongly agree). This format forced the respondent to give either a negative response or a positive response. In other words, the format did not allow an 'undecided' response. The reason underlying the choice of this format is to avoid a central tendency error. The central tendency error refers to the tendency of the respondent to answer using a neutral response or 'neither agree or disagree'. This error commonly occurs when conducting research in Asian countries, including Indonesia (Trompenaars and Hampden-Turner 2012).

The questionnaire, consisting of thirty-seven questions, was designed to test the hypotheses discussed earlier in this chapter. It was divided into seven sections according to the focus of the research. The first section aimed to collect information about the demographic characteristics of the respondents, with their economic background as the moderating variable. The second section focused on measuring the dependent variables; e-government systems success factors, by asking questions about the variables of *'e-government use'*, *'user satisfaction'*, and *'benefits of e-government'* of the respondents. Furthermore, measuring the main independent factors, the digital divide was the focus of the third, fourth and fifth sections. *'Access divide'* as the third section measured the access of respondents to information and communication technology (ICT) in general. In the *'capability divide'* section the researcher's aim was to measure the respondents' capability in using ICT. The section, *'innovativeness divide'* focused on measuring the respondents' willingness to try out any new ICT. Finally, the last section measured respondents *'trust in e-government system'* as the mediating variable.

In developing the questionnaire, the research considered the issue of common method bias. Common method bias occurs particularly in behavioural research when relations among constructs are measured by the same method (Spector 1987). Podsakoff et al. (2003) identified potential sources of common method bias. Some of the potential causes that should be avoided by researchers are: *'acquiescence'* and *'intermixing'* or *'grouping'*. Acquiescence refers to the tendency to agree with questionnaire statements regardless of content (Winkler, Kanouse, and Ware 1982). This particular bias occurs when the items are ambiguous or when the questionnaire is poorly developed (Cronbach 1950). Thus in dealing with acquiescence, Winkler, Kanouse, and Ware (1982) suggest that design, especially in terms of wording, should administer the instrument carefully. Intermixing or grouping is a bias caused by grouping together items from different constructs (Podsakoff et al. 2003). To cope with such bias, the structure is developed in sections, based on examining the constructs separately.

5.4.2. Measurement Instrument Development

A. Section 1: Moderating variables – Demographic and economic background

In this section, the research had two objectives; firstly, to obtain demographic information about the respondents involved in the research. Demographic information in the research covers ‘gender’, ‘age group’, ‘level of education’ and ‘place of residence’. Secondly, the research intended to measure the wealth of the respondents by questioning their monthly income. Table 5.2 presents all of the items in section one and the related references. All items in this section used a nominal scale. In order to reflect the research context, some modifications (eg. education and monthly income) to the original instrument were made.

Table 5.2: Measurement items related to demographic and economic background

Dimensions	Item	Statements	Reference	Measurement
Gender	DD1	Gender	(Hsieh, Rai, and Keil 2011; Agarwal, Animesh, and Prasad 2009; Mossberger, Tolbert, and Gilbert 2006)	Dichotomous Scale: Male and Female
Age group	DD2	Age group	(Hsieh, Rai, and Keil 2011; Agarwal, Animesh, and Prasad 2009; Mossberger, Tolbert, and Gilbert 2006)	Categorical: Under 20; 21-30; 31-40; 41-50; and Over 50
Place of residence	DD3	How far is your home from the city center?	(Mossberger, Tolbert, and Gilbert 2006), field study	Categorical: Under 5 kms; 5-10 kms; 10-15 kms; 15-20 kms; More than 20 kms
Level of education	DD4	What is your highest level of education?	(Hsieh, Rai, and Keil 2011; Agarwal, Animesh, and Prasad 2009; Mossberger, Tolbert, and Gilbert 2006)	Categorical: High School; Diploma; Undergraduate; Master’s degree; and Doctoral degree
Monthly income	ED1	Approximately, the total monthly income before taxes	(Mossberger, Tolbert, and Gilbert 2006; Hsieh, Rai, and Keil	Categorical: Under Rp. 2.5 million; Rp. 2.5-5

and other (2011) deductions of my immediate family – including my own job income, income from other sources and the income of my spouse – is:	million; Rp. 5-7.5 million; Rp. 7.5- 10 million; Rp. 1–12.5 million; More than Rp. 12.5 million
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B. Section 2: Dependant variables – e-Government system success

As discussed in Chapter 2, and earlier in this chapter, the dependant variables in this study are originally from the framework of DeLone and McLean (2003). Most of the measurement items are also obtained from that particular research, aside from other relevant studies. Table 5.3 shows the details of the items and references to justify the measurements.

The questions in this section measured the constructs of ‘e-government use’, ‘e-government user satisfaction’ and ‘benefits of e-government’. In terms of the construct of ‘e-government use’, two items are measured using a nominal scale (USE1 and USE2) while one item is presented in interval scale (USE3). Moreover, all measurement items related to the constructs ‘e-government user satisfaction’ and ‘benefit of e-government’ are in interval scale. For the measurement items for the construct of ‘benefit of e-government’ in particular, participants in the field study emphasised three benefits of e-government systems, which were cost, time efficiency and that the systems made respondents’ business easier. Therefore those three benefits were used to measure the construct.

Table 5.3: Measurement items related to e-government systems success

Dimensions	Item	Statements	Reference	Measurement
Number of uses	USE1	How many times have you used One-Stop Service Online System so far?	(DeLone and McLean 2003)	Categorical: Once; 2-3 times; 3-5 times; More than 5 times

Number of transactions completed	USE2	Among your total usages of One-Stop Service Online System, how many times have you completed your transactions?	(DeLone and McLean 2003)	Categorical: Once; 2-3 times; 3-5 times; More than 5 times
Using e-government system is a good idea	USE3	Using the One-Stop Service Online System is a good idea.	(Taylor and Todd 1995b)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Satisfied with the system	SAT1	I am satisfied with the One-Stop Service Online System	(Lee and Chung 2009; Kohli, Devaraj, and Mahmood 2004)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
System has met user expectation	SAT2	The One-Stop Service Online system has met my expectations	(Wang and Liao 2008)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Recommend the system to others	SAT3	I strongly recommend the One-Stop Service Online System to others	(Lee and Chung 2009; Kohli, Devaraj, and Mahmood 2004)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Made correct decision to use the system	SAT4	I think that I made a correct decision to use the One-Stop Service Online System	(Lee and Chung 2009)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
The system makes business easier	BEN1	The One-Stop Service Online System makes my business easier	(Wang and Liao 2008), field study	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
The system saves the time	BEN2	The One-Stop Service Online System saves my time	(DeLone and McLean 2003; Wang and Liao 2008), field study	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
The system costs less	BEN3	The One-Stop Service Online System costs me less than manual system	(DeLone and McLean 2003), field study	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

C. Section 3: Independent variable – Access divide

As proposed in the research model, measuring the influence of the digital divide on e-government system success is the focus of this research. The digital divide, as the independent variable, covers three constructs in the current study, which are the ‘access divide’, ‘capability divide’ and ‘innovativeness divide’.

The access divide has been the most common indicator of the digital divide and has been investigated and measured in previous studies. The focus of measurement for the access divide was the respondents’ perceptions regarding their access to ICTs in general, and the availability of both a computer and an internet connection in the home, as the basic requirements for accessing the e-government system. In this research, four dimensions were used to measure the variable of the access divide. These dimensions are referred to in previous studies, as shown in table 5.4.

Table 5.4: Measurement items related to access divide

Dimensions	Item	Statements	Reference	Measurement
Computer availability at home	AD1	Do you have computer at home?	(Wei et al. 2011)	Dichotomous: Yes or No
Internet connection at home	AD2	Do you have internet connection at home	(Agarwal, Animesh, and Prasad 2009)	Dichotomous: Yes or No
Easiness to access ICT	AD3	I can access information and communication technology easily	(Ynalvez and Shrum 2006)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Comfortable to access ICT	AD4	I feel comfortable in getting access to information and communication technology	(Ynalvez and Shrum 2006)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

D. Section 4: Independent variable – Capability divide

Table 5.5: Measurement items related to capability divide

Dimensions	Item	Statements	Reference	Measurement
Confidence in using ICT	CD1	I am confident in using information and communication technology	(Wei et al. 2011; Hsieh, Rai, and Keil 2011)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Difficulty in using ICT	CD2	I do not have any difficulty in using information and communication technology	(Wei et al. 2011)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Comfortable in using ICT	CD3	I feel comfortable in using information and communication technology	(Wei et al. 2011; Hsieh, Rai, and Keil 2011)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Sure be able to use ICT	CD4	I am sure I can use information and communication technology	(Wei et al. 2011)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Able to operate, even if no one tells	CD5	I can operate information and communication technology, even if no one tells me how to do it	(Wei et al. 2011; Hsieh, Rai, and Keil 2011)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

Table 5.5 presents five dimensions for the construct of the capability divide. These dimensions are derived from previous research, mainly research by Wei et al. (2011) and Hsieh, Rai, and Keil (2011). Adjusting the research context of Indonesia, this study does not adopt all of the measurement items in the references. The questions measure the perception of respondents on their capability in using not just e-government systems, but information and communication technologies in general.

E. Section 5: Independent variable – Innovativeness divide

As discussed earlier, the variable of the ‘*innovativeness divide*’ is derived from personal innovativeness regarding information technology, which is a variable already used in previous research. Research by Agarwal and Prasad (1998) and Yi, Fiedler, and Park (2006) are the main references to measure this variable, as shown in Table 5.6. This construct is rooted in the Diffusion of Innovation (Rogers 1976), and is used in the area of marketing. In the early stages of the conception of innovativeness, it is measured by the time taken for an individual to adopt an innovation and ownership of new products. Midgley and Dowling (1978) noted that among studies of innovativeness, 48 percent used the indicator of ‘relative time of adoption’, 39 percent the cross-section technique while 13 percent utilised purchase intention.

To develop a more valid and reliable measurement, Goldsmith and Hofacker (1991) introduced self-reporting for the ‘innovation scale’ which was then validated by Flynn and Goldsmith (1993). Furthermore, in the area of information systems, Leonard-Barton and Deschamps (1988) developed a scale to measure innovativeness. Based on the previous scales by Goldsmith and Hofacker (1991) and Leonard-Barton and Deschamps (1988), Agarwal and Prasad (1998) developed measurement items, which is used in the current research. However, not all of the items are utilised in this research, only those appropriate to the context of e-government systems and Indonesia are used.

Table 5.6: Measurement items related to innovativeness divide

Dimensions	Item	Statements	Reference	Measurement
Look for ways to try new ICT	ID1	If I hear about new information and communication technology, I would look for ways to try it	(Agarwal and Prasad 1998; Yi, Fiedler, and Park 2006)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
First to try out new ICT	ID2	Among my peers, I am the first to try out new information and communication technology	(Agarwal and Prasad 1998; Yi, Fiedler, and Park 2006)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

Hesitant to try out new ICT	ID3	I am hesitant to try out new information and communication technology	(Agarwal and Prasad 1998)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Like to experiment with new ICT	ID4	I like to experiment with new information and communication technology	(Agarwal and Prasad 1998; Yi, Fiedler, and Park 2006)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

F. Section 6: Mediating variable – Trust in e-government

This section measures the construct of ‘trust in e-government’ as a mediating variable between the constructs of the digital divide and the success of the e-government system. To measure the construct, this research utilized five items drawn from Hsieh, Rai, and Keil (2011), Gefen, Karahanna, and Straub (2003), McKnight and Chervany (2002), Teo, Srivastava, and Jiang (2009), and Pavlou (2003), as described in Table 5.7. However, most of the previous studies investigated ‘trust in e-commerce’ and ‘trust in government’, thus this research has modified the measurement items. A pre-test was conducted in order to ensure that the items were understandable to the respondents. Three local researchers were involved in the pre-test. They were required to compare the modified and original items. The analysis shows that the modified items were understandable although some improvements in terms of wording were made, based on their suggestions.

Table 5.7: Measurement items related to trust in e-government

Dimensions	Item	Statements	Reference	Measurement
Truthful and honest	TE1	I think the information in One-Stop Service Online System seems to be truthful and honest.	(Hsieh, Rai, and Keil 2011; Gefen, Karahanna, and Straub 2003; Teo, Srivastava, and Jiang 2009)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Competent and effective	TE2	I think the One-Stop Service Online System is effective in facilitating my needs	(McKnight and Chervany 2002)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

Cares about its users	TE3	I think the One-Stop Service Online System is designed to accommodate the needs of its users	(Hsieh, Rai, and Keil 2011; Gefen, Karahanna, and Straub 2003; Teo, Srivastava, and Jiang 2009)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Predictability of output	TE4	I can predict the output of One-Stop Service Online System (in terms of time, costs and process)	Field study, (Hsieh, Rai, and Keil 2011; Gefen, Karahanna, and Straub 2003)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree
Keep its commitment	TE5	I think the One-Stop Service Online System provides appropriate outcomes for its users.	(Pavlou 2003)	Likert scale from 1-6, where 1=strongly disagree and 6=strongly agree

5.4.3. Empirical Pilot Study

A pilot study was conducted to test the validity of the questionnaire and also to check any other problem with questionnaire and measurement items. The questionnaires were distributed to two groups of respondents; researchers and potential respondents. Ten questionnaires were distributed to a group of researchers from multi-disciplines (accounting, information systems, marketing and economics). The main objective of involving these researchers was to ensure that the questionnaire met the research objectives. Meanwhile, 25 questionnaires were distributed to potential respondents (apart from the main study) to ensure that the questions were applicable and understandable.

The pilot test was not intended as detailed analysis but rather as a test the content validity and appropriateness of the questions by using a simple frequency. The pilot test was also conducted to find out the length of time it would take to complete the questionnaire. In general, the findings from the pilot study showed that all of the items in the questionnaire were understandable and appropriate in the research context. The test also indicated on average, the respondents required 30-40 minutes to answer all of the items in the questionnaire.

5.5. Summary

This chapter presented the development of the hypotheses together with the rationale and justification derived from the comprehensive research model previously developed in Chapter 4. There are 16 hypotheses in total to describe the relationships among the variables, as proposed in the model (Figure 5.1). This chapter also described the development of the questionnaire and measurement items. To test the developed hypotheses, the questionnaire was developed based on prior literature along with findings in the field study. The questionnaire contained 37 items in total. In order to test the validity of the questionnaire, a pilot study was conducted. The final questionnaire was then distributed for a national survey, and this is discussed in the next chapter.

Chapter Six: Data Analysis using Partial Least Square (PLS) Based Structural Equation Modeling (SEM)³

6.1. Introduction

In this chapter, an analysis of the data collected from 237 respondents is undertaken in order to test the reliability and validity of the model as well as the hypotheses. The analysis was conducted using the Partial Least Square (PLS) approach to Structural Equation Modelling (SEM). PLS is a powerful tool of analysis due to the a minimum of reliance on measurement scales, sample size and residual distributions (Wold 2006).

There are three parts to the quantitative analysis detailed in this chapter. Part one examines the influence of the digital divide on e-government systems success. Part two analyses the mediating role of trust in e-government in the relationship between the digital divide and the success of e-government systems. Finally, the last part assesses the moderating effect of demographics and the economic divide using multi-group analysis. In each stage, measurement model and structural model are examined.

³ Part of this chapter has been presented at the:

Rahman A., (2013), "Rethinking the Digital Divide: Mediation Role of Computer Self-efficacy" in *the Curtin Graduate School of Business*, Perth, Australia, 20-21 May 2013. *Peer reviewed.*

The structure of this chapter starts with an overview of the survey that was conducted. It is followed by a descriptive analysis of the respondents participating in the survey. The results, based on the three parts of analysis, are then presented. The chapter closes with the summary.

6.2. Overview of the Survey

6.2.1. Response Rate

Although a low response rate has been acknowledged as one of the major problems in research surveys, there are many techniques to overcome this problem. The techniques include using non-technical general statements and avoiding technical jargon in the questionnaire (Converse and Presser 1986a). With this in mind, the current questionnaire was examined through the pilot test not only by other researchers but also by potential respondents to ensure that the questionnaire was understood. The respondents of the survey were also offered a complimentary souvenir gift. This research adopted the personally administered survey format (Frazer and Lawley 2000), which allowed the researcher to deliver the questionnaires directly to the respondents. However, to maintain the independency and secrecy, the questionnaire was completed by the respondent. This kind of survey offers a high response rate, quick data collection and gives the respondents the opportunity to ask direct questions about the research and questionnaire. However, this type of survey is costly. The researcher worked in tandem with research assistants who were final year undergraduate students, with qualifications in research method subjects. The assistants were trained by the researcher prior to distribution of the questionnaires on how to contact the potential respondents and handle the questionnaires. The importance of respondents' independency and secrecy were also emphasized.

In order to secure the confidence of the respondents, it was ensured, and they were assured, that their identities could not be traced thus protecting their privacy

and keeping their anonymity. Therefore the research did not include any codes, which also made it impossible for the researcher to link the survey to respondents' identity, to find the responses from a certain criteria and compare the responses. This was intentional for the purposes of increasing test reliability and thus the response rate.

The minimum requirement for the sample size for PLS research is 10 times the number of items in the most complex formative construct or the largest number of antecedent constructs leading to an endogenous construct in the research model (Gefen, Straub, and Boudreau 2000; Barclay, Higgins, and Thompson 1995). Since the most complex constructs in this research are the 'capability divide' and 'trust in e-government', which have 5 items each, the minimum sample size for this study was 50.

Table 6.1: Result of response review

Response	Number
Total responses	251
Incomplete responses	14
Usable responses	237

As presented in Table 6.1, the survey received 251 total responses. A review was then undertaken to seek out errors in the form of invalid data, including missing values or incomplete responses. This step was conducted to produce clean data for research analysis. As a result, 14 questionnaires were found to be incomplete. Therefore, those incomplete questionnaires were excluded to avoid fallacious results. Finally, 237 responses were found to be useable in this research, indicating the effective response rate of 35.5% from the total e-government users of 668. Compared to other studies in the stream (eg. Hsieh, Rai, and Keil 2008; Morris and Venkatesh 2000), the level of response rate is considered acceptable.

Based on the useable questionnaires, pre-analysis tests were undertaken using PLS to get an overview of the applicability of the data in this study. The pre-analysis tests covered assessment of the measurement and the structural model. The

results revealed that the minimum R^2 was 0.288 (User Satisfaction), and R^2 of the ultimate dependent variable, which is Benefits of e-Government, is 0.481. As suggested by Hair, Ringle, and Sarstedt (2011), the R^2 values of 0.481 for endogenous latent variable in the structural model is considered moderate to strong structural model. Therefore the results indicate the applicability of the data and the increment of the explanatory power of the model. A full analysis was then conducted and this is explained in a later section.

6.2.2. Non Response Bias

In order to examine whether the responses from the survey represent the larger population, a non-response-bias test is undertaken. The test checks whether there is any difference in opinion between the respondents and non-respondents, who could have participated in the survey. The rationale for the test is that the late respondents were likely to have a similar characteristics to non-respondents, as suggested by Thong (1999).

As mentioned in Chapter Three, the survey was conducted in 2011 until the midyear of 2012. The responses were split into early (within 2011) and late (beginning until mid of 2012) respondents. As a result, the number of early respondents was 153 and the late was 84. Independent sample Mann-Whitney U test was undertaken to test the differences between demographic and selected items (Table 6.2). The minimum acceptable value of significance in the test is 0.05 that detect the non-response bias.

Table 6.2: Mann-Whitney U test to test non response bias

Item	z-value	Significance
Gender	-0.37	0.71
Age	-1.01	0.31
Place	-1.20	0.23
Income	-1.19	0.24
I can access ICT easily	-0.12	0.90
I am confident in using ICT	-0.39	0.70

The test was performed in terms of gender, age groups, place of residence, household income, and one e-government use-related, one access divide-related, and one capability divide-related items. The results of Mann-Whitney U test demonstrated that there is no significant difference between the two groups. Therefore, it would reasonable to conclude that this study does not have the issue of non-response bias.

6.2.3. Common Method Bias

One of the threats to construct validity is common methods bias (Doty and Glick 1998), which occurs when there is divergence between observed and true relationships among constructs. The divergence might be the result of the respondents' misperception, since the measurement of the constructs based on the responses of a single respondent with no additional assessment from other individuals. However, the factor analysis using Harman's single factor test (Podsakoff and Organ 1986) presented in Table 6.3 shows that a single factor solution does not emerge. Hence, there is unlikely to be any common method bias in this research.

Table 6.3: Harman's single factor to test common method bias

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %
1	10.683	35.611	35.611	10.683	35.611	35.611
2	6.469	19.562	55.173	6.469	19.562	55.173
3	1.905	8.351	63.524	1.905	8.351	63.524
4	1.502	5.006	68.530	1.502	5.006	68.530
5	1.277	4.256	72.785	1.277	4.256	72.785
6	1.191	3.971	76.757	1.191	3.971	76.757
7	.922	3.075	79.831			
8	.760	2.533	82.364			
9	.687	2.291	84.656			
10	.605	2.018	86.674			
11	.547	1.822	88.496			
12	.502	1.673	90.169			
13	.415	1.385	91.554			
14	.359	1.198	92.752			
15	.291	.968	93.720			
16	.279	.930	94.650			
17	.229	.763	95.413			
18	.207	.691	96.104			
19	.184	.615	96.719			
20	.166	.552	97.271			
21	.152	.508	97.779			
22	.129	.430	98.209			
23	.114	.381	98.591			
24	.104	.345	98.936			
25	.088	.293	99.229			
26	.069	.229	99.458			
27	.061	.202	99.660			
28	.048	.159	99.819			
29	.039	.131	99.950			
30	.015	.050	100.000			

6.3. Descriptive Analysis of the Sample

Based on the final data, a descriptive analysis using PLS was undertaken to understand the respondents' demographic characteristics in this research. Tables 6.4 to 6.8 present the results.

6.3.1. Gender

Table 6.4: Respondents by gender

Gender	Frequency	Percentage
Male	184	77.6%
Female	53	22.4%
Total	237	100.0%

As presented in Table 6.4 above, 184 respondents were males (78%) and 53 respondents were females. A male majority was to be expected due to the results of the field study.

6.3.2. Age Group

Table 6.5: Respondents by age group

Age Group	Frequency	Percentage
Under 20	2	0.8%
21 – 30	63	26.6%
31 – 40	104	43.9%
41 – 50	58	24.5%
Over 50	10	4.2%
Total	237	100.0%

Table 6.5 shows that most of the respondents (44%) were in the age groups '31-40', followed by the group of '21-30' (27%) and group of '41-50' (26%). The remainder is in group 'under 20' and 'over 50' (5%).

6.3.3. Residential Place

Table 6.6: Respondents by residential place

Residential Place	Frequency	Percentage
Under 5 kms	75	31.6%
5 – 10 kms	93	39.2%
10 – 15 kms	30	12.7%
15 – 20 kms	24	10.1%
More than 20 kms	15	6.3%
Total	237	100.0%

Based on Table 6.6, most of the respondents lived within a radius of 10 kms or less from the centre of the city (total of 71%). The results show that most of the respondents lived in the city area, and only 29% lived in remote areas.

6.3.4. Education

Table 6.7: Respondents by education

Residential Place	Frequency	Percentage
High School	6	2.5%
Diploma	49	20.7%
Undergraduate	148	62.4%
Master's Degree	28	11.8%
Doctoral Degree	6	2.5%
Total	237	100.0%

As shown in Table 6.7, the majority of the respondents (77%) had received higher education (to undergraduate level and/or above), while only 23% or 55 respondents have attended less than undergraduate degree (high school and diploma).

6.4. Data Examination

6.4.1. PLS Examination

The Partial Least Square Based Structural Equation Modeling (PLS-SEM) approach was used for data analysis, since the nature of this research is exploratory and an extension of an existing theory (Hair, Ringle, and Sarstedt 2011). Chin (1998) suggests that the advantages of PLS include fewer restrictions on measurement scales, sample size, data distribution and normality.

Table 6.6 presents two stages of the application of the PLS technique, namely the assessment of the measurement model and the assessment of the structural model. The objective of the first stage assessment is to examine the validity and reliability of the measurements of the constructs. In doing so, this research tested

item reliability, internal consistency and discriminant validity. The second stage focused on examining the relationships that existed between the paths in the model (Igbaria, Guimaraes, and Davis 1995). The examinations in the second stage involved the value of β or path coefficient, t-values or the statistical significance, the examination of R^2 or the amount of variance explained, and f^2 or effect size. To obtain the path coefficient and t-values, a bootstrap procedure was undertaken by using a resample size of 500. Bootstrap is a general resampling procedure for estimating the distributions of statistics based on independent observations (Chin 1998).

Table 6.8: Two step PLS examination

Phase	Examination	Analysis
1	Measurement model assessment	Item reliability Internal consistency Discriminant validity
2	Structural model assessment	Path coefficient (β) t-values R^2 f^2

Source: Chin (1998)

6.4.2. Analysis Details

Consistent with the research objectives, this research undertook data analysis in four stages. Table 6.9 outlines those three stages.

The objectives of the first stage were to examine the impact of the digital divide on the success of the e-government system and to investigate the relationships between the digital divide constructs. In doing so, the related constructs were examined. Although the first stage had two objectives, the PLS analyses were completed simultaneously.

In the second stage, an analysis was undertaken to investigate the mediating effect of trust in e-government on the impact of the digital divide on the success of the e-

government system. In the third stage, the moderating impact of the demographic divide and the economic divide on the relationship between the digital divide and e-government system success was the focus of the assessment.

Table 6.9: Overview of the analyses

Stage	Objective of the Analysis	Constructs
1	To examine the impact of digital divide on e-government system success in Indonesian local governments.	Access Divide Capability Divide Innovativeness Divide e-Government Use e-Government User Satisfaction Benefits of e-Government
	To investigate the relationship among the digital divide constructs	Access Divide Capability Divide Innovativeness Divide
2	To investigate the mediating role of trust in e-government in the impact of digital divide on e-government system success in Indonesian local governments.	Trust in e-Government
3	To assess the moderating impacts of demographic divide and economic divide on the relationship between digital divide and e-government system success in Indonesian local governments.	Demographic Divide Economic Divide

6.5. Analysis Stage 1: Impact of Digital Divide on e-Government System Success

6.5.1. Assessment of the Measurement Model – Stage 1

In total, there were 23 items in measuring the total of six constructs: *Access Divide* (ACCE_1 – ACCE_4), *Capability Divide* (CAPA_1 – CAPA_5), *Innovativeness Divide* (INNO_1 – INNO_4), *e-Government Use* (USE_1 – USE_3), *User Satisfaction* (USAT_1 – USAT_4), and *Benefits of e-Government* (BENE_1 – BENE_3). In order to assess the measurement model, examinations of reliability, internal consistency, and discriminant validity were undertaken (Barclay, Higgins, and Thompson 1995). The focus of the assessments was to examine the relationships between the observed

variables and the constructs, to ensure that the items which represent the observed variables could measure the constructs (Igbaria, Guimaraes, and Davis 1995).

A. Item Reliability – Stage 1

As suggested by Hair, Ringle, and Sarstedt (2011), a minimum value of PLS loading is 0.7. Table 6.10 shows that all items in all constructs achieved the required minimum value in the first run, therefore all items can be used. This result indicates that all items are able to represent their respective constructs.

Table 6.10: Item loading

Construct	Item	PLS Loading
Access Divide	ACCE_1	0.763
	ACCE_2	0.829
	ACCE_3	0.901
	ACCE_4	0.925
Capability Divide	CAPA_1	0.883
	CAPA_2	0.934
	CAPA_3	0.925
	CAPA_4	0.940
	CAPA_5	0.932
Innovativeness Divide	INNO_1	0.911
	INNO_2	0.758
	INNO_3	0.904
	INNO_4	0.906
e-Government Use	USE_1	0.912
	USE_2	0.808
	USE_3	0.794
User Satisfaction	USAT_1	0.963
	USAT_2	0.942
	USAT_3	0.946
	USAT_4	0.755
Benefits of e-Government	BENE_1	0.957
	BENE_2	0.959
	BENE_3	0.938

B. Internal Consistency – Stage 1

Table 6.11 presents the measures of internal consistency and Average Variance Extracted (AVE) of each construct. The values met the acceptable criterion for internal consistency as suggested by Hair, Ringle, and Sarstedt (2011), which was a minimum of 0.7. The *Capability Divide* and *Benefits of e-Government* shared the same value of internal consistency, 0.966, which was the highest. The lowest value, belonging to *e-Government Use* was 0.877,

In terms of the values of AVE, Hair, Ringle, and Sarstedt (2011); Fornell and Larcker (1981) consider 0.50 as the acceptable minimum value. AVE measures the amount of variance that a latent variable captures from its items relative to the amount due to measurement error. The AVE value of each construct exceeded the requirement; therefore the convergent analysis for these constructs was satisfied. The lowest AVE value was *e-Government Use* (0.705), and the highest value was achieved by *Benefits of e-Government* (0.906). The results could be interpreted such that at the highest point, 90.6% variance of indicators accounted for the construct of *Benefits of e-Government*.

Table 6.11: Measures of internal consistency and AVE

Construct	Internal Consistency	AVE
Access Divide	0.916	0.734
Capability Divide	0.966	0.852
Innovativeness Divide	0.927	0.761
e-Government Use	0.877	0.705
User Satisfaction	0.947	0.820
Benefits of e-Government	0.966	0.906

C. Discriminant Validity – Stage 1

To examine the discriminant validity at the construct level, the square root of AVE was compared to the correlation of the latent variable. In order to meet the requirements, each construct should have a greater value of square root of AVE than the variance shared between a construct and other constructs in the model

(Barclay, Higgins, and Thompson 1995). Table 6.12 presents the square root of AVE (diagonal elements in parenthesis), and the correlations between constructs (off-diagonal elements). The results demonstrate that the values met the requirements and they confirm the establishment of the discriminant validity at the construct level.

Table 6.12: Correlation of latent variables and square root of AVE

	ACCE	CAPA	INNO	USE	USAT	BENE
ACCE	0.857					
CAPA	0.849	0.923				
INNO	0.791	0.804	0.872			
USE	0.662	0.677	0.664	0.840		
USAT	0.348	0.405	0.477	0.536	0.906	
BENE	0.466	0.601	0.562	0.625	0.590	0.952

At the items level, assessment of discriminant validity is undertaken by calculating the loading and cross loading values for each item and construct. The matrix of loading and cross loading is presented in Table 6.13 with the matrix showing the correlations of the items with the constructs. The results indicate that all items met the requirements, which were higher than cross-loadings in other constructs. Thus it is confirmed that the measurement model has strong discriminant validity at the items level.

Table 6.13: Loading and cross loading matrix

	ACCE	CAPA	INNO	USE	USAT	BENE
ACCE_1	0.763	0.525	0.515	0.218	0.064	0.079
ACCE_2	0.829	0.641	0.622	0.326	0.090	0.097
ACCE_3	0.901	0.814	0.769	0.753	0.429	0.616
ACCE_4	0.925	0.845	0.746	0.765	0.452	0.581
CAPA_1	0.732	0.883	0.671	0.537	0.338	0.530
CAPA_2	0.799	0.929	0.763	0.616	0.339	0.510
CAPA_3	0.698	0.922	0.718	0.621	0.399	0.628
CAPA_4	0.841	0.937	0.749	0.651	0.370	0.549
CAPA_5	0.831	0.933	0.809	0.654	0.382	0.556
INNO_1	0.718	0.766	0.911	0.677	0.544	0.578
INNO_2	0.565	0.544	0.758	0.432	0.204	0.292
INNO_3	0.762	0.749	0.904	0.600	0.454	0.521
INNO_4	0.696	0.716	0.906	0.574	0.406	0.525
USE_1	0.619	0.610	0.593	0.912	0.468	0.560
USE_2	0.469	0.487	0.440	0.808	0.488	0.538
USE_3	0.575	0.604	0.635	0.794	0.395	0.474
USAT_1	0.331	0.396	0.472	0.555	0.963	0.572
USAT_2	0.347	0.419	0.485	0.593	0.942	0.590
USAT_3	0.286	0.326	0.428	0.433	0.946	0.502
USAT_4	0.292	0.309	0.315	0.302	0.755	0.454
BENE_1	0.465	0.613	0.575	0.587	0.584	0.957
BENE_2	0.452	0.584	0.502	0.603	0.567	0.959
BENE_3	0.411	0.516	0.529	0.594	0.531	0.938

Based on the results as presented in Table 6.10 to Table 6.13, the assessment of the measurement model provided satisfactory support for the reliability, consistency and validity requirements. Having adequate and sufficient results for the measurement model, the next stage of PLS analysis was undertaken: the assessment of the structural model. The analysis is described in the next section.

6.5.2. Assessment of the Structural Model – Stage 1

A. Path Coefficient (β) and Statistical Significance of t -Value

Table 6.14 shows the evaluation of each hypothesis. Based on the path coefficient (β) and t -value, all of the hypotheses are supported. In Figure 6.1 the path coefficient value and t -value are shown near to each link among the constructs.

Table 6.14: Evaluation of the research hypotheses

Hypothesis	Link	Path Coefficient (β)	t -value	Result
H1a	AD \rightarrow EU (+)	0.208	1.367*	Supported
H1b	CD \rightarrow EU (+)	0.279	2.135**	Supported
H1c	ID \rightarrow EU (+)	0.275	2.668***	Supported
H2a	AD \rightarrow CD (+)	0.849	32.985****	Supported
H2b	CD \rightarrow ID (+)	0.804	20.748****	Supported
H3a	EU \rightarrow US (+)	0.536	12.470****	Supported
H3b	EU \rightarrow BE (+)	0.433	9.722****	Supported
H3c	US \rightarrow BE (+)	0.357	8.140****	Supported

Significant * $p < 0.1$; ** $p < 0.05$; *** $p < 0.005$; **** $p < 0.0005$

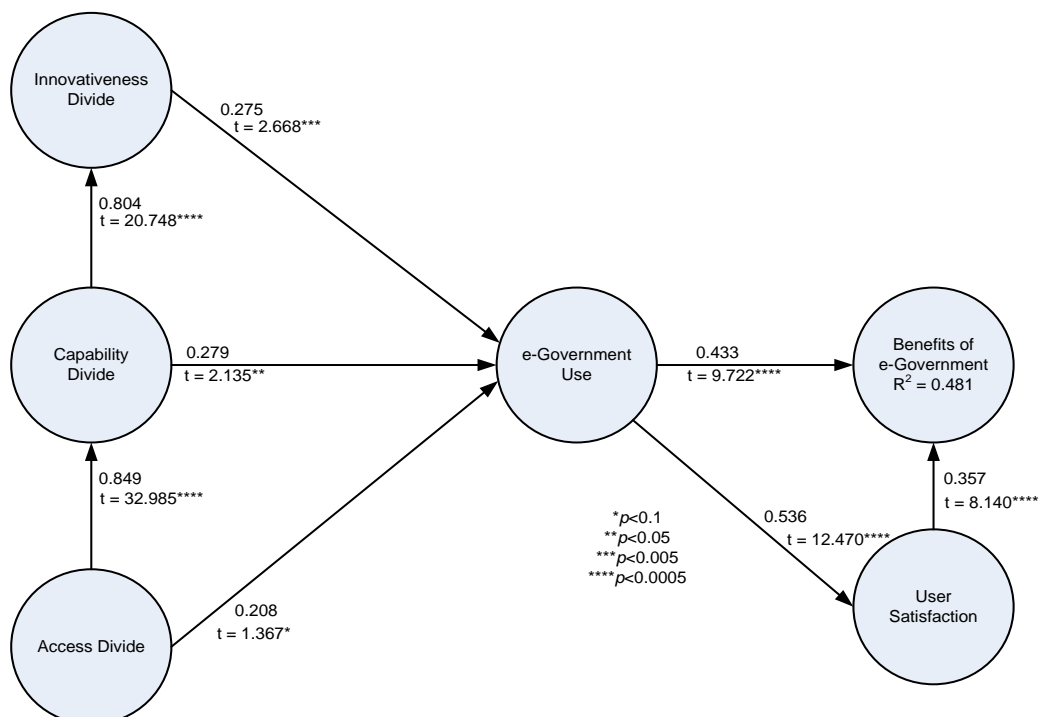


Figure 6.1 Assessment of Path Coefficient and Statistical Significance in Stage 1

The results indicate that all factors of the *Digital Divide*, namely the: *Access Divide*, *Capability Divide* and *Innovativeness Divide* are important factors influencing *e-Government System Success*, and at the same time the results also provide evidence of the relationships between the variables of the Digital Divide. The significant influence of the *Access Divide* on *e-Government Use* was proven by the path coefficient of 0.208 and *t*-value of 1.367. The path coefficient and *t*-value for the influence of *Capability Divide* on *e-Government Use* were 0.279 and 2.135, respectively. On the other hand, the influence of the *Innovativeness Divide* on *e-Government Use* had a path coefficient of 0.275 and the *t*-value of 2.668. In other words, the influence of the *Innovativeness Divide* on *e-Government Use* was the strongest among other factors of the *Digital Divide*. The results are further discussed in the following chapter (Chapter Seven).

In terms of the variance explained, the ultimate endogenous variable which was *Benefits of e-Government* had the R^2 value of 0.481 (Table 6.15). This means that the model explained 48.1% of the variance in the *e-Government Systems Success*. Hair, Ringle, and Sarstedt (2011) and Teo, Wei, and Benbasat (2003) argue that the value is considered moderate and satisfies the minimum threshold of 0.10.

In order to explore whether the impact of a particular independent latent variable on a dependent latent variable is substantive or not, the calculation of f^2 was undertaken. With a formula that has been explained in Chapter Three, Table 6.15 shows the results of the f^2 . As per the recommendation of Chin (1998), all of the constructs fulfilled the requirement of a minimum value (0.02). The results indicate that *e-Government Use* is the most substantive construct with the f^2 value of 0.258.

Table 6.15: Evaluation of R² and effect size (f²)

Construct	R²	f²
ACCE		0.029
CAPA	0.727	0.029
INNO	0.646	0.047
USE	0.513	0.258
USAT	0.288	0.175
BENE	0.481	-

6.6. Analysis Stage 2: The Mediating Role of Trust in e-Government

6.6.1. Assessment of the Measurement Model – Stage 2

There are 21 items to measure five constructs, namely the *Access Divide* (ACCE_1 – ACCE_4), *Capability Divide* (CAPA_1 – CAPA_5), *Innovativeness Divide* (INNO_1 – INNO_4), *e-Government Use* (USE_1 – USE_3), and *Trust in e-Government* (TRUS_1 – TRUS_5). In assessing the measurement model, analyses of item reliability, internal consistency and discriminant validity, were undertaken, as in the previous stage.

A. Item Reliability – Stage 2

All items in all constructs achieved the requirement minimum value of 0.7 as suggested by Hair, Ringle, and Sarstedt (2011) in the first run (See Table 6.16). The smallest value of item loading was 0.736 (TRUS_3), which is still above the threshold. Therefore we can conclude that all items were sufficient to represent their respective constructs and no item needs to be deleted.

Table 6.16: Item loading

Construct	Item	PLS Loading
Access Divide	ACCE_1	0.733
	ACCE_2	0.804
	ACCE_3	0.918
	ACCE_4	0.937
Capability Divide	CAPA_1	0.882
	CAPA_2	0.933
	CAPA_3	0.927
	CAPA_4	0.940
	CAPA_5	0.931
Innovativeness Divide	INNO_1	0.910
	INNO_2	0.754
	INNO_3	0.905
	INNO_4	0.909
e-Government Use	USE_1	0.912
	USE_2	0.780
	USE_3	0.819
Trust in e-Government	TRUS_1	0.915
	TRUS_2	0.850
	TRUS_3	0.736
	TRUS_4	0.849
	TRUS_5	0.904

B. Internal Consistency – Stage 2

Table 6.17: Measures of Internal Consistency and AVE

Construct	Internal Consistency	AVE
Access Divide	0.913	0.726
Capability Divide	0.966	0.852
Innovativeness Divide	0.927	0.760
e-Government Use	0.876	0.703
Trust in e-Government	0.930	0.728

Composite reliability (CR) analysis was conducted to verify convergent validity and discriminant validity. Values greater than 0.70 in CR imply that the construct retains both its internal consistency and convergent validity (Hair, Ringle, and Sarstedt 2011). The factor loading and Average Variance Extracted (AVE) were also

examined to determine the convergent validity. The criteria for the acceptable level of convergent validity is an individual factor loading greater than 0.60 and an AVE greater than 0.50 (Gefen, Straub, and Boudreau 2000). Table 6.17 summarises the CR and AVE of the constructs. All factor loading, CR and AVE in this measurement model were deemed acceptable.

C. Discriminant Validity – Stage 2

Table 6.18 outlines the square root of AVE and the correlations between constructs. The results show that the values meet the minimum requirements and thus are adequate for the establishment of the discriminant validity at the construct level.

Table 6.18: Correlation of latent variables and square root of AVE

	ACCE	CAPA	INNO	USE	TRUS
ACCE	0.852				
CAPA	0.856	0.923			
INNO	0.796	0.804	0.872		
USE	0.690	0.681	0.671	0.838	
TRUS	0.639	0.701	0.719	0.610	0.853

At the item level, Fornell and Larcker (1981) argue that a construct should share greater variance with its respective indicators rather than with another construct in the structural model. In other words, the indicator's loading with its associated construct should be greater than its loadings with all of the remaining constructs (Table. 6.19). All of the items here satisfied the requirements.

Table 6.19: Loading and cross loading matrix

	ACCE	CAPA	INNO	USE	TRUS
ACCE_1	0.734	0.522	0.515	0.222	0.365
ACCE_2	0.804	0.639	0.622	0.337	0.450
ACCE_3	0.918	0.814	0.770	0.754	0.643
ACCE_4	0.937	0.845	0.746	0.766	0.620
CAPA_1	0.737	0.882	0.669	0.539	0.618
CAPA_2	0.808	0.933	0.756	0.634	0.641
CAPA_3	0.716	0.927	0.716	0.641	0.626
CAPA_4	0.845	0.940	0.751	0.660	0.656
CAPA_5	0.836	0.931	0.809	0.662	0.691
INNO_1	0.730	0.767	0.910	0.682	0.657
INNO_2	0.561	0.543	0.754	0.447	0.448
INNO_3	0.764	0.748	0.905	0.602	0.680
INNO_4	0.701	0.716	0.909	0.583	0.687
USE_1	0.641	0.610	0.592	0.912	0.550
USE_2	0.492	0.487	0.440	0.780	0.480
USE_3	0.589	0.604	0.635	0.819	0.501
TRUS_1	0.535	0.596	0.694	0.556	0.915
TRUS_2	0.725	0.762	0.674	0.560	0.850
TRUS_3	0.462	0.451	0.389	0.391	0.736
TRUS_4	0.449	0.544	0.579	0.501	0.849
TRUS_5	0.513	0.582	0.662	0.558	0.904

6.6.2. Assessment of the Structural Model – Stage 2

In this stage, the objective is to investigate the mediation role of *Trust in e-Government* in the relationships between the *Digital Divide* and *e-Government Systems Success*. In doing so, the mediation hypotheses were tested using a statistical technique suggested by Baron and Kenny (1986). They suggested that a given variable might function as a mediator (M), if the following conditions held: (1) a significant relationship existed between the independent variable (X) and the dependent variable (Y); (2) a significant relationship existed between X and M; and (3) in the presence of a significant relationship between M and Y, the previous relationship between X and Y was no longer significant, or the strength of the relationship was significantly decreased.

Figure 6.2 describes the results of the data analysis when the link from the mediator variable (Trust in e-Government) to the dependent variable (e-Government use) was excluded. The links among variables were significant, except the link which showed the positive influence of the *Access Divide* on *Trust in e-Government*. The results in Figure 6.2 were then compared to the results in Figure 6.3.

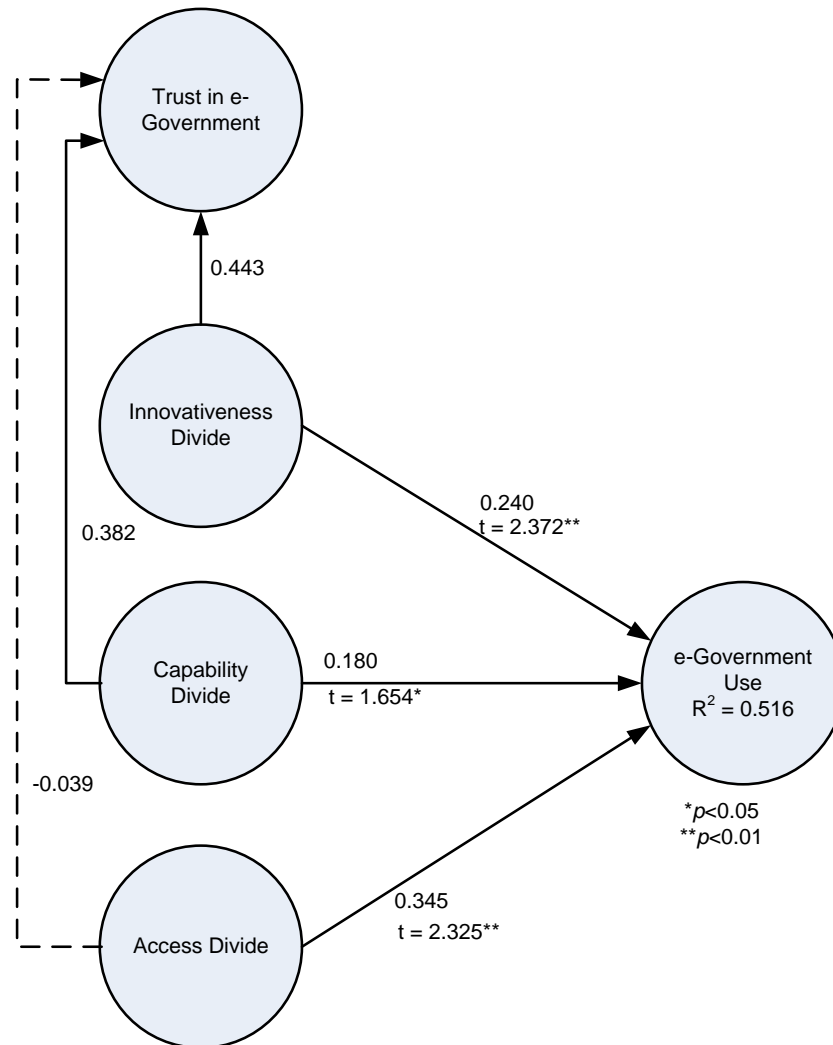


Figure 6.2 Data analysis results of a model excluding the mediator

When the mediator variable is included in the data analysis, the results (Figure 6.3) show that the positive influence of the *Capability Divide* and the *Innovativeness Divide* on *e-Government Use* turns out to be insignificant. The t-values were decreased to 0.815 and 1.519 for the links between the *Capability Divide* and e-

Government Use and between the *Innovativeness Divide* and *e-Government Use*, respectively. On the other hand, the positive influence of *Trust in e-Government* on *e-Government Use* was confirmed with t-value of 2.940.

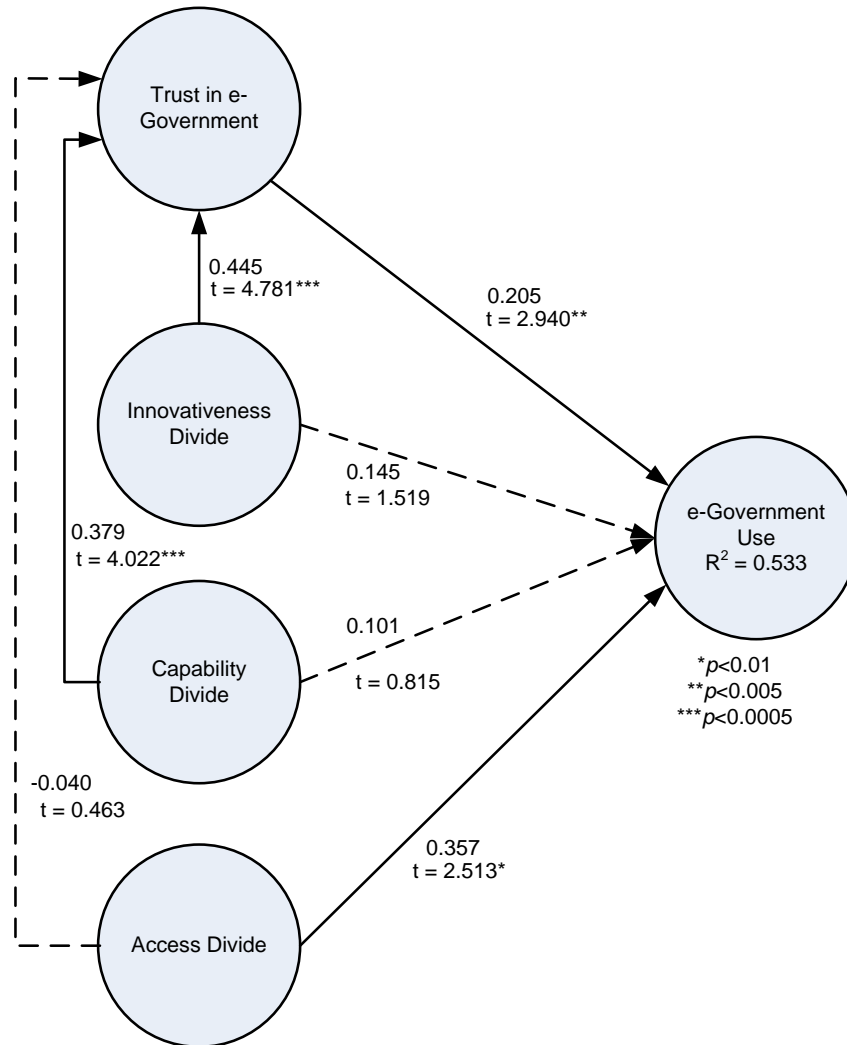


Figure 6.3. Data analysis results of a model including the mediator

The results of the assessment of the mediating effect of *Trust in e-Government* on the relationship between the *Digital Divide* and *e-Government Systems Success* (Table. 6.20) indicate that the *Access Divide* does not have a mediation effect. The influence of the *Access Divide* on *Trust in e-Government* is not significant (t-value = 0.463), and therefore it does not meet the conditions as outlined by Baron and Kenny (1986). In other words, we can conclude that the *Trust in e-Government* does

not have a mediation role. However, since the inclusion of a mediator variable decreases the t-value significantly, the results imply that *Trust in e-Government* is a complete and valid mediator in the relationship between the *Capability Divide* and *e-Government Use*, as well as between the *Innovativeness Divide* and *e-Government Use*. The assessment was then followed by the calculation of the z-value using the Sobel test (Sobel 1982).

Table 6.20: Assessment of mediation effect

	t-value				Mediation effect
	X → Y		M → Y	X → M	
	Without M	With M			
Access Divide	2.372*	2.513**		0.463	No mediation
Capability Divide	1.654*	0.815	2.94**	4.022***	Fully mediation
Innovativeness Divide	2.325*	1.519		4.781***	Fully mediation

* $p < 0.05$; ** $p < 0.005$; *** $p < 0.0005$

The assessment of the significance of the reduction of the relationship between the independent and dependent variables cannot be assessed from the coefficient. Rather it has to be mathematically proven. The Sobel test (Sobel 1982) has long been a traditional method for testing the significance of mediation effects. The Sobel test was used in this research, as it has been the most widely utilized (Bontis, Booker, and Serenko 2007; Preacher and Hayes 2008). The significance was measured using the following formula:

$$z\text{-value} = a*b/\text{SQRT}(b^2*s_a+a^2*s_b^2)$$

The formula required the use of the non-standardised regression coefficient (a) and the standard error (s_a) of the relationship between the independent variable and the mediating variable, and the non-standardised regression coefficient (b) and standard error (s_b) of the path from the mediating to the dependent variable. Table 6.21 below summarises the data and the results of the Sobel test. The results show that both the *Capability Divide* and the *Innovativeness Divide* have a significant z-value.

Table 6.21: Calculation of Sobel test

	$X \rightarrow M$		$M \rightarrow Y$		$z\text{-value}$
	a	s_a	b	s_b	
Capability Divide – Trust – e-Govt Use	0.379	0.110			1.966*
Innovativeness Divide – Trust – e-Govt Use	0.445	0.118	0.205	0.0863	2.010*

* $p < 0.05$

6.7. Analysis Stage 3: The Moderating Role of the Demographic Divide and the Economic Divide

The last stage of analysis in this research aimed to examine the moderating effect of the *Demographic Divide* and the *Economic Divide* on the relationship between the *Digital Divide* and *e-Government System Success*. Variables of gender, age group, place of residence and education were tested, representing the *Demographic Divide*, while household income represents the *Economic Divide*. In examining the moderating effect, multi-group analysis was undertaken (Moore and Chang 2006; Baron and Kenny 1986). The procedure and results of the analyses are explained in the following sections.

However, before proceeding with the analyses, the characteristics of the respondents were examined, as shown in Table 6.22. This describes the characteristics of the respondents based on gender, age group, place of residence, education and household income. As shown in the table, the majority of the respondents were males (N = 184), belonging to the age group '40 years old and below' (N = 169), living in the city area or living within a radius of 10 kms or less from the city centre (N = 168), attending higher education or possessing an undergraduate degree or above (N = 182), and earning an income of 7.5 million per month or less (N = 130).

Table 6.22: Summary of demographic and economic characteristics of respondents

Characteristics	Total	Percentage
Gender		
Male	184	78%
Female	53	22%
Age		
Younger (40 years old and below)	169	71%
Older (above 41 years old)	68	29%
Place of residence		
City area (10 kms and lesser from city centre)	168	71%
Remote are (further than 10 kms from city centre)	69	29%
Level of Education		
Lower (Diploma and below)	55	23%
Higher (Undergraduate and above)	182	77%
Household Income		
Lower (7.5 million per month and lower)	130	55%
Higher (above 7.5 million)	107	45%

6.7.1. Assessment of the Measurement Model – Stage 3

Assessment of the measurement model was carried out to ensure the reliability and validity of the measurements. The assessment covered three parts, being (1) item reliability, (2) internal consistency, and (3) discriminant validity. In this stage, the assessment was conducted for two categories: the whole sample (N = 237), and groups of the sample based on the subgroups of gender, age, place of residence, level of education, and household income.

Table 6.23 presents the measurement analysis for the whole sample (N = 237). Item reliability was examined based on the item's loading along with its respective construct. As suggested by Gefen, Straub, and Boudreau (2000), the minimum value for the item loading was 0.7. Hence, all items satisfied the requirements. In terms of internal consistency, all constructs exceed 0.60, hence they were sufficient, as suggested by Bagozzi and Yi (1988). The values of average variance extracted (AVE) from the constructs were also above the threshold, which was 0.50 (Fornell and

Larcker 1981). The results demonstrate that the measurement model for all respondents (N = 237) was sufficient.

Table 6.23: Measurement model analysis (All samples = 237)

Construct	Item	Item Loading	Internal Consistency	AVE
Access divide	ACCE1	0.763	0.916	0.734
	ACCE2	0.829		
	ACCE3	0.901		
	ACCE4	0.925		
Capability Divide	CAPA1	0.883	0.966	0.852
	CAPA2	0.934		
	CAPA3	0.925		
	CAPA4	0.940		
	CAPA5	0.932		
Innovativeness Divide	INNO1	0.911	0.927	0.761
	INNO2	0.758		
	INNO3	0.904		
	INNO4	0.906		
e-Govt Use	USE1	0.912	0.877	0.705
	USE2	0.806		
	USE3	0.794		
User Satisfaction	USAT1	0.963	0.947	0.820
	USAT2	0.942		
	USAT3	0.946		
	USAT4	0.755		
Benefits of e-Govt	BENE1	0.957	0.966	0.906
	BENE2	0.959		
	BENE3	0.938		

The assessments of the measurement model for each group sample, namely gender, age, place of residence, educational attainment and household income are shown in Table 6.24 and 6.25. The results also demonstrate that all measurements were valid and reliable in terms of the level of item and the construct. Having achieved effective results, the next stage undertaken was the analysis of the structural model to examine the moderating effect of the *Demographic Divide* and *Economic Divide*.

Table 6.24: Item loading based on each variable

Item	Gender		Age Group		Residence		Education		Income	
	Male	Female	Younger	Older	City	Remote	Higher	Lower	Higher	Lower
ACCE_1	0.713	0.817	0.779	0.809	0.765	0.839	0.755	0.876	0.814	0.763
ACCE_2	0.819	0.865	0.779	0.912	0.744	0.918	0.779	0.921	0.863	0.767
ACCE_3	0.874	0.895	0.888	0.942	0.937	0.947	0.896	0.927	0.900	0.905
ACCE_4	0.885	0.946	0.911	0.955	0.941	0.959	0.915	0.953	0.935	0.917
CAPA_1	0.759	0.914	0.835	0.924	0.818	0.935	0.867	0.914	0.929	0.831
CAPA_2	0.884	0.940	0.904	0.953	0.968	0.970	0.919	0.952	0.943	0.925
CAPA_3	0.867	0.909	0.918	0.933	0.924	0.943	0.924	0.931	0.922	0.932
CAPA_4	0.885	0.958	0.919	0.956	0.891	0.971	0.925	0.960	0.954	0.920
CAPA_5	0.863	0.945	0.905	0.951	0.877	0.969	0.911	0.956	0.957	0.902
INNO_1	0.831	0.921	0.895	0.927	0.916	0.930	0.902	0.937	0.901	0.932
INNO_2	0.779	0.850	0.745	0.928	0.794	0.925	0.774	0.896	0.825	0.766
INNO_3	0.838	0.914	0.877	0.915	0.871	0.944	0.882	0.950	0.933	0.871
INNO_4	0.837	0.897	0.904	0.901	0.857	0.948	0.882	0.944	0.907	0.905
USE_1	0.885	0.928	0.907	0.912	0.914	0.923	0.900	0.935	0.879	0.933
USE_2	0.849	0.796	0.822	0.713	0.814	0.837	0.808	0.747	0.756	0.834
USE_3	0.789	0.859	0.777	0.830	0.756	0.835	0.797	0.737	0.810	0.794
USAT_1	0.947	0.984	0.964	0.958	0.962	0.979	0.967	0.944	0.920	0.985
USAT_2	0.926	0.955	0.947	0.926	0.945	0.943	0.946	0.922	0.908	0.960
USAT_3	0.922	0.956	0.940	0.951	0.945	0.938	0.945	0.952	0.911	0.962
USAT_4	0.794	0.763	0.783	0.741	0.726	0.819	0.764	0.729	0.740	0.820
BENE_1	0.959	0.940	0.971	0.926	0.955	0.965	0.962	0.938	0.968	0.951
BENE_2	0.958	0.941	0.971	0.933	0.966	0.954	0.960	0.967	0.957	0.964
BENE_3	0.943	0.896	0.968	0.843	0.945	0.928	0.936	0.944	0.950	0.936

Table 6.25: Internal consistency and AVE based on each variable

Construct	Gender				Age Group				Residence			
	Male		Female		Younger		Older		City		Remote	
	IC	AVE	IC	AVE	IC	AVE	IC	AVE	IC	AVE	IC	AVE
ACCE	0.895	0.681	0.933	0.778	0.872	0.635	0.948	0.822	0.712	0.741	0.955	0.841
CAPA	0.930	0.727	0.971	0.871	0.953	0.804	0.976	0.890	0.943	0.768	0.982	0.917
INNO	0.858	0.607	0.942	0.802	0.888	0.672	0.955	0.842	0.874	0.644	0.966	0.877
USE	0.852	0.659	0.818	0.715	0.875	0.700	0.861	0.676	0.869	0.690	0.900	0.750
USAT	0.944	0.809	0.931	0.778	0.951	0.831	0.930	0.773	0.944	0.809	0.957	0.850
BENE	0.968	0.909	0.947	0.856	0.979	0.940	0.928	0.813	0.969	0.913	0.965	0.901

Table 6.25: Internal consistency and AVE based on each variable (part 2)

Construct	Education				Income			
	Higher		Lower		Higher		Lower	
	IC	AVE	IC	AVE	IC	AVE	IC	AVE
ACCE	0.854	0.602	0.956	0.846	0.931	0.773	0.890	0.672
CAPA	0.960	0.827	0.976	0.889	0.975	0.885	0.957	0.815
INNO	0.905	0.706	0.964	0.869	0.940	0.797	0.911	0.723
USE	0.874	0.699	0.851	0.659	0.857	0.666	0.891	0.732
USAT	0.650	0.827	0.939	0.795	0.913	0.728	0.965	0.872
BENE	0.967	0.908	0.965	0.901	0.971	0.918	0.966	0.903

6.7.2. Assessment of the Structural Model – Stage 3

One of the main objectives of this thesis is assessing the moderating impact of the Demographic and Economic Divide on e-Government System Success in Indonesian local government. E-Government system success is represented by 3 variables, which are Use, Benefit and User Satisfaction. Thus multigroup analysis is applied in this study to assess the moderating variables.

In the structural model, the data was divided into two categories, which were full-sample and multi-group based on gender, age, place of residence, education and income. PLS analysis using the bootstrap procedure was employed to obtain the path coefficients, standard errors and t-values to determine the statistical significance.

Figure 6.1 presents the results of the assessment of the structural model for the full sample of respondents (N = 237). The results confirm that the three variables of digital divide took the form of a sequential process. The results demonstrate the strong influence of the *Access Divide* on the *Capability Divide* (t-value of 32.985) and of the *Capability Divide* on the *Innovativeness Divide* (t-value of 20.748). The influence of the *Digital Divide* on *e-Government System Success* was also significant for the *Innovativeness Divide*, the *Capability Divide* and the *Access Divide*, with the t-values of 2.668, 2.135 and 1.367, respectively. The relationships between the variables of *e-Government Systems Success* were also confirmed. The R² of the ultimate dependent variable (*Benefits of e-Government*) gave the value of 0.481, which represents a medium strength of explanation (Hair, Ringle, and Sarstedt 2011).

The assessment of the structural model based on the groups of gender, age, residential place, educational attainment and income was conducted, as shown in Figures 6.4a - 6.4i. The assessment of the groups of subsamples was compared to the structural model for the full sample, as shown in Figure 6.1.

Figure 6.4.a and 6.4.b compare the results between a group of male and female respondents. The results in the group of male respondents demonstrate similar results to those of the total respondents (Figure 6.1). However, groups of male and female respondents produced different results; especially the influence of the *Access Divide* and *Capability Divide* on *e-Government Use* in the female group, which were statistically insignificant. The relationships among the variables of the digital divide appeared to be stronger in the group of female respondents than in the male group. The influence of the *Access Divide* on the *Capability Divide* in the male group was $\beta=0.805$, $t=10.053$, while in the female group it was $\beta=0.874$, $t=71.592$. The influence of the *Capability Divide* on the *Innovativeness Divide* in males was $\beta=0.693$, $t=5.867$ and in females $\beta=0.755$, $t=25.942$.

In terms of the structural models based on age, the results for both groups (younger and older respondents) were found to be similar to the structural model

of the full sample. The relationships among variables in the digital divide in both groups were significant. However the influence of the *Digital Divide* on *e-Government Systems Success* in the group of older respondents appeared to produce a different result than that which was expected, especially regarding the influence of the *Access Divide* on *e-Government Use* which was not significant ($\beta=-0.041$, $t=0.355$), while in the group of younger respondents the relationship was significant ($\beta=0.400$, $t=2.203$).

With regard to the structural models for the groups of respondents who lived in the city and remote areas, inconsistencies were also found. Compared to the full sample, the influence of the *Capability Divide* on *e-Government Use* was found to be insignificant for the city residents ($\beta=-1.106$, $t=1.271$), as shown in Figure 6.5.e. Other than that, all relationships were significant: *Access Divide* to *e-Government Use* ($\beta=0.844$, $t=14.140$); *Innovativeness Divide* to *e-Government Use* ($\beta=0.093$, $t=1.680$); *Access Divide* to *Capability Divide* ($\beta=0.758$, $t=16.636$); *Capability Divide* to *Innovativeness Divide* ($\beta=0.654$, $t=12.376$).

Different results were also found in the structural models for the respondents who had a lower and higher educational background. In the group of respondents who had received higher degree education, the *Capability Divide* was not a significant factor for *e-Government Use* ($\beta=0.111$, $t=1.048$). However, the other relationships were significant in both groups.

Finally, the assessment for the moderating effect of the Economic Divide, which is represented by household income, shows that the results differ for both groups (higher and lower income), as shown in Figure 6.4.i and 6.4.j. In the lower income group, the influence of the *Capability Divide* on *e-Government Use* was not significant ($\beta=0.170$, $t=1.133$), while the other relationships were significant. On the other hand, the influence of the *Access Divide* on *e-Government Use* was not significant in the high-income group ($\beta=0.139$, $t=1.259$).

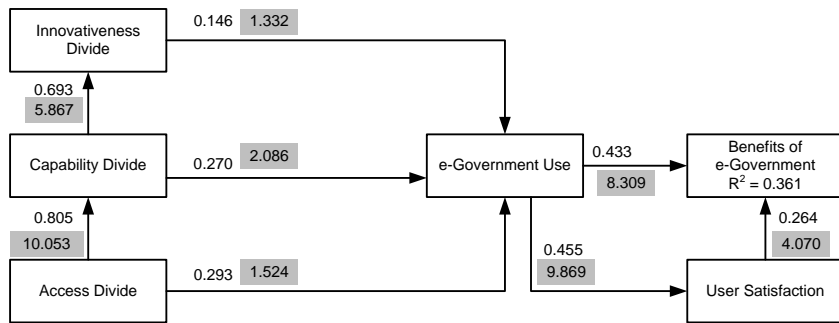


Figure 6.4.a. The structural model of male group

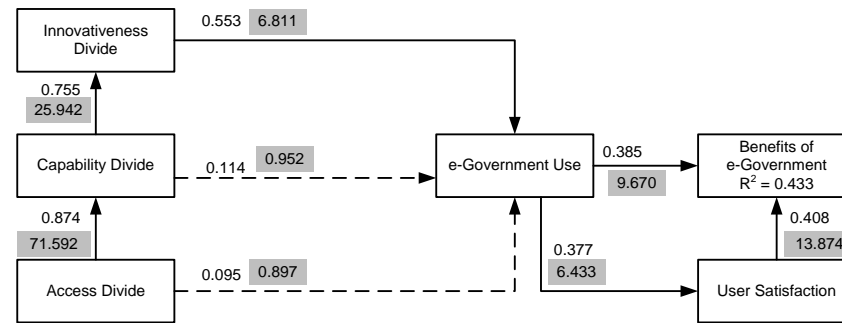


Figure 6.4.b. The structural model of female group

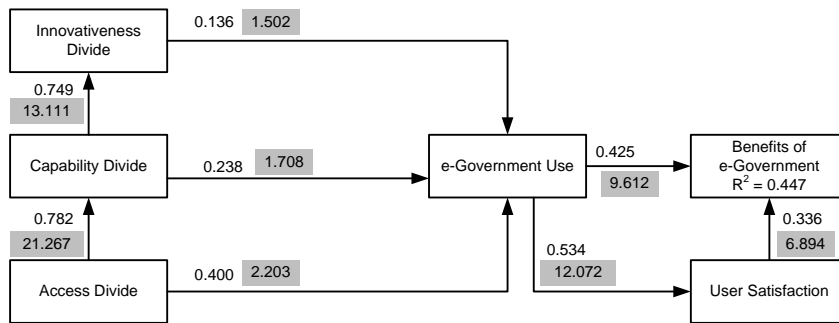


Figure 6.4.c. The structural model of younger group

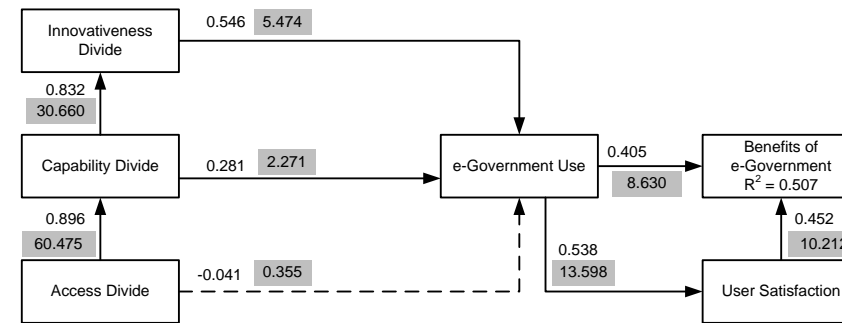


Figure 6.4.d. The structural model of older group

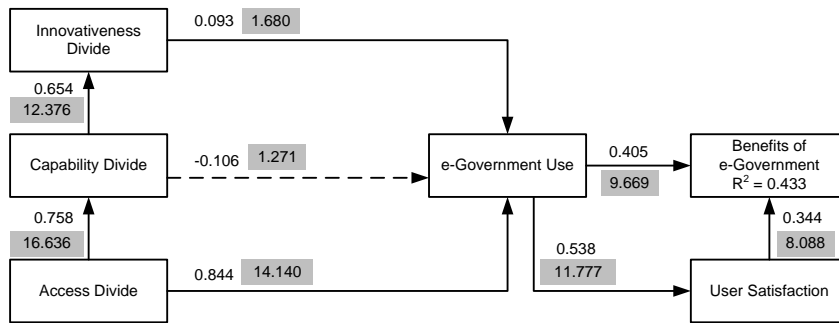


Figure 6.4.e. The structural model of city area group

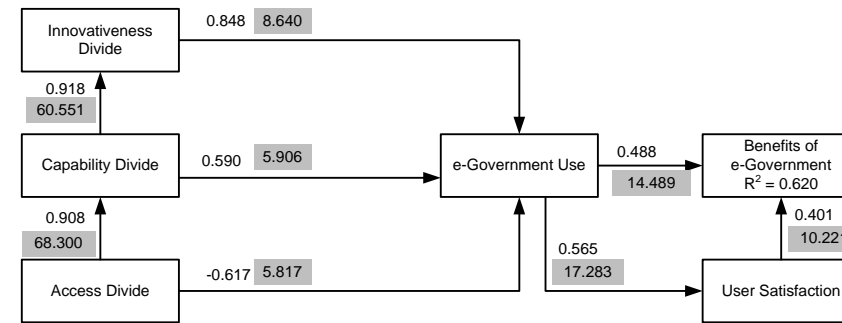


Figure 6.4.f. The structural model of remote area group

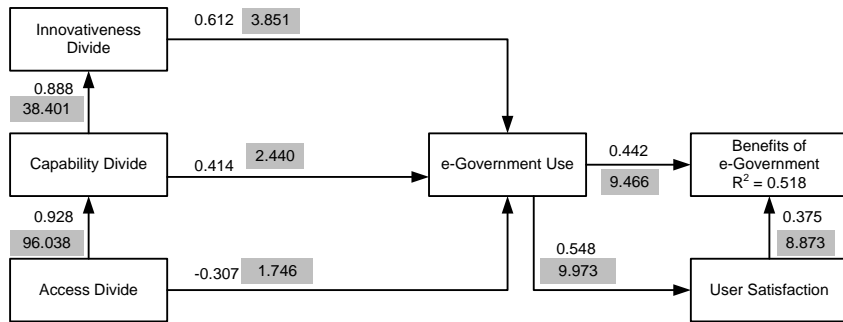


Figure 6.4.g. The structural model of lower education group

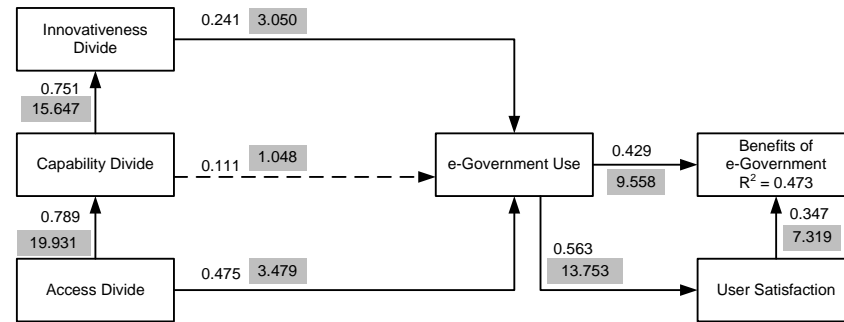


Figure 6.4.h. The structural model of higher education group

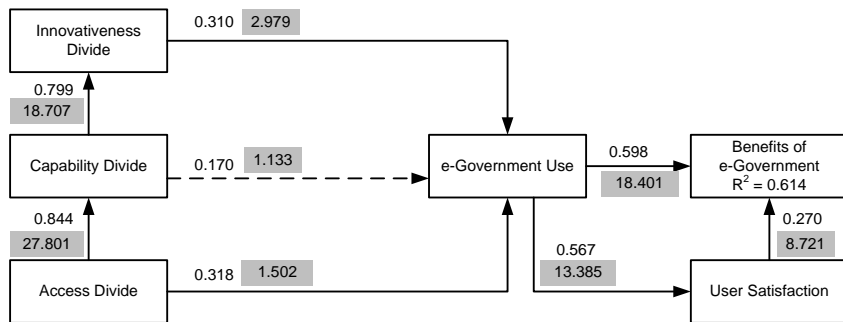


Figure 6.4.i. The structural model of lower income group

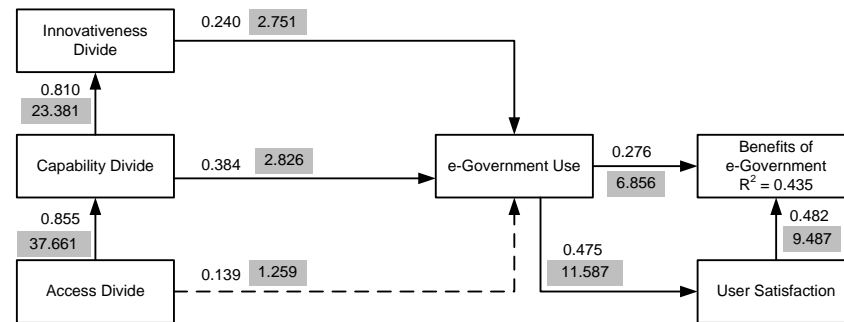


Figure 6.4.j. The structural model of higher income group

Figure 6.4. The structural model of each group

In addition to the assessment of the models for each group of respondents, this research also employed the Smith-Satterwait test to examine the moderating effect. The Smith-Satterwait test was chosen because the samples are not normally distributed and the variances of the group are not equal (Moore and Chang 2006; Hsieh, Rai, and Keil 2008).

Table 6.26 presents the results of the t-statistics to determine the significant effects of gender, age, residential place, education and income. If more than four relationships have significant results the moderating effect is supported. Whereas, if less than four relationships are significant, the hypothesis is partially supported. However, the hypothesis is not supported if there is no significant result for any relationship.

To recap, five hypotheses – Hypothesis 4 (a) to Hypothesis 4 (e) – were proposed to describe the moderating effect. As shown in Table 6.26, the findings demonstrate only 2 significant differences (significant *t*-values are shadowed in Table 6.26) in the impact of the *Digital Divide* on *e-Government Systems Success* and *User Satisfaction on Benefits of e-Government* for males and females. The significant moderating effect of gender on the influence of the *Innovativeness Divide* on *e-Government Use* implies that males and females differed in terms of their willingness to try e-government systems. However, the overall results indicate that the impact on male and female users is similar, and thus Hypothesis 5 (a) is partially supported.

With regard to the moderating of age, the results show four links with significant differences between younger and older groups of respondents. The links are: *Access Divide* to *e-Government Use* ($t=2.049$), *Innovativeness Divide* to *e-Government Use* (3.043), *Access Divide* to *Capability Divide* ($t=2.874$), *User Satisfaction* to *Benefits of e-Government* ($t=1.762$). The results indicate that access was a most important factor for younger users (younger $\beta=0.400$, older $\beta=-0.041$), whereas willingness to try the systems or innovativeness was the most important factor for older users (younger $\beta=0.136$, older $\beta=0.546$) in the use of e-government systems. Furthermore, access to ICT was seen as an important factor for increasing

user capability, especially for older users. Despite this, some links were insignificantly different, and based on the overall results; we can conclude that age has a significant moderating effect on the impact of the *Digital Divide* on *e-Government Systems Success*, as proposed in Hypothesis 5 (b).

In terms of the moderating effect of residential location, the results support five links, namely *Access Divide* to *e-Government Use* (t=12.001), *Capability Divide* to *e-Government Use* (t=5.348), *Innovativeness Divide* to *e-Government Use* (t=6.701), *Access Divide* to *Capability Divide* 3.158), and *Capability Divide* to *Innovativeness Divide* (t=4.805). Therefore Hypothesis 5 (c) or the moderating effect of age on the impact of the *Digital Divide* on *e-Government Systems Success* is supported.

The assessment of the moderating effect of education reveals that the links *Access Divide* to *e-Government Use*, *Innovativeness Divide* to *e-Government Use*, *Access Divide* to *Capability Divide*, and *Capability Divide* to *Innovativeness Divide* are confirmed. Table 6.26 illustrates that for the users who attended higher education, access to ICT was more significant than for those who possessed lower educational levels. On the other hand, computer self-efficacy and willingness to try new technologies were more important for less educated users. The relationships among the variables of the digital divide also appear stronger in users who had attained lower educational levels. Based on the assessment, Hypothesis 5 (d) is supported; age has a moderating effect on the influence of the Digital Divide on the success of e-Government Systems.

As shown in Table 6.26, the differences between the low-income and high-income groups are only evidenced by the links of *e-Government Use* to *Benefits of e-Government* (t=5.311) and *User Satisfaction* to *Benefits of e-Government* (t=2.961). Other than these links, the assessment did not show significant differences between the two groups. Therefore, based on the overall results, the links and assessment partially support Hypothesis 5 (e).

Table 6.26: Results of pooled error term t-test by subgroup

Path Relation	Male		Female		t-value	Younger		Older		t-value	City		Remote		t-value
	β	SE	β	SE		β	SE	β	SE		β	SE	β	SE	
ACCE - USE	0.293	0.192	0.095	0.106	0.903	0.400	0.182	-0.041	0.116	2.049	0.844	0.0597	-0.617	0.106	12.001
CAPA - USE	0.270	0.130	0.114	0.120	0.884	0.238	0.139	0.281	0.124	0.231	-0.106	0.0834	0.590	0.100	5.348
INNO - USE	0.146	0.110	0.553	0.081	2.984	0.136	0.091	0.546	0.100	3.043	0.093	0.0554	0.848	0.098	6.701
ACCE - CAPA	0.805	0.080	0.874	0.012	0.852	0.782	0.037	0.896	0.015	2.874	0.758	0.0456	0.908	0.013	3.158
CAPA - INNO	0.693	0.118	0.755	0.029	0.510	0.749	0.057	0.832	0.027	1.313	0.654	0.0528	0.918	0.015	4.805
USE - USAT	0.455	0.046	0.377	0.059	1.046	0.534	0.044	0.508	0.037	0.449	0.538	0.0457	0.565	0.033	0.480
USE - BENE	0.433	0.052	0.385	0.040	0.732	0.425	0.044	0.366	0.042	0.963	0.405	0.0419	0.488	0.034	1.544
USAT - BENE	0.264	0.065	0.408	0.029	2.021	0.336	0.049	0.452	0.044	1.762	0.344	0.0425	0.401	0.039	0.986

Table 6.26: Results of pooled error term t-test by subgroup (part 2)

Path Relation	High Edu		Low Edu		t-value	High Income		Low Income		t-value
	β	SE	β	SE		β	SE	β	SE	
ACCE - USE	0.475	0.137	-0.307	0.176	3.513	0.139	0.110	0.318	0.2117	0.703
CAPA - USE	0.111	0.106	0.414	0.170	1.515	0.384	0.136	0.170	0.1500	0.927
INNO - USE	0.241	0.079	0.612	0.159	2.091	0.240	0.087	0.310	0.0104	0.644
ACCE - CAPA	0.789	0.040	0.928	0.010	3.377	0.855	0.023	0.844	0.0304	0.264
CAPA - INNO	0.751	0.048	0.888	0.023	2.572	0.810	0.035	0.799	0.0427	0.181
USE - USAT	0.563	0.041	0.548	0.055	0.219	0.475	0.041	0.567	0.0424	1.410
USE - BENE	0.429	0.449	0.442	0.047	0.029	0.276	0.040	0.598	0.0325	5.311
USAT - BENE	0.347	0.047	0.375	0.042	0.441	0.482	0.051	0.270	0.0310	2.961

6.8. Summary of the Hypotheses Evaluation

As presented in a Chapter Five, 16 hypotheses were developed to explain the relationships among the constructs in the comprehensive research model. In order to test these hypotheses, analyses based on the PLS were undertaken to examine the data that was gathered from the survey.

Previous sections explained three stage analyses, consistent with the research objectives. Hence to provide the overall results based on the analyses, Tables 6.27, 6.28, and 6.29 summarise the evaluation of the research hypotheses. The discussion of the results is presented in the Chapter Seven.

Table 6.27: Hypotheses evaluation of analyses (antecedent factors)

Construct	Link	Hypothesis statement	Outcome
Digital Divide	AD → EU	H1a Access Divide positively influences e-Government Use	Supported
	CD → EU	H1b Capability Divide positively influences e-Government Use	Supported
	ID → EU	H1c Innovativeness Divide positively influences e-Government Use	Supported
	AD → CD	H2a Access Divide positively influences Capability Divide	Supported
	CD → ID	H2b Capability Divide positively influences Innovativeness Divide	Supported
e-Government Systems Success	EU → US	H3a e-Government Use positively influences User Satisfaction	Supported
	EU → BE	H3b e-Government Use positively influences Benefits of e-Govt.	Supported
	US → BE	H3c User Satisfaction positively influences Benefits of e-Govt.	Supported

Table 6.28: Hypotheses evaluation of analyses (mediating effect)

Construct	Link	Hypothesis statement	Outcome
Trust in e-Government	AD → T → EU	H4a Trust in e-Government has a mediating effect on the relationship between Access Divide and e-Government Systems Success	Not Supported
	CD → T → EU	H4b Trust in e-Government has a mediating effect on the relationship between Capability Divide and e-Government Systems Success	Supported
	ID → T → EU	H4c Trust in e-Government has a mediating effect on the relationship between Innovativeness Divide and e-Government Systems Success	Supported

Table 6.29: Hypotheses evaluation of analyses (moderating effect)

Construct	Link	Hypothesis statement	Outcome
Demographic Divide and Economic Divide	Gender*DD → ESS	H5a Gender has a moderating effect on the relationship between Digital Divide and e-Govt Systems Success	Partially Supported
	Age*DD → ESS	H5b Age has a moderating effect on the relationship between Digital Divide and e-Govt Systems Success	Supported
	Place*DD → ESS	H5c Residential Place has a moderating effect on the relationship between Digital Divide and e-Govt Systems Success	Supported
	Education*DD → ESS	H5d Education has a moderating effect on the relationship between Digital Divide and e-Govt Systems Success	Supported
	Income*DD → ESS	H5e Income has a moderating effect on the relationship between Digital Divide and e-Govt Systems Success	Partially Supported

6.9. Summary

This chapter described research findings based on the analyses of the research data that was undertaken by using Partial Least Square (PLS) analysis. In section 6.2, the overview of the survey was presented to explain the research process that was conducted. It was followed by a section describing the characteristics of the

respondents in terms of demographic factors, such as gender, age, residential place, and education, and in terms of economic factors, represented by household income. This research involved 237 respondents who were users of e-government systems provided by local governments in Indonesia.

Furthermore, full analyses using PLS were explained in sections 6.5, 6.6, and 6.7, following the sequence of research objectives. The first stage of the PLS analyses examined the influence of antecedent factors (*Digital Divide*), including the *Access Divide*, *Capability Divide*, and the *Innovativeness Divide* on *e-Government Systems Success*, represented by the constructs of *e-Government Use*, *User Satisfaction* and *Benefits of e-Government*. At the same time, the analysis also tested the relationships among variables in the *Digital Divide*. The second stage investigated the mediating effect of *Trust in e-Government* on the influence of the *Digital Divide* on *e-Government Systems Success*. In the final stage, the analysis focused on the assessment of the moderating effect of the *Demographic Divide* and *Economic Divide* on the impact of the *Digital Divide* on *e-Government Systems Success*.

At every stage, two major procedures of assessment were undertaken, namely the assessment of the measurement model and the assessment of the structural model. Nevertheless, the analysis was extended in stage two by using the Baron and Kenny (1986) test and the Sobel (1982) test in order to investigate the mediating effect. The extension of the analysis was also conducted in stage three using multi-group analysis. Based on the findings of the analyses, the research hypotheses were evaluated. Overall, of the 16 hypotheses proposed in this research, 13 hypotheses were supported, with the other 3 hypotheses being rejected. Thus in the next chapter, the discussion and implication of the findings are discussed, based on theoretical development and practical significance.

Chapter Seven: Discussion and Implications

7.1. Introduction

The previous chapter discussed the results of the hypotheses testing whereby thirteen of the sixteen hypotheses were supported. In this chapter, the findings related to the hypotheses are discussed in detail, along with the implications of each finding. Any significant relationships found are then linked to practical propositions, and it is hoped that these may serve as guidelines toward the implementation of effective measures to increase the use of e-government systems. The theoretical implications of the results and their impact on current research gaps are also deliberated. Possible explanations for the rejected hypotheses are also discussed.

7.2. Interpretation and Discussion of Data Analysis Results

As presented in Figure 7.1, the results reveal that the explanatory power of all the endogenous constructs in the model exceeds the minimum R^2 , which is 0.25, as suggested by Hair, Ringle, and Sarstedt (2011). The overall model explains 48.1% of the variance of citizens' actual use of e-government systems, (figures provided by local governments). The results of the hypotheses testing, as depicted in Figure 7.1, found thirteen relationships to be statistically significant.

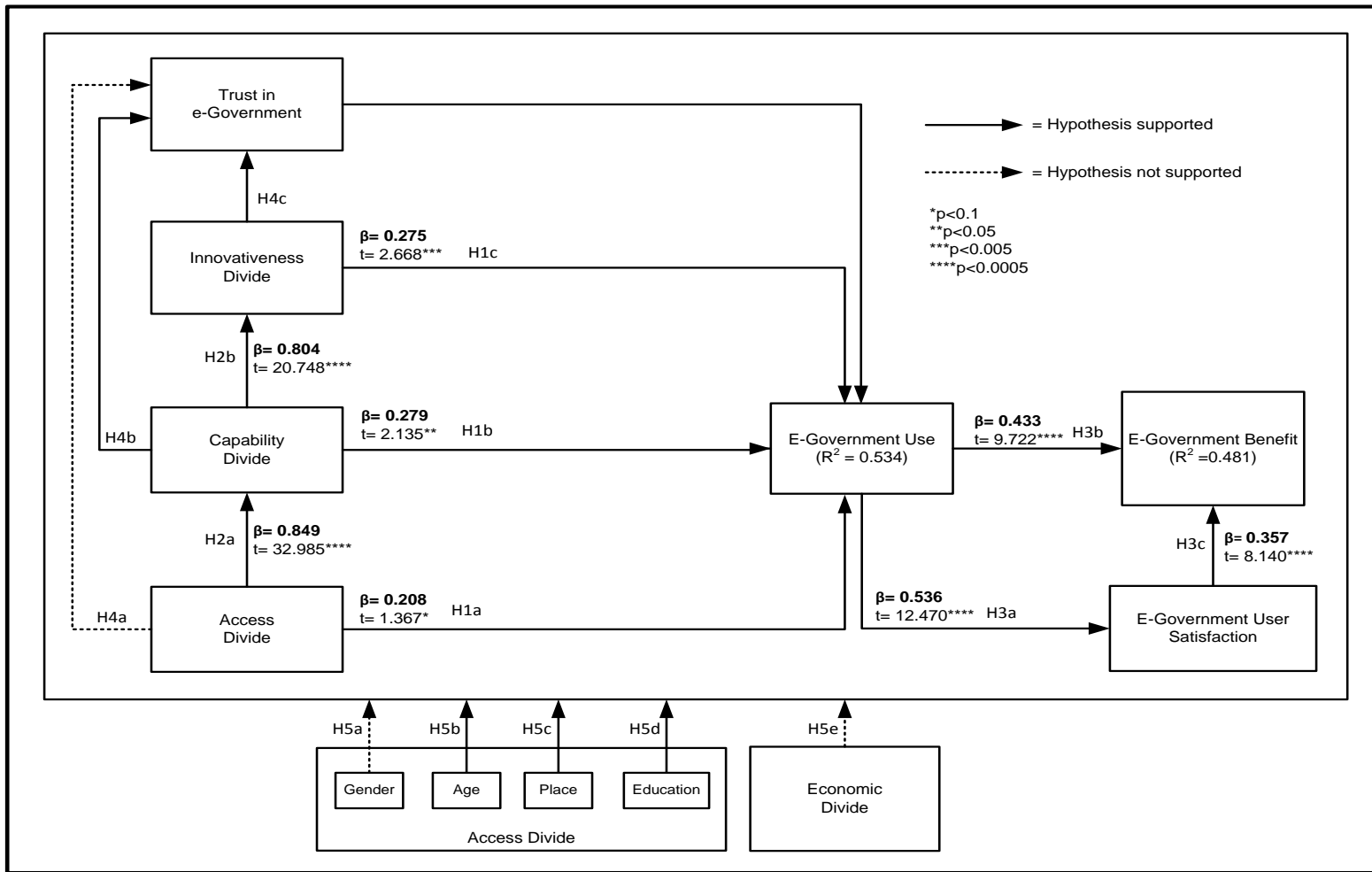


Figure 7.1 Results of hypotheses testing

7.2.1. Hypotheses Related to the Digital Divide

The literature review and field study identified three variables that could potentially influence the success of e-government systems. The influence of each variable was explored through hypotheses H1a, H1b, and H1c. The results of the hypotheses testing are discussed in detail in the following sections.

A. Hypothesis H1a

This research argues through hypothesis H1a, that access to information and communications technology (ICT, also referred to as the Access Divide) has a positive influence on e-Government Use. The results of the hypothesis testing indicate that there is significant statistical evidence to support the fact that the Access Divide influences e-Government Use in that inequalities of access result in limiting people's ability to use the system. This finding is consistent with previous research on ICT adoption (eg. Ferro, Helbig, and Gil-Garcia 2011; Attewell 2001; James 2007; Corrocher and Ordanini 2002), which found that access to ICT significantly influences ICT adoption. Moreover, as argued by Rahman and Quaddus (2012), most of the research into the digital divide that examines the role access to ICT plays with regard to ICT adoption has reached similar conclusions.

The results are also in accordance with the studies by the United Nations (2012, 2010) which include access to ICT infrastructures as one of key indicators of e-Government Readiness. The results are also congruent with field study findings where all of the informants agreed upon the substantial role that access to ICT played in increasing e-government use. Hence, this study confirms that the Access Divide is an important factor, which influences e-Government Use.

The practical implications of this finding are that policy makers in Indonesia, especially local governments, in attempting to increase the use of e-government, should improve the availability of ICT infrastructures to their citizens, especially the provision of Internet connections. As mentioned by some informants, free Internet access in public spaces, such as offices, shopping centres, parks, airports and other

places would help citizens have access to the Internet. Ease of access to the Internet would more easily encourage citizens to use the e-government system.

Evidence of success regarding e-government may be found in the UK, where in 2005, the government spent 1.14% of its GDP on ICT investments, making the UK the biggest spender on public sector IT in Europe (Irani, Elliman, and Jackson 2007). The ICT investments were made in e-government and back office infrastructures. By implementing e-government, the UK government will make savings in terms of significant improvements to efficiency of service delivery. Prattipati (2003) argues that provision of public Internet access is found to be the most important factor affecting the use of e-government services. The experience of Singapore in developing its e-government shows that the Indonesian government would be wise to undertake measures to make the Internet accessible to every citizen. To help citizens on the disadvantaged side of the digital divide, the Singapore government partnered with private industry to implement the PC Reuse Scheme to distribute second hand PCs to needy parties (Ke and Wei 2004).

B. Hypothesis H1b

Statistical evidence indicates the significant positive impact of the Capability Divide on e-government use ($\beta=0.279$; $t=2.135$). The findings confirm previous studies (Wei et al. 2011; Warschauer 2003b; Dewan and Riggins 2005) that suggest the significant influence of computer self-efficacy on ICT use. Compared to the influence of the Access Divide, the statistical results suggest that the Capability Divide has a stronger influence on e-Government Use. Therefore, as hypothesised in the study, the Capability Divide has a substantial effect in increasing e-Government Use.

The practical implications are that the government, as the provider of the e-government system, should play a greater role in improving the capability of its citizens in using ICT in general and the e-government system in particular. Warschauer (2003bp. 1-2) recounts that in 2000, the government of New Delhi, India provided computer access in slum areas for the city's street children. The project, known as Hole-in-the-Wall, allowed the street children to have 24-hour

access to computers and the Internet. Besides the Internet connection being made through dial up access, the computers were also equipped with some essential programs, such as Microsoft Office and Paint. Without any instruction whatsoever, the children were able access computers and the Internet at their own pace and speed, in the hope that learning would take place.

The results indicated that the access to Internet was negligible, with the majority of the children using a computer to draw with Paint programs or to play games. The failure of the project was caused by the fact that no specific computer education was made available to the children. Some parents expressed their concern that the absence of instruction took away from the project's value. Some others even raised negative feelings about the project, complaining that the computers distracted their children from their homework and schoolwork.

The story above represents the nature of incomplete policies by many governments to overcome the Digital Divide where they perceive the main problem to be merely inequality of access (especially physical access) to ICT. Although access to ICT is an important factor, capability in using ICT is essential.

C. Hypothesis H1c

Rogers (1995, 2003), through the Diffusion of Innovations Theory, argues that innovators are individuals who are able to cope with high levels of risk and uncertainty. With regard to attitude toward e-government initiatives, this research attempts to examine the influence of the Innovativeness Divide on the willingness to change and try new ICT. Through hypothesis H1c, this research proposed that the Innovativeness Divide positively influence e-Government Use.

Based on the PLS analysis, the results confirm the significant positive influence of the Innovativeness Divide on e-Government Use ($\beta=0.275$, $t=2.668$). The results show that the effect of the Innovativeness Divide is the strongest, when compared to the Access Divide and the Capability Divide. This finding supports the findings of previous studies by Agarwal and Prasad (1998, 1997), and Yi, Fiedler, and Park (2006). Moreover, the findings are also in congruence with the results in the field

study, in which 10 informants (out of 12) confirmed the importance of the Innovativeness Divide on e-Government Use.

The results imply that on top of access to ICT and the capability to use ICT, the willingness to change and try new ICT is vital for e-government use. van Dijk and Hacker (2003) assert that there are four type of access, namely: (1) ‘Motivational access’ or lack of elementary digital experience because of lack of interest, computer anxiety, or unattractiveness of the new ICT; (2) ‘Material access’ or lack of ownership of (or access to) computers and network connections; (3) ‘Skills access’ or lack of digital skills caused by insufficient user-friendliness and/or inadequate education; and (4) ‘Usage access’ or significant usage opportunities. Furthermore, the access problems may be shifted or translated from the first two types of access to the last two types. As illustrated in Figure 7.2, when the problems of mental and material access are solved, wholly or partially, the problems of skill and use become more operative (van Dijk 2006). Van Dijk and Hacker (2006) underline the problem of information *want-not* that is more important than information *have-not*.

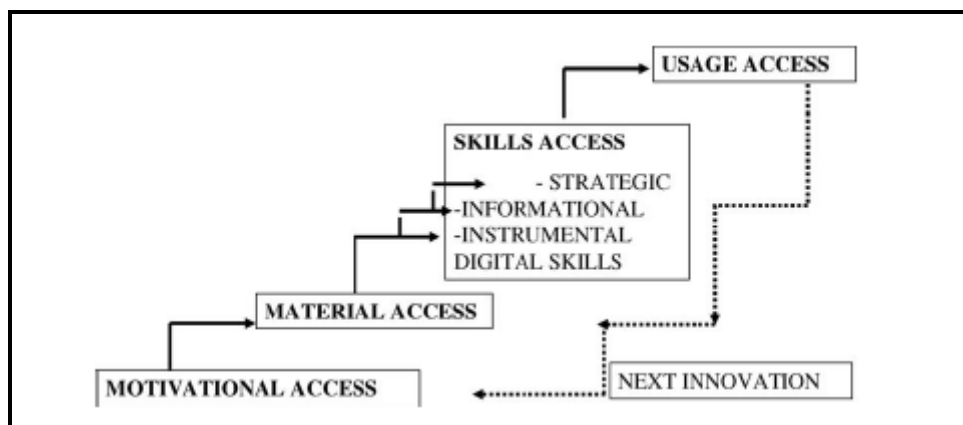


Figure 7.2 Cumulative and recursive model of successive types of access to digital technologies.

Source: van Dijk (2006, p.224)

The implications of the findings suggest that government should increase awareness and create a positive attitude in its citizens toward the implementation of e-government systems. Referring to van Dijk and Hacker (2003), some reasons for not using the innovations could be: “do not need it”, “can’t handle it”, or “don’t

want it". By more actively socialising the existence and benefits of e-government, citizens' lack of interest, anxiety, and lack of attraction to the technology could be removed. Another significant factor in the improvement of innovativeness is the development of user-friendly e-government systems.

In addition, this study also advances the theoretical account of the Digital Divide by going beyond previous studies and introducing a new type of Digital Divide, which is the Innovativeness Divide. The results provide a theoretical and more comprehensive understanding of the Digital Divide. This framework can be applied and examined in a variety of contexts to test the boundaries of its applicability.

7.2.2. Hypotheses Related to the Relationships among Variables in the Digital Divide

A. Hypothesis H2a

According to Dewan and Riggins (2005), individuals acquire computer self-efficacy through the availability of ICT resources. The digital Access Divide refers to the first level of the digital divide, while the digital Capability Divide refers to the second level (Dewan and Riggins 2005). In order to examine the positive influence of the Access Divide on the Capability Divide, this research proposed hypothesis H2a. The results indicate that the relationships are significantly positive, as illustrated in Figure 7.1 ($\beta=0.849$, $t=32.985$). The findings confirm previous research by Seltzer (1983), Selwyn (1998), Bertot (2003), Wei et al. (2011), and Gripenberg (2011). All of the participants in the field study also agreed on the influence of the Access Divide on the Capability Divide.

Based on Social Cognitive Theory, Wei et al. (2011) posit that access to ICT partly influences the individuals experience of mastering mastery computer self-efficacy. Bertot (2003) argues that access to ICT would assist in individuals becoming more information-literate. Once they have access, they need to know how: to 1) use the technology; 2) to find and retrieve the information needed; 3) to evaluate and assess the relevance of the information; and 4) to synthesise the information in order to solve their particular problem.

The findings highlight the importance of the provision of access to ICT. The availability of the ICT infrastructure is a prerequisite for improving an individual's capability in using ICT. The same reason leads local governments in many countries to expand the availability of computers and Internet connections, with a particular emphasis on public schools, libraries, higher education institutions and the broader community. In the US for example, former President Bill Clinton proposed a tax incentive for businesses to donate computers to poor schools and communities (Lacey 2000). The government of Texas also established the telecommunication Infrastructure Fund (TIF) to address the ICT infrastructure in Texas, specifically with regard to educational institutions and health care facilities (Bertot 2003). By focusing on the educational institutions, the computers and Internet connection could be used for daily teaching and learning processes, and these processes in turn would contribute to improving the ability of the next generation to utilise ICT.

B. Hypothesis H2b

Organisations, including those in the public sector, are continually reminded that technological innovation, both within the organisation and for its customers, is key to success and technological innovations are vital to survival in a highly competitive environment (Blackler and Brown 1985). While the purported benefits to the organisation may be attractive, researchers have found that the end users often have a less than enthusiastic response to the many technological innovations introduced by organisations (Blackler and Brown 1985; O'Connor et al. 1990). This study therefore proposed Hypothesis H2b in order to investigate the influence of the Capability Divide on the Innovativeness Divide.

The findings in this study shows that there is a significantly positive influence of the Capability Divide on the Innovativeness Divide ($\beta=0.804$, $t=20.748$). The results support previous research by Frantzich (1979), Burkhardt and Brass (1990) and Ellen, Bearden, and Sharma (1991). The results are in congruence with the findings in the field study, where all of the informants confirmed the influence of the Capability Divide on the Innovativeness Divide.

Numerous factors influence an individual to change from a pre-existing product/service or pattern of behaviour. These include the effects of environmental factors (Gatignon and Robertson 1989), the degree of tolerance for risks and switching costs (Watson 1971; Gatignon and Robertson 1989), and the loss of autonomy (Coch and French Jr. 1948; Nadler 1981). At an individual level, Frantzich (1979, p.968) posit that "technological innovation requires knowledge of one's needs and goals, awareness of optional ways of reaching the goals, the willingness and ability to take risk and access to the skills necessary for putting the innovation to use". Moreover, studies by Cody et al. (1999) suggest that the provision of adequate training, to improve one's capability in utilising the Internet, may increase one's willingness to use the internet.

Studies in personal innovativeness or individual willingness to change have been dominated by market research. This research contributes to the theoretical understanding of personal innovativeness in the area of information systems. The results provide an underlying foundation for the theoretical understanding of the influence of computer self-efficacy on an individual's willingness to change and try new ICT.

Practically, the findings provide a basis for policy makers to formulate strategies to encourage change. Once any inhibiting factors have been identified, a variety of strategic approaches could be formulated. Where low self-efficacy exists, modification of the innovation may be necessary. However, since self-efficacy is often based on self-perception rather than reality, changes in the promotion of the innovation (i.e., training programs, availability of support services, toll-free help lines) may be effective in changing perceptions of self-efficacy (Blackler and Brown 1985; O'Connor et al. 1990).

7.2.3. Hypotheses Relating to e-Government Systems Success

DeLone and McLean (2003) have updated their previous model (1992) based on several studies on IS success. Basically, the model consists of two levels of IS success, namely the *semantic level* and the *effectiveness level* (DeLone and McLean 2003). The semantic level measures technical success including: information

quality, system quality, and service quality. The effectiveness level measures the effect of the information on the receiver or user and includes: system use, user satisfaction and benefits of the system. The present study focuses on measuring the effectiveness of e-government systems. This study argues that key elements of e-government system success are: e-Government Use, User Satisfaction and Benefits of e-Government. The elements and sequential relationships between elements of e-government system success are adapted from DeLone and McLean (1992, 2003). Hypotheses H3a, H3b, and H3c represent the influence of e-Government Use on User Satisfaction, the influence of e-Government Use on the Benefits of e-Government, and the influence of User Satisfaction on the Benefits of e-Government, respectively.

A. Hypotheses H3a, H3b, and H3c

The findings in this research show the statistical significance of the influence of e-Government Use on User Satisfaction (H3a), the influence of e-Government Use on the Benefits of e-Government (H3b), and the influence of User Satisfaction on the Benefits of e-Government (H3c). The findings in the field study also confirm the results of the quantitative analysis.

The results are in line with evidence from the literature review, which validated the model of IS success. This model was initially developed in the context of e-commerce; however the model has been applied in wide variety of systems (Lee and Chung 2009; Fisher et al. 2000; Ruttan 1996; Gelderman 1998) and in an e-government context in particular (Wang and Liao 2008; Floropoulos et al. 2010).

The findings imply that by increasing e-government use and user satisfaction, the benefits will be tangible to the users. As discussed in Chapter Two, the e-government system is believed to be able to elevate the quality of communication between government and their citizens, and to improve the quality of public administration as well as accountability. The informants in the field study also confirmed the benefits that they received from using the e-government system, including more efficiency in terms of cost and time consumed, and this was in addition to transparency and accountability. Therefore the findings in this study

suggest that government encourage its citizens to increase their use of e-government systems.

7.2.4. Hypotheses Relating to Trust in e-Government

The current study argued that Trust in e-Government has a mediating effect on the influence of the digital divide on the success of e-government systems. Based on the literature, Trust in e-Government mediates the influence of the Access Divide (H4a), the Capability Divide (H4b), and the Innovativeness Divide (H4c) on the success of e-government systems. The following section discusses the results, including the implications.

A. Hypotheses H4a, H4b, and H4c

The results show that the direct influence of the Access Divide on e-Government System Success was not affected by the inclusion of the mediator variable. Hence, hypothesis H4a, positing the mediating effect of Trust in e-Government on the influence of the Access Divide on e-Government System Success is not supported by the results. On the other hand, the quantitative analyses demonstrate that H4b and H4c are supported. In the other words, the influence of the Capability Divide and the Innovativeness Divide on e-government system success is fully mediated by Trust in e-Government.

This study has implications for information system research on trust in e-government systems. This is due to disagreement among researchers as to whether or not the study of trust, in the context of information science, is necessary or appropriate. Some researchers argue that trust does not play an important role in a user's obtaining of information through the internet (Nadler 1981; Coch and French Jr. 1948). Other researchers assert that trust is a construct that is only applied to people, not to computers or systems (Frantzich 1979; Melitski and Holzer 2007). However, some studies have acknowledged trust as an important factor for ICT use in general (Pavlou and Gefen 2004; McKnight and Chervany 2002; Kelton, Fleischmann, and Wallace 2007; Gatignou and Robertson 1989), and in an e-government context in particular (eg. Teo, Srivastava, and Jiang 2009; Warkentin et

al. 2002). Hence, this study confirms the applicability of the concept of trust in information sources such as websites and e-government systems.

Furthermore, one of the key insights in this study is in the findings on the role of trust in e-government. Previous research predominantly examined the direct influence of trust on the adoption of technology. The present study, on the other hand, found that trust in e-government plays an important role as a mediator in the success of e-government systems. Trust has previously been acknowledged as a mediating variable in many other disciplines, such as marketing (Morgan and Hunt 1994; Sirdeshmukh, Singh, and Sabol 2002) and behavioural intention in management (Cropanzano and Mitchell 2005; Vlachos et al. 2009). The PLS analyses show that by introducing Trust in e-Government into the model, the direct influence of the Capability Divide and the Innovativeness Divide on e-government system success become insignificant (see Chapter Six, Figures 6.2 and 6.3). In other words, Trust in e-Government fully mediates the influence of the Capability Divide and Innovativeness on e-Government.

As to the practical implications of the findings; it is imperative to build citizens' trust in e-government if the scheme is to succeed. In order to mitigate user uncertainty, the government could provide informative content and describe their services and benefits in terms of costs, required time, and step-by-step processes. The government might also make efforts to establish citizens' trust in e-government by promoting its commitment through effective and transparent leadership, which the public would be made aware of.

7.2.5. Hypotheses Relating to the Demographic Divide and Economic Divide

Williams (1990) asserts that inequalities in socio-economic circumstances are found in the internal and external resources, or constraints, that together shape experience and opportunities, and in turn influence behavioural patterns. Based on this notion, the moderating effect of socio-economic characteristics on the relationships between the digital divide and e-government system success is expected. To test the notion, H5a, H5b, H5c, H5d, and H5e were proposed to test

the moderating effects of gender, age group, place of residence, education, and income, respectively.

A. Hypothesis H5a: Gender

In terms of gender, contrary to expectations, the findings of the multi-group PLS analysis partially support this variable as having a moderating effect, since only two significant differences were found between men and women regarding the influence of the digital divide on e-government system success (ie. INNO-USE and USAT-BENE).

Despite the above findings, it is noteworthy that earlier studies presented some contradictory results on the effects of gender on e-government use. Research by Venkatesh et al. (2011) found that in the UK, e-government service users were predominantly male. Some studies however, did not find gender differences in the use of, and attitudes towards, e-government systems (Wang and Shih 2009; van Dijk, Peters, and Ebbers 2008; Colesca and Dobrica 2008; Belanger and Carter 2009; Abdulai and Huffman 2005).

The research conducted in this paper produced results that may bear re-examination. On the other hand, the users of e-government systems were predominantly male (see Table 6.2). Since this research only examined actual 'hands-on' users of e-government systems, men and women in general might possibly share the same views once they had become users of e-government systems. Therefore different results might be found by including both users and non-users in further research.

B. Hypothesis H5b: Age group

Rhodes (1983, p.329) states that psychologically, ageing can be defined as "systematic changes in personality, needs, expectations, and behaviour as well as performance in a sequence of socially prescribed roles and accumulation of experiences". Moreover, Rhodes further explains that biological ageing includes changes in anatomy and psychology, such as changes in sensori-motor performance and in visual acuity. In line with studies in psychology, previous research in

information systems found similar results. Hindman (2000) and Loges and Jung (2001), for example, found different patterns in internet use between age groups in the US.

Referring to the multi-group analysis, the results of this study indicate that younger and older age groups have different behavioural patterns. Morris and Venkatesh (2000) argue that those in younger age groups are much more likely to have been exposed to ICT at a relatively early age. In contrast, older individuals are much less likely to have ICT experience due to the completion of their education prior to the introduction of the personal computer. Hence, opportunities for older people to interact with ICT have been very limited. Younger people in general have more experience in making judgements about technology. As a consequence, older people tend to be less confident in their ability to utilise ICT and show less willingness to try new ICT. Similar conclusions were also drawn by Czaja and Sharit (1993) and Forte-Gardner et al. (2004).

One interesting result found among variables in the digital divide was that the Access Divide was the most important factor in e-Government Use for the younger age group. The influence was not significant for older age groups. A possible explanation of this phenomenon is that older age groups do not find access to ICT to be an important factor in e-government use, as, unlike the younger age group, they have more stable economic circumstances. Therefore they are more capable of investing in home computers and Internet connections, may have computer and Internet access in their offices.

C. Hypothesis H5c: Place of residence

This study posited through Hypothesis H5c that place of residence moderates the influence of the digital divide on e-government system success. As discussed in Chapter Five, the hypothesis was proposed based on previous research that found differences in ICT use in rural and urban areas. The inequalities were found in developing countries (Mariscal 2005; Akca, Sayili, and Esengun 2007) and developed countries (Mossberger, Tolbert, and Gilbert 2006; Schleife 2010; Hindman 2000). This situation was related to the issues of “market efficiency gaps”

and the “access gap” as suggested by the World Bank (Mariscal 2005). The market efficiency gap refers to the differences between the levels of ICT infrastructure and service penetration that can be reached under current conditions, and the level one would expect under optimal market conditions. Furthermore, the access gap refers to situations where a gap between urban and rural areas continues to exist, even under efficient market conditions, where a proportion of the population cannot afford to pay market prices. Since rural areas tend to lag economically behind urban areas due to industrial and labour markets being concentrated in urban areas (Jensen 2001), people in rural areas tend to lag behind in term of access to ICT.

The overall findings in the multi-group analysis demonstrate the fact that there is a moderating effect by residential place on the influence of the Digital Divide on e-Government System Success. The findings are consistent with prior research into the digital divide (Schleife 2010; Hampton 2010, 2003; Hausman 2005; Stern, Adams, and Elsasser 2009; Abdulai and Huffman 2005) indicating significant differences in ICT use based on place of residence.

D. Hypothesis H5d: Education

The present study proposed the moderating role of education on the influence of the digital divide on e-government system success. Based on the multi-group analysis, hypothesis H5d was supported. Hence, the results of the analysis provided additional support for previous research which suggest that education is a powerful predictor of the use of and attitudes towards e-government services (Hindman 2000; van Dijk, Peters, and Ebbers 2008; Colesca and Dobrica 2008; Abdulai and Huffman 2005). These studies concluded that people with an advanced education tend to use more e-government online services than people with lower levels of education.

Education is crucial to ICT use as it provides the skills required for utilising such technologies. Although it is possible for those who are near-literate to take advantage of certain technology applications, education becomes increasingly important as the technology becomes more complex (DiMaggio, Hargittai, Celeste, et al. 2001). Stern, Adams, and Elsasser (2009) argue that higher education plays an

important in the adoption of ICT. They found that where computers and the Internet were first introduced into academic and research institutions, highly educated people adapted to these new technologies earlier than others. The important role of universities in the process of internet diffusion was also analysed by Goldfarb (2006), who suggested the spillover effect of higher education into technology development and diffusion. Similar conclusions were also drawn by Tengtrakul and Peha (2013) and Agyapong and Ferreira (2009). Those studies found the spillover effect of ICT in schools on ICT utilisation by adults who lived with students, and this was not just a case of Internet adoption in the home.

E. Hypothesis H5e: Income

It is expected that household income has a moderating effect on the influence of the digital divide on e-government system success. Therefore, a difference in such influences between higher income level users and lower income level users was proposed. Referring to the findings, although a significant difference was detected, it was limited to the link e-Government Use to Benefits of e-Government and User Satisfaction to Benefits to e-Government.

Overall findings however, failed to support a moderating effect of income level on the influence of the digital divide on e-government system success. This outcome suggests that when it comes to e-government use, no differences between individuals with high or low economic circumstances can be derived. Therefore, H5e was partially supported. This result contradicts previous studies (Mills and Whitacre 2003; Nicholas 2003; Peter and Valkenburg 2006; DiMaggio, Hargittai, Celeste, et al. 2001) demonstrating that people with higher levels of income tend to use the internet more than those on a lower income. Nevertheless, the finding provides additional support to previous studies, which found that income, is not related to Internet usage (Shih and Venkatesh 2004; Colesca and Dobrica 2008; Abdulai and Huffman 2005).

The findings in the field study were also consistent with the result of the quantitative analysis, where only 3 out of 12 informants agreed that there was a relationship between the Economic Divide and e-Government Use, with the

majority of the informants not acknowledging a relationship. Informant 8, for example, said:

“I don’t think that personal economic circumstances influence the usage of the e-government online system, as nowadays we can easily find Internet facilities in shopping centres, restaurants and other public areas. We can access the internet for free...”

Hence, the possible explanation on insignificant moderating effect of Economic Divide refers to the argument of one of the informants as presented above. Local government in cooperation with the private companies have provided free Internet access in public areas, such as parks, shopping centres, restaurants, airports, etc.

F. Implications of the Moderating Effect of the Demographic Divide and Economic Divide

The results of the multi-group analysis and the demographic and economic characteristics of e-government system users (Table 6.22), as well as the results in the field study, imply that gaps exist. E-government users in Indonesia are dominated by males, young people, city dwellers, those with a high-level education and those coming from middle to upper level economic backgrounds. The characteristics of users are in line with findings from previous research into ICT users. Studies across the globe on the digital divide have long been documenting the gaps in developing countries (Schuppan 2009; Akca, Sayili, and Esengun 2007; Warschauer 2003a; Hwang and Syamsuddin 2008) and developed countries (Mossberger, Tolbert, and Gilbert 2006; Stern, Adams, and Elsassser 2009; Schleife 2010; Ono 2006), with similar results. Even in the US, one of the most developed countries in the world, NTIA (2000); (NTIA 2011) reported that groups of rural poor, ethnic minorities, and female head-of-households are the most disadvantaged groups in terms of ICT access.

Scholars in ICT4D (Information and Communication Technology for Development) such as Heeks (2009), Steyn (2011), and Johanson (2011b) posit that ICTs nowadays have become more and more important as economic, social and political life

becomes increasingly digital. Hence, the issue of the digital divide requires further understanding and ultimate resolution. Otherwise, those who are in disadvantaged groups living without ICTs will be increasingly excluded. Warren (2007) argues that non ICT-users will suffer many disadvantages when offline services from government, corporations and individuals are reduced as a result of increasing dependence on the internet. The use of online services is increasing rapidly as service providers take advantage of lowering costs and strive to improve the quality of their services (making them quicker, more interactive, and more flexible). Social gaps lead to a digital divide, which lead to deeper inequalities, and create a vicious digital cycle (Warren 2007).

With the implications of the findings on the moderating effects of the Demographic and Economic Divide, the current research suggests that in resolving the digital divide, policy makers must understand the complexity and dynamics of the issue, and incorporate the behavioural patterns of different demographic and economic groups (Hsieh, Rai, and Keil 2008), rather than implementing single generic policies that treat every individual as the same. Additional funds could be spent on the group alignment approach in order to understand the behavioural patterns of each group. This approach is believed by some to lead to a more effective outcome (Hsieh, Rai, and Keil 2011). Policies such as tax exemption for projects by corporations that bring ICT to low-income people through their CSR (Corporate Social Responsibility) and “E-rates” to subsidise Internet use and ICT for public schools and libraries, might be implemented by Indonesia. These strategies have effectively boosted the connectivity rate in the US (DiMaggio, Hargittai, Celeste, et al. 2001), Free Internet access in public places, which has been provided by some local governments in Indonesia, is a proven strategy in assisting disadvantaged people to access the Internet. In addition to access to ICT, the government might increase the awareness of the existence, and moreover the benefits of e-government services for disadvantaged groups.

Furthermore, the findings highlight the moderating role of place of residence in the influence of the digital divide on e-government system success. In this research, place of residence was proven to have the strongest moderating effect. Therefore

rural residents might be prioritised with regard to access to ICT and e-government services. As mentioned earlier, providing free public access to the Internet especially in rural areas is one of the keys to resolving the problem. In addition, the government could provide services that bring benefits to rural residents (Prattipati 2003; Ramirez 2001). In G2C (Government to Citizens) and G2B (Government to Business) e-government systems, the needs of citizens are paramount and need to be the focus in system planning and development. Citizens may lose their enthusiasm if there is no useable service and there are no tangible benefits.

7.3. Summary

This chapter presented the interpretation of the results of hypotheses tests undertaken. The results were discussed and compared with existing literature and field study analysis. The practical implications of the findings provide suggestions on effective measures that could be undertaken towards improving e-government system success, particularly in Indonesia. Theoretical implications were also underlined. Furthermore, plausible explanations for the statistically insignificant hypotheses were considered. The final chapter will summarise the research and draw attention to the theoretical and practical contributions of the research. The research limitations will be discussed and suggestions made for future research.

Chapter Eight: Conclusion and Future Directions

8.1. Introduction

This chapter presents the conclusions reached in the current research. A summary of the research is given in the next section and provides a brief description of the research objectives, methodology, analyses, results and interpretation of the findings. This chapter also highlights the contributions of this research towards the advancement of relevant theories and practices. Furthermore, the implications of the findings on the development of e-government in Indonesia are also presented, followed by the limitations of the study. In the final section, suggestions for the future research are made in order to identify potential areas that could be valuable.

8.2. Summary of Research

Based on the extensive literature review and previous studies, this research explored the digital divide at an individual level. In order to understand the digital divide more comprehensively, the research examined five types of digital divide, namely the demographic divide, economic divide, access divide, capability divide, and innovativeness divide. Furthermore, the current study examined the impact of the digital divide on e-government systems success, directly as well as indirectly, through the mediating effect of trust in e-government.

In conducting the research, the mixed methods approach was utilised. This method combined qualitative and quantitative data in a two-stage data collection process. The qualitative research conducted in the first stage, aimed to test the applicability of the initial model. The first stage was also useful for exploring the dimensionality of each construct. The field study was conducted by interviewing 12 users of e-

government systems and using semi-structured interviews. To analyse the data, content analysis was performed. Overall, the findings support the initial model. Nevertheless, some adjustments were made to accommodate the findings from the field study. Most of the informants did not agree on the influence of the Economic Divide on Trust in e-Government, and the influence of the Economic Divide on e-Government Use. Due to the field study findings, the role of the Economic Divide was changed to that of a moderator variable in the influence of the Digital Divide on e-Government Systems Success (Figure 4.3). Consequently, the hypotheses within the model were developed and presented in Chapter Five. Overall, 16 hypotheses were proposed.

In the second stage, the quantitative approach was used by conducting a survey involving 251 respondents in the second stage in order to test the hypotheses. However, after the data screening process, only 237 questionnaires were used in the data analysis. Analyses using the Partial Least Square (PLS) technique were carried out, in line with the research questions. Overall, the findings confirmed the impact of the Digital Divide on e-Government Systems Success. The results also underline the relationships among the variables of the Digital Divide. Furthermore, with the exception of the Access Divide, the findings demonstrate the mediating role of Trust in e-Government in the influence of Digital Divide on e-Government Systems Success. In terms of the moderating effect of the Demographic Divide and the Economic Divide, the results confirmed the role of age, residential place and education as the moderating variables on the impact of the Digital Divide on e-Government Systems Success.

8.3. Contributions of the Research

8.3.1. Theoretical Contributions

This research pioneers an advance in the theoretical account of the digital divide. As mentioned before, the previous studies on digital divide focused on the access divide. The study thus goes beyond previous research by more comprehensively

describing the influence of three orders of digital divide on e-government use as well as how the access divide influences the capability divide, which in turn impacts upon the innovativeness divide. This finding contributes to the more advanced explanations of the digital divide as a socio-economic phenomenon. Overall, this research makes four contributions to theory.

Firstly, Dewan and Riggins (2005) and Wei et al. (2011) has expressed the need to extend our understanding of digital divide beyond access divide. In addition, they suggested the urgency to examine the capability divide. On the other hand, Dijk and Hacker (2003) also admitted that the willingness of targeted users was a more important problem than the problem of access. Therefore, the current research extends the model into five-types of digital divide framework. This framework can be applied and tested in wide variety of contexts to establish the boundaries of its applicability.

Secondly, the results provide explanations on how factors in the digital divide affect one another, as proposed in the research model. The findings highlight the relationships between the access divide and the capability divide as well as relationships between the capability divide and the innovativeness divide. Based on these results, a more comprehensive policy to close the digital divide is needed.

Thirdly, this study introduces a new order of digital divide, namely the innovativeness divide. The results are in agreement with a previous study by Dijk and Hacker (2003), which suggested that motivational problem existed in using new technology. Such cognitive/behavioural issues such as anxiety and hesitancy are also experienced in Indonesia and Asia in general, where culturally people tend to avoid taking risks (Hofstede 2009). Thus, the barriers to trying any technological innovations, particularly Internet based technology, need to be lowered. Improving computer self-efficacy is one of the significant ways to improve motivation or willingness to try technological innovations.

Fourthly, this research finds that trust in e-government has a mediating effect, although previous studies were dominated by investigations of its direct influence

to technology adoption (eg., Gefen, Karahanna, and Straub 2003; Sharma 2008; Pennington, Wilcox, and Grover 2003). There has been a disagreement among scholars on the role of trust in e-government system (Kelton, Fleischmann, and Wallace 2007), thus this current research confirms its applicability.

As presented in Figure 2.1 (p. 16), scholars of ICT4D (Information and Communication Technology For Development) argue that development of a system, including e-government system, is just the first step toward the next steps, which are adoption, use and impact. In order to be adopted and used, the development of e-government system should consider the need of the users. Those at the bottom of the pyramid or disadvantaged people should not be ignored. They need to be able to access government services transparently and at low cost. The findings of this research highlight the Informatics Lifecycle Stage of Applicability, and this is the fifth contribution.

8.3.2. Practical Contributions

The results of this research have important practical implications, particularly in relation to improving e-government use or e-government readiness. Lack of use and access to e-government systems can have a flow-on effect, causing wider inequalities in society (Jorgansen and Cable 2002; Warren 2007). The e-Government Readiness Survey shows that the development of e-government systems in Indonesia has not been progressing. Indonesia needs strategic and integrative policies to improve their e-government systems. This research provides a more comprehensive understanding of the issue of the digital divide as the basis for a new integrative policy for the Indonesian government to close the gap.

The demographic characteristics of those who actually used the e-government system in this study were: male, aged 30-40, residing in the city area, well-educated and mostly from a middle-income economic background. Most of the previous research into the digital divide found similar demographic characteristics for the Internet users. However, in order to expand the numbers of e-government users,

the government could improve its customer base by paying more attention to other groups of people. By considering such factors as gender, socioeconomic status and place of residence it should be possible to increase the number of e-government users.

The results of multi-group analysis by using PLS show that place of residence has the strongest moderating effect, compared to other demographic and economic measures. Hence, special policies are needed to narrow the digital divide between rural and urban residents. Learning from the experiences of other countries, local governments in Indonesia should provide free public Internet and ICT access in rural areas. In addition, the government should develop the e-government services based on the needs of its citizens, including those disadvantage groups of citizens (those of lower socio economic status, older age, with less education, female gender, and reside in rural areas). A comprehensive analysis of needs assessment is thus needed before planning and developing e-government systems.

The results of this study indicate that due to the low cost of an Internet connection nowadays, personal economic circumstances were not perceived as significant to e-government use. However, according to Badan Pusat Statistik (BPS) or Statistics Indonesia (2011), in 2011, there were 11.05 million and 18.97 million people living below the poverty line in rural and urban areas, respectively. This amounts to 9.23% and 15.72% of people in rural and urban area in Indonesia who live below the poverty line. These people are still struggling with basic needs and therefore may not consider investment in ICT, as their circumstances would not permit it.

The participants in this study emphasised the importance of the access divide, the capability divide and the innovativeness divide on e-government use. This finding might be used by the government of the day to go beyond the fact that the digital divide is not only evidence of the inequality between those who have access and those who do not; providing access is one policy that will assist in closing the digital divide. However, in addition to access provision, the government might investigate the options for educating its citizens in the utilisation of ICT, along with popularising

the existence and benefits of e-government in order to minimise its citizens' hesitancy.

This research underlines the importance of trust in e-government; trust plays a significant role as a mediator. It is imperative to build all citizens' trust in e-government if it is to succeed, particularly when inequalities and gaps are so wide. From this study, the government may now choose to upgrade its system by providing informative content, and by clearly describing their services and tariffs through their websites. The websites should be constructed in such a way that they are able to mitigate uncertainty and inspire trust.

8.4. Research Limitations

The first limitation of this study is in focus on the economic, social, and cultural environment that is distinctive and unique to Indonesia. This may restrict the generalisation of the results to other cultures (Teo, Wei, and Benbasat 2003). Nevertheless, this restriction may not be as severe as it first appears, as in the context of culture, Asian countries and other countries share many similar cultural traits, as suggested by Hofstede (2009); Hofstede et al. (2006). In terms of socio-economic environment, other developing countries may also have a similar environment to that of Indonesia. Notwithstanding possible cultural limitations, this research makes an overall contribution to IS research by validating and assessing the applicability of the research in the context of both Asian countries and developing countries.

The second limitation in the research is regarding the actual use of the e-government system. The sample of users was limited to users of G2C (Government to Citizens) e-government systems provided by local governments. Users of other types of e-government systems as well as those of central government may have different views on e-government usage and the digital divide. Therefore, there is still a need to investigate and compare the perceptions of users of other e-government systems.

The third limitation is that evidence in the qualitative approach (field study) was collected using interviews, which were then interpreted by the researchers. The subjectivity of the researchers may possibly have influenced the data analysis (Chan and Ngai 2007). Nevertheless the findings in the quantitative approach following the field study confirm the field study results.

Finally, since the quantitative data in this research was collected using self-reporting surveys, the data is potentially vulnerable to the common method bias (Podsakoff et al. 2003). For example, respondents may have attempted to guess the researchers' intentions, and responded accordingly, or each respondent may have perceived the strength of each Likert scale measurement in a different manner.

8.5. Future Research Directions

The abovementioned limitations in this study imply the need for further research. The lack of ability to generalise, due to the socio-economic and cultural environment in Indonesia, points to the need for cross-country studies. Cross-country research could widen the applicability of the conceptual model when used under different circumstances.

This study collected data from the users of e-government systems provided by local governments. Although the justification for the choice of these particular users is valid, future research might interview and survey other significant respondents. In addition, the use of multiple respondents would widen applicability.

Finally, in addition to researching the impact of the digital divide on e-government system success, the core of this model is applicable in other contexts, especially those that are influenced by the digital divide. Beyond the scope of e-government systems, the conceptual model could be applied to other systems such as e-commerce. Notwithstanding this, the model may require some extension and further construct operationalisation for different types of services and contexts.

8.6. Summary

E-government has been acknowledged to be an essential system for delivering government services nowadays. It offers many benefits to the government internally, along with benefits for citizens and business. However, e-government initiatives face some challenges in their implementation. The digital divide is known as one of these challenges, as empirical evidence is still lacking. Moreover, the understanding of the issue of digital divide requires further work. This study aims to fill the research gap.

A qualitative field study combined with a national survey and quantitative data analysis determined the influence of the digital divide on e-government system success. The Access Divide, Capability Divide, and Innovativeness Divide were proven to be substantial for e-Government System Success. Furthermore, this research confirmed the relationships among variables in the digital divide. The research also offered a theoretical contribution through the finding of the mediating effect of trust in e-government in the influence of the digital divide on e-government system success. The moderating effects of residential place, age and education were proven.

Based on the findings, this research contributes significantly to theoretical developments in the literature on the digital divide and e-government, and to the information systems field by providing a more comprehensive framework for understanding the issue of the digital divide. Practically, this research should be valuable to governments as it provides evidence of the impact of the digital divide on e-government use.

References:

- Abdulai, A., and W. E. Huffman. 2005. The diffusion of new agricultural technologies: The case of crossbred-cow technology in Tanzania. *American Journal of Agricultural Economics* 87 (3): 645-660.
- AbuShanab, E., and J. M. Pearson. 2007. Internet banking in Jordan: The unified theory of acceptance and use technology (UTAUT) perspective. *Journal of System and Information Technology* 9 (1): 78-97.
- Agarwal, R., A. Animesh, and K. Prasad. 2009. Social interactions and the digital divide: Explaining variations in internet use. *Information Systems Research* 20 (2): 277-294.
- Agarwal, R., and J. Prasad. 1997. The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sciences* 28 (3): 557-582.
- . 1998. A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research* 9 (2): 204-215.
- Agyapong, P., and P. Ferreira. 2009. *37th Telecommunications Policy Research Conference, Spillover effects from wiring schools with broadband: Implications for universal service policy*. Arlington, VA. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2004029 (accessed 21 June 2013).
- Ahmad, N., N. T. Amer, F. Qutaifan, and A. Alhilali. 2013. Technology adoption model and a road map to successful implementation of ITIL. *Journal of Enterprise Information Management* 26 (5): 553-576.
- Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50 (2): 179-211.
- Ajzen, I., and M. Fishbein. 1980. *Understanding Attitudes and Predicting Social Behavior*. Upper Saddle River, NJ.: Prentice-Hall, Inc.
- Akca, H., M. Sayili, and K. Esengun. 2007. Challenge of rural people to reduce digital divide in the globalized world: Theory and practice. *Government Information Quarterly* 24 (2): 404-413.
- Al-Kibsi, G., K. d. Boer, M. Mourshed, and N. P. Rea. 2001. Putting citizens online, not in line. *The McKinsey Quarterly Special Edition* (2): 65-73.
- Amri, P. 2000. *Dampak Ekonomi dan Politik UU No. 22 dan 25 Tahun 1999 Tentang Otonomi Daerah*. Jakarta: CSIS.
- Annan, K. 2004. Secretary General, Marking World Telecommunication Day, Says Affordable Technologies Can Be Effective Engines Of Social, Material Change. <http://www.un.org/News/Press/docs/2004/sgsm9294.doc.htm>.
- Atewell, P. 2001. The first and second digital divides. *Sociology and Education* 74 (3): 252-259.
- Au, N., E. W. T. Ngai, and T. C. E. Cheng. 2008. Extending the understanding of end user information systems satisfaction formation: An equitable needs fulfillment model approach. *MIS Quarterly* 32 (1): 43-66.

- Bagozzi, R. P. 1992. The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly* 55 (2, Special Issue: Theoretical Advances in Social Psychology): 178-204.
- Bagozzi, R. P., H. Baumgartner, and Y. Yi. 1992. State versus action orientation and the Theory of Reasoned Action: An application to coupon usage. *Journal of Consumer Research* 18 (4): 505-518.
- Bagozzi, R. P., and S. K. Kimmel. 1995. A comparison of leading theories for the prediction of goal-directed behaviours. *British Journal of Social Psychology* 34 (4): 437-461.
- Bagozzi, R. P., and Y. Yi. 1988. On the evaluation of structural equation models. *Journal of the Academy of Marketing Science* 16 (1): 74-94.
- Ballou, D. P., and G. K. Tayi. 1999. Enhancing data quality in data warehouse environments. *Communications of the ACM* 42 (1): 73-79.
- Bandura, A. 1977. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review* 84 (2): 191-215.
- . 2001. Social cognitive theory: An agentic perspective. *Annual Review of Psychology* 52 (1): 1-26.
- Barclay, D., C. Higgins, and R. Thompson. 1995. Partial least squares approach to causal modelling: Personal computer adoption and use as an illustration. *Technology Studies* 2 (2): 285-324.
- Barki, H., S. Rivard, and J. Talbot. 1993. Toward an assessment of software development risk. *Journal of Management Information Systems* 10 (2): 203-225.
- Baron, R. M., and D. A. Kenny. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 51 (6): 1173-1182.
- Barua, A., C. H. Kriebel, and T. Mukhopadhyay. 1995. Information technologies and business value: An analytic and empirical investigation. *Information Systems Research* 6 (1): 3-23.
- Beedell, J., and T. Rehman. 2000. Using social-psychology models to understand farmers' conservation behaviour. *Journal of Rural Studies* 16 (1): 117-127.
- Belanger, F., and L. Carter. 2009. The impact of the digital divide on e-government use. *Communications of the ACM* 52 (4): 132-135.
- Bem, D. J., and A. Allen. 1974. On predicting some of the people some of the time: The search for cross-situational consistencies in behavior. *Psychological Review* 81 (6): 506-520.
- Bem, S. L. 1981. The BSRI and gender schema theory: A reply to Spence and Helmreich. *Psychological Review* 88 (4): 369-371.
- Benjamin, P. 1999. Community development and democratisation through information technology: Building the new South Africa. In *Reinventing Government in the Information Age: International Practice in IT-Enabled Public Sector Reform*, edited by R. Heeks. London and New York. Routledge.
- Berg, B. L. 2004. *Qualitative Research Method for the Social Science*. 5th. ed. Boston: Pearson Education Inc. .
- Bertot, J. C. 2003. The multiple dimensions of the digital divide: More than the technology 'haves' and 'have nots'. *Government Information Quarterly* 20 (2): 185-191.

- Billon, M., R. Marco, and F. Lera-Lopez. 2009. Disparities in ICT adoption: A multidimensional approach to study the cross-country digital divide. *Telecommunications Policy* 33 (10-11): 596-610.
- Blackler, F., and C. Brown. 1985. Evaluation and the impact of information technologies on people in organizations. *Human Relations* 38 (3): 213-231.
- Bontis, N., L. D. Booker, and A. Serenko. 2007. The mediating effect of organizational reputation on customer loyalty and service recommendation in the banking industry. *Management Decision* 45 (9): 1426-1445.
- Borstein, M. H., and R. H. Bradley. 2003. *Socioeconomic Status, Parenting, and Child Development*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Bozeman, B. 2000. *Bureacracy and Red Tape*. Upper Saddle River, NJ.: Prentice Hall.
- Brown, D. H., and S. Thompson. 2011. Priorities, policies and practice of e-government in a developing country context: ICT infrastructure and diffusion in Jamaica. *European Journal of Information Systems* 20 (3): 329-342.
- Brown, D. M. 1999. Information systems for improved performance management: Development approaches in US public agencies. In *Reinventing Government in the Information Age: International Practice in IT-Enabled Public Sector Reform*, edited by R. Heeks. London and New York. Routledge.
- Brown, M. M. 2001. The benefits and costs of information technology innovations: An empirical assessment of a local government agency. *Public Performance and Management Review* 24 (4): 351-366.
- . 2003. Technology diffusion and the "knowledge barrier": The dilemma of stakeholder participation. *Public Performance and Management Review* 26 (4): 345-359.
- Brown, M. M., and J. L. Brudney. 2003. Learning organizations in the public sector? A study of police agencies employing information and technology to advance knowledge. *Public Administration Review* 63 (1): 30-43.
- Bucy, E. P. 2000. Social access to the internet. *The Harvard International Journal of Press/Politics* 5 (1): 50-61.
- Bulguru, B., H. Cavusoglu, and I. Benbasat. 2010. Information security policy compliance: An empirical study of rationality-based beliefs and information security awareness. *MIS Quarterly* 34 (3): 523-548.
- Burbridge, L. 2002. Accountability and MIS. *Public Performance and Management Review* 25 (4): 421-423.
- Burkhardt, M. E., and D. J. Brass. 1990. Changing patterns or patterns of change: The effect of a change in technology on social network structure and power. *Administrative Science Quarterly* 35 (1): 104-127.
- Burn, J., and G. Robins. 2003. Moving towards e-government: A case study of organizational change processes. *Logistics Information Management* 16 (1): 25-35.
- Burton, R. J. F. 2004. Reconceptualising the 'behavioural approach' in agricultural studies: A socio-psychological perspective. *Journal of Rural Studies* 20 (3): 359-371.
- Campbell, A. 1962. The passive citizen. *Acta Sociologica* 6 (1/2): 9-21.
- Carter, L., and F. Belanger. 2005. The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal* 15 (1): 5-25.
- Carter, L., L. C. Shaupp, J. Hobbs, and R. Campbell. 2011. The role of security and trust in the adoption of online tax filing. *Transforming Government People, Process and Policy* 5 (4): 303-318.

- Cavana, R., U. Sekaran, and B. L. Delahaye. 2001. *Applied Business Research: Qualitative and Quantitative Methods*. Milton, Queensland: John Wiley and Sons.
- Chan, S. C., and E. W. Ngai. 2007. A qualitative study of information technology adoption: How ten organizations adopted web-based training. *Information Systems Journal* 17 (3): 289-315.
- Charng, H.-W., J. A. Piliavin, and P. L. Callero. 1988. Role identity and reasoned action in the prediction of repeated behavior. *Social Psychology Quarterly* 51 (4): 303-317.
- Chau, P. Y. K. 1996. An empirical assessment of a modified Technology Acceptance Model. *Journal of Management Information Systems* 13 (2): 185-204.
- Chen, W. S., and R. Hirschheim. 2004. A paradigmatic and methodological examination of information systems research from 1991 to 2001. *Information Systems Journal* 14 (3): 197-235.
- Cheng, Y.-M. 2011. Antecedents and consequences of e-learning acceptance. *Information Systems Journal* 21 (3): 269-299.
- Chengalur-Smith, I., and P. Duchessi. 1999. The initiation and adoption of client-server technology in organizations. *Information & Management* 35 (2): 77-88.
- Chiffoleau, Y. 2005. Learning about innovation through networks: The development of environment-friendly viticulture. *Technovation* 25 (10): 1193-1204.
- Chin, W. W. 1998. The Partial Least Squares Approach to Structural Equation Modeling. In *Modern Methods for Business Research*, ed. G. A. Marcoulides, 295-336. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publisher.
- Chin, W. W., and A. Gopal. 1995. Adoption intention in GSS: Relative importance beliefs. *Data Base Advances* 26 (2 & 3): 42-64.
- Cho, Y. H., and B.-D. Choi. 2004. E-Government to combat corruption: The case of Seoul metropolitan government. *International Journal of Public Administration* 27 (10): 719-735.
- Coch, L., and J. R. P. French Jr. 1948. Overcoming resistance to change. *Human Relations* 1 (4): 512-532.
- Cody, M. J., D. Dunn, S. Hoppin, and P. Wendt. 1999. Silver surfers: Training and evaluating Internet use among older adult learners. *Communication Education* 48 (4): 269-286.
- Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Cohen, N., and T. Arieli. 2011. Field research in conflict environments: Methodological challenges and snowball sampling. *Journal of Peace Research* 48 (4): 423-435.
- Cole, R. L. 1973. Toward a model of political trust: a causal analysis. *American Journal of Political Science* 17 (4): 809-817.
- Colesca, S. E., and L. Dobrica. 2008. Adoption and use of e-government services: The case of Romania. *Journal of Applied Research and Technology* 6 (3): 204-217.
- Compeau, D., C. A. Higgins, and S. Huff. 1999. Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly* 23 (2): 145-158.
- Converse, J. M., and S. Presser. 1986a. *Survey Questions: Handcrafting the Standardized Questionnaire*. Edited by J. L. Sullivan and R. G. Niemi, *Quantitative Applications in the Social Science*. Beverly Hills, California: SAGE Publications, Inc.
- Converse, J. M., and S. Presser. 1986b. *Survey Questions: Handcrafting the Standardized Questionnaire*. Thousand Oaks, California: SAGE Publications Ltd.

- Corrocher, N., and A. Ordanini. 2002. Measuring the digital divide: A framework for the analysis of cross-country differences. *Journal of Information Technology* 17 (1): 9-19.
- Creswell, J. W. 2003. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, California: SAGE Publications Ltd.
- Creswell, J. W., and V. L. P. Clark. 2011. *Designing and Conducting Mixed Methods Research*. 2nd ed. Thousand Oaks, California: SAGE Publications Ltd.
- Cronbach, L. J. 1950. Further evidence on response sets and test design. *Educational and Psychological Measurement* 10 (3): 3-31.
- Cropanzano, R., and M. S. Mitchell. 2005. Social exchange theory: An interdisciplinary review. *Journal of Management* 31 (6): 874-900.
- Crotty, M. 1998. *The Foundations of Social Research: Meaning and perspective in the research process*. Crows Nest: Allen & Unwin.
- Cyr, D. 2008. Modelling web site design across cultures; Relationships to trust, satisfaction, and e-loyalty. *Journal of Management Information Systems* 24 (4): 47-72.
- Czaja, S. J., and J. Sharit. 1993. Age differences in the performance of computer-based work. *Psychology and Aging* 8 (1): 59-67.
- Datta, P. 2010. A preliminary study of ecommerce adoption in developing countries. *Information Systems Journal* 21 (1): 3-32.
- Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 13 (3): 319-340.
- Davis, F. D., R. P. Bagozzi, and P. R. Warshaw. 1989. User acceptance of computer technology: A comparison of two theoretical models. *Management Science* 35 (8): 982-1003.
- . 1992. Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology* 22 (14): 1111-1132.
- Davison, R. M., C. Wagner, and L. C. Ma. 2005. From government to e-government: A transition model. *Information, Technology and People* 18 (3): 280-299.
- Dawes, S. S. 1996. Interagency information sharing: Expected benefits, manageable risks. *Journal of Policy Analysis and Management* 15 (3): 377-394.
- De Haan, J. 2004. A multifaced dynamic model of the digital divide. *IT Society* 1 (7): 66-88.
- DeLone, W. H., and E. R. McLean. 1992. Information systems success: The quest for the dependent variable. *Information Systems Research* 3 (1): 60-95.
- . 2003. The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems* 19 (4): 9-30.
- Dewan, S., D. Ganley, and K. L. Kraemer. 2005. Across the Digital Divide: A Cross-Country Multi-Technology Analysis of the determinants of IT Penetration. *Journal of the Association for Information Systems* 6 (12): 409-432.
- Dewan, S., and F. J. Riggins. 2005. The Digital Divide: Current and Future Research Directions. *Journal of the Association for Information Systems* 6 (12): 298-337.
- DiMaggio, P., and E. Hargittai. 2001. From the 'Digital Divide' to 'Digital Inequality': Studying Internet Use as Penetration Increases. Princeton University. Center for Arts and Cultural Policy Studies.
- DiMaggio, P., E. Hargittai, C. Celeste, and S. Shafer. 2001. *From Unequal Access to Differentiated Use: A Literature Review and Agenda for Research on Digital Inequality*. Russel Sage Foundation.

- DiMaggio, P., E. Hargittai, W. Neuman, and J. Robinson. 2001. Social Implication of the Internet. *Annual Review of Sociology* 27 (1): 307-336.
- Doty, D. H., and W. H. Glick. 1998. Common methods bias: Does common methods variance really bias results? *Organizational Research Methods* 1 (4): 374-406.
- East, R. 1993. Investment decisions and the theory of planned behaviour. *Journal of Economic Psychology* 14 (2): 337-375.
- Edmiston, K. D. 2003. State and local e-government: Prospects and challenges. *The American Review of Public Administration* 33 (1): 20-45.
- Ellen, P. S., w. O. Bearden, and S. Sharma. 1991. Resistance to technological innovations: An examination of the role of self-efficacy and performance satisfaction. *Journal of the Academy of Marketing Science* 19 (4): 297-307.
- Escobar-Rodriguez, T., P. Monge-Lozano, and M. M. Romero-Alonso. 2012. Acceptance of e-prescriptions and automated medication-management systems in hospitals: An extension of the Technology Acceptance Model. *Journal of Information Systems* 26 (1): 77-96.
- Evans-Cowley, J., and M. M. Conroy. 2004. What is e-governance? *Planning Advisory Service Report* May (525): 1-25.
- Evans, D., and D. C. Yen. 2005. E-Government: An Analysis for Implementation: Framework for Understanding Cultural and Social Impact. *Government Information Quarterly* 22 (3): 354-373.
- Ferro, E., N. C. Helbig, and J. R. Gil-Garcia. 2011. The role of IT literacy in defining digital divide policy needs. *Government Information Quarterly* 28 (1): 3-10.
- Fetler, M. 1985. Sex differences on the California Statewide assessment of computer literacy. *Sex Roles* 13 (3/4): 181-191.
- Fisher, D. K., J. Norvell, S. Sonka, and M. J. Nelson. 2000. Understanding technology adoption through system dynamics modelling: Implications for agribusiness management. *International Food and Agribusiness Management Review* 3 (3): 281-296.
- Flick, U. 2007. *Designing Qualitative Research*. Los Angeles: SAGE.
- Floropoulos, J., C. Spathis, D. Halvatzis, and M. Tsipouridou. 2010. Measuring the success of the Greek taxation information system. *International Journal of Information Management* 30 (1): 47-56.
- Flynn, L. R., and R. E. Goldsmith. 1993. A Validation of the Goldsmith and Hofacker Innovativeness Scale. *Educational and Psychological Measurement* 53 (4): 1105-1116.
- Fornell, C., and D. F. Larcker. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 18 (1): 39-50.
- Forte-Gardner, O., F. L. Young, D. A. Dillman, and M. S. Carroll. 2004. Increasing the effectiveness of technology transfer for conservation cropping systems through research and field design. *Renewable Agriculture and Food Systems* 19 (4): 93-114.
- Foundation, B. M. G. 2012. *Libraries*. <http://www.gatesfoundation.org/libraries/Pages/default.aspx> (accessed 8 October 2012).
- Fountain, J. 2001. *Building the Virtual State: Information technology and Institutional Change*. Washington DC.: Brookings Institution Press.

- Frantzich, S. E. 1979. Technological innovation among congressmen. *Social Forces* 57 (3): 968-974.
- Frazer, L., and M. Lawley. 2000. *Questionnaire Design & Administration*. Brisbane, Australia: John Wiley & Sons Australia, Ltd.
- Furuholt, B., and F. Wahid. 2008. *41st Hawaii International Conference on System Sciences E-Government Challenges and the Role of Political Leadership in Indonesia: the Case of Sragen*. Hawaii: IEEE
- Gagnon, Y. C. 2001. The behavior of public managers in adopting new technologies. *Public Performance and Management Review* 24 (4): 337-350.
- Gatignon, H., and T. S. Robertson. 1989. Technology diffusion: An empirical test of competitive effects. *Journal of Marketing* 53 (1): 35-49.
- Gauld, R., S. Goldfinch, and S. Horsburgh. 2010. Do they want it? Do they use it? The 'demand-side' of e-government in Australia and New Zealand. *Government Information Quarterly* 27 (3): 177-186.
- Gefen, D. 2000. E-Commerce: The Role of Familiarity and Trust. *Omega* 28 (6): 725-737.
- Gefen, D., I. Benbasat, and P. A. Pavlou. 2008. A research agenda for trust in online environments. *Journal of Management Information Systems* 24 (4): 275-286.
- Gefen, D., E. Karahanna, and D. W. Straub. 2003. Trust and TAM in online shopping: An integrated model. *MIS Quarterly* 27 (1): 51-90.
- Gefen, D., D. W. Straub, and M.-C. Boudreau. 2000. Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems* 4 (7): 1-77.
- Gelderman, M. 1998. The Relationship Between User Satisfaction, Usage of Information System and Performance. *Information and Management* 34 (1): 11-18.
- Gil-Garcia, J. R., and T. A. Pardo. 2005. E-Government Success Factors: Mapping Practical Tools to Theoretical Foundations. *Government Information Quarterly* 22 (2): 187-216.
- Goldfarb, A. 2006. The (teaching) role of universities in the diffusion of the internet. *International Journal of Industrial Organization* 24 (2): 203-225.
- Goldfinch, S. 2007. Pessimism, computer failure, and information systems development in the public sector. *Public Administration Review* 67 (5): 917-929.
- Goldsmith, R. E., and C. F. Hofacker. 1991. Measuring consumer innovativeness. *Journal of the Academy of Marketing Science* 19 (3): 209-221.
- Greene, J. C., V. J. Caracelli, and W. F. Graham. 1989. Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis* 11 (3): 255-274.
- Gripenberg, P. 2011. Computer self-efficacy in the information society: Design of learning strategies, mechanisms and skill areas. *Information Technology & People* 24 (3): 301-331.
- Guba, E. G., and Y. S. Lincoln. 1994. Competing paradigms in qualitative research. In *Handbook of Qualitative Research*, ed. N. K. Denzin and Y. S. Lincoln, 105-117. Thousand Oaks, California: SAGE Publications Ltd.
- Guinea, A. O. d., and M. L. Markus. 2009. Why break the habit of a lifetime? Rethinking the roles of intention, habit, and emotion in continuing information technology use. *MIS Quarterly* 33 (3): 433-444.
- Gupta, M. P., and D. Jana. 2003. E-Government evaluation: A framework and case study. *Government Information Quarterly* 20 (4): 365-387.

- Gurstein, M. 2003. Perspectives on urban and rural community informatics: Theory and performance, community informatics and strategies for flexible networking. In *Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology*, ed. S. Marshall, W. Taylor and X. Yu, 1-12. Westport, CT: Praeger Publishers.
- . 2007. *What is Community Informatics (and Why Does It Matter)?* Vol. 2. Milan, Italy: Polimetrica.
- Hair, J. F., C. M. Ringle, and M. Sarstedt. 2011. PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice* 19 (2): 139-151.
- Hair, J. F., M. Sarstedt, C. M. Ringle, and J. A. Mena. 2012. An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science* 40 (4): 414-433.
- Haldenwang, C. V. 2004. Electronic government (e-government) and development. *The European Journal of Development Research* 16 (2): 417-432.
- Hampton, K. N. 2003. Grieving for a lost network: Collective action in a wired suburb. *The Information Society* 19 (5): 417-428.
- . 2010. Internet use and the concentration of disadvantage: Glocalization and the urban underclass. *American Behavioral Scientist* 53 (8): 1111-1132.
- Hargittai, E. 2006. Hurdles to Information Seeking: Spelling and Typographical Mistakes During Users' Online Behavior. *Journal of the Association for Information Systems* 7 (1): 52-67.
- Harijadi, D. A. 2004. Developing e-Government: The Case of Indonesia. In *29th Meeting APEC Telecommunication and Information Working Group*. Hong Kong, China. UNPAN.
- Harijadi, D. A., and E. Satriya. 2000. Indonesia's Roadmap to e-Government: Opportunities and Challenges. In *APEC High-Level Symposium on e-Government*. Seoul, Korea. UN APCICT-ESCAP.
- Haryono, T., and Y. K. Widiwardono. 2010. *Current Status and Issues of e-Government in Indonesia*. <http://www.aseansec.org/13757.htm> (accessed September 7, 2010).
- Hategekimana, B., and M. Trant. 2002. Adoption and diffusion of new technology in agriculture: Genetically modified corn and soybeans. *Canadian Journal of Agricultural Economics* 50 (4): 357-371.
- Hausman, A. 2005. Innovativeness among small businesses: Theory and propositions for future research. *Industrial Marketing Management* 34 (8): 773-782.
- Heeks, R. 1999. Reinventing government in the information age. In *Reinventing Government in the Information Age. International Practice in IT-Enabled Public Sector Reform*, ed. R. Heeks, 9-21. London: Routledge.
- . 2007. Theorizing ICT4D research. *Information Technologies and International Development* 3 (3): 1-4.
- . 2008a. ICT4D 2.0: The Next Phase of Applying ICT for International Development. *IEEE Computer Society*.
- . 2008b. *Success and Failure in e-Government Projects*. <http://www.egov4dev.org/success/sfrates.shtml#survey> (accessed June, 5th 2010).
- . 2009. The ICT4D 2.0 Manifesto: Where Next for ICTs and International Development. In *Development Informatics, Working Paper Series*. Manchester, UK. Development Informatics Group, Institute for Development Policy and Management.

- Heintze, T., and S. Bretschneider. 2000. Information technology and restructuring in public organizations: Does adoption of information technology affect organizational structures, communications, and decision making? *Journal of Public Administration Research and Theory* 10 (4): 801-830.
- Hindman, D. B. 2000. The rural-urban digital divide. *Journalism and Mass Communication Quarterly* 77 (3): 549-560.
- Ho, A. T.-K. 2002. Reinventing Local Governments and the e-Government Initiative. *Public Administration Review* 62 (4): 424-444.
- Hofstede, G. 1983. Cultural Dimensions in Management and Planning. *Asia Pacific Journal of Management* 1 (2): 81-99.
- . 2009. *Cultural Dimensions*. <http://www.geert-hofstede.com/> (accessed August, 10th 2010).
- Hofstede, G. J., C. M. Jonker, S. Meijer, and T. Verwaart. 2006. Modelling Trade and Trust Across Cultures. In *Trust Management*, ed. K. Stolen, 120-134. Berlin: Springer.
- Hohenthal, J. 2006. Integrating qualitative and quantitative methods in research on international entrepreneurship. *Journal of International Entrepreneur* 4 (2): 175-190.
- Holden, S. H., D. F. Norris, and P. D. Fletcher. 2003. Electronic government at the local level: Progress to date and future issues. *Public Performance and Management Review* 26 (4): 325-344.
- Hosmer, L. T. 1995. Trust: The connecting link between organizational theory and philosophical ethics. *The Academy of Management Review* 20 (2): 379-403.
- Hsieh, J. P.-A., A. Rai, and M. Keil. 2008. Understanding Digital Inequality: Comparing Continued Use Behavioral Models of Socio-Economically Advantage and Disadvantage. *MIS Quarterly* 32 (1): 97-126.
- . 2011. Addressing Digital Inequality for the Socioeconomically Disadvantaged Through Government Initiatives: Forms of Capital That Affect ICT Utilization. *Information Systems Research* 22 (2): 233-253.
- Hu, P. J., P. Y. K. Chau, O. R. I. sheng, and K. Y. Tam. 1999. Examining the Technology Acceptance Model using physician acceptance of telemedicine technology. *Journal of Management Information Systems* 16 (2): 91-112.
- Hulland, J. 1999. Use of Partial Least Squares (PLS) in strategic management research: A review of four studies. *Strategic Management Journal* 20 (2): 195-204.
- Hurt, H. T., K. Joseph, and C. D. Cook. 1977. Scales of the Measurement of Innovativeness. *Human Communication Research* 4 (1): 58-65.
- Hwang, J., and I. Syamsuddin. 2008. Failure of e-government implementation: A case study of South Sulawesi. In *3rd International Conference on Convergence and Hybrid Information Technology*. IEEE Computer Society.
- Igbaria, M., and A. Chakrabarti. 1990. Computer anxiety and attitudes towards microcomputer use. *Behaviour & Information Technology* 9 (3): 229-241.
- Igbaria, M., T. Guimaraes, and G. B. Davis. 1995. Testing the determinants of microcomputer usage via a Structural Equation Model. *Journal of Management Information Systems* 11 (4): 87-114.
- Indonesia, S. 2011. *Trends of the selected socio-economic indicators of Indonesia; November 2011*. Jakarta: Badan Pusat Statistik Indonesia.
- Irani, Z., T. Elliman, and P. Jackson. 2007. Electronic transformation of government in the UK: A research agenda. *European Journal of Information Systems* 16 (4): 327-335.

- Jaggi, A. 2003. Transforming regional economies and communities with ICT developing countries: An Indian perspective. In *Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology*, ed. S. Marshall, W. Taylor and X. Yu, 181-194. Westport, CT.: Praeger Publishers.
- James, D. W., and P. Ziebell. 2003. Community capacity building through ICT networking. In *Closing the Digital Divide: Transforming Regional Economies and Communities With Information Technology*, ed. S. Marshall, W. Taylor and X. Yu, 45-62. Westport, CT: Praeger Publishers.
- James, J. 2004. Reconstructing the digital divide from the perspective of a large, poor, developing country. *Journal of Information Technology* 19 (3): 172-177.
- . 2007. From origins to implications: Key aspects in the debate over the digital divide. *Journal of Information Technology* 22 (3): 284-295.
- Jensen, R. A. 2001. Strategic intrafirm innovation adoption and diffusion. *Southern Economic Journal* 68 (1): 120-132.
- Johanson, G. 2011a. Delineating the meaning and value of development informatics. In *ICTs and Sustainable Solutions for the Digital Divide: Theory and Perspectives*, edited by J. Steyn and G. Johanson. Hershey, Pennsylvania. IGI Global.
- . 2011b. Delineating the meaning and value of development informatics. In *ICTs and Sustainable Solutions for the Digital Divide*, ed. J. Steyn and G. Johanson, 1-18. Hershey, Pennsylvania: IGI Global.
- Johnson, R. B., and A. J. Onwuegbuzie. 2004. Mixed methods research: A research paradigm whose time has come. *Educational Researcher* 33 (7): 14-26.
- Johnson, R. B., A. J. Onwuegbuzie, and L. A. Turner. 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research* 1 (2): 112-133.
- Jorgansen, D. J., and S. Cable. 2002. Facing the challenges of e-government: A case study of the city of Corpus Christi, Texas. *Advanced Management Journal* 67 (3): 1-7.
- Jung, J.-Y., J. L. Qiu, and Y.-C. Kim. 2001. Internet connectedness and inequality: Beyond the "divide". *Communication Research* 28 (4): 507-525.
- Kauffman, R. J., and A. A. Techatassanasoontorn. 2005. Is there a global digital divide for digital wireless phone technologies? *Journal of the Association for Information Systems* 6 (12): 338-382.
- Ke, W., and K. K. Wei. 2004. Successful e-government in Singapore. *Communications of the ACM* 47 (6): 95-99.
- Kelton, K., K. R. Fleischmann, and W. A. Wallace. 2007. Trust in Digital Information. *Journal of the American Society for Information Science and Technology* 59 (3): 363-374.
- Keong, M. L., T. Ramayah, S. Kurnia, and L. M. Chiun. 2012. Explaining intention to use an enterprise resource planning (ERP) system: An extension of the UTAUT model. *Business Strategy Series* 13 (4): 173-180.
- Kim, E., and J. Lee. 1986. An exploratory contingency model of user participation and MIS use. *Information & Management* 11 (2): 87-97.
- Kim, S., and D. Kim. 2003. South Korean public officials' perceptions of values, failure, and consequences of failure in e-government leadership. *Public Performance and Management Review* 26 (4): 360-375.
- King, J. L. 1982. Local government use of information technology: The next decade. *Public Administration Review* 42 (1): 25-36.

- Kirton, M. 1976. Adaptors and Innovators: A Description and Measure. *Journal of Applied Psychology* 61 (5): 622-629.
- Kohli, R., S. Devaraj, and M. A. Mahmood. 2004. Understanding determinants of online consumer satisfaction: A decision process perspective. *Journal of Management Information Systems* 21 (1): 115-135.
- Krauss, S. E. 2005. Research paradigms and meaning making: A primer. *The Qualitative Report* 10 (4): 758-770.
- Kuhn, T. S. 1970. *The Structure of Scientific Revolutions*. 2nd ed. Chicago: The University of Chicago Press.
- Kuk, G. 2003. The Digital Divide and the Quality of Electronic Service Delivery in Local Government in the United Kingdom *Government Information Quarterly* 20 (4): 353-363.
- Kumar, N. 1996. The power of trust in manufacturer-retailer relationships. *Harvard Business Review* 74 (2): 92-106.
- Kvasny, L., and M. Keil. 2006. The challenges of redressing the digital divide: A tale of two US cities. *Information Systems Journal* 16 (1): 23-53.
- La Porte, T. M., C. C. Demchak, and M. d. Jong. 2002. Democracy and bureaucracy in the age of the web. *Administration & Society* 34 (4): 411-446.
- Lacey, M. 2000. Clinton enlists top-grade help for plan to increase computer use. In *The New York Times*. New York.
- Landsbergen Jr., D., and G. Wolken Jr. 2001. Realizing the promise: Government information systems and the fourth generation of information technology. *Public Administration Review* 61 (2): 206-220.
- Layne, K., and J. Lee. 2001. Developing fully functional e-government: A four stage model. *Government Information Quarterly* 18 (2): 122-136.
- Lee, J. K., and H. R. Rao. 2012. Service source and channel choice in G2C service environments; A model comparison the anti/counter-terrorism domain. *Information Systems Journal* 22 (4): 313-341.
- Lee, K. C., and N. Chung. 2009. Understanding Factors Affecting Trust In and Satisfaction with Mobile Banking in Korea: A Modified DeLone and McLean's Model Perspective. *Interacting with Computers* 21 (5-6): 385-392.
- Leonard-Barton, D., and I. Deschamps. 1988. Managerial influence in the implementation of new technology. *Management Science* 34 (10): 1252-1265.
- Lewis, D. J., and A. Weigert. 1985. Trust as a Social Reality. *Social Forces* 63 (4): 967-985.
- Loges, W. E., and J.-Y. Jung. 2001. Exploring the digital divide: Internet connectedness and age. *Communication Research* 28 (4): 536-562.
- Loo, W. H., P. H. P. Yeow, and S. C. Chong. 2009. User acceptance of Malaysian government multipurpose smartcard applications. *Government Information Quarterly* 26 (2): 358-367.
- LSI. 2010. *Akuntabilitas Politik: Evaluasi Publik Atas Pemerintahan SBY-Boediono*. Jakarta: Lembaga Survei Indonesia.
- Lucas, H. C. 1978. Empirical evidence for a descriptive model of implementation. *MIS Quarterly* 2 (2): 27-42.
- Luk, S. C. Y. 2009. The Impact of Leadership and Stakeholders on the Success/Failure of e-Government Service: Using the Case Study of e-Stamping Service in Hong Kong. *Government Information Quarterly* 26 (4): 594-604.

- Mahler, J., and P. M. Regan. 2002. Learning to govern online: Federal agency internet use. *The American Review of Public Administration* 32 (3): 326-349.
- Manfredo, M. J., and B. Shelby. 1988. The effect of using self-report measures in tests of attitude-behavior relationships. *The Journal of Social Psychology* 128 (6): 731-743.
- Marakas, G. M., M. Y. Yi, and R. D. Johnson. 1998. The multilevel and multifaceted character of computer self-efficacy: Toward clarification of the construct and an integrative framework for research. *Information Systems Research* 9 (2): 126-163.
- Marche, S., and J. D. McNiven. 2003. E-Government and e-Governance: The future isn't what it used to be. *Canadian Journal of Administrative Sciences* 20 (1): 74-86.
- Mariscal, J. 2005. Digital Divide in a Developing Country *Telecommunications Policy* 29 (5-6): 409-428.
- Mason, R. O. 1978. Measuring Information Output: A Communication Systems Approach. *Information and Management* 1 (2): 219-234.
- Matell, M. S., and J. Jacoby. 1972. Is there an optimal number of alternatives for Likert-scale items?: Effects of testing time and scale properties. *Journal of Applied Psychology* 56 (6): 506-509.
- Mathieson, K. 1991. Predicting user intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior. *Information Systems Research* 2 (3): 173-191.
- McFarlan, F. W. 1981. Portfolio approach to information systems. *Harvard Business Review* 59 (2): 142-150.
- McKinnon, C. 2005. Challenges Facing the Public Sector. *KM World* 14 (6): 53-54.
- McKnight, D. H., and N. L. Chervany. 2002. What Trust Means in E-Commerce Customer Relationships: An Interdisciplinary Conceptual Typology. *International Journal of Electronic Commerce* 6 (2): 35-59.
- Meehl, P. E. 1978. Theoretical risks and tabular asterisks: Sir Karl, Sir Ronald, and the slow progress of soft psychology. *Journal of Consulting and Clinical Psychology* 46 (4): 806-834.
- Melitski, J., and M. Holzer. 2007. Assessing digital government at the local level worldwide: An analysis of municipal web sites throughout the world. In *Current Issues and Trends in e-Government Research*, ed. D. Norris, 1-21. Hershey, PA: IGI Global.
- Midgley, D. F., and G. R. Dowling. 1978. Innovativeness: The Concept and Its Measurement. *Journal of Consumer Research* 4 (4): 229-242.
- Mills, B. F., and B. E. Whitacre. 2003. Understanding the non-metropolitan-metropolitan digital divide. *Growth and Change* 34 (2): 219-243.
- Mingers, J. 2001. Combining IS research methods: Towards a pluralist methodology. *Information Systems Research* 12 (3): 240-259.
- Mintzberg, H. 1996. Managing government, governing management. *Harvard Business Review* 74 (3): 75-83.
- Moon, M. J. 2002. The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review* 62 (4): 424-433.
- Moores, T. T., and J. C.-J. Chang. 2006. Ethical decision making in software piracy: Initial development and test of a four-component model. *MIS Quarterly* 30 (1): 167-180.
- Morgan, D. L. 1998. Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative Health Research* 8 (3): 362-376.

- , 2007. Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research* 1 (1): 48-76.
- Morgan, R. M., and S. D. Hunt. 1994. The Commitment-Trust Theory of Relationship Marketing *Journal of Marketing* 58 (3): 20-38.
- Morris, M. G., and V. Venkatesh. 2000. Age differences in technology adoption decisions: Implications for a changing work force. *Personnel Psychology* 53 (2): 375-403.
- Moshiri, S., and S. Nikpoor. 2011. International ICT spillover. In *ICTs and Sustainable Solutions for the Digital Divide: Theory and Perspectives*, edited by J. Steyn and G. Johanson. Hershey, PA. IGI Global.
- Mossberger, K., C. J. Tolbert, and M. Gilbert. 2006. Race, Place and Information technology. *Urban Affairs Review* 41 (5): 583-620.
- Mossberger, K., C. J. Tolbert, and R. McNeal. 2008. *Digital Citizenship: The Internet, Society, and Participation*. Massachusetts: The MIT Press.
- Myers, C., and M. Conner. 1992. Age differences in skill acquisition and transfer in an implicit learning paradigm. *Applied Cognitive Psychology* 6 (5): 429-442.
- Nadler, D. A. 1981. Managing organizational change: An integrative perspective. *The Journal of Applied Behavioral Science* 17 (2): 191-221.
- Ndeta, P. 2003. ICT integration in social and economic development: Kenya's perspective. In *Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology*, ed. S. Marshall, W. Taylor and X. Yu, 93-100. Westport, CT: Praeger Publishers.
- Newburger, E. C. 2001. *Home Computers and Internet Use in the United States: August 2000*. Washington DC: U.S. Census Bureau.
- Nicholas, K. 2003. Geo-policy barriers and rural internet access: The regulatory role in constructing the digital divide. *The Information Society* 19 (4): 287-295.
- Norris, D. F., and K. L. Kraemer. 1996. Mainframe and PC computing in American cities: Myths and realities. *Public Administration Review* 56 (6): 568-576.
- Norris, P. 2001. *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. Cambridge: Cambridge University Press.
- NTIA. 1995. *Falling through the Net: A Survey of the "Have Nots" in Rural and Urban America*. Washington DC: US Department of Commerce.
- , 2000. *Falling through the Net*.
- , 2011. *Exploring the Digital Nation: Computer and Internet Use at Home*. Washington DC.: Economics and Statistics Administration and National Telecommunications and Information Administration
- Nunnally, J. C., and I. H. Bernstein. 1994. *Psychometric Theory*. 3rd ed. New York: McGraw-Hill.
- O'Connor, E. J., C. K. Parsons, R. C. Liden, and D. M. Herold. 1990. Implementing new technology: Management issues and opportunities. *The Journal of High Technology Management Research* 1 (1): 69-89.
- OECD. 2001. *Understanding The Digital Divide*. Paris: OECD.
- Ono, H. 2006. Digital inequality in East Asia: Evidence from Japan, South Korea, and Singapore. In *Asian Economic Panel*. Keio University, Tokyo, Japan. The Earth Institute at Columbia University and the Massachusetts Institute of Technology.

- Onwuegbuzie, A. J., and N. L. Leech. 2005. On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *Int. Journal. Social Research Methodology* 8 (5): 375-387.
- Orlikowski, W. J., and J. J. Baroudi. 1991. Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research* 2 (1): 1-28.
- Osborne, D., and T. Gaebler. 1992. *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*. Reading, Massachusetts: Addison-Wesley Pub. Co.
- Pascual, P. J. 2003. *e-Government*. Manila: e-ASEAN Task Force & UNDP-APDIP.
- Pavlou, P. A. 2003. Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model *International Journal of Electronic Commerce* 7 (3): 101-134.
- Pavlou, P. A., and M. Fyngson. 2006. Understanding and predicting electronic commerce adoption: An extension of the Theory of Planned Behavior. *MIS Quarterly* 30 (1): 115-143.
- Pavlou, P. A., and D. Gefen. 2004. Building effective online marketplaces with institution-based trust. *Information Systems Research* 15 (1): 37-59.
- Peace, A. G., d. F. Galletta, and J. Y. L. Thong. 2003. Software piracy in the workplace: A model and empirical test. *Journal of Management Information Systems* 20 (1): 153-177.
- Pennington, R., H. D. Wilcox, and V. Grover. 2003. The role of system trust in business-to-consumer transactions. *Journal of Management Information Systems* 20 (3): 197-226.
- Peter, J., and P. M. Valkenburg. 2006. Adolescents' internet use: Testing the "disappearing digital divide" versus the "emerging digital differentiation" approach. *Poetics* 34: 293-305.
- Pigg, K. 2011. Information communication technology and its impact on rural community economic development. In *ICTs and Sustainable Solutions for the Digital Divide: Theory and Perspectives*, edited by J. Steyn and G. Johanson. Hershey, PA. IGI Global.
- Podsakoff, P. M., S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology* 88 (5): 879-903.
- Podsakoff, P. M., and D. W. Organ. 1986. Self-reports in organizational research: Problems and prospects. *Journal of Management* 12 (4): 531-544.
- Polgar, S., and S. A. Thomas. 2008. *Introduction to Research in the Health Sciences*. 5th ed. New York: Churchill Livingstone Elsevier.
- Prattipati, S. N. 2003. Adoption of e-governance: Differences between countries in the use of online government services. *Journal of American Academy of Business, Cambridge* 3 (1/2): 386-391.
- Preacher, K. J., and A. F. Hayes. 2008. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods* 40 (3): 879-891.
- Prybutok, V. R., X. Zhang, and S. D. Ryan. 2008. Evaluating leadership, IT quality, and net benefits in an e-government environment. *Information & Management* 45 (2): 143-152.
- Quaddus, M., and G. Hofmeyer. 2007. An investigation into the factors influencing the adoption of B2B trading exchanges in small business. *European Journal of Information Systems* 16 (3): 202-215.

- Quaddus, M., and J. Xu. 2005. Adoption and diffusion of knowledge management systems: Field studies of factors and variables. *Knowledge-Based Systems* 18 (2-3): 107-115.
- Quibra, M., S. N. Ahmed, T. Tschang, and M.-L. Reyes-Macasaquit. 2003. Digital Divide: Determinants and Policies with Special Reference to Asia. *Journal of Asian Economics* 13: 811-825.
- Rahman, A., and M. Quaddus. 2012. *Australasian Conference on Information Systems, Qualitative investigation of digital divide in Indonesia: Toward a comprehensive framework*. Geelong, Victoria, Australia: Deakin University. <http://dro.deakin.edu.au/eserv/DU:30049100/rahman-qualitativeinvestigation-2012.pdf> (accessed
- Ramirez, R. 2001. A model for rural and remote information and communication technologies: A Canadian exploration. *Telecommunications Policy* 25: 315-330.
- Ranerup, A. 1999. Internet-enabled applications for local government democratisation: Contradictions of the Swedish experience. In *Reinventing Government in the Information Age: International Practice in IT-Enabled Public Sector Reform*, edited by R. Heeks. London and New York: Routledge.
- Rattray, J., and M. C. Jones. 2007. Issues in clinical nursing: Essential elements of questionnaire design and development. *Journal of Clinical Nursing* 16 (2): 234-243.
- Redman, T. C. 1998. The impact of poor data quality on the typical enterprise. *Communications of the ACM* 41 (2): 79-82.
- Rhodes, S. R. 1983. Age-related differences in work attitudes and behavior: A review and conceptual analysis. *Psychological Bulletin* 93 (2): 328-367.
- Richards, L. 1999. *Using NVivo in Qualitative Research*. Melbourne: Qualitative Solutions and Research.
- Rigdon, E. E. 1998. Structural Equation Modeling. In *Modern Methods for Business Research*, ed. G. A. Marcoulides, 251-294. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publisher.
- Rocheleau, B. 2000. Prescriptions for public-sector information management: A review, analysis, and critique. *The American Review of Public Administration* 30 (4): 414-435.
- Rogers, E. M. 1976. New Product Adoption and Diffusion. *Journal of Consumer Research* 2 (4): 290-301.
- . 1995. *Diffusion of Innovations*. 4th ed. New York: The Free Press.
- . 2003. *Diffusion of Innovations*. 5th ed. New York: Free Press.
- Rosen, L. D., and P. Maguire. 1990. Myths and realities of computerphobia: A meta-analysis. *Anxiety Research: An International Journal* 3 (3): 175-191.
- Rossman, G. B., and B. L. Wilson. 1985. Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review* 9 (5): 627-643.
- Rotter, J. B. 1971. Generalized Expectancies for Interpersonal Trust. *American Psychologist* 26 (5): 443-452.
- Roy, J. 2003. The relational dynamics of e-governance: A case study of the City of Ottawa. *Public Performance and Management Review* 26 (4): 391-403.
- Ruttan, V. W. 1996. What happened to technology adoption-diffusion research? *Sociologia Ruralis* 36 (1): 51-73.
- Salazar, A. 1999. Evaluating information systems for decentralisation: Health management reform in Ecuador. In *Reinventing Government in the Information Age: International*

Practice in IT-Enabled Public Sector Reform, edited by R. Heeks. London and New York. Routledge.

- Schachter, H. L. 1995. Reinventing government or reinventing ourselves: Two models for improving government performance. *Public Administration Review* 55 (6): 530-537.
- Schleife, K. 2010. What Really Matters: regional versus Individual Determinants of the Digital Divide in Germany. *Research Policy* 39 (1): 173-185.
- Schuppan, T. 2009. E-Government in developing countries: Experiences from sub-saharan Africa. *Government Information Quarterly* 26 (1): 118-127.
- Schurr, P. H., and J. L. Ozanne. 1985. Influences on exchange processes: Buyers' preconceptions of a seller's trustworthiness and bargaining toughness. *Journal of Consumer Research* 11 (4): 939-953.
- Sechrest, L., and S. Sidani. 1995. Quantitative and qualitative methods: Is there an alternative? *Evaluation and Program Planning* 18 (1): 77-87.
- Seltzer, L. F. 1983. Influencing the "shape" of resistance: An experimental exploration of paradoxical directives and psychological reactance. *Basic and Applied Social Psychology* 4 (1): 47-71.
- Selwyn, N. 1998. The effect of using a home computer on students' educational use of IT. *Computer Education* 31: 211-227.
- Seneviratne, S. J. 1999. Information technology and organizational change in the public sector. In *Information Technology and Computer Applications in Public Administration: Issues and Trends*, ed. G. D. Garson, 41-61. Hershey, PA.: Idea Group Publishing.
- Sharit, J., and S. J. Czaja. 1994. Ageing, computer-based task performance, and stress: Issues and challenges. *Ergonomics* 37 (4): 559-577.
- Sharma, L. 2008. Implementation of e-governance: Some technical issues and challenges. In *Developing Successful ICT Strategies: Competitive Advantages in a Global Knowledge-Driven Society*, ed. H. Rahman, 226-239. Hershey, PA.: IGI Global.
- Shearman, C. 2003. Strategies for reconnecting communities: Creative uses of ICTs for social and economic transformation. In *Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology*, ed. S. Marshall, W. Taylor and X. Yu, 13-26. Westport, CT.: Praeger Publishers.
- Sheppard, B. H., J. Hartwick, and P. R. Warshaw. 1988. The Theory of Reasoned Action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research* 15 (3): 325-343.
- Shih, C.-F., and A. Venkatesh. 2004. Beyond adoption: development and application of a use-diffusion model. *Journal of Marketing* 68 (1): 59-72.
- Shimp, T. A., and A. Kavas. 1984. The Theory of Reasoned Action applied to coupon usage. *Journal of Consumer Research* 11 (3): 795-809.
- Siltaoja, M. E. 2006. Value priorities as combining core factors between CSR and reputation: A qualitative study. *Journal of Business Ethics* 68 (1): 91-111.
- Sirdeshmukh, D., J. Singh, and B. Sabol. 2002. Consumer Trust, Value, and Loyalty in Relational Exchanges. *Journal of Marketing* 66 (1): 15-37.
- Sirgy, M. J., D. Efraty, P. Siegel, and D.-J. Lee. 2001. A new measure of quality of work life (QWL) based on need satisfaction and spillover theories. *Social Indicators Research* 55 (3): 241-302.

- Sobel, M. E. 1982. Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology* 13: 290-312.
- Spector, P. E. 1987. Method variance as an artifact in self-reported affect and perceptions at work: Myth or significant problem? *Journal of Applied Psychology* 72 (3): 438-443.
- Srivastava, S. C., and T. T. Teo. 2007. E-Government Payoffs: Evidence from Cross Country Data. *Journal of Global Information Management* 15 (4): 20-40.
- Stern, M. J., A. E. Adams, and S. Elsassser. 2009. Digital Inequality and Place: The Effects of Technological Diffusion on Internet Proficiency and Usage Across Rural, Suburban and Urban Counties. *Sociological Inquiry* 79 (4): 391-417.
- Steyn, J. 2011. Paradigm shift required for ICT4D. In *ICTs and Sustainable Solutions for the Digital Divide*, ed. J. Steyn and G. Johanson, 19-44. Hershey, Pennsylvania: IGI Global.
- Straub, D., M. Limayem, and E. Karahanna-Evaristo. 1995. Measuring system usage: Implications for IS theory testing. *Management Science* 41 (8): 1328-1342.
- Tashakkori, A., and C. Teddlie. 1998. *Mixed Methodology: Combining Qualitative and Quantitative Approaches*. Edited by L. Bickman and D. J. Rog. 48 vols. Vol. 46, *Applied Social Research Methods Series*. Thousand Oaks, California: SAGE Publications Ltd.
- . 2003. *Handbook of Mixed Methods in Social and Behavioral Research*. Thousand Oaks, California: SAGE Publications Ltd.
- Taylor, S., and P. Todd. 1995a. Assessing IT usage: The role of prior experience. *MIS Quarterly* 19 (4): 561-570.
- Taylor, S., and P. A. Todd. 1995b. Understanding information technology usage: A test of competing models. *Information Systems Research* 6 (2): 144-176.
- Teddlie, C., and A. Tashakkori. 2009. *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Science*. Thousand Oaks, California: SAGE Publications Ltd.
- Tengtrakul, P., and J. M. Peha. 2013. Does ICT in schools affect residential adoption and adult utilization outside schools? *Telecommunications Policy* 37 (6-7): 540-562.
- Teo, H. H., K. K. Wei, and I. Benbasat. 2003. Predicting intention to adopt interorganizational linkages: An institutional perspective. *MIS Quarterly* 27 (1): 19-49.
- Teo, T. S., S. C. Srivastava, and L. Jiang. 2009. Trust and Electronic Government Success: An Empirical Study. *Journal of Management Information Systems* 25 (3): 99-131.
- Teo, T. S. H., and J. Liu. 2006. Consumer trust in electronic commerce in the United States, Singapore and China. *Omega* 35 (1): 22-38.
- Thomas, C. W. 1998. Maintaining and restoring public trust in government agencies and their employees. *Administration & Society* 30 (2): 166-193.
- Thompson, N. J., and K. E. Thompson. 1996. Reasoned action theory: An application to alcohol-free beer. *Journal of Marketing Practice* 2 (2): 35-48.
- Thompson, R. L., C. A. Higgins, and J. M. Howell. 1991. Personal computing: Toward a conceptual model of utilization. *MIS Quarterly* 15 (1): 124-143.
- Thong, J. Y. L. 1999. An integrated model of information systems adoption in small business. *Journal of Management Information Systems* 15 (4): 187-214.
- Trauth, E. M., and L. M. Jessup. 2000. Understanding computer-mediated discussions: Positivist and interpretive analyses of group support system use. *MIS Quarterly* 24 (1): 43-79.

- Trompenaars, F., and C. Hampden-Turner. 2012. *Riding the Waves of Culture: Understanding Diversity in Global Business*. 3rd ed. New York: McGraw-Hill.
- Tsikriktsis, N. 2004. A technology readiness-based taxonomy of customers: A replication and extension. *Journal of Service Research* 7 (1): 42-52.
- UN. 2005. *Global E-Government Readiness Report 2005: From E-Government to E-Inclusion*. New York: United Nations.
- . 2008. *E-Government Survey 2008: From E-Government to Connected Government*. New York: United Nations.
- . 2010. *E-Government Survey 2010: Leveraging e-Government at a Time of Financial and Economic Crisis*. New York: United Nations.
- . 2012. *E-Government Survey 2012: e-Government for the People*. New York: United Nations.
- UNCTAD. 2010. *Information Economy Report 2010: ICTs, Enterprises and Poverty Alleviation*. New York and Geneva: United Nations Conference on Trade and Development.
- van Dijk, J., and K. Hacker. 2003. The digital divide as a complex and dynamic phenomenon. *The Information Society* 19 (4): 315-326.
- van Dijk, J. A. G. M. 2006. Digital divide research, achievements and shortcomings. *Poetics* 34 (4-5): 221-235.
- van Dijk, J. A. G. M., O. Peters, and W. Ebbers. 2008. Explaining the acceptance and use of government Internet services: A multivariate analysis of 2006 survey data in the Netherlands. *Government Information Quarterly* 25 (3): 379-399.
- Vance, A., C. Elie-Dit-Cosaque, and D. W. Straub. 2008. Examining Trust in Information Technology Artifacts: The Effects of System Quality and Culture. *Journal of Management Information Systems* 24 (4): 73-100.
- Vathanopas, V., N. Krittayaphongphun, and C. Klomsiri. 2008. Technology Acceptance Toward e-Government Initiative in Royal Thai Navy. *Transforming Government: People, Process and Policy* 2 (4): 256-282.
- Venkatesh, V., and F. D. Davis. 2000. A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science* 46 (2): 186-204.
- Venkatesh, V., and M. G. Morris. 2000. Why don't men ever stop ask for direction? Gender, social influence and their role in technology acceptance and usage behavior *MIS Quarterly* 24 (1): 115-139.
- Venkatesh, V., M. G. Morris, G. B. Davis, and F. D. Davis. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly* 27 (3): 425-478.
- Venkatesh, V., J. Y. L. Thong, and X. Xu. 2012. Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly* 36 (1): 157-178.
- Venkatesh, V., J. Y.L.Thong, F. K. Y. Chan, P. J.-H. Hu, and S. A. Brown. 2011. Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context. *Information Systems Journal* 21 (6): 527-555.
- Vigoda, E. 2000. Are you being served? The responseveenee of public administration to citizens' demands: An empirical examination in Israel. *Public Administration* 78 (1): 165-191.

- Vlachos, P. A., A. Tsamakos, A. P. Vrechopoulos, and P. K. Avramidis. 2009. Corporate Social Responsibility: Attributions, Loyalty, And the Mediating Role of Trust. *Journal of the Academy Marketing Science* 37 (2): 170-180.
- Wahid, F. 2008. Evaluating Focus and Quality of Indonesian e-Government Websites. In *Seminar Nasional Aplikasi Teknologi Informasi*. Yogyakarta. Islamic University of Indonesia.
- Wang, Y.-S., and Y.-W. Liao. 2008. Assessing e-Government Systems Success: A Validation of the DeLone and McLean Model of Information Systems Success. *Government Information Quarterly* 25 (4): 717-733.
- Wang, Y.-S., and Y.-W. Shih. 2009. Why do people use information kiosks? A validation of the Unified Theory of Acceptance and Use of Technology. *Government Information Quarterly* 26 (1): 158-165.
- Warkentin, M., D. Gefen, P. A. Pavlou, and G. M. Rose. 2002. Encouraging Citizen Adoption of e-Government by Building Trust. *Electronic Markets* 12 (3): 157-162.
- Warren, M. 2007. The digital vicious cycle: Links between social disadvantage and digital exclusion in rural areas. *Telecommunications Policy* 31 (6-7): 374-388.
- Warschauer, M. 2003a. Dissecting the "digital divide": A case study in Egypt. *The Information Society* 19 (4): 297-304.
- . 2003b. *Technology and Social Inclusion: Rethinking the Digital Divide*. Massachusetts: The MIT Press.
- Warshaw, P. R. 1980. A new model for predicting behavioral intentions: An alternative to Fishbein. *Journal of Marketing Research* 17 (2): 153-172.
- Watson, G. 1971. Resistance to change. *The American Behavioral Scientist* 14 (5): 745-766.
- Weber, M. 1947. *The Theory of Social and Economic Organization*. Alexandria, VA: Alexander Street Press.
- Wei, K.-K., H.-H. Teo, H. C. Chan, and B. C. Tan. 2011. Conceptualizing and Testing a Social Cognitive Model of the Digital Divide. *Information Systems Research* 22 (1): 170-187.
- Werts, C. E., R. L. Linn, and K. G. Joreskog. 1974. Intraclass reliability estimates: Testing structural assumptions. *Educational and Psychological Measurement* 34 (1): 25-33.
- West, D. M. 2004. E-Government and the transformation of service delivery and citizen attitudes. *Public Administration Review* 64 (1): 15-27.
- West, J. P., and E. M. Berman. 2001. The impact of revitalized management practices on the adoption of information technology: A national survey of local governments. *Public Performance and Management Review* 24 (3): 233-253.
- Wilkening, E. A. 1950. Sources of information for improved farm practices. *Rural Sociology* 15 (1): 19-30.
- Williams, D. R. 1990. Socioeconomic differentials in health: A review and redirection. *Social Psychology Quarterly* 53 (2): 81-99.
- Willis, J. W. 2007. *Foundations of qualitative research: Interpretive and critical theory approaches*. Thousand Oaks, CA.: Sage Publications.
- Winkler, J. D., D. E. Kanouse, and J. E. Ware. 1982. Controlling for acquiescence response set in scale development. *Journal of Applied Psychology* 67 (5): 555-561.
- Wold, H. 2006. Partial Least Squares. In *Encyclopedia of Statistical Sciences*, edited by S. Kotz. Hoboken, New Jersey. John Wiley & Sons.
- Wolfe, L. 1999. Transforming accountability for government information technology projects: The impacts of new US legislation. In *Reinventing Government in the*

Information Age: International Practice in IT-Enabled Public Sector Reform, edited by R. Heeks. London and New York. Routledge.

- Wong, W., and E. Welch. 2004. Does e-government promote accountability? a comparative analysis of website openness and government accountability. *Governance: An International Journal of Policy, Administration, and Institutions* 17 (2): 275-297.
- Wu, P. F. 2012. A mixed methods approach to technology acceptance research. *Journal of the Association for Information Systems* 13 (3): 172-187.
- Yi, M. Y., K. D. Fiedler, and J. S. Park. 2006. Understanding the Role of Individual Innovativeness in the Acceptance of IT-Based Innovations: Comparative Analyses of Models and Measures. *Decision Sciences* 37 (3): 393-426.
- Ynalvez, M., and W. Shrum. 2006. International training and the digital divide: Computer and email use in the Philippines. *Perspectives on Global Development and Technology* 5 (4): 277-302.
- Zmud, R. W. 1979. Individual differences and MIS success; a review of the empirical literature. *Management Science* 25 (10): 966-979.

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Appendix 1 – Interview Guideline

Interview Guideline

The main objective of this research is to examine the influence of digital divide and trust on e-government system success in Indonesian local governments. This interview aims to supplement the initial research model based on the users' experiences. This leads to the following interview questions:

About e-Government System Success:

Q1. *Are you a user of e-Government system (One-stop service) provided by local government?*

Probe:

- How many times do you use the One-stop service?
- How often do you use the One-stop service?
- Which service have you used?
- Why have you shifted from traditional system to One-stop service?
- Do you think an increase of economic condition will increase your usage of the One-stop service?

Q2. *How satisfied are you with e-Government system (One-stop service)?*

Probe:

- Are you satisfied with this One-stop service?
- Do you think the One-stop service has met your expectations?

Q3. *What benefits do you get from e-Government system (One-stop service)?*

Probe:

- Do you think that the One-stop service makes your business easier?
- Do you think that One-stop service saves your time?
- Do you think that One-stop service cost you less?
- Is there any other benefit from One-stop service?

About the influence of digital divide on e-Government System Success

Q4. *What do you think of your accessibility of e-Government system (One-stop service)?*

Probe:

- Can you access to the One-stop service easily?
- Does your place of residence limit your accessibility of One-stop service?
- Do you feel comfortable in accessing this One-stop service?
- Do you think an increase of accessibility of ICT will increase your capability in using ICT?
- Do you think an increase of economic condition will increase your access to the One-stop service?
- Do you think an increase of accessibility of One-stop service will increase your trust in the One-stop service?
- Do you think an increase of accessibility of One-stop service will increase your usage of the One-stop service?
- Do you have any other comments on accessing One-stop service?

Q5. *Are you confident in working with information technology?*

Probe:

- Do you have any difficulties in using information technology?
- Do you feel comfortable working with information technology?
- Are you sure you can work with information technology?
- Do you think an increase of capability in using ICT will increase your willingness to try out any new ICT?
- Do you think an increase of capability in using ICT will increase your trust in the One-stop service?
- Do you think an increase of capability in using ICT will increase your usage the One-stop service?
- Do you have any other comments on your capability in using information technology?

Q6. *What is your perception of new information technology?*

Probe:

- If you hear about a new IT, would you look for ways to experiment with it?
- Among your peers, are you usually the first to try out new IT?
- In general, are you hesitant to try out new IT?
- Do you like to experiment with new IT?
- Do you think an increase of the willingness to try out any new ICT will increase your trust in the One-stop service?
- Do you think an increase of the willingness to try out any new ICT will increase your usage of the One-stop service?
- Do you have any other comments on your perception of new information technology?

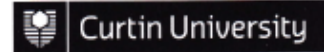
About the influence of Trust in e-Government on e-Government System Success

Q7. *Do you trust e-Government system (One-stop service)?*

Probe:

- Do you think that the One-stop service seems to be truthful and honest to you?
- Do you think that the One-stop service is competent and effective in facilitating your needs?
- Do you think that the One-stop service cares about its users?
- Do you think that the One-stop service is stable and predictable?
- Do you think that the One-stop service is sincere and genuine?
- Do you think that the One-stop service would keep its commitments?
- Do you think an increase of your trust in One-stop service will increase your usage of the One-stop service?
- Do you think an increase of economic condition will increase your trust in the One-stop service?
- Do you have any other comments on the trust in e-Government?

Appendix 2 – Ethics Approval for Qualitative Interview



Memorandum

To	Arief Rahman, Curtin Graduate School of Business
From	Debbie Jordan
Subject	Protocol Approval GSB 01-11
Date	9 February 2011
Copy	Mohammed Quaddus, Curtin Graduate School of Business

Office of Research and
Development

Human Research Ethics
Committee

Telephone: 9266 2784

Facsimile: 9266 3793

Email

hrec@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "*Toward a comprehensive conceptualization of the digital divide and its impact on e-government system success: Evidence from local governments in Indonesia*". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months **09/02/2011** to **09/02/2012**.

The approval number for your project is **GSB 01-11**. Please quote this number in any future correspondence. If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Debra Jordan

Project Officer | Curtin Graduate School of Business

Curtin University

Tel | +61 8 9266 9083

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Hours | **Tues, Wed & Thurs**

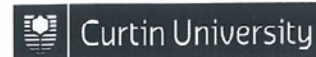
Email | debra.jordan@gsb.curtin.edu.au

Web | gsb.curtin.edu.au

Please Note: The following standard statement must be included in the information sheet to participants:

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number «Approval_Number»). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or hrec@curtin.edu.au

Appendix 3 – Ethics Approval for Quantitative Survey



Memorandum

To	Arief Rahman, CGSB
From	Debbie Jordan
Subject	Protocol Approval GSB 11-11
Date	21 July 2011
Copy	Mohammed Quaddus

Office of Research and Development
Human Research Ethics Committee
Telephone 9266 2784
Facsimile 9266 3793
Email hrec@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "*Toward A Comprehensive Conceptualization of the Digital Divide and Its Impact on e-Government System Success: Evidence from Local Governments in Indonesia*". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months **20/07/11** to **20/07/12**.

The approval number for your project is **GSB 11-11**. Please quote this number in any future correspondence. If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Debra Jordan
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Hours Tues, Wed & Thurs

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Web gsb.curtin.edu.au

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number «Approval_Number»). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or hrec@curtin.edu.au

Research Questionnaire

Digital Divide and E-Government System Success

The willingness to use and ability to access of citizens are critical in e-government system. However, unequal access and ICT usage, which is known as digital divide, has been identified as one of the obstacles to the implementation of e-government system. Digital divide inhibits citizen's acceptance to e-government; therefore, these gaps should be closed despite the lack of deep theoretical understanding on this issue. This research is conducted as part of the Doctoral program in Curtin University and aims to investigate the digital divide and its direct impact on e-government system success of local governments in Indonesia as well as indirect impact through the mediation role of trust. As part of this research, questionnaires will be distributed to the e-government system users. The questionnaire will need approximately 15-20 minutes to complete.

Your participation in this study is voluntary and you are free to withdraw at any time. Individual participant will not be identified, and all information will be kept confidential and will only be used for research purposes. The result of the study will be made available to all participants.

General Instructions

1. Please answer the questions to the best of your knowledge. Most of the questions require your view or opinion measured on a six-point scale. There are no right and wrong answers on the questionnaire. It is only about your own opinion on a number of topics.
2. Responses to all questions will be kept strictly confidential. Your responses are combined with all other respondents and are completely non-traceable. Individual responses cannot be identified in anyway.
3. The survey is made up of several short parts. Please complete them all.

Thank you so much for your help. I really appreciate it.

Researcher

Arief Rahman

Definitions



The following definitions are used for this survey questionnaire:

1. **E-government:** the use of information and communication technology to enhance the access to and delivery of all facets of government services and operations for the benefit of citizens, business, employees and other stakeholders. In this research, e-government refers to systems include those such as One-Stop Service Online System used by many local government agencies.
2. **Information and communication technology:** all technical means used to handle information and aid communication, including mobile phones, televisions and other broadcast media, all types of audio and video processing, computer, internet, hardware, as well as necessary software.

Section 1: Demographic Information

Please answer the questions below by ticking in the box, which corresponds to the most appropriate response.

1. Gender
Female...
Male...
2. Age group
under 20...
21 – 30...
31 – 40...
41 – 50...
over 50...
3. What is your highest level of education?
High School...
Diploma...
Undergraduate...
Master's degree...
Doctoral degree...
Other (please specify)

4. Approximately, the total monthly income before taxes and other deductions of my immediate family – including my own job income, income from other sources and the income of my spouse – is:
Under Rp. 2.500.000...
Rp. 2.500.000 – Rp. 5.000.000.....
Rp. 5.000.000 – Rp. 7.500.000.....
Rp. 7.500.000 – Rp. 10.000.000....
Rp. 10.000.000 – Rp. 12.500.000....
More than Rp. 12.500.000....
5. How far is your home from the city centre?
Under 5 kms...
5 – 10 kms...
10 – 15 kms...
15 – 20 kms...
More than 20 kms...
6. Do you have computer at home? No...
Yes...
7. Do you have internet connection at home? No...

- Yes....
8. How many times have you used One-Stop Service Online System so far? Once....
Two – Three times....
Three – Five times....
More than five times....
9. Among your total usages of One-Stop Service Online System, how many times have you completed your transactions? Once....
Two – Three times....
Three – Five times....
More than five times....

Section 2: About E-government Use, Satisfaction and Benefits

The statements below seek your experience and opinion about e-government, especially the One-Stop Service Online System provided by your local government. Please read each statement carefully, and then indicate the extent to which you agree or disagree by circling the number on a scale of 1 (Strongly disagree) to 6 (Strongly agree).

<i>PLEASE ANSWER ALL STATEMENTS</i>		Strongly Disagree			Strongly Agree		
10.	Using the One-Stop Service Online System is a good idea.	1	2	3	4	5	6
11.	I am satisfied with the One-Stop Service Online System	1	2	3	4	5	6
12.	The One-Stop Service Online system has met my expectations	1	2	3	4	5	6
13.	I strongly recommend the One-Stop Service Online System to others	1	2	3	4	5	6
14.	I think that I made a correct decision to use the One-Stop Service Online System	1	2	3	4	5	6
15.	The One-Stop Service Online System makes my business easier	1	2	3	4	5	6
16.	The One-Stop Service Online System saves my time	1	2	3	4	5	6
17.	The One-Stop Service Online System costs me less than manual system	1	2	3	4	5	6

Section 3: About Your Access to Information and Communication Technology

The statements below seek your opinion about your access to information and communication technology in general. Please read each statement carefully, and then indicate the extent to which you agree or disagree by circling the number on a scale of 1

(Strongly disagree) to 6 (Strongly agree).

<i>PLEASE ANSWER ALL STATEMENTS</i>		Strongly Disagree				Strongly Agree	
18.	I can access information and communication technology easily	1	2	3	4	5	6
19.	I feel comfortable in getting access to information and communication technology	1	2	3	4	5	6

Section 4: About Your Capability in Using Information and Communication Technology

The statements below seek your opinion about your capability in using information and communication technology. Please read each statement carefully, and then indicate the extent to which you agree or disagree by circling the number on a scale of 1 (Strongly disagree) to 6 (Strongly agree).

<i>PLEASE ANSWER ALL STATEMENTS</i>		Strongly Disagree				Strongly Agree	
20.	I am confident in using information and communication technology	1	2	3	4	5	6
21.	I do not have any difficulty in using information and communication technology	1	2	3	4	5	6
22.	I feel comfortable in using information and communication technology	1	2	3	4	5	6
23.	I am sure I can use information and communication technology	1	2	3	4	5	6
24.	I can operate information and communication technology, even if no one tells me how to do it	1	2	3	4	5	6

Section 5: About Your Willingness to Try Out Any New Information and Communication Technology

The statements below seek your opinion about your willingness to try out any new information and communication technology. Please read each statement carefully, and then indicate the extent to which you agree or disagree by circling the number on a scale of 1

(Strongly disagree) to 6 (Strongly agree).

PLEASE ANSWER ALL STATEMENTS		Strongly Disagree				Strongly Agree	
25.	If I hear about new information and communication technology, I would look for ways to try it	1	2	3	4	5	6
26.	Among my peers, I am the first to try out new information and communication technology	1	2	3	4	5	6
27.	I am hesitant to try out new information and communication technology	1	2	3	4	5	6
28.	I like to experiment with new information and communication technology	1	2	3	4	5	6

Section 6: About Your Trust in E-Government

The statements below describe your opinion about your trust in e-government, especially One-Stop Service Online System provided by your local government. Please read each statement carefully, and then indicate the extent to which you agree or disagree by circling the number on a scale of 1 (Strongly disagree) to 6 (Strongly agree).

PLEASE ANSWER ALL STATEMENTS		Strongly Disagree				Strongly Agree	
29.	I think the information in One-Stop Service Online System seems to be truthful and honest.	1	2	3	4	5	6
30.	I think the One-Stop Service Online System is effective in facilitating my needs	1	2	3	4	5	6
31.	I think the One-Stop Service Online System is designed to accommodate the needs of its users	1	2	3	4	5	6
32.	I can predict the output of One-Stop Service Online System (in terms of time, costs and process)	1	2	3	4	5	6
33.	I think the One-Stop Service Online System provides appropriate outcomes for its users.	1	2	3	4	5	6

FINISHED

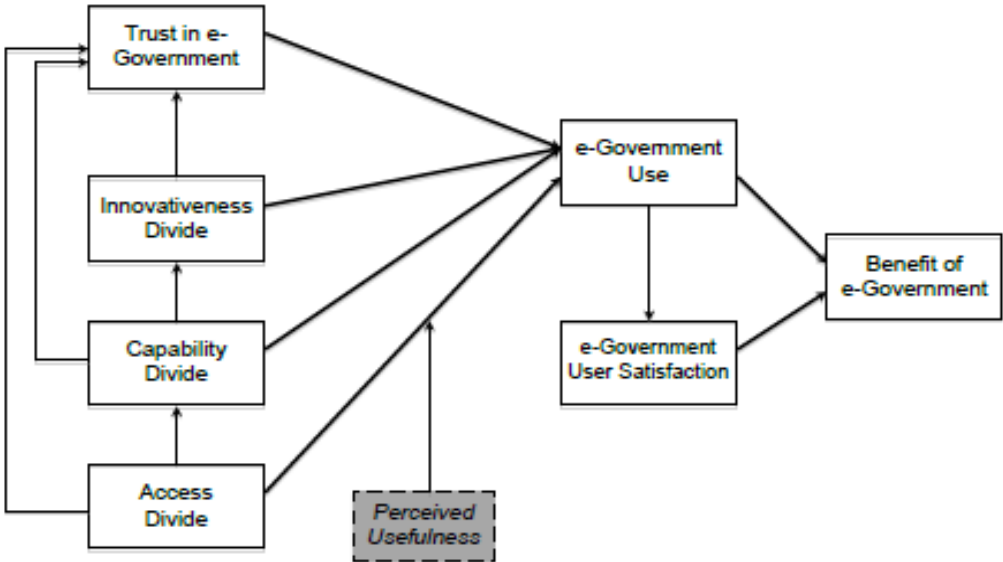
*Thank you very much for your time and cooperation!
I really appreciate it.*



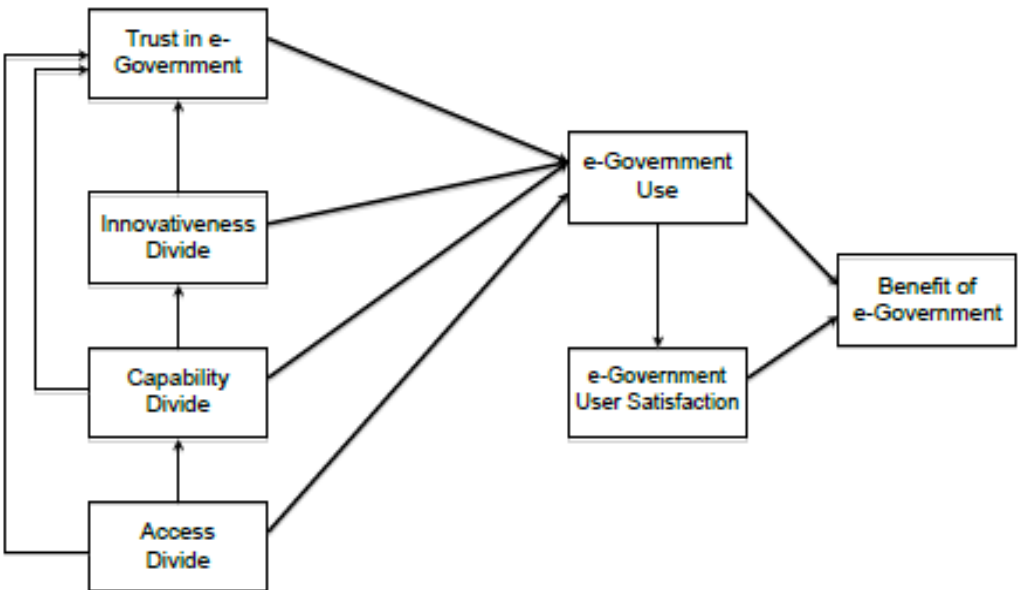
This study has been approved by the Curtin University Human Research Ethics Committee (approval number GSB 11-11). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning (+618) 9266 2784 or emailing hrec@curtin.edu.au.

Appendix 5 – Field Study Results: Individual Model

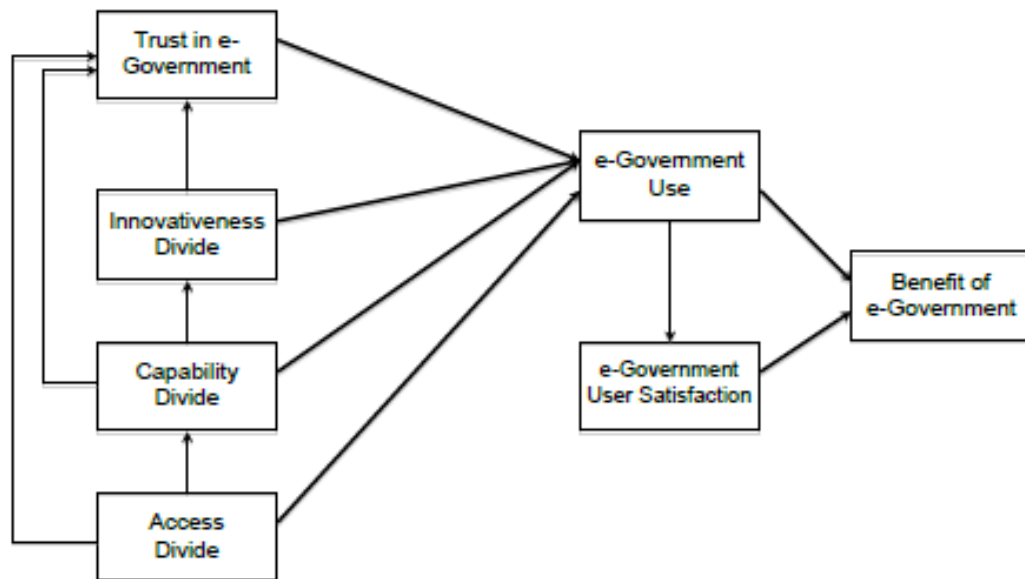
Model of the Field Study of Informant 1



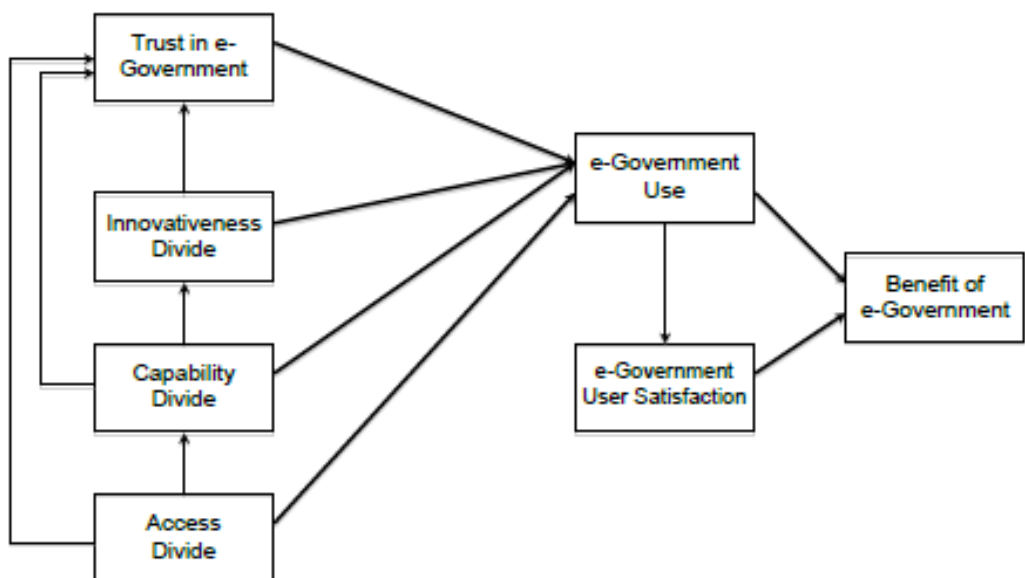
Model of the Field Study of Informant 2



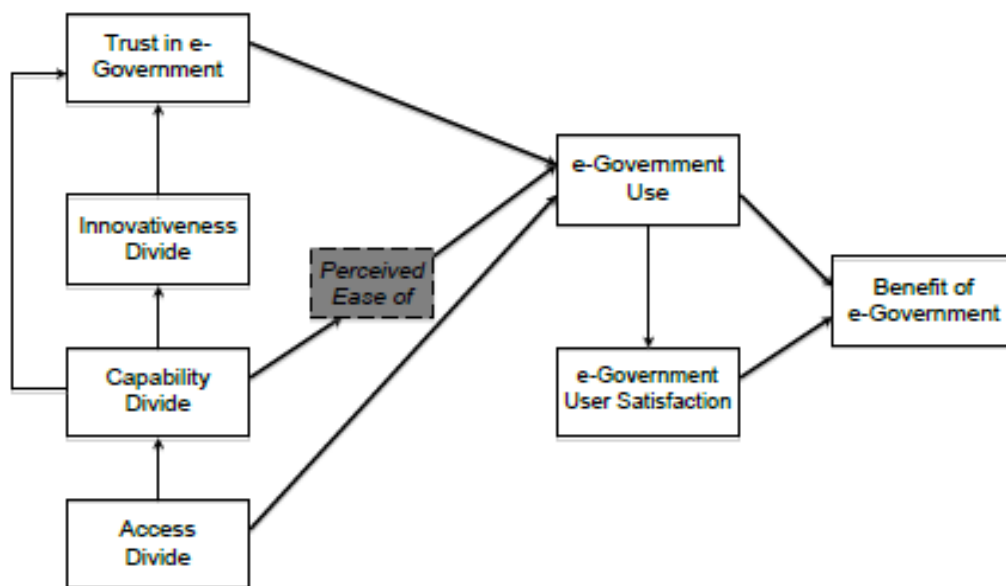
Model of the Field Study of Informant 3



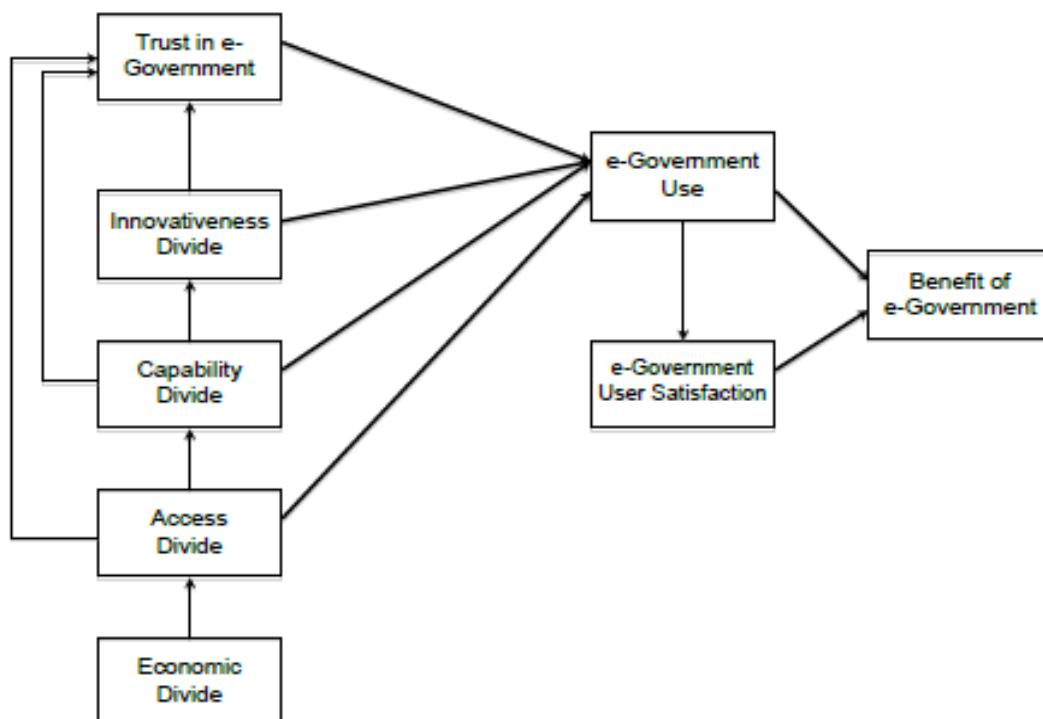
Model of the Field Study of Informant 4



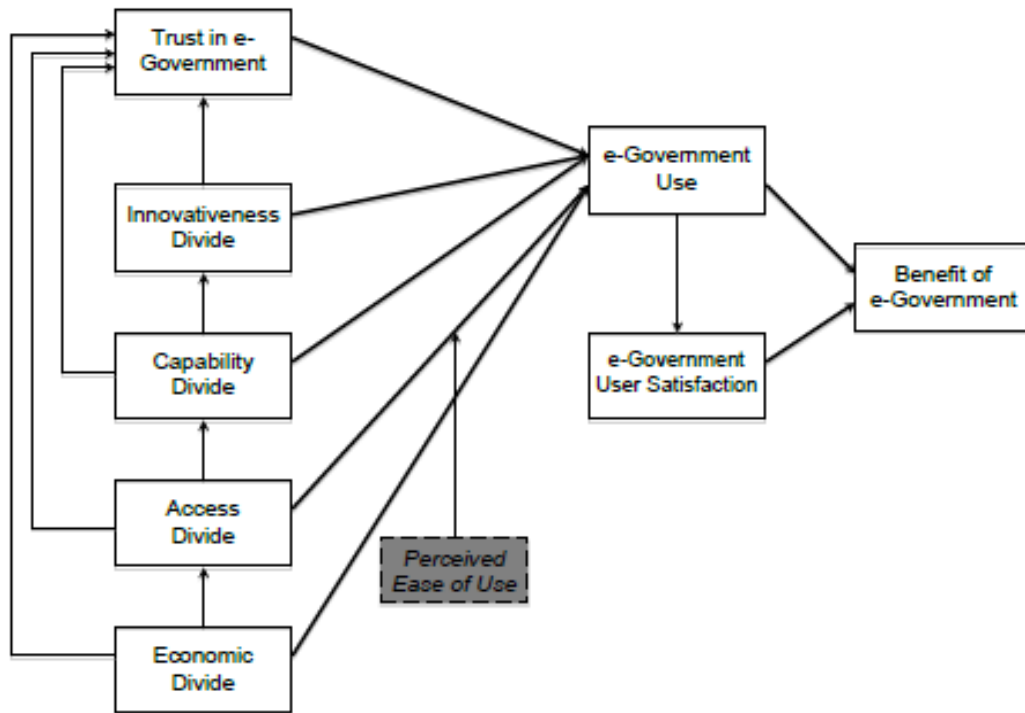
Model of the Field Study of Informant 5



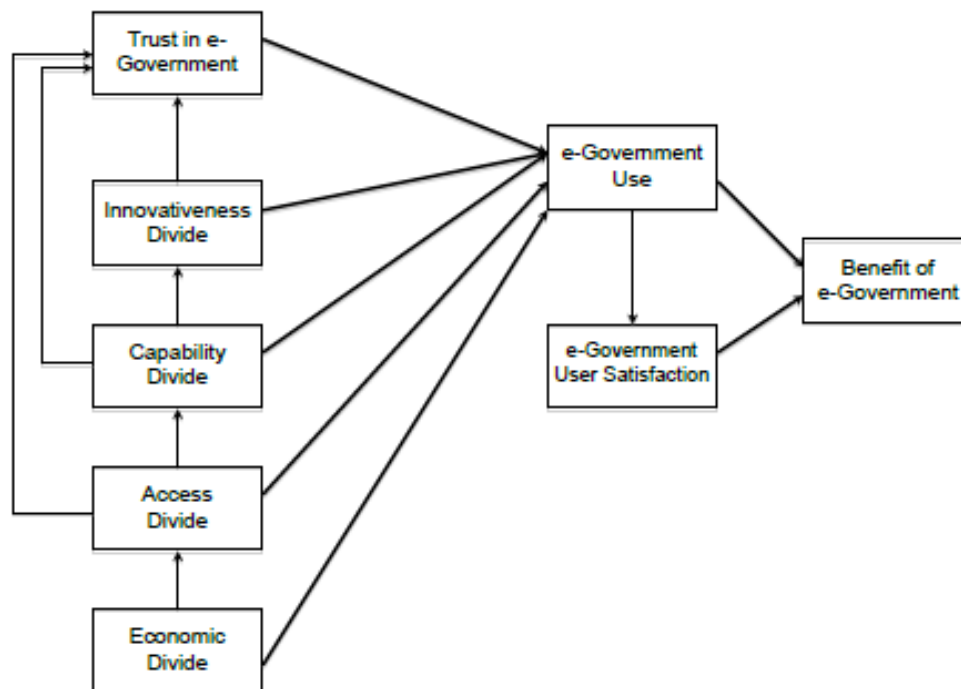
Model of the Field Study of Informant 6



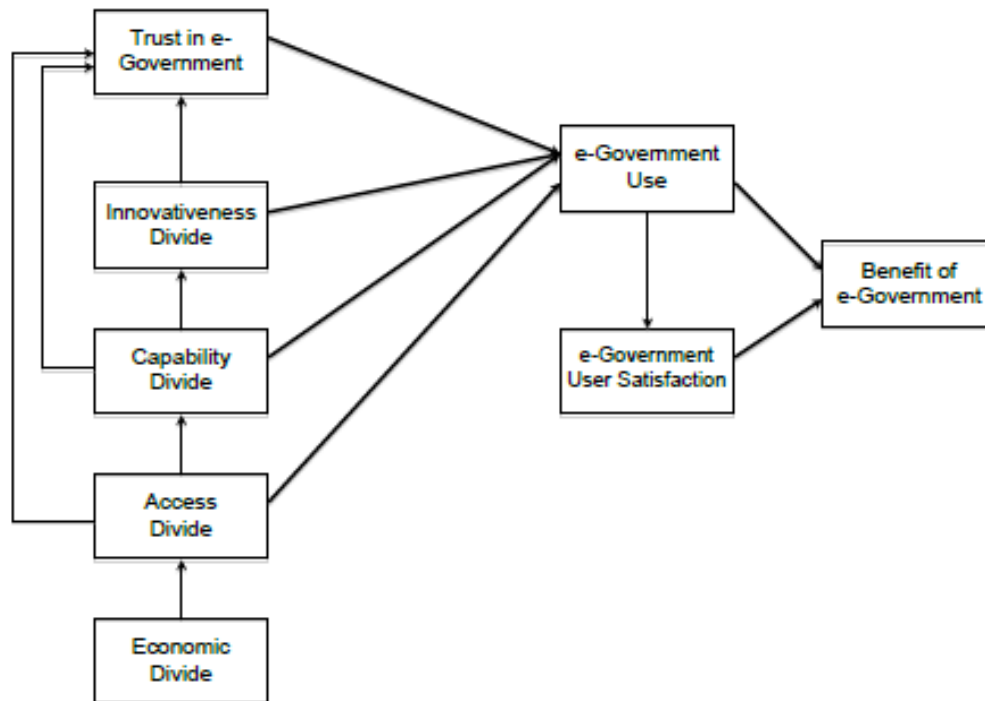
Model of the Field Study of Informant 7



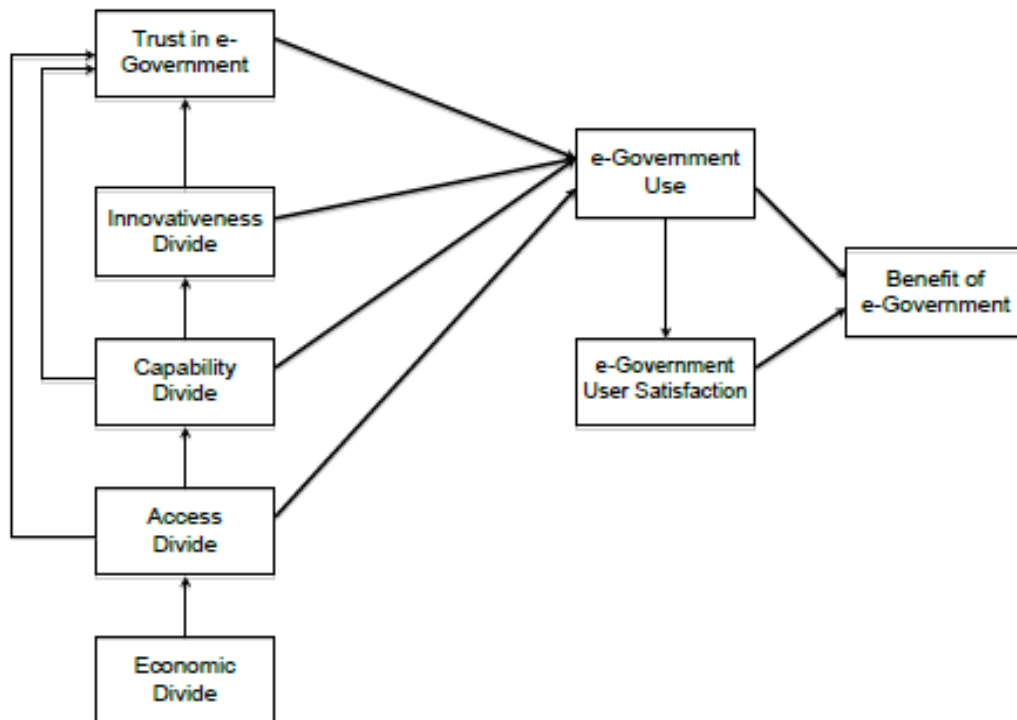
Model of the Field Study of Informant 8



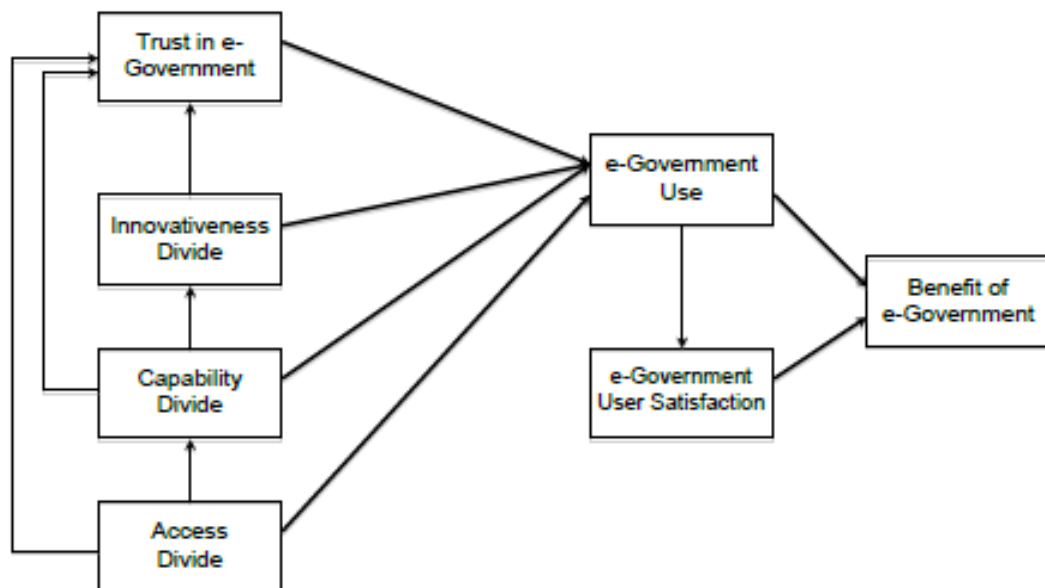
Model of the Field Study of Informant 9



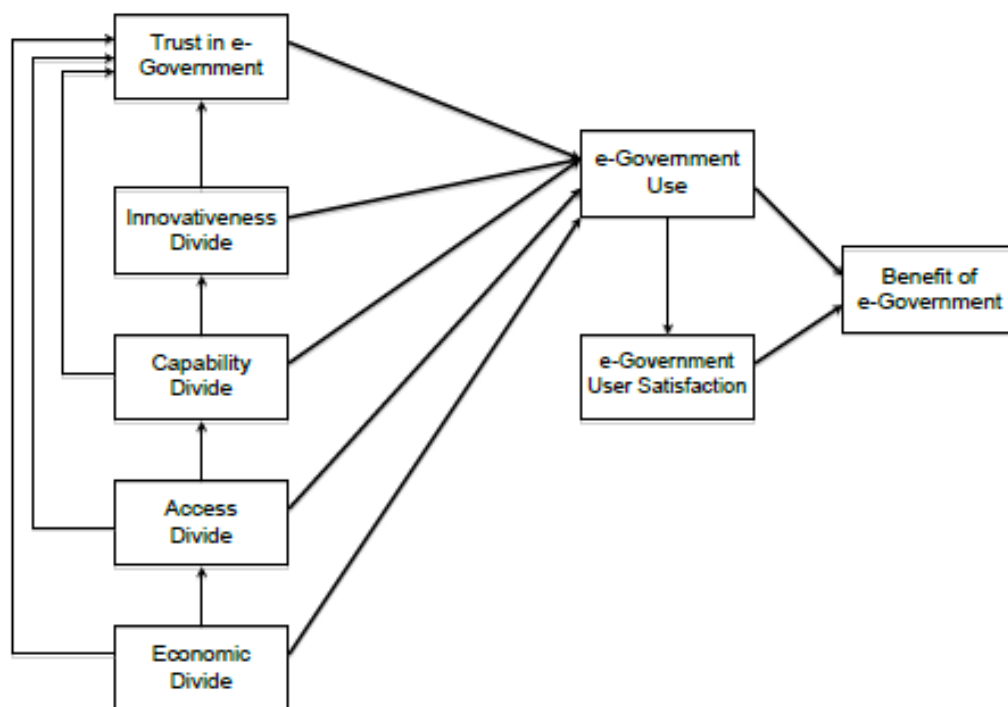
Model of the Field Study of Informant 10



Model of the Field Study of Informant 11



Model of the Field Study of Informant 12



Appendix 6 – Map of Sleman and Tulungagung Regencies

