

**CHALLENGES OF E-GOVERNMENT
IN DEVELOPING COUNTRIES:
ACTOR-NETWORK ANALYSIS OF THAILAND'S SMART ID CARD PROJECT**

A Thesis Submitted to the University of Manchester for the Degree of PhD in
the Faculty of Humanities

2011

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Word Count: 62,292 words

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List of Abbreviations

ADB	Asian Development Bank
ANT	Actor-Network Theory
ASPA	American Society for Public Administration
CEO	Chief Executive Officer
G2B	Government to Businesses
G2C	Government to Citizen
G2E	Government to Employees
G2G	Government to Government
ICT	Information and Communication Technology
MOU	Memorandum of Understanding
NECTEC	National Electronic and Computer Technology Centre
NPM	New Public Management
OEDC	Organization for Economic Cooperation and Development
OPDC	The Office of the Public Sector Development Commission
PIN CODE	Personal Identification Number Code
TOR	Terms of Reference
UN	United Nations
W3C	World Wide Web Consortium
WTO	World Trade Organisation

ABSTRACT

Empirical studies that reviewed e-government status in developing countries found that e-government research scholars preferred to ask, ‘What is happening?’ rather than ‘Why is it happening?’. This showed little use of theory when it came to e-government study. Although high failure rates can happen anywhere, e-government research seemingly forgets to raise the question of why. To fill this gap, actor-network theory (ANT) was employed by this thesis as an analytical lens to investigate the failure case study of the Smart ID Card project, which was expected to revolutionise Thai public services with a single multi-propose ID card.

Critical realism was the philosophical standpoint that framed the basic thinking in this study. It was intended to reflect on the e-government failure phenomenon; query its realities, and find a new set of answers. To achieve the aim of this study, both documentary research and in-depth interviews with relevant key persons were conducted, in order to synthesise the casual relationship and failure mechanisms in the Smart ID Card project.

Firstly, the lens of ANT observed the causes of failure that originated from the problematization process, which referred to the role of the focal actor, the Cabinet, and less room for other actors (e.g. main public agencies and citizens) to negotiate in forming the actor-network of the Smart ID Card project. This led to unrealistic, unreachable objectives in the actor-network and opened the door to failure right from the beginning. Secondly, the intersement process, which had great importance in locking actors into position, was incomplete. Thus, the focal actor failed to enact standardisation, laws, regulations and a budget through negligence or lack of concern. This resulted in the failure of both human and non-human actors to enter the actor-network. Thirdly, the uncontrolled chaos in the enrolment process weakened endurance of the actor-network in facing its obstacles, for example, the emergence of a counter-network, which aimed to attack the main actor-network, the transformation of a non-human actor (Smart ID Card) that became a Trojan actor, and the instability of the focal actor. These obstacles brought disassociation among actors in the actor-network and led to the final moment, the betrayal. Fourthly, the betrayal resulted from errors in the earlier moments, which caused betrayal everywhere in the actor-network. All relevant human and non-human actors betrayed the actor-network by not working or supporting it properly in attempting to achieve its goals. Finally, the actor-network of the Smart ID Card project collapsed and could not function to reach its objectives. This meant that the Smart ID Card project did not revolutionise Thai public services as planned.

This thesis is one of few theory based-works that contribute to the use of ANT modification as a unique vehicle for investigating failure phenomenon, especially in e-government projects in developing countries. The lessons learned from the story of failure in this study provide new solutions that open the door to successful e-government development.

DECLARATION

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

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DEDICATION

To my great-grandfather, Tep Kangkun, who gave me a dream,
and my grandmother, Fong Panwong, who helped to make it materialise.

ACKNOWLEDGEMENTS

All phenomena are the product of actors in actor-networks, which constitute both human and non-human actors (Callon 1986, Latour 1992, and Law 1992). However, achieving the desirable goal requires the willingness of all actors to participate in particular ways to create and maintain a stable and durable output of relations within an actor-network (Latour 1987). My PhD life is about the inscription of one single artefact, which is a PhD thesis. The inscription process involves honourable human and non-human actors in my actor-network, and they deserve massive thanks for their inspiration, encouragement and support.

First of all, in my country, we deeply respect people who provide a chance, and so I give my sincere gratitude to my supervisor, Dr. Ping Gao, who opened the door to my PhD programme. He not only gave me academic support, but also helped with my personal issues. I remember what he said to me when we first met, “You do your best, I do my best”. I would like to say that he really kept his side of the bargain. Another person I have the same feelings for is Professor Richard Heeks, my second supervisor. He is a role model for many students, including me. He inspired and encouraged me by passing on his invaluable advice, which drove me on in doing my work. It is a once in a lifetime thing, to work with two world class academics and I am deeply honoured.

During my PhD study, I have faced various obstacles, such as a severe chronic health problem, which I am lucky to have survived. With strong and endless support from the following persons, my life was put back on track. In this respect, I am truly grateful to Jittima Pookachatikul, Dr. Wanapa Lerasiri, Associate Professor Pirat thakarnsino, Robert Kimmins, Associate Professor Pairat Pruksachatkunakorn, M.D., and Granville Ogden.

I would like to thank Chiang Mai University and the Faculty of Political Sciences and Public Administration for providing me with a partial scholarship for my study. I would also like to thank all of the interviewees, who gave their excellent cooperation during the field study, and I fully appreciate the great assistance I received from Kannika Comela, Sureerut Kongvee and Supreeya Techa-asawanan.

Back to Manchester, UK, where I would like to give sincere thanks to the following PhD colleagues and friends, who gave me limitless and unconditional support from the day I arrived. They are Patamawadee Jongruck, Dr. Pasakara Chueasuai, Dr. Theeranuch Pusaksrikit, Dr. Richard Boateng, Dr. Onrapak Reampong, Piyawadee Rohitarachoon, Petch Sajjacholapunt, Kittimon Jirakittidul and Christopher Foster. Furthermore, thank you for the special non-human actor: a wonderful yellow magic pencil that helped me to arrange 26 English letters for the PhD thesis.

Lastly, I would like to say that I was born into a poor family in the remote area of Nan province, Thailand. My parents are farmers, Mr. Manit and Mrs, Lek Gunawong. They surely have some limitations, but certainly not when it came to bringing me up and supporting me with love, dedication and sacrifice. During my PhD study, I have learned that these are the strongest fundamental things in my life. My younger sister, Sukothiip Gunawong, is an amazing and wonderful person. During the period of my study, she has been pouring in a lot of funding and managing to control undesirable circumstance by giving me a strategy to move in every step. Before I came here, she might have been proud of me, but now I am very proud of her.

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1. Panom Gunawong, Ping Gao, 2010. Understanding E-government Failure: An Actor-Network Analysis of Thailand's Smart ID Card Project. In Proceedings of the 14th Pacific Asia Conference on Information Systems (PACIS), p.773-784, July 9-12, Taipei, Taiwan.
2. Panom Gunawong, Ping Gao, 2010. Challenges of E-government in Developing Countries: Actor-Network Analysis of Thailand's Smart ID Card Project. In Proceedings of International Conference on Information and Communication Technologies and Development, December 12-16, London, UK

Chapter 1: Introduction

1.1 Statement of the Problem

E-government has been recognised as the second revolution in public administration after the emergence of New Public Management (NPM). Its wide ranging changes have had tremendously strong effects on, for example, behaviour, organisational management, and politics and culture in all of civil society (Criado Hughes and Teicher 2002, Teicher, Hughes and Dow 2002, Saxena 2005). From various definitions of e-government (UN and ASPA 2002, OECD 2003, Curtin, Sommer and Sommer 2003, Chen et al. 2006, Heeks 2006, and World Bank 2007), it can be concluded that e-government refers to a translation and an inscription of government by embedding public activities into the Internet and associated information and communication technologies (ICTs), thus creating a more efficient and effective way of providing public services, and building relationships between government and civil society in order to achieve desirable outcomes.

E-government has become fashionable around the globe in terms of representing modern, efficient, effective, transparent, and participatory and customer oriented government. It offers a great opportunity to enhance public sector operations in terms of efficiency and effectiveness and provide benefits for citizens, politicians and civil servants (OECD 2001, Heeks 2003, and Ndou 2004). The numerous benefits of e-government have tempted many countries to invest in it heavily. However, when actual implementation has taken place, the desired outcome often does not materialise. The painful fact that must be faced is that “e-government is not a short cut to economic development, budget savings or clean and efficient government. E-government is not the big bang – a single event that immediately and forever alters the universe of government – it is a process, and often a struggle, that presents costs and risks both financially and politically” (Bhatnagar 2004, p.85).

When focusing on developing countries, e-government has been seen as a leapfrogging opportunity for society to trigger their administration into modernisation. However, there seems no easy or ready-made way of achieving these aims for developing countries, as there

is in the industrialised world. They have been therefore shrouded in a thick mist of e-government failure (Bhatnager 2003, Haldenwang 2004, Ciborra 2005, and Chen at al. 2006).

Most e-government initiatives are instigated with designing and implementing difficulties. Diverse countries have illustrated various problems. In general, developing countries have been fragile and vulnerable in terms of foundations for development; for instance, their retarded economic growth or low productivity, limited skilled personnel, bad IT infrastructure, low Internet access, and lack of computer literacy (Chen, Chen and Ching 2006). From a comprehensive survey on a number of e-government projects in these countries, Heeks (2003) reported that 35% of them had failed completely due to uninitiated implementation or immediate abandonment. Meanwhile, 50% partially failed by not managing to reach the main aims of the initiative, and/or achieving significantly undesirable outcomes. Of the few projects that were successful (15%), most stakeholders felt their main objectives were met, with no significantly undesirable outcomes. This high failure rate resulted in serious financial expenditure; damaged morale, creditability and trust; and obstacles against the advantages gained from e-government's implementation. Furthermore, taxpayers lost their money, while the country forewent the opportunity of enhancing effectiveness and efficiency (OECD 2001 and Heeks 2003).

From the review of status on e-government in developing countries (detailed in Section 2.6), it was found that many e-government projects could not achieve their goals. Different countries, areas and cases showed various problems. There was no unique answer as to why many problems had occurred. According to the study focus, academics mostly preferred to investigate 'what' factors enable or constrain e-government projects, and they gave suggestions instead of exploring 'why' many e-government projects fail. These facts inspired this study to focus on the reasons for e-government failure in developing countries, in the hope that their root cause would be exposed and possible solutions could be suggested for e-government project development in the developing world.

However, as e-government is a young field of study, a rigorous study approach and applied theory have not been used generally in exploring case studies (Gronlund 2004, and Heeks and Bailur 2006). These facts inspired the author to investigate issues regarding the failure phenomenon in developing countries from ANT perspective.

In Thailand, e-government has had the same experiences as those in some other developing countries, where e-government projects could not meet their set goals. As pointed out by Kitiyadisai (2000, p.15): “cases of failure seem to be the norm in Thailand at all government levels”. Recently, some major projects such as e-auction, the Smart ID Card, Internet in tambons (districts) and government fiscal management information systems (GFMIS) were evaluated. The result showed that these projects could not achieve their goals and the outcomes were problematic (Lorsuwanarat 2006). To understand the failure phenomenon of e-government in Thailand, this thesis conducted an in-depth case study of a unique and interesting venture: the ‘Smart ID Card project’.

In the Information and Communication Technology (ICT) master plan (2002-2006), the Smart ID Card project was prioritised as a first-mover task in the e-government initiative. The Thai Cabinet under Prime Minister, Dr. Thaksin Shinawatra, possessed a strong political will in this project. Thaksin announced his vision for the Smart ID Card project through a media broadcast on February 23, 2002, saying “Thailand will be the first country in the world to use a smart ID card as a single card to substitute many cards, for example, the identity card, civil servant card and free medical treatment card” (Lorsuwanarat 2006). Thus, the aim of the Smart ID Card project was to enable every Thai citizen to conduct all services with only one card, connected to many databases, in order to provide them with a more convenient and faster service (National Electronics and Computer Technology Centre 2003). Unfortunately, shortly after the project was initiated, public agencies were ordered to stop the project in August 2006, without clear directions for a future plan. As a result, some Thai citizens currently have Smart ID Cards, which are actually not “Smart” because there has been no card activation. Many questions as to why this important project failed to achieve its goal have been left unanswered.

1.2 Aims and objectives of the study

In the area of e-government study, one crucial gap of e-government research was the lack of a theoretical-based framework for analysing the case study. This might be regarded as a critical requirement for accumulation and knowledge building of e-government in terms of theoretical-based study (Gronlund 2004, and Heeks and Bailur 2006). Another important viewpoint was little study of interaction or incorporation among actors in e-government projects. Most studies had focused only on one specific actor such as citizens or public agencies. This implies that e-government research could not explain the various dimensions of an e-government phenomenon (Chircu 2008 and Rowley 2011). However, when focusing on e-government researches in developing countries (detailed in Section 2.6 and 2.7), they lack the question of ‘why’ to the failure phenomenon. This is another essential gap that needs to be considered. Therefore, this dissertation set three objectives by aiming to fill the gaps in e-government research as follows.

Firstly, the case study was explored by employing a theoretical-based framework by using ANT as the main analytical framework. By doing this, the study played a comprehensive part in building new knowledge into e-government research in terms of theory.

Secondly, as failure happens mostly in e-government projects in developing countries, this study intended to investigate the heart of this phenomenon by exposing the causal relationship of the failure mechanism.

Thirdly, to explain the failure causes of e-government projects deeply, this thesis reflected the failure phenomenon from various perspectives such as government, public agencies, IT vendors and citizens. These multi-viewpoints helped in understanding the relationship among actors in an e-government project.

Fourthly, this dissertation aimed to provide recommendations to policy makers and guidance for active practitioners who are responsible for e-government. The findings from this research are crucial and could be fruitful in planning and implementing e-government projects in the context of developing countries.

1.3 Research Questions

This research attempted to answer the question, “Why did the e-government Thai Smart ID Card project fail?” ANT was selected as analytical lens to explain the case study. The concepts of ANT helped to elaborate a new set of answers for the ‘why’ question in multi-dimensions, for example, negotiation, behaviour, interest alignment and association of actors (both human and non-human) in the actor-network. Furthermore, by its nature, ANT could explain ‘why’ the failure mechanism happened stage by stage from beginning to end.

1.4 Theory-based framework of knowledge

This study aimed to investigate a socio-technical phenomenon, i.e. the “Smart ID Card project” in Thailand. To find answers in this research, ANT was a suitable theoretical lens for describing the failure phenomenon because it could offer a powerful explanation of the motivations and actions among actors who associate in an actor-network, and later disassociate themselves from it, which led to the occurrence of failure.

This dissertation intended to apply the four moments of translation in ANT as a core analytical framework for investigating the failure mechanism of the Smart ID Card project in Thailand. This was not only a powerful concept in the failure analysis, but also very dynamic. Therefore, this theory-based framework was not rigid, but flexible. Other supplementary notions of ANT were allowed to integrate with the core framework. With the uniqueness of this theory-based framework, the causal relationship of failure mechanisms can be revealed more deeply and profoundly.

1.5 Research methodology

To answer the above research question, this study selected critical realism as the philosophical standpoint. Critical realism was a frame of basic thinking in this study. Its intention was to look back at the e-government failure phenomenon and ask questions of its realities as well as discovering a new set of answers. The objective of this study was to

investigate the history of the Smart ID Card project and ask why it failed. This phenomenon might have consisted of contradictions that required a real set of answers to the research question.

For data collection, this research carried out both documentary research and in-depth interviews. In the former, this study relied on two data sources, with the first being Thai public agencies that had been involved with the planning and implementing process of the Smart ID Card project. The relevant documentation was obtained from public organisation websites. In addition, news clippings found in the news clipping database in Thai university libraries were used as a second data source in order to gain more insightful details. They proved to be very useful for this researcher in gaining access to deeper details of past events, as many key persons reported facts about the Smart ID Card project to the news media. In the latter, this research conducted in-depth interviews with four main groups of people involved with the Smart ID Card project. The first group comprised public officials from the Ministry of Interior, Ministry of ICT and NECTEC. The second group included Thai scholars who were interested in public sector implementation. The third group consisted of Thai citizens who were the end users of the Smart ID Card project, and the final group was made up of IT vendors with experience of working with public agencies.

In order to analyse the qualitative data, this study employed the concept of template analysis (King 2005). This concept is a flexible technique in allowing the researcher to tailor the codes to match the requirements of the study. It begins with creating an initial template that is guided by a set of interview questions. Then, when new themes emerge, the initial template is revised to cover all data from the interviews. Finally, in achieving the objective of this study, a third template was needed. This template was adjustable based on the analytical framework. All data were categorised into relevant themes and entered in the final template.

1.6 Limitations of the research

While this thesis sheds light on the research and practice of a particular phenomenon, which is failure of e-government projects, it has some limitations. This case study traces back to the period between 2002 and 2006, which posed constraints in data collection, especially in

gaining access to some informants for the interviews. Some key informants had retired or been transferred to other organisations, and the IT vendor awarded the contract for producing the blank ID cards had ceased doing business. This research used a snowball technique in helping to find the right respondents, but some of them were still unable to remember certain details of the past in the interview process. On these occasions, this researcher had to provide some documentary data to remind them of the case; hence, the accuracy of the interview data was a problem. As this thesis deals with a failure phenomenon in a developing country, its nature showed conflicts among organisations and also rumours of corruption in the project. Some informants refused to talk about these sensitive issues because it made them feel insecure. Additionally, during the fieldwork period (November 2009-July 2010) fearful and violent political demonstrations plunged Thailand into chaos. Some interviews were interrupted or even cancelled.

1.7 Outline of the Chapters

The body of this thesis is divided into eight chapters, which are outlined subsequently. Chapter one illustrates a statement of problems. It briefly introduces the situation of e-government in developing countries, which has inspired and motivated the researcher to focus on e-government failure in those regions, especially Thailand. This chapter also presents the research questions and objectives, and outlines the key contents and structure of this dissertation.

Chapter two provides theoretical perspectives of the research. The first four sections explain the fundamental knowledge of e-government, such as the emergence of e-government, categorisation of e-government activities, benefits of e-government, stakeholders of e-government and stages of e-government development. Afterwards, it concentrates on explaining the status of e-government research in developing countries. Finally, the last section describes the interesting gap in the research study on e-government in developing countries.

Chapter three presents details of the selected theory: ANT, and analytical framework. The first part of this chapter justifies usage of ANT in this study. This is followed by an

explanation on its main concepts. Later, this chapter discusses applications of ANT in failure analysis. Lastly, the analytical framework of failure analysis in this study is developed.

Chapter four addresses the methodological aspects of the research. It begins with a discussion on philosophical assumptions. Then, it describes the selected philosophical standpoint, which is critical realism. After that, this chapter presents the research method, case selection, data collection, and data analysis. The concern of how to ensure the quality of the research is also discussed.

Initially, Chapter five reviews the background of e-government in Thailand, and later focuses on the Smart ID Card project, which is the selected case of this research. The chronology of this project is outlined finally in detail.

Chapter six exposes the findings of this research, which are the punctualisation in the actor-network of the Smart ID Card project. The details of all actors are explained, which offers fundamental elements of the actor-network for cause analysis of failure in the next chapter.

Chapter seven reveals the root causes of failure in the Smart ID Card project through the lens of ANT. It starts with the flaw in the first moment of translation: the problematization. Then, problems in the interessement moment are disclosed. After that, chaos in the enrolment stage is uncovered. Finally, betrayal in the actor-network is revealed.

Chapter eight highlights the research conclusion and discusses the findings, implications of academics and practice, and the research limitations, before giving recommendations for further study. Finally the conclusion and remarks of the study are synthesised.

Chapter 2: Understanding E-government

This chapter firstly aims to provide the basic background of e-government, such as the emergence of e-government, categorisation of e-government activities, benefits of e-government, stakeholders of e-government and stages of e-government development. Secondly, it explains the status review of e-government by focusing on developing countries and has a detailed depiction of the general fact of e-government, the method of the review process, research focus of e-government study, framework of knowledge and research approach. Finally, the last section concludes with a look at the interesting gap in research studies on e-government in developing countries.

2.1 Overview of E-government

The movement of New Public Management (NPM) evolved in developed countries during the 1980s. NPM has been originated in order to resolve the inefficiency and ineffectiveness of the public sector, especially under the dynamic circumstances: globalisation, economic recession, political instability and social chaos. Furthermore, the performance measurement, accountability and responsiveness of governments have been questioned (Navarra and Cronford 2005). Moreover, in the presence of excessive catalytic factors, administrative megatrends have attracted a change in public management; for example, attempts to reduce or slow down public spending and staffing. The ideas of privatisation and quasi-privatisation on jobs or activities that were not relevant to core public responsibility, and the development of automation by using information technology for the distribution of public services, have besieged the public administration realm (Hood 1991). The emergence of NPM can be concluded in four broad perspectives: efficiency, marketisation, accountability and decentralisation (Hood 1991, Hood 1995, Navarra and Cronford 2005). The term 'efficiency' aims to improve production at a low cost; thus, concerning decreased unit costs, reduced staff and better methods of working. Marketisation refers to a shift of command and control from a vertical hierarchy to a horizontal contractual relationship within (and outside) the public sector. Some activities are privatised or contracted out to the private sector by competitive tendering. Accountability needs a clear assignment and clearly stated aims of responsibility,

which are controlled by quality criteria and performance measurement. Decentralisation refers to more decision making being transferred to lower levels of the public sector, which means increasing local responsiveness. This includes the design of systems and mechanisms of accountability, and participation by citizen and non-governmental organisations. It could be said that NPM has put increasing emphasis on professional management practices, performance-oriented administration and customer-centric management. It asks for government needs to have good connections with its citizens, improve access to public services and respond to social development (Saxena 2005).

By the mid 1990s, globalisation of the Internet had emerged and was used widely in industrialised countries to support NPM, which gave birth to 'e-government' (Baptista 2005). In those early days, e-government had functions to produce and distribute public information through the Internet. However, the information was quite static, which meant that it lacked interactions between government and civil societies. Currently, after more than a decade of experience, e-government has developed an advanced application of ICTs as a critical tool, which can develop a good and responsive government that provides better value at a lower cost (OECD 2005). However, some scholars, for example Schedler and Scharf (2001), Curtin, Sommer and Sommer (2003), Dunleavy et al. (2005), and Heeks (2006), gave evidence that e-government has gone far beyond simply providing some public information and services via a website, or just offering technical changes in public services. They stressed that e-government is a significant paradigm shift in public management, which has determined crucial and wide ranging changes of, for example, behaviour, organisational management, politics and culture in the entire civil society. Therefore, the strong effects of e-government can be called the second revolution in public administration after NPM (Criado Hughes and Teicher 2002, Teicher, Hughes and Dow 2002, Saxena 2005).

Driven by Internet-based technology, e-government can help to transform public service deliveries and make public services available for 24 hours, 7 days a week, which would create greater accessibility from anywhere, and also eliminate visits to government offices. E-government would help to reduce costs and save time for both customers and public agencies (Teicher, Hughes, and Dow 2002). Navarra and Cronford (2005, p. 9) stated, "e-government involves the creation, development and interlinking of a variety of social, institutional and technological ecologies to deliver services which are perceived as legitimate, innovative,

useful and welfare enhancing”. This perspective hints that e-government involves creation of a large scale ICT infrastructure and also restructuring of public activities. By doing this, e-government should be expected to change relationships between the public sector and civil society for the better. It seems that e-government is highly complex in terms of involvement and expectation from civil society.

Due to the complexity of the e-government system, there are a lot of definitions for it; each has its own focus, as shown in Table 2.1.

Table 2.3 Selected Definitions of E-government

Reference	Definition	Focus
UN and ASPA 2002 (p.1)	E-government is to utilise the internet and the world-wide-web for delivering government information and services to citizens.	The use of Internet by government.
OECD 2003 (p.11)	E-government uses information and communication technology, and particularly the Internet, as a tool to achieve better government.	The use of Internet by government.
Curtin, Sommer and Sommer 2003 (p.2)	E-government uses any and all forms of information and communication technology (ICT) for governments and their agents to enhance operations, deliver public information and services, and encourage citizen engagement and public participation in the process of good governance.	The use of ICT by government for governmental activities.
Chen et al. 2006 (p.24)	E-Government is a permanent commitment made by government to improve the relationship between private citizens and the public sector through enhanced, cost-effective, and efficient delivery of services, information, and knowledge.	Improvement of public service delivery for citizens.
Heeks 2006 (p.4)	E-government is the use of IT by public sector organisations. E-government means office automation and internal management information and expert systems as well as client-facing websites.	The use of IT by the public sector.
World Bank 2007	E-government refers to the government’s use of information technology agencies that have the ability to transform relations with citizens, businesses, and other arms of government.	Transformation of government services by IT.

Source: UN and ASPA (2002), OECD (2003), Curtin, Sommer and Sommer (2003), Chen et al. (2006), Heeks (2006), and World Bank (2007)

Comprehensively referring to the definitions in Table 2.1, in this dissertation I define e-government as follows: “e-government is a translation and inscription of government by embedding the Internet and associated ICTs into public activities to efficiently deliver public services and create an effective relationship between government and civil society in order to achieve desirable outcomes.”

This definition of e-government implies that many activities need to be generated. The following section presents categorisation of activities in the e-government initiative, which provides details of the interrelationship and characteristics among the main group of actors.

2.2 Categorisation of E-government

E-government activities can be examined in terms of the interrelationships of four main groups: government (G), citizens (C), businesses (B) and employees (E). The interaction of a government agency with other sectors could be described as follows.

G2C - Government to Citizen:

G2C comprises government activities in providing service delivery to citizens; for example, information provision on public policy, employment, business opportunities, voting information and tax return forms. This way, citizens are allowed to participate and interact with government activities anywhere at any time (Jaeger 2007). G2C also focuses on the ability of government and citizens to communicate electronically with each other in an efficient manner (Evan and Yen 2003). Furthermore, it allows government agencies to talk, listen, and communicate continuously with its citizens, while supporting accountability, democracy, and improvement of public services. G2C allows citizens to access government information and services instantly and conveniently from any location by the means of multiple information channels and communication technologies (Ndou 2004).

G2B - Government to Businesses

G2B comprises electronic interactions between government and private business. It enables electronic transaction initiatives; for example, e-procurement and the development of an electronic market place for government (Fang 2002). It also concentrates on reducing costs and collecting better information. The government is then able to buy items, pay invoices and carry out business more cost-effectively (Evans and Yen 2006, and Ndou 2002). G2B has two-way interaction and transaction, i.e. government to business and business to government (B2G), and it refers to the business of selling products and services to government (Jaeger 2003).

G2G - Government to Government

G2G is concerned with relationships among governmental organisations, such as those at the international, national, regional and local level (Ndou 2004). Many activities in this group are aimed to improve effectiveness and efficiency over all government operations (Palvia and Sharma 2007).

G2E - Government to Employees

G2E refers to relations between the government and its employees by giving the latter possibilities of accessing relevant information; for example, that of compensation and benefit policies, training and learning opportunities, civil rights laws, etc. (Ndou 2004). It is involved also with strategic and tactical mechanisms for encouraging the implementation of governance goals and programmes, as well as human resource management, budgeting and accounting (Riley 2001).

Table 4.2 Categorisation of E-government

Groups of interrelationship	Characteristics	Examples
G2C (Government to Citizen)	Communication, participation, accountability, and efficiency and effectiveness of public services	Government websites, communication and discussion via the Internet, online tax payment and e-voting
G2B (Government to Businesses)	Communication, commerce and collaboration	E-auction, e-procurement and providing information on commerce via websites
G2G (Government to Government)	Communication, coordination and standard of information and services	Creating and using the same ICTs for public services from the local to international level
G2E (Government to Employees)	Communication, coordination, and learning within public agencies	Human resource information system, public financial information system and online knowledge management

Source: Adapted from Yildiz (2007)

2.3 Stakeholders in E-government

Various types of stakeholders are involved in e-government initiatives. They can be classified by roles into four groups: e-government leaders, e-government practitioners, e-government users and e-government partners (Gil-Garcia and Martinez-Moyano 2007, Nagi and Hamdan 2009, and Rowley 2011).

E-government leaders comprise politicians and Cabinet members, who support policy making needs for initiating e-government. These people mainly act as initiators and supporters for e-government schemes. They make decisions on which kinds of e-government projects should be provided for society as well as the size of budget for them. In the implementation process, they also have responsibilities in monitoring and controlling desirable directions in the progress of e-government.

E-government users refer to citizens, businesses, and government employees. In other words, users can be seen as customers of e-government projects, who need different kinds of e-government application. Citizens may need better and faster public services. Businesses may need e-government applications that support their commerce. Government employees may need e-government projects that help to reduce working procedures or enhance their capacity. Therefore, e-government leaders have to customise or tailor make e-government projects for the specific needs of each group of customers.

E-government practitioners are a combination of policy makers, managers, coordinators, and regulators in governmental organisations or public agencies. They act as a mediator between e-government leaders and e-government users. They have to transform the ideas or policies of e-government from government leaders to make them real or tangible. More importantly, e-government projects that have been implemented by practitioners should satisfy e-government users.

E-government partners include donor agencies, consultants and ICT producers. Donor agencies have a crucial role in providing financial support for e-government development. Consultants are needed to provide technical support for both e-government leaders and practitioners in e-government design and implementation. ICT producers are required for tendering proper technologies for e-government projects. These e-government partners are important also for e-government initiatives

The interrelated participants in the above stakeholder groups have significant roles in e-government development. Each group shows values in political, social, and financial dimensions. Therefore, the success in e-government development strongly depends on the interwoven workings among these stakeholders (Chircu 2008 and Rowley 2011).

2.4 Stages of E-government Development

E-government is an evolutionary phenomenon worldwide. There has been increasing development in e-government projects in many countries, with enormous financial budgets adopted and investments made to establish these schemes. Various stakeholders such as politicians, policy makers, businesses and citizens pay more and more attention to this kind of

development (West 2003, Accenture 2004, and Grant and Chau 2005). Generally, e-government has evolved from its initial stage and developed to become more complicated as shown in Figure 2.1.

At present, initiatives on e-government worldwide are developed and differ in terms of levels, in accordance with the governments' capacity. Therefore, understanding of all stages of e-government development is needed and it would be useful to learn about the nature of e-government and evaluate the stages of growth in an e-government project (Layne and Lee 2001, Gil-Garcia and Martinez-Moyano 2007, and Lee 2010). In explaining the stages of e-government development, scholars have identified them in different ways. However, all of the stages share the same concepts of development from the basic starting point to the higher stage until completion. Based on the works of UN and ASPA (2002), Layne and Lee (2001), Accenture (2003) and Lee (2010), this study synthesises the coherent stages of e-government in five stages: (1) presentation, (2) interaction, (3) transaction, (4) integration and (5) transformation. Categorising in this way could help to explain more profoundly both developmental activities inside each stage and the connection between them. The different stage models of e-government can be classified, as in Table 2.3.

Table 2.3 Comparison of Stages in E-government Development Models

Stages	Layne and Lee 2001	UN and ASPA 2002	Accenture 2003	Lee 2010
Stage 1 Presentation	(1) Catalogue: Online presence, catalogue presentation and downloadable forms	(1) Emerging: Online presence with limited, basic and static information	(1) Online presence: Information published online	(1) Presenting: Presenting information online
Stage 2 Interaction		(2)Enhanced: Content and information updated regularly (3)Interactive: Downloadable forms and online contacts	(2)Basic capability: Broad online presence and basic online transaction	(2)Assimilating: Online interaction of processes and services
Stage 3 Transaction	(2)Transaction: Online Services and working database supported online	(4)Transactional: Pay for services or conduct financial transactions online	(3)Service availability: Basic portals, some sophisticated transactions and cross-agency co- operations	(3)Reforming: Online transaction of processes and services
Stage 4 Integration	(3)Vertical integration: Local systems such as higher level systems in similar functions		(4)Service delivery: Intentions-based transactional portals and intra-agency relationships and collaboration across different levels	(4)Morphing: Change the shape and scope of processes and services to fit effectiveness
Stage 5 Transformation	(4)Horizontal integration: Systems integrated across different functions, real one-stop shopping for citizens	(5)Seamless: Total integration of e-functions and services	(5)Service transformation: Wider service transformation and multichannel integration	(5)E-governance: Synchronising processes and services with the involvement of citizens

Source: Layne and Lee (2001), UN and ASPA (2002), Accenture (2003) and Lee (2010)

Table 2.3 gives details of the five stages in e-government development, and is described as follows.

Stage 1: Presentation

In stage one, the government is forced to act by a technology push from Internet evolution, and a demand-pull by civil society. Citizens expect the government to develop public services, as the private sector has done so already by use of the Internet. However, the government has little experience or expertise in this area and all it can do at this stage is make presentations with public information on Internet websites. The information provides a general dissection of public agencies, for example, their organisational policy, working procedure, contact details, and news. This stage performs one-way communication from government to citizens. Therefore, the benefit for citizens is limited to fact-finding from governmental organisation websites (UN and ASPA 2000, Layne and Lee 2001, Accenture 2003, and Lee 2010).

Stage 2: Interaction

In stage two, governmental organisations add more content and information to the websites and update with greater regularity. Furthermore, basic interaction online between citizens and government begins. The combination of a public operation and technology takes place for citizen services, in which citizens, as users, can download forms, make appointments and requests via governmental websites. The government, as a provider, can respond to the needs of citizens. It could be said that two-way communication online begins at this stage (UN and ASPA 2000, Accenture 2003, and Lee 2010).

Stage 3: Transaction

In stage three, governmental agencies become more skilful in developing governmental websites, from which citizens learn about the value of online services, and e-government moves on to the transaction stage. This stage refers to public process reformation by using ICTs, meaning that face-to-face services are moved and generated online. For example, citizens can fill out forms online and the government can respond automatically with an online confirmation system. This stage requires sophisticated technological development; therefore, a revolution of technology in governmental organisations is needed to make public services more reliable. This would include advances such as the development of databases

working online. The target at this stage is to increase efficiency (UN and ASPA 2000, Layne and Lee 2001, Accenture 2003, and Lee 2010).

Stage 4: Integration

This stage aims to increase permanent changes in government processes because of greater expectations from citizens. The old routine-type government services are transformed into electronic-based ones. Citizens have more opportunity to participate in creating new services. Governmental services can be developed and improved directly to the specific needs of citizens. Therefore, integration across governmental public services among many different agencies is required. Technically, various database systems are connected to form a web database centre. Information and services can be transferred from local to central government. At this stage, effectiveness of government processes and services is the main objective (Layne and Lee 2001, Accenture 2003, and Lee 2010).

Stage 5: Transformation

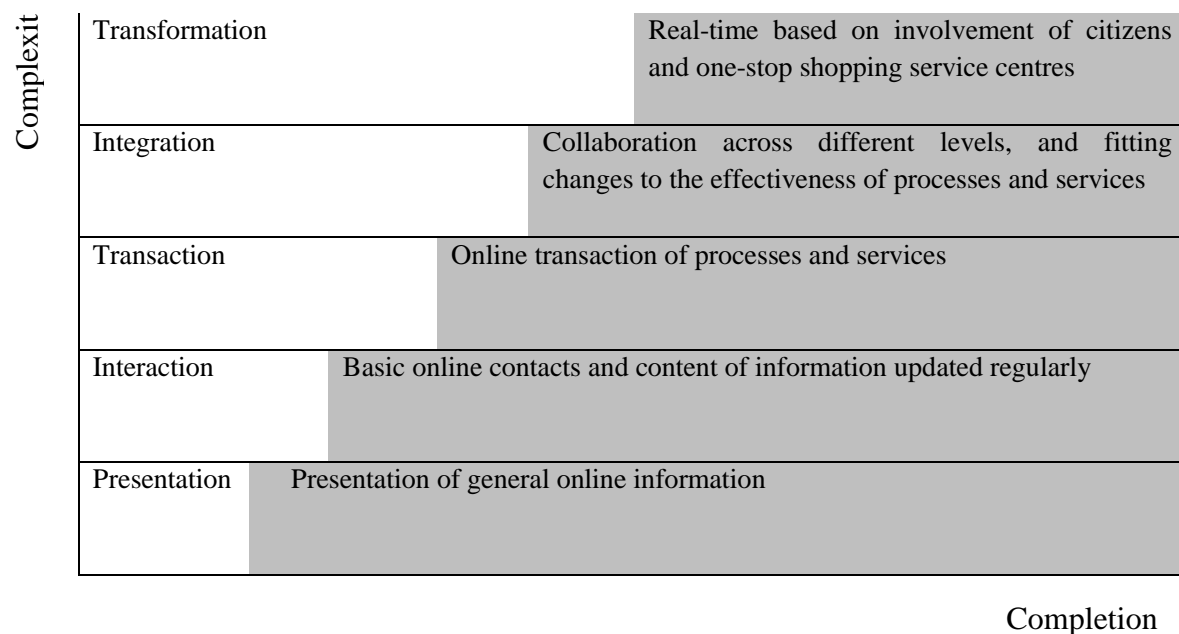
Stage five is borderless. The government have the capability to provide many services from different agencies for citizens in one-stop shopping service centres. For example, citizens are able to process all requirements at the same time in any period, including those concerned with education, housing, jobs, food, medical attention, etc. Furthermore, the interrelated function between the public and private sector is shared and connected, which means that citizens have more channels to contact government agencies. Another important issue at this stage is that the norms of government begin to change. Ideally, political and administrative decision-making are transformed to real-time, based on the involvement of citizens. For example, when government needs an opinion from citizens on making decisions on administrative issues, the citizens have multi-channel ICTs from which to participate in the decision making process (UN and ASPA 2000, Layne and Lee 2001, Accenture 2003, and Lee 2010).

As seen from Table 2.3, completion at the higher stages of development requires a better combination of technology and public services (see Figure 2.1). With reference to the assessments of UN and ASPA (2002) and Accenture (2003), different countries around the world developed and implemented e-government that has been classified at different stages of

development. UN and ASPA (2000) state that, in the broad picture, the capacity of e-government development in each country depends on the significant factor of telecommunications infrastructure, human capital, political will and national leadership. In contrast, Accenture (2003) specified that key factors depend on improving citizen satisfaction; for instance, customers demand new and better services, government performance targets, political push and pull, and new technologies.

However, e-government development is still implemented around the world because of the huge advantages expected, which are presented in the next section.

Figure 2.1 A Stage Series of E-government Development



Source: Adapted from Layne and Lee 2001 and Accenture 2003

2.5 Advantages of E-government Initiatives

If implemented successfully, e-government can improve and enhance government activities for the stakeholders involved, such as citizens, businesses and government agencies. In addition, successful e-government can create outcomes with positive effects on social and economic development. The benefits of e-government initiatives can be catalogued as follows.

(1) Increasing Efficiency and Effectiveness of Service Delivery

By using ICT, public services become more convenient, friendly, simple and economical to access (Bhatnagar 2002). Public agencies could be helped by e-government in adopting a customer focus agenda, which means that users do not have to understand complex government structures and relationships (OECD 2003). Public services would become more reliable, accurate and faster especially, without data losses (Almabeh and Ali 2010), and accessibility to government services would be more encouraging (Nour, Abdelrahman and Fadlalla 2008). It could be said that e-government can create better, cheaper and faster services for users, and all e-government services could be accessed anywhere with no time limit.

(2) Cost Reduction in Service Delivery

ICTs enable development of efficiency in vast processing works and public operations. They can help to manage greater sharing of data within and between governments (OECD 2003), and create a significant reduction in costs (cost of paper, storage space and processing time), which can result from electronic documents that flow across work stations (Bhatnagar 2003). Therefore, public employees would have more time to create increased productivity, which may lead to reductions in government employees or re-positioning, and provide more productive tasks (Ibid.). It could be said that cost reduction comes from electronic services, which create more services with less employees.

(3) Transparency, Anticorruption and Accountability

With e-government, society is given an opportunity to be involved in the decision-making process by using online communications (Ndou 2004). Good e-government applications allow users to track down government activities. This helps to increase transparency and

accountability. By putting procedures online, transactions can be monitored easily, thus supporting anti-corruption (Bhatnagar 2003), and trust can be built through e-government by enabling citizen involvement in the public process, promoting transparent and responsible government and preventing corruption (OECD 2003).

(4) Quality Improvement in Decision Making

Sharing data between all government agencies enables fast decision making and a better service to society. When citizens are considered as governmental customers, e-government allows the government to listen and understand their needs and requirements, thus helping government to improve decision making (Ndou 2004).

(5) Promotion of ICT Use in Other Sections

Interrelationships between government and its stakeholders, through e-government applications, can create awareness of information and communication technology use in society. The advent of new technological and managerial capacities requires e-government to encourage development functionally in terms of new training courses in schools and universities, and attempts to supply the required talent to the marketplace (Bhatnagar 2003).

(6) Contribution to Revenue Growth

If citizens feel comfortable with fast and clear online services, they would have the advantage of making payments on time and thus contributing to revenue growth (Almarabeh and Abuali 2010).

(7) Empowerment of Communities

Due to the electronic transformation of public services, citizens can access them through a new channel, which can eliminate or reduce the negotiating force of intermediaries (Bhatnagar 2003).

The immense benefits of e-government initiatives described above have inspired and tempted many countries around the world to develop their own e-government projects. By 2003, more

than 198 countries had implemented e-government applications (West 2003). However, different countries have different circumstances and while the spotlight of success in e-government has been shining on the developed world, developing countries have been shrouded in a mist of failure. According to the global assessment of the UN and ASPA (2002), most developed countries have been classified in the high e-government capacity category with a high score rating, while many developing countries are placed in the minimal and deficient e-government capacity categories with a very low score rating. This evidence creates a curious situation regarding e-government in the world's developing countries, from which this research explores and uncovers more relevant facts. The next section of this thesis gives various details of e-government studies in developing countries.

2.6 Literature Review of E-government in Developing Countries

As developing countries have fallen into the category of minimal and deficient e-government capacity categories, this convinces the researcher that this study needs to explore at length the status of e-government in developing countries and their place in the academic world. While, review articles on e-government are available, such as those of Hutto (2001), Lofstedt (2005), and Heeks and Bailur (2007), their works mainly focus on e-government in general or in developed countries. Review articles on the status of e-government in developing countries are rarely found, which gives reason to why this subject is interesting.

The section intends to review the status of e-government in developing countries. It begins by presenting general facts on e-government in developing countries, aiming to answer why these nations are of interest to the study. It then moves on to the method of literature review. After that, various dimensions of e-government are explained; for example, the focal point, framework, research approach, and findings of the literatures studied. Finally, the confirmation of a gap in the e-government study is incorporated, which can be affirmed by other scholars.

2.6.1 General Status of E-government in Developing Countries

As described earlier, e-government acts as a huge revolutionary wave in public administration, which has been driven by new technology. Traditional public services have been enhanced to a higher level by embedding them in ICTs, thus reducing the limitations of public management and providing high hopes of new opportunities. These public services with e-government are expected to be the panacea for public management in various positive aspects. According to the UN and ASPA (2002), 17 countries, which were assessed and categorised with high e-government capacity, proved that success in e-government created not only better, cheaper, and faster public services, but also greater benefits such as economic growth, increased transparency, and promotion of democracy for the whole of society. The success stories and experience of e-government from developed countries have been published widely; however, they may not bear relevance to developing countries that mostly report nothing but bad news (Chen et al. 2006).

Nevertheless, “e-government has become fashionable and the term itself is often used as a synonym for modern, efficient, transparent, participatory and customer-oriented government” (Haldenwang 2004, p. 418). As a vehicle of modern public administration, developing countries have seen e-government as a ‘leapfrogging’ opportunity to strengthen civil society in similar ways to those in developed countries (Basu 2004, Haldenwang 2004, and Ciborra 2005). In reality, as seen in Table 2.4, there are various limitations in developing countries, which do not support but rather obstruct e-government initiatives. Such limitations are not present in the developed world. There is, therefore, no easy or ready-made method for developing countries to trigger their society into administrative modernisation by e-government initiatives (Bhatnager 2003, Haldenwang 2004, Ciborra 2005, and Chen et al. 2006).

Table 2.4 The Main Differences Between Developed and Developing Countries

	Developed countries	Developing countries
History and culture	Relatively long history of democracy and more transparent policies and rules Consistent economic growth, high productivity and high standard of living	Relatively short history of democracy and less transparent policies and rules Inconsistent economic growth or decreasing productivity and low standard of living
Technical staff	Current staff with capacity to increase technical ability and hire younger professionals Outsourcing ability and financial resources to outsource	Inadequate staff or very limited in-house technical staff No outsourcing ability and usually no funding to outsource
Infrastructure	Good current infrastructure High Internet access rate for employees and citizens	Low current infrastructure Low Internet access rate for employees and citizens
Citizens	High Internet access and computer literacy Relatively more experience in the democratic system and more active participation in the governmental policy-making process	Low Internet access and computer literacy Relatively less experience in the democratic system and less active participation in the governmental policy-making process
Government officers	High priority providing high computer literacy and dedication of resources for e-government development	Low priority causing insufficient computer literacy and lack of resources for e-government development

Source: Chen et al. (2006, p. 27)

The comprehensive survey of Heeks (2003), which focused on the number of successful and unsuccessful e-government projects in developing countries, produced interesting results as follows. The complete failure of projects reached 35%, with failure due to implementation never being initiated or immediately being abandoned. Partial failure reached 50%, with such cases failing to attain the initiative's main objectives and/or the occurrence of significantly undesirable outcomes. Successful projects reached 15%, with success based on the main

objectives of most stakeholder groups being met and no significantly undesirable outcomes occurring.

From the global e-government survey of ASPA (2002) and West (2003), most developing countries were classified in the minimal and deficient e-government capacity categories and faced a lot of barriers in e-government development. The e-government situation can be summarised by the statement of Bhatnagar (2004) that e-government cannot be implemented at once or spontaneously. Besides, it also differs from one government to another. Its process regularly causes both expenses and political risks.

2.6.2 Method for the Literature Review

Reviewing e-government in developing countries needs a systematic approach for collecting articles. Therefore, this section explains the method used for the literature review.

In selecting articles that are relevant to e-government in developing countries, this research searched those that mainly focus on the empirical study of e-government. This allows us to learn what is really happening to e-government in developing countries. In explaining the phenomenon from a broad view, this research collected articles from 2000 to 2008 by using a structured and systematic approach (recommended by Webster and Watson 2002), to determine the relevant articles.

Firstly, this study searched through the electronic journal database in the library to identify journals focusing on the field of e-government. By doing this, it found 6 journals that could be accessed fully before downloading abstracts and articles. After that, the researcher searched each journal issue by issue by looking at the title first and then the abstract. If any of these had direct relevance to e-government in developing countries, the full text would be read. Using this method clearly identified articles about e-government in developing countries. As a result, 43 articles were found relevant to the subject in question.

Secondly, as suggested by Heeks (2001), e-government is an offspring of the public administration field and the information system. Therefore, 7 top journals on the information system and 7 on public administration were selected, as ranked by ISI Web of Knowledge.

This researcher then used the same strategy as that for collecting relevant articles (investigating issue by issue and article by article).

Results from searching IS journals showed few articles explored e-government, all being case studies of developed countries. The results were almost the same in public administration journals, and only 4 articles studied e-government in developing countries. Therefore, it can be assumed that the information system rarely focuses on e-government in developing countries, but some journals in public administration do; for example, the Public and Development Journal.

Thirdly, to ensure that no articles were missed from back issues, two databases were selected: the ABI database and EBSCO host database, in which key words were used in the search; for example, 'e-government in developing countries', 'electronic government in developing countries', and 'public information in developing countries'. It was found that the most relevant articles were the same as those uncovered by using the first two methods, as explained above. However, a further 8 relevant articles were also found.

Consequently, by using the methods described above, 51 articles relevant to studies on e-government in developing countries were found. However, these articles consisted of both documentary and empirical research, based on secondary and mainly primary data, respectively. The objective of this review is to explore the real and implicit e-government phenomena in developing countries; therefore, the researcher finally selected 36 articles for empirical study reviewing. The selected articles showed the achievements of e-government scholars in various useful dimensions; for example, research focus, research findings, framework of knowledge, research approaches, research methods and units of sampling. The results of the literature review are summarised in Appendix Four. The next section presents sensitised findings of the review starting from the main research focus of e-government in developing countries.

2.6.3 Review of the Findings of E-government Researches in the Context of Developing Countries

This section illustrates the main findings of e-government research in developing countries and aims to explain the issues that combine with the research focus, research findings, framework of knowledge, and research approaches. All details are provided as follows.

2.6.3.1 Study of the Research Focus of E-government in Developing Countries

The initial review of e-government study in developing countries aims to explain in which areas of study scholars were interested in exploring. In categorising the researches, the author read through all details of each paper and finally found the focal point of each paper. Therefore, research studied can be categorised in accordance with its focal points, which are: performance evaluation of application, assessment of implementation, user acceptance of application, success/failure analysis, impact evaluation, assessment of design, and the stakeholder involvement of e-government development. Table 2.5, on the next page, summarises the research focus of e-government in developing countries.

Table 2.5 Research Focus Points of E-government in Developing Countries

Research focus points	Number of articles in total 36 articles and (%)	Articles (authors)
Performance evaluation of applications	12 (33.33%)	Abanumy, Al-Badi, and Mayhew 2005, Chen, Huang and Hsiao 2006, Chhabra and Jaiswal 2008, Higgo 2003, Holliday and Yep 2005, Joia and Zamot 2002, Mitra and Gupta 2008, Parajuli 2007, Rahardjo, Mirachandani and Joshi 2007, Shi 2007, Subramanian and Saxena 2008, Tseng et al. 2008,
Assessment of implementation	11 (30.55%)	Al-Fakhri et al. 2008, Arif 2008, Dinesh, Julius, and Kailash 2008, Gupta and Jana 2003, Hussein et al. 2007, Kumar and Best 2006, Lau et al. 2008, Luna-Reyes, Gil-Garcia, and Cruz 2007, Luna-Reyes, Gil-Garcia, and Estrada-Marroquin 2008, Mutshewa 2007, Santos 2008,
User acceptance of applications	6 (16.66%)	Chang et al. 2005, Fu, Chao, and Farn 2004, Hung, Chang, and Yu 2006, Hwang 2000, Sahu and Gupta 2007, Wangpipatwong, Chutimaskul, and Papasratorn, 2008
Success/failure analysis	4 (11.11%)	Joia 2007, Stanforth 2007, Wang and Liao 2008,
Impact evaluation	2 (5.55%)	Madon 2005, Joia 2008
Assessment of design	1 (2.7%)	Ciborra and Navarra 2005
The stakeholder involvement of e-government development	1 (2.7%)	Wong, Fearon, and Philip 2007

Source: Author's Construct

Table 2.5 shows the research focus points, which can be explained as follows.

Firstly, thirty three percent of studies referred e-government applications to online government services via the Internet or websites. Largely, scholars evaluated website performance of both federal and local governmental agencies, which were found in works such as those of Holiday and Yeb (2005) and Shi (2007) in the case of China; Chhabra and Jaiswal (2003), Kurma and Best (2006) and Subramanian and Saxena (2008) in the case of India; Rahardjo, Mirachandani and Joshi (2007) in the case of Indonesia, and Parajuli (2007) in the case of Nepal. Others, meanwhile, only investigated a single application that had a specific function, for example, e-trade (Joia 2008), e-auction (Joia and Zamot 2002), e-complaint (Chen and Hsiao 2006), and e-finance (Higgo 2003). These studies had the objectives of exposing factors that obstructed web-based services and suggesting ways to develop the performance of e-government services.

Secondly, twenty five percent of all studies were interested in assessing and evaluating e-government development, with the intention of answering questions about the current status of e-government initiatives. The researchers aimed to discover the progress of e-government development mainly in the board picture; for example, the development of e-government in Saudia Arabia (Arabia,Al-Fakhri et al. 2008); e-government Agencies in Malaysia (Hussein et al. 2007); IT Projects in the Mexican Federal Government (Luna-Reyes, Gil-Garcia, and Cruz 2007, and Luna-Reyes, Gil-Garcia, and Estrada 2008), and E-PING Brazilian Framework in Brazil (Santos 2008). Other researchers, meanwhile, assessed e-government development by comparing with other countries, for example, Dinesh, Julius, and Kailash (2008), who compared e-government development in Thailand and Indonesia, and Lau et al. (2008), who compared e-government adoption in three Latin American countries: Argentina, Brazil and Mexico.

Thirdly, user-acceptance of e-government application also was of interest to scholars, but differed from the two areas mentioned above, in that the focus area aimed to explain the expressions and opinions of citizens as end users of e-government applications. The application mainly selected was e-tax, as found in the works of Hwang (2000), Chang et al. (2005), Fu, Chao, and Farn (2004) and Hung, Chang and Yu (2006). E-tax has the purpose of providing citizens with online tax transactions.

Fourthly, only four research articles focused on success/failure analysis, and they took different perspectives in analysing the case study. Stanforth (2007) investigated the ups and downs of the governmental financial system in Sri Lanka. Joia (2007) explained the key success factor of the G2G project in Brazil, while Wang and Liao (2008) and Hussein et al. (2007) attempted to find the factors that could affect success of e-government projects directly. Interestingly, no article intended to study the failure case study.

Fifthly, the minority of researches focused on these areas, which had impact on e-government, assessment of e-government design and stakeholder involvement in e-government projects. Perhaps these areas can be considered as the gap in e-government study.

In conclusion, the research focus of e-government resides in evaluating the performance of e-government application and assessing the progress of e-government development. Very limited attention was paid to areas such as failure analysis, impact of e-government and stakeholder involvement.

2.6.3.2 Review of Lessons Learned From the Researches in the Context of Developing Countries

There were just 3 papers (2 cases) out of 36 articles that strongly claimed successful cases. The first case was the e-auction project in Brazil. Joia and Zamot (2002) expressed that this G2B project was successful in terms of efficiency, effectiveness and transparency. The other case was the G2G project also in Brazil, from which Joia (2007) found 3 key success factors: security system, organisation culture and sufficient training. He also stated that success of this project had positive effects on the intellectual capital of public agencies, this being human, organisational, and innovation capital.

A lot of case studies reported disappointing results of e-government implementation. The majority of case studies could not claim the success of projects completely, even when achieving more citizen satisfaction, as the projects still faced difficult problems. This hinted at uncertainty in e-government projects in developing countries. The findings of barriers or problems in e-government projects are summarised in Table 2.6.

Table 2.6 Summary of Problems in E-government in Developing Countries

Problems in e-government	Articles (authors)
1. Lack of partnerships from all stakeholders involved	Wong, Feason and Phillip (2007), and Gasmelseid (2007)
2. Focus on IT implementation, but not on citizens' needs	Navana (2005), Wong, Feason and Phillip (2007), Gasmelseid (2007), and Tseng et al (2008)
3. The problem of the digital divide	Navana (2005), Kumar and Best (2006), Wong, Feason and Phillip (2007), Lau et al. (2008), Subramanian and Saxena (2008)
4. Failure to focus on the desires of citizens	Abanumy et al (2005); Navara (2005); Arib (2008), Kannabiaran, Xavier and Banumathi (2008), and Lau et al. (2008)
5. Lack of IT infrastructure, especially in remote areas	Nair (2002), Navara (2005); Kumar and Best (2006), Chhabra and Jaiswal (2008), Kannabiaran, Xavier and Banumathi (2008), Mutula (2008), and Subramanian and Saxena (2008)
6. Outdated laws and regulations for the requirement of e-government	Gatthegi (2005), Al-fakhri (2008); Chhabra and Jaiswal (2008), Luna-Reyes, Gil-Garcia and Cruz (2007), Lau et al (2008), and Mutula (2008)
7. Lack of knowledge about e-government in both society and public agencies	Nair (2002), Higgo (2003), Ciborra and Navara (2005), Kumar and Best (2006), Al-Fakhri (2008), Arif (2008), and Subramanian and Saxena (2008)
8. Flaws in policy setting, resulting in implementation process problems	Nair (2002), Jan and Tsai (2002), Ciborra and Navara (2005), Ma, Cheng and Thorson (2005), and Mutshewa (2007)
9. Lack of capable and skilful public employees in e-government	Higgo (2003), Kumar and Best (2006); Mohmed and Sackett (2007), Suha and Gupta (2007), Arif (2008), Mutshewa (2007), and Mutula (2008)

Table 2.6 (continued)

Problems in e-government	Articles (authors)
10. Lack of a standard setting in hardware, software and information	Holiday and Yab (2005), Hussein et al. (2007), Mohmed and Sackett (2007), Mutshewa (2007), Parajuli (2007), and Arif (2008)
11. Negative attitudes toward e-government development	Luna-Reyes, Gil-Garcia and Cruz (2007), Al-Fakhri (2008), and Subramanian and Saxena (2008)
12. Lack of a strong political will to support the E-government initiative	Kannabiaran, Xavier and Banumathi (2008), Subramanian and Saxena (2008), and Zambramo (2008)
13. Lack of awareness in designing e-government applications for disabled citizens	Abanumy, AlBadi and Mayhew (2005), Parajuli (2007), and Shi (2007)
14. Lack of security and privacy in e-government applications	Kannabiaran, Xavier and Banumathi (2008), Holiday and Yab (2005), and Parajuli (2007)
15. Lack of financial support	Nair (2002), and Kumar and Best (2006)
16. Failure to provide various languages on e-government applications for different groups of citizens	Holiday and Yab (2005) and Parajuli (2007)

Source: Author's Construct

Briefly, the facts show that e-government development in developing countries suffers from various constraints. This may explain the reasons of e-government projects failed to achieve their target. Scholars mainly focused on factors that constrained e-government development, but not the direct reasons why e-government projects fail.

2.6.3.3 The Framework of Knowledge in E-government Research

The framework of knowledge in research studies plays a crucial part in each area of knowledge building. It is a fundamental guideline for the use of a researcher in answering questions that originate new knowledge. Heeks and Bailur (2007) classified the framework of knowledge into seven categories from the largest to the smallest contribution to the research study. These are as follows: theory-based work, framework-based work, model-based work, schema-based work, concept-based work, category-based work and non-framework-based work. Theory-based work refers to applying or testing theory in the research study. Framework-based work means that building of frameworks is synthesised from various ideas or perspectives on different theories. Model-based work is the use of a model that does not present a deeper framework of knowledge such as the World Wide Web Consortium (W3C) model. The category-based framework represents a set of categories or factors such as those used to evaluate e-government websites, and non-frame-based work refers to no use of any framework of knowledge, but only presenting data and ideas. In my review, it was found that five types of framework were used in e-government research, as shown in Table 2.7.

Table 2.7 Framework of Knowledge Used in E-government Research

Knowledge framework	Number of articles in total 36 articles and (%)	Articles (authors)
Theory-based work	6 (16.66%)	Ciborra and Navarra 2005, Hung, Chang, and Yu 2006, Luna-Reyes, Gil-Garcia, and Cruz 2007, Luna-Reyes, Gil-Garcia, and Estrada-Marroquin 2008, Stanforth 2007, Wong, Fearon, and Philip 2007
Framework-based work	7 (19.44 %)	Dinesh, Julius, and Kailash 2008, Hussein et al. 2007, Joia and Zamot 2002, Joia 2008, Lau et al. 2008, Mitra and Gupta 2008, Sahu and Gupta 2007

Table 2.7 (continued)

Knowledge framework	Number of articles in total 36 articles and (%)	Articles (authors)
Model-based work	9 (25 %)	Abanumy, Al-Badi, and Mayhew 2005, Arif 2008, Chang et al. 2005, Fu, Chao, and Farn 2004, Holliday and Yep 2005, Madon 2005, Shi 2007, Wang and Liao 2008, Wangpipatwong, Chutimaskul, and Papasratorn, 2008
Category-based work	13 (36.11 %)	Al-Fakhri et al. 2008, Chhabra and Jaiswal 2008, Gupta and Jana 2003, Higgs 2003, Hwang 2000, Joia 2007, Kumar and Best 2006, Mutshewa 2007, Parajuli 2007, Rahardjo, Mirachandani and Joshi 2007, Santos 2008, Subramanian and Saxena 2008, Tseng et al. 2008
None-frame-based work	1 (2.7 %)	Chen, Huang and Hsiao 2006

Source: Author's Construct

The above Table shows that results from the framework of knowledge can be explained from two perspectives.

Firstly, sixty one percent of research studies were dominated by a model-based and category based framework. This hints that e-government research fails to study the e-government phenomenon in depth due to a lack of knowledge building in the field of study. From various cases, which employed these two frameworks above, it is obvious that those different cases presented varied findings in the case studies. There was a lack of unique explanations in the same direction or same language. While this could benefit practical purposes in each case study, the theory contribution may not be achieved.

Secondly, only five theories (in six articles) have been used in e-government research, as shown in Table 2.8. Most papers, eighty three percent (30 from 36 articles), did not use the theories. The lack of theories in e-government researches signals a disadvantage in this area. Sahay and Walsham (1995) explained that little or no theory in the research area of study loses the benefits of communication among scholars and practitioners, and the accumulation of knowledge building and recognition of the research area as a field of study are also lost.

Table 2.8 Theories Used in E-government Researches in Developing Countries

Theory	Research focus	Articles (authors)
New institutional economics theory	To analyse the influences of e-government on socioeconomic development and change	Chiborra and Navarra (2005)
Actor – network theory	To explain the trajectory of e-government implementation	Stanforth (2006)
Theory of planned behaviour	To examine e-government service acceptance	Hung et al. (2006)
Stakeholder theory	To explore the role of stakeholders in promoting e-government	Wong, Tearon, and Philip (2007)
Institutional theory	To explore institutional arrangements and organisational structure that enable or hinder the inter organisational collaboration and trust in e-government initiatives	Luna-Reyes et al. (2007), and Luna-Reyes, Gil-Garcia and Cruz (2007)

Source: Author’s Construct

In summary, the knowledge in the e-government area requires better theory-based research. Most recent studies applied other frameworks, e.g. framework-based work, model-based and category-based framework, which provided less contribution to the specific area of e-government. As pointed out by Heeks and Builur (2007, p. 225) “the models being presented might give some insights into what is happening in e-government, but few are offering any understanding of why things are happening. Theoretical perspectives may do the latter, and so may help e-government practitioners understand why, for example, models that work well in one place do not work well in another”.

2.6.3.4 The Research Methodologies Conducted in Developing Countries Studies

Twenty-one articles used quantitative research, twelve used qualitative research and three used a mixed method. The selection of the research approach depended on the framework of study; for example, the model-based framework tended to use a quantitative research.

Interestingly, it was found that approximately sixty six percent of research designs used just one unit of sampling, as detailed in Table 2.9. This means that most articles selected just one group of samples to study; for example, a group of citizens, public employees, and public managers. Therefore, the results of the research represented only one set of viewpoints. This point is very complex, as described by earlier e-government studies. It involves many stakeholders, such as governments, public agencies, the business sector, consultants, and citizens. One unit of sampling may not speak well on behalf of the e-government phenomenon. The argument is that e-government research sampling should be concerned about various relevant stakeholders. Doing this may help to improve the quality of research, and different viewpoints could be presented in the research findings. Furthermore, interaction and relationships would be seen among stakeholders.

Table 2.8 Research Unit of Sampling in E-government Research

Unit of sampling	Number of articles in total 36 articles and (%)	Articles (authors)
One unit	24 (66.66 %)	Abanumy, Al-Badi, and Mayhew 2005, Al-Fakhri et al. 2008, Chang et al. 2005, Chen, Huang and Hsiao 2006, Fu, Chao, and Farn 2004, Gupta and Jana 2003, Holliday and Yep 2005, Hung, Chang, and Yu 2006, Hussein et al. 2007, Hwang 2000, Joia and Zamot 2002, Joia 2007, Joia 2008, Luna-Reyes, Gil-Garcia, and Cruz 2007, Luna-Reyes, Gil-Garcia, and Estrada-Marroquin 2008, Mitra and Gupta 2008, Mutsheva 2007, Parajuli 2007, Sahu and Gupta 2007, Shi 2007, Subramanian and Saxena 2008, Tseng et al. 2008, Wang and Liao 2008, and Wangpipatwong, Chutimaskul, and Papasratorn, 2008
Two units	7 (19.44 %)	Arif 2008, Chhabra and Jaiswal 2008, Higgs 2003, Kumar and Best 2006, Rahardjo, Mirachandani and Joshi 2007, Santos 2008, Wong, Fearon, and Philip 2007
Three units	2 (5.55%)	Lau et al. 2008 and Stanforth 2007
Four units	1 (2.7 %)	Dinesh, Julius, and Kailash 2008
Five units	2 (5.55%)	Ciborra and Navarra 2005, and Madon 2005

Source: Author's Construct

The varied dimensional findings of the review on e-government in developing countries (see sections 2.6.3.1 - 2.6.3.4) provide useful debatable information on what is missing in e-government research. Therefore, the next section presents the confirmation of gap in the research study on e-government in developing countries.

2.7 Confirmation of Gap in Study of E-government in Developing Countries

Based on the literature review in section 2.6, it can be concluded that the missing pieces in the research work of e-government in developing countries are as follows.

Firstly, if most cases (in section 2.6) are evaluated by their objectives, it can be claimed that most of them have failed or have difficulty in achieving their goals. This fact can be supported by the statement of Heeks (2003) that declares that 85 percent of e-government projects in developing countries fail either totally or partially. The reasons why many e-government projects could not achieve their goals can be noted from problems that occurred (see more details in Table 2.6). Scholars have illustrated that e-government projects in developing countries have flaws and defects in both design and implementation. Academics mostly aim to answer the question, ‘What factors enable or constrain e-government projects?’. However, as failure happens everywhere, the following question ‘Why did many e-government projects fail?’ is ignored. The answer to this question is in the heart of e-government in developing countries and it calls for research to find a better solution for e-government initiatives and development.

Secondly, according to the use of the framework of knowledge in e-government research in developing countries, academics prefer to use the model-based and category-based framework instead of the theory-based framework (see Table 2.7). Only a few theories have been applied in the studies (see Table 2.8). The model and category-based framework may lack direct explanations of results, as different cases show various factors resulting from their findings. According to the work of Gronlund (2004), and Heeks and Bailur (2007), they confirmed that the research work in e-government studies rarely uses or applies theory. Interestingly, it could therefore be assumed that little or no theory indicates a lack of

communication (among and between researchers and practitioners), insufficient knowledge building or accumulation and, more importantly, “lack of legitimacy and recognition for e-government as a field of study” (Sahay and Walsham 1995). Not using the theory-based framework merely answers ‘What is happening?’ by a superficial explanation of the phenomenon. In contrast, use of the theory-based framework can answer questions of the phenomenon more deeply by asking ‘Why things are happening?’ (Heeks and Bailur 2007, p.255). Therefore, e-government research is needed in order to move to a higher level in aiming to answer the question ‘Why?’ by using theory.

Thirdly, e-government is very complex in terms of involvement, with various actors needing to work corporately in e-government projects. It could be said that the relationships and conflicts among them determine the destiny of success or failure in e-government projects. From section 2.6.3.4: the research approach, the unit review of sampling in e-government research shows that in most studies exploration is limited to just one unit of sampling, which presents a lack of varied opinions from different actors that have their own characteristics and interests. Importantly, it also hints at forgotten focus on the study during interaction among actors in e-government projects. This fact is confirmed by the works of Chircu (2008) and Rowley (2011), who stated that very little analysis has been carried out on the perspective of incorporating different actors in e-government. Most studies had focused only on one specific actor such as citizens or public agencies.

The three gaps in e-government study, as described above, inspire and encourage this author to fill them. Firstly, as failure of e-government in developing countries is widespread, and its causes are rarely researched, this study focuses initially on failure analysis specifically in order to answer the important question ‘Why do e-government projects in developing countries fail?’. Secondly, as theory is used rarely in the e-government area, this study strongly applied it as an analytical tool to analyse the cause of failure. Doing this would help to support e-government in being recognised as a field of study. Thirdly, as there has been very little analysis of relevant actors in e-government, this study focused on analysing the interaction among actors that causes e-government projects to fail.

In brief, this dissertation aims to fill these gaps in e-government study and study failure cases through using theory as an analytical framework. The selected theory should help to explain the interrelation and inaction among actors, which cause the projects to fail.

Chapter 3 Actor-Network Theory

This Chapter initially justifies use of actor-network theory (ANT) by providing the rationale and suitability of ANT use in this research. Then, the background and fundamental concepts of ANT are illustrated. However, in order to understand the way in which researchers use this theory, this chapter also reviews applications of ANT from various perspectives of failure analysis. Finally, it presents the main analytical framework that is used in this study.

3.1 Justification of Actor-Network Theory

To identify an appropriate theory for investigating failure in the e-government area, understanding needs to go back to fundamentals. The nature of e-government refers to the government agencies that employed information and communication technology as a critical tool, such as the Internet, in order to create and improve government services to citizens (OECD 2003, Curtin, Sommer and Sommer 2003, World Bank 2007 and Heeks 2006).

As e-government is a new area of study, it lacks theory in explaining the phenomenon (Gronlund 2004, and Heeks and Bailur, 2007). Therefore, Gronlund (2005) proposed a set of candidate theories, which may fit with the nature of e-government. Three theories were suggested namely, institutional theory, structuration theory, and actor-network theory, and they are summarised as follows:

Institutional theory:

Scott (2004. p. 2) explained, “institutional theory attends to the deeper and more resilient aspects of social structure. It considers the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behaviour. It inquires into how these elements are created, diffused, adopted, and adapted over space and time; and how they fall into decline and disuse.”

According to institutional theory, organisations are stable entities and difficult to alter, therefore, when development of information or technology occurs, much of its system is restricted by the organisation's rules and culture (Grolund 2005).

From the underlying concepts of this theory, when applied in the e-government research, the focus of study would aim to analyse the interacting institutions which affect e-government.

Structuration theory:

Giddens (1984) explained that structuration theory refers to the connection between the structure of the social system and human action, which mutually depends on duality, and is called 'the duality of structure'. Structure is constituted by human actors and at the same time it serves as the medium of human interaction across time and space. It is the sets of rules and resources that individual actors depend upon in practices that reproduce social systems. Giddens also categorises three dimensions of structure in the social system: significance, domination and legitimacy. Human interaction is also broken down into three dimensions: communication, power and sanction. Both sets of dimensions are likened to the dimension of modality: interpretive scheme, facility and norm.

This theory has been adapted by researchers who are interested in the relationship between technologies and structures, for example, the work of Orlikowski (1992). Her work employs structuration theory to consider the roles and uses of technology and proposes a model for investigating the mutual interaction between agents and technology. For this reason, both were structurally and socially constructed. There are two dimensions of structure that influence human interaction: institutional context and institutional properties. Briefly, "human actions are enabled and constrained by structure, yet these structures are the result of previous action" (Ibid., p.404).

In applying this theory to explain the e-government phenomenon, the framework of study would aim to research what enables people to interact with e-government, focusing on the practices which establish and maintain structures that mould the emergence and situation of that e-government.

Actor-network theory:

Callon (1987, p.97) stated, “actor-network theory (ANT) describes the dynamics of society in terms totally different from those usually used by sociologists.” A socio-philosophical approach of actor-network theory “...rejects any sundering of human and non-human, social and technical elements” (Hassard, Law and Lee 1999, p.338). ANT accepts the differences of human and non-human actors, but denies treating them separately. It supposes everything to be an actor-network where elements of any kind hold together such as humans, technological artefacts, organisations, institutions, etc., and it does not differentiate between or delegate a priority of any kind of elements (Walsham 1997, and Hanseth, Aanestad and Berg 2004).

Walsham (1999, p.468) summarised, “actor-network theory examines the motivations and actions of actors (both human beings and non-humans such as technological artefacts), who form elements, linked by associations, of heterogeneous networks of aligned interests” In addition, Gronlund (2005, p.4) added that “actor-networks are the most salient structures driving the technological development by negotiations.”

Therefore, if this theory is used in the e-government research, the negotiation, behaviour, interest alignment and association of the actor-network (both human and non-human) should be seen on a continuance.

In conclusion, these three theories have the potential to different aspects in illuminating the e-government phenomenon. However, the key point in this research is the needs to focus on the specific phenomenon in the e-government area, which is the failure of an e-government project. Therefore, a narrowing down to which theory is the most appropriate is needed for this failure study.

From the literature on e-government failure; it could be said that different cases of failure show varied failure factors because these case studies employ a factor approach without theory. Therefore, many factors cause e-government projects to fail. However, if failure factors are categorised into groups, the cause of failure might concern only human and non-human factors. For example, human factor failure can be caused by conflict of self interest, insufficient participation, lack of trained staff, inadequate leadership, etc. (Heeks and

Bhatnagar 1999, Kitiyadisai 2000, Kumar and Beast 2006, and Gauld, 2007). Failure caused by the non-human factor could be due to an incompatible IT system, a lack of good information, legislative regulations, financial barriers, etc. (Heeks and Bhatnagar 1999, OECD 2003, and Pawlowska 2004).

Therefore, institutional theory and structuration theory may not be suitable for exploring a failure case study. This is because structuration theory focuses on the way people interact with e-government and how such interactions establish structures that shape e-government. While institutional theory concentrates on how an institution affects technology.

On the other hand, ANT focuses at the actor level, which is involved with technology. From this point, details of the failure caused by an actor can be greatly elaborated. However, by its nature, ANT can create insight into the failure of technology in an e-government project for instance. Looking back in the past, original works of failure case analysis by actor-network theorists can be found, for example, Callon's work (1986) in the scallop case study, Law and Callon (1992) on the life and the death of an aircraft and Latour's work (1996) in Aramis or the love of technology. Currently, the concept of ANT is used widely by many scholars to investigate many areas that answer the question of how and why inventions in technology fail, for example, Gao's work (2007) investigated why the Wireless Local-area failed to be implemented in China, Sarker, Sarker and Sidorova (2006) explained the implementation failure of the Business Process Change (BPC) initiative, and Mahring et al. (2004) explored why high technology project building could not deliver the intended outcome.

From the rationality, as demonstrated, it can be claimed that ANT is appropriate for examining failure in e-government projects. The next section provides the concept of ANT that is used in this study.

3.2 Fundamental Concepts of Actor-Network Theory

ANT was originally developed at the Ecole Nationale Supérieure des Mines de Paris in the 1980s. Since then, it has contributed significantly to the study of science and technology through the works of three well-known scholars, notably *The Scallops Case at St. Brieuc Bay* by Callon (1986), *Portuguese Navigation by Law* (1986), and *Pasteurization of France and Where are the Missing Masses?* by Latour (1988, 1992) (Walsham 1997 and Neyland 2006).

Callon (1987 p.97) states that “actor-network theory describes the dynamics of society in terms totally different from those usually used by sociologists.” A socio-philosophical approach of ANT “...rejects any sundering of human and non-human, social and technical elements” (Hassard, Law and Lee 1999, p.338). ANT accepts the differences of human and non-human actors, but denies treating them separately. It supposes everything to be an actor-network where elements of any kind hold together such as humans, technological artefacts, organisations, institutions, etc., and it does not differentiate between or delegate a priority of any kind of elements. Any element in the actor-network is preferably called and treated as an ‘actant’, which constitutes and shapes a hybrid network (Walsham 1997 and Hanseth, Aanestad and Berg 2004).

To analyse everything in the actor-network, every actor or element should be treated in the same analytical vocabulary (Callon 1987 and Hassard, Law and Lee 1999). This concept, for actor-network theoreticians, is called the principle of generalised symmetry. The concept of abandoning differentiation between humans and non-humans is named the principle of free association (Callon 1986). Law (1992, p.97) also states, “sociologies that do not take machines and architecture as seriously as they do people, will never solve the problem of reproduction in society”, because it is materially heterogeneous in reproducing itself.

Walsham (1999, p.468) summarises and concludes, “actor-network theory examines the motivations and actions of actors (both human beings and non-humans such as technological artefacts), who form elements, linked by associations, of heterogeneous networks of aligned interests”

3.2.1 Actor and Actor-Network

In the view of ANT, everything or any element in the network is itself an actor-network and is considered in the same status whether humans and non-humans, including technological artefacts. As noted above, these 'actants' constitute and shape networks (Walsham 1997). However, all networks are different at least when human actors and technological artefacts interplay in organisations or social life. They have their own actions. These different actions from different actors produce and are produced by different actor-networks through the process translation. In the process of translation in the actor-network, many programmes of actions are inscribed, typically into the non-human actors (Hanseth, Aanestad and Berg 2004). These mutual actions make up the relationship among actors in the actor-network. Actors or actants are continuously produced and reproduced (Hassard, Law and Lee 1999 and Doolin and Lowe 2002). Latour (1992) gives an example of this concept. When customers at a hotel are asked by the manager to leave their room keys at reception before going out, a verbal request might not be heeded. Therefore, a written notice might be added, and finally a large weight or tag is attached to the key. The network objects; room keys, hotel managers and weights, are simultaneously and continuously affected by, and affect, the interests that they adhere to and their strategic references. It can be assumed that the "actors and actor-network are naturally embedded in open ranges of relationship, which cannot be artificially limited by the scope of any particular analysis" (Cordella and Shaikh 2006, p.10).

3.2.2 Heterogeneous Network

In terms of ANT, "networks are materially heterogeneous" – that is, they are made up of different elements – and "heterogeneous networks lie at the heart of actor-network theory" (Law 1992 p.379 and 380). Society, organisations, agents, and machines are all components that constitute the heterogeneous network, and are themselves constituted by such networks. For example, a machine can be understood as a heterogeneous network, composed of human actors such as operators, users, and mechanics (Law 1992). When looking inside the box of a network, the heterogeneous network not only lies within, but it also contains both humans and non-humans or technological artefacts (Hanseth, Aanestad and Berg 2004). Maintaining stability in the heterogeneous network, which may include or exclude network components, reflects the accomplishment of a workable solution and relationship.

For exploring the heterogeneous network, Law (1987) suggested two intimately related methodological principles for use as a study device. The first is the generalised symmetry principle, which means that all elements in the heterogeneous network, whether human or not, are studied with the same type of analysis, e.g. the same language for interpreting the expression of actors. The second is the reciprocal definition in which actors and the network influence and are influenced by each other. Putting it simply, the actions of actors can affect the network structure, which conversely, can affect the behaviour of actors. Therefore, by the second principle, network study is required to analyse both actors and the network in parallel because of their inter-related association.

3.2.3 Punctualisation

“All phenomena are the effect or the product of heterogeneous networks” (Law 1992, p. 358), for example, a television can be considered as a single object. However, when it breaks down, the user or repair mechanic suddenly sees it as a complex system comprised of many electronic and mechanical components, themselves deriving from a network of designers, manufacturers, suppliers, etc. The same can be said for a healthy person, whose working system is concealed in the body until he or she is sick. Then the body is converted into a complex network of processes in the eyes of physicians and the person involved. The point from these two examples is that complexities are hard to deal with. Therefore, complex networks are often seen as a single black box, seen to constitute and act as a single entity, and then the complexities are concealed. Actor-network theorists call this effect; ‘punctualisation’ in relation to the placing of the black boxed elements into any other network (Ibid.).

Callon (1991, p. 153), explains that “the process of punctualisation thus converts an entire network into a single point or node in another network.” Law (1992, p. 385) explains more on the notion that “punctualisation is always precarious; it faces resistance, and may degenerate into a failing network. On the other hand, punctualised resources offer a way of drawing quickly on the networks of society without having to deal with endless complexity.”

Sarker, Sarker and Sidorova (2006) depict that the notion of punctualization warns us about punctualised actors are always in flux. This means that a set of punctualised actors can be de-punctualised or disintegrated at anytime. This acts as a benefit in exploring and observing the

process of actors that attempt to be punctualised or alternatively de-punctualised by disintegration in the actor-network.

In summary, for research purposes, this conceptualisation allows unpacking complexity by zooming in or collapsing complexity by zooming out, as suits the purposes of this study (Monteiro 1999). Whether zooming in or out, it is essential and important to recognise large contexts with a huge number of actors. For example, zooming out can simplify a comprehensive actor-network as one actor, such as an organisation or governmental agency, while zooming in can see it as a set of different actors.

3.2.4 The Sociology of Translation

To translate is “a verb which implies transformation and the possibility of equivalence, the possibility that one thing (for example an actor) may stand for another (for instance a network)” (Law 1992, p.386). The concept of translation focuses on the continuity of the displacements and transformation that happen in the story; for example, displacement of goals and interests, and also displacement of human devices and inscriptions. Displacement happens at every stage of a network’s life (Callon, 1986). Law and Callon (1992, p.52) state that in a translation shaped by a set of compromises between a somewhat different set of actors “... translation is the product of continual negotiation.” In conclusion, translation is the mechanism of progressive temporary social orders in which we see the transformation from one order to another through changes in the alignment of interests in a heterogeneous network (Sarker, Sarker and Sidorova 2006).

Callon (1986) describes that translation is composed of four moments, namely problematization, interessement, enrolment and mobilization.

Problematization is the first moment of translation, which relates to the process of a focal actor striving to become indispensable to the other actors by defining the problem and motivating them into the network, and suggesting that the problem would be resolved if the actors negotiated the “obligatory passage point (OPP)”. Problematization describes a product of alliances, or associations between actors by identifying what they want (Callon 1986). OPP relates to the process in which a focal actor convinces all other actors to accept the proposal of a network. OPP also relates to the process in which a focal actor shows an interest in all the actors who accept the proposal of the network (Callon 1986).

Interessement is the second moment of translation, which relates to a series of processes where a focal actor attempts to lock other actors into a position that has been offered to them in the network. Interessement also means the group of actions by which the focal actor aims to impose and stabilise the other actors’ identity. These actions are defined through the problematization process. Different devices for different actors are used in these actions. For example, in the Callon’s scallop case study; some devices of the interessement process had a favourable balance of power: the fisherman’s devices were the towlines in St. Brieuc Bay and for the scientific colleagues the devices were texts and conversation, which attracted the actors concerned to follow the project (Callon 1986). If the interessement succeeded, then enrolment could take place.

Enrolment is the third moment of translation, which refers a set of strategies in which a focal actor attempts to define and interrelate the various roles that allow other actors to enrol. The process of enrolment involves “group multilateral negotiations, trials of strength and tricks that accompany the interessements and enable them to succeed” (Callon 1986 p.211). When the negotiation between actors has been achieved, the inscription appears. The inscription is a process of artefact creation that ensures the concretisation of some interests (Sarker, Sarker and Sidorova 2006). In brief, an enrolment relates to the other actors’ acceptance of the interests defined by a focal actor through the process of bargaining and making concessions (Madon, Sahay and Sahay 2004, and Sarker, Sarker and Sidorova 2006).

Mobilization is the final moment of translation, which relates to a set of methods utilised by a focal actor to ensure that all actors have legitimate speakers to represent them in the groups, and avoid betrayal in various collectives from the latter (Callon 1986, and Madon, Sahay and Sahay 2004). Speakers or representatives are actors who speak or deputise for other actors (Walsham 1997). In the scallop case, the researchers, as focal actors, were seen as the legitimated speakers for the scallops at St. Brieuc Bay.

The main vocabulary of ANT is summarised in Table 3.1 and employed in this work. However, according to the principle of generalised symmetry, there is no discrimination or differentiation for all actors. All vocabulary, as follows, is used for all human actors and non-human actors or technological artefacts (such as the Smart ID Card in the particular case under study here). These terms will be applied without discrimination.

Table 3.1 The Main Concept of Actor-Network Theory

Concept	Definition
Actor (or actant)	Both human and non-human actors such as technological artefacts.
Actor-network	Heterogeneous network of aligned interests, including people, technology, organisations, etc.
Translation	Process of alignment of the interests in a diverse set of actors with the interests of the focal actor.
Problematization	The first moment of translation, during which a focal actor defines identities and interests of other actors that are consistent with their own interests, and establishes translation as an obligatory passage point, thus rendering itself indispensable.
Obligatory passage point (OPP)	A situation that inevitably occurs in all actors to enable them to achieve their interests, as defined by the focal actor.
Interessement	The second moment of translation, which involves negotiating with actors to accept the definition of the focal actor.
Enrolment	The third moment of translation, wherein other actors in the network accept (or become aligned to) the interests and roles defined for them by the focal actor.

Table 3.1 (continued)

Concept	Definition
Inscription	A process of creation of artefacts that would ensure the protection of certain interests.
Mobilization	A focal actor's use of a set of methods to ensure that all actors have their representatives or spokespersons act according to the agreement and not betray the initiator's interest.
Speaker/delegate/representative	An actor that speaks on behalf of (or deputises for) other actors.
Betrayal	A situation where actors do not abide by the agreements arising from the enrolment of their representatives.

Sources: Callon (1986), Law (1992), Walsham (1997), and Sarker, Sarker and Sidorova (2006)

3.3 Actor-Network Theory and Failure Analysis

ANT is furnished with a wide vocabulary, which allows academics to apply it in different ways. When focused on failure analysis, the vocabulary of ANT, they can be used in various perspectives depending on the nature of the case. This section reviews case studies that used ANT as a vehicle to investigate failure cases. The aims of this section are firstly, to show the validity of ANT in failure study; secondly, to describe the value of ANT in failure study; thirdly, to conclude the causes of failure through the lens of ANT; and fourthly, to learn how academics modify ANT by investigating failure.

It was found from the literature that at least three main concepts of ANT have been applied to exploration of failure cases. They are the concept of the four moments of translation, the concept of global and local network, and the concept of counter-network. The lessons learned from these concepts are presented after addressing the aims described above. All details are illustrated below.

3.3.1 The Four Moments of Translation

This concept combines the four moments: problematization, interessement, enrolment, and mobilization (See details in Section 3.2.4). This concept of ANT was applied as a vital tool in investigating and explaining failure in various areas, for example, technology standard setting (Lee and Oh 2006), a Business Process Change (BPC) initiative (Sarker, Sarker and Sidorova 2006), high technology project building (Mahring et al. 2004) and in the financial area (Greener 2006). The details and lessons learned from these case studies are presented as follows.

With regard to setting technology standards, Lee and Oh (2006) investigated China's failure in setting a standard in an international context. Their study applied ANT as a crucial framework to analyse the formulation and development of the Wireless Lan Authentication and Privacy Infrastructure (WAPI) in China. It is interesting that this case showed the way to apply ANT by explaining the international level, which has many actors involved such as individual firms, industry associations, national governments, and international organisations.

The strong belief that China is the world's largest telecommunication market made its government confident in bringing Chinese standards to the international level. For this reason, it could be said that various actors were involved and accepted these standards, due to their interests in a huge Chinese market. Therefore, China likely ignored current standards in the world market such as Wi-Fi, which proved an obstacle in creating WAPI standards. Later, a standards war broke out between WAPI and Wi-Fi, with WAPI finally being defeated. Consequently, China failed to implement WAPI standards as an international standard.

In analysing the origin and development of setting WAPI standards in China, Lee and Oh (2006) applied the four stages of translation as an analytical lens. In detail, they aimed to expose how actors formed alliances and strengthened them to compete against each other, thus protecting their own interests surrounding the mobile standard technology in the international context.

The result of this study showed that the failure of setting WAPI standards occurred in the third moment of translation, at the stage of enrolment. Some actors refused the translation at

this stage and denied enrolment into the WAPI actor-network. Furthermore, they openly confronted the focal actor of the WAPI actor-network; the Chinese government, and formed an alliance with the Wi-Fi actor-network. This actor-network comprised commercial firms (e.g. Intel and Boardcom), the US government, and international standardisation bodies (e.g. IEEE and ISO). In protecting its Wi-Fi interests as the world standard, the Wi-Fi actor-network announced that it did not back or produce the products supporting WAPI standards. Due to the strength of Wi-Fi alliances, the focal actor of WAPI postponed WAPI implementation.

In addition, this study added that the root cause of WAPI failure came from China's over confidence in having the world's largest telecommunication market, and non-transparent WAPI standards, which were not released for international scrutiny.

Sarker, Sarker and Sidorova (2006) wrote an interesting article on ANT and failure analysis. They used the four moments of translation to depict the sequence of events that brought a business process change (BPC) initiative to failure at a telecommunication company (TELECO) in the United States of America.

According to concern about the competitiveness of the company, TELECO was forced to reorganise itself to ensure profitability in the long term. The top leaders of TELECO came up with the idea of redesigning every process in the company by adopting the BPC project. This project was intended to finish in one year to improve the service, speed, quality, and value for customers. After implementing for awhile, TELECO struggled to continue its operation. Later, when the top leader was changed, the BPC plans were abandoned. In explaining why this project failed, Sarker, Sarker and Sidorova (2006) illustrated the cause in stages by following the moments of translation, as follows.

In the problematization process, the focal actor failed to recognise all the relevant actors. It had focused primarily on human actors but not non-human ones such as IT. Regarding the BPC concept, IT must play a crucial role in redesigning every process. However, this project lacked awareness of IT's importance as an active actor, and its exclusion at this stage set off IT betrayal later. The project viewed IT as merely an assistant's tool and money was simply

poured out to the vendors. Therefore, no specification on the role of IT was given in detail nor was it recognised how important IT was to the BPC initiative.

At the interestment stage, there were limitations in strategies. Even though employees of TELECO had been identified as important actors at an early stage, the focal actor could not develop the rationale or incentives to lure or convince employees to become allies in the actor-network. The focal actor used only an economic incentive (retirement packages) to prevent resistance to the BPC project. It also ignored the strong social ties that the employees had with the existing actor-network. Additionally, there was a lack of communication with employees regarding project details. These situations created mistrust, suspicion, and anxiety among the employees.

At the moment of enrolment, the focal actor failed to manage the process of translation at different levels in the organisation. At the beginning of the project, the focal actor successfully set up an aligned network with the BPC team members and BPC concept. However, senior executives were dissatisfied with changes made in their own interests. Therefore, they opposed and rejected the redesigning of TELECO. Finally, the BPC plan had to be abandoned.

In explaining the BPC failure more clearly, the authors illustrated the betrayal in this case. The betrayal refers to the actors that did not follow the prior commitments made, and this can cause failure of translation. In the case of TELECO, there were three events of betrayal. Firstly, IT betrayed its representative, the vendors, and could not perform as the vendors had promised TELECO. This happened because the vendors could not comprehend the complex system within the BPC concept, and the BPC team also lacked understanding of the capacity and limitations of IT involvement in the BPC initiative. More importantly, IT was not thought of as an actor, but only a passive assistant. Secondly, employees betrayed their representative; the union. Initially, employees (represented by the union) agreed to support the BPC project, but later on, they betrayed the union by taking advantage of the early retirement package and left the company. Thirdly, top management betrayed the BPC initiative. All these problems in the BPC project led to a change in top management, and without notice, the new president declared the BPC project closed.

Mahring et al. (2004) applied the four moments in translation to examine a well-known IT project disaster, the computerized Baggage Handling System (CBHS) at Denver International Airport (DIA), USA. However, to understand the details of the failure deeply, new ideas were developed within the concept of the four moments in translation; swift translation and Trojan actor-network. From the political will of the city of Denver, construction started on Denver International Airport in late 1989, as the world's most efficient and the nation's largest airport. From the master plan, this new airport needed to install the most complex baggage-handling system ever built. Because of the complicated system and short timeline, many problems occurred. Finally this project had to be abandoned. This resulted in a 16 month delay in opening the airport and created costs of US\$2 billion over budget. The project's failure could be explained in terms of moments of translation, as follows.

In the problematization stage, the DIA actor-network, as a focal actor, intended to create the most modern baggage handling system for the new airport. The final solution was to have an actor within the DIA network responsible for the CBHS project. However, at this stage, it was not known who would take control of the CBHS actor-network. In the interessement stage, the DIA actor-network was looking for a company who could commit the problematization offered. Sixteen companies tendered for the contract, but none could meet the DIA's requirements. However, in the end, BAE Automated System Inc., with its reputation of success stories became a passive actor that inherited the problematization from the DIA actor-network. Thus, the failure began.

At the enrolment stage, the negotiation of roles between the DIA actor-network and BAE (CBHS actor-network) resulted in contracts that must succeed as planned. For mobilization, one actor in the DIA actor-network spoke on behalf of the other actors including the CBHS actor-network. They said that the CBHS project would succeed on time. As time passed by, however, the CBHS was tested and it failed, resulting in costs exceeding budget and delays in completion. Finally, the CBHS project had to be abandoned. Mahring et al. (2004) concluded that failure of the CBHS came from what they call: (first), 'the swift translation', which involved the embedded network (CBHS actor-network), inherited actors, relationships, roles and agreements from its host network (DIA actor-network). It meant that the CBHS actor-network's formation was so rapid that it did not involve comprehensive negotiation and met

with limited resistance and opposition in defining the problems and solutions from the beginning. This turned the CBHS actor-network into (second) a Trojan actor-network – a threat potentially fatal for its host which would betray the initial problematization. In summary, it could be concluded that “while the translation process that led to the acceptance of the CBHS was swift, the process of abandonment was not. It took sometime to identify the CBHS project as a Trojan and abandon it. Furthermore, the swift translation process set the stage for making the Trojan possible, as so much of the actor-network (actors, goals, and intentions) was inherited from the DIA host actor-network” (Ibid., p.230).

Another case is the collapse of Barings Bank, which Greener (2006) scrutinized by examining the behaviour of Nick Leeson, a rogue trader, through the lens of ANT. Greener integrated his work with that of Munro, and in his article he explains how Leeson created his actor-network, how he lost control of it and how it remobilised against him, resulting in collapse of the bank. The four moments of translation from the work of Callon (1986) is a main analytical framework in the study but Greener also extended the framework by adding two more concepts from Munro’s work (1999), ‘remobilization’ and ‘disentanglement’ to reveal and explain the consequence after the actor-network collapsed. The two concepts are defined as follows. “Remobilization is a point where authorities become powers, reestablishing discretion even if only in the moment of choice between problematizations. Remobilization occurs after the actor-network has already been mobilized, where entities challenge and overturn that which they were previously working.” (Greener 2006, p.424). “Disentanglement describes the concept where after an actor-network has remobilized, entities attempt to disassociate themselves from the entity whose problematization had previously mobilized them. Disentanglement is the mirror image of interessement, it is the disassociation from an entity and its plan” (Ibid p.424).

The result of this study could be explained by following the vocabulary, as explained above. Firstly, problematization; Barings Bank as a focal actor established the actor-network and created the obligatory passage point that was to make a high profit. Leeson, a financial trader of Barings in Singapore, constructed a second actor-network besides the one under Barings, and the two actor-networks and Leeson shared the same OPP. The fraud of Leeson was started at the moment of interessement and enrolment. Leeson was very successful in locking

the actors, e.g. his staff and software, into particular roles and defining them in relation to his actor-network. In the meantime, Barings had a problem in lines of accountability, as they could not appoint Leeson in a clear position. The two big holes that materialized created the opportunity for Leeson to start his fraud. He began trading in large volumes and reported only the benefit to Barings and not the debt from exchange. At the moment of mobilization (who speaks for whom?), with the successful (fraud) trading story that Leeson had created, he could speak on behalf of Barings, as an executive of the Japanese stock market and Barings Bank, Singapore office. In the meantime, another actor-network was trying to investigate Leeson's behaviour, but the translation was not completed because of the protection Leeson received from being a Barings executive.

At the moment of remobilization, Barings mobilized against Leeson to make him responsible for their losses. To retain his problematization with Barings and try to cover the debt he had created, Leeson gambled huge volumes of capital on the Japanese stock market. Unfortunately for him, the market surprisingly crashed after a serious earthquake in Kobe, Japan, leaving Leeson losing over £100 million. Consequently, Leeson ran away after Barings Bank collapsed, and the moment of disentanglement occurred. The actors in Leeson's actor-network and also Leeson attempted to escape from the network and the penalties they now faced.

In this case, it could be said that the four moments of translation could help to investigate the sequence of the collapsed actor-network in detail. Moreover, adding two more ideas, 'remobilization' and 'disentanglement', to analyse this study could help in understanding the consequence or what happened after the actor-network broke down.

3.3.1.1 Lesson Learns: the Four Moments of Translation and Failure Study

Validity of failure study:

From failure study of the above case studies, the concept of ANT can be seen as a powerful tool in investigating failure cases. This concept comprises four moments, which allow scholars to explore failure systematically stage by stage. Each moment has its own nature; therefore, causes of failure can be identified in deep detail. Furthermore, the change and development of the actor-network can be seen from the moment of actor-network formulation until it breaks apart.

Also, this concept is very much concerned about the association of a human and non-human actor. Therefore, the behaviour of two kinds of actors that cause failure is exposed as well.

Value of failure study:

In applying the four moments of translation in the failure analysis, it could be said that this concept expands the understanding of failure components in various dimensions. It can state that every moment of translation is very important to the actor-network and could be destabilised at any stage. A flaw or defect in one moment can disturb and imbalance the actor-network at a later stage and sometimes lead to eventual failure.

However, in the actor-network both human and non-human actors are important points in the failure study. They affect and are affected by each other. This concept can help to detect which actor is the cause of failure and in what moment.

Another contribution of this concept of failure study is its possible application in different areas and various kinds of case studies. It can help to explain failure at the project level such as the case of the Business Process Change (BPC) in TELECO (Sarker, Sarker and Sidorova 2006), or the organisational level such as the collapse of Barings Bank (Greener 2006), or the international level such as the case of technology standard setting in China (Lee and Oh 2006).

The causes of failure:

From the four case studies that applied the four moments of translation as an analytical lens, the causes of failure can be summarised as follows.

It could be said that the first moment, problematization, is a crucial one because it is the beginning of actor-network formulation. If there is something wrong in this moment, it can have a crucial effect at a later stage. It can be learned from this moment that the cause of failure starts when the actor-network creates an unrealistic OPP (Obligatory Passage Point), which does not match the actor-network capacity. This kind of OPP would create resource constraints (e.g. time, budget, manpower etc.) in the actor-network because all of the actors involved have less participation in defining OPP (Mahring et al. 2004). Another critical point in identifying relevant actors in the actor-network is failure to recognise a non-human actor as an active actor, which can result in the non-human actors later betraying the actor-network (Sarker, Sarker and Sidorova 2006).

There are at least three issues that lead to failure at the interessement stage. Firstly, there are limitations in strategies for locking actors into the actor-network, as actors sometimes require various strategies to motivate them into joining the actor-network (Sarker, Sarker and Sidorova 2006). Secondly, swift translation occurs when at this stage a new actor faces situations from the host actor-network without participating from the beginning. This can create an eventual Trojan actor-network (Mahring et al. 2004). Thirdly, locking an actor into unclear or unsuitable positions can lead to problem such as putting the wrong man in the job, as in the case of Barings Bank (Greener 2006).

At the enrolment stage, three aspects in the causes of failure should be of concern. Firstly, due to conflicts of interests in the actor-network, some actors refuse the translation and ignore enrolment into the actor-network. Furthermore, these actors may formulate a new actor-network against the main actor-network (Lee and Oh 2006). Secondly, because there are various actors in the actor-network, it is difficult to align the interests. Some actors may not be satisfied with their interests, and they finally oppose and reject project implementation (Sarker, Sarker and Sidorova 2006). Thirdly, a lack of tools (e.g. meetings, onsite evaluation,

etc.) for monitoring the dynamic of association among actors results in vagueness over actor-network stability (Mahring et al. 2004 and Greener 2006).

Most cases of failure in the actor-network break down before reaching the final moment, mobilization which, therefore, offers little insights on the basis of these case studies. One exception was the case of Barings Bank, when failure came from false representation by lies of what really happened to the actor-network, and this situation finally led to betrayal (Greener 2006).

Modification of failure analysis:

Some case studies can give a clearer understanding of failure, when scholars add new supplementary concepts for exploring them. In the case of the computerised Baggage Handling System (CBHS) at Denver International Airport (DIA), USA, Mahring et al. (2004) explained false translation by adding drawing in the concepts of 'swift translation' and 'a Trojan actor-network'. These two supplementary concept are used to explain the main causes of failure. In the case of the collapse of Barings Bank, Greener (2006) added the notion of 'remobilization' and 'disentanglement' to illustrate events after the actor-network collapsed.

In summary, it could be said that the concept of the four moments of translation alone is enough to analyse a case of failure. However, different cases are of a different nature. Some scholars also have different objectives for analysing cases. In explaining profoundly, the supplementary concepts can be added with the core concept of the four moments of translation. This shows that this concept is can be thought of as flexible and dynamic, and thus suited to analyse a range of failure cases.

3.3.2 The Global and Local Networks

The concept of global and local networks is comprised of two parts. Firstly, “Global network” refers to the set of relations “that is built up, deliberately or otherwise, to generate a space, period of time, and set of resources in which innovation takes place” (Law and Callon 1992, p.21). The entire global network comprises outside resources, for example, budget, past experiences and regulations, which enable the project to work. Secondly, “Local network” refers to the set of relations “necessary for the successful production of any working device” (Law and Callon 1992, p.22); for instance, recognized interaction in a project between implementing actors that are thought to be ‘inside resources’ within a local network.

A project can be initiated by one or both of the two networks; however, to make the project succeed, they must work in harmony. Therefore, both global and local networks have to ground themselves and also keep a stable and balanced association. They need to support each other along the way in creating technological artefacts. Referring to the original work of Law and Callon (1992) “The Life and Death of an Aircraft”, the association of global and local networks reflects the ups and downs in a project at all times. On the other hand, it is inevitable that both networks will change during the project’s duration.

The example of applying the concept of global and local networks is presented by two case studies. The first one is a failure case in high technology innovation (Lambright 1994), and the second, the success/failure in an e-government project (Heeks and Stanforth 2007). These two case studies are described as follows.

In analysing a large and highly technical project in the public sector, Lambright (1994) investigated the rise and fall of the NASA project; ‘Mission to Planet Earth’. This project was redeveloped with sophisticated satellites to monitor the environmental ills of Earth. However, it finally failed to achieve the goal settings.

In Lambright’s work (1994), “Administration Entrepreneurship and Space Technology: the Ups and Downs of Mission to Planet Earth”, the study focused on the very high-tech construction of NASA. He used parts of global and local network concepts of ANT to reveal the political construction of technology. In this case, the local network comprised agency

officials such as NASA, and the global network as, e.g. Congress, the President, Office of Management and Budget, and interest groups. By the end of that project, the goal set from the beginning was not achieved.

The Mission to Planet Earth (MTPE) project aimed to monitor the ozone depletion problem, probe the ocean dynamic and investigate climate change. NASA planned to create a space station consisting of two 13-ton platforms that would provide continuous global observation of the Earth. This project required approval from the US President and a budget from the Office of Management and Budget. In 1989, President George Bush, who proclaimed himself to be an 'environmental president' decided to support the MTPE as a presidential programme. In 1990, Congress approved the budget for NASA to implement the MTPE project. Unfortunately, the President and Congress later agreed to set limits on federal funding. In this situation, Congress forced the MTPE project to downsize, which showed that the political/policy support did not run deep.

During that period, many scientists went against the MTPE project in order to protect their interests (budget) in other programmes and NASA had lost control of the political process. In 1992, NASA's administration was changed and its leader dismissed by President Bush. The new leader of NASA announced that the new policy on space technology must be smaller, cheaper and faster, and the NASA organisation must be restructured. Due to these changes, NASA lost much control of the MTPE project. In 1993, Bill Clinton became the US President and Al Gore was Vice President. With internal weakening of the NASA organisation, the MTPE project could not gain much attention from the President's office regarding global environment issues.

From the perspective of ANT, it may be concluded that the causes of failure were as follows. Firstly, the local network (NASA) had lost control of the political process (global network) that shaped the project. Secondly, by using very high technology to investigate the whole of planet Earth, NASA took too long to make final decisions, by which time things had changed, such as the Presidential cabinet. Therefore, it was very difficult to stabilise the actor network. Thirdly, more new actors in the actor network did not guarantee success of the project, and

sometimes more new actors created more problems such as conflict of interests. Finally, the rhetoric of design did not match technological reality, and this was a key cause of failure.

The work of Heeks and Stanforth (2007) fully applied the concept of global and local networks. It may not be a complete example of a failure case, but it does show the trajectory of a project, which helps in understanding why its initial proposal did not succeed as planned. The authors scrutinised the mobilisation, interaction and disintegration of the global and local networks in an e-government project in Sri Lanka called the Integrated Financial Management Information System (IFMIS). The chronology of this project was divided into four phases.

Phase 0: pre-IFMIS (pre-1999). The Asian Development Bank (ADB) supported with a budget to Sri Lanka for improving the government's finance management procedures, namely, the Computerised Integrated Government Accounts System (CIGAS). This project was the largest computerisation programme in Sri Lanka, collecting financial data from all public sector organisations across the country.

Phase 1: package of the IFMIS proposal (1999-2001). After success of the CIGAS, the ADB suggested that Sri Lanka (Ministry of Finance) upgrade and modernise the financial management information system to the next level, which resulted in an agreement that the IFMIS would be designed together with consultants from an international accounting firm. The IFMIS was expected to be the best practice in public expenditure management.

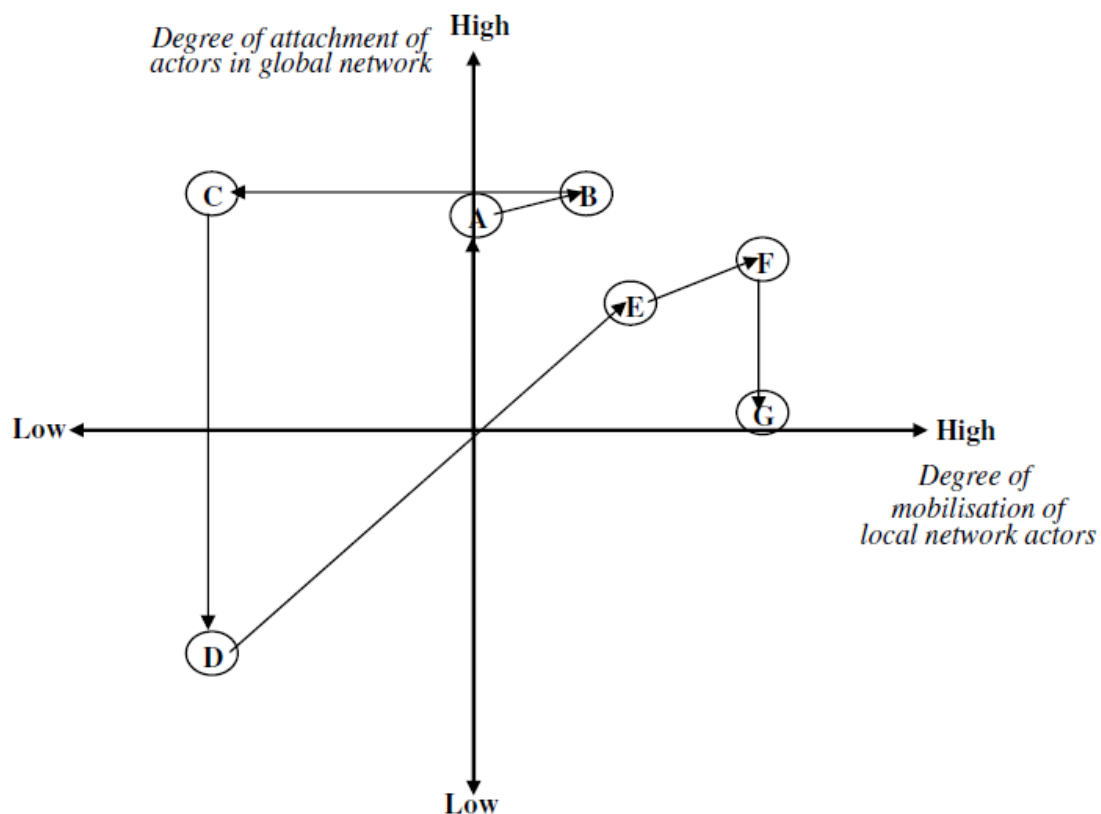
Phase 2: failure of the initial IFMIS proposal (2001). The IFMIS proposal was distributed to the relevant stakeholders such as various government line ministries and departments of the Ministry of Finance. Later, the IFMIS proposal was rejected because of a disagreement about the technology-led development strategy and lack of ownership.

Phase 3: building the foundation for a new IFMIS (2002-2003). After the rejection of the first IFMIS proposal, the groups of administrative offices and national office of the accounting firm rebuilt it. The project was set up with supervision of the committee from the Ministry of Finance and ADB. The new system was designed to interface with the existing system

instead of replacing it. This new proposal was claimed to be the first national interactive e-government application.

Phase 4: a revised IFMIS proposal (2003-2005). The new IFMIS proposal had strong support from staff at the Ministry of Finance and Institute of Public Finance and Development Accountancy (IPFDA). After that, negotiations took place between the Ministry of Finance and ADB for a new loan package for implementation of the new IFMIS. At the beginning, the ADB agreed to support the integrated e-government proposal, but later the funds could not cover the IFMIS. This resulted in the Ministry of Finance having to find the budget from other sources, and discussions started with South Korea's Bilateral Aid Agency. The support of funding was possible, but the IFMIS proposal had to be revised to follow the Korean government version. The trajectory of the project was plotted according to the concept of global and local networks as shown in Figure 3.1.

Figure 3.1 The E-government Case Project Network Analysis



Source: Heeks and Stanforth (2007, p.171)

Figure 3.1 is described as follows. Point 'A' was plotted according to global network establishment for providing funds and designing the IFMIS. Point 'B' refers to the mobilisation of a local network during Phase 1, which was appointed to implement the IFMIS. Point 'C' shows that a well-mobilised local network could not be formed because many candidates could not accept the IFMIS proposal as an obligatory passage point. This resulted in point 'D', which explains disintegration of the global network in Phase 2, due to withdrawal of its main actors. Point 'E' represents the new global and local networks that were formed by new actors from creation of the new IFMIS proposal during Phase 3. Point 'F' shows that more actors were enrolled in both networks for development of the new IFMIS. Point 'G' indicates rejection of the financial supporter, ADB, of the new plans in Phase 4, which weakened the global network.

From the notion of global and local networks, both of them have to work together in harmony to make the project successful. The disassociation of both networks is associated with the point at which failure can occur. The disintegration of both networks can be observed from this case study, especially at point 'D' (Figure 3.1). This moment emerged because the IFMIS proposal could not act as an OPP to hold both networks together. When tracing back in time, the IFMIS proposal (or OPP) was created by a global network with no participation from the local network (point 'A'). Later, the majority of the local network rejected the IFMIS proposal because it lacked a sense of belonging and the IFMIS proposal did not match local network interests. This situation influenced some global actors to withdraw from the network, and then the global and local networks disintegrated. According to the concept of power in actor-networks (Latour 1986), this study suggested another issue causing disconnection between two of them. It implied that the global network had no direct power in actually enrolling or controlling the local network.

3.3.2.1 Lessons learned: The global and local networks and failure study

Validity of failure study:

The concept of global and local networks provides the understanding of failure from a different viewpoint. It focuses on the association of two actor-networks working together in seeking to implement a project, and it might be said that this concept – judging from the three

cases referred to above – is particularly suitable in exploring the failure in a large technology project in the public sector. This concept divides actors in the project into two actor-networks: one is an implementation group (a local network) and the other a support group (a global network). Therefore, in investigating the failure causes can be pointed out clearly from either a local or global network, or both. Furthermore, the trajectory of the project also can be seen. This means that the ups and downs of the project can be not just traced but also understood across a period of time.

Value of failure study:

This concept gives knowledge on the main causes of failure, which have not only come from conflicts of interests in the actor-network, but also the lack of association, participation and cooperation between two actor-networks that depend on each other in making the project successful. Therefore, the linkages between two actor-networks are crucially important. To maintain the relationship between both networks, continuous negotiation skills are crucial in stabilising the actor-network. At another point of failure analysis, this concept discloses the different nature of the two actor-networks. A global network is responsible for the policy decision of what should be done or not done, and a local network is responsible for translating, e.g. ideas and policies, or intangible things into tangible ones. Therefore failure can be tracked by following the nature of responsibility of these actor-networks.

The cause of failure:

As seen through the lens of the global and local network concept, the causes of failure in NASA's MPTE project came from both global and local actor-networks. It could be said that the local network proposed a very large and complex technology project, which was difficult to implement in reality. It consumed a great deal of public expenditure in the long term. This caused difficulty in negotiating with the global network. However, as time passed, instability occurred in the local network, thus causing changes inside the NASA organisation such as finding a new top leader and restructuring. These changes caused loss of control in the MPTE project. From the beginning, the global network had agreed to support the MPTE project, but it failed to show a strong commitment. Then, due to limits in public expenditure, the global network could not fully support the project. This forced the project to downsize. Later, a

change in the global network (e.g. a new US president) affected its focus, and the global network finally paid no attention to the MPTE project.

Referring to the IFMIS initiative in Sri Lanka, failure can be observed in phase two or point 'D' in Figure 3.1. The causes of failure can be explained mainly in two aspects. Firstly, the IFMIS proposal, which was created by the global network, could not act as an OPP because the local network rejected it for failing to match local network interests. Secondly, from the view of the power lens, the global network could not exercise enough power to force the local network into following the set OPP. This resulted in the two networks failing to hold together.

The modification of failure analysis:

Heeks and Stanforth (2007) argued that from the notion of global and local networks, project trajectory can be seen from network mobilisation and connection. However, this concept lacks explanation of the network mobilisation and connection process. Therefore, they showed that the concept of power in an actor-network (Latour 1986) could help to address this limitation by explaining how actors influence each other.

3.3.3 The Concept of Counter-Networks

The notion of a counter-network originally appears in the work of Castells (2000); 'Globalisation in the Network Society'. The opposition or contradiction to the network can be called, 'counter-networks'. Castells (2000, p.5, cited in Braa, Monteiro and Sahay 2004) explains this notion by stating, "Increasingly, counter-domination operates through networks as well, as in the case of the environmental movement, or of counter-cultural movement, or of human rights organizations, linking up the local and global through the network."

This concept has been generalised and used by scholars to explain the way that different actors have difficulties in the process of actor-network building. These actors form contradictory networks by aiming to negotiate and compromise on conflicts of interests (Braa, Monteiro and Sahay 2004, and Gao 2007). We have seen some signs of counter-networks in some of the earlier cases reviewed above but example cases that have explicitly used this concept to explain failure are as follows.

In the area of technology standardisation, Gao (2007) employed the concept of counter-network to analyse why China had failed to design and implement its own Wireless Local-area Network (WLAN) standard. According to the existing WLAN standard, Wi-Fi (Wireless-Fidelity) was seen to have a security flaw and could not be developed as the market required. China then saw an opportunity to develop its own standard, which was called WAPI (WLAN Authentication and Privacy Infrastructure). Consequently, a standard war broke out between Chinese and foreign stakeholders to dominate the WLAN market. It can be noted that this case is the same as that already analysed in the work of Lee and Oh (2006), who employed the four moments of translation (details in Section 3.3.1). However, Gao (2007) showed that this phenomenon could be seen through another lens of ANT.

In analysing this case, Gao (2007) identified the main actor-network in China, which created the WAPI as a 'defensive network' and the counter-network that was against the WAPI development as a 'challenging network'. The defensive network aimed to develop WAPI to protect the benefit of consumers, operators and national interests. In 2001, the Ministry of Information Industry (MII) in China launched a research and development plan for WAPI and set up the China Broadband Wireless Internet Protocol Standard Group (BWIPS) as an ally in support of it. BWIPS comprised Chinese technology, public organisations, universities and Chinese technology producers. China claimed that WAPI standardisation could provide better security solutions than Wi-Fi. As the WAPI algorithm was a national secret, only certain Chinese companies could gain authorisation for involvement from the Chinese government, and foreign companies were required to buy a WAPI license from the Chinese ones.

In 2003, China announced prohibition on producing, importing, and selling products that were not compatible with WAPI standards. This situation originated the challenge actor-network, which wanted to protect its interests (the Wi-Fi standard) from the WLAN market. The US Information Technology Office (USITO) was prompted into warning China about its WAPI algorithm protection. In 2004, the Boardcom, Intel and Wi-Fi alliance declared rejection of WAPI standards. Later, more powerful actors such as technology companies and the US government stepped in to the challenging network. As the challenging network

became stronger, the Chinese government was pressured into keeping quiet and the defensive network grew weak.

Later, negotiations on the WAPI issue took place between China and the US government at the forum of the US-China Joint Commission on Commerce and Trade (JCCT). The US government offered a better solution with high-tech product trading with China, which would support China's market economy status in the World Trade Organisation (WTO). The US government requested China to revise WAPI implementation by accepting more participation from international bodies. Finally, the Chinese government decided to postpone WAPI implementation.

Gao (2007) explained that there were three contexts that affected the failure of WAPI standardisation. Firstly, in the technology context, technology research and development in China were not strong enough to lead the WLAN market. Secondly, in an institutional context, the distribution and institutionalisation of the WAPI strategy was not supported by any research, development or standardised administration. Thirdly, in the social context, the creation of WAPI was meant to be the pride of the Chinese nation. This deterred China from enrolling foreign actors, who were involved and experienced already with this type of technology in the developmental process. This brought about a boycott of WAPI by the challenging actor-network. In summary, contexts, i.e. technological, institutional and social, influenced the process of actor-network formation in WAPI standardisation.

The competition in constructing a technology standard of mobile communication between TD-SCDMA and WiMAX in China was another story of the counter-networks. Wujie and Tingjie (2008) employed the analytical framework of Gao (2007), the above article, to investigate the case study. In this case, the counter-networks were divided into two camps, the defensive network and the challenging network. The defensive network was TD-SCDMA, the indigenous Chinese technology standard, which consisted of the Chinese government, domestic operators, manufacturers, universities, research institutes, standard bodies, and the industrial alliance. The challenging network comprises WiMAX, which was composed of IEEE (the traditional IT standard body), and WiMAX forum with hundreds of world leading ICT companies and operators such as Intel, Nokia, Motorola, Samsung, ZTE, etc. The

WiMAX actor-network was aiming to dominate the world market. In contrast, the TD-SCDMA actor-network wanted to dominate the Chinese market and protect it from other standards, and then planned to expand into the world market. TD-SCDMA had strong support from the Chinese government and main operators in China. Its technology standard was tested in ten cities throughout the country in 2006. Even though TD-SCDMA's mobile terminals and network equipment had been developed extensively, its equipment design and network construction had many functional deficiencies. Therefore, the standard had not been commercialised yet.

On the other hand, WiMAX had great support from international alliances. It also had been successful in global markets such as those in the U.S.A., Europe, Asia-Pacific, South America and the Middle East. The success of WiMAX thus challenged the construction of TD-SCDMA.

In explaining more details of each counter-network, this study applied the SWOT model to illustrate the strengths, weaknesses, opportunities, and threats in both the defensive and challenging network. Wujie and Tingjie (2008) predicted that in the case of two counter-networks still competing against each other, both may fail in the end to dominate in the world market. The TD-SCDMA actor-network was the national pride of technology development in China, and its construction was a closed process. Therefore, just as in the WAPI case, China did not enrol foreign major actors of current standard technology into the actor-network. This made development very slow and not yet commercialised. On the other side, WiMAX had found it difficult to access and dominate the world's largest markets such as China, because of obstacles like incompatible frequency bands and Chinese telecom regulation policy.

To avoid the failure of both counter-networks, this study suggested that negotiation and compromise between them should be considered. A possibility was that TD-SCDMA and WiMAX should merge and develop a standard technology together. This would create a win-win situation.

3.3.3.1 Lesson Learned: The Concept of Counter-Networks and Failure Study

Validity of failure study:

From the case study, it should be noted that the concept of counter-network can clarify the mechanism of project failure. This concept shows that different actors can be divided into two counter-networks, according to their interests or objectives. These two networks occur due to conflicts of interests and they are aimed against each other in protecting their benefits. By this concept, the behaviour of networks in actor enrolment, interest alignment and counter-network compromise can be observed. This behaviour can show the strength of each counter-network. Obviously, a weak counter-network that consists of less powerful actors and lack of bargaining skill can fail to dominate another counter-network. This causes failure to happen. In brief, the concept of the counter-network is a proper tool by which to analyse failure.

The value of failure study:

In the broad picture, the concept of counter-network mainly helps researchers to expose the causes of failure that mainly come from conflict of interests of two sets of actors. By this concept, the actor-network formulation in protecting its interests can be observed. This also shows the factors that affect the collapse of one actor-network in its endeavour, such as to build a new technology.

In their case studies, Gao (2007) and Wujie and Tingjie (2007) proved that this concept can be used to analyse failure at the international level. Actors in an actor-network can be an organisation, a group of organisations or even the national government. However, these actors can be separated into two actor-networks by their interests. As the actor-networks stand on opposite sides and compete against each other, their attempt to strengthen themselves can be seen through this competing model.

In short, the value of this concept for failure analysis is, firstly, to help in understanding the causes of failure that comes from conflict of interests between two actor-networks. Secondly, viewing failure from a broad view (e.g. international level) can be investigated by explaining

the behaviour of an individual actor. Thirdly, it is brought to notice that the causes of failure not only occur inside one actor-network, but also others outside an in the relations between actor-networks, which can cause failure to happen.

The cause of failure:

From the case study of WAPI development in China (Gao 2007), it can be concluded that the actor-network of WAPI failed to implement the project for several reasons. Firstly, this network was closed and defensive and left no room for participation from foreign stakeholders in WAPI development. This caused suspicion and mistrust in WAPI. Secondly, the actors in the defensive network were quite weak and limited to only Chinese technology, public organisations and Chinese technology companies. In contrast, a challenging network could enrol more powerful and global actors into the network. Thirdly, the Chinese government, as the focal actor of a defensive network, made a compromise with the US government by accepting their offer of other interests. In return, the Chinese government had to reconsider and postpone the WAPI development. This made the defensive network immediately unstable and it lost direction. Fourthly, constraints in WAPI development were in the technological, institutional and social contexts.

In the case of TD-SCDMA and WiMAX, (Wejie and Tingjie 2008), the failure could happen anyway in both counter-networks, if there was no negotiation or compromise, and because they both had strengths and weaknesses. WiMax had no way of breaking into the Chinese market because of the country's telecom policy, and TD-SCDMA also had problems because of its closed development policy and fewer major actors involved worldwide.

Modification of failure analysis:

We might argue that the idea of counter-network is implicit in ANT but not explicit, so the very idea is something of a modification to ANT. Further, in applying ANT to analyse the case study, Gao (2007, p. 395) argued that “the context analysis at the macro level is critical for an actor-network study”. Therefore, his study attempted to extend the use of ANT by including context analysis in the analytical framework. By doing this, the influence of contexts that affect the mechanism of the actor-network process could be observed.

In the case of TD-SCDMA and WiMAX, Wejje and Tingjie (2008) expanded the analytical work of Gao (2007) by applying the SWOT model for analysing the strengths, weaknesses, opportunities, and threats of two counter-networks. This method helped to explain more details and characteristics of the two counter-networks in a systematic way.

3.3.4 Summary of Actor-Network Theory and Failure Study

Based on the literature review, the lessons learned from ANT and failure study can be summarised as follows.

The validity of failure study:

It can be learned from case studies that failure is a compound issue with many components. In studies of failure, a proper tool is needed to deal with its complexity. It could be argued that ANT has power, as a very effective lens in failure analysis, because this theory offers various concepts for scholars in investigating a failure case study and in providing a way to deal with complex failure scenarios. Failure can be disclosed moment by moment through the concept of four moments of translation. By this concept, the development of failure can be observed gradually from the beginning of the project until the moment it fails, and in the global and local network concept, failure can be detected by following the behaviour of two actor-networks (a global and local network) in parallel. This concept helps in understanding why these two networks can share the same objective, but fail to work together. In the notion of a counter-network, failure can be exposed by tracking the competition or war between two counter-networks that have conflicts of interests. Failure can be observed from inside one counter-network that has failed and the outside influence from another.

Value of failure study:

ANT is fruitful with many notions that can explain failure in various dimensions. This allows academics to select an appropriate concept that is suitable for the purpose of their failure study. Furthermore, ANT is flexible as shown where explanations of failure were expanded more profoundly by adding supplementary concept to the analysis. It is an interesting issue that this theory can be an analytical tool for failure study, from a small case (e.g. a project in an organisation) to a very large project at the national or even international level.

The cause of failure:

It can be seen from the literature review that even when the cases investigated are different in nature through varied concepts of ANT, they share the basic or fundamental causes of failure. Failure is caused by the behaviour of both human and non-human actors, and this destabilises the actor-network as a whole until it finally collapses. However, detailed cases of failure causes may be different depending on the various concepts of ANT used. The four moments of translation concept shows that every moment is very important. Failure causes can happen in any moment through a failure of translation. The concept of the global and local networks mainly reveals that disassociation of two actor-networks is the cause of failure. Regarding the concept of the counter-network, causes of failure are mainly from conflicts of interests between two actor-networks. This concept helps to observe the way that two actor-networks attempt to protect their interests.

The modification of failure study:

It is hard to say that ANT has shortcomings as a lens for study of failure because when referring to some case studies (Lee and Oh 2006, Sarker, Sarker and Sidorova 2006, and Lambright 1994) the concept of ANT alone is enough for failure analysis. As described before, ANT is dynamic and flexible. Therefore, scholars can add supplementary concepts (Marhing et al 2004, Greener 2006, and Wujie and Tingjie 2008) or even the context analysis (Gao 2007) to core concepts of ANT. Doing this, helps to expand the understanding of failure more profoundly.

In summary, ANT provides various powerful and helpful approaches for analysing a failure case study. Each approach shows the significant validity and value of the failure study. The causes of failure are revealed uniquely by the nature of each concept. However, each concept is still under ANT umbrella, which refers to, for example, both human and non-human actors being equal and treated in the same ANT language. The modification of ANT concepts is followed freely, and it adapts to the nature of the failure case and ideas of the researchers. This shows that ANT is very flexible.

The next section presents discussion and debates on which concepts should be applied or not in this particular research. Following that, a unique and powerful analytical framework is innovated and presented.

3.4 Analytical framework

This study aims to investigate a socio-technical phenomenon, i.e. the “Smart ID Card project” in Thailand. ANT serves as a critical theoretical tool for understanding this phenomenon because it can provide a powerful explanation of the motivations and actions of actors who establish elements of the heterogeneous network of aligned interests. Furthermore, in particular contexts, it largely explains and tracks down why successful networks of aligned interests can be created, and finally, why those networks fail to form by themselves.

ANT and failure analysis from the earlier section show that failure is very complex and has many components. Failure can be investigated and explained in various dimensions, and it can be seen that ANT is valuable when analysing it. This theory provides many powerful concepts that can depict failure phenomena and therefore benefit scholars in selecting useful concepts appropriately for failure study objectives. In addition, the concepts of ANT are very dynamic and flexible. They can be modified or merged with other concepts in explaining failure more profoundly or deeply.

The three concepts of ANT have different advantages and offer various views in explaining failure. (1) The four moments of translation help to expose the failure causes step by step from the actor-network’s formation until its collapse. (2) Failure caused by the behaviour of two actor-networks can be tracked down in parallel by the notion of global and local networks. This concept helps to explain why two actor-networks, which share the same objectives, fail to work together. (3) In the counter-network concept, failure comes from two competing counter-networks that have conflicts of interests.

From the literature review in Section 3.3(ANT and failure analysis), it can be said that there are two ways to apply the concepts of ANT as an analytical tool in scrutinising a failure case. The first way is to select one concept from three main ones: the four moments of translation,

global and local networks or counter-networks, as a crucial analytical lens. However, this approach may be limited in explaining failure. The second way is to select one concept as a core analytical framework. After that, modifying or integrating it with other concepts or supplementary ideas may help to develop an analytical framework, which is more flexible and powerful in explaining the causes of failure.

To investigate failure in the case of the Smart ID Card project, this author decides to use the second approach in analysing the causes of failure because of the strong benefits described above. However, the three main candidate concepts: the four moments of translation, global and local networks and counter-networks, raise the question of which one should be a core analytical framework. With concern about contribution in extending use of ANT in failure analysis in the e-government research, this author decides to select the four moments of translation as the core analytical framework. It is strongly believed that this concept could explore deeply the association and disassociation of the actor-network stage by stage from beginning to end of the project. Furthermore, in Section 3.3 (ANT and failure analysis), evidence shows this concept to have been adopted more flexibly than the other two (global and local networks, and counter-networks) in work to date, when needing to join or merge with other notions.

The reasons why the other two main concepts are not selected can be clarified as follows. The concept of global and local networks has a demonstrated value in analysing an e-government project failure, but it probably has limitations in exploring all relevant actors freely. This is because it aims to separate all actors into two groups: the global network and local network. Failure causes are mainly observed from the behaviour of these two actor-networks. But in many cases, it may not be so easy to classify actors into these two groups and/or the idea of just these two actor-networks may seem a bit simplistic. Unlike the moments of translation, it does not offer any systematic means for analysing the chronology of a project. Also, at least from the limited literature available, this concept has not yet demonstrated its strengths in incorporating with other ideas. As for the concept of counter-networks, it is not suitable for a core framework, especially in this study, as in the nature of this case (the Smart ID Card project); there were no clear competing counter-networks at the start of the project. However,

this concept could be used as supplementary to the core framework in failure analysis, when a contradictory network comes to exist within the main actor-network.

In conclusion, the concept of the four moments of translation is employed as a core analytical framework and guideline in investigating the failure causes in this study. In exploring the case more profoundly, some other interesting concepts are used with the core framework. Details of the analytical framework are constructed in three sequential stages as follows.

Stage one: Drawing the scenarios of the actor-network

At this stage, the concept of punctualisation is used to draw the fundamental picture of the actor-network and present the scenario it desires. By this concept, the punctualised actors can emerge and be observed. Each punctualised actor tells its own story such as its association with actors inside the actor-network, the obstacle within itself, the output expected from it, etc. Consequently, the integration of all punctualised actors can be observed. This moment displays the way that all punctualised actors convert themselves into a single black-boxed unit or one punctualised actor of the Smart ID Card project.

By this process, the best hypothetical scenario of a successful actor-network can be drawn. This helps in understanding what the mechanisms of the actor-network should look like, e.g. if the Smart ID Card project is being implemented successfully. In brief, this stage provides fundamental information about the combination and association of the actor-network, which can help to support the failure analysis comprehensively in the second stage. Furthermore, the results of this stage can expose the detachment and betrayal of punctualised actors, which leads to the actor-network breaking down in stage three.

Stage two: Analysing the failure causes in the actor-network

The four moments of translation are used as a core concept to investigate the causes of failure. However, some supplementary concepts also are integrated into the core concept to explain the failure in the actor-network. The analysis procedure is presented moment by moment.

Firstly, problematization is the moment in this study that describes initiation of the focal actor to create the Smart ID Card project, and how that actor identifies the other actors involved from its point of view. This research later explores how the focal actor suggests that problems would be resolved if all actors negotiate the obligatory passage point (OPP). Furthermore, the OPP explains the process in which the focal actor shows its interest and convinces all actors to accept the proposal of the network. This illustrates how the other actors overcome obstacles in order to pass through the OPP. These are the main issues or events in this study that aim to find the possible causes of failure in this moment.

Secondly, interessement is studied to see how the focal actor convinces the other actors to accept the interests of the project, and how it creates incentives for the actors to overcome obstacles by way of passing through the OPP. In doing this, many devices are necessary to lock the actors into their positions. The use of such devices by the focal actor is crucial in investigation because it could cause failure.

Thirdly, this research studies the enrolment process to investigate the set of strategies and negotiations in the actor-network in order to define the various roles played by the actors in creating the Smart ID Card artefact. This moment consists of numerous activities in the actor-network. Therefore, interesting supplementary concepts from the literature review are provided to explain the mechanism of the failure such as swift translation, the Trojan actor-network and counter-networks.

In the final moment, mobilization is studied to understand the collective methods that the focal actor uses to ensure qualified speakers speak on behalf of all actors and thus avoid varied types of betrayal. This moment occurs when the actor-network has been punctualised or is working as a single unit, which refers to when an actor-network achieves its goal as planned. From documentary data, it is evident that the Smart ID Card project cannot be punctualised. Therefore, this moment cannot be analysed in full terms.

Stage Three: Exposing betrayal in the actor-network

This stage is the consequence of the failure analysis from stage two. Normally, failure in a failure case study is noticeable when an actor betrays the actor-network. For example, in the scallop case on the coast of St. Brieuc in France, the actor-network is broken from betrayals by the fishermen and scallops. Things change as the years pass by. The scallops refuse to anchor larvae, and one Christmas Eve in a prohibited area the fishermen break up the concrete belt that catches the scallops for restocking. These betrayals bring about catastrophe in the scallops domestication (Callon 1986).

Inspired by Sarker, Sarker and Sidorova (2006), betrayal in the actor-network can be exposed by the punctualisation concept, which is a powerful tool that reveals the mechanisms of betrayal in the actor-network. At this moment, the integration scenario of punctualised actors in stage one can be transformed into their detachment scenario. Therefore, the mechanisms of betrayal are disclosed such as the disassociation of punctualised actors, motives for betrayal, unexpected outcomes of the betrayal, etc. Details of failure causes in stage two, by way of the four moments of translation, are condensed to explain the sequence of the betrayals step by step.

In summary, this work intends to apply the four moments of translation as a core analytical framework for investigating the case study. With lessons learned from ANT and failure study, the four moments of translation are not only a powerful concept in failure analysis, but also very dynamic. Therefore, the framework of this study is not rigid, but flexible. Supplementary concepts are used with the core framework. By doing this, the causes of failure in the Smart ID Card project are revealed more deeply and profoundly.

Chapter 4: Research Methodology

This chapter's initial aim is to clarify the philosophical standpoint used in this thesis. It then explains the research methodology and data enquiry technique used as a means to answer research questions. After that, the quality of the research is debated, which relates to the reliability and validity of this research.

4.1 Philosophical Assumption

One objective of this study is to investigate the causes contributing to the failure of the smart ID card project in Thailand in the hope that such profound understanding will, in turn, help rectify the problems encountered by the Thai government and other actors. The research methodology employed in this study is a qualitative one because qualitative methodology helps to provide a holistic picture and in-depth information of the project. As stated by Yin (2002), a qualitative research method provides comprehensive details of a particular social phenomenon in a real life context, which enhances the understanding of a case study, especially a unique case like this one. Several research techniques will be used in data enquiry, namely documentary research, participatory observation, questionnaires, and in-depth interviews (Myers 1997). However, Mayer (1997, p.2) states that "the findings of qualitative research studies on the same topic may differ depending on the underlying philosophical assumptions of the researcher". Various philosophical assumptions take different stands on how they understand the nature of things (ontology) as well as how to explain the nature of knowledge and what counts as "knowledge" (epistemology). Different philosophical assumptions also lead to different methods for acquiring knowledge (methodology) (Yeung, 1997).

Chua (1986), Orlikowski and Baroudi (1991), and Myers (1997), among others, suggest at least three philosophical standpoints, based on underlying research ontology and/or epistemology, namely positivism, interpretive and critical school. Each has a different nature, and varied strengths and weaknesses. A brief description of each category is discussed as follows:

4.1.1 Positivism

A positivist study is evidence of formal propositions, quantifiable measures of variables, hypotheses testing and the drawing inferences on a phenomenon from the sample to a stated population (Orlikowski and Baroudi 1991). In a positivist study “reality is objectively given and can be described by measurable properties, which are independent of the researcher and his or her instruments” (Myers 1997, p.3). In other words, the positivist school emphasises objectivity of study based on empirical evidence. Positivist scholars aim to specify a truly scientific conception of worldly knowledge; however, their standpoint has been heavily challenged on the issue that observed reality is not objective but theory-dependent. Observed reality, thus, can be deducted (Mingers 2004). To empiricists who believe in directly observable reality, one very important question remains: how can one accept theoretical entities that cannot be directly observed?

4.1.2 Interpretive Research

Interpretive studies assume that people create and associate their own subjective meaning as they interact with the world around them based on their perception, conceptualisation, and judgement. Interpretive researchers attempt to understand phenomena through the meanings that people assign to them (Orlikowski and Baroudi 1991, and Myers 1997). Moreover, interpretive studies aim to understand the context of the phenomenon and the process, whereby the phenomenon influences and is influenced by context (Walsham 1993). In contrast to the positivist school, the interpretative approach does not claim objectivity of the finding. On the contrary, it allows researchers to interpret social phenomena through their own worldviews.

4.1.3 Critical Research

Critical researches assume that social reality is historically constituted, and produced and reproduced by people. Critical researchers focus on the oppositions, conflicts and contradictions in contemporary society and seek to be emancipatory, i.e. help to eliminate the cause of alienation and domination (Myers 1997). Critical studies aim to criticise the status quo by exposing what is believed to be deep-seated structural contradictions within social

systems, and thereby transforming these alienating and restrictive social conditions (Orlikowski and Baroudi 1991).

According to Chau (1986) and Orlikowski and Baroudi (1991), critical research perspective believes that social phenomena are interdependent parts within the whole, and that organisations cannot be studied in isolation from the industry, society or nation in which they operate, and partly constitute. Critical realists cannot single out social phenomena from ever changing historical, economical, social, and political conditions in the nature and development of events. On the contrary, social reality is historically constituted and, hence, human beings, organisations and societies are not confined to inexistence within a particular state. Critical perspective reminds us of the dynamic social phenomena that results in human nature not wanting confinement in immediate circumstances. Orlikowski and Baroudi (1991, p.23) state: “The status quo is merely one moment along an evolving and emergent dynamic of social reality” and “social reality is understood to be [not only] produced and reproduced by humans but also as possessing objective properties which tend to dominate human experience”.

The important distinction of critical research philosophy from positivist and interpretive research perspectives is the positivist and interpretive school’s aim to predict or explain the status quo, whilst the critical approach attempts to critically evaluate and transform the social reality under investigation. Critical philosophy urges scholars to ask questions and be sceptical, and its perspective is concerned with criticising existing social systems and revealing any contradictions and conflicts that may inhere within their structures (Chou 1986, Orlikowski and Baroudi 1991). As a result, the critical approach presents a different view of the social world, whereas the previous two schools are content with what “reality” is.

4.2 Critical Realism as a Philosophical Standpoint

As mentioned in previous chapters, this thesis aims to discover the root cause of failure in the smart ID card project in Thailand. Posing questions such as “what went wrong?” is unavoidable when regarding the Thai government’s plan and implementation of a would-be good project, In order to arrive at a different understanding and explanation of the project’s implementation, as well as capture the dynamic of its surroundings, employment of the critical approach is the better choice over its two alternatives. Hence, this study of the smart

ID card project failure in Thailand is based on the standpoint of critical realism. According to Mingers (2004), critical realism needs to dig beneath the surface in order to understand and explain why things are as they are, and hypothesise the structures and mechanisms that shape observable social phenomena. In relation to this research, critical research is the kind of study that looks back at a social phenomenon and asks questions of its realities as well as discovering a new set of answers. An objective of this study is to investigate the history of the smart ID card project and ask why it failed. This phenomenon may consist of contradictions that require a real set of answers to the research questions.

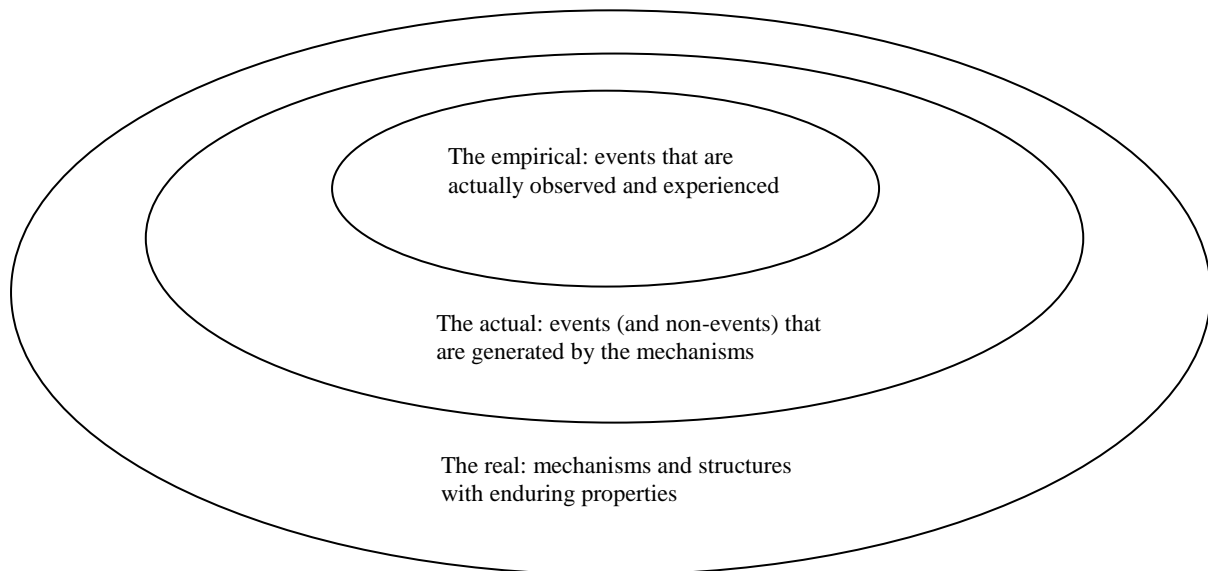
The critical philosophy assumes that contradictions existing in current social forms lead to inequalities and conflicts, from which new social modes will emerge. Contradictions arise through conflict between certain parts of the whole, and their incompatible development. (Orlikowski and Baroudi 1991). Critical research has the role of exposing hidden contradictions and thereby attempts to reframe basic disagreements that potentially enact a different social order. In the words of Orlikowski and Baroudi (1991), “Contradiction is a key theme in the critical research tradition” (p.22).

Critical realism has gradually gained serious attention as a philosophical standpoint in various areas of social science. Regardless of its popularity, critical realism is not without shortcomings. Yeung (1997) argues critical realism should be treated as a philosophy rather than a method. He describe critical realism as “a scientific *philosophy* that celebrates the existence of reality independent of human consciousness (realist ontology), ascribes causal powers to human reasons and social structures (realist ontology), rejects relativism in social and scientific discourse (realist epistemology), and re-orientates the social sciences towards its emancipatory goals (realist epistemology)” (Yeung 1997, p. 52). Furthermore, critical realism is more a philosophy that deals with the ontology and epistemology aspect of social science than a theory and/or method (why social phenomena occur the way they do and how to conduct a research study on them).

Critical realism accepts a three-fold ontological stratification between distinct real (what exists), actual (events), and empirical (observable events) domains (see Figure 4.1). The real domain contains mechanisms, events and experience, i.e. the whole of reality, while the

actual domain consists of events that do (or do not) occur. The empirical domain, meanwhile, includes those events that are observed or experienced (Minger 2004 and Smith 2006).

Figure 4.1 The Three Domains of the Reality



Source: Mingers 2004, p.94

In efforts to find a new set of answers about the e-government failure in developing countries, the real domain can be used as a philosophical standpoint to reveal the reality of the failure phenomenon. According to Minger (2004) and Smith (2006), to begin a critical research, focus should first be placed on the empirical domain in order to describe the events that were actually seen and experienced. To put it simply, the researcher needs to review reliable facts on the failure phenomenon in order to explain observations. For example, it was found that in developing countries, e-government project failure could be attributed to various causes (details in Table 2.6). However, the absence of certain truths creates a lack of explanation of the structures and mechanisms of failure, e.g. the relationship among actors that make the failure occur. Secondly, the duty of truth is in the actual domain, since the structures and mechanisms of failure are not available for observation and a new model or framework needs to be constructed. Therefore, in discussing a new framework construction, this dissertation argues that the notions of ANT must be appropriated for a new framework to investigate the failure mechanisms. Thirdly, in the real domain, the mechanisms and structures of failure

must be presented. With these facts considered, the author of this dissertation uses a newly developed analytical framework in the actual domain to explore reality from a selected case study (the Smart ID Card project). Finally, the research results would present the mechanisms and structures of failure, which include this new set of real failure phenomena in e-government projects in developing countries.

4.3 Research Methodology

As previously discussed, critical realism, as a “philosophy”, frames a basis of thinking in this study. This section discusses data finding techniques as well as research methodology based on the critical realism philosophy. Research methodology according to Sarantakos (1998, p.32) is a “model, which entails theoretical principles as well as a framework that provides guidelines about how research is done in the context of a particular paradigm”. Furthermore, Guba and Lincoln (1994) propose that research methodology is a practice that researchers use to investigate what they believe can be known and the rationales behind these procedures. Therefore, research methodology asks the questions, ‘How do researchers find an answer to the question?’, and ‘why do social phenomena occur in the way that they do?’

For scholars of this orientation, Mingers (2004) and Downward and Mearnam (2007) suggest a retroduction research strategy. According to Allen (1983, cited in Yeung 1997, p.58), the realist method provides “a set of guidelines which outline how to critically analyse a re-work of existing conceptions of social processes”. Thus, the realist method basically seeks to reconstruct causal structures in the social production of knowledge.

As discussed earlier, critical realism acknowledges both observable and unobservable realities. Considering the case of the Smart ID Card, studied in this thesis, there is no doubt that the smart ID card project in Thailand was a failure. This is an observable fact that can be proved by statistics, reports, interviews and other evidence. However, to explain the root cause of the failure, one cannot dismiss the fact that there might be an unobservable factor or even relationship or mechanism that led to the demise (the actual and the real). In this study, ANT will be used as a framework to discover the cause of failure by applying the “retroductive” technique. Retroduction is a “...mode of inference in which events are

explained by postulating [and identifying] mechanisms which are capable of producing them...” (Sayer 1992, p.107). Retroduction refers to “the inference from a description of some phenomenon to a description of something that produces it or is a condition for it. Merely knowing that event ‘C’ has been followed by event ‘D’ was insufficient, what was important was gaining an understanding of how ‘C’ gave rise to ‘D’” (Bhaskar 1978).

In relation to this research, detailed answers that only demonstrate the Smart ID Card project failure are inadequate or insufficient. Research is needed to investigate and explain what is beneath the surface of this phenomenon. Therefore, to answer the question, ‘How?’ and ‘Why?’ the failure occurred is a principal requirement of this study. In applying retroduction as a research strategy, there are three main steps to follow for a critical realism study (Denermark et al. 2002, Mingers 2004 and Boateng 2008). These steps are subsequently described.

Firstly, we start by examining events that were actually observed and experienced in the empirical domain, which is connected to social phenomena including events in the actual domain, whether observed or not. In Chapter 2 of this study, the phenomenon in the research of e-government in general, and specifically in developing countries, is reviewed.

Secondly, we need to develop models or generate propositions based on a theory in order to explain the observed regularity in the actual domain (Boateng 2008). Conceptualised theory refers to “a description of structures and mechanisms which causally generate the observable phenomenon: a description which enables us to explain them” (Denermark et al. 2002, p. 120). In relating that to this research, the application of theory, as discussed in Chapter 3, is captured in the conceptual framework to unearth the phenomenon, i.e. the failure analysis of the Smart ID Card project.

Thirdly, the dissertation demonstrates the existence and operation of the mechanisms and structures in the real domain. This involves collecting appropriate data, as described in data collection methods in Chapter 4, which aim to deeply explore explanation of the real causes of failure in the smart ID card project. Finally, the causal relationships of the failure mechanism are presented in Chapter 7.

4.3 Case Selection

According to Yin (2002), there are three criteria that help the researchers judge what type of research strategy they should select. The type of research question posed, the extent of control an investigator has over actual behavioural events and the degree of focus on contemporary as opposed to historical events should be considered. This classifies five types of research strategies: experiments, surveys, archival analyses, histories and case studies. Yin (2002) argues that to identify such research as a case study, a 'How?' or 'Why' question should be asked about a contemporary set of events over which the investigator has little or no control.

This study attempts to investigate the case of failure in e-government in a developing country such as Thailand, which is thought to be a contemporary set of events. Moreover, in this case the researcher has no control over the phenomenon. This study focuses on answering the 'Why' question. Therefore, this research is categorised as a case study research.

Moreover, Yin (2002) states that there are different types of case study designs: holistic single-case designs, embedded single-case designs, holistic multiple-case designs, and embedded multiple-case designs. This study is a holistic single-case design for various reasons. Firstly, it extends the use of theory by including ANT in the e-government area. Secondly, the case studied in this research is unique as it represents the failure of an e-government project. Thirdly, the researcher can obtain insight into the case by using documentary research and in-depth interviews. Finally, this study is longitudinal because it traces back to the time that affected project failure.

Thailand was chosen for this study because it has initiated many e-government projects in order to enhance public administration by means of ICT. There are both long and short term plans for these initiatives and a very large budget has been put into place for them, with the aim of increasing transparency, reducing costs in administration, building good governance and so on. After some of these projects had been implemented, many problems occurred that obstructed e-government development (Lorsuwannarat 2006) such as a lack of human resource capacity in public servants (Kasikorn Research Centre 2004), and a loss of focus on the needs of the people and bureaucratic system. These events showed that Thai e-

government projects have difficulty in achieving their objectives. Consequently, e-government in Thailand lost international attention.

It is evident from a survey on e-government in developing countries (see Section 2.6) that only a very limited number of articles on e-government in Thailand can be found, and the whole story remains unavailable. Therefore, it is very interesting to unravel what happened in this country that once envisioned self-enhancement to revolutionise public services as a world class phenomenon by e-government initiatives.

The Smart ID Card project in Thailand is particularly interesting because among many e-government projects in the country, this one has had its effects in the contexts of e-revenue, which affected people paying tax, and in e-auction, for companies wanting to submit applications to the government for project contracts. The Smart ID Card project also affected every Thai citizen, in that every living Thai person should have held a Smart ID Card. Interestingly, this project failed to achieve its goal, presenting two very interesting points, worthy of both study and research. Firstly, it is very interesting to search for the reason why this failure occurred. A set of answers to the questions could help to expand and build the body of knowledge about the failure study in e-government projects in an academic society. Secondly, a further set of findings could provide lessons learned for e-government practitioners, especially in developing countries, to implement an e-government project in an appropriate direction to avoid the failure trap and create more chances of success.

4.4 Unit of Analysis

A different unit of analysis relates to the various focus points of the project (Platton 1980). Selecting an appropriate unit of analysis depends on “What it is you want to be able to say about the end of the research” (Platton 2002, p.225). According to the ANT framework in this study, it could be said that the unit of analysis is the actor in the actor-network of the Smart ID Card project, because this dissertation aims to find out what happened with the association and interrelation of the actor that caused the project to fail in the end.

4.5 Data Collection

The actor in the actor-network of the Smart ID Card project is a unit of analysis in this study. To comprehensively explore the interrelation of actors in the actor-network, this research carries out in-depth interviews as well as documentary research for data collection.

4.5.1 Documentary Research

Part of this study relies heavily on documentary research. Initially, there are several ways of acquiring a formal official document. In Thailand, public agencies normally provide much information about their organisation such as policies, plans, projects, and minutes from meetings. Therefore, a great deal of data, especially general information, on e-government and the Smart ID Card project in Thailand could be found on an organisation's website, for example the Ministry of Interior (<http://www.moi.go.th>), Ministry of Information and Communication Technology (<http://www.mict.go.th/>), Department of Provincial (<http://www.dopa.go.th/>) and National Electronics and Computer Technology Centre (<http://www.nectec.or.th>).

These websites mostly provide general information such as smart card project objectives, project details, minutes from meetings and progress reports. However, insightful details, such as the problems in implementation could not be found. To solve this setback, the researcher used newspaper clippings to find more in-depth details about the Smart ID Card project.

News clippings from around 25 different newspapers in Thai or English were found in Thai university libraries. News clipping databases provide information of all that has occurred in Thailand over the last 15 years. To collect news on the Smart ID Card project, this study researcher used keywords to search for information. These key words were, for example, 'eGovernment', 'e-government', 'electronic government', 'ID card', 'identity card', 'smart ID card project', 'Ministry of ICT and smart ID card', 'Ministry of Interior and smart ID card' and 'NECTEC and smart ID card'. These keywords were searched in both Thai and English to cover most of the news needed for the research.

It was subsequently found that there were many news articles from various newspapers in Thai or English that are relevant to the Smart ID Card project. These news items have been very useful in allowing the researcher to gain access to past events and explore in depth the details of the project. Many key persons in the Thai government reported to the media such as the Prime Minister, other ministers, and key persons in the Smart ID Card project and so on. Furthermore, they allow investigation and insight into the interrelationships among actors, and conflict of interest in the project, as well as the way actors tried to create stability in the Smart ID Card project.

4.5.2 Sampling Strategy

When the unit of analysis is known, the criteria of actor sampling should be defined. This study intends to use the notion of purposeful sampling for selecting the informants. Therefore, because of its importance in a case study research, the kind of sampling strategy and rationale for purposeful sampling should be clearly specified by the researcher (Creswell 2007). Furthermore, when identifying a certain population proves costly or impossible, due to data availability, purposeful sampling is used to solve the problem (Blaikei 2002). By its nature, the concept of purposeful sampling is used in qualitative research to acquire in-depth understanding without needing to make generalisations (Patton 1980). Researchers select purposeful samplings for a study because “they can purposefully inform an understanding of the research problem and central phenomenon in the study. Decisions need to be made about who or what should be sampled, what form the sampling will take and how many people need to be a sample” (Creswell 2007, p.215).

In this research, the central phenomenon is the failure of the project, and the sampling focus is based on an actor in the actor-network that deeply understands the situation. For the purposeful sampling strategy, Patton (2002) suggests that it depends on the objective of the study, the research question that needs to be answered, the resources available and the constraints being faced. However, more than one qualitative sampling strategy may be necessary. In the case of serving multiple purposes of the research, Patton (2002) also proposes many strategies for qualitative research sampling. Nevertheless, this work has selected two sampling strategies, namely intensity sampling and snowball sampling, which fit the framework and research questions in this study.

Firstly, intensity sampling comprises information-rich cases that intensely manifest the phenomenon of interest. Much can be gleaned from information-rich cases regarding matters of central importance concerned with why the study is taking place. “Intensity sampling involves some prior information and considerable judgment. The researcher must do some exploratory work to determine the nature of the variation in the situation under study, [and] then sample intense examples of the phenomenon of interest” (Patton 2002, p. 234). Also, the researcher may select sampling that manifests sufficient intensity to clarify the nature of success or failure, but not extreme sampling for preventing bias or misinformation.

According to the requirement of intensity sampling, which is the background of a case study, this research selected informants from the Ministry of Interior, Ministry of ICT, NECTEC, and Office of the Public Sector Development Commission, as well as Thai scholars and Thai citizens who were involved intensely with the Smart ID Card project. The criteria for selecting informants followed the concept of the intensity sampling strategy that requires the informants to have intense involvement in the Smart ID Card project and to have the ability to manifest the phenomenon of participation in, or responsibility for, the project. However, the group of citizens may be unique insofar as this project involved millions of people. To select useful informants for this group, this research created the sampling strategy by visiting the issuing stations. This method was very useful because citizens in issuing stations had direct contact and experience with the Smart ID Card.

Secondly, snowball sampling is used in searching for information-rich key informants. It refers to “the process [that] begins by asking well-situated people [the questions]: ‘Who knows a lot about [e.g., the smart ID card project]?’ [And through asking a number of people who else they have talked with] ‘Whom should I talk to?’” (Patton 2002, p.237). By asking these questions, more key persons would materialise. Therefore, further criteria for selecting informants are created by asking the questions above, and thereby reaching key persons via recommendations. The snowball sampling strategy was used for the groups of informants from the Ministry of Interior, Ministry of ICT, NECTEC, Thai research institutes and the Office of the Public Sector Development Commission.

In conclusion, this case study conducts intensity sampling so as to get good information with no bias, and be able to trace back to between 2002 and 2006 in order to investigate the failure. In the meantime, some key informants may have moved to other positions or organisations, or even retired. In view of this, the snowball approach is required to fill the gaps in this issue and prevent missing key informants. Therefore, when considering the reasons illustrated above, it can be argued that this research ensures that we can obtain the right informants with the right information, which can profoundly illuminate the phenomena by the two sampling strategies in this study.

4.5.3 In-depth Interview

In this research, an in-depth interview was employed to key persons who are involved in the Smart ID Card project. This offers the researcher a chance to learn from the interviewees and get close access to their meanings and interpretations in society. Moreover, it also allows the informants to identify and describe their own situations, and express what they have been involved in (Dexter 1970 and Blaikie 2000). In so doing, semi-structured interviews are composed of an inflexible set of questions in order to provide the interviewees with more flexibility and the ability to broaden the points of interest that they regard as relevant (Denscombe 2004).

A qualitative interview is a leading tool for data inquiry in this research. However, as Myers and Newman (2007) argue, this tool is not without problems regarding the reliability and validity of findings, lack of resources and time, lack of trust, bias, etc. They, therefore, suggest guidelines for executing a qualitative interview, which is the basis of this study. Seven guidelines suggested by Myer and Newman (2007) and how to apply them to this study are discussed as follows.

The first guideline concerns the researchers themselves. Researchers should “situate” themselves in relation to the interviewees. This process helps the researcher to evaluate the validity of findings, since the interview is a social interaction process. Position and/or characteristics of the researcher might influence the answer given by interviewees. For example, interviewees might give different answers to researchers of different nationalities.

Furthermore, by identifying themselves with the interviewees, the researcher promotes familiarity and trust from the informants.

Since the researcher in this study is a state official and an academic in a leading university, and most interviewees are state officials in related state positions, it is not too difficult for this researcher to gain access to his informants via formal channels such as official letter of introduction. In the Thai context, collaboration between state organisations is expected; however, it should be kept in mind that information gained from the interviews might not be 100% valid. While formal channels might help the researcher to gain easy access to the informants, some information, especially that of a negative nature might not be volunteered or passed on correctly. This problem can be overcome by the triangulation process, which is discussed in the next section.

The second guideline is about the encounter between the researcher and the interviewees. Myers and Newman (2007) warn researchers to be careful in choosing the environment (atmosphere) for the meeting. It is very important to make the interviewees feel at ease when they are giving information. Some of them would like to be interviewed in their workplaces because it is more convenient for them. Moreover, conducting interviews at the offices of the interviewees would help them to feel more secure, as the interviews would be carried out on their “territory”. However, some interviewees were more comfortable giving interviews at a neutral venue such as a coffee shop, while others would rather have an interview at home on the weekend. The venue was totally down to the interviewees’ preference. However, Smart ID Card users, namely, the people or citizens, were interviewed at the Smart ID Card issuing station for spontaneous and impromptu results.

The third guideline, Step 3, concerns the variety of the informants. It is important for the researcher to look at the problems studied thoroughly and from all aspects. Thus, the researcher has to be cautious about the choice of interviewees. The researcher should interview more than one informant in order to triangulate information gained from them (triangulation of subjects).

The fourth guideline requires that “everybody is an interpreter” (Myers and Newman 2007, p. 17). As a result, the researcher should be aware of possible bias based on the interviewees’ perception, since everybody sees the world differently. The researcher might have to deal with different sets of reality or artificial answers from the interviewees. Data triangulation can help to straighten out the facts from the interviewees’ own interpretation.

Guideline five is about the language used in the interview. Even though the researcher and the interviewees speak the same language and same dialect, both can misunderstand each other. Myers and Newman (2007) suggest that the researcher should apply the mirroring question and answer technique: a method in which the interviewer takes the words or phrases used by interviewees and repeats them in a subsequent question or comment in order to minimise false interpretation or different conceptualisation of the words/phrases used in the study. Since the interview used open-ended questions, it allowed the researcher to apply the mirroring technique. Following these rules, the author of this dissertation asked general questions first and then more specific ones later. This helped to familiarise the interviewees with the relevant “vocabulary” rather than imposing the researcher’s words on the interviewee.

The next guideline is about flexibility. An in-depth interview requires high flexibility, in not only its structure (in fact non-structure), but also the interviewers themselves. Researchers must be very flexible in responding to the moods or attitudes of the interviewees. The last piece of advice is about confidentiality of disclosures. All information in all forms must be kept confidential and secure. When the researcher received permission to record an interview, the recording was labelled with a code name and kept in secure storage, separate from other files, until it was eventually erased. Confidentiality of disclosure helped the researcher to gain access to in-depth information that was not opened to the general public. Thus, it was important to assure interviewees of the confidentiality of the interview.

Table 4.1 Table of Interviewees Involved in the Smart ID Card Project

Position	Involvement in the Smart ID Card project	Interview topics	No.	Time and method
Executive Director	Responsible for the implementation of e-government projects in Thailand	-E-government in Thailand -Project background -Problems in design and implementation	1	-May, 2010 -Face to face interview
Directors from the Ministry of ICT and Ministry of Interior	Responsible for implementation of the Smart ID Card project nationwide in Thailand	-Project background -Responsibility for the project -Obstacles in organisations -Problems in design and implementation	4	-May, 2010 -Face to face interviews (3) - Telephone interviews (1)
Director and Assistant Director from the National Electronics and Computer Technology Centre	Responsible for the strategic planning of information, communication and technology in Thailand	-Project background -Responsibility for the project -Obstacles in organisations -Problems in design and implementation	2	-May, 2010 -Face to face interviews
Director and Assistant Director from the Office of the Public Sector Development Commission, Thailand	Responsible for e-government policy and implementation in Thailand	-E-government in Thailand -Project background -Problems in design and implementation	2	-June, 2010 -Face to face interviews
Deputy Provincial Governor	Responsible for monitoring issuance and management of the Smart ID Card in the provinces	-Project background -Responsibility for the project -Obstacles in organisations -Problems in design and implementation	1	-November, 2009 -Face to face interviews

Table 4.1 (continued)

Position	Involvement in the Smart ID Card project	Interview topics	No.	Time and method
Deputies of the Regional Director	Responsible for facilitating all technical issues of the Smart ID Card in regional areas.	-Project background -Responsibility for the project -Obstacles in organisations -Problems in design and implementation	2	-November, 2009 -Face to face interviews
Scholars	Interested in public sector project implementation	-E-government in Thailand -Project background -Problems in design and implementation	3	-July, 2010 -Face to face interviews
Deputy District Governors	Heads of issuing stations	-Project background -Responsibility for the project -Obstacles in organisations -Problems in design and implementation	5	-November, 2009 -Face to face interviews
CEO of an IT vendor	Working with public agencies	-Project background -Responsibility for the project -Obstacles in organisations -Problems in design and implementation	1	-July, 2010 -Face to face interview
Citizens	The end user of the Smart ID Card project	-Project background -Responsibility for the project -Opinions of the design and implementation	20	-August, 2010 -Face to face interviews

Source: Author's Construct

4.5.4 Data Analysis

In order to analyse large amounts of qualitative data derived from documentary sources, a coding scheme was developed and applied. This involved putting qualitative data into categories and labelling those categories with themes (Creswell 2003). The purpose of this process was to group similar events under a similar heading or classification (Strauss and Corbin 1988). In order to allow the contents to be verified systematically, the codes were separated into different topics and the categories compared continually in order to identify common themes (Glaser and Strauss 1967). However, the data also had to be triangulated to different data sources in order to build coherent justification for themes (Creswell 2003). In the data triangulation process, for documentary research, this study used multiple sources of data (details in Section 4.5) for comparison of consistency. For interview information, the interview scripts from multi-informants were also compared in order to justify the logic and coherence of the answers. After that, the consistency of information from both the documentary research and interview was compared again in order to create a logically coherent justification for the analysis.

To analyse the data, this study employed the concept of template analysis, which required the researcher to produce a list of codes ('templates') that represented the themes identified in the textual data (King 2005). This is a flexible technique allowing researchers to tailor the codes to match the requirements of the study.

Following King (2005), this research began by creating an initial template. In this process, the initial template was guided by a set of questions (see the guideline for the interview in Appendix One), which was used for interviewing interviewees and establishing high-order codes. However, as the interview in this study was semi-structured, there were many new issues that occurred during the interview process. Therefore, as new themes emerged, the initial template needed to be adjusted. The initial template was revised after transcription of the interview process. The revision aimed to adjust the template in order to cover all the data from the interviews.

Many data elements, however, were taken from the documentary research such as minutes from meetings, official documents and newspapers, requiring the use of a third template. In

this version, the template adjustment was based on the research questions, objectives of the study and analytical framework. After the final template was finished, all elements of data were added and categorised by the relevant themes (see details of the three templates in Appendix Two). By doing this, the template analysis was very useful for the researcher in triangulating the data sources. It also helped to increase the validity of this study.

4.6 Quality of the Research

Reliability in this study was tested by using multiple modes of data collection such as documentary research and interviews.

Firstly, the interviewer elected to ask open ended questions, which were developed from the theoretical framework posted earlier. The interviewees were asked various questions on the same topic in order to test whether they would give consistent answers. All questions were asked in the Thai language in order to put interviewees at ease in answering them (see an example of the interview script in Appendix Three).

At the same time, the interviewees were observed for their body language, especially as the main theme of this study touched on a current number of hot topics and sensitive issues in Thailand. More importantly, it raised the question of huge-scale corruption among high level officials and politicians, and, thus, the interviewees might not have given sincere and direct answers. It was therefore the job of the researcher to read from the interviewees' gestures and not rely totally on their words. For example, when the interviewees were asked about the conflicts among organisations or the wrong specification of the blank ID card, some interviewees tended to pause in the conversation, avoid eye contact and take more time to think about their answers. Some of them refused to answer, while others answered indirectly, for instance, one said "these issues are normal things that normally happen in public administration". This left the researcher with some difficulty in finding the truth, and so the research investigated the sensitive issues in-depth by using documentary research from newspapers. This method helped to fill in the missing pieces on sensitive stories from the interview.

To ensure reliability, information from multi-informants was cross-checked. It was most important that informants had direct involvement or experience related to the Smart ID Card project in Thailand. At the beginning, the researcher carried out documentary research from official documents and websites to identify relevant organisations and people who had been involved in the Smart ID Card project. Then, appointments for an interview were made with prospective informants. Some informants were invited informally, but others needed an official letter to make contact. While the informants were being interviewed, they were asked to suggest other knowledgeable and directly experienced persons in the Smart ID Card project for further questioning. This approach was very useful in selecting informants from the Ministry of ICT, Ministry of Interior, IT vendors and scholars. However, citizens required a different approach. The researcher decided to interview citizens at the issuing station when they came to request an ID card. The atmosphere at the issuing station was conducive to aiding the citizens in their recalling of the Smart ID Card project. In the interview process, each informant was asked the same set of questions, based on the theoretical framework, to see whether they yielded the same answers, or at least ones in a similar context.

Documentary data were also used to confirm, complete and cross-check information from the interviewee. Data and information related to the Smart ID Card project were collected from various sources such as journals, official documents, newspaper, etc., with the use of many sources of information helping facilitate data triangulation.

Unfortunately, even though the qualitative researcher received the most reliable information, validity of that particular data could not be guaranteed, as was the case with the information received from multi-informants. Therefore, the quality of any research study must deal with the issue of validity, which means accurate data. In other words, validity deals with accuracy. According to Yin (2002), types of validity, namely construct validity, internal validity and external validity should be concerned with social science research. Construct validity is when the researcher develops a “sufficiently operational set of measures” and whether data are collected without the researcher’s bias (Yin 2002, p.35). To overcome the problem of construct validity, Yin (2002) advises the researcher to use a “multiple source of evidence” during the data collection process and, hence, these were the tactics adopted in this study.

Data collected from various sources and multiple informants were triangulated to ensure the construct validity of the study.

Internal validity deals with causal relationship, i.e., when certain conditions (or in this case actors) leads to other conditions (Yin 2002). Internal validity was applicable to this study because it searched for the causal relationship of actors that led to failure of the Smart ID Card project in Thailand by using ANT as a theoretical framework.

This study relied heavily on the explanation building tactic based on the theoretical framework of ANT. As mentioned earlier, the theoretical framework was used to develop questions for the interview and guide data analysis. ANT helped to organise the entire case study and answer the questions of 'How' and 'Why' from a particular standpoint.

External validity refers to a situation in which the findings of a study can be generalised. The issue of external validity is very difficult for a case study such as this one, as most of the time a case study is chosen because of its uniqueness, which in this case, does not provide a good starting point for generalisation. However, Yin (2002) argues that the researcher should not compare a case study generalisation with a survey research because of the differing natures of generalisation between the two. Survey research employs statistical generalisation, whereas, a case study focuses more on analytical generalisation. In analytical generalisation, a set of results is generalised to source the border theory, in the case of this study, ANT. However, generalisation is not complete until a theory is tested by replicating the findings in other cases, where the theory specified yields the same results. Once direct replications have been made, the result might be accepted as strongly supporting the theory. Unfortunately, given the scope of this study, coupled with time constraints, only generalised findings of the Thai case could be studied in the hope that scholars will follow ANT and utilise it for future generalisation studies.

Chapter 5 The Smart ID Card Project in Thailand

To understand the case study, this chapter presents the history of both e-government generally in Thailand and the Smart ID Card project specifically. It also presents the chronology of this project.

5.1 The Brief History of E-government in Thailand

Thailand set out the ‘National Information Technology Policy Framework 2001-2010: Thailand Vision Towards a Knowledge-Based Economy’ that primarily focuses on five sectors; e-government, e-commerce, e-industry, e-education and e-society. From these five focal areas, e-government or information technology for public administration acts as a centre for connecting people and businesses with governmental agencies. E-government, in this ten year framework, refers to the application of electronic means in public administration and services, with the goal to build a Knowledge-Based Society, creating good governance and enhancing competitiveness, leading to a higher quality of life for Thai society. E-government is expected to have many desired results in public administration such as less corruption, increased transparency and good governance, revenue growth and/or cost reductions. It is expected to be a vital basis for a knowledge-based society and a foundation for increasing the country’s competitiveness, since the government is the largest resource of knowledge and information (National Electronics and Computer Technology Centre 2002).

However, for short-term development, the National Information and Communication Technology (ICT) Master Plan (2002-2006) was developed. The plan was composed of vision, missions, objectives, strategies and activities for the first years of National Information Technology Policy 2010. The stages of strategy formulation involved interactive participation of all stakeholders from the public sector, private sector and civil society. Some workshops focused on the high-end policy makers, one of which was chaired by the Prime Minister, as chairman of the National IT Committee. This master plan took one year to carry out comprehensive research on best practices around the world, analyse the strength, weakness, opportunity, and threat (SWOT) to the country from ICT development, and to

concretise this into vision, missions and strategies. The three prime moving areas from seven strategies were emphasized in order to accelerate and kick start the whole plan, including the development of e-government, the structuring of the software industry, and the promotion of ICT utilisation among small and medium-sized enterprises.

Yet, the plan for e-government development within the five year framework significantly focused on the unity and integration of the database system, planning, coordination, budget allocation and transparent procurement, to serve each agency's requirement as well as reduce duplication of investment. This would enable the public sector to collect, exchange and share information among themselves, based on a secured and open standard platform. During this period, the Cabinet attempted to initiate many e-government projects such as e-auction, e-passport, e-revenue, e-audit, e-investment and industry, e-statistics, e-procurement and e-parliament. Among many projects in the development of e-government, 'the multi-application smart ID card project' was the first priority initiated in this area. It was therefore seen as a key foundation for e-government in Thailand.

5.2 The smart ID card project background and goals

The objective of this project was to enable all Thai citizens to conduct all government services by using only one card, in order to provide a more convenient and faster service. It would have also greatly reduced the use of paper, document filing and copies. This project started with pilot public agencies, namely the Ministry of the Interior, the Ministry of Public Health, the Ministry of Labour, the Prime Minister's Office, and the Ministry of Finance. In this way, the representatives from these pilot projects identified the fundamental data and responsible government agencies for collection and changes of data (National Electronics and Computer Technology Centre 2003).

Card issuance began with data under the responsibility of the Ministry of the Interior, including birth date, ID number and registration of name/surname. All data were included in the smart ID card. Other public agencies had the right to record and amend the data directory and fields for which they were responsible, based on the data standard of the card-reading machine, the security system, and the communication method of the card and reading

machine. The planning and implementation of the system was based on convenience, safety, durability, cost-effectiveness, high quality and uniform standard across the same database. The Cabinet also expected to promote local production of both the necessary hardware and software as much as possible, with Thailand being a manufacturing base of cards and software. Initially, data of several public agencies in the ID cards should have been combined as follows (National Electronics and Computer Technology Centre 2003).

Table 5.1 The Relevant Public Agencies in the Smart ID Card Project

Types of card	Agencies responsible for data
<ul style="list-style-type: none"> • Government official card 	Department of Local Administration
<ul style="list-style-type: none"> • Identity card 	Department of Provincial Administration, Ministry of Interior
<ul style="list-style-type: none"> • Tax card 	Revenue Department, Ministry of Finance
<ul style="list-style-type: none"> • Social security card 	Social Security Office, Ministry of Labour
<ul style="list-style-type: none"> • Health insurance card 	Ministry of Public Health
<ul style="list-style-type: none"> • Free-treatment cards 	Ministry of Public Health

Source: National Electronics and Computer Technology Centre (2003)

To achieve the objective of developing the smart ID card, an agency under the ICT Ministry was made responsible for cooperation between and integration of the relevant agencies by setting the main conditions and minimum qualifications of the card, based on security, the protection of personal data, and scalability.

There were great expectations of the Smart ID Card project, but when implemented it failed to reach any part of its planned goal. To illustrate the failure picture, this section intends to compare the four-stage goals (Department of Provincial Administration 2004) with concluded data from Section 5.3 to depict what happened really in each phase of the project. Details are shown in Table 5.2.

Table 5.2 Intended Goals Compared with Outcomes of the Smart ID Card Project Implementation

Intended goals	Outcomes of project implementation
Phase 1, 2004	
<ul style="list-style-type: none"> • To produce the first batch of 12 million Smart ID Cards and issue them to citizens. • To substitute the free medical treatment card and social security card with the Smart ID Card. • To enable the Smart ID Card holder to access and contact electronic services of both the public and private sector via electronic machines or websites. 	<ul style="list-style-type: none"> • The IT vendor was awarded the contract to produce 12 million Smart ID Cards under supervision of the Ministry of ICT. • A NECTEC test found that all the ID cards produced had a misspecification. • The Ministry of Interior therefore rejected the cards and prevented the Ministry of ICT from issuing them to citizens. The conflicts began. • Because of the misspecification, the Smart ID Card could not substitute any other cards or be used electronically.
Phase 2, 2005	
<ul style="list-style-type: none"> • To produce the second batch of 26 million Smart ID Cards and issue them to citizens. • To substitute the cash card, debit card, credit card, and telephone card with the Smart ID Card. • To use the Smart ID Card for recording change of residence and voting in a referendum or an election. 	<ul style="list-style-type: none"> • The Cabinet solved the earlier conflict by forcing the Ministry of Interior to accept the first batch of 12 million Smart ID Cards. • The Smart ID Card began issuance to citizens officially in October, 2005. • Production of the second batch of 26 million Smart ID Cards was not completed on time (in 2005). • The Smart ID Cards produced could not substitute any other cards or be used electronically.
Phase 3, 2006	
<ul style="list-style-type: none"> • To produce the third batch of 26 million Smart ID Cards and issue them to citizens. • To substitute the passport or border pass, national and international driver's licence, and national and international cash card, debit card and credit card with the Smart ID Card. 	<ul style="list-style-type: none"> • Production of the second batch of 13 million Smart ID Cards was e-auctioned, but the bidding process did not finish because of problems. • In August 2006, the Ministry of Interior stopped issuing the Smart ID Card because it had run out of stock. • In September 2006, there was a military coup that overthrew the government in Thailand.

Table 5.2 (continued)

Intended goals	Outcomes of project implementation
<p>Phase 4, 2007</p> <ul style="list-style-type: none"> To give the Smart ID Card project alternative uses such as dual contact i.e. contact or contact less. 	<ul style="list-style-type: none"> The Smart ID Card project came under investigation from the new government regarding corruption and lack of transparency. A magnetic card was issued to citizens and used instead of the Smart ID Card. There was still no sign of the Smart ID Card substituting any other card or being used electronically.

Source: Department of Provincial Administration (2004) and the summary of details from Section 5.3

From the table above, details show that the Smart ID Card project could not achieve any part of its goal in the set timeline. Only 12 million of the 64 million Smart ID Cards required were issued to citizens, and they were all in the wrong specification. The Smart ID Cards issued could not act smartly. They could not substitute any other card or work electronically with any services. It is not difficult to conclude that this project was a complete failure when comparing the project's outcomes with goals.

In the next section, this study provides further chronological details of the Smart ID Card project. Descriptions of important and interesting events have been selected.

5.3 The Chronology of the Smart ID Card Project

This section explains details of the Smart ID Card project from 2002 to 2006. Firstly, it illustrates why this project was initiated and supported in Thailand; followed by the response to the project from Thai society. Later, conflicts during the implementation process of the project are exposed. Finally, the immediate causes of malfunction in the project are presented. Before dealing with important results in this project, interesting events in this section are summarised in the following timeline overview.

February, 2002	The Prime Minister, Thaksin Shinawatra, announced through the media that Thailand would be the first country in the world with all its citizens having a Smart ID Card together with new modernised public services.
January, 2003	In promoting electronic services in the public sector, the Cabinet endorsed the year 2003, as 'the year of electronic services for citizens'. The Smart ID Card project was a crucial mover project in the five-year ICT master plan (2002-2006).
March, 2003	The Cabinet allocated a budget of 2 billion baht (approximately £30 million at that time) for the Smart ID Card project.
March, 2004	The Cabinet announced to the public that it aimed to issue the Smart ID Card to all citizens within three years (2004-2006). The rate of production would have been 12, 26, 26 million cards in the year 2004, 2005, 2006, respectively, for a total of 64 million cards (the population of Thailand)
March, 2004	Criticisms arose through the media, mainly concerning Thai society and the public sector not being ready for this kind of project at that time.
April, 2004	The Cabinet commenced with a grand opening ceremony called the 'Smart ID Card for Thais at the international level'. The first 5,000 smart cards were issued for VIPs such as the Prime Minister, Cabinet members and members of parliament, senators, governors and high ranking bureaucrats.
June, 2004	The IT vendor; CST company, was awarded the contract to produce the first batch of 12 million cards, and it started production without an officially signed agreement.
August, 2004	A problem occurred between the IT vendor and Ministry of ICT regarding the contract for card production, e.g. the approval process.
March, 2005	Before issuance of the Smart ID Cards to citizens had started, the Ministry of Interior found that all of them were made to the wrong specification. The Ministry of Interior blamed the Ministry of ICT regarding this issue, and the conflicts began.
April, 2005	The Prime Minister asked the National Electronic and Computer Technology Centre (NECTEC) to test and verify the card's compliance with the terms of reference (TOR). The test results showed that all the cards could not meet TOR requirements.

June, 2005	No consideration was given to reproducing the card and making it compatible with the TOR. Nevertheless, the Ministry of ICT set up an 8-member approval committee again, and it accepted the card with a 5 to 3 split decision.
July, 2005	The Information and Communication Committee from the House reported results of their panel meeting on the Smart ID Card situation, and confirmed that it had no problem regarding the card's specification. However, no voice was heard from the Ministry of Interior.
July, 2006	A problem occurred in the e-auction process for the second batch of Smart ID Cards, where there seemed to be a lack of transparency. The IT vendor complained to the police about the unfair bidding process.
August, 2006	Blank Smart ID Cards were in short supply all over the country, and the Minister of Interior instructed all 1,044 issuing stations to stop issuing the Smart ID Card and issue a magnetic one instead.
September, 2006	A military coup overthrew the Thai government. After that, the new government investigated alleged corruption within the Smart ID Card project.

The timeline overview above shows a broad picture of the Smart ID Card project. However, to expose what happened in deeper detail, the following parts of this work present important and interesting situation in this project. What follows is not a strict chronology but an exploration of particular facets of the project that occurred during its lifetime.

5.3.1 The Beginning of the Smart ID Card Project

With strong conviction, Thaksin Shinawatra, a former Prime Minister of Thailand, revealed the new idea of revolutionizing Thai public management by connecting public and private sector services in the long term with one card for citizens; namely the "Smart ID Card". From the success of many projects in the first term of Thaksin's Cabinet, such as the health care project and village fund, his party, Thai Rak Thai, achieved a landslide victory in a later election to win a second term in power. In the second term, e-government was a big move by the Thai Cabinet, with billions of Baht invested in the scheme. However, top priority was given to the Smart ID Card project (National Electronics and Computer Technology Centre, 2003). With a very successful background in the telecommunication business, before turning

to politics, Thaksin Shinawatra was confident in presenting his vision to Thai citizens. On February 23, 2002, he announced through a media broadcast that “Thailand will be the first country in the world to use a Smart ID Card as a single card to substitute many cards, for example, the identification card, civil servant card, and free medical treatment card.” From his statement, the Smart ID Card project was expanded to cover all 64 million people of Thailand, from newly born children to adults (Lorsuwannarat 2006).

In 2002, the Smart ID Card was proposed to the Cabinet for consideration. The idea was transformed into a project but with few specific objectives, e.g. it was described as a multi-purpose ID card containing personal data for contacting public agencies. The Cabinet hoped to inscribe increased data from more public agencies into the ID card, hoping it would act like a magic card containing personal data, such as name, address, fingerprints and picture, health care data, financial data, etc. This would create massive changes in public services and begin a long episode involving the Smart ID Card (The Committee for the Integration and Reform Registration System 2003).

From the above details, it could be said that the Smart ID Card project was strongly supported by the Prime Minister and the Cabinet as a political tool. This project not only aimed for massive changes in public services for all Thai citizens, but also world class status that would make Thailand a leading country in this field. These high expectations and broad scope suggested that this project might be very complicated, with huge budget requirements and many varied organisations having to work together.

5.3.2 The Challenge of the Smart ID Card Project

Within a few months, the information used to communicate with society changed. Opposition from analysts and the media raised the question; do Thai citizens really need the Smart ID Card? They also criticized the project by saying, ‘the Smart ID Card plan is not looking so smart.’

The question; ‘do Thai citizens really need the Smart ID Card?’ was brought up because, firstly, analysts and media thought that the card would contain a great deal of personal data, which public and private agencies could access and thereby threaten the cardholder’s privacy.

Secondly, office computer systems in public agencies were incomplete and the question of how they could be integrated remained. There was also the worry of security.

The criticism; ‘the Smart ID Card plan is not looking so smart’ was not welcomed by the Cabinet, which was the focal actor. However, the reasons for criticism were:

The Smart ID Card was new to Thailand and the Thai Cabinet did not study or seek advice from other countries, where the system worked successfully.

With nearly 2 billion baht (£ 30 million) invested, and public sector computer systems not linked, the matter of cost effectiveness came into question. Academics on the project committee were worried that the money being spent was also at risk.

The Ministry of ICT received tenders from private companies to produce the first batch of 12 million cards. The selection process for such a large project took only around one month. Also, some companies complained of insufficient time to prepare a proper bid for their tender. The terms of reference comprised only 18 pages, which were written by the Ministry of ICT and Ministry of Interior. It seemed that the 18 pages were vague and could not cover the smart card technology adequately.

Finally, two experts, including the Director of the Software Park, submitted their resignation from the committee board. The Ministry of ICT responded by giving a number of reasons for the resignations. However, these two experts were not the only members of the committee said to be unhappy with the project (The Nation 2004a).

A seminar on the Smart ID Card was organised by CIO forum magazine. In Thailand, every province has a CIO (chief information officer) and the one in this research was under the Ministry of Interior. Interesting opinions from the seminar concluded that the Cabinet should stop the project implementation until the IT links between all public agencies were ready, and related law could be enforced to ensure information security. Furthermore, more communication was needed to create public awareness for citizens. It was also reported that a speculation committee from the senate intruded on the Smart ID Card project. It was found

that card management system (CMS) and key management system (KMS) were not complete. The CMS would enable the Cabinet to manage the card issuing process as well as allow it to track card usage. The KMS was a critical component concerning the encryption of the system (The Nation 2004b).

Originally, this project used a top down approach. It could be said there was a lack of participation from Thai society in creation of this project. Therefore, criticism arose from society through the media. The main concerns of this project were firstly, whether or not Thai society really needed the project. Secondly, that the initiator was not concerned much about cost effectiveness. Thirdly, that Thailand lacked experience in this new technology and that the public sector seemed ill prepared for such a project.

5.3.3 The Communication to the Public

On January 19, 2004, the Ministry of Interior reported to the newspaper media that 5,000 Smart ID Cards would be issued and distributed to all levels of citizen as a pilot test. It aimed to pave the way to access e-government public services, push public agencies and improve its own e-service. For transaction security, each cardholder would be provided with a numeric PIN code and fingerprinting to verify who was accessing the e-government service. Regarding card security, a card control system would be launched. It would give the status of every transaction both online and offline. Around 10 million smart cards were expected to be issued through 1,077 issuing stations or registration offices around the country (The Nation 2004c).

As Civil Servants Day in Thailand is on April 1st, the Ministry of ICT and Ministry of Interior, with help from the Civil Service Commission, held a grand opening for promotion of the Smart ID Card at the civil servants day exhibition, where 5,000 ID cards were issued to politicians, senior bureaucrats, media professionals and celebrities. However, while around 2,000 people queued for this new card, only 300 of them received it. On this day, the main actors: Cabinet, Ministry of ICT and Ministry of Interior accepted the card and described it to the media as an initial Smart ID Card used for identification purposes only, and more personal data would be added later (The Nation, 2004d). This new card was to function as a magnetic ID card combined with the old ID paper version.

No date was confirmed for a fully functioning Smart ID Card. The criticism levied by experts and the media in March seemed to be true, in that the technology system in public agencies was not ready. However, judging from the front page pictures in some newspapers; smiling faces from the Prime Minister, Minister of ICT and certain celebrities made the card look successful, and it could be claimed that the promotional campaign and commotion surrounding it was something of a sham.

5.3.4 The First Move in Producing the Smart ID Card

The Ministry of ICT was forced by its Minister to hurry production of the card because he needed to follow the project schedule, especially as the Prime Minister had asked for progress reports on the project. The Ministry of ICT reported that 5,000 cards would be issued in April, in time for the grand opening day, followed by 1 million cards on May 10th and 10 million cards by the end of 2004 (MCOT 2004a).

Interestingly, the Deputy Minister of the Ministry of ICT said that there was no officially signed contract between the Ministry of ICT and CST Company before producing the card, because only one official process was needed initially to hurry production and keep within the timeframe. Therefore, production of the card came before signing the contract. At this moment, the Ministry of ICT translated the CST Company as producers of the card, but with no guarantee of how well the Ministry of ICT translated what the Smart ID Card wanted in the way of production from the CST Company. There was definitely no officially signed contract; only a draft TOR of just 18 pages at this moment, and CST may have had insufficient understanding of how to produce the cards. However, no space for negotiation was offered; things just kept going (Bangkok Post 2004a).

In June 2004, the CST Company was awarded production of the first batch of 12 million cards at the price of 888 million baht (£14 million), which was lower than the average 1,300 million baht (£ 20 million) set by the Cabinet. CST planned to send 3 million cards to the Ministry of ICT in October, 2004 and after that all cards would be sent to the Ministry of Interior for putting into the security system. By January 2005, 1,077 issuing stations were ready for national distribution of the card (Manager 2004a).

Two months later, after allowing the CST Company to start producing the card without a signed contract, the finished document was officially signed by the Ministry of ICT and sent to the company. However, the CST Company could not accept certain issues in the contract and needed the Ministry to revise it; e.g. for the final process, approval of the 12 million cards must come from the Ministry of ICT alone, and not the Ministry of ICT and Ministry of Interior together, and the card operating system patent must belong to the CST Company, not the Ministry of ICT. In an interview, the Minister for the Ministry of ICT said that some issues could be reviewed, but inspecting the card and summit meetings must be carried out by the Ministry of ICT and Ministry of Interior (Matichon 2004a).

From the above story, it looked as though this project was pressured by having to move fast. Evidentially, the blank ID card was produced before the contract had been signed by the contracted IT vendor and Ministry of ICT. This resulted in contradiction of the details in the contract. Furthermore, inadequate details in the terms of reference would likely be the cause of problems in the card production process. This issue seemed to prompt many problems at a later stage.

5.3.5 The Smart ID Card was Tested

In the case of the Smart ID Card, smart card technologies were not treated well from the beginning, as no one knew enough about them. They were consequently split into two organisations (Ministry of ICT and Ministry of Interior), between which, conflicts later arose. This resulted in instability of the project. When signs of instability were shown, outside actors tried to investigate what went wrong in the project and they sometimes tried to destroy it.

After the first batch of 12 million cards were passed by the Approval Committee, with a 5 to 3 split decision in 2004, many questions were raised about card technologies. Meanwhile, the Ministry of Interior began to issue the card. In order to make card technologies clear, the Prime Minister asked the National Electronic and Computer Technology Centre to test and verify the card's compliance with the TOR. The test results showed that the card lacked two important classes, or libraries required by the TOR: the security and storage memory management (Bangkok Post 2005a).

After results of the ID card test were disclosed, public service officers in the Ministry of Interior were pushed into expressing their opinions and deep thoughts. The Director of the Bureau of Registration Administration praised the NECTEC for doing a good job. Another Interior Ministry source revealed that other security parts in the card were not given to the NECTEC for tests (Bangkok Post 2005b).

The Ministry of ICT disclosed that the Ministry of Interior blamed them for producing the Smart ID Card to the wrong specifications with not enough memory for obtaining data. The Minister for the Ministry of ICT was against the Ministry of Interior for locking the card specification in the card management system (CMS), which was under the responsibility of the Ministry of Interior. The system was compatible with just two kinds of microchip: Philips and Infineon. The Ministry of Interior had expected one of these two microchips to win the card e-auction, but the CST company was awarded the contract; an arrangement that made the Ministry of ICT uncomfortable. The Minister suggested that the card management system (CMS) should be redeveloped to make it compatible with every kind of microchip (MCOT 2005a).

Curiosity about the blank Smart ID Card specification led to an investigation, and test results showed misspecification of the blank ID cards, when referring to the terms of reference. This situation affected the relationship between the project partners: Ministry of ICT and Ministry of Interior. They declared a media war and started to blame each other. No organisation would accept responsibility for faulty card production. The conflicts began to grow bigger, and this problem had to be solved quickly, or else the project might not be able to continue.

5.3.6 The Solution for the Conflicts

The Deputy Prime Minister was not satisfied with the project delay. He said that he and the Prime Minister had known about the conflict between the Ministry of ICT and Ministry of Interior. In taking this project forward, he did not blame anyone in particular, but just needed to involve organisations in sitting and talking with him openly. A meeting was set and the result was positive (Koudsod 2005). Later, it was reported that the Ministry of Interior cooperated with the CST Company, which was awarded the job of card production and improving the software of the card management system (CMS) to make it compatible with

microchips from the CST Company (MCOT 2005b). Then, the government reshuffled the Cabinet, and the Ministry of ICT had a new Minister. He reported to the media and confirmed that now (early May 2005) everything was in order. The remaining problem was the process of fixing the software in the card management system, and he would report the solution to the Prime Minister (Manager 2005a).

It took more than six months of contradictions and delays before the Ministry of Interior returned to its interest in the project. It was the duty of the Ministry of ICT and the Cabinet to persuade the Ministry of Interior to accept the card and issue it, even though its technology had not been passed by the NECTEC test. Initially, the Ministry of ICT set up an approval committee with 8 members, most of which came from the Ministry of ICT. One each came from the Ministry of Interior and Ministry of Science and Technology and six from the Ministry of ICT. With a split decision of 5 to 3 the Chair of the committee said, “We have confirmed that the cards’ qualification complies with the contract and it is now up to the Ministry of Interior to decide if the cards are acceptable” (The Nation 2005a).

From the Cabinet’s side, perhaps this action was another strategy or tool to pacify the Ministry of Interior. The Information and Communication Committee from the House, and the Thai Rak Thai (Thai Loves Thai) party, reported the results of the panel meeting on the Smart ID Card problem. The committee Chair reported to the media that the blank smart ID card is good value for money and has enough capacity for all the information needed. This statement made the contradictory situation clearer. However, the Chair put pressure on the Ministry of Interior to endorse the Smart ID Card project, likely focusing on the public service part (Bangkok Post 2009c).

Later, no report about this controversial issue was found. No voice from the public service office of the Ministry of Interior was heard.

This part may show that the tactics of the Cabinet stabilized the project in a way that seemed agreeable. At this time, the Cabinet was successful. All organisations were in position again and keeping quiet. It also showed how much power the Cabinet had.

After the project survived this turbulent situation, it appeared to be back on track again. The Smart ID Card began issuance to citizens officially in October, 2005, by starting in the three politically restive provinces in the south. The process of obtaining the card took just 15 minutes, which was a very quick when compared with the old procedure. However, people waited in long queues to collect their card because the machinery was limited to process only 200-300 cards a day (Bangkok Post 2005d). This may not have been a big problem to start with because later 1,044 card issuing stations began producing the card for citizens all over the country.

Unfortunately, just three months after Smart ID Card issuance, more than 100,000 of them were found to have duplicated serial numbers. The vendor passed the problem on to the Bureau of Registration Administration (BRA), which is under the Ministry of Interior responsible for issuing the card. The flawed cards were then sent back to the Ministry of ICT, as card procurement was its responsibility, and replacements were produced under warranty (Bangkok Post 2006a).

In tracing the process of implementation back to the past, the Ministry of ICT was likely to be the scapegoat for the project's problems. During the three year time span (2003-2006) of problems, there were four Ministry of ICT ministers. It was strange when the project disclosed that there was only one week between announcing the e-auction winners for production and delivery of the first batch of Smart ID Cards to the vendors (Bangkok Post 2006a).

Even if the conflicts were settled between the organisations by persuading the Ministry of Interior to accept the blank ID card, the root cause of the problem might not be solved, as that was misspecification of the card. No one showed any concern about issuing cards to citizens with the wrong specifications and no guarantee that they could be used in reality.

5.3.7 The Repeated Mess in E-auction for the Second Batch

Everything in the project plan had to be almost fully operational by mid-year 2006, with nearly 64 million citizens using the Smart ID Card from their pockets to access public services with more ease and convenience. However, in reality, the project's progress was a

long way from the original plan, with only 12 million cards issued. This indicated that the Smart ID Card had some way to go before being smart. The card's function was similar to that of old paper and magnetic versions that only provided personal identity. Nevertheless, the Smart ID Card looked very attractive with coloured pictures, and text in both Thai and English. There was also a gold coloured micro-chip, but it had no function.

Figure 5.1 The Sample of the Thai Smart ID Card



Source: The Bureau of Registration Administration (2008)

In 2006, the second bid for another 13 million cards started. Unfortunately, and interestingly, the auction was messed up again. When referring to the process of project design in making the Smart ID Card, the Cabinet secured it with big budgets. This hinted that the Smart ID Card was not just a card, but also a card with financial connotations, when the combination of card and money worked together.

The Ministry of ICT opened the second bid to provide a further 13 million Smart ID Cards at an estimated price of 980 million baht (£ 15 million). Four companies made a bid in the initial round. Later, just two companies made the final round of bidding. They were Sino-Korean and Franco-Japanese. As government regulations require at least three bidders in an e-auction for the result to be legally binding, the previously eliminated IRC-HST company re-appeared in the final round. There was no sound evidence of why this company should be there. The card e-auction was delayed further because of IRC-HST's inclusion. The eventual

e-auction result showed that the Sino-Korean bidder offered the lowest price at 37.95 baht (£ 0.59) per card; a total of 486 million baht (£ 7.48 million), which was less than half of the Ministry's 980 million baht estimate (£ 15 million). It was reported that the Sino-Korean bid could offer a lower price because its manufacturing base was in China, which could turn out 200 million cards annually. The second round seemed to be progressing satisfactorily. The Ministry of ICT had obtained a lower price, with the Sino-Korean bid expected to win the auction, as it was also a skilful company in producing cards.

Surprisingly, the old movie from the previous year (2005) went into rewind. The e-auction committee vote resulted in a split decision of 3 to 2. An external academic, the committee Chair and his direct subordinate wanted to buy the more expensive Franco-Japanese cards, while the treasurer and senior director of the Affairs Bureau said that they should buy the cheaper Sino-Korean ones. This split decision prevented a formal announcement or letter about who had won the auction. The newspapers reported the committee's refusal of at least two direct orders from the highest bidders to formally conclude the e-auction process and name the winner. The Franco-Japanese consortium complained to the police of the unfair inclusion of IRC-HST in the final bidding, as this company had been eliminated in the first round. The Sino-Korean team prepared to sue the Ministry of ICT in the administrative court to force them to honour their contract. The Ministry of ICT reported that they had less than one month's supply of the cards left (Bangkok Post 2006c).

When it came to e-auction for the second batch of cards, there seemed to be a lack of transparency in the process. This resulted in the IT vendors complaining to the police that an unfair bidding process had taken place. Furthermore, the Auction Committee was not decisive about which company to award a contract and they could not announce the winner. This showed that the Ministry of ICT had problems in managing the card procurement, which later affected the card issuing process.

5.3.8 The Smart ID Card Project Malfunctioned

In July 2006, as a result of the problems in the e-auction process, there was a card shortage nationwide. Briefly, the Ministry of ICT could not send the blank Smart ID Cards to the

Ministry of Interior as planned. Therefore, the Ministry of Interior had no more Smart ID Cards to issue to citizens.

In August 2006, the Ministry of Interior sent a formal letter to all 1,044 issuing stations, asking them to stop issuance of the Smart ID Card. The letter stated that cause of the stoppage was because of Smart ID Card shortage and the Ministry of ICT could not supply more cards at the time. It was also suggested that issuing station officers inform the people that the old fashioned magnetic card was still valid until its expiry date. For people with an expired card or those who had lost it and/or needed a new one, the station would issue a magnetic card for them.

However, there was no sign from the Cabinet in trying to solve the problem. This situation was exacerbated by mass demonstrations against the Prime Minister, Thaksin Shinawatra, for his alleged involvement in corruption and abuse of authority to serve his self-interests. Such were the protests that on September 16, 2006, a military coup overthrew the government while Thaksin was out of the country. The country found itself in disarray and so too did the Smart ID Card project.

In summary, the e-government projects in Thailand have had many high expectations in public administration such as less corruption, increased transparency and good governance, revenue growth and/or cost reduction. The Cabinet allocated a large budget for this initiative. Many projects have been launched, thus creating a huge jump in computerisation within the Thai public sector. When implementing, many projects have experienced problems that continually emerge.

The emergence of the Smart ID Card project came from the Cabinet, especially the Prime Minister of Thailand, Thaksin Shinawatra. The original idea of this project was to focus on revolutionizing Thai public services by using state-of-the-art technology – the Smart ID Card. This project plan aimed to cover all 64 million Thai citizens in having a Smart ID Card. Furthermore, from the Prime Minister's viewpoint, Thailand would become the world leader in enhancing public services by using the Smart ID Card technology. This showed how large and very ambitious the project was.

The Smart ID Card project was initiated with a top down approach, which lacked the participation of Thai society. Therefore, criticism arose that Thai citizens may not be ready for this kind of project. Additionally, there was curiosity as to how ready Thai public agencies were. However, these critiques did not make the Cabinet stop or revise the project, and the implementation process continued.

The implementation of this project faced many obstacles. In production of the first 12 million Smart ID Cards, IT vendors had few details in producing the blank card, due to a lack of knowledge and experiences in Smart ID Card technology. Therefore, this resulted in misspecification of the blank ID card, which could not meet the requirement of the TOR. This problem caused conflicts between the Ministry of ICT and Ministry of Interior as to who was responsible for the misspecification. The dispute was solved by forcing the Ministry of Interior to accept the cards regardless and issue them to the citizens. There then appeared to be no recurrence of cards with misspecification, so it could be said that 12 million Thai citizens receive Smart ID Cards with misspecification.

In the second round of 13 million cards, the project faced further difficulty, this time regarding e-auction, which seemed to lack transparency in the auction process. This was noticed by the IT vendor, who complained to the police. Furthermore, the e-auction committee could not announce the company which had won the bidding, because there was a split decision in the vote. This situation caused a shortage of Smart ID Cards nationwide. Later, the Ministry of Interior announced that it had stopped issuing the Smart ID Card. Therefore, old fashioned magnetic cards were issued for citizens instead of the Smart ID Card.

At that time, there were no signs of the Cabinet solving the problem, due to mass demonstrations against the Prime Minister, and later, on September 16, 2006, a military coup. Both Thailand and the Smart ID Card project became unstable. After the coup, the new government investigated alleged corruption within the Smart ID Card project.

From 2006 to 2010, Thai politics were very chaotic and continually fluctuating. Thailand changed its Prime Minister four times in these five years. In the final period of collecting data for this research in 2010, the current Cabinet tried to restart the Smart ID Card project. However, it still faced the same problems such as card production with the wrong

specifications, conflicts among organisations and rumours about corruption. Indeed, in some ways, the situation of the Smart ID Card was becoming worse than ever. Public agencies had no type of ID card to offer, and when citizens requested a Smart ID Card, they were only given a printed yellow A4 paper containing their personal details.

The next Chapter starts to provide detailed answers to why the Smart ID Card project failed. In analysing this phenomenon, ANT was chosen as the analytical lens in the investigation. The causes of the project failure are exposed step by step. In the next Chapter, stage one of the analytical framework starts to function by drawing the grounded scenarios of the actor-network in the Smart ID Card project.

Chapter 6: Punctualisation in the Actor-Network

Prior to analysis in the following chapter of the failure caused by the four moments of translation, it is necessary to draw a fundamental picture of the actor-network in the Smart ID Card project. Therefore, the aim of this chapter is to apply the concept of punctualisation in order to open each black-boxed actor, or punctualised actor, by zooming into each black box and explaining its contents.

The concept of punctualisation allows conversion of an entire network into a single point (Law 1992). Doing this helps to illustrate the relationships between heterogeneous actors in a single unit for producing the desired goal.

The actor-network of the Smart ID Card project requires many actors for a smart ID card to create new public services. This actor-network can be seen as a combination of various human and non-human actors. In other words, it consists of millions or perhaps countless actors. However, the concept of punctualisation allows zooming in and out of an actor-network. This concept helps to reduce the complexity of an actor-network or enlarge it for deeper and more detailed investigation (Monteiro 1999). As the actor-network of the Smart ID Card project is very complicated, zooming out is necessary to collapse its complexity, and this helps to make analysis possible. In learning how actors establish the association, Latour (2005, p.12) suggested a need to “follow the actors themselves”. This research follows the main actors in the actor network of the Smart ID Card project, those being the Cabinet, Ministry of ICT, Ministry of Interior, and citizens. The reasons for and details of actor selection are presented by the concept of punctualisation in the following sections.

6.1 The Cabinet

6.1.1 The Punctualised Actor of the Cabinet

With strong support from the citizens of Thailand, the Thai Rak Thai party gained a massive majority in parliament, which enabled the equivalent of a one-party system. Therefore, the Cabinet had enough power to shape Thai society. The Cabinet, which sought to enhance Thai public management, finally found the Smart ID Card as the answer. The Thai public sector had been bureaucratic for a long time and was difficult to change or reform because of its large size and the complexity of its organisation. Citizens tended to have a negative attitude towards public services, which had many drawn out procedures that were difficult to access and very complicated. Moreover, they seemed to lack transparency. The Cabinet, led by the Prime Minister, Thaksin Shinawatra, had its own unique management characteristics. With an established business background, the Prime Minister applied a business management style to his Cabinet. He aimed to lift Thailand to the upper levels of development with strong competitiveness.

As a focal actor, the Cabinet had the responsibility of steering the project by, firstly, encouraging public agencies to utilise the Smart ID Card in order to improve and supposedly revolutionise public service rendering. The Cabinet should have aimed at multi-government organisations working together closely, especially in sharing information from the citizens, in order to reduce duplicated data and standardise information that would be put into the Smart Card memory.

Secondly, by giving full financial support, it could be said that this project was an indicator of the Cabinet's efficiency. The Cabinet wanted this programme to take effect as soon as possible, thus, the budget allocation was passed quickly.

Thirdly, the Cabinet was responsible for final decisions, which were made in case the direction of the project was unclear. Since the Smart ID Card was a mega-project, it needed cooperation from various ministries. In the case of conflict or required information, the minister responsible had to submit the problem to the Cabinet for consideration. The Prime

Minister would be the chairperson and, therefore, decision making was swift and clear-cut. (National Electronics and Computer Technology Centre, 2003 and the Committee for the Integration and Reform Registration System, 2003).

Thailand has been faced with chronic problems in its bureaucratic system for a long time. To change or reform this system would be difficult due to its large size, which is a major problem in the Thai public sector. However, the Cabinet thought that the Smart ID Card project would solve the problems in Thai public administration. This project was expected to create massive changes in Thailand's public services. Therefore, the Cabinet set up the project, which aimed to supply all Thai citizens with a Smart ID Card within three years (2004-2006). This Smart ID Card was designed to replace many other cards and enable contact with public agencies electronically. Finally, Thailand would be the first or leading country worldwide to equip all its citizens with Smart ID Cards and modernise public services. Informants spoke of the Smart ID Card project in the same way as the Thai Cabinet, as a top director said:

“As we know, the Smart ID Card project was initiated by the Thai Cabinet, led by Dr. Thaksin Shinawatra; the Prime Minister at that time. We can say that Thailand has changed in many ways since then, including Thai public administration. The Prime minister wanted Thailand to gain more competitiveness in the world community. We heard a lot about ‘e’ projects from the Cabinet during this time such as e-government, e-auction, e-commerce, e-revenue and so on. The Smart ID Card was also a very big project of e-government initiatives. One smart ID card could become a substitute for many cards, which I think is a good idea. It would be more convenient for Thai citizens.”

From the opinion above, it could be said that the initiator of this project was the Thai Cabinet. The need for improvement in public services and Thai competitiveness was the reason why the Cabinet wanted to create this project. Therefore, the Cabinet could be identified as the focal actor in this project, with the aim of the Smart ID Card improving or revolutionising

Thai public services. Another informant gave more details on the motivation of the focal actor by saying:

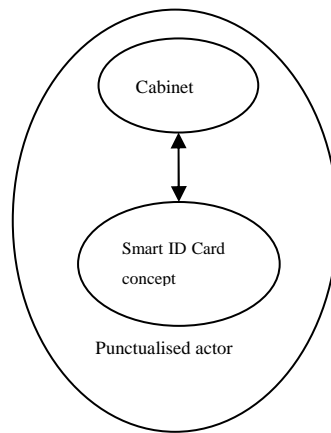
“As a practitioner who has to work with citizens daily, Thai public services need to be changed. Thai citizens are not comfortable with public services, which have long procedures, take up a lot of time, and need many varied documents and more transparency. These chronic symptoms in the public sector may cause the Cabinet to think big changes are needed. I agree with the Cabinet regarding the Smart ID Card project in terms of the project idea, which is very good, but in practice I think we need more preparation before its implementation. Sometimes, I think we are not ready yet for this kind of project. In my opinion, the starting point of this project focused mainly on producing and issuing the card without a good plan or any direction.”

In translating the project idea realistically, the Cabinet needed cooperation from other relevant actors. An informant with experience in the early part of this project stated:

“At the beginning, the Cabinet set up a meeting for the Smart ID Card project. It included many high ranking officers from public agencies, and it seemed like they must join the meeting because the project was Cabinet policy. The officers, as the implementer, had to take responsibility for this project.”

In short, the focal actor had to associate with another actor, the smart ID card concept, to motivate or force relevant actors to enrol into the actor-network of the Smart ID Card project. The Cabinet can be defined as the focal actor in the actor-network. It developed the Smart ID Card concept, which can be classed as another actor in this actor-network. The punctualised actor can be seen in Figure 6.1.

Figure 6.1 The Punctualised Actor in the Actor-Network of the Cabinet



Source: Author's Construct

6.1.2 The Problem of Translation in the Punctualised Actor

As the focal actor in the main actor-network, the Cabinet had the task of analysing problems properly and continuously. The analysis appears in Chapter 7: The causes of failure in the actor-network. Therefore, all details of this actor are revealed stage by stage in the moments of translation.

6.2 The Ministry of Information and Communication Technology (ICT)

6.2.1 The Punctualised Actor of the Ministry of ICT

The Ministry of ICT was a new organisation established in 2000, during the first term of Thaksin's Cabinet. Its objective was to encourage technology use in Thailand. The Smart ID Card required advanced technology, which was beyond the experience of any Thai organisation. Therefore, the Ministry of ICT was asked to create a state-of-the-art technology, especially one for a card that contained a memory chip filled with personal data. More importantly, this technology had to be compatible with current technologies in Thai public agencies (National Electronics and Computer Technology Centre, 2003).

The Ministry of ICT set up policy guidelines for the Smart ID Card project, with the following details.

Firstly, smart card technology should be created by experts within the country. The Ministry of ICT had to be responsible for design, which must be attractive and, unlike previous magnetic cards in Thailand, contain both the Thai and English language. Also, technology such as microchip, software and database methods should be used.

Secondly, to enhance the capability of the Thai technology industry, the card must be produced by a Thai manufacturer. This idea seemed to be part of the Science Park scheme, which wants to support technology development in Thailand.

Thirdly, the card had to be produced within a rigid timeframe. The initial step of card production by the Ministry of ICT could not be delayed or postponed, as that could affect card issuing, for which the Ministry of Interior was responsible (The Committee for the Integration and Reform Registration System, 2003).

According to the Ministry of ICT, it could not produce the Smart ID Card by itself. Therefore, an IT vendor was required to be responsible for production. From the initial plan of the Smart ID Card project, any IT vendor should be a Thai based company because the Cabinet wanted to support and encourage high technology development in Thailand (The Committee for the Integration and Reform Registration System, 2003).

In order to issue the Smart ID Card to all Thai citizens, the project needed 64 million cards, and production was planned by dividing this number into 3 lots (12, 26 and 26 million cards). IT vendors who wanted to produce the Smart ID Card had to bid via the e-auction process. The company awarded the contract for producing the Smart ID Card needed to follow the terms of reference and be supervised by the Ministry of ICT.

The Smart ID Card project required high and complicated technology, in which the Ministry of ICT was involved in the main actor-network. An informant from the Ministry of ICT explained:

“In the beginning, the Cabinet made it their policy to produce the blank ID card in Thailand. This would help to reduce the cost of production and create a new business opportunity in the ID card area. Furthermore, we were expected to be a pioneer in smart ID card technology in public services. This ministry (Ministry of ICT) was set up to promote and support ICT development in this country, and the Cabinet asked us to take charge of blank smart ID card production.”

In the eyes of the focal actor (the Cabinet), the Ministry of ICT was seen as a potential actor in producing the blank smart ID card, and therefore enrolled into the main actor-network. However, when zooming in on this actor at this moment, it contained a non-human actor, which was the blank ID card. However, in practice the Ministry of ICT could not produce the blank smart ID card by itself, and a new actor had to be enrolled into the actor-network to carry out the task. The same informant continued:

“In terms of policy, it would say that the ID card can be produced within the country, but in practice, there is no plan for investment in card production. Therefore, we had to buy the blank ID card from an IT vendor. However, the selected IT vendor must have a Thai IT company as a partner. We set this criterion because we want Thai IT vendors to have opportunities to learn about this kind of technology in ID card production. We used an auction process to award the IT vendor with a contract to produce the blank smart ID card.”

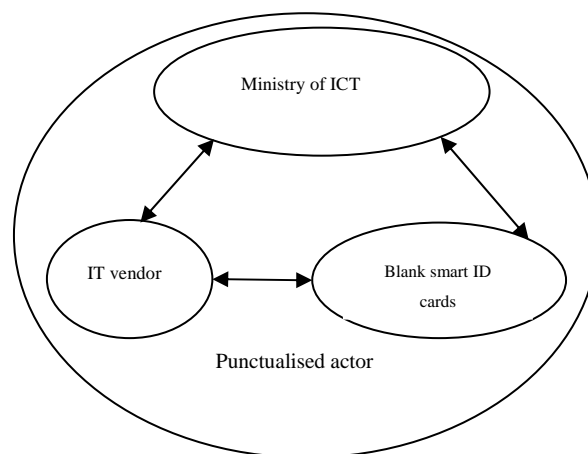
Consequently, an IT vendor was enrolled into the actor-network of the Ministry of ICT as a new actor. The association of these two actors (the IT vendor and Ministry of ICT) was crucial in creating a high technology artefact. However, trying to achieve this target was difficult, as a barrier had to be overcome. An informant said:

“We have to accept that our public agencies lack knowledgeable IT experts. It is not easy to catch up with new technology, and this applied to producing the Smart ID Card, which was quite a new technology for both the public and private sector. We had problems in communicating with IT vendors in the bidding process. We

had to make the TOR transparent by disclosing it to the public. After that, we received many notes from the IT vendor about card specifications. We had to adjust the TOR and make it more appropriate and try to communicate better with the IT vendor. This caused a delay in the project process.”

It can be summarised now that this actor-network consisted of (1) the Ministry of ICT, which had to enrol an IT vendor to help in producing the blank ID card, (2) the IT vendor, which would have the capacity to produce the blank ID card, as required by the TOR and (3) the blank smart ID card, which was a non-human actor that should have been ready to retrieve personal information with high security. However, this actor-network had a problem in understanding the new technology. If the actors had been able to solve this problem, punctualisation could have been established.

Figure 6.2 The Punctualised Actor in the Actor-Network of the Ministry of ICT



Source: Author’s Construct

6.2.2 The Problem of Translation in the Punctualised Actor

The Ministry of ICT had its own actor-network, which comprised the IT vendor and a blank smart ID card, which involved high technical production. This actor-network faced difficulties from the beginning, with the focal actor (the Cabinet) of the main actor-network

having high expectations of the Ministry of ICT in producing the blank smart ID card by itself, which in reality it could not do. An executive director said:

“In the beginning, we planned to set up a company for producing the Smart ID Card in Thailand. However, in reality we could not offer any incentive for would-be investors. Therefore, we were left with having to buy the blank ID card from an IT vendor.”

Therefore, the Ministry of ICT had to enrol an IT vendor into its actor-network to help in achieving its mission. However, in doing this, the Ministry of ICT, as the focal actor, had no proper tool for recruiting a highly capable actor. Instead, it used an electronic bidding process or e-auction. From the interviews, the CEO of an IT vendor, who had had experience in working with the public sector stated:

“In practice, e-auction in the public sector is not very good sometimes. Public organisations want to buy things very cheaply. In my opinion, this is not logical. The lowest price of a product does not guarantee its quality. According to my experience, sometimes a bidding company offers a far lower price than other companies or even the standard price. Why does this happen? As I know, in some cases the company needs the job because it is in financial crisis. Therefore, it tries everything to win the contract. To choose the cheapest price from the auction is not a good idea, I think, because it can create huge problems later. The first thing is, when the price is not based on reality, it leads to misspecification of the products. And the misspecification of the product leads to non-transparency of the approval process.”

The opinion above, hinted that the tool (e-auction) for enrolling a new actor had a defect, and implied that by using this tool, an unsuitable or incapable actor might be enrolled into the actor-network. This new actor could possibly turn out to be a Trojan actor, which would finally destroy the actor-network.

However, in controlling a new actor, such as the IT vendor, to behave accordingly and do its duty as required by this actor-network, the focal actor (the Ministry of ICT) used the terms of reference to lock the IT vendor into position. In practice, the TOR also had a defect because the focal actor lacked experience and knowledge in producing a good tool (TOR). An informant gave his opinion on this issue by saying:

“The public sector lacks IT experts, so it cannot create good or appropriate terms of reference. For this project (the Smart ID Card project), this kind of technology is very new for Thailand, especially for the public sector. It is very difficult to make things perfect in a short time. Let me say again, to make good terms of reference, the public sector needs help from IT experts and as for the complicated technology in this project, more time is needed.”

Another informant from the Ministry of Interior added:

“I understand that it was very difficult for the Ministry of ICT, because this project was expected to move fast. They did not have much experience like us (the Ministry of Interior). It was hard to build a TOR that covered everything that was needed in a short period of time.”

From the interviews, it was difficult to obtain information on these issues (e-action process and TOR), because they were sensitive. The informants refused to give details. However, further evidence could be found from newspapers, which reported that the TOR consisted of only 18 pages of guidelines for the IT vendor to produce the blank ID card (The Nation 2004a).

According to the Ministry of ICT, as the focal actor in its own actor-network, the tool (e-auction) was not effective for enrolling a reliable new actor (the IT vendor). Furthermore, no strong device was created, such as the TOR, to lock the new actor into the appropriate job. Finally, this actor-network was unable to produce a good artefact: the blank smart ID card. The resulting problem in the approval process was conflicts among the other actors in the

main actor-network. Even though the Smart ID Card was issued later to citizens, it was not practical, as an informant explained:

“Here is a Smart ID Card from the first batch (showing the card). You can see that it is not strong. It is composed of layers. As time passes, the first layer will peel away, then the second and the third. I also think thieves can make copies easily by just putting a hot iron on the card, and each layer will peel off. After that another picture [of the holder] can be inserted. For the electronic function, this version (the Smart ID Card) has limited space and cannot function electronically.”

In summary, the problem in translation of the actor-network of the Ministry of ICT, are as follows. (1) The Ministry of ICT lacked experience and knowledge in creating the technology artefact: the blank smart ID card. Therefore, it needed help from another actor. (2) In enrolling a new actor into its actor-network, the Ministry of ICT did not have a powerful tool to enrol the right actor (the IT vendor) for producing the blank smart ID card. (3) As the focal actor in its own actor-network, the Ministry of ICT could not produce a strong tool (TOR) to control the new actor (the IT vendor), when working to actor-network requirements. For these reasons, the high capacity artefact or non-human actor (the blank smart ID card) could not be produced.

6.3 The Ministry of Interior

6.3.1 The Punctualised Actor of the Ministry of Interior

The Ministry of Interior is an organisation that has a database of all Thai citizens. Since the 1980s, it has developed the population registration project. Starting with the innovation of 13 digits in the identification card for Thai citizens, these digits represent unique details of each citizen such as what type of person they are (native or immigrant), where they were born, etc. When issuing 13 digits for every Thai citizen, the Ministry of Interior started to develop the integrated population demographic system. This project has been very successful. In 1990, it received the ‘Computer World Smithsonian Award’ as the only integrated population

demographic system in the world. In 2002, it won 'Best IT Thai Government Service' from NECTEC, and in 2001, 'Best E-government Service Award' from Asia Pacific ICT awards (The Bureau of Registration Administration 2008).

Therefore, there is no doubt about the capability of this public agency. The Cabinet required it as the main organisation in managing all databases and issuing the Smart ID Card to citizens. There were more than 500 issuing stations around the country that issued magnetic identification cards on a daily basis.

It may not have been difficult for this Ministry to manage this project alone, but unfortunately, it was demanding work for other public agencies. Firstly, merging of the Ministry with relevant organisations would be needed for accumulating standard personal data, increasing issuing stations from 550 to 1,044, with fully connected online facilities, and issuing the Smart ID Card to 64 million people in 2006 (The Committee for the Integration and Reform Registration System, 2003).

When referring to past success, the Ministry of Interior's legendary integrated population demographic system project was investigated academically. Its success was put down to a system that introduced top-down management, and operated in accordance with centralised and bureaucratic principles, which provided the government with a great deal of power over Thai citizens when it came to bureaucratic surveillance (Ramasoota 1998).

It is a little curious, therefore, how this organisation adopted a very complicated Smart ID Card system and needed to work in partnership with many other organisations that were at the same level. Perhaps new management styles were required. Nevertheless, with a knowledgeable and experienced organisation that had successfully implemented a world class project, speculation was that it alone could manage this project smoothly and as successfully as before.

The Ministry of Interior is another crucial actor in the main actor-network of this project. Much experience in Thai citizen databases is very important when enabling the main actor-

network to achieve its goal. A top director in the Ministry of Interior explained the long history of ID card development involving his Ministry:

“For nearly fifty years, Thailand has been issuing ID cards to citizens, starting from a paper ID card to a magnetic one and finally the Smart ID Card. In the past, it took a very long time to distribute ID cards to citizens. Sometimes, it took around 180 days because we had less technology to work with. We (the Ministry of Interior) have continually developed both the citizen database and ID card issuing procedure. I can say now that we are able to issue ID cards to each citizen in only 5 minutes.”

Another informant from Ministry of Interior explained in detail, why the focal actor (the Cabinet) enrolled the Ministry of Interior into the main actor-network.

“Actually, while Dr. Thaksin Shinawatra was Prime Minister, I think he and his Cabinet saw the potential for creating more benefits from the Thai citizen database. We (the Ministry of Interior) can provide 13 digits for every Thai citizen. These digits are a key for personal identification and also capability of linking to other personal database systems. Therefore, with this idea, it is possible to use just one card instead of many. Accordingly, as we are responsible for developing the citizen database system, we have been asked to involve ourselves with this project. Other public agencies that want to use this database system need to sign an MOU with us. For the Smart ID Card project, personal information from us is not only needed for inclusion in the Smart ID Card’s micro-chip, but also more relevant information from other agencies such as data on free treatment, social security, passport, etc. Other organisations that want their information put into the Smart ID Card are required also to sign an MOU with us. It looks as though we are the centre of the Thai database system.”

At this point, it can be observed that the Ministry of Interior has another actor in its territory and that is other public agencies, which provide more information to the Ministry for inscription into the Smart ID Card project. This would make the Ministry of Interior the hub

of the Thai citizen database system. However, other public agencies that need to use the central database have to sign an MOU with Ministry of Interior.

By now, the Ministry of Interior also had its own actor-network, which was aside from the main actor-network in the Smart ID Card project. With the help of other public agencies, this actor-network had the objective of providing or issuing the Smart ID Card containing necessary personal information of citizens. A top director, who has been involved with the Smart ID Card project from the beginning, described the process carried out in the actor-network of the Ministry of Interior.

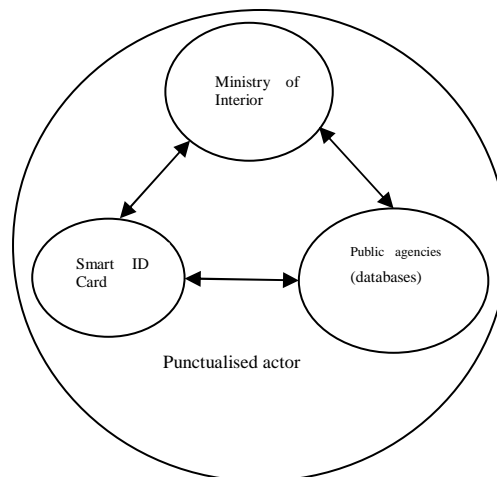
“You may know that the Ministry of ICT is responsible for blank ID card production and then the cards are sent to us, the Ministry of Interior. Our (the Ministry of Interior) duty is to issue those blank ID cards that contain personal information of Thai citizens. There is no problem in issuing the cards, as we have more than one thousand issuing stations all over the country. Our database system is also good enough. However, the Smart ID Card project requires more information from other public agencies, and I have to say that working across organisations is not easy. By concept, it is very easily said, but very hard to do in practice. Public agencies have their own individual work procedures, database system and technology. It is very difficult to motivate them to change and follow us. For an integrated working policy, I don’t know what to say, you will have to ask him, the Prime Minister (Dr.Thaksin Shinawatra).”

The above information hints at a very complicated actor-network with just one actor comprising other public agencies such as many organisations or actors with different characteristics. Working with this actor (other public agencies) corporately seems to be problematic for the focal actor, the Ministry of Interior.

In conclusion, the actor-network of the Ministry of Interior consists of mainly two other actors, which are (1) other public agencies that provide other citizen databases for and use the central database of the Ministry of Interior for new public services with the Smart ID Card, and (2) the Smart ID Card, which is a technology artefact containing personal information

and the capacity to connect electronically with public services. If all actors could work corporately, this actor-network would create the centre of the Thai citizen database system and distribute the Smart ID Card to all citizens, with the focal actor (the Ministry of Interior) acting as the hub. The punctualised actor of this actor network is shown in Figure 6.3.

Figure 6.3 The Punctualised Actor in The Actor-Network of the Ministry of Interior



Source: Author's Construct

6.3.2 The Problem of Translation in the Punctualised Actor

From the analysis of punctualisation, the Ministry of Interior needed to associate with another two actors: relevant public agencies and the Smart ID. This Ministry of Interior actor-network had the function of accumulating all personal information of relevant citizens from public agencies and later inscribing it into the Smart ID Card. If this mission were successful, the focal actor in this actor-network (the Ministry of Interior) would have been the hub of Thai citizen database management. The main obstacle in this actor-network was the requirement of the focal actor (Ministry of Interior) to work across organisations. As more cards were replaced by the Smart ID Card, more different actors (public agencies) became involved. Initially, this actor (public agencies) created and developed its own technology artefact (citizen database), based on its own basic needs. Therefore, it was very difficult for different

artefacts to communicate and work compatibly with each other, as they had different languages and structures. A director from the Ministry of Interior added details by saying:

“Our citizen database is good and advanced when compared with others. Other public organisations want to link their database with the Ministry of Interior, but I think they are not ready, as it is not easy to do this, or integrate information online. This is because there are obstacles such as different hardware and software for developing a database. It is very difficult to modify databases for a new system. What is more, these organisations lack IT expertise. Another barrier is that one ministry has thousands of organisations within it, spread all over the country. If changes are needed, they need to be made as a whole. I think it needs time before working online across public agencies.”

The above statement hints that this actor-network positioned itself far away from its goal. The focal actor (Ministry of Interior) could not create a strategy to motivate or force the actor, such as the public agencies, to develop technology artefacts that worked compatibly with the new Smart ID Card system. Furthermore, this actor was very complicated, as it was composed of many actors comprising both human and non-human actors (e.g. software, hardware and networking). It seems that more time was needed to solve the problem. A director explained one root cause of the problem:

“Public agencies have their own territories, so they have their own information system. It is very difficult when we need them to share information with other public employees are not IT experts. It is difficult to move organisations into the digital world. We lack IT-human resources. Therefore the IT project in the public sector could not run smoothly.”

It could be said that this actor-network had insufficient capacity to produce the work as the main actor-network required. Both the Ministry of ICT and public agencies were actors that lacked capacity by not having enough human actors, such as IT experts, in constructing advanced technology artefacts.

Therefore, this actor-network did not start well, due to a lack of communication within its system. It had a problem in convincing actors, such as public agencies, to realise the benefit of joining the actor-network. An informant from the Ministry of Interior explained:

“In the near future, if we want to make this project successful, they [public agencies] must be concerned about the standard of technology. For example, in developing a database system that is relevant to citizen information, we must be convinced from the start that our database can communicate or be compatible with other systems. I think what is needed to change the attitude of the public sector are many databases that can work corporately so as to cut procedures, save more time and reduce the cost of public services.”

Even though this actor-network could build excellent technology artefacts, such as a database system, software, hardware, networking infrastructure, etc., it might not be enough to complete the actor-network’s mission because this actor-network needed to associate with another non-human actor: the blank smart ID card. The actor-network of the Ministry of Interior inherited the blank smart ID card from that of the Ministry of ICT. As all the blank smart ID cards had the wrong specification, it was impossible for this non-human actor to work well with the Ministry of Interior’s actor-network. The Deputy Head of a regional issuing station stated:

“It was difficult for us (Ministry of Interior) when we could not buy the blank smart ID card by ourselves. It was the duty of the Ministry of ICT. I don’t think they knew much about this kind of thing, and we later had conflict about the card specification. We could not accept it to start with, but finally we had to accept it because of political issues. As I told you before, the card had a limited memory and could not work compatibly with other technologies. If we had bought the card by ourselves, this project would have been better.”

This case explains why coordination between two punctualised actors (the Ministry of ICT and Ministry of Interior) is very important. When one punctualised actor makes a mistake, it affects the others.

In conclusion, the actor-network of the Ministry of Interior had problems in translation because of these three issues. Firstly, this was because the focal actor failed to create strategies that motivated or forced the actors involved, e.g. public agencies, to develop or build technology artefacts, such as a database, software, hardware, networking infrastructure system, etc. Secondly, this actor-network possessed insufficient capacity in not having enough human actors, such as IT experts, for building high technology artefacts. Thirdly, it had a defective actor in the actor-network, which was the blank smart ID card with the wrong specification. This actor was a product from another actor-network, that being the Ministry of ICT. These three reasons were why all the actors in this actor-network could not work corporately.

6.4 The Thai Citizens

6.4.1 The Punctualised Actor of Citizens

All members of a population of approximately 64 million people in Thailand were expected to have a Smart ID Card. From a positive point of view, the Cabinet seemed strongly determined to enlighten citizens of public services. In the project planning stage, minutes from every meeting showed that all kinds of citizens were involved, such as newly born children, over 200,000 monks in Thai temples, immigrants living in Thailand, and citizens living in the three chaotic provinces of the south, where the first group of cards were to be issued. It can surely be said that no one was left out of this project (The Committee for the Integration and Reform Registration System, 2003).

However, Thailand does not have an openly democratic system, and most policies would likely adopt a top-down approach, from the Cabinet down to public agencies and then citizens (Kitiyadisai 2000). As it was certain that no citizens or their representatives would be on the board or committee, or even in meetings, the Cabinet and public agencies elected to speak on their behalf, becoming the voice for citizens who were dissatisfied with the bureaucratic system in public agencies, and needed new public service systems (The Committee for the Integration and Reform Registration System, 2003).

Thai citizens are another actor in the main actor-network of the Smart ID Card project, consisting of approximately 64 million people. They are part of the main actor-network as end-users of the Smart ID Card. This actor also has its own actor-network. An issuing station Head talked about the association among actors in this actor-network:

“Ideally, after receiving the Smart ID Card, citizens could use it electronically for public services. Public agencies would then provide electronic services that were better and faster than before. Citizens would not be required to copy ID cards, household and birth certificates or other personal information documents because these data should be inscribed in the micro-chip of the Smart ID Card. In contacting public agencies and officers, citizens would merely need a Smart ID Card. The card reader would show the personal information of the card holder on a computer screen. Then, public officers could manage the citizens’ needs by using the computer. Service activities would be recorded and new information updated into the micro-chip of the Smart ID Card. This is only an ideal. You can take a look in here (the issuing station). We cannot even provide the Smart ID Card, so forget what I have just said as that will not happen in reality.”

From the above information, the other actors in the main actor-network are citizens, Smart ID Cards and public agencies. These three actors can be grouped together as another actor-network. However, this actor-network has its own problems, especially regarding citizens. A scholar spoke about this issue:

“I don’t think the citizens understand or know much about this project. As I remember, at that time the Cabinet had a few campaigns for the project. I cannot remember the details. I only knew that we would have a new type of ID card, but I didn’t know its function. The Cabinet seemed in a hurry to implement this project and didn’t care whether the citizens needed the card or not. There was a lack of understanding about the project among the citizens, which resulted in their not knowing what roles they should play. For example, now the project is not working and there is no response from the citizens to protect their rights for accessing better public services by using the Smart ID Card.”

From the citizens' viewpoint, the ID card is very important for daily business, but they did not seem to know how to utilise the Smart ID Card. A citizen spoke about the Smart ID Card as follows:

“The ID card is very important in daily life for doing business with the public or private sector. We need it. You know, in our community we do not have credit to borrow money from a bank. We use this ID card as a guarantee for borrowing money from the money lender. As for this Smart ID Card, I do not know whether it is good or better than the old version. I know it is more colourful and seems stronger. I came here today (the issuing station) because I lost my ID card.”

Another citizen explained their experience of the Smart ID Card:

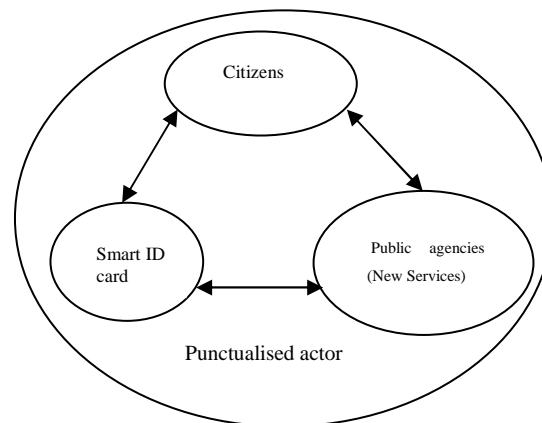
“I have one (Smart ID Card), but I think there is no difference between it and others such as the paper ID or magnetic card. They are all the same. Even though I have a Smart ID Card for contacting public agencies, I still need to copy it and other documents for public services. I don't know why they call it a smart card.”

And another said:

“I am a student. I came here (the issuing station) because I want a new and beautiful Smart ID Card. I have nearly graduated and I want to use it for a job application. It is funny, today (2010) I cannot get the real ID card, but a piece of yellow A4 paper instead. Regarding details of the Smart ID Card, I have no idea how it can act smartly.”

From the opinions of scholars and citizens, it seems that citizens did not understand the actor-network very well, probably because the focal actor (the Cabinet) in the main actor-network did not give out enough information on the actor-network to citizens, such as informing them that in possessing the Smart ID Card they could receive new and better public services from public agencies. With regards to the initial purpose of the project, the punctualised actors in this part can be seen in Figure 6.4.

Figure 6.4 The Punctualised Actor in the Actor-Network of the Citizen



Source: Author's Construct

6.4.2 The Problem of Translation in the Punctualised Actor

Along with the citizens, this punctualised actor comprised two other actors that were ready to use the Smart ID Card, which was designed to contain personal data and to provide public agencies with the ability to provide electronic services. The association of this actor-network would establish new and improved public services.

As citizens were the end user actor of the main actor-network, they had little knowledge of the project as a whole. A scholar gave the following opinion on this issue:

“I think the Cabinet has had little communication with citizens regarding this project. They [the Cabinet] have to explain why we should have this project and what the benefits of it are. Few campaigns on this project apply transparency or commitment from the Cabinet. This also suggests that the Cabinet is not sure about the whole project or completely understands it. This may have caused the difficulty in implementation.”

The above opinion showed that the focal actor of the main actor-network (the Cabinet) could not work well in communicating with citizens. This resulted in less response from citizens to its actor-network. Another scholar clarified:

“We observed that no voice was heard from the citizens when this project failed. I think that if the citizens knew a lot about the project, they might have forced or requested public agencies or the Cabinet to offer new services, as set by the project. This project could not clarify the roles of relevant stakeholders. Therefore, it was hard for the project to move forward.”

From the interviews with Thai citizens at an issuing station, it was found that most of them knew little about the mission of the main actor-network. Only some had heard that the focal actor (the Cabinet) planned to launch this project to improve public services from public agencies. A citizen said:

“I came here (the issuing station) because my ID card had expired. I don’t know about the Smart ID Card. Whether it is good or not good, I don’t care very much. I just want the ID card and that is it. It is necessary for me in my daily life.”

Another citizen said:

“As I remember, there was a campaign a long time ago for Thai citizens to have a Smart ID Card. I used to have one, but now it is lost. It looks good but is not smart at all. It functions as a normal ID card. I have no idea why they call it ‘a smart card’.”

When referring to public agencies, it could be said that this actor was inactive, as it did not act to fulfil the mission of the actor-network. This meant that no public agencies could provide new public services from the Smart ID Card. An informant stated:

“It is impossible for public agencies to offer a service from the Smart ID Card. Firstly, they do not fully understand the project or what they should do. Secondly, there is nothing to help them. Thirdly, even with regulations, public agencies still have no infrastructure such as card readers, kiosks, computer networking and so on. Therefore, I can say that this project has no future.”

Besides the lack of understanding about this project, this actor (public agencies) also lacked the capacity to work in its actor-network. Without strong motivation from the focal actor of the main actor-network (the Cabinet), public agencies were seen as a non-active actor. Another director elaborated:

“It was wrong from the beginning. The Cabinet was not concerned about the readiness of public agencies. It was impossible to move all public agencies at the same time. In my idea, it would be better to try with a few organisations in a limited area and expand to more organisations when we can see a potential for them.”

The non-human actor (the Smart ID Card) should contain valuable information that the citizens can use readily. As this non-human actor could not be constructed by itself, it needed help from other actors such as the Ministry of ICT, IT vendor and Ministry of Interior. These actors needed good coordination in building that non-human actor, but in reality this did not happen. An informant explained:

“As an organisation (the Ministry of Interior), we are responsible for the citizen database, I think we have the capacity to implement this project. The Cabinet should have permitted us to produce the card instead of the Ministry of ICT. I think that they only know about the academic side of this project. We go deeper into details because we have been involved for a very long time and it is our direct responsibility. The Ministry of ICT’s production of the first 12 million cards was problematic. They missed their specification with not having enough memory and not passing the security test.”

The above explanation implies that the focal actor from the main actor-network (the Cabinet) selected the wrong actor (Ministry of ICT) for producing the Smart ID Card. This led to the problem of Smart ID Card properties. From this defect, the Ministry of Interior could do little about the Smart ID Card. The Head of an issuing station stated:

“The products (blank smart ID cards) we received from the Ministry of ICT were no good. What could we do? We had no choice. We had to issue them to citizens. It was not workable. Even though we had a full set of personal information, it could not be inscribed into the microchip. It had limited space. So the Smart ID Card was no different from the general ID card.”

In brief, the punctualised actor or actor-network of citizens, public agencies and Smart ID Card had the problem in translation because, firstly, it lacked understanding of its role in the actor-network. Secondly, the actors, such as public agencies, had insufficient capacity to function as the actor-network required. Therefore, it transformed into a non-active actor. Thirdly, the non-human actor could not act to its full capacity because it was constructed to the wrong specification by another actor-network. These were the reasons why the three actors could not hold together, resulting in their actor-networks not creating or improving public services.

From all the details of each punctualised actor, some main issues can be concluded in Table 6.1 as follows:

Table 6.1 Summary of the Punctualised Actor in the Smart ID Card Project

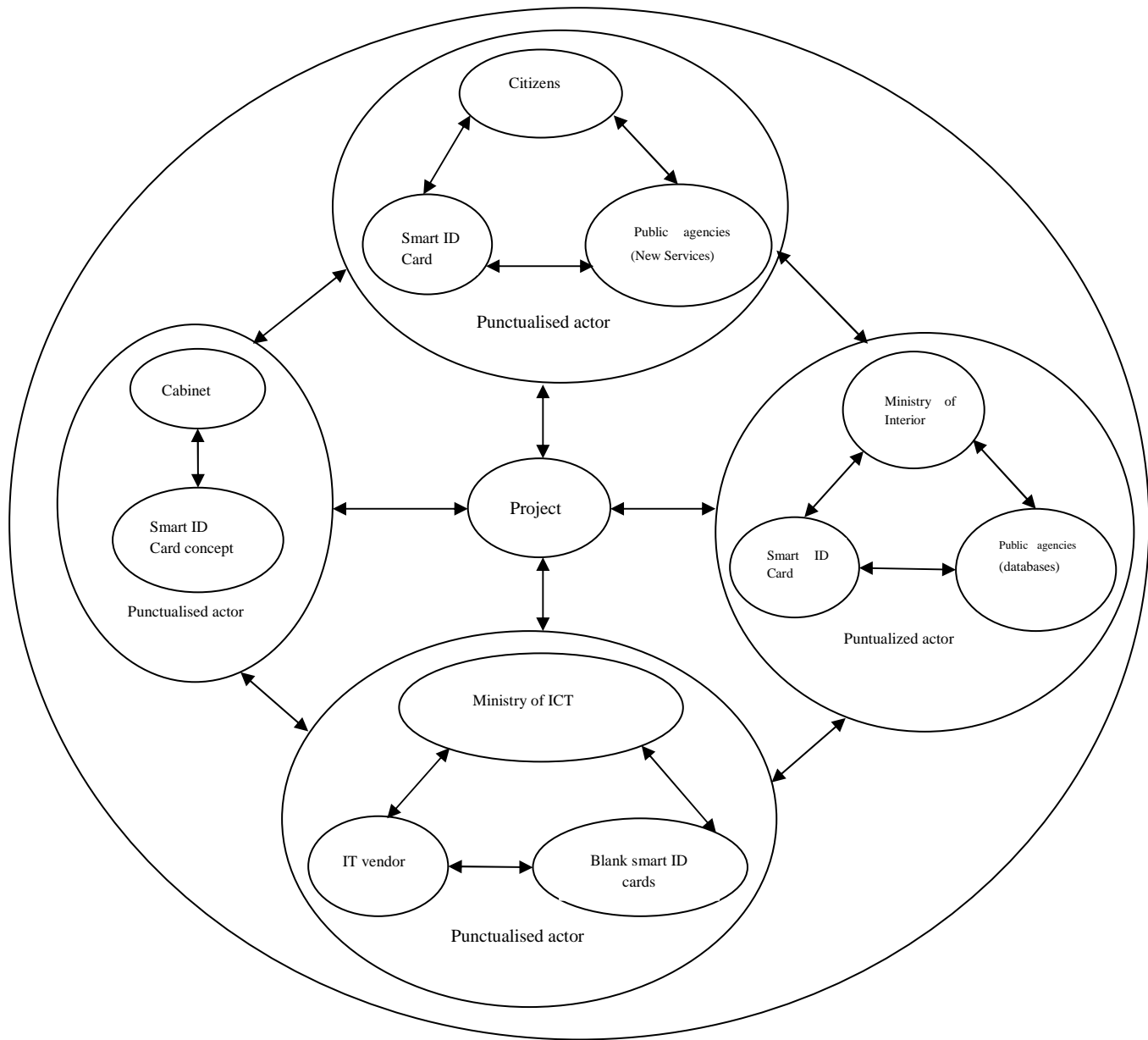
Punctualised actor	Member	Task	Obstacle	Goal
The Cabinet	The Smart ID Card concept	Aiming to negotiate, motivate and then work with other punctualised actors	No clear direction	Initiation of the Smart ID Card project
The Ministry of ICT	The IT vendor and the blank smart ID cards	Production of high capacity blank smart ID cards	Lack of knowledge, experience and technology resources	Leadership in cutting-edge technology of the Smart ID Card
The Ministry of Interior	The Smart ID Cards and public agencies	Distributing the Smart ID Card containing useful information to all citizens	Having only fundamental citizen data	Centralised control over citizen data
The citizens	The Smart ID Card and public agencies	Creating new and better public services	Lack of political will and the readiness for new public services	Improved public services

Source: Author's Construct

6.5 The Punctualised Actor of the Smart ID Card Project

ANT allows zooming in and out for analysing the case study (Monteiro 1999). When zooming in on each main actor, another sub actor-network can be seen inside. According to the punctualisation concept, all actors in any actor-network need to be held together in a single unit for achieving its main objective (Callon 1991). In the case of the actor-network in the Smart ID Card project, it was the association of main actors that was required to work corporately. The punctualised actor in the actor-network of the Smart ID Card project can be seen in Figure 6.5.

Figure 6.5 The Punctualised Actor in the Actor-Network of the Smart ID Card Project



Source: Inspired by Sarker, Sarker and Sidorova (2006)

From the figure 6.5, the association among punctualised actors can be described as follows.

Initially, the main focal actor (the Cabinet) needed to associate with the Smart ID Card concept by being a punctualised actor that aimed to communicate, negotiate, and motivate other punctualised actors in the actor-network. If other punctualised actors were enrolled into the actor-network, initiation of the Smart ID Card could start.

In making the project realistic, the Ministry of ICT needed to combine with the IT vendor and blank smart ID card as a punctualised actor, focusing on creation of a high capacity blank ID card. If successful, this punctualised actor, especially the Ministry of ICT, would have been an expert and pioneer in smart ID card technology.

In the part played by the Ministry of Interior, its cooperation with the Smart ID Card and other public agencies needed to be a punctualised actor with the intention of distributing the Smart ID Card with useful information to citizens. If successful, this punctualised actor, especially the Ministry of Interior, would have been the hub of the Thai citizen database system.

Thai citizens were required to associate with a ready Smart ID Card and other public agencies to be a punctualised actor in creating new public services. If successful, this punctualised actor, especially the citizens, would have obtained improved Thai public services.

Overall, if every punctualised actor in the actor-network of the Smart ID Card project had held together as a single unit and worked corporately, Thai public services would have been revolutionised successfully.

Unfortunately, the description of the above figure did not come about. The actor-network broke down and failed to achieve its goal. In the next chapter, all details of the failure causes are presented by the concept of the four moments of translation.

Chapter 7: The Causes of Failure in the Actor-Network

This chapter intends to provide an explanation for the cause of failure in the Smart ID Card project. Accordingly, this study applies the four moments of translation as a core analytical framework, and the failure causes are exposed moment by moment.

7.1 Errors in Problematization Initiated the Starting Point of Failure

In defining the nature and problems among actors, the focal actor is necessary in the problematization process. It has been suggested that when actors negotiate the obligatory passage point of investigation, the focal actor would address the issue. In detail, this process has addressed mainly initiation of the project idea, identified the actors involved, and described the OPP, as well as the mechanism of alliances or associations among actors (Callon 1986).

This moment had two errors in the Smart ID Card project. Firstly, the goal of the actor-network was unreachable because it was set by only the focal actor and there was a lack of participation and negotiation from the other actors. Therefore, this resulted in the project objective not being based on reality. The second problem was errors in the OPP of the actor-network. There were not enough strategies to support the actors in the actor-network in overcoming their obstacles. All details of these problems are presented as follows.

7.1.1 Problems in Setting the Goal of the Actor-Network

At the start of the translation process, problematization is a crucial stage in problem identification and the proposed project idea of a focal actor. In the Smart ID Card project, the Cabinet, as the focal actor, likely identified problems and set up the project proposal by itself. The project proposal may be seen as an artefact or non-human actor, which was created by the focal actor. However, this non-human actor had an error and from the interviews, informants indicated that it had a flaw in its objective. The head of an issuing station said:

“The project objective is very high and unreachable. It is impossible to complete it within 3, 5 or even 10 years. It is impossible because this project is very complicated. It involves more than 60 million citizens. In my opinion, it has failed because of problems in the initial process. The Cabinet created the project by ignoring the citizens and staff in public agencies. It did not study or evaluate the readiness of our society or the capability of public agencies. We can say that this project has a top-down policy; therefore many problems occurred in the implementation process.”

A Director from the Ministry of Interior added:

I do not think it's easy to make a smart ID card for 60 million people because they cannot see the benefits of having it. The project also required all children less than 15 years old to have a smart ID card. Their faces are changing all the time. In my opinion I think it's easy to talk about doing something, but doing this is impractical.”

In the eyes of citizens, they are the end-user actors in the main actor-network, and one of them gave an interesting opinion:

“As a citizen, I think the purpose of this project is not that we need it, but it is more like a proactive strategy of the Cabinet to provide something that turns out better than expected. It seems like the Cabinet had a vision to enhance public services. Then, if it is successful, they (the Cabinet) may get more votes in the national election. If not, nothing will happen because this project is not what the citizen needs.”

The above opinion illustrates how the focal actor creates the importance of a non-human actor, such as the project proposal, based on the benefits it might provide. However, in the case of the Smart ID Card project, the focal actor was not concerned about these issues, particularly the capacity of relevant actors in the actor network; for example, public agencies,

which were very important for translating the project proposal into real new public services provided by the Smart ID Card. Then, the focal actor did not consider the complexity of an actor-network that involved more than 60 million citizens. This actor (the citizens) not only seemed unready for this kind of project but also unlikely to need it. Lastly, the focal actor set up an unrealistic timeline for the actor-network to achieve its objectives. These reasons seemed to be the cause of failure in this actor-network, starting with the focal actor creating an incompatible artefact or non-human actor, which was the project proposal.

The reason why this happened is because the focal actor did not allow the other actors in the actor-network to negotiate in creating a project proposal. A director who participated at the start of processing the actor-network formation stated:

“At the beginning, we had a meeting, in which our participation, responsibilities and amount of budget we would get were taken for granted. We had no chance to agree or disagree about anything in the project. Just like other projects, a top-down policy was adopted. We had to follow the Cabinet’s orders. As you probably know, it is not good to have conflicts with the Cabinet or politicians.”

The opinion above shows that the focal actor did not allow other actors to help in redefining the project proposal: a process that typically assists in aligning a project with those other actors’ interests. The focal actor ordered other actors instead of using motivation when enrolling them into the actor-network. Therefore, the project proposal became a rigid non-human actor that could not be changed because it was a product of the focal actor alone. A scholar explained more:

“Normally, in our country (Thailand) public agencies have to do what the Cabinet tells them to do. Public agencies act as an implementer. Therefore, we rarely find public agencies ignoring an order from the Cabinet. As we know, the Cabinet had a slogan at that time: ‘Think fast, do fast’. I believe that they did not allow enough time to be concerned about possibilities, capabilities or anything like that. Back to the Smart ID Card project, I think it affects all Thai citizens. We should have a public hearing because it is about personal privacy. Citizens should be able

to choose whether to have the card or not and they should have the chance to learn more about the pros and cons of the project.”

This implies that there are other actor tools such as the citizens’ participation for revising the project proposal by holding a public hearing. However, the focal actor in the Smart ID Card project did not use this tool; therefore, no voice was heard from the citizens. A director responsible for smart ID card technology pointed out:

“Just after implementation, I thought that if we listened to citizens, we might change or readjust the project objective from the beginning. This would have helped this project to be better than it is now. We learned that rural areas have less active experience in using ID cards than urban ones like Bangkok, which uses the ID card very often. My idea is that we can offer a choice by issuing a magnetic card free of charge to citizens in rural areas, but charge 100 baht (£ 1.54) to those who want a Smart ID Card in urban areas. In that case, we can offer an electronic service for the Smart ID Card in specific areas, which would help this project to be more practical and give citizens the choice of whether to have the card or not.”

The above statement confirms that the project proposal should have been more flexible, with the focal actor opening more room for other actors to negotiate. It also hints that the project proposal, especially the objectives, should be changed, such as issuing the Smart ID Card to those who need it, and not all citizens. Another informant from NECTEC said that another tool ignored by the focal actor was making the project initiative more realistic, she said:

“In general, I think that the information and communication technology (ICT) policy in Thailand is not realistic, which means setting objectives that are not based on possibility or practicability. This implies that ICT projects are very difficult to achieve. This project was not clear from the beginning. It was not seen from the citizens’ perspective. Therefore, the citizens were not very concerned about the project. I also think that the cost and benefit analysis was not clear in this project.”

As an artefact, the project proposal could redefine itself with the help of the focal actor who created it. The proper tool is a feasibility study. From the informant's opinions, this project idea was dominated by the focal actor that did not use tools such as a cost and benefit analysis to make the project proposal more practical. The problematization therefore did not align well with the interests of either the existing or future ICTs including the cards, because no attempt was made to hear from them, or to understand what they could practically achieve within a given time frame.

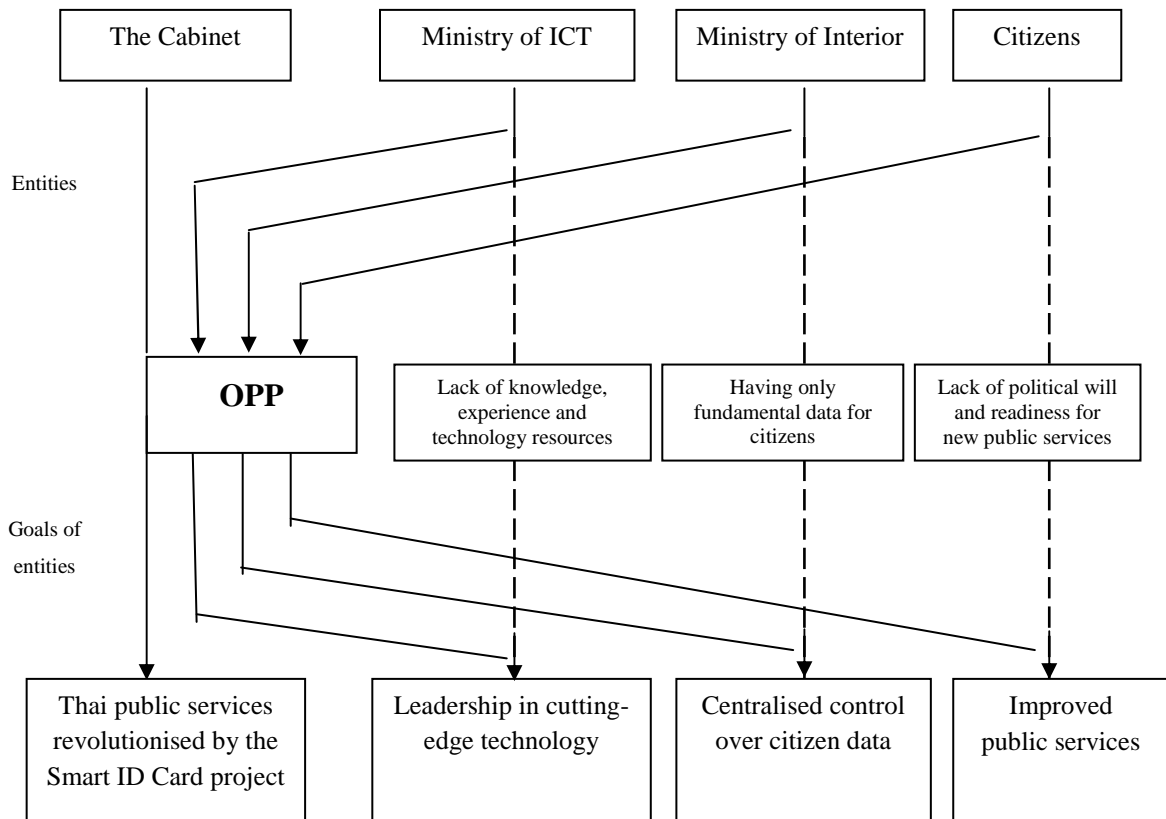
In summary, when creating an artefact or non-human actor, such as the project proposal, some errors appeared, especially in the project objectives, which had a very rigid timeframe that was not based on reality. These errors occurred for the reasons subsequently outlined. (1) Initiation of the project proposal came from one actor, the focal actor (the Cabinet). (2) The focal actor saw other actors, for instance public agencies and also information and communication technologies, as passive. Therefore, it offered less room for negotiation about what this project could or could not do, according to the set project objectives. (3) A similar situation applied to another actor, the citizens, who were not offered a role in the actor-network. The focal actor did not offer the tool of public participation in redefining project objectives to suitable ones for citizens. (4) As an artefact, the project proposal was not flexible. It did not listen to other actors in the actor-network such as public agencies and citizens and technologies, or even conduct a feasibility study to improve or develop more practical or compatible actors for the actor-network.

7.1.2 Problems in Setting up the Obligatory Passage Point (OPP)

The OPP refers to the process of motivating actors into accepting the project proposal by the focal actor showing an interest in all of them, and explaining how the project can help them to achieve their interests. However, to achieve the project goal, and self-interests, all actors must overcome a series of obstacles. Different actors would have to tackle various problems (Callon 1986). In the actor-network of the Smart ID Card project, all main actors had their own interests and obstacles (see details in Figure 7.1). However, a lack of strategies hindered each actor in overcoming them. Therefore, the mission of the actor-network was unachievable, due to those obstacles, even though they were routed via the OPP. Detailed problems of the OPP in the actor-network are described in this section.

Chapter 6 details the punctualisation in the actor-network, and information in Table 6.1 can be drawn from the following OPP diagram:

Figure 7.1 The System of Association Among Actors in the Actor-Network of the Smart ID Card Project



Source: adapted from Callon (1986)

Firstly, the above diagram shows that the actor-network contains four main punctualised actors as previously described, which are the Cabinet, Ministry of ICT, Ministry of Interior and citizens.

Secondly, in the view of the focal actor, the goal of the actor-network was to revolutionise Thai public services with the Smart ID Card.

Thirdly, in achieving the goal, all actors would receive their own benefits. The Ministry of ICT would have leadership in the cutting-edge technology of the Smart ID Card. The Ministry of Interior would have centralised control over Thai citizen data, and citizens would obtain improved public services.

Fourthly, accomplishment of these goals would not be easy however, as each actor had its own obstacles to overcome. The Ministry of ICT had lack of knowledge, experience and technology resources. The Ministry of Interior had only fundamental data of citizens, and the citizens had lack of political will and readiness for new public services.

Lastly, if all actors could overcome their obstacles, they would obtain the benefits as set, and the mission of the actor-network would be completed.

Unfortunately, this OPP could not hold all actors together in the process of translation, and none of them could solve their own problems. Finally, the mission of the actor-network was unsuccessful.

To analyse the problems in setting the OPP, looking back to the very start of the Smart ID Card project was necessary. Then, observation of how the focal actor focused on setting the OPP was a crucial aspect, which did or did not portray how each actor could achieve its goals and avoid the exiting obstacle. To clarify the situation, this research used minutes from the 2003 meetings of the Committee for the Integration and Reform Registration System. The committee comprised deputies of the Prime Minister, members of the Cabinet and top public officers. During 2003, meetings were held on January 20, March 5, April 30, June 19, July 31, and December 12.

After analysing the minutes of the meetings, it could be stated that the focal actor or Cabinet paid little attention to creation of enough strategies or tactics for each actor to tackle or avoid the obstacles in achieving its goals and the target of the actor-network. The details are described as follows.

Ministry of ICT:

As the Ministry of ICT was new, it lacked experience, knowledge and technology resources regarding the Smart ID Card. When it was offered the task of producing the blank smart ID card by itself, it did not have the capacity to do it. Hence, the focal actor allowed the Ministry to enrol an IT vendor into the actor-network. Nevertheless, the Ministry still had to achieve the goal as a leader in the cutting-edge of smart ID card technology. When looking back to the minutes of the meetings, there were no strategies for avoiding or overcoming the obstacles that the Ministry of ICT encountered. Minutes from the last meeting of the Committee for the Integration and Reform Registration System (on December 12, 2003), reported that the Ministry of ICT could not provide the blank smart ID card for issuance as planned, because it could not set suitable or compatible terms of reference for the Ministry of Interior's citizen data system. Therefore, the Ministry of ICT requested more time to carry out its responsibility.

The above shows that the Ministry of ICT had great difficulty in overcoming its obstacles, especially in a rigid timeframe. Furthermore, it had no strategic support from the focal actor. From another viewpoint, it could be said that overcoming these kinds of obstacles (lack of experience, knowledge and technology resources) needed much time. Therefore, achieving the Ministry of ICT's goal as a leader in cutting-edge technology was closed from the start.

Ministry of Interior:

The goal of the Ministry of Interior was to centralise control of citizen data, but it only had fundamental citizen data at hand. Therefore, how the Ministry could retrieve relevant information from other public agencies was a problem. It could be said that while various issues regarding the Ministry of Interior were raised at every meeting during 2003, those involving policy or planning of centralised control of citizen data were rarely mentioned. For example, the issue mostly discussed in the first meeting (January 20, 2003) was about expanding issuing stations from 252 to 1,044 in order to cover the whole country. The third meeting (April 30, 2003) dealt with budget adoption for the six years rent fees for computers and online infrastructure and a registration office in every province. The sixth meeting

(December 12, 2003) focused on additional Smart ID Card target groups such as newly born infants, immigrants, and monks.

Some meetings, however, reported on the centralisation of citizen data; for example, the second meeting (March 20, 2003) discussed the consensus of the Cabinet on the integration of citizen data across public agencies for a one-stop service in issuing stations. However, no details of an action plan were forthcoming.

Briefly, the Ministry of Interior could not achieve its goal of being the hub of centralised citizen data control. This was because the focal actor failed to create tangible strategies that would motivate or force the actors involved, e.g. public agencies, to develop or build technology artefacts, such as a database, software, hardware, networking infrastructure system, etc.

Citizens:

The focal actor showed little concern about citizen involvement in the decision making process. The citizens' perspective or needs were not reflected on or discussed at any meeting. It was noticeable that the focal actor viewed the citizens as a passive actor in the actor-network. There was no doubt that citizens possessed no political will in the actor-network. Public agencies also were a part of the citizens' actor-network, but they were treated in the same way as citizens, and assessed as a passive actor. However, at the second meeting (March 5, 2003), the focal actor showed some concern about the readiness of relevant public agencies by adopting a budget for capacity development. The budget was quite small, however, with some agencies receiving only 39,400 Baht (£ 606), or 3,167,000 Baht (£ 48,700). The most one agency received was 45,579,900 Baht (£ 701,000). In the fourth meeting (June 19, 2003), the Prime Minister told the committee that he knew the project had made little progress due to lack of readiness. He also suggested that agencies with insufficient capacity could wait until they were ready. Regarding the component of Smart ID Card services, the sixth meeting (December 12, 2003) reported that in future there would be approximately 100,000 kiosks nationwide, and by 2004, all registrar services would be fully online. Furthermore, the committee agreed to buy 33,198 card readers for the relevant public agencies.

It seemed that the focal actor had partially intended to help citizens in their actor-network by getting them through obstacles, such as preparation for the new service, with commitment to provide kiosks and card readers. In reality, up until 2010, there were only 10 kiosks in the country and no sign of the card readers, as reported by one informant in Section 7.2.3. Consequently, the focal actor could not offer a concrete plan for citizens in the actor-network to overcome their obstacles, and even if there was one, it never materialised.

In conclusion, the details described earlier indicated that the OPP could not help in holding all actors together. Each main actor had no strategic support from the focal actor, and consequently, no way was opened for them to receive their set benefits. These errors in the OPP resulted in failure to accomplish the mission of the actor-network. Firstly, by taking a broad view, the errors from the OPP occurred when the main focal actor (the Cabinet) seemed to dominate and deprive the main actor-network of negotiation. Secondly, the goals or benefits of each main actor were very high and incompatible with the actors' capacity. Thirdly, the high goals set by the main actors were relative to the large number of obstacles they had to overcome. Accordingly, the actors' goals were incompatible with their capacity, and unsuitable for supporting plans from the focal actor. Fourthly, all missions of the main actors were interrelated or interwoven, and errors in one process affected the others. This created more unexpected obstacles. Fifthly, the main actor-network was very complicated, as each main actor comprised many actors in its own actor-network. It was very difficult to provide enough strategy to make their actor-networks stable. Consequently, the main actor-network also could not be stabilised. Finally, it could be stated that errors in the OPP were another cause of failure to achieve the mission of the main actor-network.

7.2 Incomplete Intersement Created More Chance of Failure

In the problematization process, the actors involved agreed to be incorporated with the primary plan, even though it was questionable whether the OPP would help address the obstacles that had been standing in the way of their goal achievement. However, this process could not guarantee that all of them wanted to continue in the actor-network system. Some might think that it was not worth joining because of their identity. Therefore, as problematization has never been that clear cut, it requires a second moment, i.e. intersement.

Interessement is a group of actions by which a focal actor attempts to stabilise the identity of the other actors. Different devices are used to implement this moment and they aim to construct a system of alliances and protect all potential competing associations. Furthermore, the devices of interessement establish a favourable balance of power. In the case of scallop domestication at St.Brieuc Bay in France, the focal actor (the three researchers) used the towline and its collectors as the interessement device to protect young scallops from predators, i.e. starfish. Other interessement devices were texts, conversation, meetings and debates, which were used to convince and lure the other actors (fishermen and scientific colleagues) into position and follow the focal actors' (the three researchers) requirements (Callon 1986).

Referring back to the actor-network of the Smart ID Card project, many devices such as meetings, communication, official letters and budgeting were used by the focal actor (the Cabinet) in the interessement moment. However, these devices did not seem strong or powerful enough to lock all actors into their positions. It could be said that the interessement was incomplete, which created another cause of failure. The incomplete interessement could be categorised into three issues as follows.

7.2.1 The Limited Device in the Actor-Network

Standardisation is a necessary device for a non-human actor, especially in database systems process. It acted as a link between the focal actor and other actors, and helped the former in forcing and controlling the latter to perform the activities required in the actor-network. However, this device seemed limited or insufficient when compared to the size of the actor-network. An informant from the Ministry of Interior explained:

“The project was very big. The Cabinet put in a very large budget for it. I cannot remember how much it was, but I could say that big money was offered mainly for two ministries. The first one was the Ministry of ICT for producing more than 60 million blank smart ID cards. The second was the Ministry of Interior for providing a technology infrastructure from which to issue the Smart ID Card to citizens all over the country. Even though this project received big money, I don't think it was enough to move it forward. Other public agencies were forgotten

such as public hospitals that had to develop a compatible free treatment service system to fit the Smart ID Card. For one ID card to substitute many cards, more and more money was needed to invest in this kind of thing. I cannot imagine how much money this project wanted.”

The statement above implies that the intersement device, such as budgeting in the Smart ID Card project, seemed big when looked at superficially, but then seemed small when working in the actor-network. With little power to control the actors, it could lock only some parts of the actor-network. Therefore, output was limited by this device, which found its capacity down to locking two actors only into producing the blank smart ID card and issuing the Smart ID Card to citizens, respectively. Two informants from the Office of the Public Sector Development Commission explained further:

“In this project, digital divide in the public sector is one big problem. I know that public agencies in rural areas lack technology in both hardware and software and also knowledge of technology. I think it is difficult for them to create a better service through technology. By contrast, urban public agencies are full of technology and the knowledge to use it. Going back to this project (the Smart ID Card project); I think the Cabinet needs to invest more money in technology for remote areas.”

Budget is an important device in the actor-network, as the second of these two informants explained:

“We live in a big city; therefore, we do not have a problem with information and communication technology. When we look at other provinces in remote areas, especially in the northeast, the people are very poor. There is no room for IT. For this issue only, how much more money would we need to invest if we want full capacity of e-government? This is a very big problem: the digital divide in the public sector.”

This, therefore, suggests a potential geographical differentiation of interessement, which is higher in urban areas and lower in rural areas, despite the importance of the latter to the government's political support base. These two opinions also made it clear that to understand this complicated actor-network, details were required about the non-human actors such as software, hardware, a database system and ICT infrastructure. The device (budgeting) was not large enough to pull together these non-human actors for appearing in or adjusting to the actor-network, which found it impossible to move on without them. It seemed that the focal actor (the Cabinet) lacked concern regarding not only non-human actors, which were not locked in the actor-network, but also human ones, as the Head of an issuing station criticises:

“In my understanding, our staff members (public officers) lack knowledge and understanding about ICT. From the top manager down to lower level staff, they are not familiar with technology from start to finish. They are like children at times. In our organisation (the Ministry of Interior), not more than 20% of our staff understands ICT... At seminars, I often present that we have a limitation of human resource capacity. If we start the project with less knowledgeable staff, how can we make citizens understand what we want them to do?”

This criticism implies that this actor-network needed a larger device (budgeting) to upgrade human actor capacity. In brief, many human and non-human actors were not tempted or lured into the actor-network because the focal actor could not provide a large enough device, i.e. budgeting, despite the very large amounts of money being spent.

7.2.2 The Lack of a Necessary Device for the Non-Human Actor

Standardisation is a necessary device for a non-human actor, especially in database systems software and hardware. For example, if the actor-network does not have this device, there is no way to have a good communication among citizen database systems. In other words, this device can help non-human actors to have a universal language in which to interact or communicate within the actor-network. The Head of an issuing station said:

“If this project wants to be successful, the Cabinet should put it on the national agenda. As I know, each public agency has a different database. Therefore, it is

very difficult to integrate information. This problem can be solved by setting a new law for information system standards, but the Cabinet shows little concern over this issue.”

The root cause of the problem regarding this device (standardisation) in the interestment process was the focal actor’s (the Cabinet’s) lack of knowledge about details of the actor-network. Therefore, standardisation was not of major concern or top priority from the moment the actor-network formed. However, this device (standardisation) was related to another one (budgeting). It could be said that without sufficient budgeting, the non-human actors (e.g. database, software and hardware) could not be constructed under the requirement of standardisation. A director from the Ministry of Interior, who had been working closely with the citizen database system, explained the complexity of the problem as follows:

“There is a lack of standardisation in information and communication technology. Each organisation has its own software and hardware. They have bought and developed technology within their own capability and are not concerned about how it can integrate or communicate with other organisations. This may be due to limited resources such as money and expertise. Also, we do not have a host organisation that can take care of standardisation.”

Another director, who is involved with Thailand’s e-government policy, made further comments on this issue:

“I like the idea of the Smart ID Card project: one ID card for many public services. But as we know, this project did not work very well. In my opinion, back offices are a big problem. If the back offices cannot talk (integrate working online) with each other, this project could not run to its full capacity.”

The opinion of informants shows that the actor-network had less chance of tempting all relevant non-human actors into their positions by talking in the same language and working together in the same direction. This device (standardisation) had two crucial problems. Firstly, the focal actor (the Cabinet) was not concerned about it from the beginning. Therefore, the

other actors in the actor-network lacked direction. Secondly, this device (standardisation) was dependent on another one (budgeting), and neither was adequately forthcoming. Putting that simply; a larger budget and a standardisation of non-human actors was needed if both those actors and their associated human actors were to be effectively interested in the project.

7.2.3. The Neglected Device in the Actor-Network

Laws and regulations were another crucial device required by the actor-network. These non-human actors could have effectively forced an intersement from a variety of the actors within the network. However, this device was neglected or overlooked by the focal actor (the Cabinet); therefore, actors such as public agencies could not be locked into position. This device was very important, as new public services with the Smart ID Card needed it to confirm that new services were acceptable. A director from NECTEC said:

“In practice, the Smart ID Card project also had the problem of laws and regulations. Therefore, when citizens contact public agencies, a photocopy of their Smart ID Card is still needed because laws and regulations in those public agencies force them to do that. Therefore, the Smart ID Card was not so smart.”

It could be said that the mission of the actor-network could not be completed if it did not have this device, i.e. laws and regulations. An informant explained:

“Let’s say that even if the Smart ID Card is very good and full of personal information, and all public agencies have card readers and computers connected online with a main citizen database centre, but no laws and regulations, nothing would happen, because they (public agencies) would still do the same as they normally do. There are no new electronic public services because they have no laws to ensure or approve that the new services are correct. In our country (Thailand) these kinds of things move very slowly. The Cabinet is not very concerned about this.”

In light of this, the actor-network could not step up to another level because of the lack of laws and regulations. This was the responsibility of the focal actor and no other actors could

take this on. Another director from the Ministry of Interior explained the combination of this problem as follows:

“There was no card reader for the Smart ID Card for public services and no kiosks to use it in. It is quite funny that the Smart ID Card wasn’t actually smart: it could only be used as an identity card. Now (2011), we only have 10 kiosks for supplying public services to the whole country. We can print out official documents for cardholders by using the Smart ID Card at the kiosks. However, public employees do not know what they are, and they cannot accept these documents because there are no new laws or regulations to support them. We also have to accept that existing laws and regulations are not up to date: some are very old, around 50 years old. This is also a big issue that we must be concerned about if we want to make this project run better.”

From all these opinions, it could be said that this device (laws and regulations) is a significant one in the actor-network; however, it was likely ignored by the focal actor. Without this device, the focal actor could not interesse other actors (public agencies) to create new services, nor could it interesse existing and emerging technologies to participate. Therefore, those actors stayed in the same position by offering old service procedures to the citizens.

In conclusion, incomplete interessement lent more momentum to failure. The main problem in this moment arrived from lack of adequate devices (budgeting and standardisation) and neglect of a device (laws and regulations) in the actor-network. This resulted in the focal actor being unable to interesse other actors in functioning as the actor-network required.

7.3. Uncontrolled Chaos in the Enrolment Process

Enrolment is the third moment of translation, which refers to a set of strategies in which a focal actor attempts to define and inter-relate the various roles that allow other actors to enrol. The process of enrolment involves “group multilateral negotiations, trials of strength and tricks that accompany the interessement and enable them to succeed” (Callon 1986, p.211).

When the negotiation between actors has been achieved, the inscription appears. The inscription is a process of artefact creation that ensures the protection of some interests (Sarker, Sarker and Sidorova 2006). In brief, an enrolment relates to the other actors' acceptance of the interests defined by a focal actor through the process of bargaining and making concessions (Madon, Sahay and Sahay 2004, and Sarker, Sarker and Sidorova 2006). In other words, this process referred to the transformation or movement from intangible things: ideas, concepts, plans (e.g. smart ID card plan), to tangible ones (e.g. the smart ID card in public services) in the world of reality (Czarniawska 2002). Without it, anything could happen. For example, in the scallop case, many things from outside the actor-network, e.g. starfish, currents, and parasites, were waiting to destroy it and its main actors (Callon 1986).

When the inscription process occurs, the actor-network translates the idea/plan into the artefact, as in the case of the Smart ID Card and the actors need to inscribe their interests into the artefacts as well. Therefore, the negotiation or bargaining of interest alignment continues in this process. This is the point of creation (the Smart ID Card), when the actor-network must face reality. Many unexpected events or problems could emerge depending more or less on actor-network stability, capacity in the interest alignment, association of actors, and continuation of translation. If an actor-network can survive this process, it may almost guarantee that the OPP is achieved.

Chaos in the enrolment process of the Smart ID Card project may have been caused by a flaw or impairment of the earlier two moments, problematization and interessement, or from the delicate details of the enrolment process itself. Consequent analysis of what went wrong in this moment could be categorised as follows.

7.3.1 The Swift Translation Side Effects

Swift translation refers to a new actor having to inherit goals, roles, or intentions from its host actor-network in a short timeframe. In addition, this new actor has less opportunity to indulge in comprehensive negotiation on what it has inherited. According to Mahrings et al. (2004), swift translation possibly originates from a Trojan actor or Trojan actor-network that can be a potentially fatal threat to its host. When referring back to the punctualised actor in the actor-

network of the Ministry of ICT (details in section 6.2), the focal actor (the Ministry of ICT) could not produce blank smart ID cards in large numbers by itself. It needed an IT vendor as another actor to enrol in its actor-network. Therefore, the IT vendor inherited the goal and responsibility of producing the cards from the actor-network of the Ministry of ICT, and swift translation started to occur.

Evidence from the problem of translation in the punctualised actor in section 6.2.2, and the problem of setting up the OPP in the actor-network in section 7.1.2, showed that the Ministry of ICT was forced to produce a high technological artefact, the blank smart ID card, within a short, rigid timeframe. This opened less room for the IT vendor to negotiate with the Ministry of ICT. Hence, it could be said that the Ministry of ICT faced the difficulty of swift translation. As the focal actor in its actor-network, the Ministry of ICT did not have a powerful tool to use in enrolling a highly capable actor (the IT vendor) into its actor-network. Moreover, it had no strategic support from the main focal actor (the Cabinet), and thus, the Ministry of ICT could not overcome the obstacle in the OPP, which meant that the Ministry of ICT could not upgrade or improve itself to a very knowledgeable actor by understanding high technological artefact production. Consequently, the Ministry of ICT lost control of its actor-network and could not create an effective tool, such as a TOR, to direct and control the IT vendor to work, as required by the main actor-network. This led to the Ministry of ICT losing control of its non-human actor, the blank smart ID card.

The story of swift translation, as described above, produced two negative side-effects in the main actor-network: the Trojan actor and counter-network (details in section 7.3.2). Swift translation between the Ministry of ICT and IT vendor resulted in producing the blank smart ID card to the wrong specification, thus, the card could be implicated as the Trojan actor, which was fatal or destructive. When the Trojan actor was allowed to join another punctualised actor (the Ministry of Interior), it refused to act as a good actor. When later moving to the punctualised actor of citizens, it changed from its expected role as the Smart ID Card and became a normal ID card instead. Finally, the Trojan actor had become a threat to the main actor-network. The side-effect of swift translation was the Trojan actor, which can be discussed in two issues.

7.3.1.1 The Power Accumulation of the Trojan Actor

The punctualised actor of the Ministry of Interior, faced difficulty when the Trojan actor came into its actor-network, which expected to welcome a blank smart ID card with high capacity as a good non-human actor. Ideally, this actor should have had enough space for retrieving much information and the ability to work cooperatively with the database system. Additionally, the card should have been strong enough to last for a six-year period. Swift translation had swapped an expected good actor (the Smart ID Card) into being a Trojan actor. This generated negativity within the actor-network. A top Director concluded this about the Trojan actor

“I think we had a problem with card production management from the Ministry of ICT. The first 12 million cards have a small memory. They broke easily and could not work with the database system. Therefore, 12 million cards were wasted for sure.”

In detail, this Trojan actor was a good example of how it could harm the main actor-network in both the short and long term. By its nature, it opened the door to criminal activities. If this Trojan actor associated with a criminal element, it could cause big problems in the personal identification system. An informant said:

“Here is a Smart ID Card from the first batch (showing the card). You can see that it is not strong. It is composed of layers. As time passes, the first layer will peel away, then the second and the third. I also think thieves can make copies easily by just putting a hot iron on the card, and each layer will peel off. After that another picture (of the holder) can be inserted. For the electronic function, this version (The Smart ID Card) had limited space and cannot function electronically.”

In addition, this Trojan actor refused to associate with other actors, such as the free treatment database system, because of its properties, which were composed of a microchip with limited space and low capacity. Therefore, the Trojan actor could not retrieve much information or

work automatically with other actors in the Smart ID Card actor-network. Consequently, this Trojan actor neglected to play a useful role in the actor-network. The head of an issuing station explained the behaviour of this Trojan actor;

“We know little about the details of this issue (the conflicts of Smart ID Card production), as no one tells the truth when there is a problem with the project. We only know about them by reading the newspaper. As far as I know, the first 12 million cards were not compatible with the free treatment card system. They could only contain a small amount of data and could not be updated with new information. It could be said that the first 12 million cards were useless.”

In brief, it could be said that the Trojan actor was a threat to the actor-network. It had the power to refuse joining and working with other actors. This caused the actor-network of the Ministry of Interior to fail in becoming punctualised, and by this time, the Trojan actor had accumulated more power. When it enrolled another actor (citizens) into the actor-network, it was time for the transformation.

7.3.1.2 The Transformation of the Trojan Actor

The punctualised actor (citizens) had been forced to welcome the Trojan actor automatically. To put it simply, 12 million citizens had to obtain their Smart ID Card (the Trojan actor) from the Ministry of Interior. This ID card contained little personal information and could not be activated in public services, even though they were ready to receive it. At this moment, the Trojan actor detoured to combine with another actor (citizens), and transformation was observed. A citizen said:

“As I remember, there was a campaign a long time ago for Thai citizens to have a Smart ID Card. I used to have one, but now it is lost. It looks good but is not smart at all. It functions as a normal ID card. I have no idea why they call it ‘a smart card’”.

The expected role of the Smart ID Card was a multiple purpose ID card, which offers more than a normal ID card. It should have electronic functions and provide more useful public services for citizens; however, because of the swift translation, it turned out to be a Trojan actor. Finally, the Trojan actor transformed itself into a normal ID card for citizens. An informant came directly to the point of this issue by stating:

“For card issuing I give it no more than 50%, and for the utilities I give it 0%. This project could not achieve even one of its objectives. No citizens obtained any benefit from the Smart ID Card.”

The Trojan actor phenomenon finally confirmed that the main actor-network was not punctualised, and the Smart ID Card project failed to achieve its objectives. There were no new services provided by the Smart ID Card. There were no new benefits for citizens as the end-user. Another informant confirmed the above statement by saying:

“Regarding the project’s objective, I would give its zero out of ten because the Smart ID Card is useless and cannot be a substitute for many other cards. What’s more important, is that it has wasted a lot of money. ”

The actions of the Trojan actor demolished the main actor-network, which could not achieve its mission. Furthermore, all resources that were placed or invested into the actor-network were wasted. It could be said that all the actor-network gained was a Trojan actor, and like the Trojan horse that destroyed Troy in Virgil’s epic poem, The Aeneid, this Trojan actor helped to demolish the Smart ID Card project.

7.3.2 The Weakness of the Counter-Network and its Defeat

The swift translation between the Ministry of ICT and IT vendor caused the misspecification of the blank ID card (the Trojan actor). This created conflicts in the main actor-network, and caused serious delay in the Smart ID Card project. When analysing the controversy in terms of actor network theory, a counter-network was found to arise in the main actor-network. A counter-network refers to a new actor-network attempting to challenge the main actor-network or host actor-network for some reason or other. It could be said that a counter-

network occurs due to a conflict of interests in the actor-network (Gao 2007). The counter-network arose perhaps because of the turning point in the actor-network of the Smart ID Card project. If there had been suitable negotiations between the main actor-network and counter-network, a more desirable outcome for the main actor-network might have materialised, but in this case, it did not. In short, the counter-network had aimed to destroy the Trojan actor (the blank smart ID card); however, it had less power and was itself defeated. This resulted in the Trojan actor getting stronger and finally devastating the main actor-network.

This section intends to expose the phenomenon of the counter-network. The rise and fall of the counter-network are discussed and the consequences provided.

As described in an earlier section (7.3.1), the swift translation produced the misspecified blank ID card. Before the blank ID card turned into a complete Trojan actor, the counter-network emerged and aimed to destroy it. The counter-network comprised the Ministry of Interior and NECTEC. NECTEC was an actor outside the main actor-network, required to test the blank ID card. The test resulted in the first 12 millions blank ID cards having the wrong specification. Some top agencies from the Ministry of Interior praised the media for honestly reporting that NECTEC did a good job in bringing to notice that the blank ID card was inadequate for distribution to citizens (Bangkok Post 2005b). Then, conflicts started in the actor-network, and became an issue that no one wanted to talk about. From interviews on this issue, most of the informants responded in the same way. They were reluctant to answer any questions on the subject. Actually, they all said “I don’t want to answer this question”, or “I cannot answer the question”.

On reflection, the informants showed that there was something wrong with the lack of transparency in the actor-network. However, because of the difficulty in getting the truth from the interview with informants, this study decided to use information from the newspapers. The story of the counter-network is described as follows.

The test results showed that the card had problems in the security part of storage memory management. An expert and adviser from NECTEC said:

“Although the smart card would work by accepting it with proprietary extension....it opens the door to an incompatibility nightmare when further generations of smart cards are delivered, each with their own proprietary extension” (Bangkok Post 2005a).

After the results of the Smart ID Card, the Ministry of Interior expressed agreement with NECTEC. This situation revealed the emergence of a counter-network comprising two actors (NECTEC and the Ministry of Interior) that shared the same objective, which was not to accept the wrong specification for the blank smart ID card. The reaction from this counter-network was publicised by speaking through the media. A Director of the Bureau of Registration Administration said:

“The burden of presenting evidence to disprove the NECTEC’s conclusion is now on the Ministry of ICT, and all cards must be secure. They must be capable of supporting multiple applications and be able to work both online and offline” (Bangkok Post 2005a).

In protecting its interests, the Ministry of ICT was forced to find ways of subduing the counter-network. If it failed to do this, the Ministry of ICT might have to produce a new batch of 12 million cards. This would not only reflect badly on the Ministry of ICT, but could also prove that it acted wrongly. Therefore, it set up an approval committee with most of its members from the Ministry of ICT. As noted previously, the result was a split decision and the committee Chair approved the result, which went against the counter-network. The Chair expressed:

“We have confirmed that the card’s qualification complies with the contract and it is now up to the Ministry of Interior to decide if the cards are acceptable” (The Nation 2005a).

From the side of the focal actor, the Cabinet seemed to agree with the Ministry of ICT and ignored the views of the counter-network. The focal actor sent a request to the Information

and Communication Committee from the House to investigate this issue and draw a conclusion. The committee Chair reported to the media as follows:

“Both the Ministry of ICT and Ministry of Interior had told the committee that the card is good value for money and has enough capacity for all the information needed... the manufacturer of the card, ensured that the products were not altered to support only the company’s up-gradable software, therefore the security system was not compromised. The firm also signed contract handling of all rights over to the Ministry of ICT, which would give the Ministry permission to make any mechanical adjustment” (Bangkok Post 2009a).

This statement cleared any contradictions; however, the Chair put pressure on the counter-network to endorse the Smart ID Card project. He silenced objection by firmly stating:

“The project should not be scrapped due to what was considered to be minor technical glitches” (Bangkok Post 2009a).

Perhaps this was a strong strategy used by the focal actor to pacify the counter-network. After that, there was no voice from the counter-network. The Ministry of Interior accepted issuance of the cards to citizens, with the wrong specification. Thus, the actor-network was apparently stabilised.

The emergence of the counter-network in the Smart ID Card project caused an unstable actor-network and serious delays in the project. It seemed that the counter-network wanted to protect the interests of citizens from misspecification of the cards. This intention caused dissatisfaction in the main actor-network (the Cabinet and Ministry of ICT), which used its power to attack the counter-network. Finally, the counter-network was defeated, and the actor-network stabilised. Even though the main actor-network won the game and the project kept running, it was not a guaranteed success. As time passed, evidence showed that the counter-network was correct. The incorrect cards did not work in reality.

7.3.3 The Instability of the Focal Actor

From day one, the focal actor (the Cabinet) was strongly determined to run this project. However, by the time the process of enrolment arrived, its willingness had weakened gradually. Perhaps, other critical issues in Thailand had distracted the focal actor onto other actor-networks such as the economy, social pressure on committed policy, and more importantly, demonstration of a transparent administration. These aspects caused many Cabinet reshuffles in the government. Within three years of the project initiative, the Ministry of ICT had three different ministers. This suggests the difficulty in translating within the actor-network, with some successfully translated actors being replaced and a process of re-translation then being required. Some media confessed that they failed to understand the project fully, especially regarding technical issues. Therefore, it was very difficult to control the actor-network. One director opined:

“Another big problem is public policy. It changes every time we have a new Cabinet. This means there is a lack of continuity. It also slows the project down.”

Furthermore, the Thai bureaucratic system works to a top-down management culture, where public servants are dependent on what the Cabinet tells them to do. Therefore, public agencies could do nothing automatically or by themselves without the support, approval and final decision made from the Cabinet, which is politically motivated. It is known commonly that public agencies largely adhere to politics, and politics or the Cabinet very often deal in details of administration in public agencies. Some say that public agencies are the gold mine of the Cabinet. On the other hand, the Cabinet, as the focal actor, had conflicts of interest when aligning itself. Many news stories were written and rumours spread about companies being awarded big budgets in the project, with people from the focal actor involved. In brief, when the focal actor is uncertain, it seriously affects stabilisation in the actor-network. One informant spoke about the cause of political conflicts and corruption by saying:

“As we know, political conflicts are not only about this project. There are many conflicts concerning other big budget projects. Some may say that all this is about corruption. From the World Corruption Report, Thailand ranks high on this issue in this region (Southeast Asia). We are very low in administrative transparency.”

When looking within the actor-network, there are very often conflicts inside the actor network, as reflected in the emergence of the counter-network. The enrolment process built the Smart ID Card, which was expected to enhance public services all over the country. However, problems occurred, as illustrated earlier. Failure to use the Smart ID Card electronically in the public sector was caused by various problems. The swift translation created misspecification in Smart ID Card production. Furthermore, there was chaos in Thailand with political protests and then a military coup. This caused instability for the focal actor and a loss of focus on the actor-network. This chaos in the enrolment process caused an inability in the actor-network to inscribe the Smart ID Card as planned, rather than adhering to the increasing voices calling for a change of direction.

7.4 The Actor-Network was not Mobilised

Mobilisation includes the focal actor's use of a set of methods to ensure that all actors have their representatives or spokespersons act according to the agreement and not betray the initiator's interest. In the actor-network, the focal actor is needed to secure continued support for the underlying ideas from the enrolled actor. With allies mobilised, an actor-network achieves stability. This stability enables the actor-network and its underlying ideas to become institutionalised and they are no longer seen as controversial (Callon 1986).

The basis for mobilisation is the existence of enrolled actors. These actors may well retain their own specific agenda; they need only find it worthwhile to be part of the network on the basis of alliances concerning a specific issue. Once the web of alliance is in place, it becomes possible for some actors to speak on behalf of a whole cause. Thus, mobilisation is largely about keeping actors aligned over some period of time, and acting in agreement with the interests of the initiators (Ibid.).

According to the term, mobilisation, it could be said there was no complete mobilisation in the Smart ID Card actor-network because if the actor-network was mobilised, it may have had stability, but that stability was clearly not present in this case. The Smart ID Card project seems to have failed because the OPP could not be achieved in the time line, and the project's

future became unpredictable. Far from acting in agreement, then, we can see a process of betrayal as having taken place.

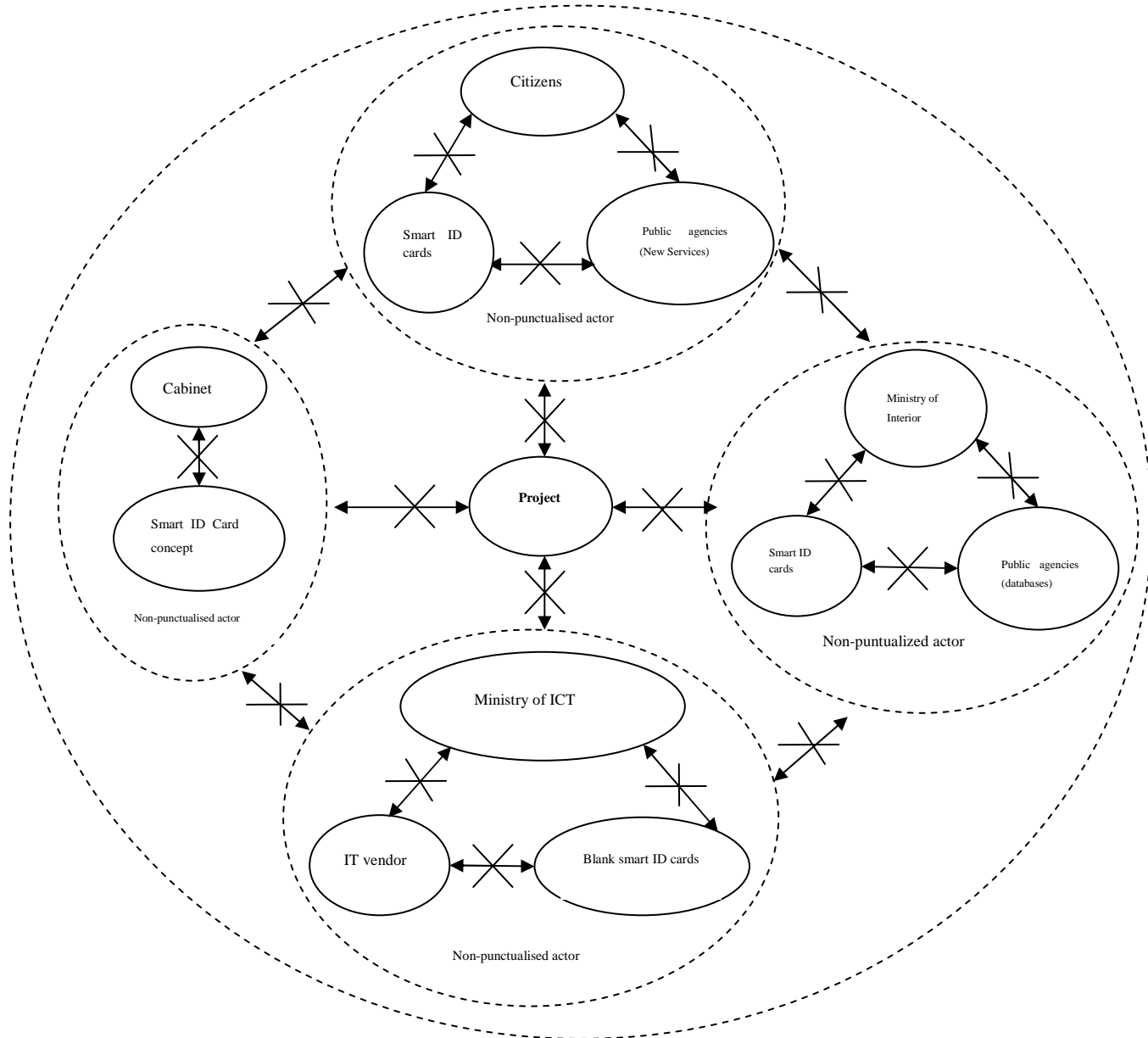
7.5 The Betrayal in the Actor-Network

The actor-network concept may conclude that its success in achieving OPP or black boxing is dependent on, firstly, a broad picture in translating the product of continual negotiation and the needed asset of compromises between a somewhat different set of actors (Law and Callon 1992). Secondly, existing actors should be able to control new ones that are being enrolled (Latour 1982). Thirdly, the actors' interests and alignment with them should be captured (Latour 1987) to make the actors willing to participate in particular ways of thinking and to act in creating and maintaining a stable and durable output of relationships within the actor-network (Latour 1987 and Walsham 1999).

When referring to the criteria for success set out above, the actor-network in the Smart ID Card project failed to reach any of them, especially in the third moment of translation: enrolment. Continual negotiation with no compromises created great difficulty in controlling newly enrolled actors. This issue, alongside a misalignment of interest were factors that resulted in controversy in the actor-network. A huge question was raised as to which actor must be blamed for the controversies that would later leave the project doomed to failure. The results from interviews struggled to identify which actor was the main betrayer or the scapegoat in this actor-network. Most interviewees agreed that this project was good for a developing country such as Thailand, which had a large mass of public services that many deemed to be under-performing. Its implementation seemed likely to give public services a much-needed boost, but, unfortunately it sank halfway to its destination.

By the concept of punctualisation, an actor-network needs punctualised actors to integrate and work together in order to achieve their goal (Callon 1991). Unfortunately, in the case of the Smart ID Card project, its actor-network could not be punctualised. All expected punctualised actors detached themselves from the actor-network by betraying it. Their betrayal can be illustrated by adapting the earlier diagram of punctualisation, as shown in Figure 7.2.

Figure 7.2 The Detachment of the Non-Punctualised Actors in the Actor-Network of the Smart ID Card Project.



Source: Inspired by Sarker, Sarker and Sidorova (2006)

From the figure 7.2, the betrayal sequence of non-punctualised actors and the reasons behind it can be summarised as follows.

7.5.1 Betrayal by the Non-Punctualised Actor of the Ministry of ICT

This non-punctualised actor betrayed the actor-network by not producing the blank smart ID card continuously with the appropriate properties, such as the correct specification.

The reasons for the betrayal were, firstly, the swift translation during enrolment, which was the main cause of this betrayal. The IT vendor was given the mission from the Ministry of ICT of producing the blank smart ID card in a short timeframe with little negotiation on details. Secondly, the Ministry of ICT, as the focal actor in its own actor-network, had insufficient capacity to create a good device, such as the terms of reference, for locking the IT vendor into producing technology artefacts for the blank smart ID cards, as required by its actor-network.

7.5.2 Betrayal by the Non-Punctualised Actor of the Ministry of Interior

This non-punctualised actor betrayed the actor-network by way of several other actors. Firstly, a non-human actor such as the personal database systems from relevant public agencies that refused to enrol into the actor-network of the Ministry of ICT. Secondly, another non-human actor: the blank smart ID card, which refused to function as a good actor in not working compatibly with the Smart ID Card system. Thirdly, the Ministry of Interior, as the focal actor in its own actor-network, did not have enough power to confront the main focal actor (the Cabinet), and it could not refuse the wrong specification for the Smart ID Cards. Finally, this non-punctualised actor detached itself from the actor-network by producing undesirable outputs, i.e. a Smart ID Card with misspecification and little useful information for citizens.

The issues that motivated the betrayal are as follows. Firstly, the problem in the interestment process of a weak device (budgeting) that could not support public agencies in developing and improving compatible database systems. Furthermore, the lack of another device (standardisation) did not help non-human actors, e.g. software, hardware and citizen databases, that could speak or communicate comfortably. Secondly, a Trojan actor

(misspecification of the Smart ID Card) was inherited into the actor-network from another non-punctualised actor (the Ministry of ICT). Consequently, this Trojan actor misbehaved in the actor-network of the Ministry of Interior. Thirdly, the Ministry of Interior could not establish a powerful counter-network with NECTEC to lobby the main focal actor (the Cabinet) to reject the Trojan actor (the misspecified Smart ID Card), resulting in this non-punctualised actor (Ministry of Interior) passing on the more powerful Trojan actor to another non-punctualised actor (the citizens).

7.5.3 Betrayal by the Non-Punctualised Actor of the Citizens

This non-punctualised actor also betrayed the actor-network by way of a number of other actors. Firstly, by the Trojan actor (the misspecified Smart ID Card) transforming itself into a normal ID card and refusing to act smartly. Secondly, this actor (the citizens) refused to demand the new services from the main focal actor (the Cabinet) as promised. Finally, this actor (the citizens) accepted the transformed Trojan actor for use in daily life.

The things that tempted and lured those actors into betraying their actor-network were, firstly, the Trojan actor that was inherited from another non-punctualised actor (the Ministry of ICT). Secondly, the inadequate device (budgeting) and neglected device (law and regulations) in the interestment process could not lock public agencies into creating new electronic services for the actor-network. Thirdly, perhaps there was a lack of interest in the mission of the actor-network, as it did not affect the citizens' daily life very much. As an actor, the citizens were neutral or inert, as they did not perform according to requirements of the main focal actor (the Cabinet).

7.5.4 Betrayal by the Focal Actor

The main focal actor (the Cabinet) betrayed the actor-network by way of the following. Firstly, by not providing enough multiple devices, e.g. budgeting, standardisation, and laws and regulations in the interestment process for locking in and ensuring that all actors were positioned for producing desirable outputs. Secondly, the focal actor could not control the chaos in the enrolment process very well, and it also made inappropriate decisions; for example, the emergence of the counter-network. Finally, the focal actor resigned from the

actor-network without notice owing to the political turmoil in the country. This led to malfunction of the actor-network.

There were several reasons that caused the focal actor to betray the actor-network. Firstly, its lack of skill in this kind of actor-network; for example, it created a project that was not based on reality. It could not, therefore, provide enough devices; for example, budgeting, to cover the entire actor-network. Secondly, the focal actor allowed politics to interfere with the actor-network by forcing the counter-network to accept misspecification of the Smart ID Card. Therefore, this sent the actor-network in the wrong direction. Thirdly, an unexpected event occurred: the focal actor was killed off by an actor from outside the actor-network, i.e. the military coup.

Due to the complicated and sophisticated betrayal, described above, the door closed on the chance to allow the actor-network of the Smart ID Card project to establish new kinds of public services as a world class phenomenon.

Chapter 8: Discussion and Conclusion

This final Chapter aims to conclude that this research clearly achieves its objectives as set from the beginning. Firstly, a theoretical-based framework of ANT is used to investigate the failure of e-government projects in developing countries such as Thailand. Secondly, the causal relationships of the failure mechanism have been exposed by using the Smart ID Card project as a case study. Thirdly, the causes of failure reflect from the multi-viewpoints of various actors. Fourthly, lessons learned from the results can create practical guidelines for practitioners.

For details of objective achievements, the presentation of this chapter begins with findings, conclusion and discussion. After that, both theoretical and practical contributions are explained step by step. Later, future research of e-government study is suggested. Finally, the conclusion and remarks are explained by the philosophical standpoint of this study, which is critical realism.

8.1 Discussion on Findings

This study intends to expose the e-government initiative phenomenon in a developing country by using the Smart ID Card project in Thailand. ANT was provided as a critical tool to depict why actors in the Smart ID Card project failed to formulate the actor-network, and what happened in the process of its creation. In explaining detailed causes of failure, the sociology of translation (the four moments of translation) was selected as the lens of this investigation. Consequently, the failure phenomenon can be described step by step from problematization, interessement, enrolment and finally betrayal.

8.1.1 The Flaw in the Problematization Process

The problematization process contains the moment when a focal actor creates an idea of the project, identifies the relevant actors and then convinces all actors to accept the project proposal. From the research findings, it could be concluded that the focal actor in the Smart

ID Card project was the Cabinet, which initiated a top down policy. This project was expected to finish within three years (2003-2006), with all 64 million Thai citizens holding a Smart ID Card. In addition, the Smart ID Card was expected to function as a multi-purpose ID card that would become a substitute for many other cards and, hence, provide convenience when accessing and contacting public services.

Through the lens of ANT, it could be said that ideas on the Smart ID Card project were dominated by the focal actor, that being the Cabinet, which opened little room for participation from other actors, such as citizens or public agencies. Lack of refinement or consideration from other actors allowed the focal actor to aim very high in its objectives by expecting this project to be world class in the area of smart ID cards for public services. This implied that in setting the project goal, the focal actor was unconcerned about the capacity of relevant actors joining the project's actor-network. It is no exaggeration to say that this was the starting point of failure.

In the OPP of an actor-network, to achieve the project goal and their own actors' interests, all actors must overcome or avoid a series of obstacles. Different actors would have to tackle various problems. In the Smart ID Card project, the focal actor (the Cabinet) did not have enough strategy to support all actors in overcoming their own problems, which resulted in the Ministry of Interior not being the hub of citizen data management. The Ministry of ICT could not produce the Smart ID Card by itself and the citizens were unable to obtain better public services. Finally, the Smart ID Card had little purpose for Thai citizens when it came to using public services. More importantly, Thai public services could not be revolutionised by the Smart ID Card project.

This study's findings of the failure causes in the problematization process support Lambright (2004) and Mahring et al. (2004), who state that initiating the project proposal at this stage is very important. The focal actor has a crucial role to play in setting up the project details and identifying relevant actors. The main issue is if the focal actor defines the project objective of the actor-network mainly itself, with little participation from the other actors. This may open the door for the focal actor to set up an unreachable objective. It also may be noted that an unreachable project objective creates complicated technology with resource constraints, such

as time, budget, and manpower. This kind of objective may be the starting point for the cause of failure.

This research reveals deep causes of the flaws in the process, which are ignored in other studies. Some errors happened in the OPP and the results show that the focal actor had less concern, firstly, in the interests of each actor when they accepted the project proposal or what benefits each actor would receive when achieving the project goal, and secondly, in the obstacles or problems that each actor must overcome in the actor-network. In the Smart Card case, the interests or goals set up by the focal actor for each actor did not match the actors' capacities. This was because the focal actor set up the interests for all actors by itself, with little room for negotiation by other actors. The focal actor used a top-down method in managing the actor-network; therefore, unrealistic interests or goals were created for each actor. For example, the Cabinet expected the Ministry of ICT to be the pioneer in the field of smart ID cards, when joining the actor-network. To achieve that target, the Ministry had to produce the Smart ID Card by itself. However, in reality this actor had no previous experience in this kind of work and, hence, it was very difficult for this actor to overcome this obstacle. Later, in the implementation process, the Ministry of ICT had to buy the Smart ID Cards instead of producing them. This situation led to many problems in the enrolment stage.

8.1.2 The Incompletion of the Interestement Process

The second moment of translation is interestement. This study found 3 problems in the devices used for the interestement moment.

Firstly, the “huge” budget as a device turned out to be limited as many actors in public services needed funding. Public agencies had insufficient capacity to support the objectives of the actor-network. They lacked software, hardware, and human resources. Therefore, when the focal actor could not supply more budgets to upgrade the capacity of these actors, it became difficult for them to join the actor-network of the Smart ID Card project.

Secondly, there was the lack of a standardisation device that was necessary for the non-human actor. As previously mentioned, the Smart ID Card itself could be regarded as the

most important non-human actor in the actor-network, with its own actor-network comprising other non-human actors, such as database systems, software and hardware. These non-human actors were specified differently, due to being developed by different organisations. The fact that there was no standard for them was of crucial importance. This issue resulted in failure to integrate different non-human actors into new Smart ID Card services. It could be concluded that the focal actor was not concerned with creating this standardisation device in locking non-human actors into the actor-network of the Smart ID Card project.

Thirdly, the most neglected device in the actor-network was laws and regulations, which the focal actor forgot to update for new public Smart ID Card services. This resulted in the inability to enrol or force other actors, especially public agencies, into joining the actor-network and offer and provide new public services for citizens.

Briefly, the devices are very important for locking the actors into position. In this case, the focal actor made a big mistake in failing to create devices, such as standardisation, laws and regulations, and budget by neglect or lack of concern. This resulted in many actors failing to enter the actor-network and, thus, not working properly to support the actor-network in trying to achieve its goals.

In this case, findings of the intersement process support the argument of Sarker, Sarker and Sidorova (2006), that locking the actors into position is crucially important. A focal actor has to create various tools or devices in this process because different actors have varied characteristics, and sometimes one actor requires more than one device or tool to confirm its position. If a focal actor does not create various tools or devices properly, actors in the actor-network may not work effectively and they sometimes betray the actor-network at a later stage.

8.1.3 The Uncontrolled Chaos in the Enrolment Process

The third moment of translation, enrolment, refers to a set of strategies, in which a focal actor attempts to define and interrelate the various roles that allow other actors to enrol. For the Smart ID Card project, this moment was chaotic and was caused by a flaw or impairment in

the earlier two moments i.e. problematization and interessement. It can be concluded that the enrolment process was part of the failure of the actor-network, as follows.

Firstly, chaos in the enrolment moment came from the side effects of swift translation, which were caused by a flaw in the artefact creation (the blank smart ID card). According to Marrhing et al. (2004), the swift translation refers to a new actor having to understand a project in a short period of time, with no chance to participate or negotiate from the moment of the project's birth. This flaw widened the conflict among actors in the actor-network of the Smart ID Card project. As the Ministry of ICT could not produce the blank ID card by itself, it needed to enrol a new actor, the IT vendor. Consequently at this moment the swift translation occurred.

With limited instructions on how to produce a complex blank ID card, the efforts of the IT vendor did not satisfy all actors in the actor-network, especially the Ministry of Interior, which felt that all the blank ID cards failed to meet specifications. Therefore, the focal actor, the Cabinet, requested that a new actor from outside the actor-network tested the cards for qualification. The test results showed that the cards produced failed to meet the terms of reference (TOR). The properties of this blank ID card could be named a 'Trojan actor', as it had become a threat to the actor-network. This Trojan actor had two side effects: initially, it refused to enrol other actors to join in the actor-network because of its limited space and low capacity, although early enrolment allowed these actors to take in useful information for card production. In addition, it failed to function technically. Finally, the Trojan actor later transformed itself into a normal ID card to be handed out to citizens.

Secondly, a counter-network can cause conflicts by attempting to challenge the main or host actor-network for a number of reasons. It could be said that a counter-network occurs due to conflict of interests within the actor-network (Gao 2007). In the case of the Smart ID Card project, the Ministry of Interior joined NECTEC to form a counter-network against the host actor-network by rejecting the blank ID cards produced to the wrong specification.

Furthermore, they laid most blame for this error on the Ministry of ICT, thus causing an imbalance within the main actor-network. Finally, the Cabinet, as the focal actor, took action

by using its power to mitigate the unrest in the counter-network and force it to keep silent. In doing this, the focal actor wanted to make the actor-network stable and continue to perform fully in reaching its goal. Although the counter-network considered decisions by the focal actor to be unreasonable, it finally accepted.

The counter-network was seemingly dangerous for the main actor-network. In fact it could be viewed from another perspective. The emergence of the counter-network signalled conflict of interests within the actor-network. The focal actor should have concerned itself much more with this issue. A counter-network may not always be a threat and can actually be seen as an asset to the actor-network, as in the Smart ID Card case, when it proved finally that all the blank ID cards were useless.

Thirdly, the focal actor's instability in the actor-network was a major problem in the Smart ID Card project. By the time of enrolment, the willingness of the focal actor, the Cabinet, had been weakened gradually. After several rounds of Cabinet reshuffles, huge public demonstrations took place over government transparency. These outside influences had a negative effect on the focal actor's status within the actor-network of the Smart ID Card project. Chaos also reigned inside the actor-network due to the problems described earlier. Finally, in August, 2006, the focal actor decided to terminate the Smart ID Card project. One month later, the focal actor was the victim of a military coup, and Thailand has been in disarray up until now, 2011.

In brief, instability of a focal actor directly affects stability of an actor-network, which then has difficulty in maintaining continuity, and the fulfilment of its task may be delayed or even cancelled (Lambright 1994, Sarker, Sarker and Sidorova 2006, Lee and Oh Lee 2006, and Gao 2007).

Finally, it can be stated that the actor-network was not mobilised. The mobilisation process refers to when the actor-network achieves the set OPP. To prevent betrayal in the actor-network, all actors should have a representative or spokesman to speak on their behalf (Callon 1986, and Sarker, Sarker and Sidorova 2006). It could be said that mobilisation was

not completed in the Smart ID Card project because the objectives of this actor-network were not achieved. Therefore, this moment could not be analysed in this dissertation.

8.1.4 The Betrayal in the Actor-Network

According to Sarker, Sarker and Sidorova (2006), a flaw in the early stages of translation may create betrayal in the actor-network, which leads to a breakdown in the association among actors. The many problems described earlier caused betrayal that happened over the entire actor-network. All betrayals could be summarised as follows: (1) The Ministry of ICT and IT vendor betrayed the actor-network by not producing the blank ID card continuously following the appropriate properties, such as the correct specification. (2) The Ministry of Interior betrayed the actor-network by producing undesirable outputs, i.e. a Smart ID Card with misspecification and little useful information. (3) The citizens betrayed the actor-network by refusing to ask for the new services as promised from the main focal actor (the Cabinet), and also accepting the transformed Trojan actor (the almost useless ID card) for use in daily life. (4) The main focal actor, the Cabinet, betrayed the actor-network by not controlling the chaos fully in the enrolment process, and later resigning from the actor-network without giving notice. With this series of betrayals, the actor-network collapsed automatically. This meant that Thai public services could not be revolutionised by the Smart ID Card project.

8.2 Contributions of the Research

This section aims to illustrate both the theoretical and practical contribution. The theoretical contribution explains the benefits of applying ANT and failure analysis in an e-government area. The practical contribution gives details in terms of ANT of how to avoid failure in an e-government project.

8.2.1 Theoretical Contributions

This thesis fills significant gaps in existing knowledge in the area of e-government study and failure analysis. The theoretical contributions of this thesis are discussed in the following sections.

8.2.1.1 The E-government Study and Actor-Network Theory

In literature it is generally recognised that e-government is a young field of study lacking theoretical roots (Gronlund 2004). This gap is crucial because insufficient theory applied indicates inadequate knowledge being built or accumulated, lack of legitimacy and recognition as a study field, and a barrier in communication among scholars and practitioners (Heeks and Bailure 2006). Specifically, there is very little analysis on considering different actors in e-government. Most studies have focused on one specific actor, such as citizens or public agencies (Chircu 2008, Rowley 2011).

This dissertation aims to fill these two gaps. ANT was selected as the theoretical tool for its potential to help explore the complexity of e-government projects, which consists of various interactive actors. This research extends the use of ANT in the area of e-government.

8.2.1.2 The Failure Analysis and Actor-Network Theory

The literature review in Chapter 3 shows that ANT is powerful in analysing failure cases. It allows scholars to modify concepts to suit explanations in each case. The characteristics of ANT inspired this research to set the sociology of translation, or four moments of translation, as the core analytical framework. It was a flexible framework in which more suitable vocabulary or supplementary concepts were open. It is proper to claim that this framework is very unique as it integrates important concepts in explaining the failure mechanism. The case study of this paper makes a theoretical contribution by demonstrating that ANT is efficient for failure analysis. In addition, given the fact that the failure rate of e-government is very high in developing countries, this thesis contributes to knowledge building on failure analysis of e-government through the use of ANT.

8.2.2 Practical Contributions

From this research, important lessons can be drawn for practitioners involved in e-government development. These guidelines should be useful for improving the chances of success in e-government initiatives. The practical contributions are highlighted in the following points.

8.2.2.1 Being Realistic in the Problematization Process

In initiating an e-government project or in the problematization process in terms of ANT, some crucial issues should be considered. The focal actor may have some ideas on e-government projects and they might not be realistic. This research suggests that, with certain plan to initiate an e-government project, the focal actor should soon enrol relevant actors to build the actor-network. The first task of this actor-network is to consider the project plan and set up the project objectives or goals. This process needs to involve the participation of broad areas of actors. By doing so, objectives that the actor-network can really achieve can be formed. In the Smart ID Card project, the objectives came from the focal actor, the Cabinet and were not modified by the other actors involved. Finally, the chief aims of the project, such as all 64 millions Thai citizens having a Smart ID Card within three years, proved to be unreachable. The Smart ID Card was designed to become a substitute for many other cards, with the aim that public services would be modernised and revolutionised electronically, and finally, Thailand would be the world's leading country in this area. Aiming so high with a rigid timeframe created tension in the actor-network right from the start. All actors had to follow the commands of the focal actor and they worried about its expectations in relation to their capacities. Since compromise of the objectives of this project was not an option, the dictatorial style of the focal actor in this moment signalled that the project would be a failure. In the OPP process, all actors normally should know what benefits they will receive and the obstacles they must overcome or avoid to get them. This thesis suggests that the focal actor should analyse and evaluate the capacities of all actors carefully, and the obstacles they face as well. In doing this, the focal actor will know the limitation of every actor. If some actors lack the capacity to support an actor-network, the focal actor can urge them to become qualified actors. Otherwise, the focal actor may have to exclude weak actors from the actor-network and bring in stronger or more suitable actors into the actor-network to replace them. In simple terms, the more flexible the actor-network is, the stronger it will be.

Moreover, in an e-government project, such as the Smart ID Card project, the relevant actors faced various obstacles. The higher the actors' interests, the greater obstacles were to them, suggesting that the focal actor needed to create multi-strategies to help each actor. In this study, the Ministry of ICT needed more IT experts and extra time to learn a new and complicated technology. The Ministry of Interior needed more budget to upgrade and

integrate software, hardware and database systems. The citizens needed more information about the project.

8.2.2.2 Multi-Devices are needed in the Interesement Process

The interesement process refers to how the focal actor locks actors into relevant positions, and whether an actor does its duty well or not, depends on the device or tool used by the focal actor. This thesis suggests that the focal actor has to create multiple or different devices for various actors in an actor-network. In the Smart ID Card project, it seemed easy to lock main actors in the actor-network. The focal actor, the Cabinet, controlled the budget for public agencies, such as the Ministry of ICT and Ministry of Interior. This is a powerful strategy. An e-government system, however, is very complex, as seen in the Smart ID Card project, which included various main actors. Each actor has its own actor-network, for example, the Ministry of Interior, as a part of the Smart ID Card project, had thousands of organisations within its own actor-network, and there were thousands of others from other ministries that needed to work corporately with it. In this case, the Ministry of Interior was the focal actor in its own actor-network. The significant point was how this focal actor could lock thousands of actors in a way that would make them work smoothly and collaboratively. In reality this was beyond this actor's capability. It needed help from other actors in the Smart ID Card's actor-network (especially the focal actor, the Cabinet) in creating devices or tools, such as laws and regulations, standardisation of database systems, and budget. These tools could be used for locking the many actors into its own actor-network and ensuring they would perform their roles well.

In brief, this thesis suggests to e-government practitioners that in the interesement process, the focal actor should not create tools and devices for only the main actor-network, but also look deeply into each main actor and support them in working well with their own actor-network.

8.2.2.3 Continuous Rational Negotiations are Necessary in the Enrolment Process

The enrolment process is the time for an actor-network to create an artefact, and many problems could occur. Two theoretical points are useful for the practitioners: swift translation and a counter-network in an actor-network. Firstly, swift translation refers to a new actor that

inherits the role and to the subsequent agreement and relationship from an actor-network over a short timeframe, with little or no negotiation from the beginning. As the project moves on, this would result in betrayal in the actor-network. In the case of the Smart ID Card project, the IT vendor was a new actor, which took partial charge of the actor-network mission, such as blank ID card production. It received limited instructions from the main actor, the Ministry of ICT. Finally, this created betrayal in that the production of cards could not meet the requirements of the actor-network. To prevent swift translation, this research suggests that all actors should have good understanding of an actor-network mission, their own missions, and other actor missions, as all of them are interrelated. Therefore, negotiations and clear agreements of joint responsibilities among actors are needed even before enrolling them. For a lot of e-government projects, public actors are unable to create a technological artefact on their own; they need help from IT vendors. If an actor-network can set clear terms of reference (TOR) with all actors involved, and also allow IT vendors to join in discussing details, such as specification of technological artefacts and timeframe, swift translation can be avoided.

Secondly, as an e-government project is sophisticated by nature, a counter-network could possibly appear; however, this thesis does not suggest getting rid of a counter-network. From the Smart ID Card case, it became evident that voices from the counter-network (NECTEC and Ministry of ICT) were right about misspecification of the blank ID card. This research suggests the focal actor holds a hold a collaborative attitude to the counter-network. Initially the focal actor or actor-network as a whole could encourage negotiations in a fair and democratic manner. Furthermore, rational solutions or decisions for these conflicts must be made jointly by working together and this would help to maintain actor-network stability. In the case of the Smart ID Card project, the focal actor basically ignored the opinions of the counter-network and viewed it as a threat. It turned out that the counter-network destroyed the power of the focal actor and made the actor-network unstable in the long term. Going back to Smart ID Card project, the focal actor could have encouraged the counter-network to become an ally by motivating NECTEC and the Ministry of Interior to join the Ministry of ICT in creating appropriate TOR for card production and helping to monitor the IT vendor, as both NECTEC and the Ministry of Interior were experts in this field. By doing this, the conflicts could have been reduced and the actor-network stabilised.

8.2.2.4 Being Careful of Intruders from Outside an Actor-Network

Intruders from outside an actor-network create problems, as seen in the scallop case (Callon 1986), in which intruders or enemies, such as starfish, parasites and sea currents waited to invade and destroy the scallops. This situation seems similar to the political ones in developing countries such as Thailand. The focal actor can be attacked at anytime by outside actors, such as groups of demonstrators or a military coup. This kind of intrusion caused the Thai Cabinet (the focal actor) to change frequently, which directly affected continuation of e-government projects, including the Smart ID Card project. The point of concern is how to take an e-government project out of fluctuating politics. It could be suggested that the Cabinet should not be the focal actor after the project has been set up. The focal actor should be an integrated committee of the relevant main actors. Doing it that way could open more chances of e-government success.

8.3 Future Research

This research applied ANT as its analytical framework. Due to limitations of time and resources, this research can only focus on the failure mechanism within the actor-network of the Smart ID Card project. Contexts outside the actor-network were not included. For future research, a context analysis should be included in an e-government failure study. This would help to deepen understanding of failure from a broader view (Gao 2007).

8.4 Conclusion and Remarks

The final conclusion should be explained by the philosophy of critical realism, which is the philosophical standpoint of this study. Critical realism intends to look back at a social phenomenon and ask questions of its realities or beliefs as well as discovering a new set of answers. Therefore, this study provides a new set of answers to the e-government failure phenomenon by following the guideline of critical realism, which comprises three domains: the empirical, actual and real one.

Firstly, the empirical domain starts with observations on the world of e-government development. Interestingly, the facts show that developing countries have faced difficulties in e-government initiatives, with a very high failure rate. When digging down in this phenomenon, various answers to why many e-government projects fail have been found. Different cases show varied answers, which lack uniqueness in communicating the same language among scholars and practitioners. This could be stated as a crucial gap in e-government study. According to contradictory answers to the failure phenomenon in developing countries, this study proposed a new way of finding a new set of answers by using ANT to explain them. By using this method, scholars and practitioners could speak or communicate in the same language under the umbrella of theory.

Secondly, after identifying vital points in the empirical domain, this study moved to the actual domain. In the actual domain, the ANT framework offers new lens to observe the failure phenomenon. In short, ANT explains that failure occurs because of disassociation of human and non-human actors in the actor-network. By using ANT, another gap in e-government study, which is lack of understanding of relationships among actors in e-government projects, is filled. In establishing the theoretical framework, debates on some important concepts of ANT have been made. Finally, the four moments of translation are selected as a core analytical framework. In deeply explaining the failure mechanism, other concepts of ANT can be incorporated with the core concepts, such as punctualisation, swift translation, a Trojan actor, counter-network and betrayal. At this moment, the theory-based framework is ready for the author to investigate and depict the causal relationship of the failure mechanism in an e-government project.

Thirdly, in the real domain a new set of answers to the failure phenomenon has been found. The Smart ID Card project in Thailand was selected as an interesting case study. The processes of finding the truth involved documentary research and in-depth interviews. All data from different sources were analysed and sensitised through the lens of the ANT-based framework.

Observations show that a new set of failure causes could be explained in the language of ANT through the case of the Smart ID Card project. In the first moment: problematization,

errors including unreachable objectives for the actor-network occurred and the actors had difficulty in passing obstacles in the OPP. Furthermore, the interessement moment was incomplete, with only one device (budgeting) being used in the actor-network, but in a limited amount, thereby lacking a necessary device for non-human actors (standards) and for human actors (laws and regulations). In the third moment: enrolment, chaotic situations were uncontrollable and swift translation occurred, which resulted in the appearance of the Trojan actor (the less functional Smart ID Card). A counter-network also emerged, which aimed to protect self-interests in the actor-network, though did not succeed. Lastly, instability of the focal actor affected the stabilisation and maintenance of the actor-network. All these events were interrelated and later caused betrayals to happen in the entire actor-network, affecting both human and non-human actors. Finally, the association of actors in the actor-network broke down, which meant the Smart ID Card project failed to achieve its goal.

This research has contributed to knowledge of e-government failure from the perspective of critical realism. ANT shows itself as a powerful tool in revealing a new set of answers to the failure mechanism. Another side of failure, however, reflects success; therefore, for the future of e-government development in other developing countries, the findings of this study could provide vital lessons to avoid the trap of failure and help to ensure that e-government projects can be carried out successfully.

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Appendix One: Guideline for the Interview

I. Questions for the informants from: the Ministry of Interior, Ministry of ICT, IT vendor, and NECTEC

1. Who was the main originator of this project?
2. How did the originator start this project?
3. What were the motivations or intentions for initiating this project?
4. What were the objectives of this project?
5. In your opinion, what did you think about the project objectives? Were they reasonable?
6. How many organisations were involved in this project?
7. What benefits did your organisation expect to get from joining this project?
8. What were the responsibilities of your organisation in this project?
9. Did those responsibilities suite your organisational capacity? If not, why?
10. Were there any problems regarding this project in your organisation?
11. If so, how did your organisation solve them?
12. Was the problem solving a success or not? Why?
13. In the overall picture, was this project implemented smoothly from the beginning?
14. Was there anything wrong with the project?
15. If so, what was wrong?
16. In your opinion, was this project successful or did it fail to achieve its objectives?
17. If you think it failed, why?
18. Are there any options that could make this project successful?
19. If so, could you explain them in more detail?
20. Do you have other comments about this project?

II. Questions for citizens

21. Had you ever heard about the Smart ID Card project?
22. If so, could you explain the details?
23. What is your opinion of this project?
24. In your opinion, do you think this project was successful?

25. If it was not successful, why did it fail?
26. Do you have a Smart ID Card?
27. What are the differences between the Smart ID Card and a normal one?
28. Do you have other comments to make about the Smart ID Card project?

III. Questions for scholars and officers from the Office of the Public Sector Development Commission (OPDC)

29. What is your opinion of the e-government initiative in Thailand?
30. What is your opinion of the Smart ID Card project?
31. Is this project beneficial for Thai public administration?
32. In your opinion, was this project successful or did it fail to achieve its objectives?
33. If it failed, what were the major reasons?
34. Are there any options that could make this project successful?
35. If so, could you explain them in detail?
36. Do you have other comments to make about this project?

Appendix Two: Template Analysis

1. The First Template

The development of categories in the first template was guided by a set of interview questions and the analytical framework.

1.1 Data on all actors involved. The relevant information of each actor was on general information, responsibility, and problems and relationships with other actors, which were:

- The Thai Cabinet
- The Ministry of ICT
- The Ministry of Interior
- The NECTEC
- The IT vendor
- The citizens
- The public agencies
- The Smart ID Card

1.2 The problems that occurred in the moments of translation were in:

- Problematization
- Interessement
- Enrolment

2. The Second Template

Categories of the second template were adjusted and improved based on the analytical framework and emerging issues.

2.1 The main punctualised actors in the actor-network were:

- The Cabinet and its members (e.g. the project proposal)
- The Ministry of ICT and its members (e.g. the IT vendor and the blank smart ID card)
- The Ministry of Interior and its members (e.g. the public agencies and the Smart ID Card)
- The citizens and its members (e.g. the public agencies and the Smart ID Cards that were issued)

2.2 The causes of failure in the four moments of translation were in:

- Problematization
 - The problem in the goal setting
 - The problem in the OPP
- Interessement
 - The problem of devices in the interessement process
- Enrolment
 - The conflicts among actors
 - The swift translation
 - The instability of the focal actor

3. The Third Template

The synthesis of categories in the third template was based mainly on the causal relationships of the failure mechanisms in the actor-network of the Smart ID Card project.

3.1 The punctualisation in the actor-network

- The punctualised actor of the Cabinet and its obstacles
- The punctualised actor of the Ministry of ICT and its obstacles
- The punctualised actor of the Ministry of Interior and its obstacles
- The punctualised actor of citizens and its obstacles
- The punctualised actor of the Smart ID Card project and its obstacles

3.2 The causes of failure in the actor-network were:

- The errors in problematization that initiated the starting point of failure
 - Problem in setting the goal of the actor-network
 - Problem in setting up the OPP of the actor-network
- Incomplete interessement created more chance of failure
 - The limited device in the actor-network
 - The lack of a necessary device for the non-human actor
 - The neglected device in the actor-network
- Uncontrolled chaos in the enrolment process
 - The side effects of swift translation
 - The power accumulated by the Trojan actor
 - The transformation of the Trojan actor
 - The weakness of the counter-network and its defeat
 - The instability of the focal actor

Appendix Three: Example of the Interview Transcript

(This informant is an officer from the Ministry of Interior)

Who was the main originator of this project? What were the motives or intentions for initiating this project?

“Before that [the project] we [the Ministry of Interior] issued magnetic ID cards to citizens. We had developed our IT infrastructures and procedures that could issue an ID card to citizens immediately on request. There was no more waiting for 60 days to receive a new ID card like in the old days. We had a pilot project in 9 provinces and were ready to expand throughout the whole country. At that time, one citizen must have had many cards such as an ID card, free treatment card, social security card, government officer card and so on. Many public agencies needed to create their own new cards. I cannot remember the year exactly; 2001 or 2002, when the Prime Minister, Dr. Thaksin Shinawatra asked the question, ‘Why don’t we combine every personal card into one card?’ Later, the cabinet approved this idea and launched the Smart ID Card project”.

- Codes for template analysis: Problematization (The start of the Smart ID Card project)

What were the responsibilities of your organisation (the Ministry of Interior) in this project?

“The Ministry of ICT had to provide us with the blank ID card. Our duty was to adjust our systems to support the one for the Smart ID Card, based on the assumption that the Smart ID Card must be compatible with other citizen databases from other public agencies.”

- Codes for template analysis: The Ministry of Interior (Responsibility)

In the overall picture, was this project implemented smoothly from the beginning?

“Around 2004, I am not sure about the year. After starting production of 12 million cards, we found they had limited space and the micro chip was no good....I think there was no clear direction for this project. It had no detailed action plan for what we should do. We just issued the card, and that’s all.

Implementation and direction of this project were not clear cut for the e-government initiative.”

- Codes for template analysis: Problematization process and enrolment process (The problems about direction and implementation of the project)

Were there any problems about this project in your organisation (Ministry of Interior)? If so, how were they solved?

“Our citizen database is good and advanced when compared with others. Other public organisations want to link their database with the Ministry of Interior, but I think they are not ready, as it is not easy to do this, or integrate information online. This is because there are obstacles such as different hardware and software for developing a database. It is very difficult to modify databases for a new system. What is more, these organisations lack IT expertise. Another barrier is that one ministry has thousands of organisations within it; spread all over the country. If changes are needed, they need to be made as a whole. I think it needs time before working online across public agencies.”

- Codes for template analysis: Ministry of Interior (The problem in working across public agencies), and Interessement process (The problem in database systems)

What do you think about the project objectives? Were they reasonable?

“Just after implementation, I thought that if we listened to citizens, we might change or readjust the project objective from the beginning. This would have helped this project to be better than it is now. We learned that rural areas have less active experience in using ID cards than urban ones like Bangkok, which uses the ID card very often. My idea is that we can offer a choice by issuing a magnetic card free of charge to citizens in rural areas, but charge 100 baht to those who want a Smart ID Card in urban areas. In that case, we can offer an electronic service for the Smart ID Card in specific areas, which would help this project to be more practical and give citizens the choice of whether to have the card or not.”

- Codes for template analysis: Problematization process (The problem in the project’s objective)

In your opinion, was this project a success or failure in trying to achieve its objectives? If you think it failed, why?

“Let me say, it is impossible for public agencies to offer a service from the Smart ID Card. Firstly, they do not fully understand the project or what they should do. Secondly, there is nothing to help them. Thirdly, even with regulations, public agencies still have no infrastructure such as card readers, kiosks, computer networking and so on. Therefore, I can say that this project has no future.”

- Codes for template analysis: Enrolment process (New public services could not be created from public agencies)

Was there anything wrong with the project? If so, what was it?

“There was no card reader for the Smart ID Card for public services and no kiosks to use it in. It is quite funny that the Smart ID Card wasn’t actually smart: it could only be used as an identity card. Now (2011), we only have 10 kiosks for supplying public services to the whole country. We can print out official documents for cardholders by using the Smart ID Card at the kiosks. However, public employees do not know what these documents are, and they cannot accept them because they are not supported by new laws or regulations. We also have to accept that existing laws and regulations are not up to date; some are very old; around 50 years old. This is also a big issue that we must be concerned about if we want to make this project run better.”

- Codes for template analysis: Interessement process (Laws and regulations are not up to date)

Do you have any other comments about this project?

“.....let me say, it must be clear why we have the Smart ID Card. Is it a card that represents personal identity in the computer? We have to make it clear like we do an ATM card. That represents the bank account of the card holder when using it in an ATM kiosk. It needs a supporting system. When issuing an ATM card to a user, it must be used at an ATM kiosk. A user should not use an ATM card at counter service, right? In Thailand, there is no supporting system for a Smart ID Card. The card holder has no idea where to use it. There is no card reader, no

kiosk. It is very funny that the Smart ID Card holder has to use a copy machine to copy the front and back of the card for contacting public agencies.”

- Codes for template analysis: Intersement process (No supporting system for the Smart ID Card)

Appendix Four: Summary of Review Articles on E-government in Developing Countries

Authors	Title	Research focus	Research findings	Framework of knowledge	Research approach: Method and sampling	Sources/Journals
Abanumy, Al-Badi, and Mayhew 2005	'E-Government Website Accessibility: In-Depth Evaluation of Saudi Arabia and Oman'	The performance evaluation of e-government application (e-service)	E-government websites had low accessibility due to the lack of various specific services, policies and IT experts.	Model-based work: The W3C web content accessibility guideline (W3C 2003)	Quantitative research: Questionnaires/Webmasters	Electronic Journal of e-Government vol. 3, no. 3, pp. 99-106
Al-Fakhri et al. 2008	'E-Government in Saudi Arabia: Between Promise and Reality'	The assessment of e-government implementation	The government websites were ineffective due to the lack of appropriate regulations, trust, training and knowledge in both society and public agencies.	Category-based work	Quantitative research: Questionnaires/ Government employees	International Journal of Electronic Government Research vol. 4, no. 2, p. 59-82
Arif 2008	'Customer Orientation in e-Government Project Management: a Case Study'	The assessment of e-government implementation	The government websites had difficulties in achieving their objectives due to the lack of standardised procedures, trained employees and knowledge management of e-government.	Model-based work: The customer orientation model, (Jaworski and Kohli 1993)	Qualitative research: Interviews/Government employees and citizens	Electronic Journal of e-Government vol. 6, no. 1, pp. 1-10
Chang et al. 2005	'An empirical study on the impact of quality antecedents on tax payers' acceptance of Internet tax-filing systems'	The user acceptance of e-government application (e-tax)	The users were satisfied with the information provided and inclined to use e-tax, due to the slow speed of the system and awareness of security and privacy.	Model based work: The technology acceptance model (TAM), (Davis et al. 1989)	Quantitative research: Questionnaires/Taxpayers	Government Information Quarterly, vol. 22, no. 3, pp. 389-410
Chen, Huang and Hsiao 2006	'Reinventing government through on-line citizen involvement in the developing world: a case study of Taipei city mayor's e-mail box in Taiwan'	The performance evaluation of e-government application (e-complaint)	E-complaint reduced the cost of citizen involvement, but failed to increase citizen satisfaction because it had no organisational reform to support the new system.	None-framework-based work	Quantitative research: Questionnaires/Citizens	Public Administration and Development, vol. 26, no. 5, pp. 409-423
Chhabra and Jaiswal 2008	'E-Government Organizational Performance Framework: Case Study of Haryana State in India - A Log Linear Regression Analysis'	The performance evaluation of e-government application (e-service)	Four issues on government websites needed to be improved: Transparency, organisation culture, ICT infrastructure and regulatory environment.	Category-based work	Mixed method: Questionnaire and interviews/ Government employees and citizens	International Journal of Electronic Government Research, vol. 4, no. 3, pp. 57-80

Authors	Title	Research focus	Research findings	Framework of knowledge	Research approach: Method and sampling	Sources/Journals
Ciborra and Navarra 2005	'Good governance, development theory, and aid policy: Risks and challenges of e-government in Jordan'	The assessment of e-government design	E-government in Jordan might have faced problems from various actors due to the top-down policy of government, demands from donor agencies, less involvement from citizens and state of the art technology.	Theory-based work: The new institutional economics theory (North 1981, 1990, North et al. 1996 and Williamson 1975)	Qualitative research: Interview and meeting/Government employees, private sector, consultants, non-governmental and donor organisations	Information Technology for Development, vol. 11, no. 2, pp. 141-159
Dinesh, Julius, and Kailash 2008	'Perspectives of citizens towards e-government in Thailand and Indonesia: A multi-group analysis'	The assessment of e-government implementation	The implementation of e-government in these two countries needed to focus on the integrated platform, reliability of information and citizen involvement.	Framework-based work	Mixed method: Questionnaires and interviews/Government employees, private IT sectors, researchers and citizens	Information Systems Frontiers, vol. 10, no. 4, pp. 483-497
Fu, Chao, and Farn 2004	'Determinants of taxpayers' adoption of electronic filing methods in Taiwan: An exploratory study'	The user acceptance of e-government application (e-tax)	E-tax users were more satisfied than non-users. However, e-tax could not reach the entire population because of the digital divide.	Model based work: The technology acceptance model (TAM), (Davis 1989)	Quantitative research: Questionnaires/Taxpayers	Journal of Government Information, vol. 30, no. 5-6, pp. 658-683
Gupta and Jana 2003	'E-government evaluation: a framework and case study'	The assessment of e-government implementation	The results showed the positive effects in manpower reduction, increased automation, and transparency. However, public employees and citizens still needed to enhance their knowledge of e-government.	Category-based work	Qualitative research: Interviews/Government employees	Government Information Quarterly, vol. 20, no. 4, pp. 365-387
Higgo 2003	'Implementing an Information System in a Large LDC Bureaucracy: The Case of the Sudanese Ministry of Finance'	The performance evaluation of e-government application (e-finance)	The findings showed what hindered the performance of e-finance, i.e. fear of employees, lack of lessons learned, insufficient standardisation and obstacles in the bureaucratic system.	Category-based work	Qualitative research: Interviews/Government employees and private consultants	The Electronic Journal of Information Systems in Developing Countries, vol. 14, no. 3, pp. 1-13
Holliday and Yep 2005	'E-government in China'	The performance evaluation of e-government application (e-service)	The e-government progression in China was limited to surface change rather than fundamental reworking of government systems.	Model-based work: Dunleavy et al. (2002)	Quantitative research: Website surveys/ Chinese government websites	Public Administration and Development vol. 25, no. 3, pp. 239-249

Authors	Title	Research focus	Research findings	Framework of knowledge	Research approach: Method and sampling	Sources/Journals
Hung, Chang, and Yu 2006	'Determinants of user acceptance of the e-Government services: The case of online tax filing and payment system'	The user acceptance of e-government application (e-tax)	The acceptance of taxpayers was very high (72%) in the following dimensions: attitude, subjective norm and perceived behaviour control.	Theory-based work: Theory of planned behaviour (Ajzen 1991)	Quantitative research: E-mail questionnaires/ Taxpayers	Government Information Quarterly, vol. 23, no. 1, pp. 97-122
Hussein et al. 2007	'The Influence of Organizational Factors on Information Systems Success in E-Government Agencies in Malaysia'	The assessment of e-government implementation	The results explained the strong influential factors that could predict e-government success, such as goal alignment, management style and centralisation of decision making.	Framework-based work	Quantitative research: Questionnaires/Government employees	The Electronic Journal of Information Systems in Developing Countries, vol. 29, no. 1, pp. 1-17
Hwang 2000	'A comparative study of tax-filing methods: manual, Internet, and two-dimensional bar code'	The user satisfaction of e-government application (e-tax)	The findings showed that the manual tax filing method had the lowest rate of user satisfaction when compared to the 2D bar-code filing method and Internet filing.	Category-based work	Quantitative research: Questionnaires/ Taxpayers	Journal of Government Information, vol. 27, no. 2, pp. 113-127
Joia and Zamot 2002	'Internet-Based Reverse Auctions by the Brazilian Government'	The performance evaluation of e-government application (e-auction)	The results expressed that e-auction was successful in terms of efficiency, effectiveness and transparency.	Framework-based work	Quantitative research: Observations/ The bidding activities	The Electronic Journal of Information Systems in Developing Countries, vol. 9, no. 6, pp. 1-12
Joia 2007	'A Heuristic Model to Implement Government-to-Government Projects' (G2G)	Success/failure analysis	This study found that there were 3 key success factors for the G2G project, i.e. security system, organisation culture and sufficient training.	Category-based work	Qualitative research: Observations and interviews/Government employees	International Journal of Electronic Government Research, vol. 3, no. 1, pp. 1-18
Joia 2008	'The impact of government-to-government endeavours on the intellectual capital of public organizations'	Success/failure analysis	The success of this project had a positive effect on the intellectual capital of public agencies, i.e. human, organisational and innovation capital.	Framework-based work	Quantitative research: Questionnaires/Government employees	Government Information Quarterly, vol. 25, no. 2, pp. 256-277
Kumar and Best 2006	'Impact and Sustainability of E-Government Services in Developing Countries: Lessons Learned from Tamil Nadu, India'	The assessment of e-government implementation	The result found that the project was successful in the beginning period but later failed due to the lack of trained personnel, sustained public leadership, consistent evaluation and monitoring, and involvement of all stakeholders.	Category-based work	Qualitative research: Interviews and observation/government employees and village kiosks	Information Society, vol. 22, no. 1, pp. 1-12
Lau et al. 2008	'Adoption of e-government in three Latin American countries: Argentina, Brazil and Mexico'	The assessment of e-government implementation	The e-government in the federal governments was at the high development stage when compared to state and local governments.	Framework-based work	Quantitative research: Website surveys/ Government websites of Argentina, Brazil and Mexico	Telecommunications Policy, vol. 32, no. 2, pp. 88-100

Authors	Title	Research focus	Research findings	Framework of knowledge	Research approach: Method and sampling	Sources/Journals
Luna-Reyes, Gil-Garcia, and Cruz 2007	'Collaborative digital government in Mexico: Some lessons from federal Web-based interorganizational information integration initiatives'	The assessment of e-government implementation	Three main aspects impacted e-government development: organisational form, digital divide and a network of decision makers and stakeholders.	Theory-based work: Institutional theory (Fountain 1995 and 2001)	Qualitative research: Interviews/Government employees	Government Information Quarterly, vol. 24, no. 4, pp. 808-826
Luna-Reyes, Gil-Garcia, and Estrada-Marroquin 2008	'The Impact of Institutions on Interorganizational IT Projects in the Mexican Federal Government'	The assessment of e-government implementation	The study found that results of e-government initiatives were affected by technology decisions and designs, and the organisational form such as structures, goals and performances.	Theory-based work: Institutional theory (Fountain 1995 and 2001)	Quantitative research: Questionnaires/Government employees	International Journal of Electronic Government Research, vol. 4, no. 2, pp. 27-42
Madon 2005	'Evaluating the Developmental Impact of E-Governance Initiatives: An Exploratory Framework'	The impact evaluation of e-government initiative	The e-government project had positive effects in terms of increased range of ICT-generated applications, trust between citizens and state, and quality of life for citizens.	Model-based work: Sen's notion of capabilities (Sen 1984, 1993 and 1999)	Qualitative research: Interviews/Government employees, local politicians, entrepreneurs, private sectors and citizens	The Electronic Journal of Information Systems in Developing Countries, vol. 20, no. 5, pp. 1-13
Mitra and Gupta 2008	'A contextual perspective of performance assessment in e-Government: A study of Indian Police Administration'	The performance evaluation of e-government application (e-service)	This study found positive impacts in three dimensions, which were internal efficiency, employee satisfaction and public satisfaction.	Framework-based work	Quantitative research: Questionnaires/Police	Government Information Quarterly, vol. 25, no. 2, pp. 278-302.
Mutshewa 2007	'The information behaviours of environmental planners: An exploratory study'	The assessment of e-government implementation	There were various problems in this project such as insufficient standardised information, lack of skilful officers and a bureaucratic system.	Category-based work	Qualitative research: Interviews/Government employees	Government Information Quarterly, vol. 24, no. 2, pp. 429-442
Parajuli 2007	'A Content Analysis of Selected Government Web Sites: a Case Study of Nepal'	The performance evaluation of e-government application (e-service)	This study found four main problems, which were lack of privacy, low accessibility, less interactivity and few usability features.	Category-based work	Quantitative research: Website surveys/ Nepal government websites	Electronic Journal of e-Government vol. 5, no. 1, pp. 87-94
Rahardjo, Mirachandani and Joshi 2007	'E-Government Functionality and Website Features: A Case Study of Indonesia'	The performance evaluation of e-government application (e-service)	The results suggested that to improve e-government at the high level, the following issues must be considered: quality of website, acceptance of citizens and specific variety of needed services.	Category-based work	Quantitative research: Questionnaires/Government employees and citizens	Journal of Global Information Technology Management, vol. 10, no. 1, pp. 31-50
Sahu and Gupta 2007	'Users' Acceptance of E-Government: A Study of Indian Central Excise'	The user acceptance of e-government application (e-service)	The acceptance had a low ratio due to the anxiety of users, less skilful employees and lack of ICT facilities.	Framework-based work	Quantitative research: Questionnaires/Government employees	International Journal of Electronic Government Research, vol. 3, no. 3, pp. 1-21

Authors	Title	Research focus	Research findings	Framework of knowledge	Research approach: Method and sampling	Sources/Journals
Santos 2008	'Implementing Interoperability Standards for Electronic Government: An Exploratory Case Study of the E-PING Brazilian Framework'	The assessment of e-government implementation	The results found that the development and implementation of e-government standards were difficult, due to the lack of resources, technological incompatibility among agencies and changes in the technological context.	Category-based work	Mixed method: Questionnaires and interviews/Government employees and consultants	International Journal of Electronic Government Research, vol. 4, no. 3, pp. 103-112
Shi 2007	'The accessibility of Chinese local government Web sites: An exploratory study'	The performance evaluation of e-government application (e-service)	The study revealed that Chinese local government websites had significant web accessibility problems.	Model-based work: The World Wide Web Consortium (W3C) model (W3C 1999)	Quantitative research: Website surveys/ Chinese local government websites	Government Information Quarterly, vol. 24, no. 2, pp. 377-403
Stanforth 2007	'Using Actor-Network Theory to Analyze E-Government Implementation in Developing Countries'	Success/failure analysis	The results showed that the trajectory of e-government projects depends on the association among actors in the actor-network of an e-government project.	Theory-based work: Actor-network theory	Qualitative research: Interviews and memos/Government agencies, donors, suppliers	Information Technologies and International Development, vol. 3, no. 3, pp. 35-60
Subramanian and Saxena 2008	'E-Governance in India: From Policy to Reality. A Case Study of Chhattisgarh Online Information System for Citizen Empowerment (CHOICE) Project of Chhattisgarh State of India	The performance evaluation of e-government application (e-service)	This project not only had increased efficiency and speedy services, but also various problems such as lack of political will, ICT infrastructure and need for change.	Category-based work	Interviews/Citizens	International Journal of Electronic Government Research, vol. 4, no. 2, pp. 12-26
Tseng et al. 2008	'To explore managerial issues and their implications on e-Government deployment in the public sector: Lessons from Taiwan's Bureau of Foreign Trade'	The performance evaluation of e-government application (e-trade)	The study suggested improvement to e-government projects by creating a concrete plan, reducing user resistance and advancing IT skills for employees.	Category-based work	Qualitative research: Interviews/Government employees	Government Information Quarterly, vol. 25, no. 4, pp. 734-756
Wang and Liao 2008	'Assessing e-Government systems success: A validation of the De Lone and McLean model of information systems success'	Success/failure analysis	The results indicated that five factors significantly and marginally supported e-government success, i.e. information quality, system quality, service quality, use, and user satisfaction.	Model-based work: De Lone and McLean model (De Lone and McLean 1992)	Quantitative research: Questionnaires/Taxpayers	Government Information Quarterly, vol. 25, no. 4, pp. 717-733

Authors	Title	Research focus	Research findings	Framework of knowledge	Research approach: Method and sampling	Sources/Journals
Wangpipatwong, Chutimaskul, and Papisratorn, 2008	'Understanding Citizen's Continuance Intention to Use e-Government Website: a Composite View of Technology Acceptance Model and Computer Self-Efficacy'	The user acceptance of e-government application (e-service)	The findings showed that perceived usefulness, ease of use and computer self-efficacy significantly affected the citizens' continuance intention.	Model-based work: Technology acceptance model (Davis 1989)	Quantitative research: Questionnaires (web-based survey)/Citizens	Electronic Journal of e-Government vol. 6, no. 1, pp. 55-64
Wong, Fearon, and Philip 2007	'Understanding e-government and e-governance: stakeholders, partnerships and CSR'	The stakeholder involvement in e-government development	The results found that to enhance e-government development, it was necessary to be concerned about the role of citizens as a partner, and the social inclusion of relevant stakeholders.	Theory-based work: Stakeholder theory (Freeman 1984)	Qualitative research: Interviews/ Citizens and government employees	The International Journal of Quality & Reliability Management, vol. 24, no. 9, pp. 927-943