A Study on User Traits Toward Public e-Service Quality and Satisfaction

利用者特性が公共電子サービスの品質及び満足度に与える影響の研究

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Acronyms and Abbreviations

AVE	Average Variance Extracted
HTML	Hypertext Markup Language
ICTs	Information and Communication Technologies
LVs	Latent Variables
MVs	Manifest Variables
NPM	New Public Management
PLS	Partial Least Squares
SCT	Social Cognitive Theory
SEM	Structural Equation Modeling
SSTs	Self-Service Technologies
TAIMS	Tokyo Advanced Information Management System
TAM	Technology Acceptance Model
TCG	Taipei City Government
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action

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1 Introduction

1.1 Research Background

1.1.1 A New Age of ICTs

With the prevalence of cyberspace and online activities in our daily lives, which are powered by information and communication technologies (ICTs), our lifestyles and behavior are becoming highly related to ICTs. In this case, people are able to break barriers in terms of organization boundaries, power, information capability, and time-space, as well through ICTs, in order to achieve their goals (Frissen, 1996). We agree that the application of ICTs has helped transform society and organization in certain ways; however, the causality between ICTs and society does not solely depend upon the development of ICTs, which in turn means that a relationship of unilinear technological impact does not exist between these two dimensions. Meanwhile, a social-technical analysis with too many simple assumptions, such as technicism[1], considered that the implementation of new ICTs will undoubtedly cause changes in terms of society, economics, politics, and management, and form new activities at the same time. However, this approach ignored the complexity of applying ICTs and the autonomy of human beings or social mechanisms (Scarbrough and Corbett, 1992; Bellamy and Taylor, 1988).

In the context of the present-day information society, politics, economics, and culture, the sector of public administration certainly cannot remove itself from the

[1] Technicism is a way of approaching the world that places its confidence in technology as a benefactor of society and one of the driving forces for change in society

comprehensive influences caused by ICTs. Many scholars have proposed several concepts combining ICTs and public administration together, such as "digital/electronic democracy," "digital/electronic government," "Teledemocracy," "information polity," "electronic republic," "digital/electronic governance," and so on. These concepts somehow illustrated that ICTs are going to innovate approaches of governance, force an unprecedented challenge and shaking in terms of design and practice of public policy, and make significant progress on forming the value of democracy (Arterton, 1987; Bellamy and Taylor, 1998).

These fantastic discussions promise that ICTs are going to provide the opportunities for changing political and societal environments, and creating a new type of governance and lifestyle. However, many scholars also agree that a new governance model cannot be created by merely implementing ICTs. In fact, during the procedure of dealing with public affairs, other than ICTs, economical, societal, political, and cultural factors will influence the practice of public administration. Therefore, simply placing ICTs into the processes of the public sector without any modification of the context of the system or environment will not guarantee a real transformation in terms of government (Bellamy and Taylor, 1994; Bekkers, 1996; Donk and Snellen, 1998).

1.1.2 The Rise of e-Government

One of the most remarkable and dramatic changes of ICT usage in recent decades has been the explosion of interest in the Internet, with the phenomenon of e-commerce becoming, in just a few years, a principal growth area in the worldwide economy. As the use of the Web by the private sector has increased, the public sector has followed closely behind, with all developed countries and almost all developing

countries now having their own websites providing services and/or promoting their policies in real-time. More and more government agencies are using websites or portals in the same way as the private sector. The use of websites or ICTs in the public sector, so-called digital or electronic government (e-government), is a global phenomenon, and public servants around the world are adopting novel ways to leverage information and communication technology (ICT) to better serve their constituents (Marchionini et al., 2003).

As these websites have been seen as the first step toward e-government, they are rapidly becoming a new aspect of government. Many citizens now have a brand new experience of contacting their governments online to communicate their opinions on current issues, request or submit an application, or petition an Act.

On one hand, most e-government initiatives are aimed at improving the efficiency of public administration through ICTs. On the other hand, such initiatives are also looking at ways to govern the public in an interactive way. In other words, engaging citizens in public affairs has been treated as a serious pursuit by government agencies, and the existing relationship between government and citizens is changing from the traditional one. This is also called "e-governance," as it tries to reinforce the connection between public officials and communities, thereby leading to a stronger and more accountable and inclusive democracy (CoE[2]).

In addition, in any modern large-scale democracy, technological systems for social communication are essential for addressing collective action and social control (Tranvik, 2004). This shows that modern ICT, particularly the Internet, is crucial for

[2] The Council of Europe is the continent's oldest political organization, founded in 1949. It aims at defending human rights, parliamentary democracy and the rule of law, developing continent-wide agreements to standardize member countries' social and legal practices, and promoting awareness of a European identity based on shared values and cutting across different cultures.

social communication, as social communication is crucial for civic engagement or democracy. Thus, e-government initiatives, being an Internet application, can be a direct way for governments to reach their citizens through a social communication means.

1.1.3 The Importance of Policy Marketing

"Marketing" is a term used to describe the managing process of recognizing, expecting, and satisfying customer benefit (Sargeant, 1999). According to this definition, marketing can be thought of as a process of management, which means a managing-oriented organization places an emphasis on marketing activities. Moreover, marketing is a customer-oriented concept in which organizations should always put their customers first. Finally, marketing is the process of recognizing, expecting, and satisfying customer's needs, which in turn mean that identifying and satisfying customer needs will be key points.

The concept of marketing has long been adopted by the private sector, and has already obtained great success. Some have argued that it is unnecessary to implement policy marketing into the public sector, as the nature of policy and public service is somehow different from commercial business. Nevertheless, more and more scholars have been adopting the concept of marketing government or non-government organizations since the 1970s. The concept of "social marketing" was born under the context of transferring social value and perspective into the general public and making the public accept or adopt the value and perspective as the norm.

Thanks to the pervasion of technology use, policy information has today become much more transparent and accessible for citizens, and technological systems, website

for example, for social communications[3] or social marketing are essential for addressing collective action and social control (Tranvik, 2004). Based on this context, many countries are now implementing their own e-government systems or applications in order to make social communication easier. However, even though governments have built sophisticated electronic mechanisms to help serve their citizens online, the use of electronic government services by citizens is still at a relative low level. It has been proven that information systems have been found to be underutilized or sometimes even abandoned due to a lack of user acceptance during the last decade (McCarroll, 1991; King, 1994; Gillooly, 1998), and thus the urgency lies in exploring where and who the target users might be.

1.2 Analytical Perspective

A new approach, a so-called citizen-centric service, was proposed in order to reinforce the connection between public officials and citizens, thereby leading to a stronger, more accountable, and inclusive relationship (CoE). Therefore, the emergence of a New Public Management (NPM) movement has enabled governments to view citizens as their customers or consumers, and the performance of governments or their policies is determined through public satisfaction (Osborne and Gaebler, 1992).

There is no doubt that public e-service, or so-called e-government, has currently become the mainstream of public management. Even in academia, more and more researches have been made on this topic; however, most researchers have placed their efforts on the issues of how to improve the efficiency and effectiveness of

[3] Social communication refers to using social media like speech or advertisement to form social norm and cognition.

e-government, or what kind of services should be established in order to meet public requirements (Marchionini et al., 2003; Cook, 2000; Koh and Prybutok, 2003; Kaylor and Eck, 2001). Conversely, we know very little about how the attitudes and behavior of citizens are toward public e-services.

With the increase of social communication between government and its citizens via ICT, as well as the importance of the NPM movement, we are eager to know the factors affecting public satisfaction toward e-services, especially the intrinsic factors. The purpose of this research is aimed at exploring intrinsic factors from the viewpoint of marketing, particularly pertaining to the service marketing theory, and from an information system perspective. Moreover, the concept of the NPM movement is also discussed in order to clarify the characteristics of public e-service. Specifically, three major perspectives, service marketing, information system and public administration, are employed in this study, and the related theories and topics are as follows.

1.2.1 Service Marketing Perspective

Public e-service is a tool for governments to connect with their citizens via a virtual channel. A channel made by public sector can be accessed anytime, anywhere, and by anyone. According to Kolter's "Service Triangle" (1994), the key players within a service are the company, its employees, and its customers. Within each player, different types of marketing approaches exist. For example, between a customer and an employee there is interactive marketing, which refers to the decisive moment of interaction between front-office employees and customers. This step is of utmost importance, because if the employee falters at this level, all prior efforts made toward establishing a relationship with the customer will be wasted. In order to capture the complexities resulting from the growing infusion of technology into serving

customers, Parasuraman (1996) added technology influence into the triangle, and named it a "Service Marketing Pyramid." A Service Marketing Pyramid places its attention on the transformation of technology toward each player, company, employees and customer in the service triangle. In particular, the process of technology that the customer has experienced will be totally different from traditional human contact, even though the outcome for the customer is usually the same.

Moreover, literature related to Self-Service Technology (SST) may be employed in this study because a comprehensive discussion in private sector has already been conducted (Bateson, 1985; Dabholkar, 1996; Parasuraman, 1996; Meuter et al., 2000; Kotler, 2001). Additionally, the concept of service quality and customer expectation will be introduced in order to form a measurement model to test the user's perception toward public e-service.

1.2.2 Information System Perspective

Although ICTs have brought many benefits to users in many different ways, they still make some users feel frustrated when interacting with the system. As we take public e-service as a system with sophisticated ICTs combinations, then the approach is turned into an information system perspective. From this point of view, many researchers have focused on how ICTs can be employed by users, and how to improve the efficiency and effectiveness of a system. For example, a famous model proposed by Davis (1989) called the "Technology Acceptance Model" has been discussed quite often due to its explanation and parsimony of theory abilities created through many empirical studies (Davis, 1989; Davis et al., 1989; Mathieson, 1991; Taylor and Todd, 1995; Jackson et al., 1997).

A major consequence of technology development is a commensurate growth in a

system itself. However, there have been few scholarly researches pertaining to user readiness for such systems. The extant literature related to the adoption of technology and people-technology interactions has suggested that consumers simultaneously harbor favorable and unfavorable views regarding technology-based products and services. A combination of positive and negative feelings regarding technology underlies the domain of technology readiness. In order to determine the characteristics of user behavior toward public e-services, technology readiness and related concepts will be employed in this research.

1.2.3 Citizen engagement in public e-service

To obtain their response and support, government has to find an effective way to involve citizens in public affairs, which has become a significant feature of public administration. This concept, which we call civic engagement, emphasizes not only passive participation in daily or regular public affairs, but also the active involvement of citizens. Moreover, civic engagement also brings out the self-consciousness of the individual and equal relations in politics between citizens and government (Qiu, 2000).

With the infusion of ICTs, the traditional way citizens interact with governments has changed. According to Norris's (2002) "Internet Engagement Model," an individual who engages in public affairs online (online civic engagement) is influenced by well-designed political institutions as well as resources and personal motivation. Norris's model has illustrated a clear and sophisticated framework in explaining the causality. It causes of online civic engagement from a micro perspective, and "well-designed political institutions" can be seen as a means of e-governance. Based on this viewpoint, differentiations in e-service between the

public and private sectors can be clarified, and user motivations toward the use of public e-services can be understood.

1.3 Research Objectives and Scope

The public sector is one of the most primitive and predominant service domains in any community, with a wide array of government services catering to all aspects of society and the economy (Haque, 2001). Many governments and public sector organizations have embraced the language of service quality, and indeed have committed themselves to quality service and customer orientation. Academically, e-government and e-service related issues have been approached from various perspectives, such as e-government and trust (West, 2000; Tolbert and Mossberger, 2006); e-government and participation (Mossberger, Tolbert and Stansbury, 2003; Thomas and Streib, 2003); e-government and administration reform (National Performance Review, 1993; Osborne and Gaebler, 1992); G2C relationship management (Chadwick and May, 2003); and so on.

These e-government topics are important to the academic and public sectors, and have already received a lot of attention from scholars. However, as mentioned earlier, the topic of user traits and e-service quality in terms of the public sector still needs to be reclaimed, and thus this research addresses this topic. By reviewing cross-field literatures such as sociology, management, and public administration, factors that might be related to public e-service will be locked in order to test their effect on public e-service as well as the consequent public satisfaction.

This study aims to understand who users are and their perception of public e-services. The purpose of this study is therefore as follows.

- Explore the traits (intrinsic factors) of public e-service users from various perspectives.
- Propose a framework regarding e-service quality and its satisfaction in order to verify the fitness of these factors.
- Provide a user profile and an applicable model to those who are designing and implementing an e-government marketing policy.

The remainder of this study is organized into six chapters. In chapter two, various literatures are reviewed in order to obtain adequate factors showing user behavior in terms of public e-service usage. With an emphasis on civic engagement, information systems and service marketing theory, a comprehensive model for public e-service quality and satisfaction is established, which will be shown in chapter 3. In chapter 4, the research design and methodology will be described. Two cases will then be selected to test the relationships between factors, the results of which will be shown in chapters 6 and 7, respectively. Finally, major findings and the conclusion of this study will be addressed along with the theoretical and managerial implications.

As mentioned above, data from two cases are employed in this study to examine the intrinsic factors of users in terms of e-service usage behavior and other related path relationships. However, since this is an exploratory study, it will only focus on personal characteristics, ignoring other factors, including environmental or cultural, despite the use of two different cases. This will make the study more concentrated and dedicated to exploring the intrinsic variables and consequent reactions of users.

2 Literature Review

2.1 e-Government and Related Issues

2.1.1 What is e-Government?

There are many definitions regarding e-government derived from various view points, each with its own perspective. For example, the United Nations (2004) defines e-government as the use of information and communication technology (ICT) and its application by the government for the provisioning of information and basic public services to the people. The functionality perspective has been adopted to view e-government as a tool for governments to increase their effectiveness and efficiency in terms of public affairs and daily operation. In addition, the question of how to deliver information and basic public services via ICTs is also a concern of the UN.

Moreover, e-government can be a continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet, and new media (Gartner group, 2000). Obviously, these definitions consider e-government as a sustained process of optimistically using ICTs to deliver services to citizens, as well as the importance of new media like the Internet.

Last but not least, Schedler and Scharf (2001) define e-government as a form of organization that integrates the interactions and interrelations between government and citizens, companies, customers, and public institutions through the application of modern information and communication technologies. From their definition,

e-government has been seen as an integrated mechanism focused on dealing with the relationship among different organizations, groups or so-called "stakeholders"[4].

Based on the discussion above, we understand that even though different definitions have their own perspectives or foci on e-government, some similarities can be seen among them. The "usage of ICT," "information and services delivery," and "interaction between stakeholders" could be concluded as three major elements of e-government, and e-government is thus a formula of these three elements. Moreover, regarding the "interaction with stakeholders," stakeholders are separated into external (citizens) and internal (employees) elements in general. Here, we position our research scope on citizens only, and explore their attitude toward public affairs as well as their perception of e-government quality.

2.1.2 Functions of e-Government

The ICT in government, or so-called e-government, has been adopted for more than ten years. Even though defining it is relatively simple and consistent, what actually constitutes e-government still varies widely depending on a wide range of factors. Cook (2000) compiled a wish list for e-government based on citizen input. Kaylor and Eck (2001) identified 51 different e-government features, examined the extent to which small city governments utilize the Internet, and then organized these e-government features into 12 categories. Despite these different views, most existing researches agree that e-government is a convenient and multidimensional collection of functions and features.

[4] A stakeholder refers to any individual or group who can affect or is affected by the action, decisions, policies, practices, or goals of the organization. Moreover, individuals who are identified through the actual or potential harms and benefits that they experience or anticipate as a result of an organization's actions or inactions are also included (Freeman, 1984; Donaldson and Preston, 1995).

Koh and Prybutok (2003) proposed a simple, intuitive, and yet comprehensive framework for the functioning of e-government. The so-called "Three Rings Model" contains all e-government applications and services in three categories of use: (1) informational function; (2) transactional function; and (3) operational function. Informational function is a foundation of e-government to serve and meet citizen needs in terms of information seeking. This is also the function of the first two stages in the e-government evolution proposed by the United Nations[5]. Information function can be explained as the transparency characteristic of e-government, which constitutes a layman's basic map of an organization, as depicted in the on-site information, and reveals the depth of access the organization follows, the depth of knowledge about the processes it is willing to reveal, and the level of attention to citizen response it provides (Sited from Welch and Hinnant, 2002). The more transparent an organization's website is, the more it is willing to allow citizens to monitor its performance (Reichard, 1998).

Transactional function contains two subcategories, "procurement transaction" and "payment transaction." These are also the most popular transactional functions adopted by most countries. Furthermore, Welch and Hinnant (2004) explained these transactions using a broader definition. According to the authors, transactional function comprises the perceived convenience, quality, privacy, efficiency, and security of online transactions with the government. Repeated transactions with the government may contribute toward public confidence in the government, and when repetitive exchanges occur, they should obey the expectations of convenience, quality, privacy, efficiency, and security.

[5] The UN proposed "five stages of e-government evolution," which are emerging presence, enhanced presence, interactive presence, transactional presence, and networked presence (UN, 2001). Here, the informational function of e-government refers to emerging presence and enhanced presence. The difference of these two types is the number of websites that one country has.

An operational function is divided into two aspects, one external, the other internal, which deal with issues such as property registration, license issuance, surveys, forums, and so on. The use of the above applications will improve the productivity of different agencies and enhance communication, coordination, and collaboration among government agencies, citizens, and enterprises. Moreover, due to its quick response feature, an operational function could be viewed as the interactive character of e-government[6]. Interactivity refers to the willingness or ability of an agency to be responsive to citizens, and it may be a two-way interaction with an iterative communication of ideas or information between citizens and government that contributes to a discussion, dialogue, or debate about publically relevant topics (Sited from Welch et al. 2004).

The "Three Rings Model" provides us with a clear and general way to analyze e-government mechanisms, and while it is too simplistic to obtain a sophisticated outcome, we still believe it does help in building up a fundamental framework of e-government functions. More specifically, citizen satisfaction with e-government can be explained from the "Three Rings Model," which means citizens who have used e-government services perceive e-government quality from the three functions, and were satisfied with one of them.

2.1.3 Civic Engagement in Public Affairs

According to the Corporation for National Service, civic engagement is the means by which an individual, through collective action, influences society. Here, civic engagement should encompass broader action than traditional citizenship activities

[6] LaPorte, Demchak, and de Jong (2002) believe that interactivity refers to a measure of the degree of immediate feedback provided.

such as voting and knowledge of government. Moreover, The World Bank believes that civic engagement refers to the participation[7] of private actors in the public sphere, conducted through direct and indirect interactions of civil society organizations and citizens-at-large with government, multilateral institutions, and business establishments in order to influence decision making or pursue common goals (The World Bank). In addition, the Development Gateway[8] believes that civic engagement consists of the methods and approaches in which people and organized networks of people influence and share control over priority setting, policy making, resource allocations, and access to public good and services.

Putnam (1995) also made a definition of civic engagement from a measurement perspective. He believes that civic engagement includes voting, political participation, newspaper readership, and participation in local associations, and that these are serious grounds for concern. Moreover, citizens can show their commitment to the community where they live through active and specific involvement in community issues. In general, the level of civic engagement can be tested by the degree of involvement in citizen-related organizations or parties having a common interest or goal.

In Putnam's view, the lowest entity for citizen involvement in public affairs is the community itself, which is similar to the "community citizens governance model" proposed by Box (1998). In Box's book "Citizen Governance," he tried to build a balanced cooperation model among governments, officials, and citizens, the features

[7] The World Bank also defines participation as the process through which stakeholders influence and share control over priority setting, policy-making, resource allocations and access to public goods and services.

[8] The Development Gateway was sponsored by the World Bank at its beginning, and then funded by the Development Gateway Foundation. Their mission is to put the Internet to work for developing countries and to provide innovative Internet solutions for effective aid and e-government – increasing access to critical information, building local capacity, and bringing partners together for positive change.

of which are openness, high autonomy, decentralization, local value response, and involvement in collective affairs. Here, he preferred the term "governance" rather than "governing" or "administration" to represent a joint action to create or execute community policies by community citizens, public representatives, and government officers whose main jobs are to help and provide necessary information and advice to the community.

In addition, Putnam and his "Saguaro Seminar"[9] separate "civic engagement" into "community" and "political" (Putnam, 2000) areas. The former refers to general community services such as volunteering, donations, and community-related involvement (Fine, 2002), while the latter includes traditional political actions such as voting or petitioning campaigns. Here, we would like to address these two kinds of civic engagement in detail.

1. Community Engagement

The concept of community engagement was proposed by communitarianism, which switched the participatory entity, topic, and action of collective issues from the macro level (nationwide) to the micro level (local or community). The original idea of community engagement is a social movement in which deprived and disadvantaged groups in the community want to enhance their position in public the decision-making process; they are concerned with local issues within a small or limited area. This concept has now been recognized as a popular type of social involvement by the World Health Organization (WHO) and other non-profit organizations.

[9] The Saguaro Seminar is an ongoing initiative of Professor Robert D. Putnam at the John F. Kennedy School of Government at Harvard University. The project focuses on expanding what we know about our levels of trust and community engagement and on developing strategies and efforts to increase this engagement.

A community is where we live and so many of the things that happen in our communities are related to our daily lives. Involvement in the community, such as participating in community services and activities, is helpful not only to decrease the apathy of society, but also to increase community-consciousness, a sense of belonging, and trust between other members of the community. Furthermore, community-based involvement has been thought of as an important way to promote or execute public affairs by the government (Lam, 1996). Cooperation between community entities and the government contributes toward making government projects a success.

2. Political Engagement

Political engagement is derived from political participation, which means an involvement in public affairs by an individual or organization, however, political engagement is different in nature. Political participation refers to the experimental research derived from the beginning of 20th century, the concerns of which are voting rate and action, while political engagement focuses on an active interest and movement toward public affairs. Therefore, political engagement contains not only traditional political participation but also active involvement in public affairs.

In addition, political engagement is a main element and a reason to create and develop schools focusing on civic engagement. This can be thought of as feedback from people who think their government is unable to meet their requirements, and who believe that the gap between vision and reality in policy planning and execution is getting bigger and more unpredictable. Due to an improper design of traditional government structures, it is difficult to involve citizens in public affairs, which will eventually lead to a failure in terms of

ineffective operation, privatization of public goods, alienation, and distrust in the government. To overcome this kind of "government failure," some scholars have suggested that government should be concerned about political engagement and collective obligations rather than altruism and civil virtue.

Based on the above thinking, scholars have started to lead citizens in an involvement in public affairs. For example, Walzer (1980) considered that concern and involvement regarding public affairs is a critical factor of civil virtue. Meanwhile, the scope of political engagement can be extended from public activity related to others in daily life to policy making and execution in government. From this point of view, political engagement is no longer just political participation, but has become a core value of civic engagement.

2.1.4 e-Governance and Related Issues

1. The Concept of e-Governance

During the past decade, due to the development of media and information dissemination technologies, millions of citizens could access the public sphere in a convenient and cheap way. The public sphere usually refers to an ideal situation in which citizens engage in open-ended conversations that are neither strategic nor self-interested on issues of common interest (Habermas, 1996). Traditionally, the public sphere has been referred to as a bourgeois salon, where discussants take on each other's roles in a "second-person attitude" and are able to abstract their own position and consider it in relation to the positions of others. Thus far, sociologists have studied the public sphere in terms of social movement and church settings, neighborhood associations and civic groups, Internet discussion boards, and volunteer meetings (Baiocchi, 2003).

However, the debate on whether ICTs promote civic engagement still remains. Some cyber-optimists think that almost limitless information available via the Internet has the potential to allow the public to become more knowledgeable about public affairs; more articulate in expressing their views via e-mail, online discussion lists, or chat rooms; and more active in mobilizing around community affairs (Norris, 2002). In contrast, the more skeptical adherents suggest that online information will be used only by those who are already active and well connected via traditional channels, such as by middle-level actors including journalists and lobbyists, party members, and grassroots activities (cited from Norris, 2002). Norris (2002) also mentioned the importance of cyber-culture, and aims at understanding the impact of the Internet by examining whether the predominant values, attitudes, and beliefs found within the online world are distinctive from the broader political culture. Moreover, these social and political values are understood as deep-rooted phenomena that are grounded in early patterns of socialization in the home, school, and workplace. Similarly, the individual's engagement via the Internet or through ICTs might be affected by existing political behavior or civic culture[10] in certain ways or patterns.

Governance is a term used to describe specific positive conditions to maintain order and avoid messy actions that will further affect the establishment of an institution. Most scholars have discussed this concept from three perspectives. To society, governance is a process of socialization, as both the public and private sectors join in (Kooiman, 2000). From a political perspective,

[10] Civic engagement is a part of civic culture that refers to citizens who are interested in public affairs and participate in politics. As virtuous members of society, they feel an obligation to actively promote the public good, which they define as more than an aggregate of individual interests.

governance is an administering of political institutions and guidance toward the maximum public welfare (Green and Hubbell, 1996). From an interactive perspective, governance could be employed to explain the relationship between the government and civil society, as opposed to a new type of negotiable politics and interactive development (Bang and Sorensen, 1999). In essence, governance includes ideas of the changing governmental nature, the revolution of administration, and a new contingency governing method. In order to promote public welfare, governance should be an administration process in terms of self-control, cooperation, and interactivity among stakeholders.

To extend the idea of governance, e-governance is a technology-mediated relationship between citizens and their governments from the perspective of potential electronic deliberation over civic communication and policy evolution, and in democratic expressions of citizens' will (Marche and McNiven, 2003). Different from IT-governance, e-governance is more concerned with manipulating the relationship of stakeholders via ICTs, and not the ICTs themselves. Nowadays, many countries are attempting to reach the goal of e-governance by deploying e-government initiatives; however, as Tolbert and McNeal have stated (2003), it took time before the Internet began having a major impact in shaping citizen participation. In other words, e-readiness is not merely a panacea for e-governance of one country. Instead, the level of civic engagement should be viewed as a critical reference for designing or deploying e-government initiatives.

2. The Role of ICTs in e-Governance

In the "Internet Engagement Model," Norris (2002) argued that social-economic development, technological diffusion, and democratization are

the antecedents of online political institutions, and lead eventually to online civic engagement. Regardless of the social-economic development factor, the level of technological diffusion can be illustrated by the e-readiness of one country or the technology readiness of an individual, while the civic culture in an engagement is a democratization behavior. Moreover, these two factors construct online political institutions as well as the phenomenon of e-governance, which I mentioned above, and they can be seen as the foundations toward the goal of e-governance.

Chang's research (2007) has shown that for those countries with a high intention toward civic engagement, a skeptical perspective is perhaps more appropriate to explain the relationship between civic engagement and ICTs, where ICTs should be a catalyst of reinforcement rather than mobilization. Norris (1999) employed the 1996 and 1998 American elections as a sample in order to observe online user behaviors, and the results showed that people who used the political resources available on the Internet were drawn from the population that was already among the most activated, informed, and interested. In contrast, those countries with a low intention of civic engagement, ICTs may be seen by most citizens as a tool to solve one's own problem or finish certain obligations with the government quickly, for example, tax declarations. Thus, an individual's primitive interest and attitude in public affairs are always the foundation toward civic engagement. At the national level, a different civic culture fostered a unique perception toward public affairs for most citizens, and thus a well-designed and sophisticated e-government system is merely a medium for those who are educated and well-skilled in ICTs as desired. In other words, ICTs will only play a reinforcement role in encouraging engagement at a national level once the civic

culture has matured.

Bimber (2001) employed the 1996 campaigns and his own survey in 1998 in order to test the Internet's effect in terms of political participation. Interestingly, the findings showed that political interest is less strongly associated with obtaining campaign information on the Internet than with watching television or reading newspaper articles. While these results may be still arguable, it is a certainty that neither ICTs nor the Internet are a panacea in terms of promoting civic engagement, which has also enhanced the reinforcement perspective in terms of Internet engagement proposed by Norris (2002).

3. E-Governance Patterns from a Macro Perspective

Regarding the patterns of e-governance, Tan et al. (2005) have employed management and business theories to discuss the interest of stakeholders and e-government implementation, and some scholars have also concentrated on the impact of the business-like transformation embodied in e-government. Most researchers have preferred to employ transaction cost economics (TCE) as the framework to explain the patterns of governance first. This framework provides market and hierarchy patterns to explain the reasons for the establishment of an organization; however, it ignores the process of value creation. Other theories such as the agency theory, resource dependence theory, stakeholder theory, and social capital theory also provide reasonable support for the patterns of governance and make this school of thought more complete. Furthermore, the patterns of governance can be separated into a fully discrete model and a relational model (Macneil, 1980). There is a spectrum from the discrete model to the relational model, within which many other models exist. In general, the relational model tends to be a bilateral system in which each party focuses on

long-term collective interests or goals, while the discrete model has the intention of unilateral relationship in which one person may be eager to connect with another person in a certain way.

However, there is no further discussion on the relationship between personal characteristics and civic engagement with ICT, although some researchers have focused on this topic from a macro perspective. Employing the concept of civic attitude, Rice and Feldman (1997) argued that individuals coming from nations with highly civic populations tend to hold relatively civic attitudes, while those from nations with less civic populations tend to hold relatively less civic attitudes. Additionally, Chang (2007) selected 59 countries as samples and used the raw data from the World Value Survey[11] to group these countries according to their civic culture on ICT usage. The results showed that most of the countries are grouped as low intention countries, which means that most of their citizens are not actively concerned with the public, while few countries are in the group of high intention such as United States, the Netherlands, and Sweden. These results are partially similar to Rice and Feldman's research that the Netherlands and Sweden are high in terms of civic culture, while Spain and Italy are low. Moreover, some countries show a relative neutral intention toward civic engagement compared with the other groups. Citizens in these countries might be either indifferent about public affairs or are only concerned with fewer things (but not to the extent as high intention countries). Canada, Finland and Singapore are located in this group.

[11] The World Values Survey is an investigation of sociocultural and political change. Led by a group of social scientists from leading universities, the survey is performed on nationally representative samples in almost 80 societies on all six inhabited continents. Meanwhile, four waves have been carried out in 1981, 1990-1991, 1995-1997, and 1999-2001. The sample size is at least 1,000 in each country and represents almost 85% of the world's population.

There is no clear or direct evidence to explain how the phenomenon is shaped; however, the differences and level of civic culture in each country might provide guidance toward correcting the situation. A civic culture that emphasizes the value of citizen participation and a democratic structure will be more stable (Almond and Verba, 1964). The differences in civic engagement among these countries might be derived from their own specific civic culture, which has accumulated for years and cannot be transformed easily. From the perspective of cultural evolution, differences may exist as each country remains in different stages and holds a specific core value by its citizens.

In Chang's conceptual framework of e-governance (2007), he employed the readiness of ICTs and the engagement of civic culture as two major elements of e-governance. From an interactive perspective, the two elements represent a relationship in which the government and its stakeholder cope with each other. Thus, under a ready ICT environment, both the government and its stakeholders should have their own attitude or value that is opposed to the other side, such that different e-governance patterns appear. Normally, most countries mobilize as many resources as they can in order to establish an ICT environment, while the citizens have a different perspective or tendency of using the ICT. According to the findings, this research proposes new e-governance patterns such that e-governance at the national level can be classified according to the readiness of ICTs and citizens' attitude or value in terms of engagement in civic culture. First, citizens have a great intention to engage in public affairs by joining social, religious, or sports and cultural organizations, while their countries also construct an ICT-ready environment for them. This type of group is termed "bilateral governance" in that an interactive e-governance relationship may become true

here. Here, ICTs play a role as an accelerator to help citizens obtain related information quickly as well as lowering the cost of information (Bimber, 2001).

Secondly, certain countries express a low intention of civic engagement due to the civic culture, which means that citizens of these countries show a relative low desire or demand in terms of public affairs. Once the ICT environment is prepared by the government, these citizens may behave as usual or take the ICTs as a tool in order to transact discretely instead of interacting continuously with the public sector. From the public sector's point of view, the relationship might be one way, from government to citizen, by providing e-government services or information. This kind of e-governance can be named "unilateral governance."

Last but not least, between bilateral and unilateral governance lies "partial governance" where countries display a medium to low tendency toward civic engagement. In other words, the citizens only crave for one or two kinds of collective issues with moderate concern. To citizens, government efforts on ICTs are seen as "nice to have," but do not require "must have" actions. In essence, their e-governance relationship is considered quite ambiguous or incomplete.

4. E-Governance and Web 2.0

Since 2003, a new series of Web-based services have been launched and have undoubtedly obtained a huge success. These e-services based on the concept of the user being a producer of content, contacts, feedback, and even applications is generally known as the stream of Web 2.0.

A preliminary definition of Web 2.0 was proposed by O'Reilly (2005):

Web 2.0 is a network as platform spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of this

platform. Delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation".

Generally speaking, Web 2.0 is not a real object, but a stage, process, or new business model. According to O'Reilly's perspective, Web 2.0-based applications have the following principles, which are "the Web as a platform," "harnessing collective intelligence," "data is the next 'Intel inside'," "end of the software release cycle," "lightweight programming model," "software above the level of a single device," and "rich user experience." These principles are derived from multiple dimensions, and thus they can be applied to any scenario in cyberspace.

As we have discussed above, e-governance represents a process of knowledge delivery and user participation through an e-channel. In this context, compared with the technology we used now, the concept of Web 2.0 implies a more active, participative, and interactive approach. Moreover, using the common platform, "Web," it is easy to integrate all sub-systems and accumulate complete user-oriented e-services.

First, full e-participation can be realized with Web 2.0 in cyberspace, and can be referred to as "Cyber Deliberative Democracy." Deliberative democracy assumes that a citizen's preference can be transferred (Warren, 1992), and places an emphasis on "Communicative Power" (Rehg, 1998), such that an individual can change his/her opinion through a well-controlled discussion. The ultimate goal of deliberative democracy is to establish an ideal speech situation for the general public.

After the emergence of the Internet, most scholars thought that the Internet was a perfect platform to make this vision come true. Basically, Internet-based deliberative democracy, or so-called "Cyber Deliberative Democracy," relies on the Internet or computer-mediated communication as a channel, and it can overcome the obstacles that might occur in deliberation.

Obviously, Web 2.0 enhances the necessary elements to reach this vision. By applying Web 2.0, citizens are able to address their opinions easily in a bottom-up fashion. In addition, it has the effect of shifting social power from a few political elite to the general public. In this context, collective intelligence and transparent information further empower citizens and provide them with both social and political advantages.

Second, the innovation of e-government is going to continue with the help of Web 2.0. Government is typically considered as a knowledge-intensive organization and will become increasingly so in the future (OECD, 2005). As we mentioned earlier, knowledge is an important element in enhancing the effectiveness and efficiency of government as well as connecting the stakeholders.

Within the government, the Web 2.0 approach is particularly effective in enabling employees to share their information officially or unofficially. For external users such as citizens, enterprises, and other organizations, Web 2.0 can offer a more direct and speedy way to obtain useful information to form a common consensus, and of course, this kind of common consensus is a key source for policy making decisions.

Some related issues have been proposed regarding Web 2.0 and a new public

administration. For example, to establish a knowledge government, it is important to have a knowledge management system, as well as a digital content and e-document archives system. In this respect, some Web 2.0 applications can be employed to enhance these functions, such as CSS design and Blogs.

To summarize, Web 2.0 has the value of collective intelligence, with users as producers participating in open discussions with an emphasis on collaboration toward a common consensus. By applying Web 2.0 in government, the traditional top-down relationship can be reversed into an integrated, interactive, and user-oriented goal. Government can provide an opportunity of "citizen empowerment," where the citizens are able to participate in various kinds of policy making if they are willing.

2.1.5 e-Service in the Public Sector

An e-Service can be defined as an electronic provision of a service to customers (Saanen et al., 1999). Madlberger and Kotzab (2001) have suggested that the definition of e-business, and thereby e-service, is a complex issue. They based their eventual definition on business transactions and defined "electronic commerce as electronic business via public or private networks including electronic publishing, electronic banking, and electronic retailing." They went on to further refine this by suggesting that there are two separate aspects to electronic business, as with the non-electronic business world, namely business-to-business and business-to-consumer. Boyer et al. (2002) defined an e-service as follows:

The e-service encounter is the initial landing on the home page until the requested service has been completed or the final product has been delivered and is fit for use.

These definitions, while helpful, are clearly based on a private sector assumption. In order to define e-service in the context of the public sector, it is helpful to look at the definition of e-government. Lenk and Traunmüller (2002) pointed out that while e-government was coined as a term after e-commerce, it addresses a reality that is very different that commerce over the Internet. They suggest that a common understanding of e-government is fairly simplistic and focuses on "simple transactions between identifiable customers (citizens, enterprises) on one side, and a multitude of government organizations in charge of registering objects, issuing passports, collecting taxes, or paying benefits on the other."

In seeking to define e-service in a public sector context, it seems sensible to draw on literature regarding both the private sector and e-government. In this study, the definition by Boyer et al. (2002) was employed.

Regarding the category of e-service, Goldkuhl & Persson (2006b, sited from VINNOVA report) proposed a clear and easy-understanding model called the e-diamond model based on the data material represented in the e-service context. There are three types of e-services mentioned.

1. Separate vs. coordinated e-services

   Separate e-services are those in which only one authority is involved in producing. A coordinated e-service requires several authorities to be involved in its supply.

2. General vs. individual e-services

   General e-services are those aimed toward the general public, while individual e-services require that the client become known to the producer/supplier of the e-service.

3. Informative vs. performative e-services

The informative dimension is only oriented toward the possibility for the client to study information supplied by the producer. In the performative dimension, the client can act communicatively.

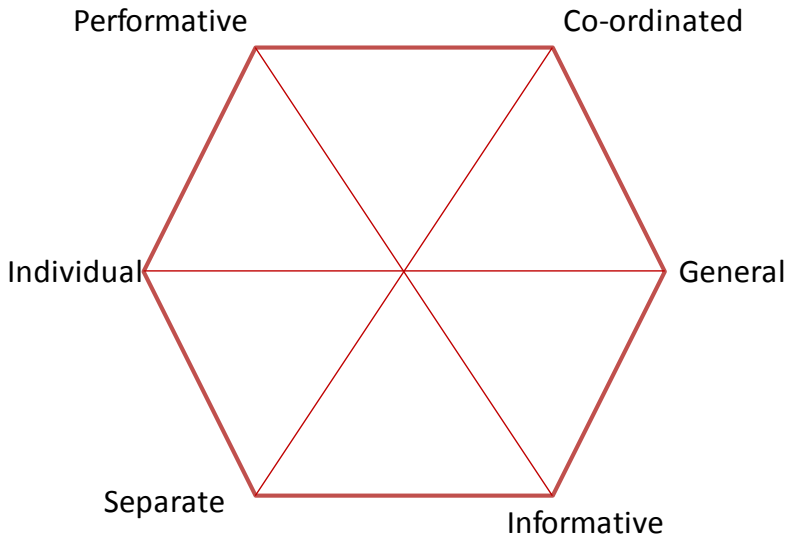

Figure 2.1 The basic constituents of the e-diamond model
Source: Goldkuhl & Persson, 2006ab

According to a survey by the Swedish government in 2006, 27% out of the 335 e-services are informative and are distributed toward the general public by a single organization. Twenty-four percent out of the 335 e-services make it possible for the client to perform communicative acts, require identification, and are distributed by a single organization. The last category (13%) is distributed jointly by several organizations, in which identification is required and where the client can perform communicative acts. These three categories represent approx. 65% of the studied e-services.

2.2 User Behavior in Adopting a New Technology

The value of an ICT depends on how it can be used by a human being. Without use by people, ICTs become undoubtedly valueless. However, we always wonder what standard or factors people consider while deciding to adopt an ICT. This topic has received a lot of attention from scholars over a long period of time. In this section, related theories or models will be discussed in order to understand and form a potential model to fit the case of public e-services.

2.2.1 Social Cognitive Theory

The social cognitive theory (SCT) was proposed by Bandura in 1986, which combined the concepts of behaviorism and social learning, and has been considered as a comprehensive and verified personal behavioral model (Compeau and Higgins, 1995a). Until now, SCT has been applied popularly in the areas of medicine, decision making, human resources, training, and education in order to understand the cognitive level of human behavior.

The social cognitive theory (Bandura, 1986) posits that people are driven by neither inner forces nor simple external stimuli. Instead, human behavior is explained via a model of triadic reciprocity in which behavior, cognitive and personal factors, and environmental events all operate interactively as determinants of each other. With the interaction among these dimensions, behavior is affected by different scenarios faced by an individual, the behavior of whom will also change the environment at the same time. Therefore, continuous interaction by the environment, individuals, and behavior can be a way to explain human actions.

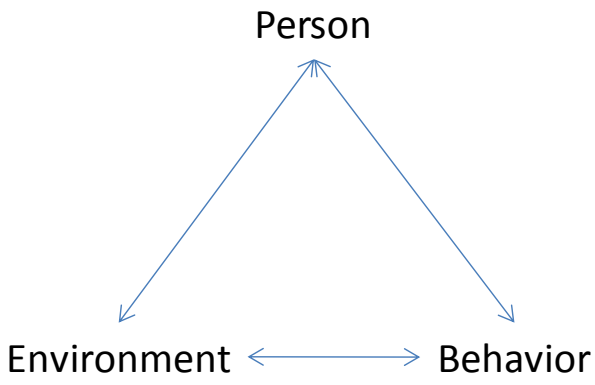

Figure 2.2 Triadic Reciprocality Model
Source: Bandura, 1986

SCT considers that it is a dynamic relationship that makes humans take real action from mere motivation. A set of regulatory mechanisms links motivation and real action in this dynamic relationship. A key regulatory mechanism in this dynamic relationship that affects human behavior is self-efficacy, which is the judgment of a person regarding his/her capabilities to perform a given task (Bandura, 1986). Self-efficacy refers to the capability of realizing the motivation and resource to control the process during execution. Somehow, this is different from the idea of ability, because people with the same ability might have different levels of self-confidence. When faced with a problem, people will inherently act differently because of different self-efficacy. The level of self-efficacy is determined by the following dimensions (Compeau and Higgins, 1995b; Bandura, 1977).

1. Magnitude

Magnitude refers to the level of task difficulty that a person believes he/she is capable of executing. Those who have a higher magnitude of self-efficacy will believe that they are capable of finishing a difficult task. Oppositely, those with a lower magnitude of self-efficacy will only execute simple tasks by

themselves.

2. Strength

Strength refers to whether the judgment about such magnitude is strong (perseverance in coping ability despite disconfirming experiences) or weak (easily questioned in the face of difficulty). For someone with low self-efficacy, he/she will easily encounter more problems during task execution, and despise himself/herself even more. Oppositely, once someone has achieved high self-efficacy, he/she will not encounter problems or will not consider a negative situation as a problem. In this case, people are able to overcome problems easily because of their high self-efficacy.

3. Generalizability

Generalizability refers to an individual's self-efficacy to meet specific conditions. Some think they can complete certain tasks under a specific condition, while others think that they can complete the task no matter what the condition is. This is the difference in terms of generalizability.

Self-efficacy has been thought of as a core concept in SCT, and thus there have been many researches discussing how to affect self-efficacy, and the influence of self-efficacy on completing tasks. Regarding the conceptual frameworks of self-efficacy, most are derived from Bandura's debate, and categorize the determinants of self-efficacy as "Past Performance," "Behavior Modeling," "Verbal Persuasion," and "Physiological Arousal." Moreover, Gist and Mitchell (1992) established a different conceptual framework from Bandura after reviewing self-efficacy-related literature. The authors think the determinants of self-efficacy are a compound of resource availability and constraints.

In terms of ICT acceptance behavior, according to Bandura's SCT concept, Compeau and Higgins (1995b) employed "computer self-efficacy," "affect," "anxiety," "outcome expectations-performance," and "outcome expectations-personal" to explain the behavior of computer users. Moreover, they also proposed three environmental factors as the antecedents of computer self-efficacy and outcome expectations, which are "encouraged by others," "others' use," and "support." An empirical study illustrated that computer self-efficacy, effect, anxiety, outcome expectations-performance, and outcome expectations-personal were significant toward computer usage. Meanwhile, computer self-efficacy and outcome expectation were adequate mediators between environmental factors and real usage.

In Compeau and Higgins's research (1995b), the five major variables are defined as follows:

1. Computer Self-Efficacy

   This refers to the ability of using a computer to execute a task by an individual.

2. Outcome Expectations-Performance

   The individual perceived that the effect or efficiency increased when using a computer.

3. Outcome Expectations-Personal

   The individual perceived a promotion in terms of personal image, status, position, or salary in an organization when using a computer.

4. Affect

   The level of enjoyment perceived by the user during usage.

5. Anxiety

The level of anxiety or apprehension perceived by the user during usage.

Extended from Compeau and Higgins's model (1995b), Compeau et al. (1999) conducted an empirical study to analyze the variables of computer usage. The outcome showed that all variables except anxiety are significant to computer usage. This result was consistent with Compeau and Higgins's research (1995b).

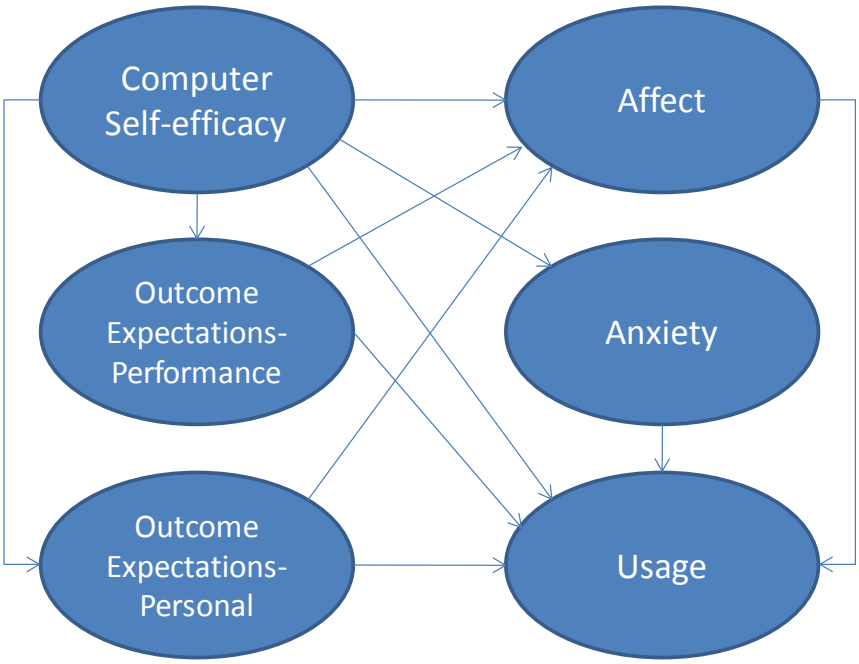

Figure 2.3 Technology Acceptance in SCT
Source: Compeau et al., 1999

Research on the relationship between computer self-efficacy, anxiety, and computer usage by Igbaria et al. (1995) showed that computer self-efficacy had a significant and direct influence, while anxiety had a significant negative influence toward perceived ease of use, and has no influence toward perceived usefulness. Moreover, anxiety had no significant direct effect on computer usage, but it did have a significant total effect on such usage.

Other studies on information systems focused on the effect of computer self-efficacy toward ICT acceptance behavior, such as the effect of computer self-efficacy, outcome expectancy, and modeling behavior toward training performance (Compeau and Higgins, 1995a); the effects of computer self-efficacy toward training performance (Gist et al., 1989); and effects of computer self-efficacy toward perceived ease of use (Venkatesh and Davis, 1996; Venkatesh, 2000). However, very few researchers have discussed the relationship between computer self-efficacy (or other variables derived from SCT) and technology acceptance behavior (behavior intention).

2.2.2 Theory of Reasoned Action

According to the social psychology theory, Fishbein and Ajzen (1975) analyzed reasoned behavior and proposed the Theory of Reasoned Action (TRA). They assumed that one's actual behavior is determined by his/her behavior intention, which is affected by his/her attitude toward a behavior and subjective norm.

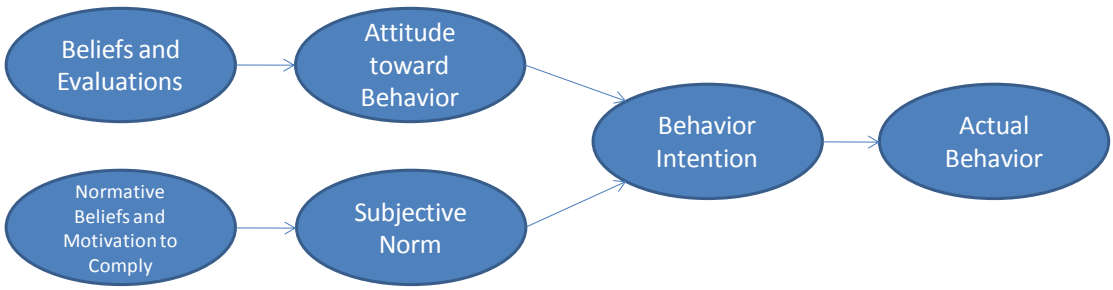

Figure 2.4 Theory of Reasoned Action
Source: Fishbein and Ajzen, 1975

Fishbein and Ajzen (1975) defined each dimension in TRA as below.

1. Behavior intention

This refers to an indication of an individual's readiness to perform a given behavior. It is assumed to be an immediate antecedent of behavior (Ajzen, 2002b). It is based on the attitude toward the behavior, the subjective norm, and perceived behavioral control, with each predictor weighted for its importance in relation to the behavior and population of interest. Due to the high direct relationship between behavior intention and actual behavior, the measurement of actual behavior has been replaced by measuring the behavior intention, or a so-called intention model.

2. Attitude toward Behavior

This refers to an individual's positive or negative evaluation of self-performance regarding a particular behavior. It is determined by the total set of accessible behavioral beliefs linking the behavior to various outcomes and other attributes.

3. Behavior Belief

This refers to an individual's belief regarding the consequences of a particular behavior. The concept is based on the subjective probability that the behavior will produce a given outcome.

4. Outcome Evaluation

This refers to the response to a particular consequence.

5. Subjective Norm

This refers to the perceived social pressure to engage or not in a particular behavior. It is determined by "normative belief" and "motivation to comply."

6. Normative Belief

This refers to an individual's perception regarding a particular behavior, which is influenced by the judgment of significant others (e.g., parents, spouse, friends, teachers).

7. Motivation to Comply

This refers to an individual's compliance to another person's opinion.

According to TRA, an actual action is able to be forecasted based on behavior intention, and behavior intention is affected by the attitude toward the behavior and subjective norm. Furthermore, an attitude toward a behavior is affected by a belief and outcome evaluation, while subjective norm is affected by normative beliefs and motivation to comply. Remarkably, the effect from an attitude toward a behavior and subjective norm is not only the belief itself but the importance of that belief. The reciprocal effect between a belief and outcome evaluation will be the external variable affecting the attitude toward a behavior. The reciprocal effect between a normative belief and motivation to comply will be an external variable affecting the subjective norms.

Therefore, one's attitude toward a behavior is the sum of the product of a belief and an outcome evaluation.

$$A = \sum b_i \, e_i$$

A: Attitude toward a behavior
b_i: Belief
e_i*: Outcome evaluation*

Subjective norm is the function of a normative belief and the motivation to comply.

$$SN = \sum n_i \, m_i$$

SN: Subjective norm
n_i: Normative belief
m_i: Motivation to comply

TRA was derived from social psychology, which has been thought to be one of the basic and most popular theories in terms of explaining human behavior. Many studies have been applied in various fields, and some have proven that TRA has the goodness of fit to forecast and explain a user's behavior in terms of adopting a information system (Davis, 1989; Davis et al., 1989).

2.2.3 Theory of Planned Behavior

The theory of Planned Behavior (TPB) was developed from the theory of Reasoned Action (Ajzen, 1985). In TPB, an individual's behavior is determined by his/her free will, which means the individual can decide whether to execute an action or not by him/herself. However, besides free will, the factors that affect behavior intention contain the formula of resource and opportunity during the execution of the action. When someone lacks the ability and resources to execute an action, or has a past experience that makes him/her feel that it is difficult to proceed, he/she will definitely have a weak intention to complete the action. In other words, the adoption of physical activity depends not only on intention, but also on a variety of control factors such as abilities, resources, and conditions. In other words, the performance of a physical activity is not fully under complete volitional control. Therefore, the capability to execute or control behavior is also an important factor affecting behavior intention. Consequently, Ajzen added "Perceived Behavioral Control" in TRA, and argued that in addition to the attitude toward a behavior and subjective norm, the opportunity, resources, and capability to manage the behavior affects the behavior intention as well. The TPB framework is as below.

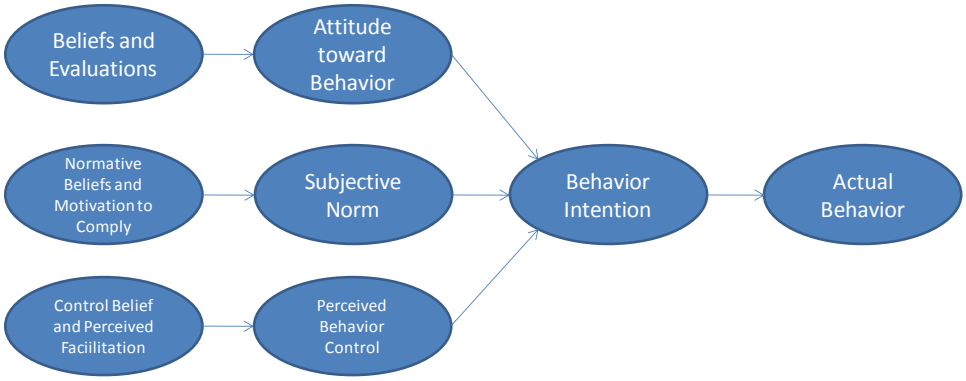

Figure 2.5 Theory of Planned Behavior

Source: Ajzen, 1985

The definitions of "perceived behavior control," "control belief," and perceived facilitation" by Ajzen (1991) are as follows.

1. Perceived Behavior Control

This is defined as an individual's capability to control an opportunity and resource while executing an action. It shows the level of behavioral control perceived by an individual. The greater the ability or resources in terms of executing an action that someone has, the more perception of control he/she has.

2. Control Belief

Control belief refers to the control level of a necessary opportunity and resource when adopting an action by an individual. These beliefs also depend on personal past experience, secondary information, and a friend's experience.

3. Perceived Facilitation

This refers to the importance of an opportunity and resource to adopt an action perceived by an individual.

Perceived behavior control is the function of control belief and perceived facilitation.

$$PBC = \sum c_i p_i$$

PBC: Perceived Behavior Control
c_i: Control Belief
p_i: Perceived Facilitation

After two empirical studies, Ajzen and Madden (1986) found that TPB is better than TRA in terms of behavior explanation. Therefore, TPB is often touted as a theory framework to explain human behavior, and many studies have proved that it has adequate forecast ability on behavior intention (Ajzen, 1991). The most significant difference between TRA and TPB, as found by Ajzen, is that the latter adds the concept of perceived behavior control, which means the actual behavior is affected not only by behavior intention, but also by perceived behavior control. Moreover, perceived behavior control, subjective norm, and attitude toward behavior determine the behavior intention at the same time, while perceived behavior control is influenced by control belief and perceived facilitation.

Among the various studies related to technology acceptance, an empirical study on technology adoption conducted by Harrison et al. (1997) showed that TPB is adequate to explain behavior intention in terms of technology adoption, and the influence of the site or individual characters is excluded. Moreover, while explaining a technology adoption, both the TPB and technology acceptance models have adequate explanation power; however, the difference between the two models is that the former is a general model that can be applied to many fields, while the latter is a simple model that can be employed in only information systems (Mathieson, 1991; Taylor and Todd, 1995b). Taylor and Todd (1995b) also indicated that the simplified technology acceptance model is good at forecasting a user's actual behavior, while

TPB is good at analyzing the factors affecting such behavior.

2.2.4 Technology Acceptance Model

The technology Acceptance Model (TAM) proposed by Davis (1989) is one of the most influential extensions of Ajzen and Fishbein's TRA in the literature. In order to simplify the previous TPB model, TAM focused on the influence brought on by perception and emotion toward technology usage, particularly the behavior of new technology adoption, and the antecedents of new technology adoption behavior by the user. Based on TRA, TAM extended the assumption of an individual's behavior, which considered whether the behavior was determined through the individual's free will. In this case, the individual will think about the outcome before deciding to execute an action. However, TAM excluded the antecedents of an attitude toward a behavior in TRA (subjective norm, normative belief, and motivation to comply), and replaced them with perceived usefulness and perceived ease of use.

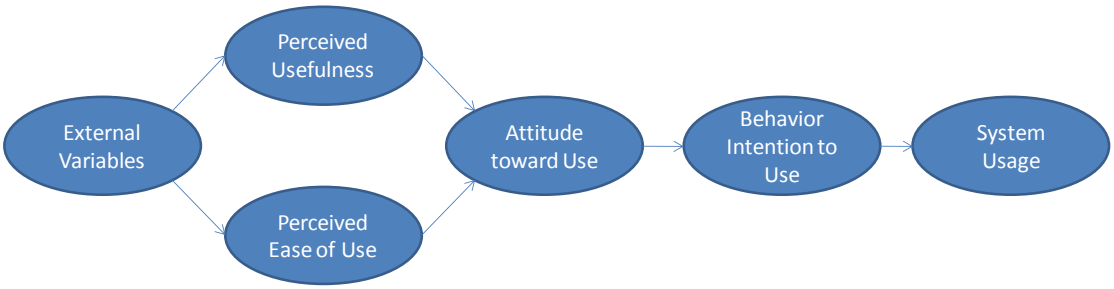

Figure 2.6 Technology Acceptance Model
Source: Davis, 1989

The two major influence factors in TAM, perceived usefulness and perceived ease of use, proposed by Davis et al., are defined as below.

1. Perceived Usefulness

Perceived usefulness is defined as the degree to which a person believes that using a particular system will enhance his/her job performance. The higher the perceived usefulness is the more positive the individual's attitude toward the information system will be.

2. Perceived Ease of Use

Perceived ease of use is defined as "the degree to which a person believes that using a particular system will be free from effort." The easier the user perceives the system to be, the more positive his/her attitude will be in adopting the system.

Based on TAM, Venkatesh and Davis (2000) analyzed various factors and extended TAM as TAM2. Compared to TAM, TAM2 eliminated the attitude dimension and added five dimensions that might affect perceived usefulness and perceived ease of use, at the same time adding two new moderators. The five dimensions are "subjective norms," "image," "job relevance," "output quality," and "result demonstrability," and the two moderators are "experience" and "voluntariness."

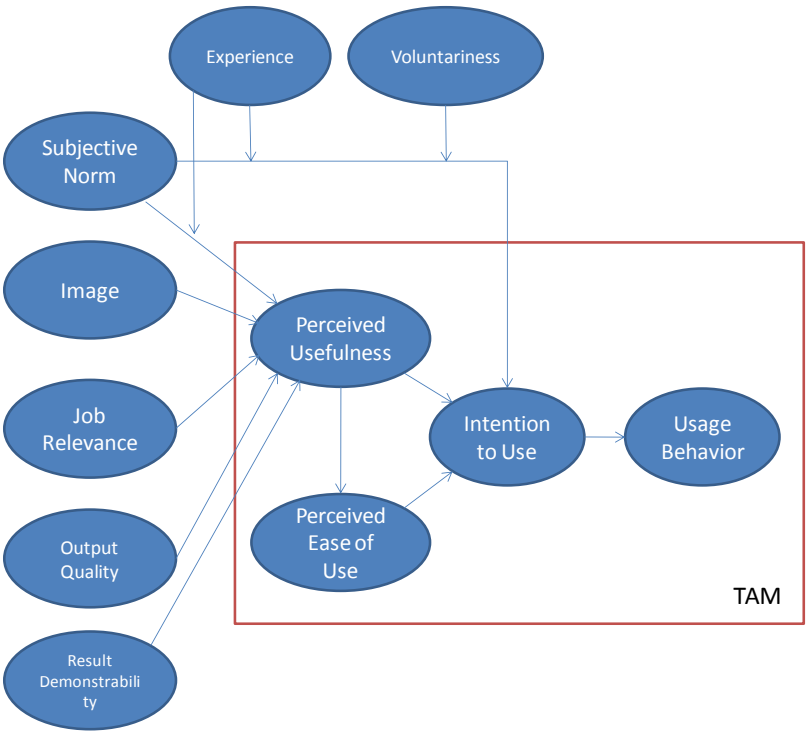

Figure 2.7 TAM2
Source: Venkatesh and Davis, 2000

The definition for each dimension by Venkatesh and Davis is as follows.

1. Voluntariness

Voluntariness refers to the extent to which potential adopters perceive an adoption decision to be non-mandatory.

2. Subjective Norms

Subjective norm refers to a person's perception that most people who are important to him or her think that the person should or should not perform the behavior in question.

3. Image

Image refers to the degree to which the use of an innovation is perceived to

enhance one's status in one's social system.

4. Job Relevance

Job relevance refers to an individual's perception regarding the degree to which the target system is applicable to his or her job.

5. Output Quality

Output quality refers to the fact that people will take into consideration how well the system performs the tasks in question.

6. Result Demonstrability

Result demonstrability is defined as the tangibility of the results when using an innovation, which will directly influence the perceived usefulness.

Many empirical studies on information systems have employed TAM as framework to build up a theoretical model, which has been proven as adequate in the foregoing literatures. Compared with other theoretical models, TAM is easier, simpler, clearer, and has higher theoretical support as well (Hu et al., 1999). In general, the accuracy of TAM is more than 40% in terms of forecasting a user's behavior regarding system usage based on a number of empirical studies (Legris et al., 2003).

2.2.5 Combined TAM and TPB

The combination of TAM and TPB, as proposed by Taylor and Todd (1995a), argued that even though TAM is adequate to forecast a user's behavior regarding the use of a new system, two major significant factors, social and control, still need to be considered. Therefore, Taylor and Todd combined TAM and TPB into "Combined TAM and TPB" (C-TAM-TPB), in which two factors, subjective norm and perceived

behavior control, are added to TAM. The model is shown below.

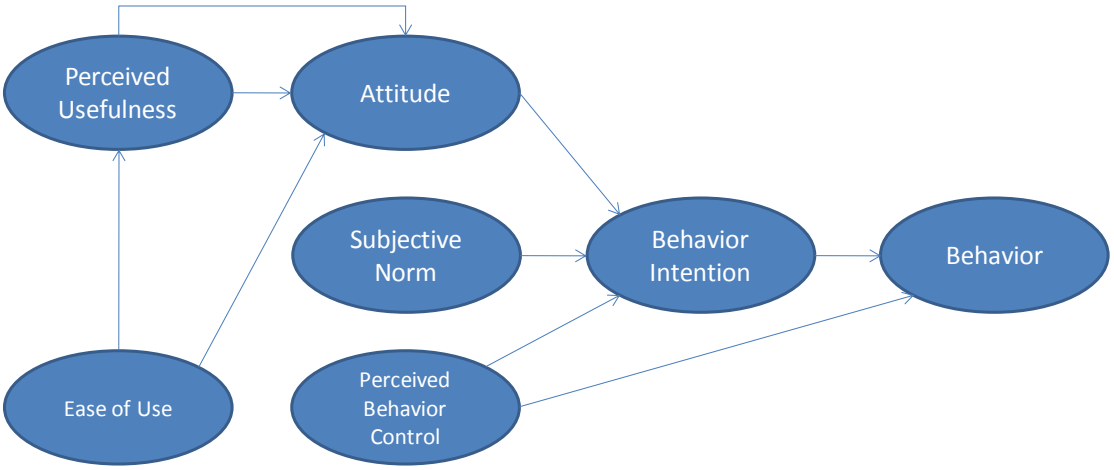

Figure 2.8 Combined TAM and TPB
Source: Taylor and Todd, 1995a

Taylor and Todd took a campus computer center as a sample to conduct an empirical study. They found that the C-TAM-TPB model has an adequate goodness of fit in terms of new technology adoption by users. Moreover, after clustering users by experience, C-TAM-TPB is a good method to explain the cases of both good experience and non-experience.

2.2.6 Motivation Model

Motivation is the procedure of enabling someone to achieve a goal or task, which means the activation or energization of a goal-oriented behavior (Herbert, 1976). Motivation has been considered an important determinant to behavior in many fields, and is categorized as “intrinsic” or “extrinsic” (Vallerand, 1997; Deci and Ryan, 2000). Intrinsic motivation refers to motivation that comes from inside an individual rather than from any external or outside rewards, such as money or grades. In other words, the source of motivation comes from the pleasure one gets from the task itself, or

from the sense of satisfaction in completing or even working on the task. Extrinsic motivation refers to motivation that comes from outside an individual. These motivating factors are external, or outside, with rewards such as money or grades. These rewards provide satisfaction and pleasure that the task itself may not provide (Deci and Ryan, 1985).

In researches related to technology acceptance, Davis et al. (1992) were the first to discuss this issue from the perspective of motivation theory. They argued that a user's motivation in using an information system will be affected by the user's intrinsic and extrinsic motivation. In order to meet the characteristics of information system usage, they employed "enjoyment" as the user's intrinsic motivation and "perceived usefulness" as the user's extrinsic motivation. The model is shown below.

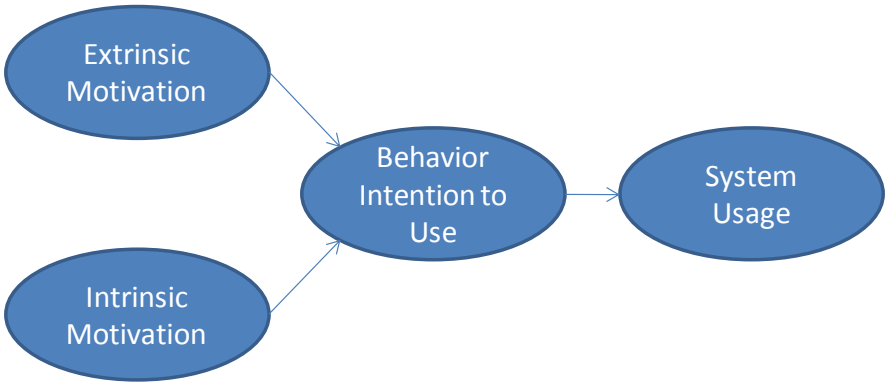

Figure 2.9 Motivation Model
Source: Davis et al. 1992

The two major factors in the Motivation Model, intrinsic motivation and extrinsic motivation, are defined as follows (Davis et al., 1992).

1. Extrinsic Motivation

This refers to the performance of an activity, as it leads to instrumental

rewards that are distinct from the activity itself (addressed in the previous section/paragraph).

2. Intrinsic Motivation

This refers to the performance of an activity for its inherent interests and enjoyment other than a separable outcome.

According to an empirical study conducted by Davis et al. (1992), perceived usefulness and enjoyment are significant toward a user's new technology adoption behavior. In addition the influence of perceived usefulness is greater than that of enjoyment.

To continue the Motivation Model by Davis et al. (1992), Venkatesh and Speier (1999) argued the effect of mood on intrinsic and extrinsic motivation during the training of a new information system. Their results illustrated that there is no significant correlation between mood and extrinsic motivation; however, a positive mood is significant to short-term intrinsic motivation and behavior intention, while a negative mood is significant to short-term and long-term intrinsic motivation as well as behavior intention.

2.2.7 Model of PC Utilization

The Model of PC Utilization (MPCU) came from Triandis's theoretical framework on behavior models. Triandis (1971) thought that the determinants of behavior should contain "attitude," "social norms," "habits," and "expected results." Among these, attitude refers to when someone wants to do something in his/her own way; social norms refer to when someone ought to do something in an expected way; and habits refers to when someone usually does something in a certain way. Additionally,

Triandis (1971) indicated that one's attitude should contain "cognitive," "affective," "behavioral" aspects. Cognitive attitude refers to perception and belief; affective attitude refers to feeling; and behavioral attitude refers to the execution intention of the behavior.

A more specific Interpersonal Behavior Model proposed by Triandis (1979) indicated that behavior is affected by "habits," "intention," and "facilitating Conditions," while intention is affected by "perceived consequences," "affect," and "social factors." The framework is shown below.

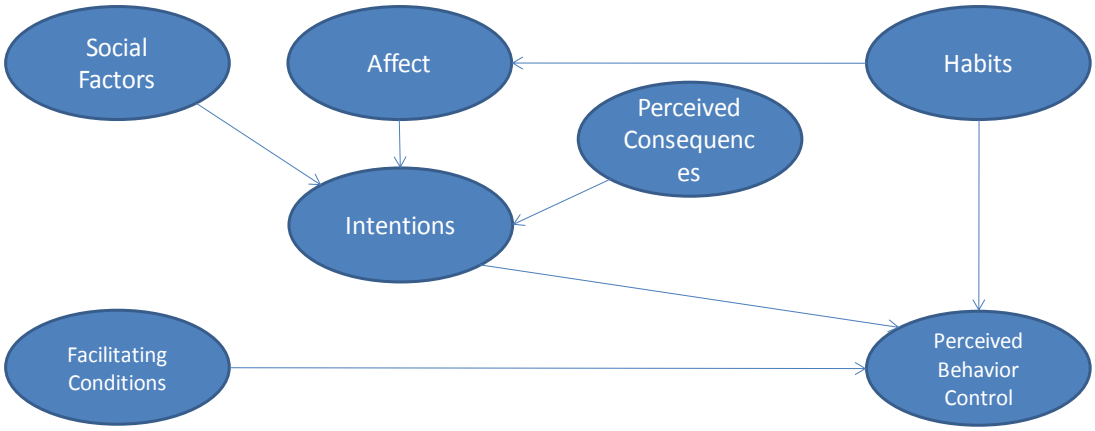

Figure 2.10 Interpersonal Behavior Model
Source: Triandis, 1979

Based on Triandis's Interpersonal Behavior Model, Thompson et al. (1991) established a "PC Utilization Model" to explain the behavior of PC usage. This model first introduced the three dimensions of affect, social factor, and facilitating conditions into the Interpersonal Behavior Model. It categorized "Perceived Consequences" into three parts, "complexity," "job fit," and "long-term Consequences," as well as "utilization of PCs." It argued that PC usage will be influenced by affect, social factors, facilitating conditions, complexity, job fit, and long-term consequences. The

model is shown below.

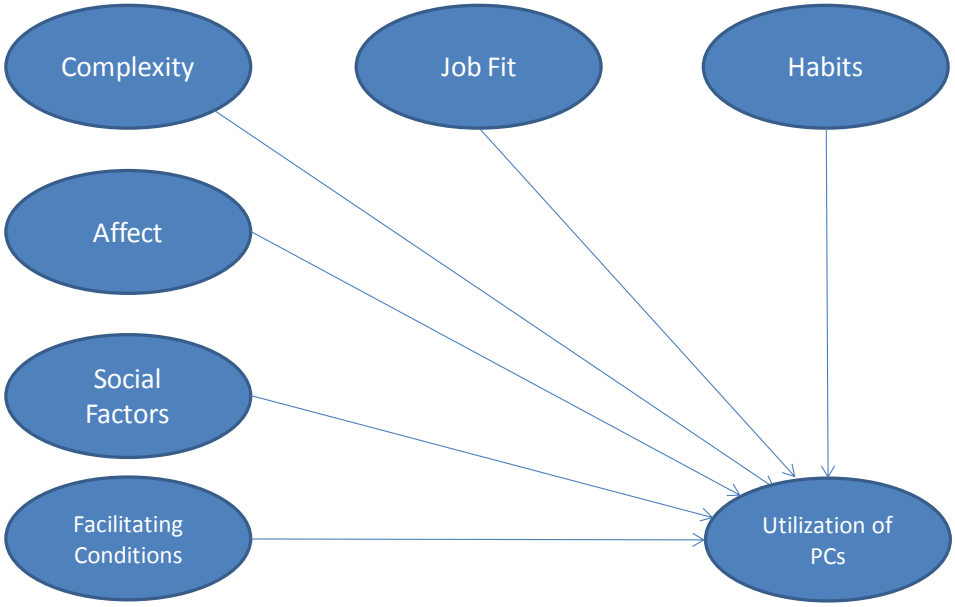

Figure 2.11 PC Utilization Model
Source: Thompson et al., 1991

Each variable in the PC Utilization Model is defined as follows (Thompson et al., 1991).

1. Affect

This refers to the experience of a feeling or emotion. An individual shows his/her happiness, excitement, satisfaction, depression, dislike, or hate toward a specific behavior.

2. Social Factors

An individual forms his /her "internalization," which is affected by the "subjective culture" he/she faces, and the convention with other people under a certain social condition. Subjective culture contains "norms," "roles," and

"values." Moreover, "norms" refers to an individual's perceived ongoing behavior as being correct, and can be accepted by other members in a specific case. "Role" indicates an individual's perceived ongoing behavior as being correct, and can be accepted by other members in a specific position. "Value" is an abstract factor with an extremely strong inherent emotion.

3. Facilitating Condition

This is an objective factor that will enable a specific behavior to be achieved easily within a certain environment. As for PC usage, providing real-time support is a kind of facilitation condition.

4. Complexity

This refers to the difficulty to use a new technology as perceived by the user.

5. Job Fit

This refers to a promotion in job performance from the use of a PC as perceived by the user, for example, to obtain better information on decision making or to shorten the necessary work time.

6. Long-term Consequences

Over a long-term period, there is a potential success from using a specific product as perceived by the user, for example, increasing flexibility in changing to a new job, or the opportunity of getting a more interesting job.

Thompson et al. (1991) conducted an empirical study on knowledge workers in manufacturing, and their results showed that "social factors," "complexity," "job fit," and "long-term consequences" are significant to PC usage. "Affect" and "facilitation condition" are non-significant to PC usage. Furthermore, Thompson et al. (1994)

added user experience to the PC Utilization Model in order to figure out the moderating effect of experience. The outcome indicated that a user's experience has a significant moderating effect among social factors, affect, long-term consequences, and PC usage.

Cheung et al. (2000) modified the PC Utilization Model to discuss Internet usage behavior. The results indicated that social factors, complexity, job fit (called "Near-term 22 Consequences" in this research) and facilitating conditions are significant on Internet usage. Moreover, it is also shown that complexity is significant toward job fit, affect, and long-term consequences, while social factors are significant toward affect.

Chang and Cheung (2001) modified the PC Utilization Model again, and discussed the behavior intention of Internet usage. After a two-step SEM analysis, the modified PC Utilization Model is better at providing a fit in terms of behavior intention of Internet usage. As for the causality of variables, it showed that affect, social factors, job fit, and facilitating conditions are directly significant toward behavior intention. Moreover, complexity has a moderating effect among job fit, affect, and behavior intention.

2.2.8 Brief Summary

Theories or perspectives related to technology adoption are derived from two mainstream ideas, one being "Social Cognitive Theory," and the other "Technology Acceptance Model." Due to the clear definition and comprehensible framework between dimensions, TAM has become the most popular theoretical model with a lot of empirical evidence. The major dimensions of TAM, perceived ease of use and perceived usefulness, have included intrinsic factors of human behavior due to a

simplified consideration; however this makes it difficult to understand what kinds of influential internal attitude or traits have a real influence on people when adopting a new technology. Compared with TAM, the social cognitive perspective provides more details regarding the insight and internal reasoning of human behavior in terms of adopting a new technology.

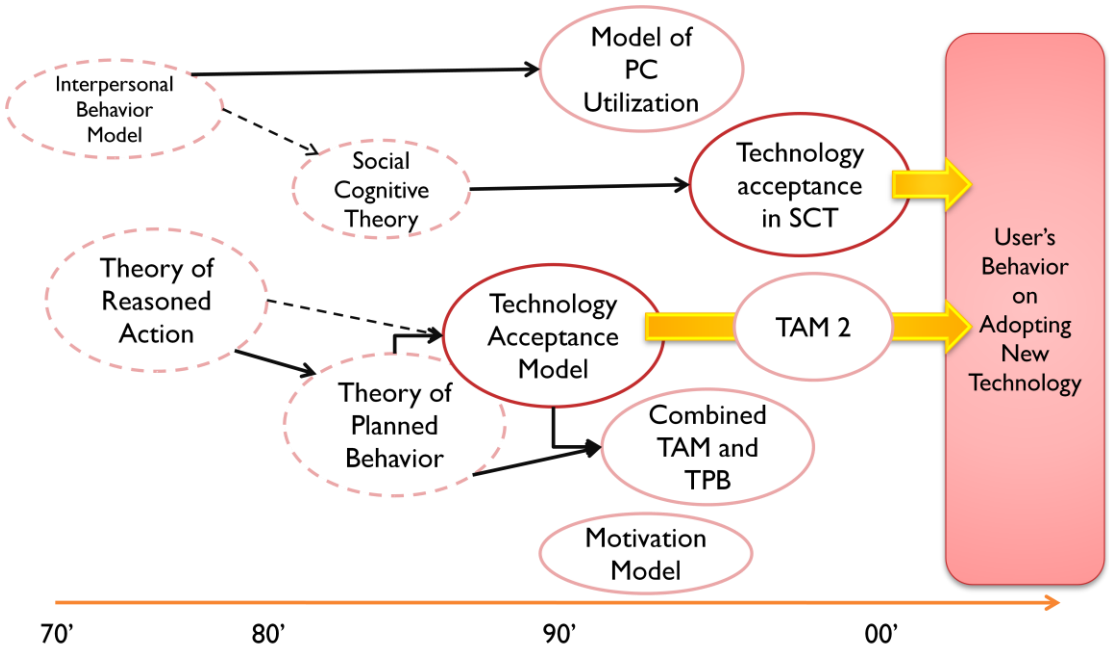

Figure 2.12 The evolution of theories related to new technology adoption

The review of technology-adoption-related theories conducted above allows identifying major determinants that might affect a user's behavior regarding new technology adoption. The determinants are summarized in Table 2.1. According to the definition and characterization of each dimension, some of the determinants inherent traits like computer self-efficacy, affect, anxiety, and intrinsic motivation, while other users need an external stimulus such as a trigger, job relevance, or external motivation, for example. Moreover, based on the context of public e-service, this study will thus concentrate on inherent traits such as computer self-efficacy and anxiety. Other inherent factors like intrinsic motivation and affect related to the enjoyment and

emotion toward a technology are less relevant to the purposes of this research.

Table 2.1 Major dimensions affecting technology acceptance behavior

Determinants	Past researches or model
Computer self-efficacy	SCT (Compeau et al., 1999)
Outcome expectation-performance	SCT (Compeau et al., 1999)
Outcome expectation-personal	SCT (Compeau et al., 1999)
Affect	SCT (Compeau et al., 1999) PC Utilization Model (Thompson et al., 1991)
Anxiety	SCT (Compeau et al., 1999)
Attitude toward behavior	TRA (Fishbein and Ajzen, 1975) TPB (Ajzen, 1985) C TAM-TPB (Taylor and Todd, 1995)
Subjective norm	TRA (Fishbein and Ajzen, 1975) TPB (Ajzen, 1985) TAM2 (Venkatesh and Davis, 2000) C TAM-TPB (Taylor and Todd, 1995) PC Utilization Model (Thompson et al., 1991)
Perceived behavior control	TPB (Ajzen, 1985) C TAM-TPB (Taylor and Todd, 1995)3 PC Utilization Model (Thompson et al., 1991)
Perceived usefulness	TAM (Davis, 1989) TAM2 (Venkatesh and Davis, 2000) C TAM-TPB (Taylor and Todd, 1995)
Perceived ease of use	TAM (Davis, 1989) TAM2 (Venkatesh and Davis, 2000) C TAM-TPB (Taylor and Todd, 1995)
Image	TAM2 (Venkatesh and Davis, 2000)
Job relevance	TAM2 (Venkatesh and Davis, 2000) PC Utilization Model (Thompson et al., 1991)
Output quality	TAM2 (Venkatesh and Davis, 2000)
Result demonstrability	TAM2 (Venkatesh and Davis, 2000)
Motivation	Motivation Model (Davis et al. 1992) TRA (Fishbein and Ajzen, 1975) TPB (Ajzen, 1985)

2.3 Service Marketing Perspective

2.3.1 Service Encounter

Service encounter refers to the period of time during which a customer interacts with a service itself (Shostack, 1985), and is a major source for a customer to evaluate the service quality. Under this definition, a service encounter is not only the contact between the customer and service employee, but any form between the service organization and consumer, such as a service employee, facility, or other tangible factor (Bitner, 1990). This also implies that a service encounter can occur without any personal interaction.

From a customer's perspective, he/she will evaluate the service based on the service encounter or period of time interacting with the service organization directly (Bitner, 1990), and the managing and monitoring of the service encounter will consequently determine the customer's satisfaction.

In this research, under the scenario of technology-based service, a service encounter is viewed as an execution of service in any means, and not merely as a personal interaction.

2.3.2 Self-Service Technologies and Service Marketing Pyramid

Due to the rapid development of ICTs and related applications, the traditional "marketplace" is going to be replaced by a "marketspace," which is defined as a virtual area where products and services exist in a digital way and can be delivered

through information channels (Rayport and Sviokla, 1994 and 1995.

Lovelock and Gummesson (2004) consider that the ways of providing various high-cost interactive services in the traditional marketplace are going to be reduced. However, in order to increase productivity and effectiveness, service providers are keen to implement self-service technologies (Walker et al., 2002; Zeithaml and Gilly, 1987). Service delivery is going to be transferred in a modern and convenient way (Meuter et al., 2003), and is expected to meet user requirements with a higher level of satisfaction (Bitner et al., 2002).

Self-Service Technologies (SSTs) refers to "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al. 2000). During the process of using SSTs, the user will finish the service by himself/herself using a technical interface facility （Hoffman and Bateson, 2001. Therefore, the difference between a traditional service and self-service are the level of "interface" and "personal interaction."

There are many kinds of self services, one of which is an interactive kiosk like a vending machine, automatic tailor machine (ATM), ticket machine, information kiosk, or automatic car-wash facility. Another kind is an online service or e-service such as an online ticket purchasing system, e-ticket system for check-ins, online hospital registry, railway e-ticket vendor, and so on.

So far there has been no consensus regarding the advantages of adopting SSTs. Globalization and internationalization have forced enterprises to keep their costs down, and thus if a process can be designed in such a way that the customer is able to serve himself/herself, the costs can be lowered, allowing the company to remain profitable (Lovelock and Young, 1979). Moreover, viewing the customer as the

employee is able to not only save money but also increase the service quality (Bowen, 1986). Fenili (1985) argued that a well-designed service system must integrate self-service and full-service, so that the system can increase the organization's overall service performance. If a company can have an effective self-service system, it helps increase productivity (Dabholker, 1996).

Parasuraman (1996) enhanced the original service marketing triangle by adding a technology factor, and called it a service marketing pyramid. A service encounter can be seen as a dynamic interaction among employees, the company, and its customers. Once a technology is implemented in the service delivery process, not only can service employees (internal customers) utilize self-services to make the job more effective, but customers are also able to finish many more services by themselves. The service marketing pyramid is as shown below.

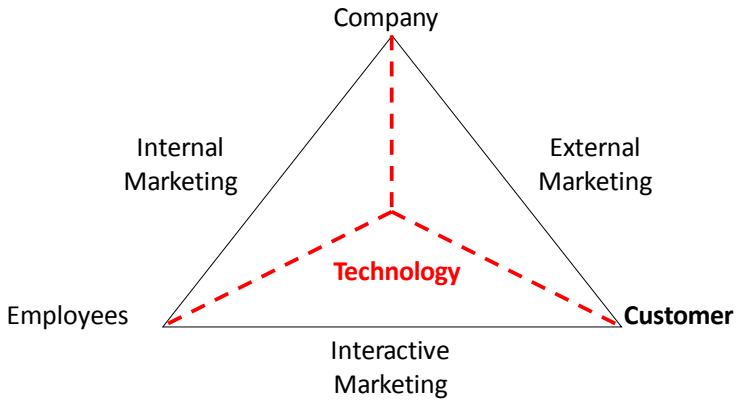

Figure 2.13 Service Marketing Pyramid
Source: Parasuraman, 1996

2.3.3 The Differences of General Service and Self-Service

Globerson and Maggard (1991) viewed services as a "sequence of transactions,"

which are continuous interactions between the consumer and organization within the spectrum of “full-service transactions” and “self-service transactions.”

Full-service transactions refer to the service activities completed partially by both the customer and organization. Self-service transactions refer to the service activities completed by customers themselves, and the proportion they are involved in within this procedure is defined as “self-service intensity.” Self-service intensity can be extremely small or extremely large, but never 100%, as the self-service of the front stage must be delivered and prepared by the back stage. In an ATM for instance, the bank needs to take charge of maintenance and refilling the cash.

Meuter and Bitner (1998) categorized service types as below.

1. Firm Production

   Services are produced by a service provider completely, and users do not need to participate in the process at all. For example, cars wash and house cleaning services.

2. Joint Production

   Services are produced by both the user and first-tier employees. Due to the “inseparability” and “intangibility” of the service, the user’s involvement becomes much more important during the process of service creation (Langeard et al., 1981). When the user receives the service, he/she is also involved in the production and delivery of the service (Bowen, 1986; Langeard, et al., 1981).

3. Customer Production

   The user proceeds with the service encounter, delivery, and production through

self-service technology (Bateson, 1981; Langeard et al., 1981). Based on a platform of technology, the user can be served without interacting with service employees.

Globerson and Maggard (1991) argued that self-service is an activity that can be completed by the user him/herself. The authors developed a matrix of service encounter and service type as follows.

Table 2.2 Service contact/service type matrix

	Full-Service	**Self-Service**
High	Outpatient service Drama performance	Shopping in supermarket Cafeteria and salad bar
Low	Bank loan Car repair shop	ATM Electronic funds transfer

Source: Globerson and Maggard (1991)

2.3.4 The Categories of SSTs

Dabholkar (1994) used three dimensions to illustrate a technology-based service delivery.

1. Who: “Person-to-person” and “person-to-technology”
2. Where: “At service site” and “at customer’s home/place of work”
3. What: “Direct contact” and “indirect contact”

Eight kinds of service types were developed using the above three dimensions.

Table 2.3 Technology-based Service Delivery

		Person-to-Person Service employee provides service by technology mean.	**Person-to-Technology Customer uses self-service technology.**
Service site	Direct	Service employee delivered service at service site.	Customer uses SSTs at service site.
	Indirect	Customer goes to the site, and communicates with service employee via phone call. Service employee provides service by technology mean.	Customer completes the service by the mean of phone call at service site.
Customer's home/place of work	Direct	Service employee goes to customer's place, and provides service with portable technology.	Customer completes service by technology mean at his/her place.
	Indirect	Customer calls for service at his/her place, and service employee delivers service by technology mean.	Customer calls for service at his/her place, and completes service by himself/herself.

Source: Dabholkar, 1994

Meuter et al. (2000) employed the "interface" and "purpose" of SST usage to classify SSTs, and used some examples in different applications.

1. Customer Service

This contains the billing system, frequently asked questions (FAQ), inquiry of service progress and other matters, online ATMs, and package tracing systems, for example.

2. Transactions

This refers to the process in which the customer is able to complete a service by him/herself without any interaction with service employees. Examples of this include online shopping and trading services. Internet-based SSTs were also the fastest growing field during the past decade (Hof， 1999).

3. Self-help

The user is able to learn and search for any information using SSTs. Long-distance learning (e-learning) or e-tax systems are examples.

2.3.5 Determinants of Technology-Based Service Encounters

Many researchers have focused not only on the category of SSTs but also on the determinants of SSTs implementation. It is clear that service encounters are very important to customers no matter how the contact is performed by the service employees or technologies. However, in a self-service setting, the service delivery process is difficult to be controlled because service employees cannot interact with the customer directly.

Based on prior researches, the determinants of using SSTs by users are mostly technical characteristic factors. However, except for such technical factors, user characteristics will affect their use of SSTs. Parasuraman and Grewal (2000) and Lang and Colgate (2003) argued that every user has a different level of technology acceptance, which means some users are devotees of technology, while others are hesitant to using technology. For example, age is a key factor. The elderly cannot accept technology products compared to the younger generations. In this case, user beliefs or attitudes toward a technology will definitely influence the acceptance and evaluation of SSTs.

Globerson and Maggard (1991) reviewed previous self-service related literature, and concluded that seven factors affect consumer preference on using a self-service from the user point of view. The seven factors are “convenience,” “time saved,” “self-control,” “money saved,” “self-image,” “risk,” and “self-fulfillment.”

1. Convenience

This refers to the accessibility of self-service equipment or facilities.

2. Time saved

This refers to saving time when using a self-service as compared with personnel service.

3. Self-control

As a major motivation to use a self-service, the customer can finish the service without the need for service personnel.

4. Money saved

To some customers, money savings is an important attribute to choosing a self-service, since the cost of self-service is usually lower than service with personnel contact.

5. Self-image

Using a self-service might be more fashionable than using a personnel service, and thus one’s self-image can be promoted during service use.

6. Risk

Whether using a personnel service or self-service, the customer will take a certain risk while being served, and the level of risk depends on the nature of

the service.

7. Self-fulfillment

By completing a self-service, the customer might raise his/her self-fulfillment at the same time.

Based on system architecture perspective, Dabholkar (1996) employed fast-food ordering SSTs as a target to discuss how to measure the expected service quality of SSTs in terms of the "Attribute-Based Model" and "Overall Affect Model."

1. Attribute-Based Model

Customer expectation regarding SSTs shows the customer's evaluation of the perceived SSTs characteristics, such as "expected speed of delivery," "expected ease of use," "expected reliability," "expected enjoyment," and "expected control."

- Expected speed of delivery: Time is the most important factor when the customer chooses a self-service (Langeard et al., 1981). Time includes waiting and the entire process of service delivery. The expected speed of delivery means the expected time he/she finishes the service. Therefore, the faster the expected speed of delivery, the more positive the service quality.
- Expected ease of use: As the service system is easier than another service delivery, the customer is able to benefit from lower effort, which reduces the social risk by the complexity of the system usage.
- Expected reliability: Service reliability is an important determinant in evaluating service quality (Parasuraman et al., 1988), as indicated by computer-science related researches (Davis et al., 1989). Therefore, the

stability of the self-service delivery process and outcome, as well as the expectation of the self-service, will affect the customer's evaluation of the service quality.

- Expected enjoyment: For the customer, using SSTs can be interesting (Langeard et al.，1981). This is thought to be an essential value of service delivery by customers (Davis et al，1992). If a customer thinks it is interesting to use SSTs, it will help increase the expected service quality.
- Expected control: Perceived control refers to the self-control level that customers perceive during a service encounter and delivery (Langeard et al., 1981). Customers prefer using SSTs not only due to the money saving but also the self-control achieved during the serving process (Bateson, 1985; Bowen, 1986). Therefore, Bateson and Hui (1987) argued that customer evaluations of a service will increase as the self-control level of the service increases.

2. Overall Affect Model

This deals with customer feelings regarding the use of technology. The model argues that decisions based on personal emotion or attitude (rather than perception) will form the expectations of SSTs, such as attitude toward using technological products and the need for interaction with service employees.

- Attitude toward using a technological product: For users, many SSTs are rather fancy and novel, and thus they will evaluate SSTs based on previous experience and attitude in terms of related products. This kind of general attitude is called a category-based effect (Fiske, 1982). If users have a more positive attitude toward a technological product, they will have a positive expectation of the SST service quality.

- Need for interaction with service employees: Service employees cannot be replaced in some services, and thus interaction with service employees is still a relatively important factor (Surprenant and Soloman, 1987). Hence, the higher the demand of interaction with service employees, the lower the expected service quality of SSTs.

Dabholkar (1996) argued that the "Attribute-Based Model" has better forecasting ability than the "Overall Affect Model" in measuring the service quality of SSTs, as well as greater "expected enjoyment" and "expected control," which are the most important attributions. The Attribute-based Model and Overall Affect Model are as shown below.

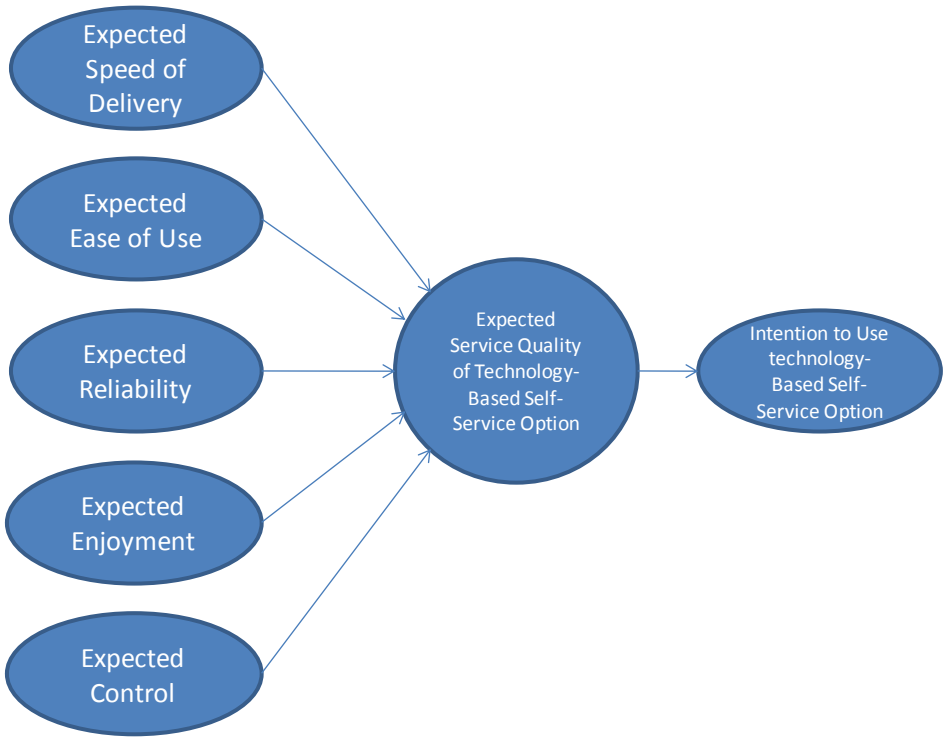

Figure 2.14 Attribute-based Model
Source: Dabholkar, 1996

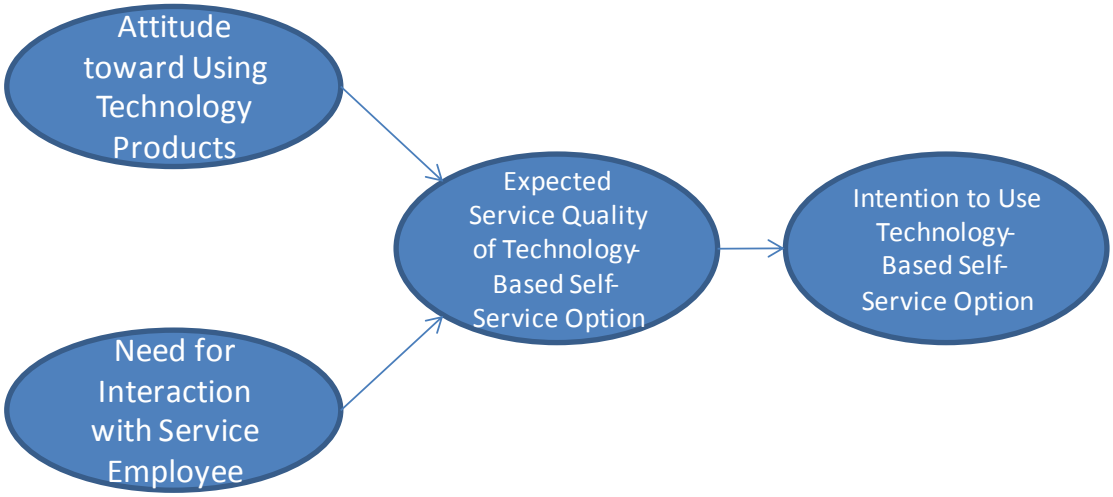

Figure 2.15 Overall Affect Model
Source: Dabholkar, 1996

Meuter et al. (2000) investigated customer satisfaction regarding SSTs and determined the key successful factors through a critical incident technique. These factors are as follows:

1. Solved intensified need

Eleven percent of the respondents thought SSTs can solve intensified needs, meaning any emergency transaction due to an external environment can be met by SSTs.

2. Compared with personnel services, self-service is better than the alternative

Sixty-eight percent of the respondents answered that the advantages of SSTs makes them satisfied with their use. The advantages are as described below.

- Easy to use: Sixteen percent of the respondents thought SSTs are easier than personnel services in terms of transaction.
- Avoid service personnel: Three percent of the respondents thought using SSTs can avoid interruptions from service employees. Most cases

considered SSTs to be much more effective than employees.

- Saved time: Thirty percent of the respondents thought using SSTs can save time.
- When I want: Eight percent of the respondents thought SSTs have no limitation in terms of time. They can be used anytime if needed.
- Where I want: Five percent of the respondents thought that SSTs have no limitation in terms of place. They can be used anywhere.
- Saved money: Six percent of the respondents thought they can save money using SSTs.

3. Did its job

Twenty-one percent of the respondents thought that technology itself can genuinely accomplish what it is supposed to do. SSTs make transactions easier and more convenient.

In addition to the factors mentioned above, personal characteristics were considered as a major variable affecting SST adoption behavior (Dabholkar and Bagozzi, 2002; Susskind, 2004).

Parasuraman (2000) argued how personal characteristics affect the intention of adopting SSTs. His proposition is helpful in understanding the causality between personal characteristics and SSTs. Technology readiness was employed to measure the user differentiation analysis in each country (Parasuraman, 2000; Parasuraman et al., 2004; Tsikriktsis, 2004), or the technology readiness of service employees (Maylor et al., 2004), as well as the causality among perceived ease of use, ease of use itself, and behavior intention (Yi et al., 2003). To summarize, regarding SSTs, the influence of individual characteristics (intrinsic variable) must be considered (Parasuraman and

Grewal, 2000; Lang and Colgate, 2003).

Parasuraman (2000) defined "Technology Readiness" as an individual's propensity to embrace and use a new technology to accomplish goals at home and work. This dimension is an overall mental status derived from a gestalt of mental attitudes, and this kind of individual difference can be viewed as an enabler or inhibitor in determining jointly an individual's tendency to use a new technology.

Parasuraman cooperated with Rockbridge Associates and proceeded with a focus group interview of its customers in order to collect the key factors in using a technology. Among these factors, flexibility, convenience, effect, and enjoyment were positive, while insecurity, out-of-date risk, bad human interface, and incontrollable factors were negative. After decoding, they developed a preliminary Technology Readiness Index scale containing 44 items. The scale was then reduced to 36 items, with four dimensions based on reliability, validity, and a factor analysis. The remaining four dimensions were "optimism," "innovativeness," "discomfort," and "Insecurity."

1. Optimism

   This is a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives.

2. Innovativeness

   This is a tendency to be a technology pioneer and thought leader.

3. Discomfort

   Discomfort is a perceived lack of control over technology and a feeling of being overwhelmed by it.

4. Insecurity

This is a distrust of technology and skepticism about its ability to work properly.

Among these four dimensions, “optimism” and “innovativeness” are considered enablers of technology readiness to encourage a consumer’s positive feeling in terms of technology use. On the other hand, “discomfort” and “insecurity” are inhibitors restraining consumer’s feelings regarding the use of technology. These results are similar to the “Technology Paradox” proposed by Mick and Fournier (1998), which indicates that the consumer has both positive and negative attitudes toward a technology.

For applying technology readiness, Hendry (2001) investigated the relationship between technology readiness and e-learning usage. He categorized students into three groups, face-to-face learning, long-distance learning, and online learning, in order to understand how different technology readiness will affect their willingness to use a technological service delivery. The results showed that students choosing online learning tend to adopt new technologies, while students choosing face-to-face learning have a lower tendency in terms of technology adoption.

To summarize, the major determinants of using SSTs by the customer are as shown below. Some determinants are considered as external factors like service design, financial security, and so on, while some are internal, such as human contact, perceived risk, and technology readiness. Thus, in order to explore the user’s intrinsic traits of public e-service adoption, human contact, perceived risk, and technology readiness are discussed further in the next chapter.

Table 2.4 The determinants of using SSTs based on customer willingness

Determinants	Past researches
Service Design	Bitner (1992) Szymanski and Hise (2000) Meuter et al. (2000)
Convenience	Szymanski and Hise (2000) Rayport and Sviokla (1994) Globerson and Maggard (1991)
Financial Security	Szymanski and Hise (2000) Parasuraman (2000)
Low Cost	Rayport and Sviokla (1994) Meuter et al. (2000) Globerson and Maggard (1991)
Demographic Characteristics	Dickerson and Gentry (1983)
Consumer Creativity	Dickerson and Gentry (1983)
Previous Experience	Dickerson and Gentry (1983)
Enjoyment	Davis et al. (1992) Dabholkar (1996) Dabholkar and Bagozzi (2002)
Perceived Control	Dabholkar (1996) Bateson (1985) Parasuraman (2000) Globerson and Maggard (1992)
Ease of Use	Davis et al. (1989) Dabholkar (1996) Dabholkar and Bagozzi (2002) Meuter et al. (2000) Bateson (1985)
Human Contact	Bateson (1985) Dabholkar (1996) Meuter et al. (2000)
Time	Lovelock and Young (1979) Bateson (1985) Globerson and Maggard (1991) Dabholkar (1996) Meuter et al. (2000)
Perceived Risk	Bateson (1985)

	Globerson and Maggard (1991)
Customization	Bitner et al. (2000) Meuter et al. (2000)
Reliability	Dabholkar (1996)
Technology Readiness	Parasuraman (2000)

2.4 Service Quality and Customer Satisfaction

2.4.1 Conceptualization of e-service quality

Service quality has been shown to promote user satisfaction in the literature in the IS field (Van Dyke et al., 1997), and customer satisfaction and loyalty in the marketing field (Collier and Bienstock, 2006). More recently, interest in service quality has shifted to reflect current developments in e-commerce that emphasize service quality. E-service quality can be described as overall customer evaluations and judgments regarding the excellence and quality of e-service delivery in a virtual marketplace (Santos, 2003). An online transaction is a complex process that can be divided into various sub-processes such as navigation, information searching, negotiation, online payment, delivery, and after-sales services. Thus, e-service quality contains multi-components, which reflect two attributes: a measurement-system attribute and service attribute. A system attribute stresses technological elements, such as efficiency, speed, and security. On the other hand, e-service quality is not solely an evaluative outcome of a system, and the essence of service quality is customer service such as order delivery and after-sales service.

A definition of e-service quality can be generated from the following descriptions, which are based on previous studies.

1. Rust and Oliver (1994)

They argued that services provided through Internet retail were not only to fulfill the contract and real-time responsiveness to the customer, but also the experience in terms of information interaction.

2. Hoffman and Novak (1996)

A service provided on the Internet is a human-to-machine interaction, and not a human-to-human one. Therefore, users are unable to know the attitude or uniform of the service employees. This is a completely different context from measuring traditional service quality.

3. Lociacono et al. (2000)

They defined e-service quality as being derived from the quality of the website's operational skill, but not the quality passed on to the customer by the look of the website.

4. Zeithaml et al. (2002)

They defined e-Service quality as the extent to which a website facilitates efficient and effective shopping, the purchasing and delivery of products and services. They noted four key dimensions, efficiency, fulfillment, reliability and privacy.

From the discussion above, it can be stated that the nature of a service will present different intangibilities according to the different service types. This usually occurs during interaction among the customer, service provider, facilities, equipment, and resources. Zeithaml et al. (2002) argued that when experiencing a virtual environment, the customer will have another set of criteria to evaluate the service quality from a

real environment. Moreover, the factors that influence an online service include not only traditional reliability, but also the trust level from the buyer or user toward the website.

In addition, the e-service quality will influence the purchase attitude, loyalty, satisfaction, and repurchasing decision of the user, as well as provide a great effect toward the organization's performance in terms of operation and financing.

Table 2.5 The definitions of e-service and e-service quality

Scholars	Definition
Rust and Oliver (1994)	E-service refers to an interaction experience in term of information between user and service provider.
Hoffman and Novak (1996)	A service provided on the Internet is a human-to-machine interaction, and not a human-to-human one. Therefore, users are unable to know the attitude or uniform of the service employees.
Lociacono et al. (2000)	They defined e-service quality as being derived from the quality of the website's operational skill, but not the quality passed on to the customer by the look of the website
Parasuraman et al. (2002)	e-Service quality as the extent to which a website facilitates efficient and effective shopping, the purchasing and delivery of products and services.

2.4.2 Service Quality and e-Service Quality

Obviously, an e-service is different from a traditional service in terms of its character and nature. The traditional service industry contacts customers by setting up a service site to provide face-to-face service delivery. However, an e-service provides human-to-machine interaction instead of human-to-human interaction. Users will not

know who is serving them and what the service employee's attitude is, and the context is quite different from measuring traditional service quality. In this case, the connotation of e-service quality cannot be covered by using a traditional service quality model directly, and some differences between traditional service quality and e-service exist from the user's viewpoint as well.

Yang and Jun (2002) analyzed the differences between traditional service quality and e-service quality in order to clarify the service nature and its measurement dimensions according to different service types.

Table 2.6 The definition of traditional service quality and e-service quality

Measuring Dimension	Traditional Service Quality Dimension	e-Service Quality Dimension
Security	The professional and polite service is accepted by customer	The risk as user proceeds with online shopping, online transaction and sensitive data exchange.
Personalization	Service provider provides customer a intimate and specific attentive service.	Whether service provider is able to interact with user to provide customized service immediately.
Availability	NA	Whether user is able to find necessary product from the information source in the website.
Responsiveness	The willing that service employee to help customer in a speedy means.	The response to customer, recovery of data and the speed of Internet transferring.
Ease of Use	NA	The understanding of online index, website contents as well as the information and description of product and service.

Access	NA	Whether customer is able to access the service provider through any channel to get help or support like e-mail or toll-free call.
Reliability	The ability to provide promised service precisely and reliably.	During the promised period, service provider is able to response effectively, the certainty and accuracy of product and service delivery.

Furthermore, the SERVQUAL scale developed by Parasuraman et al. (1988) and its related models have established a perfect benchmark in terms of service quality measurement. However, with the speedy development of emerging technologies and the pervasion of SSTs, e-services also face new challenges in terms of individualization and self-service (Dabholka, 2000; Bitner et al, 2000). These challenges are as follows:

1. The way to serve customers

   The appearance of the Internet has made organizations change their perspective from a product-oriented to service-oriented one. A sales-oriented strategy is not the only way to interact with customers; instead, organizations should understand what users need.

2. To change and increase competitive advantage

   A new service model can be provided using the Internet. Using SSTs, for example, the customer is able to serve him/herself, and consequently this can change the basic principles of competition.

From this point of view, it can be determined that interactions between consumer

and ICTs are becoming more and more extensive, and thus most scholars are paying attention to e-commerce and Internet-based interactive customer services. Moreover, these Internet-based services are still too complex and risky to be accepted by customers, and thus e-service quality will play an important role in differentiating services from their competitors. Therefore, service providers should understand how users view e-service quality, and how to help them fulfill their needs effectively.

2.4.3 The Dimensions of e-Service Quality

Since the business model of an e-service is quite different from the traditional service industry, the dimensions of e-service quality need to be restructured by reviewing the business model of the e-service, but not by applying these dimensions for a real environment blindly into a virtual context. For example, there are huge differences between online stores and real stores, even though both are in the retail industry. In this case, the retail service quality scale cannot be applied to the online retail store due to these differences in nature (Dabholkar et al., 1996).

Moreover, among these dimensions, a different service quality dimension has a different influence on the consumer's perception of service quality. In other words, only few services are able to fulfill and achieve the consumer's service quality requirements. By doing so, an organization is able to add important but limited resources to effectively improve service quality. It can also avoid spending important resources to improve minor ones (Oliva et al., 1992). Therefore, in order to understand e-service quality, we must review what the service quality dimensions are. The following are some perspectives and arguments.

Zeithaml et al. (2002) proposed 11 dimensions regarding e-service using a "focused conversation method" and "qualitative analysis." Then, using an exploratory

focused conversation method and two-step empirical study, they developed e-SERVQUAL with important dimensions to measure e-service quality. Its seven dimensions are as follows.

Table 2.7 The dimensions and descriptions of E-SERVQUAL

Dimensions	Description
Efficiency	The ease and speed of accessing and using the site
System Availability	The correct technical functioning of the site.
Fulfillment	The extent to which the site's promises about order delivery and item are fulfilled.
Privacy	The degree to which the site is safe and protects customer information.
Responsiveness	Effective handling of problems and returns through the site.
Compensation	The degree to which the site compensates customers for problems.
Contact	The availability of assistance through telephone or online representatives.

Source: Zeithaml et al., 2002

Yang and Jun (2002) modified the E-SERVQUAL from Parasuraman et al. (2002) by reviewing the literature and personal interviews, and developed an evaluation scale. They also invited certain experts to evaluate the scale and pre-tested it using nine students. They finalized the scale and called it e-service quality (E-SQ) after a factor analysis. In their scale, many important service quality dimensions that might affect a user's behavior regarding the use of an information system were contained, such as security, personalization, availability, responsiveness, ease of use, access, and reliability. The definitions are as follows.

Table 2.8 Modified E-SQ

Dimension	Definition
Security	The risk perceived by user as proceeding with online shopping, online credit case transaction and sensitive data exchange.
Personalization	To provide a real-time and customized interaction and service with user.
Availability	User is able to search what he/she wants through the information on website.
Responsiveness	The response to customer, recovery of data and the speed of Internet transferring.
Ease of Use	The understanding of online index, website contents as well as the information and description of product and service.
Access	Whether customer is able to access the service provider through any channel to get help or support like e-mail or toll-free call.
Reliability	During the promised period, service provider is able to response effectively, the certainty and accuracy of product and service delivery.

Source: Yang and Jun, 2002

Van Riel et al. (2003) investigated the quality expectations concerning online service offerings, and conducted a survey on the effect of customer disposition toward traditional services. In addition, the zone of tolerance was replicated for an online context. The results indicated that online customers have the smallest zone of tolerance for the two quality dimensions they found most important: security and reliability. Furthermore, positively predisposed online customers appear to be more demanding with respect to service quality. The dimensions they employed are as

follows.

Table 2.9 Measurement items for e-service quality perception

Dimension	Item
User Interface	Interesting information available and accessible; website is clear and well organized; link/downloads function well
Reliability	Website is 24/24 and 7/7 available; information is up-to-date or real-time; service does things right first time
Security	Transactions via the website are secure; personal information is treated confidentially
Customization	The website can be customized; the website takes your needs into account; special deals are offered to loyal customers; personal assistance is available on the website
Responsiveness	It is easy to get in touch via the website; the website responds rapidly to requests; the website confirm orders rapidly

Source: Van Riel et al., 2003

In addition, many scholars are dedicated to developing a scale of e-service quality, and have proposed various measurement dimensions as follows.

Table 2.10 Other dimensions related to service quality

Scholar	Dimension	Definition/Items
Liu and Arnett (2000); Loiacono et al. (2000); van Riel et al. (2001); Yoo and Donthu (2001); Barnes and Vidgen (2002); Yang et al. (2004)	Website design quality	quality of information; service; security; playfulness perceived by consumer; design of the website; information fit to task; interactivity; trust; response time; design appeal; intuitiveness; visual appeal; innovativeness; flow; integrated communication; business process; substitutability; core service; support service; user interface; aesthetic design; processing speed; usability; service interaction; accessibility
Wolfinbarger and Gilly (2001, 2002, 2003); Zeithaml et al. (2001); Cox and Dale (2001); Parasuman et al. (2005)	Online retailing services	website design; reliability; privacy; customer service' performance; features; structure; storage capacity; service ability; security and system integrity; trust; responsiveness; product/service differentiation and customization; web store policies; reputation; assurance; empathy; responsibility; access; flexibility; ease of navigation; efficiency; price knowledge;
Schwartz (1999)	Connectivity	Website can be connected to each other.
Honeycutt et al. (1998); Lynch and Ariely (2000)	Information content	To provide more valuable and detail information, and more categories are able to attract more customers. Fast search could increase re-browse or re-purchase action.

Connectivity (Schwartz, 1999) referred to the characteristic linking to different websites, which eliminates the limitation of geography in providing searching services to users.

Honeycutt et al. (1998) argued that the Internet can offer more valuable and detailed information, and the more categories there are, the more customers there will be. They called this the information content dimension of e-service quality. Similarly, Lynch and Ariely (2000) argued that the user is able to utilize a search engine to obtain the information he/she wants rapidly. This can increase user satisfaction in terms of e-service and make the user re-browse or re-purchase. Kanter (2000) argued that as the development of ICTs, such as computer hardware and software, progresses, the operation will become more complex; this will create new problems, and fail to solve problems in terms of utilization. Javenpaa and Todd (1997) indicated that when establishing online services, we must consider not only the functions of the site, but also the ease of use toward the user, for example, the existence of an internal search engine, read speed, overall design, a clear index, and so on. To summarize, these are the measurements of the ease-of-use dimensions of e-service quality.

In addition, Liu and Arnett (2000) indicated that information quality, system usage, system design, and enjoyment are key successful factors of e-commerce. Information quality refers to the user's subjective perception of the information system, which means whether the system is able to provide precise, real-time, detailed, and customized product information. Service quality focuses on a quick response and related after-service.

System usage means that the interface must be friendly and easy to use, allowing the user to handle and track the procedure, as well as provide a mechanism for

protecting user privacy and establishing trust between the user and company. The quality of the system design refers to the information system itself, such as the engineering-oriented performance, a well-designed search function and links, smooth browsing, and a secure mechanism. Enjoyment means the content of the website is able to encourage the user to become actively involved, and can make the user feel enjoyable and excited during the browsing process.

Shohreh and Christine (2000) indicated from a customer perspective that there are seven essential factors, namely, responsiveness, company background, customized service, content, accessibility, search engine, and website layout.

Gefen (2002) suggested that in evaluating the online service quality, the five dimensions of the SERVQUAL model must be collapsed into tangibles, within a combined dimension of responsiveness, reliability and assurance, and empathy.

Chaffey and William Edgar (2002) examined online services using the SERVQUAL model and concluded that the constructs of SERVQUAL are valid. They also suggested that both provision of accessible and relevant information and clarity of technical performance of the site are important.

There are a plethora of Internet marketing guides and texts in print, however, the e-service quality discussion is limited to didactic discussions on the relationship of management rather than the metrics of service quality (Harrel, 2001; Strauss and Frost, 2001). The discussion of e-services in the public sector is even more limited. Kaylor et al. (2001) pointed out that considerable literature to date on the area of e-government service delivery tends to focus on ideal standards rather than actually examining the realities of delivery: “these standards do not give us insight, however, into the specific function and service as they emerge on municipality Web sites.”

To summarize, many indicators have been proposed, as mentioned above. However, in order to meet the context of a public e-service, this study employed the e-service quality perception model proposed by Van Riel et al. (2003) for its measurements. This model contains "user interface," "reliability," "security," "customization," and "responsiveness," and these measurement items focus not only on the website design but also on the service efficiency. They also perfectly match the trend and logic of a public e-service design.

2.4.4 Customer Satisfaction

The concept of customer satisfaction was introduced by Cardozo (1965), who studied how the gap between actual feeling and expectation affects user satisfaction and repurchasing behavior. The most common definition of customer satisfaction was "within the disconfirmation of expectations paradigm" (Oliver, 1980). This refers to the scenario of the customer judging a service or product according to prior experience or expectation and the actual performance, and whether to feel satisfied or not based on a gap.

This definition comes from an important theory foundation, the "expectancy-disconfirmation theory." This theory consists of two processes, one is the expectation before consuming, and the other is the disconfirmation derived from an inconsistency between expectation and perceived performance. Hence, the level of expectancy has become a comparison standard for customers, and they will form their evaluation after comparing their expectation with a real performance (Oliver, 1980).

Bitner (1990) presented the "Service Encounters Evaluating Model" to integrate the expectancy-disconfirmation model, attribution theory, service marketing matrix, customer satisfaction, and perceived quality in order to describe the major construct

during a service encounter.

In this model, the "expectancy-disconfirmation theory" is related to customer satisfaction, which refers to the gap, magnitude, and direction between the expectation and real perception toward a service as encountered by the user. If the expectation is above the real perception, the user will be dissatisfied with the service; otherwise, if the expectation is lower than the real perception, the user will b satisfied with the service (Oliver, 1980).

Attribution refers to the inference process when the customer perceives a successful or failed service outcome. According to Weiner's research (1980, 1985), attribution occurs not only for the reason of outcome, but also due to the attributions of responsibility, the judgment of avoidance, frequency, and so on.

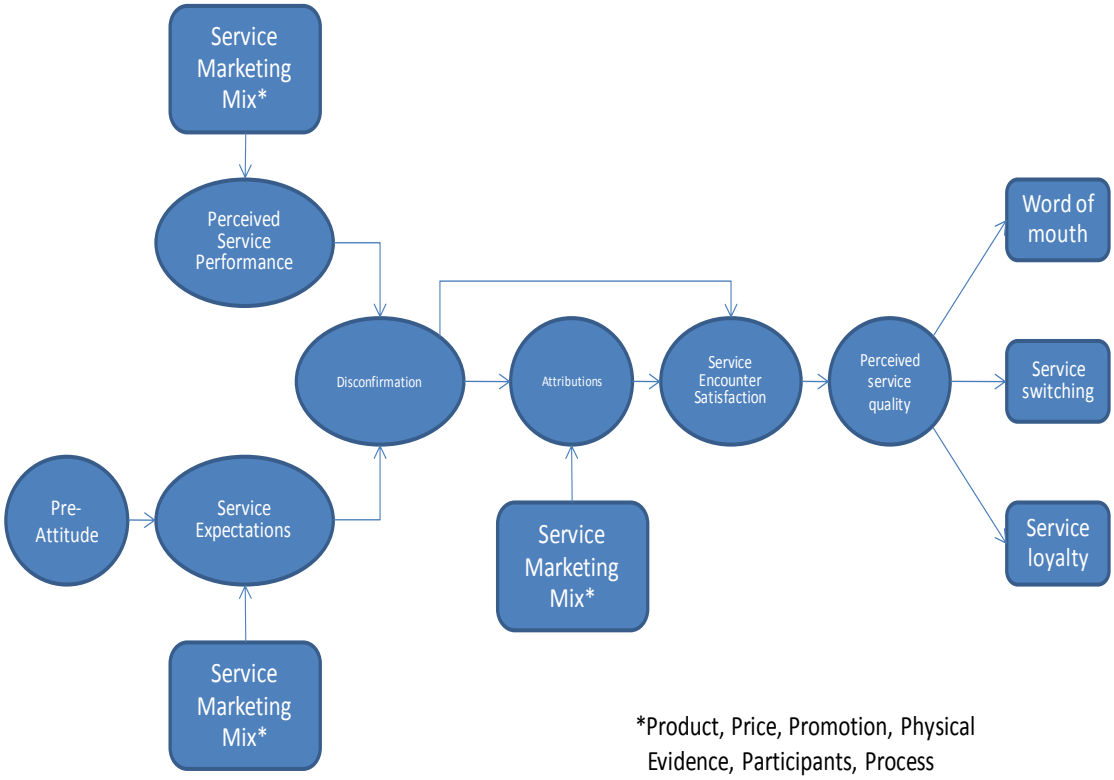

Figure 2.16 A model for a service encounter evaluation
Source: Bitner, 1990

A service marketing matrix was developed by Booms and Bitner (1981). A traditional marketing matrix comprises the 4 Ps, “product,” “place,” “promotion,” and “price,” which are unable to explain a marketing matrix in terms of service industry. Therefore, the authors completed a service marketing matrix by adding extra components, people, physical evidence, and process, according to the characteristics of intangibility, inseparability of production and consumption, and the belief that the customer is the process itself.

According to Bitner’s research (1990), from a customer’s point of view, every encounter is a service in itself, which means that the customer will have his/her own judgment on the service quality and will consequently form his/her own level of satisfaction. From the service provider’s viewpoint, a service encounter should be seen as one of the important strategies in terms of customer satisfaction.

3 Conceptual Framework and Relationship

3.1 Conceptual Framework

Many previous studies that have adopted a user-centric approach to e-government are concerned with how to provide a more convenient and continuous service to users from a system perspective. However, there is no research that explores the intrinsic characteristics and their effects on public e-services. Considering the innumerous evidence that public e-services have only been adopted by a specific group of users, and that we are able to spread out the user experience as we first identify user profiles and understand user perception toward e-service quality and satisfaction, more comprehensive work is needed to inform approaches revealing the specific characteristics of a user and their influence on e-public service adoption.

According to the discussion mentioned in chapter 2, this study generated the proposition that user traits will significantly affect an individual's perception on service quality and satisfaction. Based on the context of public e-service, a comprehensive and integrated framework was proposed in order to explore and verify the relationship among a user's intrinsic traits and his/her perceived quality toward the e-service under the context that the user has adopted the e-service already. Moreover, this research intends to explore the relationship between user satisfaction toward an e-service derived from the perceived quality, and the consequence in terms of satisfaction with the government.

This study tries to look into this important individual variance in terms of intrinsic traits in order to gain insight into the current user's profile, by discussing user traits

and the perception of quality of the e-service, and by examining the causality. Meanwhile, unlike previous studies that discuss from a single perspective, such as information system or service marketing, this study employs a multi-faceted analytical method by integrating different kinds of theories and perspectives, namely sociology, management and informatics, and thus providing an interdisciplinary blueprint to be further used for revealing user traits. From a multi-faceted literature review, the major intrinsic determinants, such as computer self-efficacy, technology readiness, anxiety, perceived risk, human contact and engagement experience, that might be influential toward the user's willingness to use a public e-service have been considered.

The essence of public e-service is different from other e-services as it contains a political structure and authority that may intimidate users from embracing the service. To explain a user's behavior toward a public e-service, this study introduced the concept of civic engagement tendency, which is derived from a public administration perspective. Engagement tendency refers to people's experience in terms of their involvement in public affairs, and it is exclusive in the context of a public e-service. Another factor, technology anxiety, was obtained from the perspective of information systems, while technology readiness, need for interaction with service employees, and perceived risk were derived from service marketing theory.

Moreover, the user's perception of e-service quality is partially derived from these user traits, and e-service quality is considered as major source of satisfaction with an e-service and the entire government. Thus, the results of this study are able to be used as a benchmark or reference for public e-service policy makers. These managerial and policy implications, as well as a policy marketing model, will be discussed according to the results of an empirical analysis.

Based on the preliminary outcome, five components, technology readiness, technology anxiety, need for interaction with service employees, engagement tendencies, and perceived risk are defined as the key traits in this study, and will be discussed in more detail in the following section.

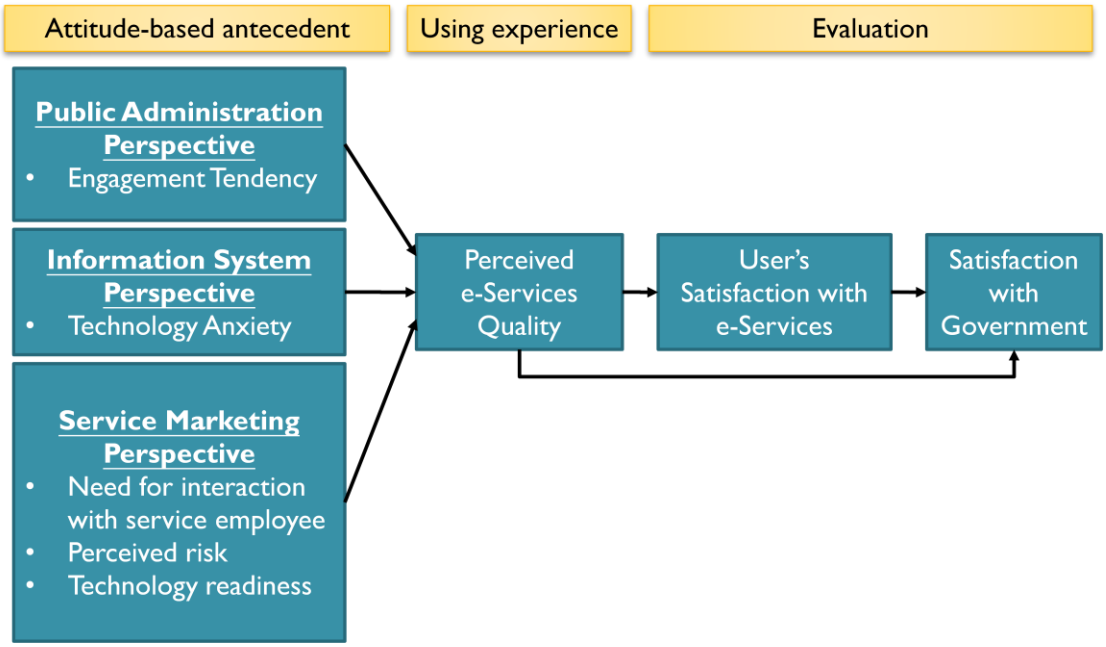

Figure 3.1 Conceptual Framework

3.2 Relationship between Factors

According to the conceptual framework mentioned above, this study proposes three relationships under a well-designed public e-service delivery system as follows.

- User traits (attitude-based antecedent) significantly affect user perception of e-service quality (use experience). The attitude-based antecedents contain an engagement tendency from a public administration perspective; technology anxiety from an information systems perspective; and the need for interaction with service employees, perceived risk, and technology readiness from a service marketing perspective.

- User perception of public e-service quality (using experience) significantly affects user satisfaction with an e-service, as well as satisfaction with the government (evaluation).
- User satisfaction with an e-service significantly affects user satisfaction with the government.

In the following section, the factors of user traits and other dimensions are discussed in order to understand the causality and relationship among them.

3.2.1 Technology Readiness and Technology Anxiety

The concept of technology readiness was proposed by Parasuraman in order to reinforce the explanation of a traditional triangle model of service marketing. This can be viewed as an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's predisposition to use a new technology (Parasuraman, 2000). Similarly, from a user competency perspective, McClure (1994) thought that people who have surfed the Internet should hold a certain amount of literacy, such as computer and network literacy, in order to solve problems through the use of technology. However, compared to McClure's viewpoint, technology readiness is much closer to the level of human psychology in nature, but not the level of acquired ability.

Technology readiness consists of four dimensions, optimism, innovativeness, discomfort, and insecurity. It serves as an insight into a person's own motivation and inhibitions regarding the adoption of technology, but not competency (Parasuraman and Colby, 2003). Optimism refers to a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives.

Innovativeness is a tendency to be a technology pioneer and thought leader. Discomfort refers to a perceived lack of control over technology and a feeling of being overwhelmed by it. Insecurity is the distrust of technology and skepticism about its ability to work properly.

Another idea, "computer anxiety," is somehow related to technology readiness, which is defined as "the fear, apprehension, and hope people feel when considering using or are actually using computer technology (cited from Meuter et al., 2003). Meuter et al. (2003) extended the idea to include technology anxiety, which focuses on the user's state of mind regarding general technology tools, whereas computer anxiety is more narrowly focused on anxiety related to personal computer use. Furthermore, technology anxiety is an opposite concept to technology readiness, which specifically focuses on people's willingness and ability to use technology-based tools.

In the Technology Acceptance Model (Davis, 1989), attitudes toward technology use have been discussed widely, as derived from users' perceived ease of use and perceived view of the technology's performance. In addition, the perceived ease of use and perceived performance are affected by the individual's innovativeness or so-called technology readiness. Citrin et al. (2000) pointed out that individual domain-specific innovativeness will produce an interference effect on Internet use and online shopping. In addition, Dabholkar and Bagozzi (2002) found that the characteristic of inherent novelty seeking, which is similar to technology readiness, will attenuate a positive relationship between perceived performance and attitude toward the use of technology-based self-services.

In addition, Dabholkar and Bagozzi (2002) have employed the term "self-efficacy" to explain the user's attitude toward using technology-based self-services. Generally

speaking, a user with greater self-efficacy will have more confidence in his/her ability to use a technology-based self-service. In this case, a high self-efficacy is quite similar to low technology anxiety, and perceived ease of use may not be that important compared to those with low self-efficacy. Yi and Hwang (2003) stated that application-specific self-efficacy and computer self-efficacy will have a positive effect on ease of use and actual use of a system, respectively. Meuter et al. (2003) also illustrated that the level of technology anxiety will influence the experience of using a technology, and that the lower the technology anxiety, the higher the satisfaction toward technology-based self-services.

To summarize briefly, technology readiness and technology anxiety are both states of mind in terms of technology use. Compared with extrinsic factors that will influence the use of e-services such as information access, information ability, and information literacy, intrinsic factors, technology readiness and technology anxiety, are able to provide a better explanation as the ratio of citizens who are capable of using the Internet is generally increasing in certain countries and areas[12]. In other words, as the ability of technology utilization reaches a specific level, the user's intrinsic factors will become more influential than the extrinsic ones.

3.2.2 Need for Interaction with Service Employees

A "service encounter" has been thought of as a key element affecting a customer's perceived quality of a service. Many people called this "the moment of truth." It has been defined broadly as the period of time during which a consumer directly interacts with a service, which means the interaction between the customer and service delivery

[12] According to a survey conducted by the Ministry of Public Management, Home Affairs, Post and Telecommunications of Japan, 74.9% of Japanese citizens were capable of using the Internet in 2005, whereas 69.4% were capable in 2003. In Taiwan, the same ratio has grown from 61.1% in 2004 to 65.6% in 2007.

system including service employees, facilities, and other tangible factors (Bitner, 1990). However, many researchers have indicated that a loyal customer is derived from the quality of human contact between the customer and service employee (Soloman et al., 1985), and thus face-to-face interaction by a customer and service employee has been thought to be a core factor in terms of service marketing.

Dabholkar (1996) used the term, "need for interaction with a service employee," to illustrate this phenomenon. This interaction during a service delivery is very important to some consumers (Bateson, 1985). Moreover, in the case of self-service technology use, users with a need for interaction with service employees will avoid using self-service technologies like ATMs, and vice versa. A similar concept and finding was proposed by Meuter et al. (2000).

Also, within the need for interaction with service employees exists a moderating effect of the consumer's perceived ease of use on his/her attitude to use a technology-based self-service (Dabholkar and Bagozzi, 2002). As mentioned above, an individual with a greater need for interpersonal contact tends to avoid machines, and instead would like to interact with service employees. Therefore, for those who have high interpersonal contact needs, the perceived ease of use of a service should be strengthened in order to be adopted by the user.

Being technology-based services, public e-services may have the same effect. Citizens who have the need for interaction with public servants will not use public e-services actively. The reason may be that, on one hand, the intrinsic tendency of human contact makes the citizen comfortable, and thus the citizen values this kind of contact. On the other hand, a long term relationship has probably been established between the citizen and his/her public servants, and thus the citizen tends to contact such servants directly. In this case, public e-services will become merely a

complement for an on-site service, but not a substitution.

3.2.3 Tendency of Engaging in Public Affairs

The tendency to engage in public affairs, or so-called civic engagement, has multi-dimensional definitions depending on the scope and field. Civic engagement refers to the ways in which citizens participate in the life of the community in order to improve the conditions of others or help shape the community's future (Adler and Goggin, 2005). In Putnam's classical book, *Bowling Alone,* the author indicated that civic engagement is a basic foundation for building "Social Capital." The forms of civic engagement contain official and unofficial social activities. The former includes visiting friends, and playing poker with friends or other similar activities, while the latter is to engage in community services and political engagement (Putnam, 2001).

Regarding the interactive effects between technology use and a citizen's tendency to engage in public affairs, it has been thought that an ambiguous relationship exists due to the limitations of the methodology and observations of raw data (Norris, 2001). Even so, two perspectives can be generated by the existing literature, one is optimism and the other is pessimism or skepticism. Norris (2001) proposed mobilization and reinforcement hypotheses based on skepticism. A mobilization hypothesis considers that technology is able to provide an opportunity to those who would like to be involved in public affairs, whereas a reinforcement hypothesis believes that technology will increase the digital divide because only a portion of its citizens can access information and will dominate resources technologically. Similarly, Carpini's research (2000) also indicates that technology can increase civic engagement for those who are interested in public affairs, or have been involved in public affairs; conversely, for those who are not interested in public affairs, the technology is

somehow useless or ineffective. In general, most researchers agree that technology causes a reinforcement effect rather than a mobilization effect toward civic engagement, at least at this moment. Citizens who engage in the real world will extend their experience into the virtual world using technology.

According to Norris's reinforcement hypotheses, it has been said that a citizen's experience or tendency toward civic engagement may have a positive effect in encouraging him/her to use public e-services to access information, furthering daily contact once he/she has the ability to get online, with the network environment being readied. Moreover, public e-services may not be the only tools for citizens to engage in public affairs. Actually, an e-service itself is one kind of "public sphere" for citizens to engage in. A public sphere refers to an ideal situation in which citizens engage in open-ended conversations that are neither strategic nor of self-interest to the citizen regarding an issue of common interest (Habermas, 1996). In this context, a citizen with a tendency to engage in public affairs should be willing to utilize public e-services as his/her end of civic engagement.

3.2.4 Perceived Risk

Perceived Risk (PR) refers to the feeling of uncertainty regarding possible negative consequences of using a product or service (Featherman and Pavlou, 2003). The formal definition is a combination of uncertainty plus seriousness of the outcome involved, and the expectation of losses associated with a purchase acts as an inhibitor to purchasing or use behavior (cited from Featherman and Pavlou, 2003).

Generally speaking, the major categories of perceived risk can be thought of as performance and psychosocial (Cunningham, 1967). Cunningham further typified perceived risk into six dimensions, performance, financial, opportunity/time, safety,

social, and psychological losses. In addition, an overall measure of perceived risk was proposed to illustrate the occurrence of a trade-off behavior (Featherman and Pavlou, 2003), in which a luxury may reduce social risk by increasing financial risk, for example.

In the marketing literature, perceived risk has been regarded as one of the most important factors influencing consumer behavior (Bauer, 1960; Cunningham, 1967). In the context of e-services or self-service technology, many discussions are dedicated to psycho-social and performance risks. In addition, new items such as privacy risk have been introduced (Featherman and Pavlou, 2003).

Furthermore, Dabholkar and Bagozzi (2002) adopted social risk to explain the concept of "self-consciousness" in terms of using a technology-based self-service. Self-consciousness refers to a person's view of him/herself as a social object, with an acute awareness of other people's perspectives about him/her. Their research pointed out an interesting fact that an individual with greater self-consciousness will hesitate to use technology-based self-services. In other words, a person who perceives a high social risk may be reluctant to use technology-based services. The outcome was also in line with Bateson's research (1985) in terms of risk.

To summarize, compared with e-services provided by the private sector, public e-services contain much more confidential or personal information. Therefore, it is no surprise that citizens may perceive greater risk when using public e-services. Similarly, citizens who risk avoidance will hesitate to use public e-services in which their personal information may be hacked or stolen, particularly if they have an inherent negative image toward government information architecture in terms of uncertainty and insecurity.

3.2.5 Perceived Quality, Satisfaction with e-Service, and Government

In addition, this study is also concerned with the relationship between perceived e-service quality and user satisfaction with the e-service, as well as a consequential satisfaction with the government in general. Hence, the following causalities were determined:

- The perceived e-service quality affects user satisfaction with an e-service significantly.
- The perceived e-service quality affects user satisfaction with the government directly.
- Satisfaction with an e-service affects user satisfaction with the government significantly.

4 Methodology

To verify the factors proposed in this study, a survey was conducted based on two cases. Two leading-edge cities in terms of e-service implementation, Taipei and Tokyo, were adopted to examine the framework. Taipei and Tokyo are both dedicated to developing their own e-government systems, named "CyberCity project" and "E-city project," respectively. Taipei has earned a great deal of attention in terms of ICT deployment, and was awarded the Intelligent Community Award in 2006 by the WTA[13]. Similarly, most online services in Tokyo are highly utilized compared with other cities of Japan. These two cities are good representatives of Taiwan and Japan, which are always in the top-four leading Asian countries according to Waseda University's e-government ranking.

This study also developed a delicate questionnaire according to the proposed framework, as well as an operational definition fitted to this study. Furthermore, the constructs, measurements, and scales of this study are considered to meet the requirements of content validity academically.

Moreover, a sophisticated and accountable statistic methodology called Partial Least Squares (PLS) was employed in this study to verify the path relationships. In order to verify the causality of the model, the PLS method is a useful alternative to Covariance-based SEM[14], and it can be a powerful method of analysis due to the minimal demands regarding measurement scales, sample size, and residual distributions.

The rest of this chapter will discuss the methodology of this study in terms of case

[13] World Teleport Association
[14] Structural Equation Modeling

description, and the survey and analytical methods used.

4.1 Case Description: Taipei

4.1.1 Taipei-A Vision of Cyber City

Taipei is located on the western rim of the Pacific Ocean, in the Southeast of the Asian mainland. The city of Taipei is situated in a basin surrounded by mountains on three sides and a river on the other. Founded in 1884, the city now boasts 120 years of history. Taipei is the political, economic, financial, and cultural center of Taiwan. With a total area of 272 km^2 and a population of 2.62 million, the city has an average population density of 9700 people per km^2.

Under this geographic limitation, the Taipei city government (TCG) resolved to establish a virtual new city called CyberCity. From 1999, TCG initiated the CyberCity project, which included not only ICT infrastructure but also applications in order to make Taipei a leading frontier of digitalization. To date, Taipei has earned a great deal of attention in terms of ICT deployment. For example, TCG won the best prize for ICT deployment in the public sector, WCIT 2002[15]. It was also awarded the best intelligent community of the year in December, 2003, as well as the Intelligent Community Award in 2006 by the WTA.

4.1.2 CyberCity Project and its Accomplishments

Until now, TCG has completed two stages of the CyberCity project. From 1999 to 2002, the main tasks were internal reengineering involving service processes, management procedures, and organizational learning. From 2003 to 2006, more

[15] World Congress of Information Technology

applications including both wireless and wired were deployed. The major achievements are illustrated below.

1. Cyber Citizen

The citizens of Taipei city are able to register an account that can be used to access all databases within the Taipei city network. As of 2005, there are more than 312,798 people who have registered as cyber citizens in Taipei city.

2. Free Internet Resources

TCG provides many kinds of free Internet resources for its citizens. Free email space for non-profit purposes, for example, has attracted more than 300,000 applications from its citizens. Moreover, TCG had also established the Taipei Link for every community to provide local information and services. Thus far, all communities in Taipei city have their own websites.

3. E-document

In order to reduce the costs in dealing with a document exchange and delivery, TCG decided to integrate their e-document system. By 2006, more than 80 agencies of TCG had upgraded their system, and almost 99% of the city's documents were exchanged electronically.

4. Online e-services

TCG offers many kinds of e-services including online declarations and online payments. In April of 2006, there was an average of 27,993 users for these online services each day. Moreover, all of these online services were integrated into one website called "Taipei s-services Online"[16]. A total of 152

[16] http://www.e-services.taipei.gov.tw/hypage.cgi?HYPAGE=index.htm&clsid0=5&scat=0

services and 873 application forms are available through this one-stop portal. It is now serving more than 5,000 cases per month.

5. TCG Portal

TCG established a portal for not only its citizens but also foreigners to provide necessary and real-time information. The portal is multilingual, with data from more than 130 TCG agencies.

To summarize, according to a survey conducted in April of 2006, there are more than 8,526 people accessing the TCG website each day; 1,250 people accessed the English website; 310,773 citizens have registered their account in cyberspace; and 21,475 people access the “Taipei Education Portal” every day, which is the biggest government website in terms of Internet flow rate.

4.2 Case Description: Tokyo

4.2.1 The Profile of Tokyo

Tokyo Metropolis is located in the Southern Kanto region, positioned approximately in the center of the Japanese archipelago. It is bordered to the east by the Edogawa River and Chiba Prefecture, to the west by mountains and the Yamanashi Prefecture, to the south by the Tamagawa River and Kanagawa Prefecture, and to the north by the Saitama Prefecture.

The Tokyo Megalopolis Region, or Greater Tokyo Area, is made up of Tokyo and the three neighboring prefectures of Saitama, Kanagawa, and Chiba. This area is home to around 26% of Japan's total population. The National Capital Region is made up of Tokyo and the seven surrounding prefectures of Saitama, Kanagawa, Chiba,

Gunma, Tochigi, Ibaraki, and Yamanashi.

Tokyo Metropolis is a metropolitan prefecture comprising smaller administrative bodies, special wards, and municipalities. The "central" area is divided into 23 special wards, while the western Tama area is made up of 26 cities, 3 towns, and 1 village. The area comprising the 23 special wards and the Tama region together form a long, narrow stretch of land, running about 90 kilometers east to west and 25 kilometers north and south. The Izu and Ogasawara Islands, two island groups in the Pacific Ocean, are also administratively a part of Tokyo, despite being geographically separated from the metropolis. The islands have 2 towns and 7 villages between them.

The overall population of Tokyo is about 12.79 million (as of September 1, 2007), and the area is about 2,187 square kilometers. The climate is generally mild.

4.2.2 E-City Project of Tokyo

In order to follow the e-Japan strategy developed by Japan’s central government, the Tokyo government initiated an ICT-based project called e-City for its 3.3 million citizens in 2001. The project contained three major parts, infrastructure, application, and government. In terms of governing, the Tokyo government made a sub-project called the e-capital promotion project, and focused on four initiatives, internally and externally. The aspects of these initiatives are as follows.

1. To increase user perception of e-service for both inhabitants and enterprises

To fulfill user needs in terms of e-service, the Tokyo government established a sophisticated architecture for users to conduct e-services, e-applications, and e-procurement. Users are able to download, apply e-service documents and

pay charges and feed online. The architecture also allows enterprises to bid for public procurements with very detailed and transparent information electronically. Moreover, ICT is implemented in various public facilities, such as museums, libraries, hospitals, and disaster prevention centers.

2. To make public administration transparent and extend civic engagement

In order to involve inhabitants in policy making and expressing their opinions, timely and quality information needs to be offered to residents through electronic means. Therefore, the Tokyo government first established a portal to provide necessary information to the public online. The portal enables a two-way interaction through which residents can obtain information and provide feedback. Moreover, the information that the government provides can also be applied to other parties such as schools, transportation companies, and so on, maximizing the utilization of information.

3. Internal management process re-engineering

In this respect, the Tokyo government has set up an internal network for management and processing. These activities include the establishment of documents, general affairs, and accounting systems, as well as the implementation of knowledge management. The network enables the sharing of information among all agencies and local governments.

4. To improve the infrastructure of City Hall and the OA system

A system named TAIMS (Tokyo Advanced Information Management System) and a super backbone for the Tokyo government were established in order to increase the effectiveness and efficiency of internal operations. The backbone is able to connect with other agencies or local governments via the Internet. A

public key ID is also planned for implementation as well.

Moreover, certain legacy information systems have to be upgraded in order to provide better services to both internal and external customers. These systems included a human resource system, integrated health care information system, hospital information system, financial accounting system, and many others. A new system development and operational approach was also introduced to improve the existing system performance. The main points are the use of a standardized format and protocol, identifying a key performance index, establishing a mechanism to monitor system performance, and consulting with external experts and advisors.

To summarize, as the capital of Japan, Tokyo has shared a great number of resources and placed a great deal of attention on e-government and related policies in order to be the benchmark of the e-Japan strategy and a model of a nationwide ICT framework. Moreover, according to a survey from 2004, almost 50% of the residents know what an e-government or e-service is, and many of them have used such services. Based on this rate of penetration and utilization, this study chose Tokyo as one of the samples to examine the proposed relationships.

4.3 Survey of this Study

4.3.1 Instrument Development and Data Collection

A conceptual framework was derived from a thorough review of the related literature. A questionnaire was then developed based on this framework, which referenced many related studies. The initial survey instrument was modified, based on

suggestions and feedback from an adviser and other subject experts. Moreover, the instrument was also reviewed by the webmaster of the Taipei e-service online to reduce any biases that might occur from wording or phrasing. The questionnaire was finally finalized based on all these inputs.

The survey was conducted in both Taipei and Tokyo as an online questionnaire fronted jointly by Waseda University and the Institute for Information Industry[17]. The targets are users of "Taipei e-service online" and "e-Tokyo online services[18]." A cover letter was provided to explain the purpose of the research to respondents in order to persuade them to participate in the survey.

In the case of Taipei, the survey was conducted from the 1st through the 15th of November, and direct email was sent to potential users asking them to complete the questionnaire voluntarily. There were 118 respondents in total. However, 16 respondents had missing data or other problems such as internal employees. Thus, in the end, only data from 102 samples were used in this study.

[17] Institute for Information Industry (III) was incorporated in 1979, through joint efforts of the public and private sectors, as a Non-Government Organization (NGO), to support the development/applications of information industry as well as the information society in Taiwan. III is also the think tank serving the Taiwan government in terms of ICT policy.

[18] The website is operated by Tokyo city government, connected with all municipalities of Tokyo. User is able to access the e-service he or she wants through this portal. In this case, the website is an entry for those who want to use e-services.

Figure 4.1 Taipei e-services online

Source: http://www.e-services.taipei.gov.tw/

On the Japanese side, the survey was conducted from the 15th through the 29th of October. To meet the requirements of the sampling, a pre-test was conducted through the database of goo Research, which is an NTT-based company monitoring more than 4 million cases. A total of 3,700 questionnaires were sent to these potential respondents, with 1,333 replying. Among the respondents, 301 were willing to proceed to the second stage. Finally, 105 samples were obtained to continue the following analysis.

Figure 4.2 e-Tokyo online service

Source: https://www.e-tokyo.lg.jp/info/res/top/PrtlRTopMenu.do

4.3.2 Constructs, Measurements, and Scales

The main purpose of this study is to explore how user traits will affect his/her attitude satisfaction regarding e-services, and consequently toward the government. The key construct is user traits, of which there are five factors, technology readiness,

technology anxiety, engagement tendency, need for interaction, and risk tendency. Furthermore, e-service quality is measured by five variables, responsiveness, reliability, customization, user interface, and overall. Before developing multi-item scale measurements for these constructs to test the relevant relationships, an explicated operational definition of these constructs is needed in order to achieve empirical testability, verifiability, and confirmability. These constructs are derived from related literatures as shown below.

Table 4.1 Constructs and their operational definition

Construct	Operational Definition
Technology Readiness	Constituted by optimism, innovativeness, discomfort and insecurity which is considered overall as the tendency of people are willing to use technology-based service.
Technology Anxiety	The fear, anxious and aspire as people are using or going to use technology-based services.
Engagement Tendency	People's experience in terms of involving in public affairs.
Need for Interaction	People would like to interact with service employee rather than using technology-based service anytime and anywhere.
Perceived Risk	The risk or insecurity that people perceived as they use technology-based service.
Perceived e-Service Quality	People's evaluation toward e-service in terms of responsiveness, reliability, customization, security, user interface and overall aspect.
Satisfaction with e-Service	An overall attitude toward e-service after using it.
Satisfaction with Government	An overall attitude toward government, including the trust and recognition toward policy planning and implementation.

A seven-point Likert scale was employed, as most related studies were conducted in the same way. Ambiguity of the respondents can be avoided with better discriminability. The scale was measured from 1 (strongly disagree) to 7 (strongly agree).

In addition, content validity (also known as logical validity) refers to the extent to which a measure represents all facets of a given social construct. In this study, all measurements were derived from previous research, which indicates that the measurements in this study do have adequate content validity. The constructs and their sources are shown below.

There were 54 questions in the questionnaire, starting with a cover letter describing the purpose of the questionnaire. To execute the survey, the questionnaire was translated into Japanese and Chinese, and was pre-tested by experts of each country. In addition to the items in each dimension, the questionnaire also contains questions regarding the respondent's information such as their age, sex, and education. These questions are beneficial for demographic analysis.

Table 4.2 Questionnaire item and source

Construct	Item	Number	Source
Technology Readiness	Optimism	4	Parasuraman (2000)
	Innovativeness	3	
	Discomfort	3	
	Insecurity	3	
Technology Anxiety		5	Meuter et al. (2003)
Engagement Tendency	Community	4	Kahne et al. (2002, 2005)
	Political	1	Putnam (1998)
Need for Interaction	Need interaction with service employee	4	Dabholkar (1996)
Risk Tendency		3	Featherman and Pavlou (2003)
Perceived e-Service Quality	Responsiveness	3	Van Riel et al. (2003)
	Reliability	3	
	Customization	3	
	Security	3	
	User Interface	3	
	Overall	1	
Satisfaction with e-Service		3	Van Riel et al. (2003)
Satisfaction with Government		5	Van Ryzin et al. (2004) Cohen (2006) Van Ryzin and Immerwahr (2007)

4.4 Analytical Method

4.4.1 Introduction

The covariance-based approach for Structural Equation Modeling (SEM) involves constraints in the form of parametric assumptions, sample size, model complexity,

identification, and factor indeterminacy. Covariance-based SEM assumes that the observed variables follow a specific multivariate distribution and that the observations are independent of one another. Covariance-based SEM analysis conventionally requires indicators in a reflective mode, and in this situation, indicators are viewed as being affected or influenced by the underlying variables. Therefore, indicators are viewed as causing, rather than being caused by, the latent variables. This procedure was not developed for predictive purposes, where the research desires parameter estimates in order to create latent variable scores that can be used to predict its own indicators or other latent variables. In addition, the sample size requirement seems to pose a critical problem, because this requirement is often beyond the research range (Chin and Newsted 1999).

Wold's Partial Least Squares (PLS) method (see Fonell and Cha, 1994; Chin and Newsted, 1999; Fornell and Bookstein, 1982) is a useful alternative to covariance-based SEM. PLS can be a powerful method of analysis due to its minimal demands on measurement scales, sample size, and residual distributions (Wold 1985; Chin and Newsted, 1999), and hence this method is usually termed "soft modeling." PLS models can be specified by an arrow scheme, as shown in Figure 4.3, and each latent variable (LV) is indirectly observed by a block of manifest variables (MVs). LS (Least Squares) estimation is distribution-free, except for predictor specifications, and does not require independent observations. Predictor specifications can be summarized as a linear conditional expectation relationship between dependent and independent variables, and LS modeling based upon predictor specifications is prediction oriented (Wold 1985). That is, the variance-based approach of PLS shifts the orientation from casual model/theory testing to component-based predictive modeling (Chin and Newsted 1999). Table 4.3 summarizes the key differences

between covariance-based SEM and variance-based PLS.

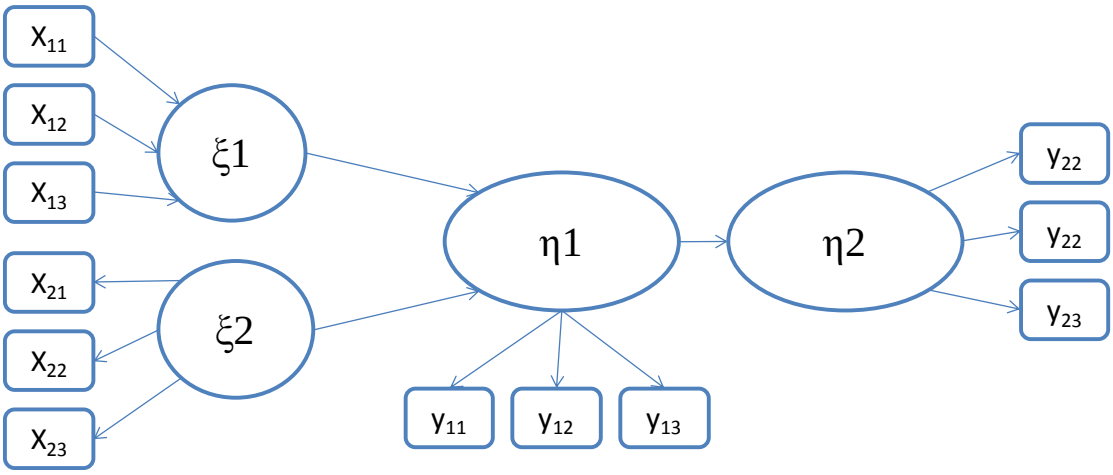

Figure 4.3 An example of PLS Model
Source: Fonell and Cha, 1994

Table 4.3 Comparison of PLS and Covariance-based SEM

Criterion	PLS (Partial Least Square)	SEM (Structural Equation Modeling)
Objective:	Prediction oriented	Parameter oriented
Approach:	Variance based	Covariance based
Assumptions:	Predictor specification (nonparametric)	Typically multivariate normal distribution and independence observations (parametric)
Parameter estimates:	Consistent as indicators and sample size increase (i.e., consistency at large)	Consistent
Latent variable scores:	Explicitly estimated	Indeterminate
Epistemic relationship between a latent variable and its measures:	Can be modeled in either formative or reflective mode	Typically only with reflective indicators
Implications:	Optimal for prediction accuracy	Optimal for parameter accuracy
Model Complexity:	Large Complexity (e.g., 100 constructs and 1,000	Small to moderate complexity (e.g., less

	indicators)	than100 indicators)
Sample Size	Power analysis based on the portion of the model with the largest number of predictors. Minimal recommendations range from 30 to 100 cases.	Ideally based on power analysis of specific model. Minimal recommendations range from 200 to 800.

Sources: Chin and Newsted, 1999

In certain situations, there may be many variables, but not necessarily as many samples and observations. PLS is considered especially useful for constructing prediction equations in such situations (Hoskuldsson 1988; Garthwaite 1994), and the sample range of minimal recommendations is from 30 to 100 cases (Chin and Newsted, 1999). There are two reasons why this study adopted PLS as the statistical method. One is the sample size, and the other is the existence of formative indicators. Due to the limitations of the field survey, a total of 102 and 105 cases were obtained in Taipei and Tokyo respectively, during the testing period. It was suggested that the best sample size for the PLS method is over 10-times the maximum number of latent variables (Barclay et al., 1995), and is 60 in this study. Due to the limitation of this study in terms of sample size, the PLS method was adopted to analyze the data. Moreover, since there are two formative indicators in this study, it was suggested that PLS be used rather than SEM.

Fonell and Cha (1994) and Chin and Newsted (1999) introduced ample information regarding the PLS method, which is useful for learners; therefore, the PLS knowledge used in this study mainly refers to their contribution.

The PLS algorithm follows a three-stage process to obtain three sets of estimates. The first stage helps in obtaining the weight estimates. The second stage provides

estimates for the inner model (i.e., structural relations among latent variables) and outer model (i.e., reflective or formative measurement paths). Finally, the third stage yields the means and location estimates. Once the latent variable scores from stage 1 are estimated, the path relations are immediately estimated through ordinary least squares regression in stage 2. Each dependent variable in the model (either endogenous LVs or indicators in a reflective mode) is regressed in its respective independent variable (i.e., other LVs or indicators in formative mode). When the final paths are estimated in stage 2, and the estimation makes substantive sense (e.g., differences in means, scale, and variances are meaningful), the means and location parameters for the indicators and LVs are finally estimated in stage 3 (Chin and Newsted, 1999).

4.4.2 Model Structure

In PLS modeling, all path models with latent variables consist of three parts: (1) inner relations, (2) outer relations, and (3) weight relations (see Fonell and Cha 1994).

1. Inner (Structural) Relations

The relationships among the latent variables are defined by the inner relations (structural model). Predictor specification implies $E(\eta|\eta,\xi) = \beta\eta + \Gamma\xi$, $E(\zeta|\eta,\xi) = 0$, and $E(\eta\zeta') = E(\xi\zeta') = 0$. The inner relations are defined as

$$\eta = \beta\eta + \Gamma\zeta + \xi.$$

η : Dependent variable
ζ : Independent variable
ξ : Error

2. Outer Relations (Measurement Model)

The outer relations depict the relationships between the manifest variables and latent variables. There are two kinds of measurement modes: reflective and formative. The reflective (outward) model assumes that the observed phenomena are a reflection of the underlying construct. When each manifest variable is influenced by one latent variable, the standardized loadings are correlation coefficients between the manifest variables and their corresponding latent variables. Predictor specification implies $E(y|\eta) = \Lambda_y\eta$, $E(x|\xi) = \Lambda_x\xi$, and $E(\eta\varepsilon_y') = E(\xi\varepsilon_x') = E(\varepsilon_y) = E(\varepsilon_x) = 0$. The relationships between the latent variables and manifest variables are defined as

$y = \Lambda_y\eta + \varepsilon_y$, and

$x = \Lambda_x\xi + \varepsilon_x$.

x and y: Manifest variable
η : Dependent variable
ζ : Independent variable
ε : Error

The formative (inward) model assumes that the manifest variables form a latent variable as a composite. That is, the manifest variables are multiple causes of a latent variable, and the manifest variables are assumed to be a collection of variables, and are informative regarding matters of unknown dimensionality and unknown representativeness. Predictor specification implies $E(\eta|y) = \pi_\eta y$, and $E(\xi|x) = \pi_\xi x$. The relationships between latent variables and manifest variables are defined as

$\eta = \pi_\eta y + \delta_\eta$, *and*

$\xi = \pi_\xi x + \delta_\xi$.

η : Dependent variable

ζ *: Independent variable*
δ_η *: Error of dependent variable*
δ_ξ *: Error of independent variable*

The choice of indicator model depends primarily on the way in which the variables are conceptualized. In this study, there are nine constructs: asset specificity, complete contracting, information gathering, monitoring cost, measurability, social relations, network position, distribution intensity, and performance. All constructs except network position are defined as reflective models because indicators belonging to each construct give rise to an observed phenomenon. However, the construct network position is conceived as an explanatory combination of variables, and its indicators are probably better understood as formative.

3. Weight Relations

In PLS, each case value of the latent variables is estimated by the following weight relations:

$\hat{\eta} = \omega_\eta y$, and

$\hat{\xi} = \omega_\xi \chi$.

$\hat{\eta}$ *: Weight of dependent variable*
$\hat{\xi}$ *: Weight of independent variable*

In the reflective model, the loadings are the weights after rescaling; thus, the multiple regression coefficients between manifest variables and latent variables are used as weights.

In PLS, a set of model parameters is divided into subsets and is estimated using ordinary multiple regressions with the parameter values in other subsets as given. An iterative method provides successive approximations for the estimates,

subset by subset, of the loadings and structural parameters. Wold (1966) proposed treating each residual variable separately, by defining a set of PLS criteria:

1. Minimize Var[ζ] for all endogenous latent variables.

2. Minimize Var[ε] for all outward directed blocks.

3. Minimize Var[δ] for all inward directed blocks.

For one- and two-block models, the iterative algorithms of PLS are almost always convergent. For multi-block models, however, convergence has not been proved, but practice suggests that non-convergence is rare (Fonell and Cha 1994).

4.4.3 Fit Indices

In PLS, there are no summary statistics to measure the overall fit of the models because PLS does not attempt to minimize residual item covariance (Sarkar et al 2001). However, PLS models make several types of predictions, and there are different fit indices for testing the predictive relevance of the model. The critical indices are communality, structural prediction, validity, redundancy, and operational variance (see Lohmoller 1989; Fonell and Cha 1994).

1. Communality

The manifest variables can be predicted by their own latent variables. The proportion of shared variance to the total variance of the manifest variable, i.e., $\frac{\lambda_k^2}{\lambda_k^2} + \theta_k$, is called the communality of the manifest variable, which is the same as the reliability (convergent validity) measure in measurement error models.

When the manifest variables are standardized, the communality measures of the manifest variables are simply squared loadings. The average of the communalities in each block can be calculated as block communalities, and the average communalities of all the manifest variables can be calculated as the communality of the overall model.

Fornell and Lacjer (1981) proposed a measure called Average Variance Extracted (AVE) to measure the amount of variance due to measurement errors. When all the manifest variables are standardized, AVE is equivalent to the average of the communalities in each block, i.e., the block communalities. This measure can be used to evaluate the goodness of fit of the measurement model, that is, the reliability of the latent variables. In addition, AVE also can be used to evaluate the discriminant validity of the constructs. The AVE of a latent variable is calculated as follows:

$$AVE = \frac{\sum_{k=1}^{k} \lambda_k^2}{\sum_{k=1}^{k} (\lambda_k^2 + \theta_k)}$$

2. R^2: Explanatory Power of Structural Models

When the case values of the latent variables are given by the weight relations, each inner structural mode can be estimated by OLS using predictor specifications, and the explanatory power of each model can be evaluated using the standard R^2 of OLS.

3. Redundancy

Redundancy is the average variance of the set of MVs that is explained by the predictor LVs. In figure 4-4, for example, the redundancy coefficient of y_{11} is

$$F_{11}^2 = \frac{Var[\lambda_{11}\gamma\xi]}{Var[y_{11}]} = \lambda_{11}^2\gamma\emptyset\gamma/Var[y_{11}]$$

This measure represents the explanatory power with which the predictor latent variables, ξ in the example, can explain the manifest variables, y_{11}, belonging to η1. The redundancy coefficients of the manifest variables in a block can be averaged to obtain a block redundancy coefficient, and all redundancy coefficients of the manifest variables can be averaged to obtain a redundancy coefficient of the overall model.

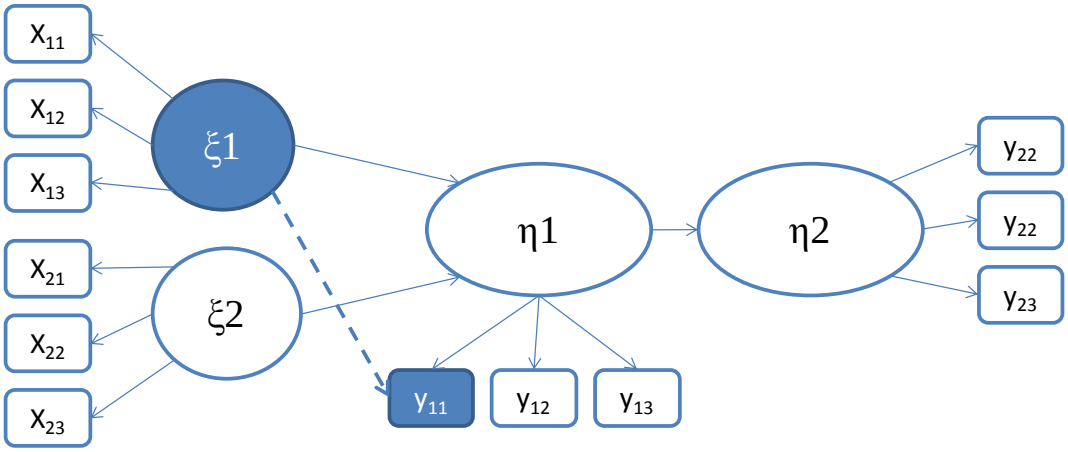

Figure 4.4 An example of redundancy coefficient
Source: Adapted from Fonell and Cha, 1994

4. Validity

A latent variable can be predicted by its own manifest variables:

$$\eta = \prod_y + \delta$$

where δ represents the unmeasured part of the latent variable, η, and a validity coefficient can be defined as the multiple correlation coefficient from $\eta = \prod_y + \delta$. However, since PLS estimates the latent variables using the weight relations, this type of validity cannot be evaluated in PLS.

5. Operational Variance

Because the validity residual is deliberately set to zero based on the weight relation in PLS, as a result, the operational variance is equivalent to redundancy.

4.4.4 PLS Scheme of this Research

1. Analysis Software

This study utilized SmartPLS software developed by Ringle et al. (2005) at the University of Hamburg, and it has been adopted in most academic research. SmartPLS is Java-based, and is independent from the user's operating system. In addition, only raw data can be analyzed. The model is specified by drawing the structural model for the latent variables and by assigning the indicators to the latent variables via "drag and drop." The output is provided in HTML, Excel, or Latex format, as well as in a parameterized path model. Bootstrapping and blindfolding are the resampling methods available. A special feature of SmartPLS is the finite mixture routine (FIMIX). Such an option might be of interest if unobserved heterogeneity is expected in the data (McLachlan and Peel, 2000).

For the resampling method, Bootstrap is adopted in this study. The Bootstrap samples are built through resampling using a replacement from the original samples. The procedure produces samples consisting of the same number of units as in the original sample. The number of resamples has to be specified. The default is 100 but a higher number (such as 200) may lead to more reasonable standard error estimates. In this study, the number 300 is used to resample the cases.

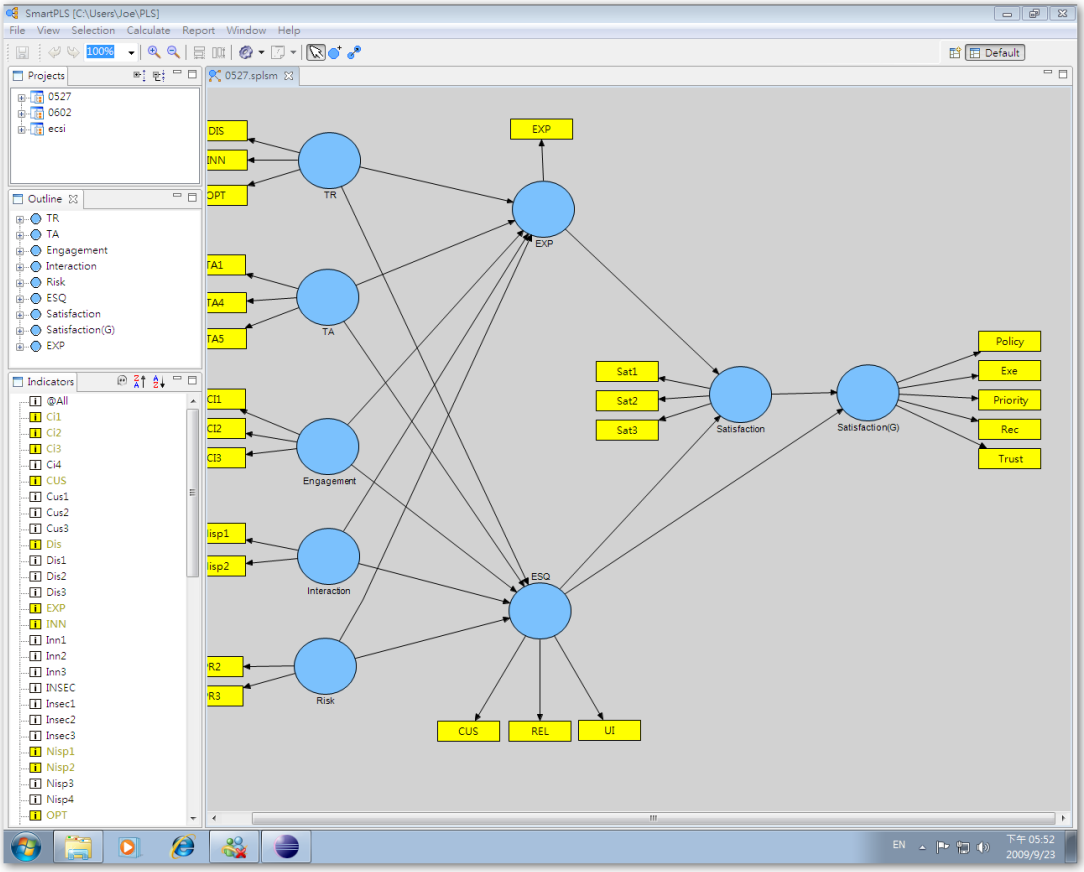

Figure 4.5 An example of SmartPLS 2.0

2. Formative and Reflective Measurement Model

Under a reflective measurement model, the indicators are influenced by the underlying latent variables. Under a formative measurement model, the

indicators are viewed as causing the latent variables. Constructs such as “attitude” and “satisfaction” are typically viewed as the underlying factors that give rise to an observed phenomenon. In such a case, the reflective measurement model will be used. In contrast, when constructs are conceived as explanatory combinations of indicators, such as “social position,” which are determined by a combination of variables, these indicators are probably better understood using the formative measurement model (Fornell and Bookstein 1982, Fonell and Cha 1994).

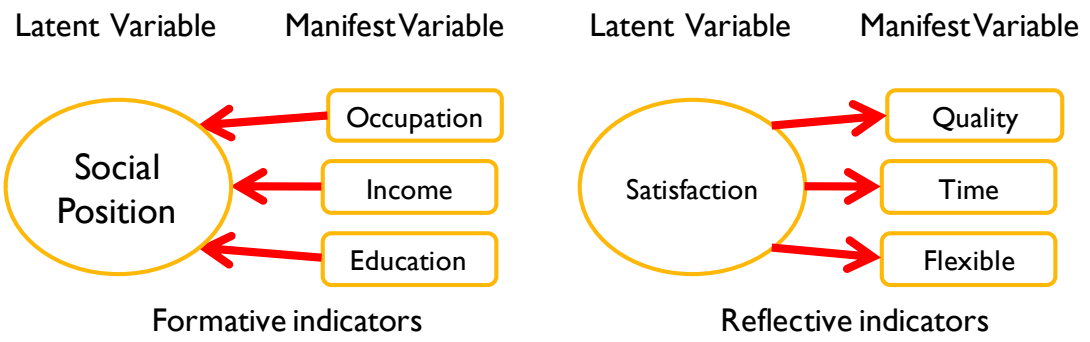

Figure 4.6 Formative and Reflective Measurement Model

In this study, the constructs including technology anxiety, engagement tendency, need for interaction, risk tendency, satisfaction with e-service, and satisfaction with the government are viewed as reflective measurement models since the observed indicators are a reflection of the underlying construct, and only the relationship between technology readiness and e-service quality and their manifest variables are formative. Thus, all measurement models (the relationships between latent variables and manifest variables) are outward (reflective) except technology readiness and e-service quality (formative).

According to the PLS Arrow Scheme used in this study, there are five endogenous latent variables and four exogenous latent variables. The number range of manifest variables of each latent variable is from 1 to 5. The related

information is summarized below.

Table 4.4 Basic information of PLS arrow scheme (Taipei)

Construct	Numbers of LV (final)	LV-Mode	Model
Technology Readiness*	4(3)	Formative	Exogenous
Technology Anxiety	5(3)	Reflective	Exogenous
Engagement Tendency	5(3)	Reflective	Exogenous
Need for Interaction	4(2)	Reflective	Exogenous
Risk Tendency	3(2)	Reflective	Exogenous
e-Service Quality*	6(3)	Formative	Endogenous
Satisfaction with e-service	3(3)	Reflective	Endogenous
Satisfaction with Government	5(5)	Reflective	Endogenous

Table 4.5 Basic information of PLS arrow scheme (Tokyo)

Construct	Numbers of LV (final)	LV-Mode	Model
Technology Readiness*	4(2)	Formative	Exogenous
Technology Anxiety	5(3)	Reflective	Exogenous
Engagement Tendency	6(2)	Reflective	Exogenous
Need for Interaction	3(2)	Reflective	Exogenous
Risk Tendency	3(3)	Reflective	Exogenous
e-Service Quality*	6(5)	Formative	Endogenous
Satisfaction with e-service	3(3)	Reflective	Endogenous
Satisfaction with Government	5(5)	Reflective	Endogenous

5 Case Analysis: Taipei

5.1 Descriptive Analysis

5.1.1 Frequency

Among the respondents, more than 55% browse or use the services of Taipei e-service online frequently. However, 38% of the users visited the website only once every six months. The user profile in terms of frequency was divided into two opposing extremes.

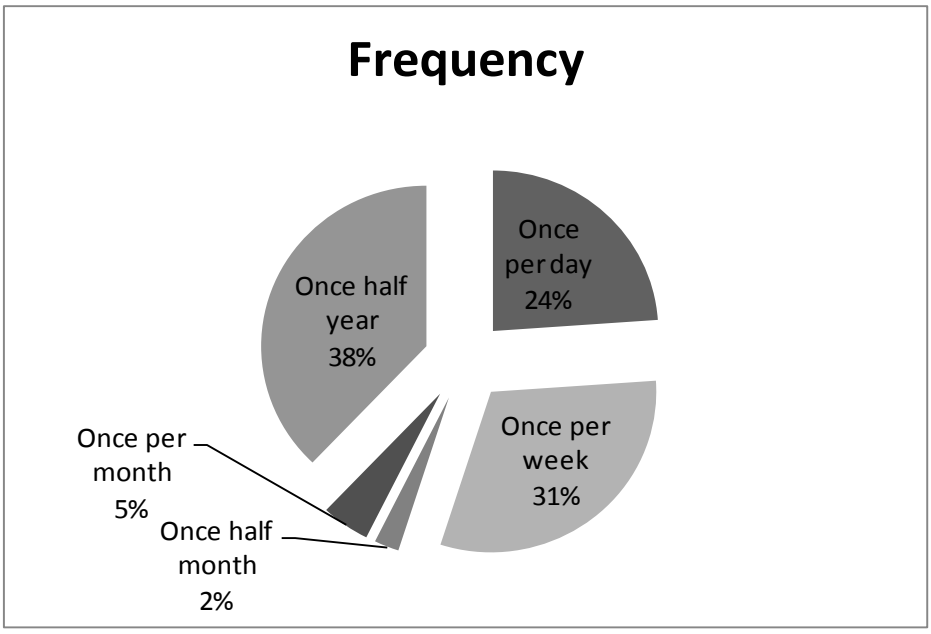

Figure 5.1 Frequency (Taipei)

5.1.2 Occupation and Education

Figure 5.2 shows that most of the respondents are public servants (29%) or white-collar workers (26%), followed by housewives (12%) and specialists (10%).

Also, in terms of education, most of the respondents have a college or university degree (93%). Almost 30% of respondents work for public or government, since the website also served for these people as work and private at the same time. This profile shows a limitation of the online survey, which may have produced a bias in terms of population.

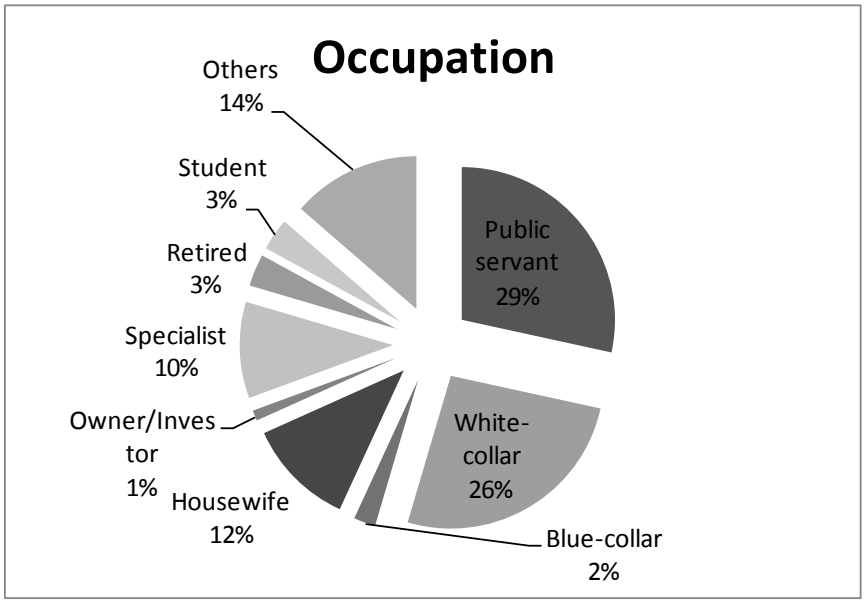

Figure 5.2 Occupation (Taipei)

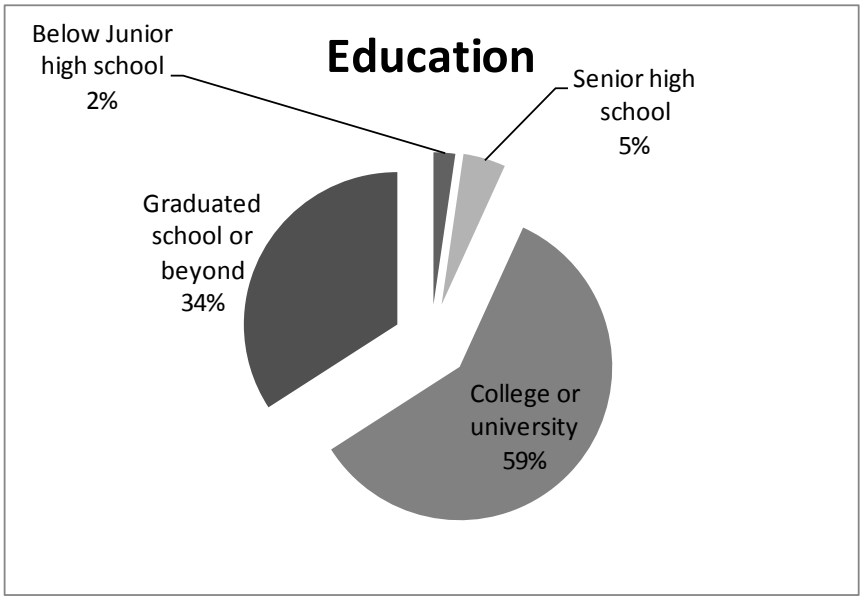

Figure 5.3 Education (Taipei)

5.1.3 Internet Surfing

While the occupation and education profiles may have created a bias in terms of population, the time the respondents spent Internet surfing showed no significant differences, which means that the sample has a normal distribution in terms of Internet use.

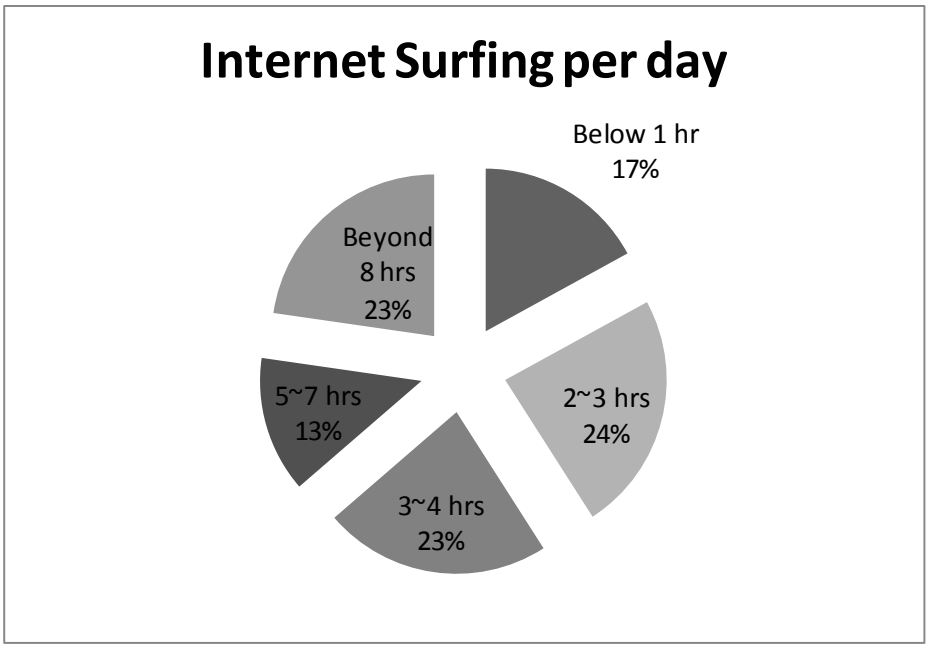

Figure 5.4 Internet Surfing (Taipei)

5.2 PLS Analysis

5.2.1 Factor Analysis

To extract adequate variables in order to proceed with a further analysis, a factor analysis was first conducted (Table 5.1). While the original survey contained 54 manifest variables, some of them may have a low correlation with this study. Moreover, a second-order problem exists in the constructs of technology readiness

and perceived e-service quality, and thus the use of a factor score to represent each first-order factor or latent variable was suggested. For these two reasons, a factor analysis was executed, the results of which are shown below. Consequently, 30 items were eliminated, and the rest have a relatively high loading factor of 0.64 to 1, which means those MVs were highly correlated when measuring a single LV against the other LVs. Further in-depth analysis of the correlation matrix (Table 5.3) revealed that the correlations between MVs intended to measure the same factor were significantly higher than those designed for different factors.

Table 5.1 Results of Factor Analysis (Taipei)

Construct	Initial Items	Final Items	MV	Factor Loadings
Technology Readiness	4	3	OPT	0.9001
			INN	0.7363
			DIS	0.6433
Technology Anxiety	5	3	TA1	0.8307
			TA4	0.9037
			TA5	0.9228
Engagement Tendency	5	3	CI1	0.7998
			CI2	0.8591
			CI3	0.8878
Need for Interaction	4	2	NISP1	0.8336
			NISP2	0.8044
Risk Tendency	3	2	PR2	0.9047
			PR3	0.9326
e-Service Quality	6	3	CUS	0.9212
			REL	0.8696
			UI	0.8902
Satisfaction with e-Service	3	3	SAT1	0.9515
			SAT2	0.9255
			SAT3	0.9288
Satisfaction with Government	5	5	POLICY	0.9351
			PRACTICE	0.9305
			PRIORITY	0.9016
			REG	0.9372
			TRUST	0.9592

5.2.2 Reliability and Validity

Construct reliability reflects the internal consistency of the scale items (manifest variable; MV) measuring the same construct (latent variable; LV) for the collected data (Straub, 1989). As for the reflective measurement model, it was suggested that

AVE (Average Variance Extracted) and the composite reliability are higher than 0.5 and 0.7, respectively (Fornell and Larcker, 1981; Hair et al., 2006). In the Taipei case (Table 5.2), the AVE of each LV is from 0.5887 to 0.8748, and the composite reliability of LVs is from 0.803 to 0.9711. All values are above the required thresholds, and thus the measurement models seem to have both high reliability and convergent validity.

Regarding the discriminant validity, Fornell and Larcker's (1981) criterion shows positive result for all constructs. It was also suggested that AVE be larger than the correlations between a single LV and the other LVs in order to assess the discriminant validity (Agarwal and Karahanna, 2000). In table 5.3, all AVEs (the italicized bold numbers) in this study were larger than the inter-construct correlations (the remaining numbers). Thus, it was concluded after the discussion above that the model can be explained sufficiently based on the revealed LV structure (convergent validity), and that this structure includes all unique MVs (discriminant validity).

The coefficient of determination (R^2) describes the share of variance of an endogenous construct, as explained by the relationship in the model. The R^2 of perceived e-service quality, satisfaction with e-service, and satisfaction with the government are reasonably high (0.4112, 0.6803, and 0.4316, respectively).

Table 5.2 Reliability and vaildity (Taipei)

	Convergent Validity			Discriminant Validity	
Construct	Factor Loadings	Composite Reliability	AVE	Fornell/Lacker	R^2
Criterion		>0.7	>0.5	<AVE	
Technology Readiness	0.9001 0.7363 0.6433	0.8081	0.5887	0.29	
Technology Anxiety	0.8307 0.9037 0.9228	0.9167	0.7861	0.29	
Engagement Tendency	0.7998 0.8591 0.8878	0.8861	0.722	0.1126	
Need for Interaction	0.8336 0.8044	0.803	0.6709	0.275	
Risk Tendency	0.9047 0.9326	0.9154	0.8441	0.2045	
e-Service Quality	0.9212 0.8696 0.8902	0.9227	0.7991	0.6752	0.4112
Satisfaction with e-Service	0.9515 0.9255 0.9288	0.9545	0.8748	0.6752	0.6803
Satisfaction with Government	0.9351 0.9305 0.9016 0.9372	0.9711	0.8703	0.3946	0.4316

Table 5.3 LV correlation (Taipei)

	ESQ	Engagement	Interaction	Risk	Satisfaction	Satisfaction(G)	TA	TR
ESQ	***0.893924***							
Engagement	0.2487	***0.849705831***						
Interaction	0.3427	0.3355	***0.81908486***					
Risk	-0.4522	-0.044	-0.1893	***0.918749***				
Satisfaction	0.8217	0.3341	0.3816	-0.4003	***0.93530744***			
Satisfaction(G)	0.6282	0.1622	0.5244	-0.3521	0.6258	***0.932898708***		
TA	0.0604	0.1224	-0.0127	0.2058	-0.1124	-0.0193	***0.886623***	
TR	0.3425	-0.0619	0.1525	-0.3186	0.2161	0.1909	-0.5385	***0.767268***

5.2.3 Path Analysis

1. Direct Effect

There are eight relationships including five factors of user traits mentioned in this study, which implies that there are eight paths that need to be tested. Five of the eight paths are the antecedents that affect the perceived e-service quality. The other three are the relationships among perceived e-service quality, and satisfaction with the e-service and the government. The path coefficients and related t-statistic are shown in Table 5.4. The empirical results of each relationship are discussed as follows.

All path coefficients are significant at the 0.5 level and support the relationships proposed in the Taipei case. First, technology readiness has a significant positive relationship with the perceived e-service quality (path coefficient = 0.3888, $p<0.01$), technology readiness significantly affects the perceived e-service quality. Users with high technology readiness will have a positive image regarding the e-service before use, as well as a positive perception of the e-service quality. The higher the technology readiness of the user, the less time the user will spend on operating the e-service compared with other users. Moreover, users with higher technology readiness will not dwell on the complexity when utilizing the e-service, and thus they will subjectively perceive that the system is much easier to use than those who have a lower technology readiness. This result is somewhat similar to researches from TAM in terms of ease of use (Davis, 1989; Gummesson, 1987; Garbarino and Edell, 1997; Dabholkar, 1996; Meuter et al., 2000).

Technology anxiety has a significant negative relationship with perceived service quality (path coefficient = -0.3256, $p<0.01$), and thus technology anxiety has a significant effect on perceived e-service quality. The higher the technology anxiety is, the more the user will refuse to use the technology-based service. Moreover, those who have higher technology anxiety will have lower self-efficacy as well, and therefore will have a low perception of ease of use during a service encounter.

The need for interaction with service employees is also a significant factor regarding perceived e-service quality (path coefficient = 0.1658, $p<0.05$), which means the need for interaction with service employees will positively influence the user's perceived quality toward the e-service. However, this direction is opposite the SSTs proposed in the literature (Dabholkar, 1996). Users who need to interact with service employees during a service encounter in a public e-service context will have a positive image toward e-service use.

Engagement tendency has a significant positive relationship (path coefficient = 0.1616, $p<0.05$) with perceived e-service quality. Users will transfer their real experiences in terms of engaging in public affairs in the virtual world, which means that once they are comfortable with something in the real world, they will look for a solution online to continue this activity. Similarly, someone who is frequently involved in public affairs will be more willing to seek another channel to do the same thing. With the enjoyment of engagement, users will easily perceive the quality of e-service compared with those who are not involved in public affairs. This perspective is similar to the works by Higgins (1995b) and Thompson et al. (1991) in the SCT and PC Utilization Models, respectively.

Risk tendency has a significant negative relationship (path coefficient =

-0.3569, $p<0.01$) with perceived e-service quality. Users with a high-risk tendency will avoid using technology-based services, and will perceive a low ease of use of such services. Consequently, they will perceive a lower quality when using an e-service. Featherman and Pavlou (2003) integrated the factor of perceived risk into TAM, and it was found to exert a strong inhibiting influence on the model's criterion variables.

Perceived e-service quality has a generally significant positive relationship with satisfaction of e-service and the government (path coefficient = 0.8442, $p<0.01$ for satisfaction with an e-service, and path coefficient = 0.3507, $p<0.01$ for satisfaction with the government). As a result, the e-service quality perceived by the user is quite an important factor in influencing user satisfaction. Finally, there is a positive relationship between satisfaction with an e-service and the government. This finding is within the expectations, and is also consistent with many previous studies.

2. Indirect Effect

Based on the approach suggested by Baron and Kenny (1986), and Sarkar et al. (2001), only statistically significant indirect effects are included in the computation, as the total effect includes both statistically significantly direct and indirect effects.

Using this approach, satisfaction with e-services significantly mediates the relationship between perceived e-service quality and satisfaction with the government, and the size of the indirect effect is 0.285 (total effect = 0.6357, $p<0.01$). The indirect effect indicates that the perceived e-service quality may directly influence the user's satisfaction with the government, and similarly it

may also influence the user's satisfaction with the government through the mediating effect of user satisfaction with the e-service, in which case the total effect become larger. In the case of Taiwan, satisfaction with an e-service is seen as a key factor in increasing the user's satisfaction of the government.

Table 5.4 Path coefficient and its t-statistic (Taipei)

Constructs	ESQ		SAT				SAT(G)			
	Direct		Total		Direct		Total		Direct	
TR	0.3888***	(3.4035)	0.3105***	(3.1701)			0.2412***	(3.2298)		
TA	-0.3256***	(3.2624)	0.2714***	(3.2609)			0.2058***	(3.1135)		
Engagement	0.1616**	(1.8437)	0.1286**	(1.7668)			0.1001**	(1.8043)		
Interaction	0.1658**	(1.8086)	0.1201*	(1.5347)			0.0987*	(1.5848)		
Risk	-0.3569***	(4.5228)	-0.3073***	(0.3918)			-0.2289***	(4.1962)		
ESQ					0.8442***	(19.9691)	0.6357***	(9.7644)	0.3507***	(2.5667)
SAT									0.3377**	(2.2002)

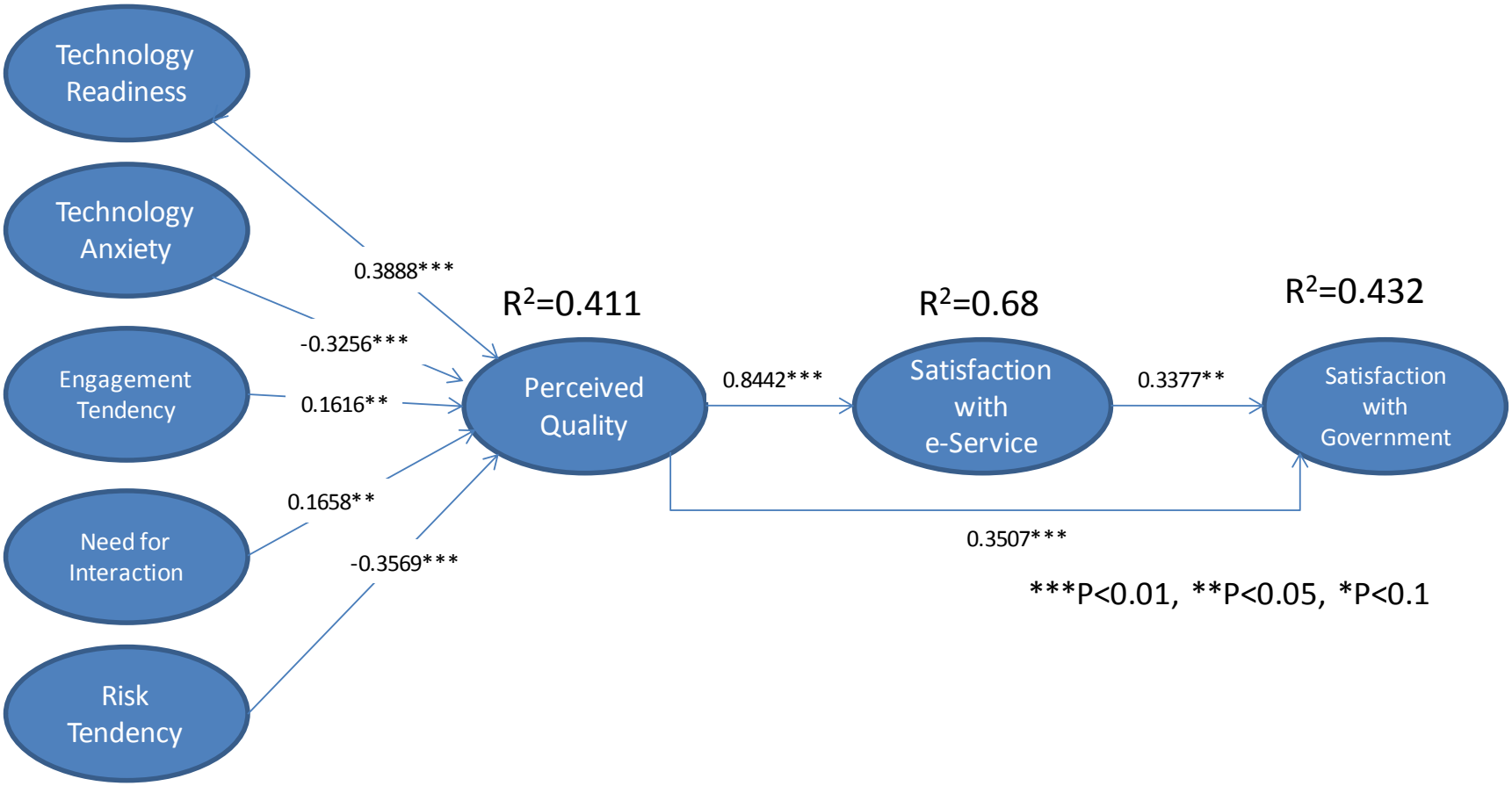

Figure 5.5 Result of PLS Path Scheme (Taiepi)

6 Case Analysis: Tokyo

6.1 Descriptive Analysis: Tokyo

6.1.1 Frequency

Among the respondents, 32% frequently visit or use the services of the e-Tokyo website. However, 68% of the users who visit the website do so only once every six months. Compared with the Taipei case, the users of e-Tokyo are relatively low in frequency in terms of online e-service use.

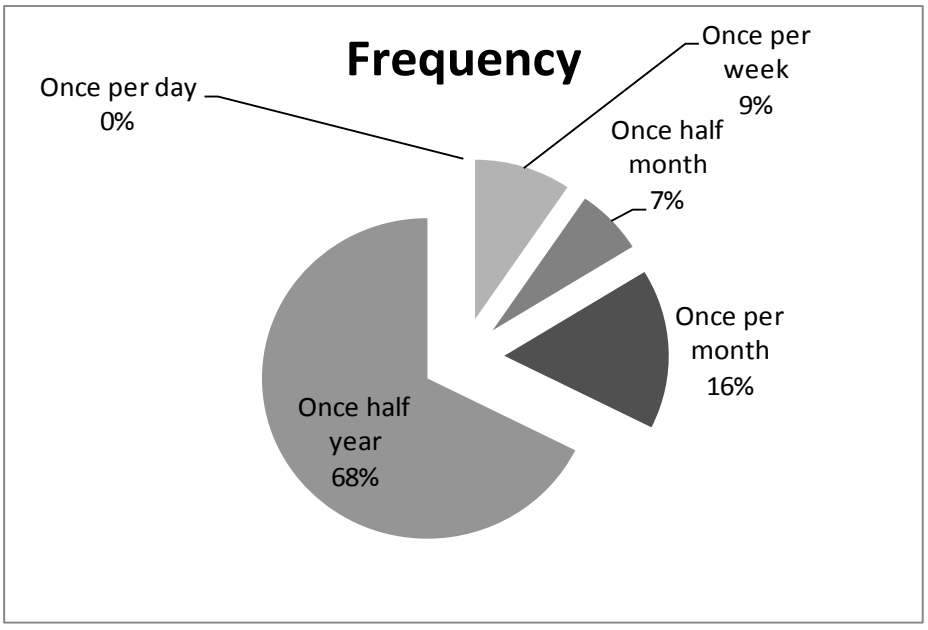

Figure 6.1 Frequency (Tokyo)

6.1.2 Occupation and Education

The figures for occupation show that most respondents are white-collar workers

(40%) or housewives (24%), followed by blue-collar workers (7%) and owners/investors (6%). Again, in terms of education level, most respondents are college or university educated (71%).

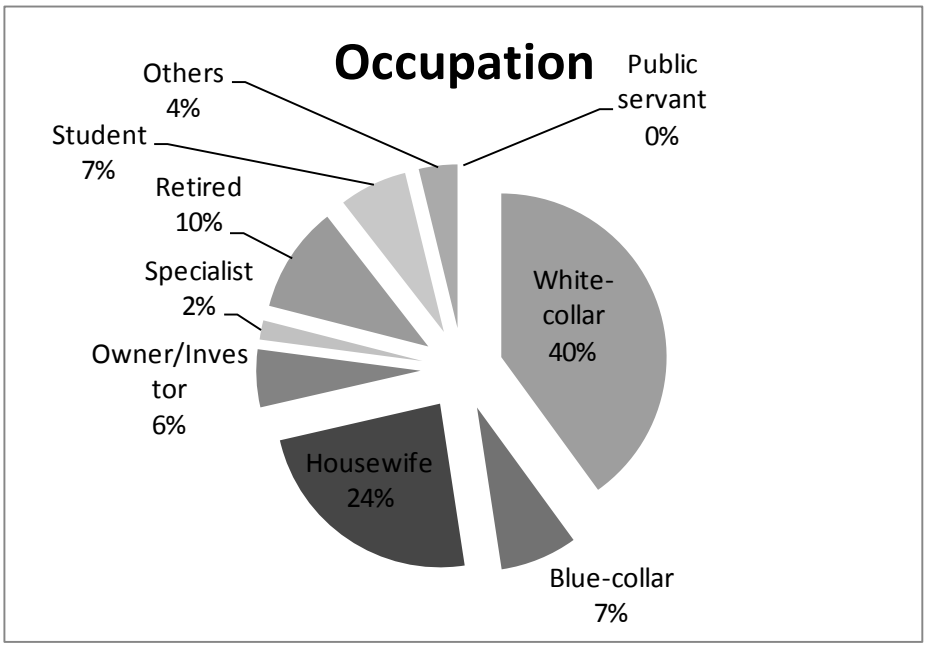

Figure 6.2 Occupation (Tokyo)

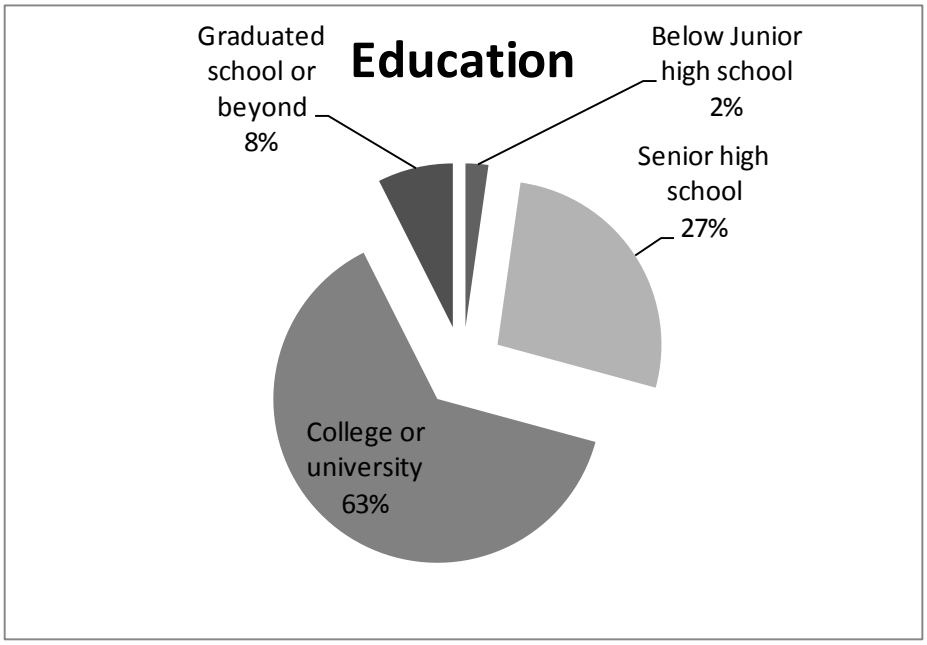

Figure 6.3 Education (Tokyo)

6.1.3 Internet Surfing

The Internet surfing profile shows no differences among the respondents. Most of the respondents are light to moderate Internet users.

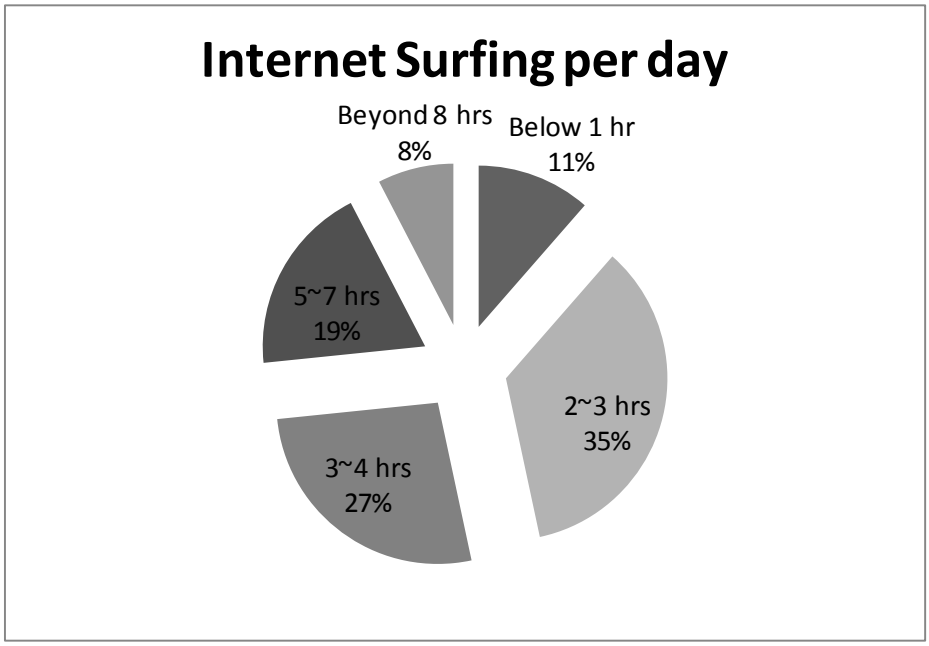

Figure 6.4 Internet Surfing (Tokyo)

6.2 PLS Analysis

6.2.1 Factor Analysis

A factor analysis was first conducted to eliminate and filter inadequate variables in order to enter into the next stage. Twenty-six variables remain with a relative high loading factor of 0.72 to 1, which means these MVs are highly correlated in measuring a single LV compared with measuring multiple LVs (Table 6.1). Again, the correlation matrix (Table 6.3) reveals that the correlations between MVs intended to measure the same factor were significantly higher than between those designed for

different factors.

Table 6.1 Results of Factor Analysis (Tokyo)

Construct	Initial Items	Final Items	MV	Factor Loadings
Technology Readiness	4	2*	OPT	0.94
			INN	0.8585
Technology Anxiety	5	3	TA2	0.9018
			TA4	0.7229
			TA5	0.7604
Engagement Tendency	6	2	CI1	0.9804
			CI2	0.9726
Need for Interaction	3	2	NISP1	0.8791
			NISP2	0.9143
Perceived Risk	3	3	PR1	0.8191
			PR2	0.8974
			PR3	0.806
e-Service Quality	6	5*	OVERALL	0.8552
			CUS	0.8788
			REL	0.8133
			SEC	0.7913
			UI	0.8403
Satisfaction with e-Service	3	3	SAT1	0.8972
			SAT2	0.7866
			SAT3	0.9048
Satisfaction with Government	5	5	POLICY	0.9463
			PRACTICE	0.901
			PRIORITY	0.9035
			REG	0.9302
			TRUST	0.9401
***After data reduction (factor analysis)**				

6.2.2 Reliability and Validity

Regarding the reliability and convergent validity of the Tokyo case (Table 6.2), the

AVE of each LV is from 0.638 to 0.9536, and the composite reliability of each LV is from 0.8397 to 0.9762. All values are above the required thresholds, and thus the measurement models seem to have both high reliability and convergent validity.

Regarding discriminant validity, Fornell and Larcker's (1981) criterion shows a positive result for all constructs, and the AVE is larger than the correlations between the LV and other LVs, which means the discriminant validity is adequate. In table 6.3, all AVEs (the italicized bold numbers) were larger than the inter-construct correlations (the remaining numbers). Thus, the model is considered able to sufficiently explain the revealed LV structure (convergent validity), and this structure includes all unique MVs (discriminant validity).

The R^2 of perceived e-service quality, satisfaction with the e-service, and satisfaction with the government in the Tokyo case are relatively lower than in the Taipei case (0.3784, 0.6497, and 0.2569 respectively). The R^2 of the expectation factor here is low, which indicates, as in the Taipei case, that this construct is unable to be explained by only these five traits. Again, the R^2 of satisfaction with the government is relatively lower than in Taipei, which shows that the importance of satisfaction with e-services is relatively low in generally satisfying the residents of Tokyo with their government.

Table 6.2 Reliability and vaildity (Tokyo)

	Convergent Validity			Discriminant Validity	
Construct	Factor Loadings	Composite Reliability	AVE	Fornell/Lacker	R2
Criterion		>0.7	>0.5	<AVE	
Technology Readiness	0.94	0.8951	0.8104	0.4167	
	0.8585				
Technology Anxiety	0.9018	0.8397	0.638	0.4167	
	0.7229				
	0.7604				
Engagement Tendency	0.9804	0.9762	0.9536	0.0511	
	0.9726				
Need for Interaction	0.8791	0.8915	0.8043	0.2449	
	0.9143				
Perceived Risk	0.8191	0.8792	0.7086	0.1769	
	0.8974				
	0.806				
e-Service Quality	0.8552	0.9208	0.6995	0.6492	0.3784
	0.8788				
	0.8133				
	0.7913				
	0.8403				
Satisfaction with e-Service	0.8972	0.8984	0.7474	0.6492	0.6497
	0.7866				
	0.9048				
Satisfaction with Government	0.9463	0.9671	0.8545	0.245	0.2569
	0.901				
	0.9035				
	0.9302				
	0.9401				

Table 6.3 LV correlation (Tokyo)

	ESQ	Engagement	Interaction	PR	Satisfaction	Satisfaction(G)	TA	TR
ESQ	***0.8364***							
Engagement	0.1933	***0.976524449***						
Interaction	0.4949	0.146	***0.896827743***					
PR	-0.4206	0.0277	-0.1835	***0.8418***				
Satisfaction	0.8057	0.1333	0.4145	-0.3004	***0.864523***			
Satisfaction(G)	0.495	0.1797	0.3677	-0.2536	0.3343	***0.924391692***		
TA	-0.1311	0.031	-0.0744	0.3321	0.0313	-0.1704	***0.7987***	
TR	0.2044	0.2262	0.2037	-0.3289	0.0692	0.2269	-0.6455	***0.9002***

6.2.3 Path Analysis

1. Direct Effect

Most paths (relationship) supported in the Taipei case are also supported in Tokyo, except technology readiness and technology anxiety. Moreover, as mentioned above, the R^2 of satisfaction with the Tokyo government is relatively low. It shows that the source of satisfaction with the government actually comes from many aspects, and satisfaction with e-services is merely one of them.

2. Indirect Effect

In the case of Tokyo, since the relationship between satisfaction with an e-service and satisfaction with the government is insignificant, the mediating effect of satisfaction with the e-service is ignored. While the perceived e-service quality does influence the user's satisfaction with the e-service, and perceived e-service quality influences the user's satisfaction with the government, the importance of an e-service is not that much higher than in Taiwan, and thus users in Tokyo will not be satisfied with the government from merely the aspect of e-service policy.

Table 6.4 Path coefficient and its t-statistic (Tokyo)

Constructs	ESQ		SAT				SAT(G)			
	Direct		Total		Direct		Total		Direct	
TR	-0.0396	(0.3872)	-0.0303	(0.3616)			-0.0199	(0.3936)		
TA	-0.0117	(0.1044)	-0.0067	(0.0731)			-0.0063	(0.1186)		
Engagement	0.1521*	(1.6058)	0.1231*	(1.5707)			0.0752*	(1.5692)		
Interaction	0.4142***	(3.9809)	0.33424***	(3.6834)			0.2053**	(2.3009)		
PR	-0.3579***	(3.9858)	-0.2882***	(3.9412)			-0.1772***	(3.5482)		
ESQ					0.7911***	(15.7369)	0.4976***	(4.1785)	0.6431***	(4.5417)
SAT									-0.1839	(1.0137)

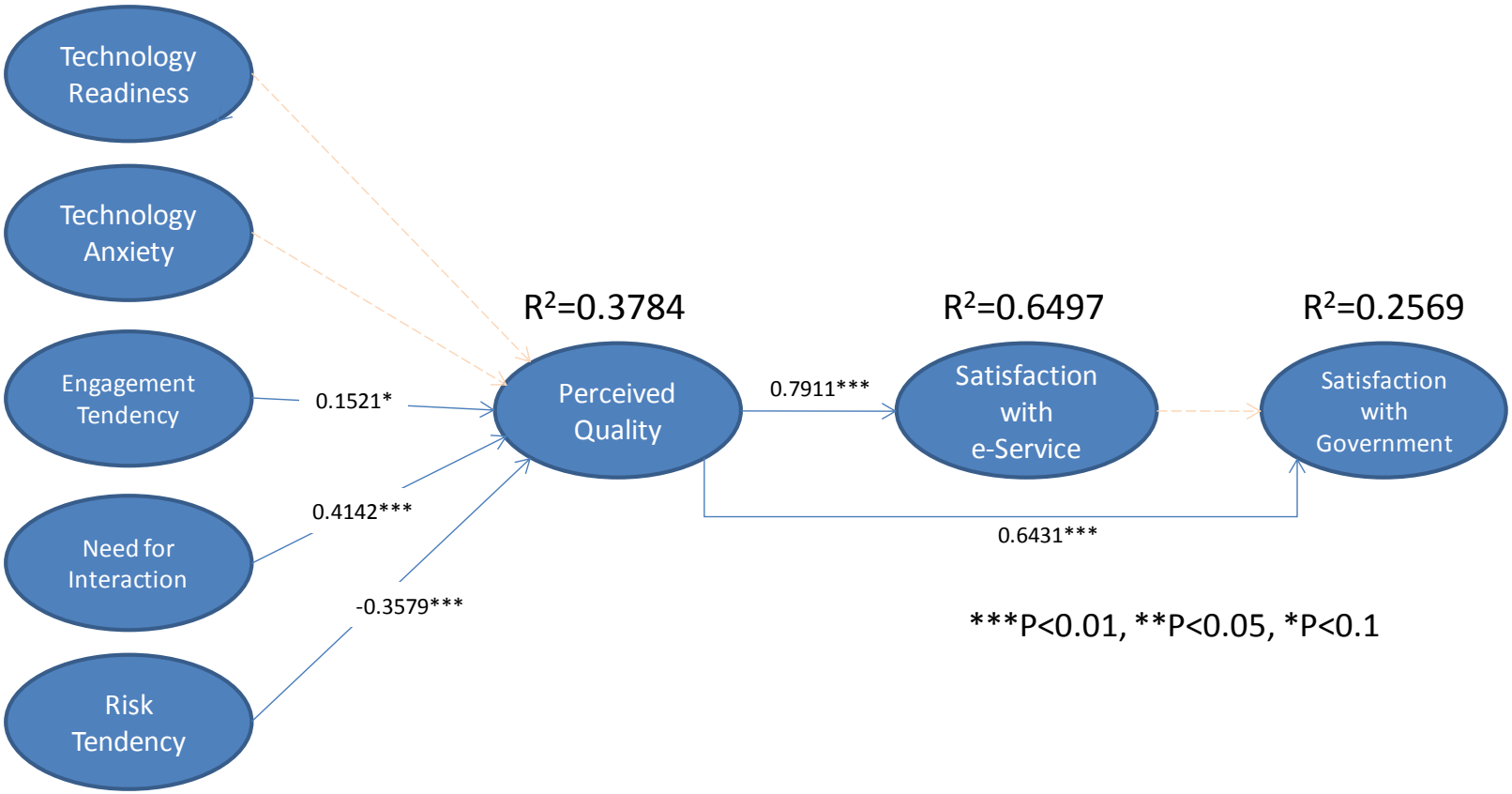

Figure 6.5 Result of PLS Path Scheme (Tokyo)

7 Discussion and Conclusion

E-government definitely brings about a lot of benefits, not only for the government itself, but also to other stakeholders such as citizens and enterprises. The transparency of information makes users become more effective, responsive, interactive, and accountable. Internally, the government is able to manage its employees and systems in a more effective and productive way. Externally, better service can be provided to both citizens and businesses. As a result, effective and productive employees, citizens (or enterprise), government, and technology constitutes a so-called “Service Marketing Pyramid” in the public sector. Under this logic, the only objective of e-government for each party is to provide or be served by better services through technology. However, among e-government studies, few have addressed user traits on public e-services, and very little research has been conducted using a comprehensive and integral approach to explore this issue. Therefore, this study employs the perspective derived from service marketing, information systems, and public administration in order to figure out user traits that might have an impact on e-service use. Furthermore, this research adopted the concept of technology adoption and service marketing to describe user behavior and the accompanied perception on e-service quality and satisfaction. Along with the customer satisfaction theory, a comprehensive public e-service evaluation model regarding user traits was established. Based on a sophisticated survey conducted on two e-service systems, Taipei e-services online and e-Tokyo online service, the proposed model was thoroughly tested.

The results partially support the proposed path relations in the context of public e-service. First, engagement tendency, the need for interaction with service employees,

and perceived risk were found to affect user perception on e-service quality significantly, while technology readiness and technology anxiety were only supported in the case of Taipei. Undoubtedly, in both Taipei and Tokyo, user perception of e-service quality does affect user satisfaction with an e-service, but only the Taipei case showed that a link between satisfaction with e-service and the government exists.

Discussion of research questions and proposed path relationships, managerial implications, and the contributions of both this research and future research are described in the following section.

7.1 Discussion

7.1.1 The Determinants of Perceived Public e-Service Quality

In this study, two case studies were employed to test five of the major factors that might affect user judgment in terms of public e-service use, and further perceived quality and satisfaction, consequently. While these two cases tell different stories due to their differences of context, the results are still significant in determining a set of key factors in terms of public e-service use.

The unique variable introduced in this study, an engagement tendency, was significantly proven in both cases. The results imply that ICTs are able to enhance mobilization by those who are active in public affairs, and it also confirms the concept of cyber skepticism.

In addition, the relationship between the need for interaction with service employees and perceived e-service quality showed a positive causality, which is different from the results derived from the SST perspective. These results might be

due to the immaturity of the public e-service. The existing public e-service system is not as mature as commercial e-services offered by the private sector, and users sometimes need to consult with back-end service employees when they are using the e-service.

7.1.2 The Role of Perceived e-Service Quality and Satisfaction with e-Service

Many studies have shown strong evidence in terms of e-service quality regarding customer satisfaction in the private sector, and this research revealed the same story in the public sector. In the studied cases, perceived e-service quality is significant regarding both satisfaction with the e-service and the government. Satisfaction is constituted by expectation and real using experience toward a certain product or service. The gap between expected quality and perceived quality is called “zone of tolerance”. Once the zone is large, which means user is not satisfied with the product or service, and vice versa. According to the results, ignored the effect of expectation, perceived e-service quality showed 68% and 65% variances of satisfaction with the e-services in Taipei and Tokyo, respectively, and the correlations between them were extremely high.

Moreover, in the Tokyo case, perceived e-service quality revealed a relatively high correlation with government satisfaction, and no significant connection between satisfaction with the e-service and satisfaction with the government. This indicates that perceived e-service quality might directly dominate user satisfaction, not only regarding the e-service but also the entire government. And we learned from this fact that e-service quality is definitely a key factor in influencing user satisfaction in the public sector as well.

Interestingly, the outcome revealed a different causality between satisfaction with the e-service and the government in both cases. In the case of Taipei, as users become satisfied after experiencing the quality of the e-service, their sense of satisfaction toward the government is enhanced. However, such a spillover effect is lacking in the case of Tokyo, where satisfaction with the e-service does not automatically translate into satisfaction with the government.

Thus, we can clearly see that the value of providing an e-service differs from one country to another. In Taiwan, e-service has become a synonym for government services, while in Tokyo, due to the utilization rate of e-services or e-readiness, the correlation between e-service and the government appears to be weaker. For the latter, e-service is one of many factors to be considered when analyzing the public's satisfaction with their government.

7.1.3 The Effect of Technology-based Factor

This study selected two cities as samples in order to test the path relations empirically. The results indicate that five extracted traits are significant regarding user perception of e-service quality in Taipei, while in Tokyo, only three traits, engagement tendency, need for interaction with service employees, and perceived risk, have the same significance. The comparison of these two cases indicates that the effects of technology readiness and technology anxiety are still ambiguous. While there is no clear evidence showing that technology-based characteristics such technology readiness and technology anxiety are related to country or race, regional factors seem to indicate some truth to this. According to Elliott et al. (2008), their research on assessing the differences among American and Chinese students with respect to their level of "technology readiness" showed that Chinese students exhibited a lower

propensity to embrace and use new technology than American students. Similarly, some differences between the Taipei and Tokyo cases do exist; however, this research focused on the relationship between user traits and user perception of e-service quality in a specific context, and thus other regional factors were excluded. Nevertheless, the importance of regional factors cannot be ignored, and may be suggested as a point of further research.

7.1.4 The Fitness of Model

This study aimed at establishing an exploratory framework to understand the causality and relationship among user traits, perception of e-service quality, and satisfaction based on the context of public e-service. Through a literature review and empirical survey, the five factors of user traits proposed in this study are meaningful regarding perceived e-service quality in Taipei due to an adequate R-Square ratio, while three factors have the same effect in the case of Tokyo. In other words, there is a proper explanation regarding perceived e-service quality based on these five factors, which was concluded based on various perspectives.

In addition, perceived e-service quality plays a critical role in this model as mentioned in the previous section. From the perspective of e-service satisfaction, perceived e-service quality can be used to explicate more than 60% of users' satisfaction toward the e-service, in both the Taipei and Tokyo cases. In other words, user perception regarding e-service quality will determine the level of satisfaction towards the e-service. Thus, user perception of e-service quality will be one of the critical factors determining the success of an e-service. By understanding user traits and how users consume e-services, perceived e-service quality can be improved and replicated.

In summary, the framework proposed in this study was appropriate in explaining the causality and relationship between user perception of e-service quality and e-service satisfaction. Although this study is unable to provide the value of explanatory power for the entire framework, the framework itself still represents a valuable basis for future research that will lead to the discovery of more factors and dimensions.

7.2 Managerial and Policy Implications

As mentioned earlier, the purpose of this research was to explorer some of the major user traits that might consequently influence user perception on public e-service quality and satisfaction. The five traits concluded and tested in this research each have their own managerial meaning. First, from the perspective of policy marketing, in spite of a limited ability to get a lock on their target customers (Snavely, 1991), government agencies still need to know who and where these customers are. In Snavely's policy marketing model, the core is a target customer along with other facilitators such as services, policy analyses, human resources, and so on, which means that the concept of a target customer does exist, but so far no one has suggested a way to identify such customers for a specific service or policy.

Moreover, according to the diffusion of innovations theory (Rogers, 1995), an innovation will become diffused among different members within a societal system as time passes. These members can be categorized by the time series of innovation adoption, namely, innovators, early adopters, early majority, late majority, and laggards. Rogers also mentioned the importance of individual traits on innovation-diffusion-related research. The main idea of diffusion of innovations theory emphasizes the importance of early adopters in terms of playing the "opinion

leader" in spreading the news of the advantages of a new technology.

In this research, the characteristics of target customers regarding public e-services were defined by five factors, and the relationship between user characteristics and perceived quality were confirmed. In other words, government agencies are able to first establish who their target customers are according to these characteristics, and then proceed to the design and marketing stages for these users. In the case of Tokyo, for example, a user who perceives a high e-service quality also possesses the characteristics of high engagement tendency, high need for interaction with service employees, and low-risk tendencies. In this case, a more effective way of promoting a brand new public e-service is to target these users on site or online. Once these users have a better experience in using the e-service, it will be easier to broadcast their experience to others, as a multiplier effect. These users who spread their positive experience to other early majorities might be the most influential group. This also corresponds to the nature of technology diffusion. In practice, it has been suggested that the promotion of a new public e-service can be made as user is being served by a government agency, or by sending emails to those who are often involved in public affairs, such as the registrar of online forum users or volunteers of public works. Nevertheless, even when these characteristics are understood, it becomes another story to seek out these groups in reality. However, a solution to solve this problem still remains. Community marketing, for example, might be the best way for government agencies to find their target users. Most Internet users will organize communities based on their interests, and those users who are active in virtual communities usually possess high technology readiness, low technology anxiety, or even high engagement tendencies. Using community marketing tools or the so-called Web 2.0, it is relatively easy to involve or deal with public affairs for both the government and citizens.

Another issue may be related to a government's internal administration, as two factors, need for interaction with service employees and perceived risk, are confirmed to be related to perceived quality and further satisfaction. For the government, when designing the e-service architecture, the very first step will be to reduce the system risk as perceived by the user. Apparently, this point is slightly different from commercial service as users do not trust public e-services, probably because of privacy concerns[19]. Meanwhile, the more interactions with employees the users have, the more they are able to understand the e-services provided. Thus, government agencies should educate or provide necessary help to users before or when they are using the system.

7.3 Reinforced Public e-Service Policy Marketing Model

In policy marketing related studies, Snavely (1991) was the first to introduce the concept of marketing to public administration area. In practice, it is important to establish a policy marketing model in public sector, however, the transaction between public sector and citizen is essentially different from private sector which is based on mutual benefit. Therefore, the marketing tool for private sector cannot be applied indiscriminately to public sector. In order to have a proper and applicable tool for public sector, Snavely proposed "Policy Marketing Model" by revising Kolter's traditional marketing model. In Snavely's model, he emphasized on developing the policy marketing mix[20], and the overall model has been considered as an effective and applicable tool for policy marketing.

[19] In private sector, consumer is able to choose what kind of personal information he or she wants to share, however, in public sector, government manages much personal information more than private sector.

[20] The traditional marketing mix, or so-called "4P", is product, price, place, and promotion. In Snavely's Policy Marketing Model, because of the peculiar environments of public sector, he referred product as "service", price as "cost", promotion as "informing & educating", and place was regarded as the cost of service delivery. In addition, "policy analysis", "legal authority", and "personnel" are considered in Policy Marketing Model.

Snavely's policy marketing model was designed for general purpose, not for specific policy area. Nevertheless, each policy has its own attributes so that policy marketing strategy needs to be revised accordingly in order to reach its expected performance. Therefore, this study revises Snavely's policy marketing model and with the result of this study proposes a "Reinforced Public e-Service Policy Marketing Model" based on the context of public e-service.

The traditional way of public policy marketing tends to take every citizen as the target customer at the very beginning; however, due to the characteristics of e-services, a different way should be taken to make the marketing strategy for an e-service policy. As mentioned, this research adopted the perspective of reinforcement, so the role of ICT in e-governance will be only adopted by a specific group at this moment, e-readiness for example. In this case, it is important to know what the specific group is and identify its members as the target customers.

Based on the Reinforced Public e-Service Policy Marketing Model, we should identify "target customers" by using the confirmed traits of e-service users. The target customer of a policy refers to the specific group within citizens who will receive the information of the e-service and adopt it earlier than others.

Like the concept of strategy fit, a superior policy should consider the external environment, customer needs for example, as well as internal resource, budget, and authority at the same time. In this stage, policy makers should pay attention to all details in order to combine them (external and internal) together smoothly. After deliberation and internal discussion, it is then possible to make further progress.

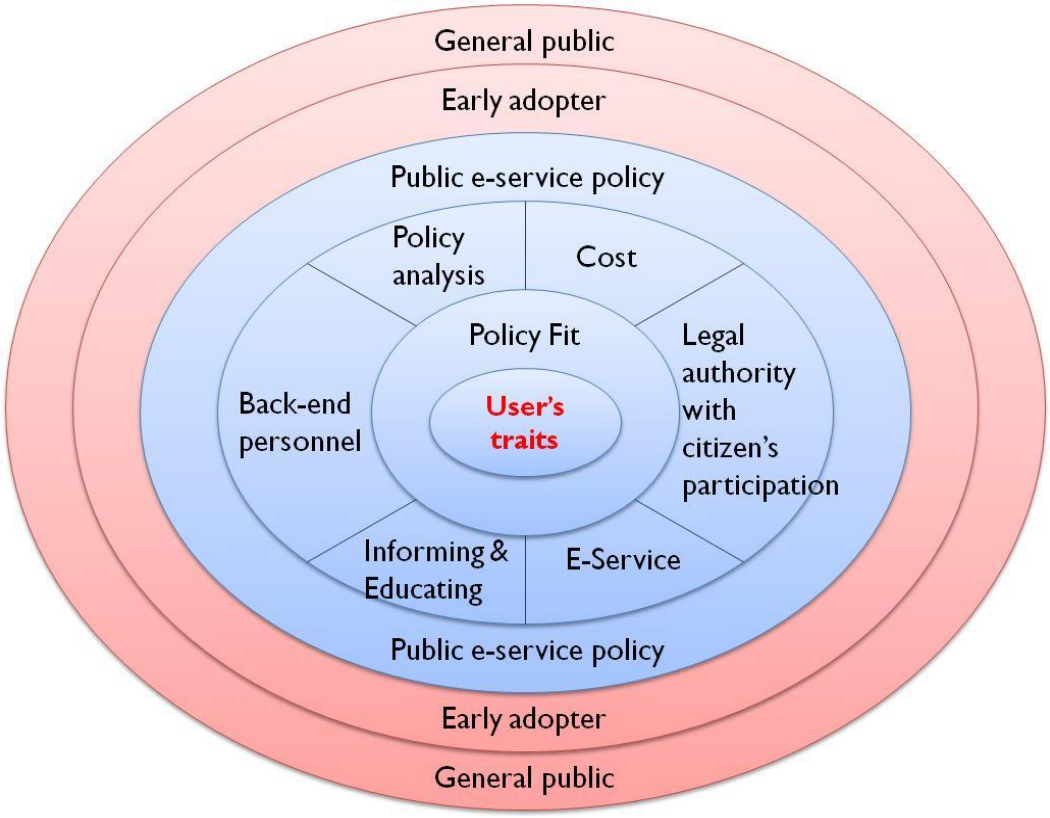

Figure 7.1 Reinforced Public e-Service Policy Marketing Model

Snavely's policy marketing mix contains "Service," "Cost," "Informing and Educating," "Policy Analysis," "Legal Authority," and "Personnel." However, because of the peculiar environments of public e-service, the proposed model modified some elements of Snavely's mix. In the Reinforced Public e-Service Marketing Model, "e-Service Policy Marketing Mix" includes the e-service itself, cost, informing and education, policy analysis, legal authority with citizen participation, and back-end personnel. For policy makers, once the target customer has been identified, it is easy to formulate an adequate mix for e-service policy marketing. At least three traits in this study are confirmed to affect perceived e-service quality: engagement tendency, perceived risk, and the need for interaction with service employees. Connected with the e-service policy marketing mix, back-end personnel for example, since the user has a higher need for interaction with service employees

during emergency, the response from back-end personnel, as well as the quality, should be increased in order to meet the user's unexpected requirements. Moreover, user perceptions of risk and engagement tendency have been confirmed, and are significant toward the perceived e-service quality. Thus, the legal authority should be proper and reasonable in order to eliminate this perceived risk, providing correct and sufficient knowledge to those with higher engagement tendencies. Regarding the formation of a legal authority, it is also necessary to have citizen participation at any means, and conduct a policy analysis on how to reduce the perceived risk of the e-service, among other needs. The range of identifying the customer to the completion of the public e-service policy is considered an internal service design process.

After a policy formulation, an external diffusion of the policy begins. When the public sector makes an e-service policy according to the above procedure, the policy is considered to be reinforced, and is able to serve a specific group such as earlier adopters who have a higher engagement tendency or need for interaction with a service employee. Based on their use experience, it is easy to spread out the advantage of an e-service to the general public. In a word, compared with Snavely's policy marketing model, the model proposed in this study emphasizes more the specific policy- e-service, as well as the service delivery process.

7.4 Contributions and Further Research Directions

While most e-government or e-service researches have focused on system or internal efficiency improvements, this study has tried to raise another important topic regarding user traits and perception of quality, as well as examining their causality. Meanwhile, by integrating different kinds of theories and perspectives, namely sociology, management, and informatics, a comprehensive blueprint is fully discussed.

The findings contributed to our knowledge of theoretical development regarding e-governance, service marketing, and policy marketing.

First, this study confirmed that the user's intrinsic characteristics are able to influence their perception of e-service quality and consequent satisfaction of the e-service, and the profile of a public e-service user was discovered from multi-faceted perspectives through a comparison with other similar research. The findings of this study have raised and confirmed the approach of user's trait in e-governance theory from the demand-side perspective. It gave a necessary supplement of an e-governance theory from the user side, which serves as a guideline for governments to manage their relationships with their citizens electronically.

Secondly, even e-government is derived from public administration theory, and the findings of this study confirmed that the perspective of management theory is ready to explain the phenomenon of e-government. In this case, further research in terms of e-government can be discussed from not only public administration theory but also management theory such as service marketing, which is in line with the essential aspects of the New Public Management movement.

Moreover, this study too has contributed greatly to the formulation and implementation of public e-service. As users of public e-service possess unique user traits, traditional policy marketing model needs to be reconsidered and redesigned so as to promote the benefits and effectiveness of public e-service. Based on the result of this study and by revising the policy marketing model from Snavely, an applicable and accountable model for public e-service policy marketing is proposed. It can serve as a useful guideline, providing direction when countries are formulating or implementing their public e-service policies.

Finally, a comparison study conducted on two leading Asian cities and its results showed a difference in terms of technology tendency toward a public e-service. The findings illustrated that regional factors might be major moderating variables affecting the public's acceptance of public e-services, and are suggested for consideration in further research. On the other hand, due to privacy or security issues, people in Tokyo are hesitant to accept a public e-service even when some of them are familiar with the technology. These findings also offer determinative elements for real practice.

This is an exploratory study to establish a framework for a public e-service, and is considered as a proper study to evaluate perceived e-service quality and satisfaction with an e-service. However, there may be other factors or user traits that have the same effect toward perceived e-service quality and satisfaction with an e-service. Thus, it is suggested that other researchers can input more innovative ideas or suitable factors into this conformed framework. Moreover, this study also proposed a conceptual model for reinforced public e-service policy marketing, which is totally different from a traditional policy marketing method. Thus, a well-designed research or case study is needed to verify the "Reinforced Public e-Service Policy Marketing Model" proposed in this study under certain conditions in order to understand the real effects, and to modify the model accordingly.

Despite all the care given to this study, there are several limitations that should be noted and addressed in any future research. First, this research empirically tested the e-service use of two cities, and did not select any specific e-services from the target cases. As there is great variety and diversity in e-services, the characteristics of each e-service might probably influence the results in certain ways. Future empirical studies should select a particular e-service that is available in both cities to eliminate possible variances.

Another issue regarding the methodology is the sample size. For this study, each case has a sample size of around 100. This is definitely accepted by the PLS; however, the PLS is used to discriminate the relationship between variables, and has nothing to do with cluster or other types of analyses. The users in this study should be able to be grouped according to their traits, which will then be meaningful to describe the behavior of each group academically and practically.

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Appendix 1: Questionnaire (Chinese ver.)

敬啓者：

本問卷乃由「早稻田大學電子政府研究所」發起並執行，主要為瞭解公共服務網站之使用者，其個人傾向與網站品質之認知、滿意度之關係，以便改善現存之政策行銷機制。在此，很榮幸邀請您參加此次的問卷訪查，相信有了您的寶貴意見，將使得 e 化公共服務與政策行銷體制至臻完善。同時我們承諾您所提供的任何資料，將只供作學術研究與內部改進之用。若您對研究結果有興趣，我們也樂於將研究成果與您分享。最後，再次感謝您的耐心與貢獻！

順頌

萬事如意

早稻田大學電子政府研究所

敬啓

2009/11/1

請您先回答以下問題，謝謝。

0 您瀏覽「台北市民 e 點通」的頻率約為				
每天一次以上	每週一次	半個月一次	一個月一次	半年一次
☐	☐	☐	☐	☐

一、使用者傾向

請根據您個人使用科技類產品（如 PDA、電腦、行動電話等）之經驗與印象，回答以下問題，謝謝。

1-1 我傾向使用最新的科技類產品						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-2 我常用電腦來處理身邊的大小事務						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-3 我同意在工作上，科技類產品可以提高我的工作效率						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-4 我同意科技類產品可以提高我的行動自由性						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-5 身邊的人常向我請教有關科技之類的事情						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-6 我總是可以自行解決科技類產品與服務的問題						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

1-7 有關科技方面的知識，相較於周遭的人，我總是可以迎刃而解						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-8 有時，我會認為科技類產品並不是設計給像我這樣的人使用的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-9 如果要買一個高科技產品，通常我會選擇基本款式，而不是複雜的多功能款式						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-10 我認為科技類產品常常會在緊要關頭，失去作用						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-11 我對於像網路購物之類的服務，會感覺到不安						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-12 網路購物完成後，我會希望對方以郵件或電話確認						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-13 透過機器或網路，我常常不確定對方是否能夠收到我提供的資訊						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-14 我對科技相關的知識與技巧相當沒有把握						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-15 我對於使用科技類產品相當熟練						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-16 當我使用科技類產品時，常會擔心弄壞它						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-17 我常會因為不熟悉使用方法而避免使用科技類產品						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-18 我常會因為害怕造成無法預期的錯誤而避免使用科技類產品						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-19 我對於志工的工作相當有興趣						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-20 我對於社會安全福利方面的議題，相當關心，同時也樂於參與						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

1-21 我對於社區鄰里所發生的事情，相當關心，並樂於去解決						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-22 我每天都會觀看報紙或電視新聞						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-23 我對於政治相關或政府部門的工作相當有興趣						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

請就您以往與『**公部門**』（含政府、教育機關）面對面互動與使用『**網路公共服務**』（如線上繳費、線上繳稅、線上申請證照等）之經驗，回答以下問題，謝謝。

1-24 一般說來，在與服務人員互動的過程中，我覺得相當愉悅						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-25 在接受服務的過程中，我通常喜歡與對方聊上兩句						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-26 對我來說，來自服務人員的細心的問候，不是特別重要						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-27 可以的話，我寧可採取面對面方式，也不願意使用電子郵件或線上申請來解決問題						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-28 整體來說，我認為使用「網路公共服務」具有相當大的風險						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-29 我認為在政府網站上註冊並登入某項服務，是很不安全的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
1-30 我認為政府網站容易被駭客侵入，以致於個人隱私遭竊取						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

二、公共服務網站之品質認知

本問卷所指的『**公共服務網站**』，乃指由台北市政府所成立之「臺北市民 e 點通」。
（http://www.e-services.taipei.gov.tw/hypage.cgi?HYPAGE=index.htm，以下簡稱「該網站」）

請根據您對於『該網站』的使用經驗，回答以下問題，謝謝。

2-1 我認為透過「該網站」與台北市政府之各局處室等互動，是相當容易的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

2-2 我所提出的意見或問題可以很快在「該網站」得到回覆						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-3 在我提出意見或問題後,「該網站」會很快確認我所提的問題						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-4 我同意「該網站」提供的內容非常即時，更新得非常快						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-5 我同意透過「該網站」，可以一次就解決我的問題						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-6 「該網站」的連線狀況一直都沒有問題						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-7 我可以依照自己喜歡的方式，更改「該網站」提供給我的內容或資訊						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-8 「該網站」有將我的需求考慮在內，也就是我想要的服務與資訊都可以在該網站內找到						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-9 當我無法找到所需資訊或服務時,「該網站」內的 FAQ 或線上支援可以提供必要的解答						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-10 我同意在「該網站」，我的個人資訊被當作機密保護，絕對不會被洩漏						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-11 我認為「該網站」所提供的服務是非常安全的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-12 我認為「該網站」提供的隱私權政策是非常清楚的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-13 在網站的使用上,「該網站」提供的資訊與服務都是有效且可連結的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-14 我同意「該網站」在版面的編排與內容架構是非常清楚的						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
2-15 我同意「該網站」在使用介面上，可以讓我很輕易的操作與瞭解						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

2-16 整體來說，我同意「該網站」的品質在水準之上						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

三、公共服務網站滿意度與政府政策印象

請根據您的印象，回答以下問題，謝謝。

3-1 我同意「該網站」的內容與服務相當好						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-2 我相當喜歡使用「該網站」的服務						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-3 我對於「該網站」所提供的資訊與服務感覺相當滿意						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-4 基本上，我認同台北市政府所提出的政策						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-5 基本上，我信任台北市政府所提出的政策						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-6 我相信台北市政府能夠實現所提出的政策						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-7 我同意台北市政府會將市民的利益放在第一優先						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐
3-8 整體而言，我對於台北市政府所提出的政策相當滿意						
非常同意	相當同意	稍微同意	無意見	稍微不同意	相當不同意	非常不同意
☐	☐	☐	☐	☐	☐	☐

四、一般資訊

請協助填入以下個人資訊，謝謝。

4-1 我的年齡介於				
20~30	31~40	41~50	51~60	61 以上
☐	☐	☐	☐	☐
4-2 我的性別為				
男性	女性			
☐	☐			
4-3 我的職業為				
自行開業或副總以上主管	中階管理人員	高學歷之技術人員	藍領工作者	公務人員
☐	☐	☐	☐	☐
軍人	家管	已退休	待業中	
☐	☐	☐	☐	
4-4 我的年薪約（新台幣）				
40 萬元以下	41 萬元～70 萬元	71 萬元～100 萬元	101 萬元～150 萬元	150 萬元以上
☐	☐	☐	☐	☐
4-5 我的教育程度為				
國中以下	高中	專科或大學	研究所或以上	
☐	☐	☐	☐	
4-6 我每天上網的時數平均約為				
8 個小時以上	5~7 小時	3~4 小時	2~3 小時	1 小時以下
☐	☐	☐	☐	☐

問卷到此結束，感謝您的參與！

Appendix 2: Questionnaire (Japanese ver.)

拝啓

本アンケートは、利用者特性による電子行政サービスに対する期待、利用実態及び満足度について調査を行います。電子行政に関する政策の策定や効果評価を行う過程において、主要な利用者層の特性や利用状況を十分に把握して推進することで、政策効果を高めることを図っております。ユーザ本の電子行政サービスの今後の発展、かつ、国民参加の拡大に貢献して頂ければ幸いです

早稲田大学電子政府・自治体研究所　敬具

2009/10/15

一、利用者層の特性

***IT* 製品【*PDA*、パソコン、携帯電話等】に関してお伺いします。**

1-1 自分がいつも最新の IT 製品を使いたい						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐
1-2 よくパソコンを使って物事を処理する						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐
1-3 仕事をする際に、IT 製品を使うと仕事の効率を向上させることが出来る						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐
1-4IT 製品による自分のモビリティーが増加できる						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-5 周りの人は、よく自分に IT の動向及び製品情報に関することを伺う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-6　IT 製品・サービスに関する問題をいつも自分で解決している

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-7　IT に関する知識について、周りの人と比べれば、常に問題を独力で解決している

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-8　偶に、IT 製品は自分以外の人のために設計されていると思う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-9 IT 製品を購入する際に(例：携帯電話)、高機能が持つ製品ではなく、スタンダード規格の製品を選ぶ

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-10　IT 製品はいつも肝心な時に役立ちません

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-11 インターネットによる買い物行為は、ちょっと不安を感じる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-12 インターネットにて買い物をした後、電子メールや電話による確認通知の連絡がほしい

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-13 機械やインターネットを介した連絡について、ちゃんと届いてるがどうかを心配している

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-14　IT に関する知識は、不足だと思う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-15 IT 製品をうまく使えると思う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-16 IT 製品を使用する際に、壊す可能性があると思う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-17 IT 製品の操作は苦手だから、出来れば使いたくない意識を持っている

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-18 IT 製品を使うと、予測できないミスが起こる可能性があるので、できれば使いたくない意識を持っている

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-19 ボランチィアの仕事に興味ある

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-20 社会福祉活動について関心を持っていて、喜んで参加したい

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

1-21 自分が住んでいる地域にて行われることにいつも関心を持っていて、問題発見・相談活動に積極的に参加している

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-22 毎日テレビニュースを見でいる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-23 毎日新聞を読んでいる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-24 政治関連・官公庁部門の仕事に興味がある

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

公的機関(東京都)における「職員による手続き」及び「オンラインによる手続」（オンライン支払い、オンライン納税、オンライン申請）についてお伺いします。

1-25 一般的に、職員の対応や説明に愉快だと感じる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-26 職員と会話するのは楽しいと思う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-27 電子メールかオンライン手続きで問題を解決するより、対面でのやり方がいいと思う

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-28 東京都のオンラインサービスを使うことについて不安を感じる						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-29 東京都のサービスウェブサイトに個人情報を登録することについて不安を感じる						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

1-30 東京都のウェブサイトは、一般ウェブサイトより攻撃されやすいので、個人情報が漏れる恐れがあると思う						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

二、電子行政サービスウェブサイドに関する認知度

当アンケートにおける「公共サービスネット」とは、東京都より設立された「東京電子自治体共同運営サービス」（*https://www.e-tokyo.lg.jp*）

ご自身に最もあてはまるものを、それぞれ一つずつお選びください。

2-1「当サイト」を利用し、簡単に公的部署とやり取りができる						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

2-2 「当サイト」に提出した意見や問題はすぐに返事がもらえる						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
☐	☐	☐	☐	☐	☐	☐

2-3「当サイト」に提出した申請やニーズはすぐに許可や批准がもらえる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-4 「当サイト」は更新が早くて、リアルタイムな情報を提供している

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-5 「当サイト」を利用すれば、問題は一遍に解決される

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-6「当サイト」は常に良い接続状況を保っている

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-7「当サイト」から提供してくる内容や情報を好きなように設定することができる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-8 「当サイト」は私のニーズを考慮し、ほしいサービスと情報はサイド内で確認できる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-9 「当サイト」で必要とする情報やサービスが見つからない時、FAQ 又はオンラインヘルプで必要な回答がもらえる

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-10 「当サイト」では個人情報保護を内密に保護し、漏れることはない

非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-11 「当サイト」が提供するサービスはとても安全です						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-12 「当サイト」が提供するプライバシーポリシーははっきりしている						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-13 「当サイト」が提供する情報とサービスのリンクはすべて有効である						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-14「当サイト」の配置や内容構成ははっきりしている						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-15 「当サイト」のインターフェースは理解しやすく、操作しやすい						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

2-16 トータル的に、「当サイト」の品質はノルマ以上に達している						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

三、公共サービス満足度及び政府政策イメージ

公共サービスの満足度及び都政政策イメージについてお伺いします。

3-1「当サイト」はとても良いの内容や情報、サービスを提供している						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

3-2 自分はとても「当サイト」の情報とサービスを利用し、閲覧することがとても好きです						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□
3-3「当サイト」が提供する情報やサービスにとても満足している						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□
3-4 基本的に、東京都が提出した政策に同意している						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□
3-5 基本的に、東京都が提出した政策を信用している						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□
3-6 東京都は、提出した政策を実現すると信じている						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□
3-7 東京都は、都民の利益を第一に考えてくれると思う						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□
3-8 トータル的に、東京都から提出されている政策には満足している						
非常に同意できる	かなり同意できる	どちらかというと同意	どちらともいえない	どちらかというと不同意	かなり同意できない	全く同意できない
□	□	□	□	□	□	□

四、利用者情報

以下の質問を答えなさい。

4-1「申請・届出サービス（電子申請トップ)」の利用頻度					
日に一回	週に一回	二週に一回	月に一回	半年に一回	
□	□	□	□	□	
4-2 年齢					
20 以下	21~30	31~40	41~50	51~60	61 以上
□	□	□	□	□	□
4-3 性別					
男性		女性			
□		□			
4-4 私の職業は					
自営業	会社員	サービス提供関連（工場作業員、運転手、店員、農業漁業、アルバイト等）	専門職（教師、教授、医師、弁護士、建築士、会計士等）	公務員	
□	□	□	□	□	
主婦	無職	学生	その他		
□	□	□	□		
4-5 学歴					
中学以下	高校（専門学校）	大学（短大、高専）	大学院		
□	□	□	□		
4-6 毎日のインターネット平均利用時間					
8 時間以上	5~7 時間	3~4 時間	2~3 時間	1 時間以下	
□	□	□	□	□	

アンケート調査にご協力いただき、誠に有り難うございました

List of academic achievements

Category (Subheadings)	
Articles in refereed journals or book chapter	○ 1. Chih-Hao Chang and Toshio Obi, Global Comparative Study on the Relationship between User's Traits and Public e-Service Quality, in E-Governance and Cross-boundary Collaboration: Innovations and Advancing Tools, Y.C. Chen & P.Y. Chu Eds., IGI Global publishing, USA, pp. 87-106, 2011, [ISBN13:978-1-60960-753-1] ○2. Chih-Hao Chang, The Influence of User's Trait on Public e-Service Usage: A Self-Service Technology Perspective, Asian Social Science, Vol.7, No.7, pp.3-11, 2011, [ISSN: 1911-2017] ○3. Chih-Hao Chang, The Antecedents of E-governance: A Study of Civic Culture and ICTs Readiness from Macro Perspective, Journal of CIO, Vol. 2, pp.23-30, 2008
Refereed articles published in proceedings of international academic conferences	○ 4. Chih-Hao Chang, E-government: An Effective Strategy toward Civic Engagement, Proceedings of 2006 Annual conference of Taiwan Academy for Information Society; Taoyuan, Taiwan, pp.21-31, 2006
Non-refereed articles in journals	5. Chih-Hao Chang and Toshio Obi, User's Profile on Public e-Service Usage: A Self-Service Technology Perspective, Journal of CIO, Vol. 4, pp.39-45, 2010 ○6. Chih-Hao Chang, Who is knocking at your door? A Comprehensive Study on Citizen's Traits toward Public e-Services Usage, Journal of CIO, Vol. 3, pp.39-43, 2009

Non-refereed articles or poster published in academic conferences	7. Chih-Hao Chang, Who is knocking at your door? A Comprehensive Study on Citizen's Traits toward Public e-Services Usage, Proceedings of the 6th International Conference on ICT and Higher Education 2008 Conference: ICT & Knowledge Management, Siam University, Bangkok, Thailand. Organized by International Association of University Presidents (IAUP), Asia and Pacific Distance Multimedia Education Network (APDMEN), Siam University, December 3rd-4th, 2008 8. Chih-Hao Chang, The Patterns of E-governance: A Study of National- Level Context, presented at GITI Workshop, Honjo, Japan, pp.12-13, 2007
Presentations at domestic conferences	9. Chih-Hao Chang, Introduction of 2009 Waseda Univ. e-Government Ranking, presented at The 3rd Waseda International Forum on CIO: ICT e-Government/Municipality and e-Governance, November 6th -7th, 2008, Tokyo, Japan. 10. Chih-Hao Chang, The Patterns of E-governance: An Analysis of Civic Engagement and E-tendency, presented at The 2nd IAC Annual Conference, March 23rd, 2007, Tokyo, Japan. 11. Chih-Hao Chang, E-government development: 2007 Waseda e-government Ranking, presented at The 2nd IAC Annual Conference, March 23rd, 2007, Tokyo, Japan. (Presented in 「世界電子政府ランキング」研究会)
Presentations at international workshops	12. Chih-Hao Chang, e-Government development, presented at APECTEL and CIO project in Connection with Asia Broadband Program "CIO and e-Governance", February 19th-20th, 2007, Tokyo, Japan 13. Chih-Hao Chang and Diana Ishmatova, Mobile Government, presented at the 2nd NECTEC-Waseda Workshop, sponsored by the Asia Pacific Telecommunity (APT) and Japanese Ministry of Internal Affairs and Communication (MIC), January 15th-17th, 2006, Bangkok, Thailand.