E-government Use and Use Mechanism:

A Comparison Study among Shanghai, Singapore and Taipei

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Abstract

While E-government attracts great attention and input from governments all around the world, less systematical research has been conducted from the perspective of its users. Besides, how well the users take advantage of the e-government development and are served by e-government is seldom compared between different kinds of polities, especially from the perspective of interaction between polities and technology. To fill the knowledge gap, a comparative study is conducted among three cities (Shanghai, Singapore and Taipei) by the present research from the perspective of residents' e-government use. The dissertation aims to answer the question: how citizens take advantage of the e-government in the three cities and what can influence their e-government usage. Five subquestions are detailed to illustrate the research question: 1) what's e-government use difference among the three cities? 2) What's the relation between e-government platforms use and e-government political participation? 3) What's the relation between e-government use and use intention? 4) How do political resources, political psychological engagement and overall recruitment influence e-government use in the three cities? 5) How can demographic-socioeconomic characteristics and internet use influence e-government use? To answer these questions, the Ladder of Citizen Participation and the Civil Voluntarism Model are adopted and modified. Online surveys were conducted in Shanghai, Singapore and Taipei. Research results reveal the universal applicability of the systematic political participation in e-government on one hand and unveil the e-government practice mechanism from the viewpoint of residents on the other hand. What's more, the results offer some enlightenment as well as challenges for comparing e-government practice in different forms of government.

Zusammenfassung

Regierungen weltweit schenken der Entwicklung von E-Government viel Aufmerksamkeit und investieren viel für deren Entwicklung. Eine systematische Erforschung des E-Governments aus Sicht der Nutzer ist aber bisher weniger erfolgt. Eine vergleichende Studie der E-Government Praxis in unterschiedlichen politischen Systemen ist aus Nutzersicht eher selten angefertigt worden. Diese Wissenslücke soll durch eine vergleichende Studie der Erfahrungen der Nutzer in den Städten Shanghai, Singapur und Taipeh mit den dort vorhandenen E-Government Angeboten geschlossen werden. Die Dissertation zielt darauf ab,

fünf Schlüsselfragen zu beantworten: 1) Worin besteht der Nutzungsunterschied des E-Governments zwischen den drei Städten? 2) In welchem Verhältnis stehen die Nutzung von E-Government-Plattformen und die politische Beteiligung bei E-Government? 3) In welchem Verhältnis stehen die tatsächliche E-Government-Nutzung und Nutzungsabsicht? 4) Inwieweit beeinflussen politische Ressourcen, politisch-psychologisches Engagement und die allgemeine Einstellung bzw. Rekrutierung die E-Government-Nutzung in den drei Städten? 5) Welchen Einfluss haben demografisch-sozioökonomische Merkmale und die Internetnutzung auf die E-Government-Nutzung? Um diese Fragen zu beantworten, sind „the Ladder of Citizen Participation" (die Stufen der Bürgerbeteiligung) und „the Civil Voluntarism Model" (das Modell des zivilen Freiwilligendienstes) für diese Arbeit übernommen und modifiziert worden. Online-Umfragen wurden in Shanghai, Singapur und Taipeh durchgeführt. Die Forschungsergebnisse zeigen einerseits die universelle Anwendbarkeit der systematischen politischen Partizipation im Bereich E-Government und andererseits den Mechanismus der E-Government-Praxis aus Sicht der Bewohner. Darüber hinaus bieten die Ergebnisse einige Erkenntnisse und offenbaren Fragestellungen für den Vergleich der E-Government-Praxis in verschiedenen Regierungsformen.

摘　要

尽管电子政务吸引了世界各地政府的广泛关注和投入，但从其用户的角度进行的系统研究较少。此外，很少电子政务实践比较是着眼不同类型的政体的用户。为填补知识空缺，本研究从居民电子政务的使用角度对三个城市（上海、新加坡和台北）进行了比较研究。本文旨在回答五个关键问题：1）这三个城市之间的电子政务使用有何种区别？ 2）电子政务平台使用与电子政务政治参与之间有什么关系？ 3）电子政务使用与使用意图之间有什么关系？ 4）在这三个城市中，政治资源，政治心理参与度和普遍性的纳入动员对电子政务的使用有何影响？ 5）人口社会经济特征和互联网使用如何影响电子政务使用？ 为了回答这些问题，本研究适配并调整了政治参与阶梯理论和公民自愿主义参与模型。分别在上海、新加坡和台北进行了在线问卷调查。研究结果一方面揭示了系统的政治参与对电子政务的普

遍适用性，另一方面从居民使用者的角度揭示了电子政务的使用机制。此外，对于比较不同政体中的电子政务实践方面，研究结果生发出了启发性的一面并揭示出了其挑战面。

摘　　要

儘管電子政務吸引了世界各地政府的廣泛關注和投入，但從其用戶的角度進行的系統研究較少。此外，很少電子政務實踐比較是著眼不同類型的政體中的用戶。為填補知識空缺，本研究從居民電子政務的使用角度對三個城市（上海、新加坡和台北）進行了比較研究。本文旨在回答五個關鍵問題：1）這三個城市之間的電子政務使用有何種區別？ 2）電子政務平台使用與電子政務政治參與之間有什麼關係？ 3）電子政務使用與使用意圖之間有什麼關係？ 4）在這三個城市中，政治資源，政治心理參與度和普遍性的納入動員對電子政務的使用有何影響？ 5）人口社會經濟特徵和互聯網使用如何影響電子政務使用？ 為了回答這些問題，本研究適配並調整了政治參與階梯理論和公民自願主義參與模型。分別在上海、新加坡和台北進行了在線問卷調查。研究結果一方面揭示了系統的政治參與對電子政務的普遍適用性，另一方面從居民使用者的角度揭示了電子政務的使用機制。此外，對於比較不同政體中的電子政務實踐方面，研究結果生發出了啟發性的一面並揭示出了其挑戰面。

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CONTENTS

1. INTRODUCTION

E-government witnesses a phenomenal development in recent years all around the world. With the help of ICT (information communication technology), government has undergone transformation, especially in the ways how it tries to reach users via electronic and digital means. However, much attention was paid to the supply side, namely, to how governments design and implement e-government to help assist administrative efficiency and decrease cost (P.-H. Hsieh et al., 2013).

Still though, as Svärd (2014) once pointed out that investments in information management systems alone cannot resolve information management challenges. Challenges can be found from the e-government implementation and institutional side. Some work has been conducted to illustrate the role played by e-government employees (Svärd, 2014; Wirtz & Piehler, 2016), the e-government management structure (Pierson & Thompson, 2016; Tassabehji et al., 2016; Thomas et al., 2015; Eric W. Welch et al., 2016) and its regulation issues and law conformity (L. V. Bennett & Manoharan, 2017; Law et al., 2014).

Moreover, citizens' or residents' usage of e-government is less well studied in a systematic way, which seems to lag far behind than the above-mentioned often researched e-government implementation and the less often studied organizational and institutional integration. This can lead to series of problems. Some scholars have pointed out that such problems can be found out all over the world when users' perspective falls short in the e-government development: digital divide of the users can hinder e-government to deliver service to the people especially to the digital have-nots (Epstein et al., 2014; Rosenberg, 2019; Sanchez & Brenman, 2013; Taipale, 2013); e-government can witness a low level of use (Kunstelj et al., 2009; C.-P. Lee, 2006), slacktivism (Wright, 2016) and even promotion failure (Anthopoulos et al., 2016) when users' needs are not met; it can

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even impede deliberative democracy (Tseng et al., 2009) and direct democracy features (Kang & Gearhart, 2010) which seem promising by the e-government adoption. Thus, it is necessary to include the point of view from citizens as well as residents which is somehow less well studied in the e-government research.

It is noteworthy that more and more scholars and institutions begin to focus on citizens' use of e-government and the general impact of e-government in the context of civil society and democracy or in the framework of good governance in authoritarian milieus. Grounded on basic e-government functions like information disclosing, commenting and discussions, more proactive political participation of citizens have come into being in recent years, which could enrich building-up of democratic mechanism (Field, 2003; Gil-García & Pardo, 2005; Gore, 1994; Reschenthaler & Thompson, 1996; Scholl, 2005; West, 2004).

Even though, systematic research investigating citizens' use of e-government is inadequate (Gauld et al., 2010; Helbig et al., 2009; Nam, 2014; C. G. Reddick, 2005; Streib & Navarro, 2006). Technological determinism and economic rationality remain the mainstream paradigms, especially in the beginning research period on citizens' use of e-government. However, e-government use and operation don't hang in the air, it must be attached to conventional political procedure as well as social context. Like Barbosa etc. (2013) once indicated that the structuration's view of technology and the social shaping of technology should not be neglected, although e-government and general digital development are regarded as revolutionary. Therefore, one approach of the present work is to try to connect residents' e-government use to the analog political participation practice and to relevant theories on the basis of conventional political participation studies. In other words, the present work tries to look beyond technology determinism and economic rationality. As a result, e-government usage is to be explained by users' political psychological predispositions, by their political and social surroundings, and by their demographic and socio-economic

features. Thus, a range of explanatory variables are to be drawn into the present research work.

What's more, e-government use can be observed and studied within one territory or among different territories (as comparison studies). For the latter cases, comparison can be undertaken between different municipal government forms within a polity, between western democracies in different countries (Neuroni, 2007), between western- and non-western democracies (Deakins et al., 2007), and between democracies and autocracies (Stier, 2015). By doing so, regional features, cultural characteristics or polity settings effect can be highlighted as a certain comparison angle is prudently chosen for study, while single case study can hardly fulfill such research purpose.

The present study is to present a comparative study from a seldom researched perspective for such three cities as Shanghai, Singapore and Taipei. In terms of territory, these three cities are located in different political entities; in regard to polity, these cities are scattered in a wide range of polity spectrum; with respect to region, they are situated in East Asia and Southeast Asia. It seems that the differences are too many to handle for a comparison study. However, some reasons are to be explained why these three cities are selected for the present comparison study.

Firstly, the ethnic cultural effect is expected to be minimized for the present e-government use study. All three cities can be culturally categorized in the Chinese world or where the Chinese population makes up the majority of the citizens. Here, Chinese is defined as the people who identify their culture as Chinese culture, rather than the nationality of the People's Republic of China. In Shanghai, 98.80% of the resident population are Chinese (Statistics, 2012) who are named in Mandarin as Han (汉, hàn) -Chinese. In Singapore the Chinese make up 74.34% of the total population (d. o. s. Singapore, 2018) and they are officially called as

Hua (华, huá)-Chinese. In Taiwan, Chinese take 97% of the total population (E. Yuan, 2018). They are also called Han (漢, hàn)-Chinese.

Because of the ethnic and cultural closeness, comparisons are often made within the so-called Greater China Region (大中华区 dà zhōnghuá qū), by which the term China should be understood ethnically and culturally, although culture influence and its evolution are often debated in East Asia from political motivations (D. J. Kim, 1994). Many comparison works are undertaken under the logic of Chinese Culture Region, such as comparison among Hong Kong, Singapore and Taipei (Luk, 2008), comparison between New Taipei City and Singapore (S.-H. Chang, 2015). One advantage of undertaking comparison within the Greater China Region lies in the assumption that the cultural homogeneity could minimize the cultural variance and favor social and political comparison.

Secondly, the effect of different e-government development levels can be reduced for the present study. A bunch of international rankings could provide self-evident showcases proving that these three municipalities can be grouped into the leading players in worldwide comparison. Although comparisons are often conducted from the perspective of infrastructure, citizens are seldom surveyed for their opinions of using e-government. In the second chapter, the e-government development level of the three cities is to be furtherly explored by illustrating e-government development in each specific city and by international e-government development rankings.

Last but not least, the effect of different political surroundings is to be expected to be accentuated for the three cities in e-government use, especially when the cultural difference and the technology difference are supposed to be minimized. There are huge differences among the municipalities from the perspective of polity. China is seen as a communist state, Singapore as a parliamentary republic and Taiwan as multiparty democracy (Obi, 2017a), while some researchers place Singapore as a de facto one-party state (W. Zhang, 2012). Therefore, one of the

core concerns of the present work is brought about: how e-government use differs in different polities and how far democracy-required and democracy-bringing elements of e-government can adapt themselves into these seemingly democracy-resistant polities (Tung, 2004) as well as into newly established democracy.

The main research concerns of the present work concentrate themselves on two aspects: e-government use in Shanghai, Singapore and Taipei, and what makes difference in these three cities in e-government use, if any. To reply to the concerns, several topics should be placed under observation and exploration: the e-government development in the three cities and how residents take advantage of e-government, the interplay of different kinds of e-government use, and the predictors which can influence e-government use. Specifically speaking, e-government use is to be explored in there perspectives: the e-government platforms use, the e-government functions use and the e-government themes use; predictors are to be explored in two domains, which include the direct politically relevant predictors (which in the next chapter can referred as political participatory factors) and socioeconomic background predictors (which is named as politically relevant characteristics in the present work).

At last, the arrangement of the whole work is introduced as below: a brief introduction of research background is illustrated in the first chapter, along with research concerns; the theoretic framework is presented in the second chapter, in which the above-mentioned e-government use and use predictors are to be organized in appropriate places with comprehensive literature review, while research questions and the research model are detailed at the end; methodology is to be presented in the third chapter along with variables measurement management; the fourth chapter contains e-government use survey results in Shanghai, Singapore and Taipei with corresponding data analysis to the research questions which comprehend the interplay of e-government platforms use and e-government functions use, and the predictors of e-government use in a systematic

fashion. At last, conclusions and recommendations for future research are to be presented.

2. THEORY FRAMEWORK

The theory framework is to be presented as four-fold in the present chapter. Firstly, e-government development is to be explored from the perspective of the abundance of e-government platforms supplies and international e-government rankings for the three cities. Secondly, e-government use is to be analyzed in the light of the participation ladder theory which emphasizes e-government use as a kind of political participation. Hence, the two main perspectives of observing e-government use are to be illustrated.

After that, two approaches of explaining why e-government use is conducted are to be introduced. The Civic Voluntarism Model (in short, CVM) (Verba et al., 1995) is selected and adapted, because it appears to be most appropriate and will be explained in detail in the third section. As the theory is rooted in the research of analog political participation which enjoys long-time academic attention, the analog paradigm is still in need to be transferred into the digital sphere, particularly to political participation on e-government. The second approach is entrenched in technology adoption, which is featured by the Technology Acceptance model (in short, TAM) (Davis, 1989) and its up-dated versions like TAM2 and the unified theory of acceptance and use of technology (UTAUT). In e-government research, such theories are often applied (AlAwadhi & Morris, 2008; Hung et al., 2006), as technological features are regarded as one of the most important research concerns of the e-government research work. However, technology acceptance and adoption alone cannot explain the research questions. The technological perspective is to be adjusted into the Civic Volunteering Model. The convergence of both models characterizes the present research model.

To sum up briefly, to explore e-government use, e-government platforms use and e-government functions use (as political participation) are to be reviewed and analyzed in the first two sections. In the last two sections, with the main goal to

explain why e-government is used, e-government is to be scrutinized in the light of the Civic Volunteering Model and the TAM-related Models. At the end of the present chapter, research model and research questions are to be raised by concluding literature review and furthering e-government research.

2.1 E-government platforms

In this section, two key points about e-government use are to be illustrated. Firstly, a brief introduction of e-government is to be demonstrated and a context-adapted review of e-government comparison among the three cities is to be presented. Secondly, e-government platforms development and platforms use in the three cities are to be illuminated in detail.

2.1.1 E-government development

"E-government" as a term can date back to as early as 1997 (Heeks & Bailur, 2007). Besides, several variation terms and closely related terms of e-government are often used such as electronic government, e-governance, and government websites (Joseph, 2013).

From the perspective of stakeholders, there are at least four parties to mention: (e-)government and its employees, citizens, business. The interrelationship between these parties was identified as early as 2001 in the "24 E-Government Initiatives" of the US American government (Forman, 2002). There are altogether four often studied types of interrelationships: government to citizen (G2C), government to business (G2B), internal efficiency and effectiveness (IEE) which can also be termed as government to employee (G2E) (Joseph, 2013), and government to government (G2G). From definitions of e-government by various researchers, the interrelations of these stakeholders are often indicated explicitly or implicitly. Although the type G2C serves as the one and only concern for the

present research, it is necessary to orient G2C within the context of e-government definition from all four aspects.

G2E, G2G, and G2B, G2C

At the initial stage, G2E and G2G were underscored in e-government implementation, along with e-government to non-government parties. E-government is defined as an internetworked government which is internally linked with legal systems and externally links government information infrastructure with everybody (Tapscott, 1996). The emphasis on both internal and external interrelationships can also be observed in other definitions of e-government at the initial stage: e-government is the transformation of internal and external relationships in the public sector through net-enabled operations (Fraga, 2002). Meanwhile, internal parties can be less stressed: e-government is digital governmental information or a way of engaging in digital transactions with the public (citizens and businesses) and employees (Abramson & Means, 2001). At some other cases, all four parties of e-government share equal significance in defining e-government: e-government is the use of the internet and other digital technologies to simplify or enhance the methods by which citizens, employees, business partners and government organizations interact and conduct business (Koh et al., 2005). Besides, e-government can be termed from the aspects of functionalities including e-procurement, e-administration and e-voting (Henman, 2010).

G2C and GwithC

Some researchers found e-government back office was "not accessible or visible to the general public (Y. Wu & Bauer, 2010)". Therefore, in e-government study which stresses particularly citizens, the definitions of e-government tend to concern more about citizen use. Thus, e-government can be defined as a set of

activities supported by information systems to improve the relationships between government institutions and citizens (Heichlinger, 2004). From a more sociological approach, e-government was defined as to use new information and communication technologies to help government to strengthen interactions with citizens and societal actors to solve societal problems collectively (Dawes, 2008; Dunleavy et al., 2006; Milakovich, 2012).

Also, definition of e-government from the perspective of G2C can be scrutinized in terms of its functionality. In this sense, e-government is defined as government use of the internet and web technology to deliver information and public services (Victor Bekkers & Homburg, 2007). The e-government definition by the United Nations also follows this approach and clarifies e-government as the use of ICT and its application by government for the provision of information and public services to the people (Hafeez et al., 2006)

What's more, a comprehensive expression emphasizing both G2C and its functionality can be found to regard e-government as "a permanent commitment by government to improve the relationship between the private citizen and the public sector through enhanced, cost-effective and efficient delivery of services, information and knowledge" (Durrant, 2002). Recently, a step further is moved from G2C to GwithC. Based on the G2C achievement and the idea to develop a citizen-centered government environment which is expected to serve citizens at anytime and anywhere (Holmes, 2001). The concept GwithC locates citizens in a more central and active role. Singapore, as a leader in e-government development in most international rankings, has been determined to shift from "government to you" to "government with you" since 2011 (I.-c. D. a. o. Singapore, 2011).

A brief introduction of e-government development in the three cities

A brief overview of e-government in Shanghai, Singapore and Taipei is to be presented, along which a general background in a national scale is brought up especially when the information at the city level is in absence.

In China, e-government can be traced back to the 1980s when the government started office automation. In 1993, the "three-golden projects" were launched to enhance custom (Golden Custom Project), digital currency (Golden Card Project) and taxation (Golden Taxation Project). In 1999, Government Online Project was started (Y. Zhang, 2005). With the development of ICT such as Internet and smartphones, e-government in China witnesses a transformation in the new millennium. Internet is integrated into governance and everyday life. In 2016, for example, "Internet + governance service" has been promoted by the State Council to bring informational benefit to the citizens (Xiaojuan Zhang et al., 2018). By December 2017, it is reported that 485 million people in China are served by e-government. The amount takes 62.9% of the whole online population (CNNIC, 2018). The city of Shanghai plays a leading role in e-government in China. With the largest online population in China, the website of Shanghai Municipality wins the sixth place in a longitudinal study among 100 cities in a global scale, following Singapore in the fifth place (Manoharan et al., 2015).

E-government in Singapore began in 1980. As early as in 1980, the first e-government plan was set in motion when Civil Service Computerization Program was launched by the government. This phase experienced a long time and lasted from 1980 to 1999. The second phase began in 2000 when most of the services online were provided by the government. Still, organizational boundaries were regarded as a huge blockade to remove by serving the citizens. And in the middle-term in 2003, to transcend boundaries and therefore better serve citizens became a focus in Singapore (Sriramesh & Rivera-Sánchez, 2006).

From 2006 began the third phase for whole-of-government integration and for increasing citizen acceptance of e-government. From 2011 e-government was looked upon to assist to achieve the goal of collaborative government. To support government-private value innovation, citizens were asked to co-create new digital service along with corporation and government and were encouraged to connect themselves for active participation. From 2016 e-government undergoes the fifth phase to embark on building up "smart nation". The ICT regulator Infocomm Development Authority (IDA) envisions that a smart nation would be carried out based on the Smart Nation Platform by 2025. To achieve this, big data, internet of things and alike have been applied (E Yu, 2014). Still, it is noteworthy that the e-government development mentioned above is concurrently at the national level as well as at the local level, because Singapore is a city-state. It would be interesting to observe in the present search if this distinctive character of Singapore would make a difference in e-government use comparison among the three cities.

E-government in Taiwan can be traced back to 1998 and has been going through five phases from then on (Council, 2014). Each phase takes four years, except the first period. Generally speaking, the focus of the first phase were electronization and network building, followed by the promotion in the second phase. In the third phase, an online government with good quality was forwarded. In the fourth phase and fifth phase, digital government was promoted (T.-Y. Huang, 2018). Meanwhile, the e-government development of the city Taipei is rarely illustrated by literature.

2.1.2 A brief introduction of comparison among the three cities

More informative insight into e-government development can be gained with the help of worldwide ranking lists. There are many rankings to mention, which

evaluate e-government development from various angles. After careful scrutiny three well-known worldwide e-government ranking lists are selected.

Since 2001, the United Nations Department of Economic and Social Affairs (UNDESA) has issued the United Nations E-Government Survey. The latest one to the present research is the ninth edition in 2016. Although the ranking is based on e-government assessment at the national level, not like the municipal level in the present work, core guiding principles and evaluation dimensions are inspiring and capable of being referred for the research.

The competition list is based on the E-Government Development Index (EGDI), which is a composite index consisting of the weighted average of three normalized indices. One third of it is derived from the Telecommunications Infrastructure Index (TII), one third from the Human Capital Index (HCI), one third from the Online Service Index (OSI). Besides, the E-Participation Index (EPI) is extracted as a supplementary index to the UN E-Government Survey. For the present study, the third dimension Online Service Index (OSI) and the E-Participation Index (EPI) turn out to be the most inspiring dimensions. Detailed references and interpretation will be highlighted in the e-government political participation part of the present chapter.

Except for the national-level comparison instead of municipal one, there is another reference deficiency of the UN report for the present research. Because Taiwan is not a member of all the 193 United Nations Member States, no ranking is available for Taiwan in the UN report.

Table 1. Selected Ranking from United Nations E-Government Survey 2016

	China	Singapore
E-Government Development Index (EGDI)	63	4
E-Participation Index (EPI)	22	8
Online Service Index (OSI)	31, very high	3, very high

Source: (Economic, 2017)

The survey shows that generally China was ranked at Nr.63 and Singapore at Nr.4. Specifically, China was placed at Nr.29 in Online Service Index and at Nr.22 in E-Participation Index, while Singapore was ranked at Nr.3 and at Nr.8 respectively.

The second worldwide ranking showcased here is the Waseda-IAC international digital government ranking. The ranking has been released since 2005. Every year a report is published by Waseda University and the International Academy of Chief Information Officer (CIO). Evaluation indicators are made up of more or less ten categories with several sub-indicators respectively. Although the measurement is not conducted with citizens as interviewees, these indicators like e-participation can somehow reflect the significance of citizen perspective.

Similar to the UNDESA report, analysis unite of the Waseda report is also country. However, Taiwan is included in the evaluation. China (mainland) improved its position in 2017 and reaches to Nr.44. Singapore was ranked consecutively at the first place from 2009 to 2013 and from 2015 to 2017. In 2014 Singapore was ranked at Nr.2 following the U.S. Taiwan is ranked around number 10. The gap between Singapore and Taiwan is smaller than that between China (mainland) and the other two political entities.

Although the competition is carried out between countries, the report (Obi, 2017a) still noticed the development gap within China and praised some megacities in China for their promoting "advanced e-Service and data share process to citizens (For example Beijing, Shanghai, Guangzhou) ..." The acknowledgement of development in these cities can somehow qualify the selection of Shanghai in line with Singapore and Taiwan.

Table 2. Selected Report from Waseda-IAC International Digital Government Ranking 2017

	China (mainland)	Singapore	Taiwan
overall	44	1	10

Source: (Obi, 2017a)

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One more thing that should be mentioned about the Waseda-IAC international digital government ranking is that in 2017 the key concept e-government has been addressed as d-government (digital government) mainly for the important role of digital innovation and digital economy in recent years. Still, the present work keeps following the conventional terminology – e-government.

The third world ranking, Digital Governance in Municipalities Worldwide (Holzer & Manoharan, 2016), is a collaboration between the E-Governance Institute at Rutgers University-Newark and the Department of Public Policy and Public Affairs, John W. McCormack Graduate School of Policy and Global Studies at the University of Massachusetts Boston. Different from the above-mentioned two rankings, large municipalities worldwide instead of countries are the focus of this study. Therefore, the municipalities in my study like Shanghai, Singapore and Taipei are appropriately included.

To achieve the goal of comparing digital governance, five dimensions are integrated into that study, among which several dimensions also could be found in the present study: privacy and security in the politically relevant characteristics; usability and content of websites in digital recruitment; the type of online services, and citizen engagement and participation in the participation and service part. What's more, categories from the present research are more multiple and are integrated into a systematic model, on one hand; on the other hand, survey of the present work is conducted by citizen users instead of scholar evaluators. Moreover, e-government website is counted as one of the platforms in the present study instead of the only one.

Shanghai (Nr.8) and Singapore (Nr.4) were in the top ten cities of the 2013-14 study. In 2015-2016, however, they slipped in their standing. Shanghai was ranked at Nr.39, while Singapore at Nr.13. Taipei joined the list only once and was ranked at 42 in the latest ranking in 2016. Compared to Seoul, the top city in the list, the losing points which make Singapore left behind mainly concentrate

on citizen and social engagement (-7.71), website content (-7.14), services (-3,78), privacy (-3.7) and usability (-1.56). Still, its service, and citizen and social engagement are outstanding in the worldwide comparison and win respectively the 7th and 10th place. Shanghai is also outstanding in citizen and social engagement and takes the 10th place in the worldwide list. General speaking, Taipei is left behind by the other two cities.

Table 3. Selected Ranking from Digital Governance in Municipalities Worldwide 2016

	Shanghai	Singapore	Taipei
Overall	39	13	42
Privacy/Security	64	19	40
Usability	24	26	28
Content	47	31	48
Services	35	7	41
Citizen and Social Engagement	10	46	10

Source: (Holzer & Manoharan, 2016)

By overviewing e-government development in Shanghai, Singapore and Taipei, a rough impression could emerge. By large, the three cities stand at the frontline of e-government development worldwide. Singapore, which is often near to the top position of ranking lists, is followed by Shanghai and Taipei. However, Shanghai and Taipei can also top Singapore in several points. The overviews sheds light on a further comparison in the light of citizen reports and on a systematic way of comparing e-government use for the present work.

2.1.3 E-government platforms

The definition of e-government is well explored by academia from the perspective of stakeholders and functionalities. Compared with that, e-government platform use is less researched and less systematically scrutinized. Here, the expression of platforms (in always put in Chinese 平台, píngtái) is confined to communication channels as well as tools in various forms. What's more, platforms with digital

features are regarded as different from the conventional communication channels. Firstly, communication by digital media is seen as multidirectional. Unlike traditional mass communication which paves a way for unidirectional communication, digital communication is praised for its multi-directionality. Secondly, digital technologies turns mass communication to a self-mass system, wherein personal communication and social networks can be built (Castells, 2011). Therefore, digital media is expected to exert its communicative advantage on e-government development, especially when individuals' interaction with government is often stressed and government tends to claim a user-centered governance (Snead & Wright, 2014).

One outstanding approach of e-government research is to compare e-government platforms and e-government platforms use. In some cases, the platforms use study can also be termed as channel study. Generally, distinct types of information channels can differentially influence media use (Brancheau & Wetherbe, 1990; Fichman, 1992; Zmud, 1983). In e-government research, the differences have been explored, too. A study shows that telephone or face-to-face conversation is appropriate for the need for direct interaction and complicated problems, while e-government websites are more suitable for information searching (Bonsón et al., 2014). Another research discovered that e-government websites are able to offer "large amounts of detailed information pertaining to different aspects of public services (Justice et al., 2006)", while e-government on social media is not able to achieve the similar task. When the uniqueness of certain platforms is well performed, it could be effective tools for individuals (Norazah & Ramayah 2011; Porumbescu, 2016a; Tat-Kei Ho, 2002; West, 2004).

In some other studies, the intention to use a single channel is overshadowed by the observation that actual e-government use is often across channels (Madsen & Kræmmergaard, 2015). In practice, multichannel approach is found to be a tactic to overcome accessibility barriers (Eynon & Margetts, 2007) and to stimulate the

generally low interest in e-government use (Economic, 2012). In Norway, for example, it is found that e-mail, the municipality website and municipality on social media are the top three preferred platforms for residents (Johannessen et al., 2012). In advanced studies, platform characteristics are not attributed to fixed properties anymore. Users' experiences and satisfaction with platforms, task characteristics and demographic features can influence the perception of and the willingness to use e-government platforms (C. Reddick & Anthopoulos, 2014; C. G. Reddick & Turner, 2012; Teerling & Pieterson, 2011)

However, the typology of e-government platforms is not in lack of conceptual disagreement and opacity (Lindgren & Jansson, 2013). After all, in the whole e-government research arena, "ghettoization (Pollitt, 2011)" and "conceptual vagueness (Yildiz, 2007)" are often criticized. In most cases, e-government platform studies tend to adopt the approach of case study. E-government on such platforms as websites and social media sites have been mostly studied. Although other e-government platforms have been adopted in a wide range, however, research work about them is not easy to find, not to mention comparison work between different e-government platforms and platforms use.

Two most comprehensive tables of e-government platforms can be found in the available literature. The first stems from e-government survey of all the member countries of the United Nations (Economic, 2014). Among all the items in this table, the first item is seldom studied in the realm of digital government, although a hybrid approach combining online transaction and counter service is very common in practice. Besides, no specific literature about the fifth platform can be found on a worldwide scope.

Table 4. List of Functions of New Media (non-exhaustive)

1. Counter (face-to-face) service	6. Mobile portal (mobile website)
2. Telephone (voice) service and call centers	7. Mobile app
3. Web portal	8. Social media
4. Email	9. Public kiosks
5. SMS and other messaging services	10. Intermediaries through public-private partnership

Source: UN (Economic, 2014)

In the next table, a framework of possible channels for e-government service platforms in Italy is presented (Lamberti et al., 2014). Besides public administrative websites and social networks, some other items can be categorized into either public kiosks or intermediaries through public-private partnerships in the UN table. Partly because the framework is made out for payment examination in Italy, financial related platforms such as banking are highlighted in the table. Another contribution of the framework is that the service provision in form of kiosks and stores in daily scenario were differentiated in details, which is beyond the scope of a normal e-government platforms categorization. The detailed classification reminds of the transaction with assistance of analogue infrastructure.

Table 5. A Framework of Possible Channels for E-government Service Provision in Italy

Post or Lottomatica (the company in charge of payment services at tobacconists') websites
Post offices
Bank offices
Tobacconists and Pharmacies
Social networks
Home banking
E-commerce websites or app stores
PA websites

Source: (Lamberti et al., 2014)

Still, there are some other platforms to mention which may be used by individuals unconsciously or indirectly. To assist to pass Taiwanese customs within 12 minutes, for example, analogue scanner has been conducted in recent years and has been used by individuals. Individuals can seldom be aware of such e-government service and can hardly categorize such service into e-government service. Similar platforms are too many to mention.

In the present work, somewhat active use of e-government platforms is to be focused, by which users are aware of their using of e-government platforms. In Taiwan, for example, approximately 81.5% of respondents were aware of online e-government services (Council, 2014). Upon the aforementioned platform

development and frameworks, six forms of e-government platforms are selected to review in the present study: from phone call, e-mail, websites, mobile apps, social media and other third-party platforms. Almost all these items listed in the UN list are included. Detailed analysis is to refer in the following sections.

2.1.3.1 Phone call

Before digitalization, phone call was a common platform to take part in municipal participation. After the digital reform, phone call still remains popular and gains an updated capacity to process. City hotline in Taiyuan, a city in North China, underwent such a reform in 2013 with an increased agents number from 40 to 120 and with a call completing rate from 85% to 95% (F. Liu, 2017). In this sense, phone call can be classified into e-government platform.

In China, two general phone call numbers are municipal service 12319 and major hotline 12345 (Liu, 2017). In some municipalities such as Shanghai, the municipal service is absorbed into hotline 12345 (B. Zhang, 2017). In a non-representative survey (Z. Wang & Lim, 2011), 37% of the 151 citizens reported that they used to contact government by writing letters or making phone calls in China. In Singapore, there is no unified hotline. Individuals should turn to complaint hotlines of different authorities. In Taipei, the citizen hotline 1999 is started in the year 2005. One prominent point of the hotline can be found in its one-station process which is designed to prevent individuals from waiting for being forwarded (Liao et al., 2015). The integration of authorities and their services into one hotline window is awarded with some international prices due to convenience for users. Since the end of 2014, the online website version of the citizen hotline (1999.taipei.gov.tw) has been provided. Moreover, individuals can use Skype to reach the Taipei Municipality by Taipei.1999 and its variants.

2.1.3.2 E-mail

E-mail was initially regarded as online version of letters to municipality. Gradually, some new characteristics of e-mail platform take shape and form a new kind of e-government platform. There are at least three forms of e-mail platform in current use. The first one is to send e-mail to a public e-mail box from a private e-mail address. As long as e-mail boxes of both sides are in service, this platform can be regarded as complete. In China, for example, 33% of respondents report in a non-representative survey that they used to contact government by sending e-mails (Z. Wang & Lim, 2011).

The second e-mail platform is totally based on e-government website. Often, it can be found as a column on website portal with the name of major e-mail box. Individuals are asked to fill their messages in such a column and receive answers privately or openly on the website with a certain degree of anonymity (M. Li, 2017).

The third form of e-mail platform is also based primarily on e-government but with a standing official e-mail box for individuals. In Shanghai, SMMAIL (Shìmín Xìnxiān 市民信箱) has been launched since 2004. SM mail box is available to individual, as long as real name is given to and coupled with the box. E-mails related to personalized service and open information is sent by the e-government end to individuals' box. Since 2013, the mobile App version SMCloud (Shìmín Yún 市民云) has been available in Shanghai (S. M. P. M. s. M. Center, 2018). By the end of 2016, 40% of all the citizens of Shanghai are already registered in SMMAIL (Bureau, 2017). A similar mailing system was also in use in Singapore. The OneInbox was an official mail box for individual's use (Ma, 2017). To access OneInBox, real name of individuals should be coupled with the box by logging in with the e-identity SingPass. The platform is accessible both on website and on mobile App. However, the OneInbox service was ended in 2017. Low take-up rate was reported as one of the reasons to end it; besides, the

sole function of viewing letters from government was too simple for individual's needs (Tham, 2017).

2.1.3.3 Website

E-government website is one of the key points of e-government development and of the correspondingly initial development stage of e-government research (Ebbers et al., 2008). In the U.S.A., for example, e-government website on federal, state, and local levels are well researched (Snead & Wright, 2014). In Korea, it is found that government's policy is mainly discussed on e-government websites (Chung et al., 2014).

In China, e-government website has been launched since 1999 along with the Government Online Project. There are altogether 28565 such websites by the end of October 2017 (J. Li & Zhang, 2017). Alone in Shanghai, there are 619 e-government website ending with "gov.cn" (Li J, 2017). Four functions are required by the State Council in 2017: information publish, response analysis, service and interaction, among which to analyze response from citizens is added as a new dimension compared with the requirement in 2011. In Shanghai, these four functions can be found on its website (shanghai.gov.cn). Besides the column Open Information and the column General Interaction, Public Service offers assistance for life cycle and Online Service Hall provides extra services such as application and open data. (S. M. P. M. s. M. Center, 2018). In Singapore, new technologies are deployed in e-government website. Virtual assistant Jamie, for example, provides help on website in the column "Ask Jamie". In Taipei, e-government website use is found to be positively related to individuals' political participation in major election (Lin, 2013).

From the perspective of individuals, website platforms can be identified as three types: proactive outreach, focused services, and proactive one-stop services (Council, 2014). The last one, which is often called e-government portal, is

endorsed by the advocate of holistic government in response to globalization, hyper-competition and hyper-uncertainty (Farazmand, 2009). A solution to fragmentation is also comprehended as a consequence of one-stop website. It is believed that one-stop service is able to push government to be accountable to the people, rather than only to itself (Gao et al., 2013).

It is clear that governments from many countries strive to build up one-stop website. In China mainland, one-stop website is not only asked to be horizontally integrated but also vertically. Confronted with the fact that 83% of the unqualified e-government websites are found at the below-county level (Zhou & Zhang, 2017), the one-stop website implementation has been promoted to concentrate on provincial level since 2017 (J. Li & Zhang, 2017). In Singapore, the idea of holistic government is also underscored. According to the Waseda international comparison (Waseda, 2017), the portal of Singaporean government is regarded as very well-organized: citizen only need to access one government portal for service without knowing the responsible agencies behind that. Singapore won the recognition of "promoting whole-of-government approaches in the information age" from the UN public service awards (I.-c. D. a. o. Singapore, 2011). In Taiwan, an overall one-stop website is less reported except an integral platform of welfare which is being built with the cooperation by central and local government.

The rapid development of e-government website in the one-station fashion in some countries was praised on one hand. On the other hand, it could be criticized for its authoritarian tendency. Through the integration, "authoritarianism online" (Greitens, 2013) featured with surveillance of the population and activism serving the regime goals is warned. The questions are open to explore: whether the enthusiasm of the e-government website reflects the need of citizens and whether the conviction for a Whole-of-Government is really close to the totalitarian belief of government and citizens.

M-government

In recent years, mobile e-government witnesses a rapid development and m-government services show continuing growing momentum (Benlamri et al., 2009; Y. Kim et al., 2004). One of the most important infrastructural premises of m-government is attributed to the penetration of mobile telecommunication, particularly the smart phone. In comparison with fix broadband, mobile networks with 3G or 4G standard allow users to work on the go, stead of being fixed with a desktop or a laptop (Ofcom, 2015). What's more, smart phone offers more possibilities to contact e-government at a fingertip. Larger size screens and prolonged battery life equip a more comfortable tasks accomplishment (Economic, 2017).

In developing countries in Africa, mobile technology is regarded as prominent in development. In South Africa, for example, the effect of mobile phone use on civic engagement is strengthened when it is moderated with social capital (Ingrams, 2015). In China, the mobile phone penetration rate reaches a high level not only for the younger generation (H. Zhang, 2017), but also for underprivileged rural areas (Ma, 2018) by the end of 2015. Although only 18.6% of internet users are reported to have used e-government website (CNNIC, 2018), more individuals approach e-government by mobile phone. Besides website, the e-government development strategy of Chinese government targets mobile government on the platforms of Weibo, WeChat and official mobile apps, in short, 2Ws1A (Liǎngwēi Yīduān, 两微一端) (G. Yang, 2017). Those platforms are directed by government to share their popularity with e-government. In a study, the users number of e-government on 2Ws is proved to be more than that of e-government website (C. Hu, 2017).

In Singapore, mobile penetration also reached a high level at nearly 98 percent, which can facilitate government to deliver mobile services to stakeholders. In the eGov2015 master plan, m-government is regarded as one of the cornerstones to

improve the reach and richness of government e-services. More than 300 mobile services have been created for various functions and purposes (Obi, 2017b).

In Taiwan, mobile government was stimulated as one of the flagship projects in the 4th E-government development period (2011 to 2016). Unified mobile portal has been established (Council, 2014). C2G communication effectiveness is expected to improve through m-government (Hung et al., 2013): 55% of respondents report that it is (very) convenient to use mobile phone to access e-government and a high proportion of respondents prefers to express their opinion by using mobile phone (Li, 2017). Besides, the favorable age groups are not only limited to the conventionally recognizable digital natives: adolescents from 15 to 19 years old and adults between 50 and 59 years are among the most active age groups, while the age group between 20 and 49 are generally less active. Another interesting finding of the research is that workers are more satisfied with m-government than professionals.

2.1.3.4 Mobile application

As illustrated above, m-governments gradually tends to mobile application of e-government platforms, in which the mobile apps and social media apps are among the most studied cases. While both use sorts are based on the mobile phone use. One of the remarkable differences between them is that the mobile apps are particularly designed for government use, while the e-government use on social media is integrated in social media networks.

Firstly, the official mobile application of e-government is to be illustrated. In China, the number of e-government apps reached to 400 with more than 50 million downloads by 2015 and are deployed at central, provincial and local levels (Z. Chen, 2015). In 2016, e-government app platforms appeared for the first time in a nationwide ranking list (Xiaojuan Zhang et al., 2018). By the end of 2017, 9.0% of all the internet users have used mobile apps (CNNIC, 2018).

Like website research, mobile app platforms are well studied du s popularity. Some studies examine how one's socioeconomic features (politically relevant characteristics) exert their influence on mobile app use. It is reported that gender, education, occupation and age are major influencer on satisfaction with e-government mobile apps (Yiqing Li, 2016). Some studies are undertaken from the perspective of digital settings. Except for perceived usefulness (S. Tan, 2016), perceived trust and subjective norms also have their impact on mobile app use (Xu, 2016). The relation between political activities and mobile government is also studied: transaction service is in most use (Xiaojuan Zhang et al., 2018) and information disclosing and timely updating are regarded important for mobile apps (Z. Chen & Q. Liu, 2017). On the other hand, privacy is becoming an acute problem as mobile e-government apps are integrated in user' everyday use. For transaction service alone, the security of paying online and to keep the transaction secret concern individuals (Xiaojuan Zhang et al., 2018). Generally, personal information should be prevented from leaking, falsification and unauthorized usage.

In Shanghai, m-government apps are available in a great amount which are supported either on city level or on a district level (Dong et al., 2014). Pudong e-homeland (Pǔdōng e Jiāyuán, 浦东e家园), the app for Pudong district governance in Shanghai, is reported to be successful in fulfilling its goal: 94.8% of all the respondents who account for 89% of the users feel satisfied with the platform (B. Zhang, 2017). Besides, it is also notable that some of the apps are merely the mobile version of the website counterpart, while some others are exclusive for mobile phone use.

In Singapore, some e-government websites have their corresponding mobile apps. OneService, for example, is a one-stop platform which is both available as website (oneservice.sg) and mobile app. Government agencies, town councils and citizens are expected to cooperate on the platform to build up a solidary community.

Moreover, almost all the ministries in Singapore provide their services in form of mobile apps: (new) OneMap is provided by Singapore Land Authority, my SCDF and myResponder by Singapore Civil Defense Force, myNEA by National Environment Agency (Obi, 2017b). In Taiwan, more than 300 e-government mobile applications have been available (Council, 2014). They promise not only a new entrance, but also a new contact experience of C2G. In Taipei, there is a consensus to promote mobile apps. Traffic apps such as Taipei Trip (臺北好行), Good Parking in Taipei (北市好停車) and payment m-apps such as pay.taipei (臺北市政府智慧支付平台) are in employment.

2.1.3.5 Social media

Social media can be referred to as "social technologies derived from Web 2.0 that allow the generation of virtual communities starting from the connection, generation, interaction and exchange of information of an unlimited collective of people who share some common interests (Criado et al., 2017)". Often, social media is descriptively defined as internet platforms which "are often associated with such concepts as user-generated content, crowd sourcing, and Web 2.0 (John C Bertot et al., 2010)". From the perspective of platforms, examples of social media commonly including social networking sites, microblogs and multimedia sharing services are illustrated as social media platforms (H. Hong, 2013; S. Smith et al., 2010). What's more, social media sites can be detailed listed in seven categories (Hartmann et al., 2013): (1) social networking platforms like Facebook, Google, (2) the business social networks like LinkedIn , (3) the location based social network, (4) the microblogs like Twitter, Weibo; (5) the video platforms like YouTube; (6) the photo sharing applications like Flickr and Instagram, (7) content sharing services like Pinterest.

In recent years, social media serves as another practice and research focus of m-government. Globally, as many as 152 out 193 member countries of the UN

provide social media site use for e-government (Economic, 2017). A rapid diffusion of social media among public administrations is observable at all levels (Agostino, 2013; Graham & Avery, 2013; Mickoleit, 2014; Sobaci, 2015). The U.S. is regarded as the leading player in this arena. As early as in 2012, more than 66% of all the governmental organizations in the U.S. deliver service on social media (Economic, 2012); the federal government alone interacts with individuals through more than 1000 Twitter accounts. (Khan et al., 2014)

Social media sites are attributed with four major potential strengths which can enable e-government to make some breakthroughs in certain aspects: collaboration, participation, empowerment and time (John C Bertot et al., 2010). As a platform featuring web2.0, it is reported that personal interaction is determinant on perceived usefulness on e-government (Piehler et al., 2016). For the first time government agencies are able to interact and even collaborate with individuals in a bidirectional way (Mergel, 2012). It can be observed that the popularity of social media is accelerating e-consultation (Economic, 2017). Simultaneously, an integrated social networking based on social media sites is able to foster collaboration. To begin with a like, retweet or mention, it is possible for relationships on social media to evolve to followers and friends (Bonsón et al., 2014). Thus a tie of social relationship can be built between e-government on social media and individuals.

What's more, fair participation is expected to promote by the social networking feature (Council, 2014). In South Korea, personal issues are broadly communicated on e-government social media arena, while critical attitudes toward the government are found typically in participation (Chung et al., 2014). Furthermore, The empowerment strength is praised in the initial years of social media sites, because they can enable individuals to post content and share opinions at a minimal cost (Lupia & Philpot, 2005). In Taiwan, the empowerment strength and participation strength are empirically tested in one student movement:

compared with mass media users, social media users participate more actively in and have more positive impression towards the Sunflower student movement (W.-C. Chen et al., 2016). At last, information sharing in near-real time differs social media with mass media and other communication forms in terms of time. Besides the digital setting attributions, social media could be regarded as a platform which bridges the public sphere and private sphere. Although social media started from private sectors (Council, 2014), public opinions can be explosively expressed on the platform and have huge impacts on politics, thereafter. On the other hand, e-government exposes itself on these private sectors and intrudes in the initial private sphere. Thus, the linkages between the private life and public presence, between the analogue existence and online behaviors are becoming interesting for research. In relevant studies, such theories are deployed as Media Richness Theory (Daft & Lengel, 1986), Channel Expansion Theory (Carlson & Zmud, 1999) and Uses and Gratifications Theory (Katz et al., 1973). To examine e-government on social media from the perspectives of politically relevant characteristics, political participatory factors and e-government political activities (which are to be illustrated in the rest of the present chapter), a sociological approach should be more appropriate to integrate all the perspectives in the present study.

Some researchers study e-government and e-government on social media by this approach and explore social shaping of e-government adoption and use (Barbosa et al., 2013; Liste & Sørensen, 2015). By combining reception analysis and social shaping of technology (Haddon, 2007), domestication theory, for example, which concerns technology use after technology adoption (Berker et al., 2005), explores especially how new media use can be incorporated in daily routines (Frissen, 1989). The view point of this approach comes overwhelmingly from individuals who are not just regarded as passive adopters, but as active subjects (Hirsch & Silverstone, 1992). Users are not only shaped by technology but also shape

technology in return. Thus, individuals' values, interests, and routines should be examined to clarify their relation to e-government use. Four aspects of the domestication process are identified as appropriation, objectification, incorporation, conversion (Haddon, 2011) which are not explicitly followed in the present research. However, these aspects can be interoperated on the basis of research variables.

Critical findings of e-government on social media sites can be found from the following aspects. Firstly, the cited achievement is embarrassingly confronted with low levels of citizen participation (Coursey & Norris, 2008). Deploying social media for e-government purposes doesn't necessarily mean an increase in (e-)participation. Election turn-out, for example, was little influenced by individuals' presence on social media sites (Effing et al., 2011; S. Hong & Nadler, 2012).

Secondly, the increasing risk of information overload, cyber propaganda and inadvertent information release can worsen e-government use on social media sites (Grimmelikhuijsen, 2012). A research states that distance from and cynical political attitude towards e-government can be raised (A. J. Meijer et al., 2012). Some researchers find out that interaction with government can be problematic on a media platform just for fun (Margetts & Dunleavy, 2002). In some situations where system security and users' privacy are harmed, e-government use on social media can be negatively impacted (Peng et al., 2012).

Thirdly, there are amount of hindrances to overcome by the (e-)government side. Maintenance problems have been found in Japan (Goto et al., 2011). The trials such as customized social networking service systems were often not successfully implemented and phased out quickly (Kaigo & Okura, 2016). In the U.S., social media is mainly used for one-way communication by local governments (C. G. Reddick & Norris, 2013). Therefore, social media is not yet able to promote e-government to Web 2.0 but to Web 1.5. In China municipal e-government on

microblogs is not totally identical with analogue government (Schlæger & Jiang, 2014): they are regarded as "beta institutions" of their counterpart; besides, there might be conflict in the relation between (e-)government and social media site enterprises due to their different goal pursuits; in case social media sites enterprises keep control, access and data from e-government, little improvement can be conducted in certain aspects.

Next, e-government on social media is to illustrate for the three cities of Shanghai, Singapore and Taipei. In China, the first e-government on social media can date back in 2009 on Weibo (M. Huang, 2017). By the end of 2017, there are altogether 134827 verified e-government accounts on Weibo, among which 5246 are located in Shanghai (CNNIC, 2018). As Weibo can reach to 40.9% of the whole internet users in China by the end of 2017, its popularity can also be reflected on e-government presence on it: 11.4% of the internet users are users of e-government on Weibo at the same time (CNNIC, 2018). The other popular social media WeChat also hosts more than ten thousand e-government accounts (Z. Tang et al., 2017), among which 233 are located in Shanghai with 204 public accounts and 29 city service accounts (Lv et al., 2017). As 87.3% of all the internet users use WeChat, the relative higher popularity harvests 23.1% of the total users for e-government use on WeChat. Besides, city services have been introduced into transaction on WeChat since 2014 and enjoys a large percentage of internet uses (CNNIC，2018). The Shanghai WeChat public platform Shanghai Publish (Shànghǎi Fābù, 上海发布) yields averagely more than 1 million times visits per day. Besides Weibo and WeChat, upcoming influential social media sites are emerging in China in recent years and attract the attention of e-government. TopBuzz (Jīnrì Tóutiáo, 今日头条) is one of them. By the end of 2017, altogether 948 Shanghai municipal e-government accounts settle down in TopBuzz (CNNIC, 2018).

In Singapore, Nielsen did a study in February, 2010 which showed that over half (52%) of the Singapore population were participating in at least one social media website, whose popularity ranking is Facebook (42%), followed by YouTube (35%) (I.-c. D. a. o. Singapore, 2011). However, the country seems to pay less effort in e-government development on social media. In a study, only one social media platform for general government purpose is discovered with one out-link with Twitter and one in-link with YouTube; besides, five social media platforms for all (general government, institutions, departments and political persons) are found (Hartmann et al., 2013): The activity of e-government on social media mainly demonstrates on Twitter with almost 100 posts on a monthly basis, while it is less active on YouTube. Besides, users' activity is reported to be low with the evidence of few subscribers (Mainka et al., 2014).

In Taiwan, along with online communication, social media use is regarded as the main means to surf online (C.-P. Lee & Hong, 2017). Only 10.5% of respondents reported that they never used Facebook, while 69.3% reported that they used it every day. 17% of respondents reported they posted or commented every day, while 21% reported that they never did it (Chu et al., 2016). The popularity can therefore form a solid base for e-government on social media. Altogether 46 Taipei municipal institutional accounts can be found on Facebook. The other online communication platform featured with social media is LINE, a mobile app that comes originally from South Korea. Similar to the Chinese WeChat, information publishing and transaction services are offered on the platform by e-government account. Moreover, there is one account Taipei City Government on YouTube.

As aforementioned, mobile applications and social media sites are two main platforms for m-government in practice. Some other platforms which are also based on mobile technology such as SMS alert are adopted in the three cities. M-

government platforms are hardly exhaustively illustrated in the research. Therefore, the most prominent two platforms are analyzed.

2.1.3.6 Other third-party platforms

In practice, third-party platforms are often in need to access e-government services. Social media, as analyzed above, is essentially a third-party platform which is utilized for e-government. Except for the e-government on social media, the role of non-governmental third-party platforms which mediate individuals with e-government is studied in some research. Search engines Google and web-banking are found to be more popular and more frequently used than e-government portal in Denmark, when political activities are addressed (Madsen & Kræmmergaard, 2015). Similar usage patterns can also be observed in Italy (Lamberti et al., 2014): social networks and e-commerce websites enjoy the highest popularity among young respondents.

As domestication in everyday routine is important to e-government use on social media, routine use of other third-party platforms is also found being significant in adopting e-government. In China, a study in 2017 shows that 364 out of almost 3000 counties all over China deploy Alipay (Zhīfù Bǎo, 支付宝) to serve more than 200 million individuals (Ma, 2018). Together with WeChat City Service, these two transaction third-party platforms serve 44% of all the online individuals. Therefore, they can be regarded as the most popular e-government platforms in China (CNNIC, 2018). This survey outcome can well confirm a use intention study in 2013 (Kreis eV, 2013) which reported that 41% of respondents "…would like to use electronic services for citizens on Facebook and other social media platforms".

Another interesting finding can be observed in Taiwan. Besides cooperating online third parties, offline third-party platforms such as convenience stores are also engaged in e-government deployment. With the world's highest intensity of

convenience stores, more than 9600 units offer residents with non-stop service like paying fees, querying government information by multimedia end-devices and even renewing driver's license (Council, 2014). Similar development can also be found in Italy: the first four most preferred e-government platforms in Italy are offline ones, followed by e-government websites as the fifth popular one. (Lamberti et al., 2014)

In all, e-government platforms are too many to list in a comprehensive way. In the present study, phone call, e-mail, websites/portal, mobile applications, social media and other third-party platforms consist of the main concerns of e-government platforms study. Some other innovations, whether such e-government online platforms based on newly emerging ICT breakthroughs or such e-government offline integration as city card, library assistant, mobile e-service vans, door-to-door service, etc. (Council, 2014), are not included in the present study not because of their insignificance, but because of relatively less frequent use in general. Due to limited space, these innovations are just mentioned here in a restricted manner.

2.2 E-government political activity

Political participation lies in heart of democracy (Verba et al., 1995, p. 35). For e-government, political participation plays and should also play a role as center piece. The development of ICT and other better techniques, tools and mechanisms are equipped for participation (OECD, 2001; Ridder et al., 2005). However, it is noticeable that the notions and epistemologies of political participation in e-government arena as well as public investment in digital technologies "in the absence of accountable institutions" could amplify the voice of the elite, result in greater control and menace democracy (Peña-López, 2016).

In this section, political activity in e-government is to be scrutinized under a wide perspective of political participation and e-participation. Furthermore, forms, volume and themes of e-government political activities are highlighted with the emphasis in Shanghai, Singapore and Taipei, as well as in other regions around the world.

2.2.1 Political participation theories

2.2.1.1 Political participation

As Collins, etc. (2006) pointed out that notions and epistemologies of political participation have lagged behind the imperative for participation and stakeholder involvement, it is not easy to go through the complex jungle of political participation terminology and the overlapping areas of these concepts. Three approaches to understanding political participation have been emphasized by Carpentier (2016) to help to orient in the political participation research. Firstly, the political approach regards political participation as power-sharing. Levels of power equality are the main concerns of participatory processes. Political approach ends there where the second approach begins: the critical approach. The volume of participatory processes is studied and the intensity of inequality becomes the key question. Thirdly, political participation can also be reviewed in the sociological approach which lays great value in taking part in a process. As these three approaches are widely adopted in political participation research and in e-government arena, a brief introduction of them is presented as follows to build a knowledge basis to better understand e-government political activities.

Political approach

Political approach refers to the equalization of power inequalities in particular decision-making processes (Carpentier, 2011; Carpentier et al., 2014). In the next

section, political participation of CVM is also to be studied in this light. Therefore, representation and inequality retain the core research value of their work. According to Verba, etc. (1995, p. 38), political participation can be defined as "activity that has the intent or effect of influencing government action – either directly by affecting the making or implementation of public policy or indirectly by influencing the selection of people who make those policies." In the light of political approach, the forms of political participation can define the modes "through which activists convey information to policymaker and hold them responsible for what they do (Verba et al., 1995, p. 471)".

Table 6. Forms of Political Participation

VOTING	voting;
CAMPAIGN WORK	campaign work, campaign contributions;
CONTACT	contact, protest;
COMMUNITY WORK	informal community activity, attend local board meeting, board membership;
ATTEND A POLITICAL MEETING	affiliated with political organization, attend meeting of political organization.

Source: (Verba et al., 1995)

Among all the tools of the political approach, ladder of citizen engagement (Arnstein, 1969) is noteworthy. For many political participation evaluation studies, the ladder tool obtains the heart value (Collins & Ison, 2006). Its influence implicitly and explicitly overspills to e-participation research in a digital era which highlights participation, as well blurs participation to some extent.

As illustrated, the ladder encompasses eight rungs. From bottom up, the degree of political activity is leveled-up. The first degree "Nonparticipation" is made up of (1) Manipulation and (2) Therapy which aim to "educate" or "cure" individuals respectively. The second degree "Tokenism" consists of (3) Informing and (4) Consultation which assist individuals to hear and make them to be heard. Still, no "muscle" is showed and can guarantee follow-through. Rung (5) Placation is the highest level of "Tokenism", wherein advice from individuals are granted, but the right to decide is still retained. The third degree "Citizen power" characters (6)

Partnership, (7) Delegated power and (8) Citizen control and enables individuals to negotiate, delegate and make decision.

Figure 1. Arnstein's Ladder of Citizen Engagement
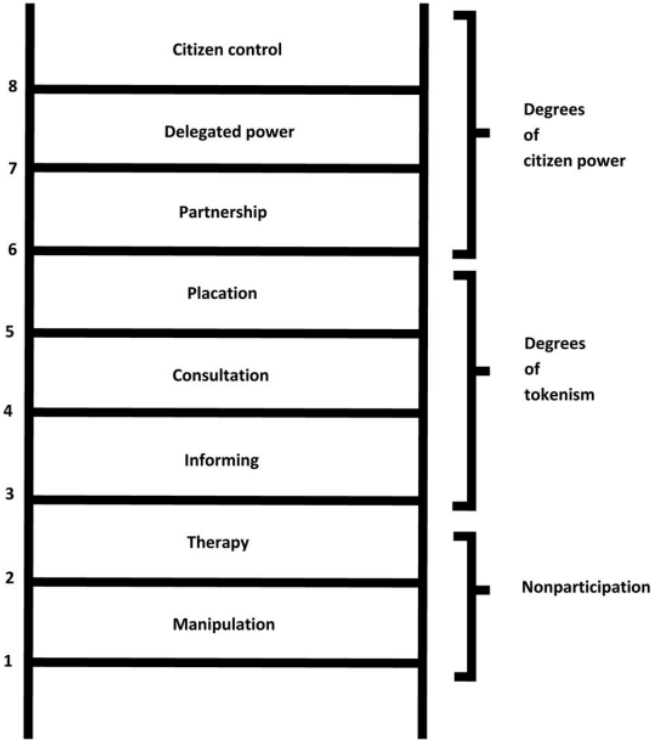
The ladder model underscores political participation as "a categorical term for power (Arnstein, 1969)" which explicitly characters the essence of political approach. Since almost fifty years of its publication the view of power struggle still has a huge impact on practice and research. In the following two patterns the influence of the ladder version can be identified (Silva, 2013): the International Association for Public Participation discerns five levels in public participation spectrum (e.g., inform, consult, involve, collaborate, empower); the OECD defines three main levels (e.g., information, consultation and active participation). However, critiques towards the ladder model can be found from several perspectives. The hierarchy of the model is often criticized (Hayward et al., 2004). Besides, the linear relationship between non-participation and citizen control is

doubted (Bishop & Davis, 2002). From case to case, participation component might be stronger in this but less intense in another (Ward, 2011). Moreover, individuals who intentionally don't want to be involved are overseen in the model (Tritter & McCallum, 2006).

Critical approach and sociological approach

As a step further from political approach of political participation, participation intensity is subsequently arisen which can be understood as the perspective of critical approach. Besides, different understanding of normativity of these two approaches is remarkable (Carpentier, 2016). In a narrow sense, critical approach can be equated with "neo-Marxists who were dissatisfied with the state of Marxian theory (Ritzer & Stepnisky, 2017)". In a broader sense, social change and social struggle are the focus points of critical approach. In the CVM research, the volume of political participation served as one of the main concerns. Therefore, a hint of critical approach can be detected.

Sociological approach "means both taking part, that is, acting so as to promote the interests and the needs of an actor as well as belonging to a system, identifying with the general interests of the community (Melucci et al., 1989)". Civic participation (usually termed as civic engagement) is conceptualized from the perspective of the sociologic approach. It can be defined as a phenomenon through which "individuals formulate ideas, surface meanings and debate actions that reflect their desired degree of participation in individual and societal decision-making processes (W. L. Bennett, 2008; Kent Jennings & Zeitner, 2003)".

Citizen participation (usually termed as citizen engagement), as a particular type of civic participation, is defined as "individual and collective actions designed to identify and address issues of public concern (Adler & Goggin, 2005)" and includes efforts to "directly address an issue, work with others in a community to solve a problem or interact with the local institutions (Gatautis et al., 2011)". Five

forms of taking part in politics are arguably the most important political actions by citizens in modern societies: voting; party activities; contacting decision makers or the media, protest activities; political activities as a consumer (Armingeon, 2007). For sociological approach, the actions such as consumer boycott are typical.

A somewhat confusing terminology issue in sociological approach is that the term "engagement" is often interchangeable with "participation" (Collins & Ison, 2006). Therefore, such a term as civil engagement often comes across. However, in the present work, engagement is understood in a narrow sense as subjective disposition that motivates the realization of participation (Dahlgren, 2013) which is to be reviewed afterwards in political participatory factors.

2.2.1.2 E-participation

Online media witnesses surging participatory practices in recent years and beholds the promise of political empowerment (Carpentier, 2016). Especially, new media, which is referred to media with web 2.0 attributions, precedes the conventional ones at real-time, mobility, diversity and richness in features (S.-H. Chang, 2015). For the less politically active individuals in traditional political participation, the Internet can stimulate their behavior (Gibson et al., 2005).

Riding the political approach momentum in political participation review, e-participation, therefore, can be referred to as "the extension and transformation of participation in societal democratic and consultative process mediated by information and communication technologies (ICT), primarily the Internet, it aims to support active citizenship with the latest technology developments, increasing access to and availability of participation in order to promote fair and efficient society and government (Sæbø et al., 2008)". In e-participation, political participation actions "like voting, polling, deliberating and joining activist

movements (Bakardjieva, 2010)" still lie in the center piece of the political approach.

Tending towards sociological approach, e-participation can be defined "as the process of engaging citizens through ICTs in policy, decision-making, and service design and delivery in order to make it participatory, inclusive, and deliberative (Economic, 2017)". E-participation is defined in the Digital Agenda for Europe 2020 as an activity that "helps people engage in politics and policy-making and makes the decision-making processes easier to understand, thanks to Information and Communication Technologies (ICTs) (Barroso, 2010)".

The paradigm change from analog to online sphere is expected because some phenomenal e-participation practices cannot be well explained by the conventional analog approach, especially the political approach. It is not easy to categorize online expression into traditional participatory notions (Holt et al., 2013). Such participation actions as e-petition around public issues, to "like" a certain nominee or institute on social media renew the traditional political participation landscape around the globe (T.-Y. Huang, 2018). In international comparisons, e-participation presents its unique developing path in various contexts and further diversifies research perspectives from the perspective of sociological approach (Åström et al., 2012; Chadwick, 2001; Rodan, 2003).

2.2.1.3 E-government political participation
Political approach

The majority of e-government political participation study was conducted explicitly or implicitly with political approach. E-government development is often analyzed by "degree (Nam, 2014)", "stages" or "maturity (Fath-Allah et al., 2014)" model. It hints that the more political power is equally shared, the higher degree, stage or maturity the e-government political participation obtains.

Often, these models character a three-level approach (e-information, e-consultation and e-decision making) which is regarded as essential in e-participation (Nam, 2014). The model can also be named as Inform-Consult-Empower (D. Lee et al., 2011). These models usually begin with information provision, continue with public consultations, and end at decision-making. The E-Participation Index (EPI) of United Nation survey well illustrates the characteristics and commonality of such models. In the first phase, provision of information on the Internet is emphasized. In the second phase, public consultations online should be organized and could take forms in e-petition, discussion forum, online polls and e-panels. In the last phase, citizens are entitled to directly take part in decision processes (Economic, 2017).

Another example of e-government participation by political approach can be observed in the E-participation or in the digital inclusion of Waseda University d-government comparison. On the first level, e-information mechanisms highlights finding public information and service via ICTs. On the second level, e-consultation underscores opinion exchanging and sharing between individuals and government through ICTs. The last level as decision-making promises to empower individuals to discuss and make policies (Obi, 2017a). The underlying influence of Arnstein's ladder as well as the political approach can be apprehended at a glance in the following table.

Table 7. Comparison of the Citizen Engagement Ladder and E-government Participation Stages

Ladder of Citizen Engagement	UN E-Participation Index	E-participation/ Digital inclusion
manipulation	e-information	e-information
therapy		
informing		
consultation	e-consultation	e-consultation
placation		
partnership		
delegation of power	e-decision-making	e-decision-making
citizen control		

Source: (Arnstein, 1969; Economic, 2017; Obi, 2017a)

Following the political approach, e-government has been accordingly designed and set into use. In several European countries, e-government is decentralized according to different purposes such as information, services, participation and open government data (Economic, 2017). A benchmarking approach was adopted in Italy under the name of "Citizen Web Empowerment Index (CWEI)" which highlights CWEI = e-information + Web tools & strategies + e-consultation + e-decision making process (Buccoliero & Bellio, 2010). Moreover, citizen control as the upmost rung in Arnstein's ladder is emphasized in presence of direct democracy over representative democracy due to development of ICT and e-government (T.-Y. Huang, 2018).

In some other stage models by political approach, electronic transaction is categorized either in one-way information provision in the first stage or in two-way communication in the second stage. Integration or transformation, political participation is counted as the fourth and the fifth stages. In these models, technological level and service level are incorporated into the mere political power approach (Lindgren & Jansson, 2013).

However, stage models are criticized for their linear understanding of ICT transforming government (Letch & Teo, 2015): these levels cab be interdependent and can co-exist, overlap and interact with each other (Economic, 2017). In practice, the blind spot is expected to be overcome with the one-stop-shop and integrated portal approach. Even after the service and technological levels are added into stage models, the linearity feature of political approach doesn't change. Besides, the risk of a naïve and techno-centric view on e-services could also emerge (A. Persson, 2009).

Sociological approach

In the U.S. e-government research, no studies focus on the maturity level (Snead & Wright, 2014). The majority of e-government participation stems from the

practical need of individuals and is studied from the perspective of social context. The sociological approach obtains a descriptive feature of e-government service dimensions (Goldkuhl, 2007; A. Persson, 2009). Three main purposes of e-government use are identified as information use, policy research, and service use (Nam, 2014). In a worldwide comparison, e-participation was examined mainly by illustrating citizens' interaction with governments, wherein approaches like current information provision and internet-based polls are the focus points (Holzer & Manoharan, 2016).

Some other researchers (Panopoulou et al., 2009) list up most common e-participation tools and activities: "(1) Information provision online, including Open Government Data; (2) E-campaigning, e-petitioning; (3) Coproduction and collaborative e-environments, including innovation spaces, hackathons, crowdfunding; (4) Public policy discourses, including crowdsourcing, online consultation and deliberation, argument mapping; (5) E-polling, e-voting". These tools are apparently not arranged according to the degrees of power distribution like the political approach does.

Usually, the relationship between governments and citizens is regarded as an information-based relationship (VJJM Bekkers & Homburg, 2005; J. A. Taylor & Lips, 2008). Information exchange, thus, forms a unique way of exploring e-government in sociological approach. The use of ICT is generally seen as a contribution to participatory and deliberative democracy (Åström et al., 2012; S. Hong & Nadler, 2012; Hun et al., 2008). With its help, individuals are expected to be active participators "engage(d) in defining the process and content of policy-making (OECD, 2001)", regardless of the stipulated degrees in political approach. Besides, in some analogue cases, political approach has been proved to be incapable to solve the problems with characteristics of interdependency, complexity, uncertainty and controversy (SLIM, 2004). In digital sphere, this description is also often well-suited to e-participation, because the arena becomes

"messes" rather than "difficulties" (Ackoff, 1974). Social learning paradigm, which some scholars conceptualized to solve the analogue problem, is also suitable to deal with e-government participation. The nature of online interaction asks more than the ladder model which is built on an epistemologically fixed forms (Collins & Ison, 2006). The social aspect which "refers to the collective process that can take place through interactions among multiple interdependent stakeholders who are given proper facilitation, institutional support and a conducive policy environment (Collins & Ison, 2006)" are outstanding in e-government arena.

In practice, e-government development also follows the sociological approach. In Europe, for example, e-government collaboration between government and citizens focuses on tangible and almost immediate results for citizens instead of the whole spectrum of public service (Szkuta et al., 2014). E-government on social media pays special attention to crisis situations (Riel et al., 2014) and learns to overcome pressure from external arena in this situations (J. Li & Zhang, 2017; B. Zhang, 2017).

At last, a brief introduction of e-government political participation in Shanghai, Singapore and Taipei is to be illustrated. A varied landscape can be grasped from the three cities. Like elsewhere in the world, e-government not only serves at first as a shift in service delivery (Otenyo & Lind, 2011), but also shapes the public service and can be influenced by the context around it.

In worldwide comparison, China ranked at No.22 according to the UN e-participation index (Economic, 2017). Specifically speaking, Shanghai ranked at No.10 in the worldwide digital governance comparison (Holzer & Manoharan, 2016). In China, multiple approaches have been tried to promote e-government. As early as 2009, it was found that all forms of political participation were offered by all provincial e-governments (Y. Wu & Bauer, 2010). They consisted mainly of information delivery and basic communicative functions; participatory

functions were possible; transactional services could be found. Moreover, Individuals are encouraged to conduct applications online and process officially offline. From the perspective individuals, e-participation is regarded as an important tool to protect private rights and therefore highly expected (C. Li & Li, 2017).

The overall ranking of China in e-government participation is, however, not satisfactory according to other worldwide comparisons, especially e-government participation is seen as ill-matched to the economic status of China (Obi, 2017b). A reason given in Obi's report is that e-government serves mainly as "a tool for administrative reform and government process re-engineering rather than developing d-government itself (Obi, 2017b)".

In Singapore, worldwide rankings of e-government participation are always outstanding: in Waseda comparison at No.1 (Obi, 2017a), at No.5 in UN e-participation index (Economic, 2017), at No.10 in a municipalities comparison (Holzer & Manoharan, 2016). Statistics from the authority also present a promising picture there: 84.0% of respondents used e-government services within one year; the majority of the 16% who have not used e-government services gained help from family members on their behalf or show no need to transact with the government (SNDGO & GovTech, 2017). Besides, promoting greater citizen participation on e-government is underscored as the most significant aspect of Singaporean e-government efforts (Sriramesh & Rivera-Sánchez, 2006).

However, e-government participation in Singapore is criticized as quite low in some studies by other approaches. According Li, etc. (2005), the reasons of low participation are attributed to either resource-relevant factors like "no time" or political-engagement-relevant factors like "no interest" or "lack of knowledge". Besides that, political apathy is evident in this research that the majority (61.3%) finds no need to participate. Moreover, the apathy is not hard to associate with limited pluralism in the republic.

Taiwan as a whole ranked at No.10 in e-government participation of Waseda comparison (Obi, 2017a). Then city Taipei ranked at 46 in the digital governance in municipalities (Holzer & Manoharan, 2016), left far behind by Shanghai and Singapore. In e-government portal of Taiwan, forms of participation are roughly categorized by the authority into information queries, online application, and public communication with the government (Council, 2014).

2.2.2 E-government functions use

To classify forms of political participation in e-government, both political approach and sociological approach are employed in the following work. For the political approach, both the Weberian bureaucracy and the citizens-as-clients of market-oriented New Public Management (NPM) is far from satisfaction (Cordella & Willcocks, 2010; Hood, 1995; Linders, 2011; Turner, 2002). For the sociological approach, ICT relights the passion of creating a more open and transparent public administration for democratic participation and networked activism (Ciborra & Navarra, 2005; Land, 2009).

Besides, a mixed approach has been adopted in some international comparison studies. In the Digital Governance in Municipalities Worldwide study (Holzer & Manoharan, 2016), two kinds of services are identified as merely to register online for municipal events or services and to allow citizens to interact with the municipality, wherein, Shanghai ranked at No.35, Singapore at No.7, and Taipei at No.41. The categorization of considering participation both from political approach and from sociological approach is an emerging trend in these years and should be taken into account in research.

In the following sections, e-government participation is categorized into information use, consultation use, decision-making use, and payment-transaction use. For the first three categories, a clear political approach could be perceived, as the agenda-setting power shifts gradually from government to citizens. A

sociological approach still implicitly underlies in a networked context of some e-government use functions. The last category payment-transaction follows the market-oriented NPM logic which still prevails for government as well as for e-government.

2.2.2.1 Information use (and e-government initiating)

E-information is defined as "the provision of relevant and sufficient information through effective communication (Manoharan, 2013)". An informed citizenry is normally expected as a result of relevant, sufficient, and reliable e-information and to make informed choices at the next stage of consultation (Economic, 2017; T.-Y. Huang, 2018).

Individuals' information use on e-government has been categorized from passive use to active use (C.-P. Lee & Hong, 2017). The whole spectrum spans from information acceptance, information searching, information sharing to commenting and discussion. Although initiating from government is mainly characterized as agenda setting by government, individuals can undertake various measures to respond to the agenda of government.

In recent years, information-oriented e-government and open data programs are promoted in such countries as Singapore (data.gov.sg) and South Korean (S. Choi, 2011; Chung et al., 2014; Park, 2002). In e-government research, information use is the predominant research field. In the U.S., 34% of research articles focus on accessibility of government information (Manoharan, 2013). At this stage, perceived ease of use is often discussed and is proved to be able to promote general information acquisition through e-government (Nam, 2014).

Besides general information acquisition, information searching as advanced phase, especially policy research, is emerging as an outstanding type of e-government use in South Korea (Nam, 2014). In an international research, the information enquiry turns out to be more often used in liberal political entities like Hong Kong

(56%) and Taiwan (86.0%) than in Singapore (Luk, 2008). What's more, civicness is found to be the determinant of policy research (Nam, 2014). However, information use doesn't necessarily mean that users are captured in the government agenda. Porumbescu (2016b) has discovered that more frequent information use on government websites results in decrease of e-government influence.

Furthermore, e-government on social media brings out new development possibilities. On one hand, social media isn't obviously equal to political participation on a certain advanced level. Individuals use more often "like" than the "comment" function because of ease of use. Some scholars view these phenomena as a limited level on engagement (Bonsón et al., 2014). On the other hand, open-ended conversations featured with commenting and discussion are expected to upgrade one-to-many conversation to many-to-many conversation and enable participation to be more effective and transparent (Panagiotopoulos et al., 2013). Under these circumstances, although the information agenda is set by the e-government, relevant citizen initiation can be generated around certain agenda. It is empirically proved that "stakeholders are more likely to actively participate in two-way communication through Twitter than other followers (Y.-T. Choi & Park, 2013)". Individuals not only prefer to communicate with e-government in this way, but also like to communicate with "other users who were interested in the government's policies and other government related issues (Chung et al., 2014)". However, the use of social media for open-ended conversations is reported to be neglected at large by academic studies (N. Ellison & Hardey, 2013). In most cases, research focus on operationalization of e-government participation is confined to comments and feedback to individual agencies or elected officials (Manoharan, 2013).

In China, a study (C. Hu, 2017) based on a non-representative sample demonstrates that 61.6% of respondents frequently read news through e-

government. In a study about e-government information repost on social media six types of reposting are discovered (R. Chen & Y. Liu, 2017). From the supply side of e-government, 60% of provincial e-government applications orient themselves towards "information propaganda" (H. Zhang, 2017). One-way communication counts to the major service forms (Z. Chen & Q. Liu, 2017). The Beijing municipality in Weibo, for example, presents its major posts with propaganda along with a minor proportion of consultation (3.5%) and response to the public (4.8%) (Jia & Zhao, 2017). Moreover, information publish takes up a humble volume with a comprehensive update delay. Still, providing opinions on government document drafts could be observed on some government websites (Economic, 2017).

In Shanghai, various e-government platforms are launched to deliver information in specific areas. Shanghai Air Quality (Shànghǎi Kōngqì Zhìliàng, 上海空气质量), for example, delivers information around air pollution; Lexing (Lèxíng Shànghǎi, 乐行上海) conveys such services as traffic report (H. Zhang, 2017). Except for the municipal level, e-government spans its structure to district and community level in Shanghai. In Pudong district, for example, Pudong e-homeland (Pǔdōng e Jiāyuán, 浦东 e 家园) provides a wide spectrum of information services: individuals are encouraged to read news, to take part in surveys and to discuss certain topics there (B. Zhang, 2017).

In Singapore, a particular e-government website "Reach (www.reach.gov.sg)" has been launched since 2006 to assist individuals to discuss public issues and to interact with government. Often, consultation conducted by the government is launched there. It is reported that there was "an average of two to four public consultation exercises each month (I.-c. D. a. o. Singapore, 2011)". In Taiwan, the majority of internet user can be categorized into "passive viewers": 72.2% of the voters seldom or never share public information to others via social media sites; more than 90% of respondents never or seldom take part in public issue

discussion online (T.-Y. Huang, 2018). From the supply side of e-government, Government Open Data Platform (政府開放資料平臺) data.gov.tw is dedicated to supply government information in an open and free-of-charge way.

2.2.2.2 Consultation use (and citizen initiating)

On the contrary to (e-)government agenda setting, citizen initiating is featured with the proactive role of individuals who set agenda on e-government. Moving beyond passive reception as e-government consumers, individuals bring in time, effort, ideas and expertise in e-government participation with greater initiative. The relationship paradigm between individuals and government witnesses a shift from the current citizen-centric mode to a citizen-driven model, whereby the former emphasizes government anticipation on individuals' needs, while the latter underlines self-driven force of citizens and businesses on their needs (Economic, 2017). A study in the western culture context highlights the expressive process, to be more specific, the expressive processes of identification, is becoming a more and more important rationale for political participation in digitally networked era as well as in the e-government area (Svensson, 2012).

In the citizen initiating category, there are some remarkable participation forms already coming into being. E-petition and crowdfunding are two outstanding phenomena among these forms. E-petition is rooted in traditional petition participation which can be defined as "all complaints, requests for an opinion, demands for action, reactions to Parliament resolutions or decisions by other Community institutions or bodies forwarded to it by individuals and associations (Committee on Petitions, 1997)". Although petitions are "usually understood as an asymmetric form of communication between individuals or a group on the one side and an institution on the other side (Böhle & Riehm, 2013)", citizens are able to start their own initiatives to interact with the authorities. In the digital era, e-petition can be defined as petitions submitted electronically or published on the

Internet. The Internet not only serves as a user-friendly instrument for individuals to undertake petition, but also broadens the influence of citizen initiating to a wider public and get them involved. The Downing Street e-petition website of the U.K. government (petition.parliament.uk) (Hale et al., 2013), the petition website of the White House (petitions.whitehouse.gov) (Dumas et al., 2015) can well illustrate the e-government petition participation development.

Another newly emerging participation form featured with citizen initiating is crowdfunding. Crowdfunding is defined as "a method of collecting many small contributions through an online platform to fund or capitalize a popular enterprise (Freedman & Nutting, 2015)". Individuals can take initiatives to fund their preferred project. According to the UN survey (Economic, 2017), 33 countries have government policy on crowdfunding. For developing countries, crowdfunding could be a significant dynamic to push public management forward (J. Best et al., 2013).

For a unitary government like the Chinese government, petition enjoys a long tradition and special value since the Wei Dynasty (220 – 589). To cope with malfunction of (especially local) government, this participation function has been kept and institutionalized after the establishment of the People's Republic of China since 1949. Petition, formulated as "letters and visits from the people (Rénmín Láixìn Láifǎng, 人民来信来访)" in Chinese term, is predominantly directed to the central government in Beijing for help. Since 2013, the petition bureau has been settled down in e-government. In this year, more than 2 million petitions were handed into e-government of State Bureau and its local branches (S. Yu et al., 2018). Except for the petition bureau, petition participations usually target certain government organs, especially where public consultations are quite rare.

Normally, the government should take the initiative to consult citizens, like the definition of e-consultation hints that "people are consulted on a particular policy,

service or project (Economic, 2017)". However, as the Chinese government is so reluctant in consulting, citizens who ought to be consulted usually take the initiative to conduct petitions to the government in the disguise of citizen consultation. Especially with assistance of ICTs, e-petition (e-citizen-consultation) is becoming popular in practice. In the context of e-petition, e-citizen-consultation is often termed as "ask for politic affairs online (Wǎngluò Wènzhèng, 网络问政)".

Specifically, e-citizen-consultation is defined as a citizen participation form, by which "citizens or citizen groups question governance and ask for government response by means of internet information communication (C. Li & Li, 2017)". In China, e-citizen-consultation is not only regarded as an e-government service, but also pan-politicized to politics-related online public opinions. Social media, therefore, is seen to accelerate e-citizen-consultation progress.

By the pan-politicized definition, the year of 2008 is seen as the beginning year of e-citizen-consultation. In a narrow sense, e-citizen-consultation on e-government took off later. The State Council launched its online complaint platform in 2013 and was loaded with 140 thousand cases in that single year; by the end of 2014, 19 out 34 provinces of China established e-citizen-consultation system (S. Yu et al., 2018). On the local city level in Suzhou, for example, such citizen initiatives as "advice-seeking and complaining" and "advising" make up the majority (77.4% and 22.2%, respectively) of all the citizen posts on a municipal forum (G. Yang, 2017).

In another political participation arena, crowdfunding develops prosperously in China. According to a report of work bank (J. Best et al., 2013), the greatest potential of crowdfunding lies in China (J. Best et al., 2013). Citizen initiating is, however, not limited to e-petition and crowdsourcing. Besides these two participation forms, in Shanghai, citizens are encouraged to submit community initiatives to Pudong e-homeland (B. Zhang, 2017). Social governance at grass-root level in Shanghai as well as elsewhere in China, which is dominated by

government, tends to be decentralized to social and grass-root sector with receding government control (B. Zhang, 2017).

However, only 3.7% of respondents often interact with government via e-government in a study with a non-representative sample (C. Hu, 2017), not to mention taking citizen initiative. Even for the mobile e-government, which is regarded as a diversified and convenient channel for e-government participation, e-government initiating activities overwhelms citizen initiating ones (H. Zhang, 2017). Some researchers found out that e-government users in China care about how response and decisions are made after information use which have the greatest impact on perceived government image (Z. Li & Xv, 2017).

In Singapore, the platform Reach (www.reach.gov.sg) not only carries government agenda such as official news and consultation exercises, but also encourage individuals to bring up their own topics for discussion. As the full name of Reach implies that the platform aims at "reaching everyone for active citizenry". Another portal with the name of eCitizen Ideas! (ideas.ecitizen.gov.sg) is launched to collect feedback and ideas from citizens.

In Taiwan, the Join platform join.gov.tw (公共政策網路參與平臺) has been launched since 2015. The core concept of citizen-driven feature is well illustrated by its three underpinning sections: in the petition section, the government should respond openly to any petition countersigned more than five thousand individuals; in the advising section, suggestions about government policy are welcome; in the finding-principal section, it is possible to talk with principals of certain government units (T.-Y. Huang, 2018).

2.2.2.3 Decision-making

Information use and consultation use, no matter they are initiated by e-government or by individuals, are extensively conducted on e-government and proved to be closely linked to e-decision-making level (Economic, 2017).

However, it is found that e-consultation is not sufficiently institutionalized in policymaking processes. According to the same survey of the United Nations in 2016, "only 38 countries out of 193 Member States (20%) indicate that e-consultation outcomes have resulted in new policy decisions, regulation or service". If the e-consultation practice was often kept from being executed and its outcomes turn out to be dissatisfied, an unwillingness to use e-government would be unavoidable.

A traditional way to measure decision-making is to measure (e-)voting. This form of participation should be (re-)considered on e-government in the digital era. Meanwhile, some other novel ways of decision-making are developed with the help of ICT. Such performances as "Like/Dislike" e-government by individuals on certain proposals are broadly seen as a form of decision-making by the UN survey.

Next, e-voting and collaborative production are introduced and analyzed in the light of decision-making with emphasis on their status quo in the three municipalities as well as elsewhere around the globe.

E-voting can be defined as "people choose political parties and candidates during elections or vote on referenda by utilizing online platforms, the inputs of citizens are translated into immediate tangible outcomes (Economic, 2017)". In the digital era, direct e-voting is always discussed from the perspective of direct democracy and therefore is looked upon as one of the main potential contributions of e-government. An analysis shows that undergoing an e-referendum could increase e-government quality by about five points (Chapman, 2017). However, e-voting can also be regarded as another form of political participation instead of as the upmost stage in some hierarchical models.

In governance arena, e-voting is essentially in lack of practice and research. Reasons can be found in some work. Firstly, even though going to the polls serves as the main, often the only, political participation form for a great proportion of

individuals (Verba et al., 1995, p. 66), voting tune-out witnesses a less optimistic development in many countries (Putnam, 2001). In this context, research emphasizing only electoral-related participation takes risks in underestimating democratic participation of individuals (Dalton, 2008). Secondly, elections are used as a simplifying mechanism to solve the problem of political equality in all democracies. In its nature, detailed messages about citizen concerns are less well communicated than concerns by other participation forms, while other forms of political participation are considered as more complicated and more communicative. Thirdly, little evidence of e-voting mechanism promoting willingness to vote can be found. On contrary to that, the ones who experienced analogue voting or are experienced at community activities tend more actively to go voting (C.-P. Lee & Hong, 2017).

Election participation is, therefore, less cherished in political participation in e-government field. In practice, election-related participation is proved to be less relevant to e-government use: in a study of 125 country samples, the coefficient of correlation between recent voting turn-out and the UN e-Participation index turns out to be meager and statistically insignificant (Jho & Song, 2015).

In voting study, there is another practical concern which points out the eligibility to vote (Verba et al., 1995). Especially in such countries as China and Singapore, suffrage is to some extent limited by the authorities, not to mention any kind of e-voting. As formulated above, the means of political decision-making by individuals are strictly limited in China. In the central government work report of 2015, to improve livelihood was targeted as the basic goal to develop e-government as well as the Internet Plus project (Yunxin Li & Yv, 2018), while no words were mentioned to promote decision-making on e-government. Citizens are seldom treated as main stakeholders in e-government development and have no say in decision-making both on national and on the regional level (Obi, 2017b),

although 37% of the respondents are willing "to be involved in policy decisions on Facebook and other social media platforms (Kreis eV, 2013) ".

In Taipei, e-government function for e-voting and direct decision of citizens has been launched since 2016. The platform iVoting (ivoting.taipei) permits citizens to bypass parliamentarians and to voice their deep concerns of Taipei municipality directly (C.-P. Lee & Tseng, 2017). Although not a few problems and controversies have been found during the platform development, more than thirty cases are directly i-voted by eligible individuals. Besides, it is problematic for municipality research to tackle voting practice, because residents in certain cities are not certainly equivalent to registered electorates of such cities, even though residents are entitled to participate politically in some other ways. In metropolises, this problem is more observable and remarkable.

In the most e-voting cases, agenda is still set by (e-)government. To cope with the passivity of e-voting participation, **collaborative e-government** was conceptualized to offer individuals chances to actively make a decision in municipal governance (Chun et al., 2010; Nam, 2012; Szkuta et al., 2014). Participation in the art of collaborative production, for short co-production, shares some similarities with other newly emerging concepts. Sometimes, the contents of these concepts overlap each other: we-government (Linders, 2011), co-creation (John Carlo Bertot, Paul T Jaeger, & Justin M Grimes, 2010), Wiki Government (Noveck, 2009), Tao government (Wimmer & Codagnone, 2007), Government 2.0 (Eggers, 2007), and networked government (Goldsmith & Eggers, 2005).

Co-production lays great emphasis on decision-making made by fellow citizens on e-government. By nature of co-production, its equal relationship is underscored two-fold: between government and individuals, between fellow individuals. From the perspective of beneficiaries, a personal kind and a collective kind of co-production can be discerned from each other. A certain group of individuals can benefit from their co-production on e-government (Barker, 2010;

Needham, 2009). Besides, beneficiaries can be broadened to all the community members (Griffiths & Foley, 2009) and their participation can change public services more drastically.

The use of co-production is not merely limited to decision-making participation. It can also be exploited in information use, as well as transaction service. All the forms of political participation have been researched in the light of co-production: from information use (data production, inclusive), policies making, to public services (John Carlo Bertot, Paul T Jaeger, Sean Munson, et al., 2010; Lukensmeyer & Torres, 2008; Nam & Sayogo, 2011; Szkuta et al., 2014). Moreover, both new service which is defined as additive co-production and volunteered service, and conventional service which is termed as substitutive co-production (Löffler & Watt, 2009) are assumed to be able to change the existing model of public service and enhance e-government in favor of individuals.

The development of co-production seems to be promising. On one hand, there is no doubt that the latest development of ICT can assist the innovative digital public service (Shuler et al., 2014), especially with help of the neo-geography technology (Silva, 2013; Warf, 2013). On the other hand, co-production is supposed to increase a high social capital and has the highest potential to transform public service delivery (Griffiths & Foley, 2009). Detailed work was undertaken to bring a deeper look into the co-production, such as scrutiny of the right of free speech in e-government crowdsourcing communities (Brabham, 2013).

The distinctive characteristics of co-production in empowering citizens, however, can be best illustrated in decision-making participation. In Shanghai, individuals, enterprises and organizations are encouraged to dig into big data and offer innovative solutions to public services by the Shanghai Open Data App (shanghai.sodachallenges.com) (H. Zhang, 2017). In Singapore, co-production is institutionalized into the REACH platform and Our Singapore Conversation (Ma, 2017). Public opinion would be heard through co-production in both

municipalities, according to their official report. However, it is hard to certify if citizens would gain the final saying in the name of co-production.

In Taipei, a progressive program to promote co-production is more evident. Collaborative local budget creating has been settled down in Taipei since 2014 (C.-P. Lee & Tseng, 2017) and spreads to other municipalities in Taiwan. With the help of co-production, a horizontal relationships between citizens can be formed (Griffiths & Foley, 2009) and therefore stabilize democratization on a local level. Data analysis program such as d4sg.org Data for Social Good (資料英雄計畫) is another example of co-operation in Taiwan: on the basis data offered by government, individuals are encouraged to group together to make solutions to social problems (C.-P. Lee & Tseng, 2017). Another specialty of co-production from a democratic polity like Taiwan is that government keeps distance from individuals' co-production and non-government sectors play the essential role of data appreciation and decision- making (T.-Y. Huang, 2018).

2.2.2.4 Payment-transaction service

E-transaction can be defined as "efficient and effective transactions that result from an integrated citizenry (Manoharan, 2013)". In a broader sense, e-transaction can be explained as e-platforms "enable citizens to make utility payments, file taxes, apply for licenses/permits, and purchase tickets for community events (Manoharan, 2013)". In a narrow sense, e-transaction can be understood as "online payment of public utility bills and parking tickets that allow citizens to directly pay bills, fees, and fines on the government website (Nam, 2014)".

In some transnational comparison studies, e-transaction is almost always descriptively defined. In the Waseda list, for example, users-related e-transaction is scattered in the service categorization such as e-Tax, e-Customs, e-Health, and One-Stop Service for Citizenry (Obi, 2017a). Transaction services serve as the dominant form of e-government use, except for information use, especially when

e-participation is narrowly defined (Andersen & Henriksen, 2006). The Beijing municipality in Weibo, for example, deals 24.8% of its posts on e-government services (Jia & Zhao, 2017). Besides, in the latest practice and research, concepts such as co-production have been adapted in transaction service on e-government (Alford, 2009; Horne & Shirley, 2009). In the present research, the payment transaction in the narrow sense is stressed and general transaction service in the broader sense is merely mentioned.

Like e-government in other regions, the three municipalities have undergone series of innovations of e-service (Chang, 2015). They develop transactional services with their own characteristics which is influenced by unique socio-demographic conditions (Nam, 2014). Although a lack of e-decision-making mechanism is noticeable in China, online transaction services are gradually mature (Obi, 2017b). Such development is oriented to livelihood issues under the umbrella term "Internet plus", according to the central government work report in 2015 (Yunxin Li & Yv, 2018). It is reasonable to believe that transaction service will witness a prosperous future in China. On the provincial level, the status quo of transaction service is less satisfactory. Among all the e-government services, transaction service which is regarded as most reciprocal and practical counts for only 2% of all the service forms on e-government App in Hebei province (Z. Chen & Q. Liu, 2017). In a study with a non-representative sample, only 2.8% of respondents reported that they often used e-government service (C. Hu, 2017).

However, Shanghai plays doubtlessly a leading role in e-government transaction service in China. Services are offered both on the one-station platform of Shanghai (shanghai.gov.cn) and on specific issue-oriented platforms (J. Li & Zhang, 2017). What's more, e-payment works outstandingly in prompting transaction service. As early as 2003, the platform of Electronic Bill Presentment and Payment (EBPP) was introduced into Shanghai. By June, 2016, the EBPP has offered service to one third of families in Shanghai for various payments (Limited,

2016). Nationwide, e-payment witnesses considerable strides in recent years. By the end of 2017, 531 million Chinese utilized e-payment, among which 527 million take advantage of mobile-phone payment (CNNIC, 2018). It is remarkable that e-payment is already integrated into public service as well as personal life. Singapore always ranks high in worldwide transaction comparison. In the Waseda ranking list, for example, the score of online service take the 4th place among all the countries (Obi, 2017b). It is reported in the Waseda ranking that most of the services in Singapore become transactional. The advancement of transaction services can also be perceived by individual users. Among all the e-government users, 90% of them used to use e-transaction service in 2015 (Ma, 2017), while in 2003 only 75% of Singaporean citizens reported transaction use (Sriramesh & Rivera-Sánchez, 2006). Supplying e-services which are in citizens' need was counted as one of the four factors critical for the creation of a successful e-government infrastructure in Singapore (Sriramesh & Rivera-Sánchez, 2006). Still, E-payment in Singapore is regarded as being left behind by China, as the premier minister Lee once in 2017 pointed out (Ma, 2017). Although 65.0% of respondents made payments to e-government in the past 12 months, the most commonly practiced payment mode was online via bank transfer or GIRO facilities (SNDGO & GovTech, 2017).

In Taiwan, most of the online services could support citizens with transactional online service, except the portal for e-Health; the transactional performance has been estimated as high (Obi, 2017b). Transaction services like filing taxes are used in a larger proportion in less liberal political entities like Singapore than in liberal political entities like Taiwan and Hong Kong, where enquiry services and other municipal services enjoy more popularity (Luk, 2008). Besides, as late as 2017, the municipal payment platform pay.taipei was launched to assist fee payment.

2.2.2.5 (Political) non-participation

In normative democratic theory, the interpretation of political inactivity is always a major issue (Verba et al., 1995, p. 280). For political participation, several forms can be differentiated as previously presented. For non-participation, at least two dimensions can be discerned from each other: the one is mere non-participation, the other is political non-participation.

Rationales to the first kind can be attributed to the lake of awareness. Rationales to the second type are more often discussed and explored. In the CVM, for example, political participatory factors were conceptualized to reflect these rationales such as the lack of resources or the lack of motivation (a lack of efficacy, the perceived dangers, for example).

In e-government practice and research, it is consistently warned that citizen participation is on a low level (Heeks, 2006; Torres et al., 2005). An absence of extensive citizen participation as well as political non-participation challenges the legitimization and advancement of e-government (Mossberger et al., 2013).

In China, the proportion of e-government users has a great potential to develop in both urban and rural areas. Even though e-government is integrated into social media and other everyday mobile applications, just merely 10% of individuals will take the dependent path to e-government use (Ma, 2018). Specifically speaking, individuals who have never used local e-government on WeChat build up the majority (36%) in the sample (C. Hu, 2017); confronted with e-government on Weibo, individuals would choose to selectively escape official posts (R. Chen & Y. Liu, 2017). In Singapore, the penetration rate of e-government use is higher: 79% of respondents reported that they visit government website in 2015 (Ma, 2017).

2.3 Explaining political participation

In the third section of the chapter, the Civic Volunteering Model which can explain why political participation is conducted is to be introduced. Subsequently, e-government use is to be explained in the light of political participation.

Before the Civic Volunteering Model is introduced, the development in the field of understanding the cause of political participation is presented as some supplementary as well as background review. The Deprivation and Grievances approach, which emphasizes that relative deprivation and the grievance it produces should be the main force to drive political participation, is explored as one of the first and foremost explanatory factors to the political participation (Gurr, 1974; Smelser, 2011). However, its explanatory effect was gradually found not sufficient enough to interpret political participation. The Resource Mobilization Theory, which made a shift of explanative variables from psychological ones to sociological ones with emphasis on such resource as money, time and skills, et cetera in political participation, at this time which was raised against the backdrop of the mass political movement in the U.S in the 1960s and 1970s. Resource approach was proved to be applicable to that time and fell into the centerpiece of academic work (Barnes & Kaase, 1979; McCarthy & Zald, 1977; Milbrath & Goel, 1977). Later on, especially in the work of McCarthy etc. (1977), the indirect support from individuals is stressed and is differentiated from a large societal background. Their contribution paves the way for following research on societal and personal influence on political participation, like the recruitment in political participatory factors of Verba etc. (1995).

This research convention from that period of mass movement keeps shedding light on recent studies. On the one hand, the concept of resources is conceptualized more delicately. As Verba etc. (1995, p. 282) once noted: "resources… are at a higher level of abstraction and generality…" Classical resources like labor and capital are paralleled with modern ones like experience,

information, beliefs and networks (Edwards & McCarthy, 2004; Zald, 1992). On the other hand, the theory is also suitable to interpret political participation beyond mass movement. Edwards and McCarthy (2004), for example, uphold the resource theory and ask about the validity of the theory in updated situations. What's more, the development of the Internet, especially the ubiquitous accessibility of smart phone, broadens the arena to adopt the resource approach (Ekman & Amnå, 2012; Norris, 2001).

The Socioeconomic Status Model (SES model), for example, is directly related to the resources approach. The central principle of the SES model is that people of higher socioeconomic status are more active in politics. Frequently, the approach is adopted by researchers as demographic or social-economic variables which imply a higher education, higher income, and higher-status jobs influence political participation positively (Verba et al., 1995, p. 281). The model is empirically powerful and is politically relevant even in the time of digital political participation. Like it is unveiled in South Korea (S. Choi, 2011) that education results in a persistent divide in access to and usage of central e-government services. However, its weak theoretical underpinning is criticized by some researchers (Verba et al., 1995, p. 281). In the work of Verba etc. (1995) elements from the SES are well integrated into the politically relevant characteristics to explain how socioeconomic position is linked to political activity. By doing so, it becomes theoretically more persuasive.

To explain why political participation is triggered, the resource-centered approach is not the only approach to undertake. Next, a second approach is briefly introduced. The Rational Theory is another common approach to tackle political participation. Benefits serve as the centerpiece of rational theory. Political participation is seen as a result from weighing-up between benefits and costs. Once benefits overweight costs, political participation is expected to undertake. However, this approach has at least two fallacies in itself. The first goes with the

free-ride phenomenon. While free-ride on the efforts of others is logically the most beneficial way, there are still individuals keeping taking part in politics. To solve the problem, the aforementioned view of benefits is labeled as narrow and instrumental, while expressive benefits are introduced which is regarded to be derived from the performance of the act rather than from the consequences of the act (Verba et al., 1995, p. 102). The second fallacy from the Rational Theory is that non-political participation cannot be bridged with political participation, when the instant benefits are not obvious to be named. In political participation research, voting and organizational membership are usually studied as the two and only kinds of political activities. Generally speaking, less research adopts the Rational Theory on e-government use, although e-government use is proved as a kind of emerging political participation.

Based on the aforementioned theories, the Civic Voluntarism Model (CVM) (Verba et al., 1995) is developed to explain and interpret political participation in the U.S. in the 1990s. Independent variables are identified by answering three questions: why individuals can't participate suggests a paucity of necessary resources; why individuals don't want to participate turns attention to the absence of political engagement; and why individuals are not asked to participate indicates isolation from the network of recruitment. Thereafter the three most fundamental claims of the Civic Voluntarism Model (CVM) are discovered and empirically tested. They testified that resources, political engagements, and recruitment are the basic sources of political participation (Verba et al., 1995).

Besides, interaction between politically relevant characteristics like demographic variables and political participation is scrutinized, which integrates the Socioeconomic Status Model into a theoretically stronger system. The complete model including three sets of variables (politically relevant characteristics, political participatory factors, and political activity) can be illustrated as below.

Figure 2. The Civic Voluntarism Model
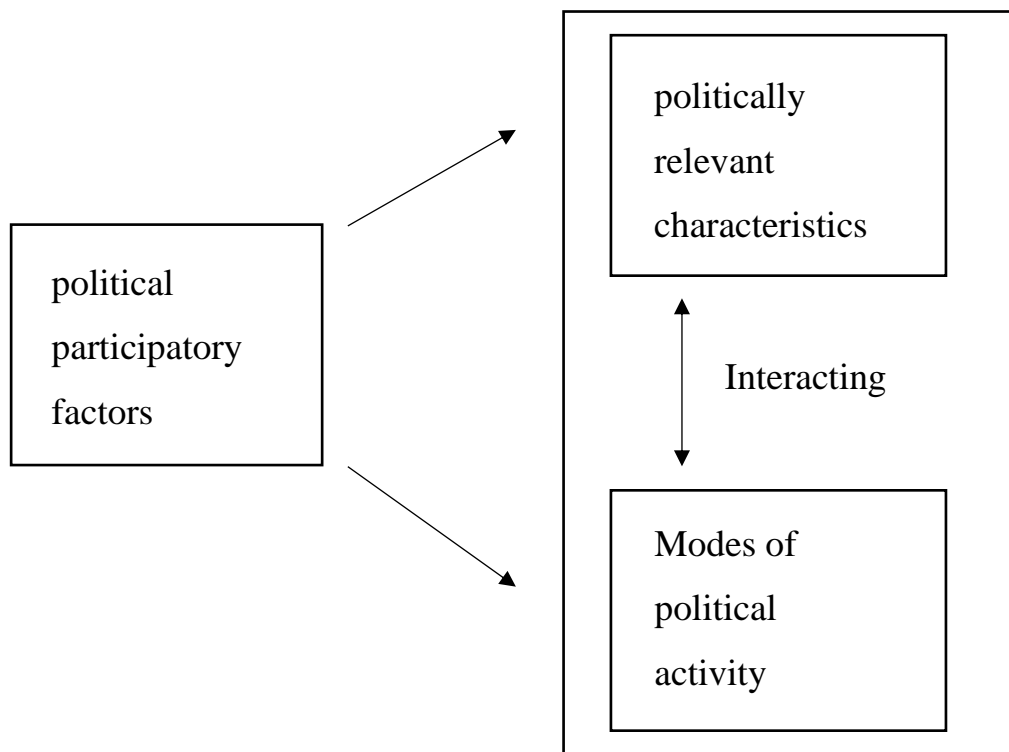
However, there are still some problems to mention when the model is transferred to general political participation and even to political participation on e-government. At least three questions are open to answer.

The first problem goes with the terminology "voluntarism", which eventually comes from the research interest of Verba etc. They mentioned that the era of the 1980s which is "often characterized as dominated by self-interest and greed… citizens sometimes see their own activity as animated by narrow, self-interested concerns (Verba et al., 1995)." At the same time, "conventional types of political participation, such as voting and engagement in political party activities, have declined in recent years in the United States and many Western advanced democracies (Blais & Rubenson, 2013; Brady et al., 1995)". Due to the reality, voluntary participation was expected to be a substantial even substitutive participation form back then. Empirical evidence is supportive in this sense:

people are still strongly engaged in various forms of political participation in terms of their citizenship norms (Verba et al., 1995). Following this logic, civil society is especially emphasized and even overshadows political settings in arranging the CVM. Both resource capacity and political motivation are examined overwhelmingly in the fundamental non-political institutions. The network of recruitment also concentrates on non-political institutions.

By relocating the research interest in civil society and by labeling the model as voluntarism, the intricate political participation reality back at that time seems well interpreted. However, even Verba etc. admitted that it is problematic to confine political participation within the voluntary realm. On one hand, the line between voluntary participation and paid employment is blurry: "in practice, it is not always easy to differentiate what is …done without financial reward from what is done in the expectation of future career enhancement… (Verba et al., 1995, p. 91)". On the other hand, voluntary activity doesn't by its nature mean non-political, while politically voluntary activity is missed out in the presumably wide spectrum of voluntary activities. In all, the model is essentially not that voluntary and political-institution-free.

In the present research, values are laid on both civil society and political setting. As reasoned above, it is not appropriate to disregard political institutions, when political participation is examined and especially when participation performed in different kinds of polities is compared. Besides, the concerns of civil society are still focused in the present work, as it is regarded as a heart piece of democracy.

The second problem is also noticed by Verba etc. (1995, p. 429). Causality direction is complicated in political participation as interactions are frequently found out. Its validity in e-government political activity needs particular scrutiny. Although the directions in the Civic Voluntarism Model are logically derived by such methodologies like "two-stage least-squares" which always need to conduct

to justify its validity. The detailed way to deal with causality direction is presented in the third chapter of methodology.

The third challenge brought about by the CVM is how to modify it to e-government use research. The only e-government research work (Vicente & Novo, 2014) based on the Civic Voluntarism Model sheds a primary light on the applicability of the model in explaining e-government political participation. In this research, however, an umbrella term is coined in the name of "resource approach" to cover up all the categories in the CVM without rendering any argument. To keep the theoretical ground solid as it was constructed in the CVM, the resources-engagement-recruitment categorization should be kept untouched as it is supposed to be.

Still, a more concrete theoretic analysis should be nailed down to pave the way for the present work. In all, the main components of the CVM can be adopted, while specific factors applied to e-government use should be examined through the lens of the CVM approach, too. Scattered pieces should be reconsidered and updated to solve the political participation in e-government puzzle.

2.3.1 Politically Relevant Characteristics and E-government Use

In political participation research, as well as in media use research, demographic conditions are often used as independent variables (Nam, 2014). Such variables as gender, age, education and income are scrutinized. In some other cases, geographically dispersed situations (P.-H. Hsieh et al., 2013) and even internet use can also be regarded as demographic variables (Taipale, 2013). These variables are listed by the CVM as politically relevant characteristics. "Any attribute of an individual that would be germane to public policy or other government action (Verba et al., 1995, p. 14)" is broadly construed to the terminology politically relevant characteristics.

The rationales to single these variables out as politically relevant characteristics are well explained by Verba, etc. (1995, p. 170). For the present research, these principles are still applicable. For e-participation, some additional research findings are also supportive of following the rationales. Main rationales from both perspectives are reasoned as follows.

Figure 3. Relation between the PRC and the E-government Use
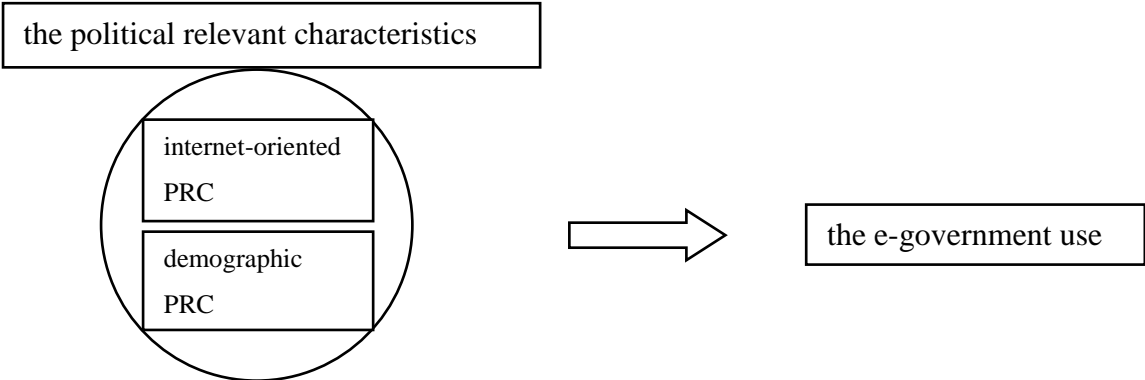
In the practical end of political participation, demographic variables are often empirically tested for examining the inequalities in activity, which "are likely to be associated with inequalities in government responsiveness (Verba et al., 1995, p. 14)". The SES model, for example, remains a long-lasting tradition. Besides, in the U.S. "economic circumstances and needs, as well as preferences with respect to economic issues, are among the most fundamental of an individual's politically relevant characteristics (Verba et al., 1995, p. 186)" under the circumstance that class conflict has traditionally been relatively damped down.

In the ideological end of political participation, the CVM is grown out of a structured societal picture of the U.S. to help to interpret questions of representation in American democracy. Not only equal rights but also equal governmental responsiveness to all citizens are expected on the theoretical basis of egalitarian views. The U.S. American people are believed to consistently have this kind of view of point.

Demographic variables also find their value in digital time and in e-government use research. The term "digital divide" is coined to depict inequality observed in digital media use. Digital divide has been identified as a key barrier (Field, 2003; A. Van Deursen & Van Dijk, 2011) for digital media use. In the e-government services research, a practical need to gain access to these services, namely the user's capability approach, is often emphasized. Some researchers remind that research on access to e-government must be promising before the principles of gratification and habit or usefulness are talked about (Klamer & Mante-Meijer, 2005). However, empirical evidence is not that unanimous. The conventional socio-demographic variables as digital divide index turn to be irrelevant in some work (Krueger, 2002) but to be predictive in other work (S. J. Best & Krueger, 2005; Hansen & Reinau, 2006).

Nonetheless, digital divide is regarded as a significant puzzle piece of the media use (Deakins et al., 2007). Such countries as Singapore are striving to overcome the divide, which takes measures to bridge low-income divide, low-speed divide and elderly divide (Tham, 2014). In the sense of digital divide, politically relevant characters are widely comprehensive more than the conventional demographic variables.

Moreover, it should be stressed that a mistake often made by researchers who took the CVM approach is that the politically relevant characteristics are misleadingly incorporated into the political participatory factors. A vague borderline of politically relevant characteristics and political participation factors was once drawn by Verba etc. (1995). In their study, income, for example, is categorized both as politically relevant characteristics and also as participatory factors. Some variables like race and views on economic policy are treated as politically relevant characteristics but not as participatory factors.

Generally speaking, politically relevant characteristics are less politic-oriented than political participation factors. Besides, they can be stimulated by political

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participation factors to exert their influence on political activities. These two dimensions are sometimes complementary, sometimes contradictory. The sophistication behind the differentiation between politically relevant characteristics and political participation factors is to discover participatory distortion when politically relevant characteristics and political participation factors are in contradiction. Some interesting findings such as the underprivileged (politically relevant characteristics) get recruited by churches with political standing points (political participation factors) are thus highlighted. Besides, this approach offers a novel way to deal with under- and over-representation, which is in digital time well-known as digital divide. In the case of contradiction mentioned above, more perspectives can thus be found to help the underprivileged out of the gap.

In the study of Verba, etc. (1995), five dimensions of politically relevant characteristics are found. Gender, race or ethnicity, (family) income, education and occupation can be grouped to the basic demographic attributes. Benefiting for government programs related to economic need and opinion on these matters can be grouped to the circumstances-related attributes. In the present study, basic demographic attributes remain the same by large, the race or ethnicity is scored out of the list mainly because the three municipalities are more or less homogenous Chinese society. Besides, circumstances-related attributes are stuffed by internet-use-related variables, because citizens' use of e-government doesn't come out of nothing but is deeply rooted in internet use. The starting point of digital media use should be taken into account for e-government use. Specific literature review of these politically relevant characteristics is as follows.

2.3.1.1 Demographic Characteristics

Gender inequality in internet use has been observed by scholars. Men are reported to use internet proportionately more often than women (P. R. Center, 2017). In

recent years, the gap between men and women in internet use is becoming smaller and even negligibly tiny. Empirical research in e-government can also reflect this improvement. In South Korea, no persistent gender inequality was detected in use of the Korean central government website in 2010 (S. Choi, 2011). In Taiwan, the change is also observable between 2013 and 2017. Among all the online political participators, the proportion of male participators gradually loses its once dominant position. From 2014, the gender proportion of online political participation has become with no significant difference in comparison of that of the whole population (T.-Y. Huang, 2018).

That by no means indicates that the gender gap totally disappears. When the e-government platforms are studied under gender perspective, a fact should not be ignored that more women than men take part in social network sites, at least in Taiwan so (Council, 2014). Besides, empirically studies confirm that gender (as well as income) moderates the relationship between Internet use and e-government use (Taipale, 2013). In Taiwan, a study demonstrated that the gender gap existed in e-government use, however, the time length of internet use can minimize the gender gap for female in e-government information searching use (Chiang, 2015).

Next, **age** as demographic characteristics is examined. Younger generation is constantly reported to be more active in digital media use, as well as in e-government use. In China, promotion of e-government on social media Weibo is mainly brought about by the age group of 19 to 24 (Luo et al., 2017). In Taipei, the younger generation (15 to 39 years old) has been reported always over-represented in e-participation, while the age group over 60 has been under-represented (T.-Y. Huang, 2018). In another study, the age can predict the e-government websites use in Taiwan: respondents in higher ages are more likely to use the e-government websites (J. Lo, 2008).

As for **education** as demographic characteristics, it is empirically confirmed that general political activities are positively related to education (Dutton & Blank, 2011; A. Smith, 2013). That is because, as Verba etc. (1995, p. 18) once stated, education plays "an important role in this process of resource accumulation". However, some work found no statistically significant evidence between education and political participation (S. J. Best & Krueger, 2005; Krueger, 2002). Furthermore, differentiation of participation helps to examine the influence of education more specifically. The work of Anduiza (2010) states that the forms of participation matter: of all the three types of e-participation forms in study only e-donation is positively related with education. This reminds of taking a closer and detailed look at the forms of political participation. Another worldwide comparison indicated that there was a strong relationship between education level and e-government citizen participation (Schatteman et al., 2012).

In China, the majority using e-government in the social media Weibo is the population who owns a degree of vocational education or of bachelor (Luo et al., 2017). In Taipei, the situation is not different than that in China mainland. The population with a degree of bachelor or above has been constantly over-represented since 2013 (T.-Y. Huang, 2018). Besides, the education degree showcases prediction in e-government website use in Taiwan: the higher educated is more likely to use e-government website (J. Lo, 2008).

As a ranking (Baller et al., 2016) suggests that education gap between the three regions are huge, while education standard of the three case cities is expected to be at similar high level because the outstanding metropolitan role in each regions. Still, the leading role of Singapore in the ranking is noteworthy. Experts confirm that educated citizenry there was counted as one of the four factors which is critical for the creation of a successful e-government infrastructure in Singapore (Sriramesh & Rivera-Sánchez, 2006).

Table 8. Education Comparison among China (mainland), Singapore and Taiwan

	China (mainland)	Singapore	Taiwan
adult literacy rate	40th	37th	23rd
quality of education system	56th	3rd	15th
Internet access in schools	47th	2nd	27th
quality of math and science education	49th	1st	46th
secondary education enrollment rate	60th	27th	41st

Source: (Baller et al., 2016)

The variable **occupation** is not included in the politically relevant characteristics of Verba etc. (1995). In political participation in East Asia, however, occupation is often considered as an important demographic as well as socio-economic variable. In South Korea, for example, occupation is discovered as a persistent gap in access to and usage of central e-government services (S. Choi, 2011). In Taiwanese e-participation study the variable occupation is also often analyzed (C.-P. Lee & Hong, 2017). In Taiwan, among nine occupation categorizes, officers are found to be more active in e-participation. According to Lee etc. (2017), 48.9% of officers send important public concerns to others via social media; more than 30% of offices use e-government service often or sometimes; on contrary, Internet users employed in agriculture, forestry, fisheries and animal husbandry are hard to reach.

The role of **income** is reported to have a positive association with e-participation, according to the Oxford internet institute (Dutton & Blank, 2011), the Pew research center (A. Smith, 2013) and some other work (Krueger, 2002). Often, the variable income is coupled with the variable education level. For offline and online participation, income and education are reported with the same importance (S. J. Best & Krueger, 2005; Hansen & Reinau, 2006). Besides, education and income have major effects on the government's e-services use (Taipale, 2013). Still, some dissents about the importance of income could be found (S. J. Best & Krueger, 2005; Saglie & Vabo, 2009).

Some other demographic variables such as with or without children (Taipale, 2013), the size of the place of residence (P.-H. Hsieh et al., 2013) are also studied in e-participation and e-government use research. In the present research, however, only the above-mentioned five variables are examined.

2.3.1.2 Internet-oriented Characteristics

It is reported that ICT makes political participation easier than the conventional measures (Anduiza et al., 2010). Beyond the general proclamation, variables related to internet use serve as another pillar of the politically relevant characteristics in the present e-government use research. As Castells (1998) once put it: the access and use of technologies is regarded generally as "the critical factor in generating and accessing wealth, power, and knowledge in our time". Like Verba etc. (1995, p. 210) stated, "those who would be most in need of government response…are the least likely to make themselves visible to the government through their activity." In digital era, **access to the Internet** is the first digital gap to individuals' approaching to e-government. Thus, access to the Internet should be regarded as a politically relevant characteristic. In Taiwan, access to internet is proved to have a positive significant influence on political efficacy, political knowledge and political campaign activities in comparison to internet non-users in Taipei major election in 2010 (Lin, 2013).

Furthermore, some studies explored the relation between the intensity of internet use and the political participation as well as e-government use. A positive relation between e-government use and time spent on the Internet is discovered (T.-Y. Huang, 2018; Taipale, 2013). However, in less democratic polities such as in Singapore, a significant influence has not been found between internet use and election in 2006, although online information exchange can enable political communication at an unprecedented level (E. Tang, 2008). It implied that context

of political systems among democratic and non-democratic political systems should be paid attention to.

A comprehensive data of the three municipalities shows that the personal internet use differs not substantially among the three cities. However, there is a big distance in household internet use. Even to the recent year of 2016, Shanghai is still left behind by the other two cities with the household internet use rate at 74.1% (Bureau, 2017). If the household internet use has a huge impact on e-government use, Shanghai is expected to be at disadvantage in this regard.

Table 9. Internet Use in Shanghai, Singapore and Taipei

	Shanghai	Singapore	Taipei
household Internet use (2013)	55.2%	87%	88.5%
personal Internet use (2013)	75.7%	79%	80%

Sources: (Authority, 2017; Bureau, 2014; Obi, 2017a)

On the other hand, the popularity of mobile communication demands increasingly mobile Internet connection. However, a satisfactory large scale cover of wireless Internet connection is by no means a status quo everywhere in the world. Baller, etc. (2016) illustrate in their worldwide comparison that China still has a long way to go to catch up with Singapore and Taiwan. The Singaporean government dedicates in promoting an ICT infrastructure that is increasingly improved over time. As Bilbao-Osorio, etc. (2013) stated: "improving the already very high number of Internet users (29th in world ranking) or households with a personal computer and Internet access (11th in world ranking) to the level of some Nordic countries, coupled with reducing the cost of accessing fixed broadband Internet (87th in word ranking), would allow Singapore to lead the overall rankings". Besides, the Network Infrastructure Preparedness in Taiwan is under the average score of other members (Obi, 2017a).

On the city level, these three municipalities are thriving to catch up with the demand of citizens by investing in various infrastructure and by cooperating with

private companies. Free Wi-Fi supply prompts one of the focus points. In Shanghai, the project "i-Shanghai" has been launched since 2012 to provide free Wi-Fi access in more than 1240 public spaces (Shanghai.gov.cn, 2016). Besides, free Wi-Fi access also provided by cooperation with companies like WiFi8 (Huāshēng Dìtiě, 花生地铁) in subways in 2014. Even in city buses, free Wi-Fi was provided by such companies as 16WiFi since the end of 2016, although the project is stranded in almost 14 months. At the same time, the risk of phishing Wi-Fi and stability of official Wi-Fi are becoming concerns of Wi-Fi users (Shanghai.gov.cn, 2016).

Growing demand for mobile connection also captures attention of the Singaporean government. The initiative called the heterogeneous network (HetNet) has been launched to ensure individuals' seamlessly roaming (E Yu, 2014). Free Wi-Fi is provided in public places by Wireless@SG, in shopping malls and so on (Board, 2018). In Taipei, government project to enhance free Wi-Fi in public area has been advanced since the beginning year 2011 under the concept of iTaiwan. In the year 2013, Taiwan is reported as the first place in the world to offer Wi-Fi access to tourists at large scale (Attwooll, 2013). Since August 2017, free Wi-Fi has been offered in subways in Taipei (TPE-Free, 2017).

Device is then considered for its relation with the complexity of e-government activities and e-government platform use. As early as 2011 in Taiwan, multiple e-government service channels have been explored from the perspective of devices (Council, 2014). However, more work is rarely to read from the perspective of devices use.

As pointed out by Baller etc. (2016), a worldwide ranking of households with a personal computer in China (mainland), Singapore and Taiwan differs: ranks at 71st, 12th, 36th respectively. In Taiwan, 77.7% of all the citizens go online by using computer (C.-P. Lee & Tseng, 2017). Compared to static devices, mobility of telecommunication enables individuals to communicate government anytime,

anywhere. In South Africa, when moderated with social capital, mobile phone use is strengthened in its effect on civic engagement (Ingrams, 2015).

In Chinese mainland, mobile telephone use becomes common. The mobile phone penetration rate develops to 130.4% in Shanghai by the end of 2016 (Bureau, 2017). Even for the conventionally disadvantaged peasants group, 92% of them are reported to use smart phone everyday (Ma, 2018). In Singapore, mobile phone penetration rate reaches to 149.8% by the end of 2016 (Authority, 2018). In Taiwan, 79.7% of all the citizens go online by using mobile phone (C.-P. Lee & Tseng, 2017). Together with other mobile devices like tablet devices, the mobile penetration rate is increasing annually from 73% in 2014 to 84% in 2016 (C.-P. Lee & Hong, 2017).

Purpose of internet use is reportedly influential on e-participation. For all the three categories of internet use purposes, individuals with the purposes of information collection and interpersonal interaction tend to be more active in e-participation, while individuals with the purpose of entertainment are less active (Chingching Chang, 2006; Lilleker & Koc-Michalska, 2017). By unveiling how single parents share their e-government channels, intentional off- and online conversations and interactions turn to be significant (Madsen & Kræmmergaard, 2015). These three work all stress the importance of interpersonal communication purpose on e-participation. For e-government research, the relation between the internet use purposes and the e-government platforms as well as functions use can be furtherly explored.

Next, **online platform use** is examined. Existing routines for online interaction are found to have a stronger impact on e-government channels use (Madsen & Kræmmergaard, 2015). The adoption of a new tool based on a trusted routine tool can be scrutinized through such perspectives as interoperability (Otjacques et al., 2007), compatibility (S. Taylor & Todd, 1995) and domestication (Berker et al., 2005).

From the perspective of compatibility, past experiences, needs of potential adopters as well as existing norms and values have been found to be positively related to intention to use (Han, 2003; Muthu et al., 2016; Tan & Teo, 2000; Van Slyke et al., 2010). The domestication approach focuses on action and practice, including symbolic explication of artefacts in new tool adoption. The flows of meaning involved, namely the moral economy (Silverstone et al., 1994), would not be examined in such a cross-sectional research as the present one. However, to discover relation of domestication or non-domestication (Frissen, 1989) of some platforms sets a meaningful position against technological determinism already.

Specific for e-government use, conventional e-mail or SMS which are frequently used are adapted to domesticate e-government digital posts (Madsen & Kræmmergaard, 2015). Social media sites are reported as a common platform to domesticate e-government use on social media. In Taiwan, e-government users are allowed to use social media account to log into e-government, while the "need to register" turns out to contribute 6.3% of all the hindrance to adopt e-government (Wong, 2007). Although efforts are broadly made to domesticate e-government on social media, critiques are raised by some researchers. Some argue that citizens may not use a medium for fun to communicate with government which is everything but fun (Margetts & Dunleavy, 2002). Some other researchers find incapability of e-government on social network sites: citizens in Korea and Taiwan, for example, use internet more for grass-roots movements and protests rather than public deliberation with the establishment (Jho & Song, 2015).

In the section below, some cognitive variables related to internet use and e-participation are presented. Unlike conventional demographic variables but related to e-participation, these variables are included and analyzed as politically relevant characteristics.

The Internet renders political participation with more possibilities. With a new public sphere coming into being, citizens seem to develop a new conception of **political efficacy in Internet** particularly for e-participation in online sphere. Citizens believe that government officials care more about concerns expressed online because of the presence of well-informed individuals as well as pressure from seemingly direct democracy. More than half of the respondents in Taiwan agree with the political efficacy which internet can bring about (Chu et al., 2016). Trust is an important cognitive dimension under scrutiny in the present work. Altogether three categories of trust will be analyzed. Here, **trust in internet** has positive significance on e-government adoption (Yan Li & Zhu, 2017). In Chinese mainland, distrust in internet is observable. For the peasants, who are considered being situated in an underprivileged situation in China, their perception of trust in internet is even more negative than that of the urban inhabitants: 59% of them believe that online information is deceivable in a great measure and 54% of the peasants believe that online transaction is of great risk (Ma, 2018). In Taiwan, the majority (55.2%) is skeptical about online information, while 27% of the respondents report that online information is almost unbelievable (Chu et al., 2016). How the trust in the Internet can effect e-government use is under-researched and will be detailed in the present work.

When speaking about trust, privacy and security concerns are often simultaneously articulated. Beyond their connection, there are some unique aspects of privacy and security worth paying attention, as they are more individual-orientated and concreter. On one hand, individuals report **online privacy and security concerns**. On the other hand, governments and legislatures are weighing up protection measures and political interests.

In China, 84% of internet users have a negative feeling towards personal information leaking (China, 2016). Only 38.8% of the internet users regard the

online environment as safe, among which 10.3% agree that it is very safe (CNNIC, 2017). From the perspective of legislations, the Personal Information Protection Law is still under construction, while privacy and security is merely protected by some articles scattered in basic laws such as the General Principals of Civil Law and the Cybersecurity Law (L. He, 2018). Besides, some rules of the authority are suspect in violating freedom of speech. The Regulations on the Administration of Internet Group Information Services which was issued in 2017, for example, causes worry about massive supervision and violation of the right of anonymity (M. Huang, 2018). Under such circumstances, political participation would be handicapped by a forced atomization of individuals, not to mention that a civil society is still in its infancy in China.

In Singapore, concrete measures have been taken to improve cyber security. From 2005 to 2007, the Infocomm Security Masterplan is conducted. The second phase was fulfilled from 2008 and 2012. From 2013 to 2018, the National Cyber Security Masterplan 2018 was carried out to upgrade cyber security level and protect individuals' privacy (G. Singapore, 2014). Since 2015, the Cyber Security Agency has been established to take responsibility in cyber security. From the perspective of legislations, the Personal Data Protection Act (PDPA) has been passed since 2013. A government body by the name of Personal Data Protection Commission has been set up to administer the PDPA. However, revision of the Act raises some concerns among citizens recently.

In Taiwan, an overview of efforts paid to improve cyber security and privacy by the authority can be illustrated as follows. In 2001, the National Information and Communication Security Taskforces was established. The Information and Communication Security Policy White Paper has been published since 2008. From 2013 to 2016, the National Information and Communication Security Development Project was launched. In 2016, the National Center for Cyber Security Technology came into effect. However, security and privacy concerns of

individuals in Taiwan, are no less relieved in comparison to other East Asian society: 18.6% of the respondents reported that their accounts were stolen in past year (T.-Y. Huang, 2018); about 80% of individuals feared that their privacy would be invaded by others (C.-P. Lee & Hong, 2017).

Altogether four groups of politically relevant characteristics are selected, introduced and analyzed above, from which two sections can be identified. The first two groups are related to the conventional characteristics and can be understood as demographic features. To be specific, gender and age, as well as education, occupation, income are to be studied in the light of relation with e-government use. The second section is internet-oriented and consists of the third and the fourth group. The third group is conceptualized from the perspective of internet use: such four variables as access to the internet, devices of internet use, purposes of internet use and online platform use are examined. The last group is constructed by cognitive approach and made up of three variables: political efficacy in Internet, trust in Internet, privacy and security concerns in Internet.

Still, some more aspects of politically relevant characteristics would be neglected. Some relevant variables on the macro level, such as economic structure of private sectors and nation controlling parts (Deakins et al., 2007), cannot be included into the politically relevant characteristics, although they can also influence internet supply and internet control, etc. However, residents on personal level are the focus point of the present work and therefore gains priority.

2.3.2 Political Participatory Factors and E-government Use

Political participation factors are not precisely defined in the CVM but indicated with great importance as "the origins of political activity (Verba et al., 1995, p. 467)". They are variables which are more directly (than politically relevant characteristics) related to political activity. Therefore, causality from these variables to political activity was explored by Verba etc. (1995). Although not

following the approach of the CVM, almost all the variables of political participation factors can be tested by other approaches. Besides, interdependency of participatory factors has also undergone research (Gibson et al., 2005; Saglie & Vabo, 2009).

Figure 4. Relation between the PPF and the E-government Use
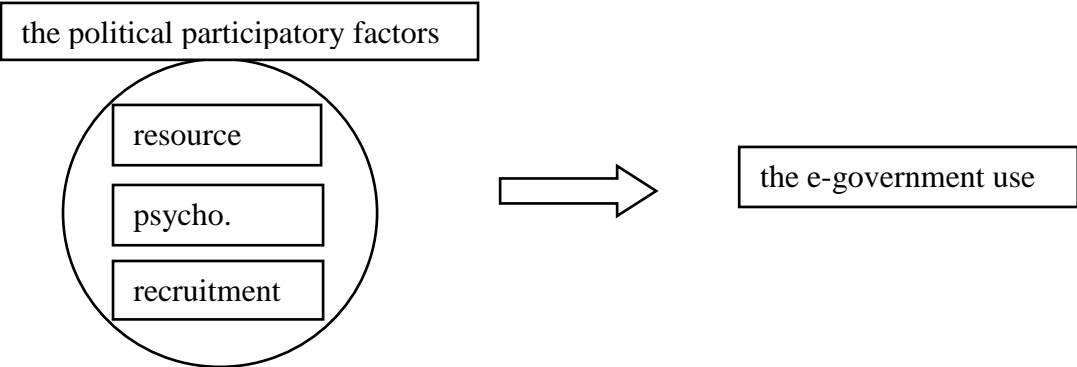
Following suit of the theoretic structure of Verba etc., political participatory factors consist of three categories. The first category stems mainly from resource mobilization theory and bears the name resources. The second category deals with psychological stimuli for political participation under the concept political psychological engagement. In the third category, recruitment is discussed. However, the scope of recruitment is enlarged beyond civil society to political settings and digital settings in the present research, in order to explore e-government use more suitably. At last, issue engagement as an always less mentioned category is also introduced.

2.3.2.1 Resources

Resource approach stems from the resource mobilization theory with the basic assumption that civil activism can only occur and carry on when adequate resources are available (Napoli, 2009). In the work of Verba etc., money, time, and civic skills are emphasized as resources to simulate political activity (Verba et al., 1995, p. 288). The three variables can also be differentiated between

tangible resources (Osman et al., 2014) and intangible resources: money, time and facilities are defined as tangible resources, while human labor and support are intangible resources (Freeman, 1979). Money and time as source are often considered as efficiency of e-government (P.-H. Hsieh et al., 2013). Efficiency is here understood as whether certain functions could be performed with minimum resource consumption (Deakins et al., 2007). In the digital era, digital literacy serves as another intangible resource which individuals should master to use digital media well. Like civic skills which is measured as resource in analog world, digital skills should accordingly be regarded as a kind of resource in digital time. In other work which also follow the resource approach, resources are understood in a broader sense. Besides financial resources, time, and knowledge, such variables as charisma, social relations, the creation of coalitions are also counted as resource (Hintz & Milan, 2009; Kern, 2008). According to the rationales of Verba, etc., however, these kinds of resource could be categorized to psychological stimuli or recruitment.

From the measurements presented by Verba etc., a conclusion could be drawn that in comparison to general incomes which could be irrelevant to politics at all, **money** here flows directly into politic arena like campaign donation, which is termed as "political money (Verba et al., 1995, p. 484)". Moreover, compared with donation as political activity, money as a kind of resource is measured by its quantity.

It is apparent that money as a resource reflects the societal and political reality in the U. S. which is highlighted by the dramatically uneven donation quantities mainly resulting from income inequality, aggravates political equality (Verba et al., 1995, p. 290). The resource inequality makes the political participation worrisome in the U.S. Income as a politically relevant characteristic is often researched in e-participation.

However, income inequality is seldom concerned. From this perspective, situation in these three regions is not less worrisome than that in the U.S. Reflected by Gini index, an index of family income distribution, income inequality of China (mainland) ranks at 31st with 46.5 in the year 2016, Singapore at 37th with 45.8 in the year 2016., whereas the U.S. at 41st with 45.00 in 2007. The situation in Taiwan is generally better with a ranking at 111th with 33.6 by the end of 2014 (Agency, 2018). Based on the rationale, donation money is seen as an unequal source. In political participation research in East Asia, however, individual donation is seldom researched, not to mention its influence on e-government use. Conventionally, the amount of **time spent in political activity** is measured as a resource which individuals can dispose of. Time as a kind of resource can be termed as political time which is directly used for politically related activities (Verba et al., 1995, p. 484). They insist that a participatory system based on time donation will be less unequal than one based on money.

As smart phone use becomes more and more popular, free time turns to be fragmented. It hints that a new perspective should be added to the conventional one which regards time as a block for political participation. Instead of a concentrated time, e-government, especially it on social media sites enables individuals to skim e-government on the fingertips and to fulfill fragmented time with e-government service. The ubiquity of e-government coming along with the ubiquity of the Internet could be integrated to the "life circumstances (Verba et al., 1995, p. 207)" of individuals.

Civic skills are referred to "the communications and organizational abilities that allow citizens to use time and money effectively in political life… (Verba et al., 1995, p. 304)." In penalization, objective measurement is taken instead of subjective feelings of efficacy. The school enrolment years and experience of taking part in civic participations are included.

Language spoken at home is also an example of objective measurement. This phenomenon is observable in Singapore, where English is used as one and the only language by e-government website, although Chinese together with the other two languages are recognized as official languages in Singapore. On one hand, the Singaporean government tries to unite its people by promoting English as the common language (Obi, 2017b). On the other hand, lack of multiple languages hinders information delivering efficiency. However, the policy can result in disadvantaging individuals less capable of English in e-government use (Ma, 2017). Besides, the language spoken at home may also have such functions as ethnic group identification and other political implication. The local language speakers (Shanghai-Chinese in the city Shanghai and Minnan-Chinese in the city Taipei) may have different political participation preferences.

Still, subjective feeling can also be an approach to deal with civic skills, especially when the objective approach can hardly distinguish certain concrete concerns. In the original research model, the perceived confidence of holding a meeting and so on is asked. In the present research, civic skills in the sense of **organizing** is also to be examined.

As Verba etc. (1995)(1995, p. 304) highlighted that examining the civic skills aimed at evaluating the communications and organizational abilities that created the basis for citizens to use time and money effectively in political life, civil skills in this sense should be broadened into the realm of digital sphere. **Digital-related skills** have been studied under various concepts: e-literature (Eynon & Margetts, 2007), technology knowledge (Cegarra-Navarro et al., 2011), and digital skills. These concepts concentrate firstly on technical know-how. In the case of ICT use, "knowledge of operating systems and application software, as well as knowledge of computer hardware and the ability to install and remove peripheral devices, install and remove software programs, create and archive documents" are studied (Nohria & Gulati, 1996; Sharma, 2000; Szulanski, 1996). For e-participation,

digital skills are often considered as an independent variable (Anduiza et al., 2010). The level of digital skills does have impact on political participation. To be specific, the higher one has digital skills, the more likely one is to take part in political activities (S. J. Best & Krueger, 2005; Krueger, 2002).

Around the technical know-how, the natural environment and social practice (W. L. Bennett, 2008; Kent Jennings & Zeitner, 2003), knowledge of benefit system and authorities (Madsen & Kræmmergaard, 2015) in which the know-how is taken effect are also studied as digital skills in a broader sense.

In China (mainland), Ma (2018) discovered that the lack of knowledge of computer and internet contributes to half of all the hindrances; another twenty percent of hindrance can be traced back to no knowledge of e-government. In Singapore, efforts are made by the government to promote a Smart Education to use such technologies as Virtual Reality Simulation to help students upgrade their digital skills (Communications & Information, 2015). In Taiwan, 8.7% of the respondents reached by a telephone survey reported that the never used internet to search for information; 12.0% of respondents used it averagely less than one time in a month (Chu et al., 2016). An apparent explanation for that is incapability of digital skills. Besides, a study from Taiwan demonstrated that the resource (digital skills included) haves and the resource have-nots showcase differences in e-government use: the haves are more likely to use e-government (C.-P. Lee, 2006). Besides, compared to Singapore, although Chinese is the only official language in China (mainland) and Taiwan, individuals should learn how to transfer the Chinese characters into alphabetic codes which can then be typed by keyboard. Typewriting is reported as a problem for the Chinese-speaking individuals who are not able to transfer Chinese characters to alphabet (Ma, 2018). New technologies such as phonetic input method are expected to help them to overcome the problem by large.

To sum up, the resource approach takes a more specific step than the standard SES model. Altogether five variables are considered in the present research: the political time and political money target the politic sphere; the civic skills of civic organizing; the language spoken at home as civic skills; the digital skills for the digital sphere as well as for e-government use.

2.3.2.2 Political psychological engagement

The first dimension of political participation factors (resources) tries to answer why individuals can (not) participate politically. The second dimension (political psychological engagement) tends to answer why individuals (do not) want to take part in political participation. Political psychological engagement is referred to psychological stimuli which can stimulate political participation. Besides, these political predispositions are regarded as critical and sensible to underpin citizens' conviction (Verba et al., 1995, p. 362). Such political views and attitudes are explored in the SVM in forms of political interest, political awareness, political consciousness and political efficacy. In some other research, knowledge of politics, interest in politics, and discussion about politics are regarded as political predispositions (Bimber, 2003; Brint & Levy, 1999; Mossberger et al., 2007; Norris, 2001). The engagement can be termed as civic mindedness (Nam, 2014), as well.

Measures of politically psychological engagement play a central role in theories of political participation (Verba et al., 1995)(Verba et al., 1995, p. 272). Political psychological engagement is proved to have positive significance on political participation (Armingeon, 2007; Dalton, 2008; Pattie et al., 2003). In the e-participation realm, statistically significant significance has also been found (Anduiza et al., 2010; S. J. Best & Krueger, 2005; Krueger, 2002). If individuals see government as unreliable, their own role as passive, they are less likely to interact with e-governments (Albert Meijer, 2015). In e-government research,

political views are unveiled to be able to an influence demand for self-service applications use (Madsen & Kræmmergaard, 2015).

As above mentioned, attitudinal predictors are too many to list. Due to conventional research tradition and the purpose of three cities comparison, political psychological engagement in the present research includes six variables. Besides the conventional variables such as political knowledge, political interest and political efficacy, three other variables are taken into consideration such as trust, privacy and security concerns, and citizenship. To examine the various possibilities offered by the Internet, e-government dimension is tugged under some variables such as trust in e-government, and perceived privacy and security concerns in e-government.

In a narrow sense, a full range of reasoned civic judgments required a level of basic **knowledge** of citizens, rather than make policy experts out of democratic citizens (Galston, 2001). In a broader sense, all education is civic education which significantly affects the level of political knowledge (Popkin & Dimock, 1999). Intuitively and empirically, levels of political knowledge affect the acceptance of democratic principles and political participation (Carpini & Keeter, 1996; Popkin & Dimock, 1999). Besides, it is discovered that education along with such demographic variables as race, gender and self-reported levels of political interest was strongly correlated with political knowledge (Carpini & Keeter, 1996).

However, for e-government use research, political knowledge of individuals is seldom measured, thus its relation to e-government use has not yet empirically discovered. If e-government use is seen as a transfer of analog political participation into digital sphere, then a positive significance is expected for the relation between political knowledge and e-government participation. Surely, the impact of political knowledge on different kinds of e-government use (information use, consultation use, e.g.) could be various.

Political interest is defined as "a citizen's willingness to pay attention to political phenomena at the possible expense of other topics (Lupia & Philpot, 2005)" and as "the degree to which politics arouses a citizen's curiosity (Van Deth, 2000)". Interest in politics plays its influential role not only for information processing and opinion formation, but also in understanding political participation (Carpini & Keeter, 1996; Strömbäck & Shehata, 2010).

In e-government research, however, study about the impact of political interest on e-government use is seldom. Compared to the analog political participation, e-government use is expected to be positively related to political interest. Still, various e-government use might require different levels of political interest.

Political efficacy about government can influence e-participation (Vrablikova, 2010). Respondents with lower political efficacy have a lower expectation and willingness of e-participation; thereafter, they are less likely to take part in political discourse in Internet (L.-H. Chen & Keng, 2008; C.-P. Lee, 2007). To be more specific, the internal political efficacy was found to be more strongly related than the external political efficacy for e-participation in the U.S.(B. J. Kim, 2015). For e-government study, some similar evidences have also been found. Interviewees demonstrating a more positive perception towards government have a positive opinion on e-government satisfaction (C. G. Reddick & Roy, 2013). Self-efficacy is proved to be critical for mobile e-government use in Taiwan (Hung et al., 2013). In Taiwan, the political efficacy demonstrates prediction in e-government use: users with a higher political efficacy are more likely to use e-government website (J. Lo, 2008).

In the politically relevant characteristics, **political efficacy in internet** is presented as a derivative variable. Together with above-mentioned political efficacy in analog world, political efficacy research could be more sophisticated when political efficacy towards e-government is also examined. Similar to the

political efficacy in internet, political efficacy in internet could be statistically significant in the relation with e-government use.

Although political efficacy has seldom been explored in the aforementioned literature review, study about trust is more refined in this sense. For both e-participation and e-government use, **trust in government**, in internet and in e-government have been well researched (Fakhoury & Aubert, 2015; McKnight et al., 2002). For e-government research, besides institutional trust (trust in government) (Bélanger & Carter, 2008; Pavlou, 2003; Teo et al., 2008), trust in technology and trust in internet channels (Bart et al., 2005; Ozkan & Kanat, 2011; Susanto & Goodwin, 2010; Tolbert & Mossberger, 2006) are often scrutinized.

Trust which is also conceptualized as trustworthiness (Gefen, 2000; Gefen et al., 2003), means "the willingness to be vulnerable to others and expecting positive intentions towards ones interest (E. Abu-Shanab, 2014; Mcaskill & Brown, 2010)". To understand it in the political trust arena, Some researchers (C. G. Reddick & Roy, 2013) find that it "essentially means that citizens have confidence that their government will make the right decisions." Except for the competence of government, citizen priority is regarded as another dimension of political trust in Taiwan (T.-Y. Huang, 2018). Some scholars try to round off citizen priority to benevolence (Grimmelikhuijsen et al., 2013; Porumbescu, 2016b) and emphasize honesty as an important dimension of political trust (Deakins et al., 2007).

Since long, trust is studied for its importance in social interactions and transactions (Alsaghier et al., 2009; Zucker, 1986). Beyond face-to-face interaction (Gefen & Straub, 2003), trust is also prove to be important in virtual transactions with institutions of public administration (Teo et al., 2008).

It has been a long tradition to explain trust in government in the political science (Nam, 2014; C. G. Reddick & Roy, 2013). In a longitudinal study from 1992 to 2001 in Taiwan, it is found that trust in government is positively related to democracy appraisal (L.-H. Chen, 2003). Moreover, individuals with higher level

of trust in government are more likely to go voting (L.-H. Chen, 2006). In this sense, trust in government can motivate individuals in political participation.

Trust in government is proved to be positively related to e-government use (Morgeson III et al., 2010). A simpler explanation of the correlation is that individuals will not interact through digital media with government, if they have little expectation of government or trust government less (Margetts & Dunleavy, 2002). Besides, trust is assumed to have an influence on expectations which further bring about intention to use (Teo et al., 2008).

What's more, the influence of trust in government on e-government has been explored by various approaches. Individuals' e-government adoption is significantly positively affected by trust in government (Bélanger & Carter, 2008; Yan Li & Zhu, 2017). Some studies discovered that higher levels of trust in government were associated with more intensive use of e-government service (Bélanger & Carter, 2008; Goldfinch et al., 2009; Rufín et al., 2012; Eric W Welch et al., 2004). On the contrary, there are some other studies showing the absence of any significant relationship between trust in government and e-government use (Sweeney, 2008; Torres et al., 2005; West, 2004). In Taiwan, a study demonstrated that the trust in government cannot be strengthened by the satisfaction towards e-government use (T.-Y. Huang & Lee, 2010).

In China mainland, trust in government is proved to have positive impact on e-government participation (L. Chen, 2012), while trust of government can exert positive effects on usage intention to e-government website use in Taipei (H.-J. Wang & Lo, 2010). Still, some unique characteristics of trust approach in China should be noticed. One of them is the so-called hierarchical trust in government. Unlike trust in most democracies, the central government in Beijing is more trusted than local government (such as Shanghai government) by individuals (C. Hu, 2017), as Tang (2004) once pointed out that the theoretical basis to analyze political trust in Confucian culture and authoritarian polity is quite thin.

Trust in e-government is regarded by some researchers as a reflection of trust in government in digital era (L. Wang, 2015). Trust in e-government is proved to be significantly positively related to trust in government (N. Yuan, 2012; Zhou, 2013). To be specific, trust in e-government is discovered being more influenced by trust in government than trust in internet (Yan Li & Zhu, 2017).

Some scholars integrate thrust in e-government into theoretic frameworks. Such frameworks as the Trust Theory, the Initial Trust Building Model, the Technology Acceptance Model (Davis, 1989), and the Trust Transfer Theory (Bélanger & Carter, 2008) have been applied to analyze trust in e-government. It is believed that as trust in e-government develops, behavioral intention to use e-government will accordingly grow (Fakhoury & Aubert, 2015). In Chile, for example, prevalence in trust of the virtual environment is studied in the context of e-government use (Somma et al., 2016).

In Chinese mainland, trust in e-government has also been researched (H. Chen et al., 2015), In Taiwan, trust in e-government approach is taken to explain e-government use: 74% of telephone respondents believe that information on e-government is reliable or very reliable (Chu et al., 2016). Besides, trust is regarded as critical for mobile e-government use in Taiwan (Hung et al., 2013).

It could be argued whether trust in e-government stimulates e-government use or the other way around. Some researchers insist than e-government use influence trust. Using e-government on different platforms can influence trustworthiness (Teo et al., 2008). Those who use e-government in social media for information are more positively associated with benevolence than those using e-government website. Those who use e-government in social media for information regard government (as well as e-government) as honest, while those who use e-government website for information are strongly and negatively related to honesty (Porumbescu, 2016a). In China, different e-government platforms are differentiated to examine their influence on trust in e-government respectively (Z.

Tang et al., 2017). Moreover, e-government use can also influence trust in government in turn: if individuals have positive experience with e-government, it can help to build trust in government (Horsburgh et al., 2011).

Speaking of trust, **privacy and security** cannot be overseen. Both privacy and security concerns are regarded as strong antecedents and central determinants of trust (Lean et al., 2009). Also, in e-government research, privacy and security assurance are proved to be significant predictors of trust (E. A. Abu-Shanab, 2017). These two constructs can be considered as one construct (Kohlborn, 2014), although they are differentiable.

The notion of privacy is conditioned highly socially and culturally (J. L. Johnson, 1989). A universal definition of privacy is in lack, no matter philosophically or legally (Introna, 1997). Still, the heart piece of privacy can be regarded as the ability of individuals to choose if, when, and to what extent they interact with and reveal themselves to others (Connors et al., 1985).

Information privacy which is among the four aspects of privacy along with communications privacy, territorial privacy and bodily privacy (Banisar, 2000), is examined mostly by privacy research and is defined as the amount of control that individuals can have over the type of information, and the extent of that information revealed to others (Westin, 1967). For e-government research, information privacy is counted as the most often studied privacy category. Communications privacy such as protection of the means of correspondence (Creemers, 2017) and territorial privacy such as protection of video surveillance, ID checks are also studied in e-government studies, especially for cases like China and Singapore which are seemingly less liberal (Y. Wu, 2014).

Online security means precaution should be taken against online theft, espionage, sabotage, etc. (Deakins et al., 2007). Two dimensions are emphasized. Firstly, operation security which means "check of the data entered by the user, generation of precise and timely feedbacks and data protection (Lambrinoudakis et al., 2003)."

Secondly, information security which deals with information reliability, correctness and timeliness (S. Smith & Jamieson, 2006). Besides, security standards are often studied (S. Smith et al., 2010).

Next, **privacy and security concerns towards government** are explored. In Taiwan, when being asked about whether people fear online surveillance from government, 49.7% of telephone respondents reported very concerned or concerned, while 49.5% reported they were not concerned or thoroughly not (Chu et al., 2016). Privacy and security concerns in authoritarian countries like China and Singapore is more complicated. As such regimes have a large repertoire at disposal in their online presence. Their presence approach can be dimensioned as: (1) control which includes such reactive means as content filtering and website blocking; (2) surveillance of the population by tracking their online activity; (3) state-sponsored online activism aiming at actively shaping online or social media content to favor the regime (Greitens, 2013). All of the three categories can potentially menace individuals' privacy and concerns.

China has adopted sophisticated technological means on internet censorship and online surveillance. Individuals may feel menaced by pressure exerted by Chinese government. Conventionally, citizens' privacy gains low priority in China. Scattered laws and regulations serve to protect privacy in China. According to Wu (2014), "personal data protection in China is fairly inadequate". Some companies even declare they should take advantage of the individuals' unconsciousness of privacy, like Li Yanhong, the leader of the biggest Chinese research engine Baidu, once announced (Lin 2018). Insecurity can also be observed by authoritarian presence online. As the ideological campaign in social media deepened in 2013, more and more users left the Weibo social media platform and turned to WeChat service (Creemers, 2017). Besides, bodily security concerns are reported by 70% of the whistleblowers who have fallen to be subject to retaliation or disguised retaliation to various degrees (M. Huang, 2018).

Authoritarian presence of Singaporean government is also regarded as strict (Chu et al., 2016). Internet service providers (ISPs) are granted to three entities which are controlled directly by the government. Politically sensitive website should be blocked by the three providers. Besides, private providers are not allowed to enter the market. Moreover, internet content providers (ICPs) are also muzzled by such laws as Broadcasting Act.

The immediate hindrance of privacy and security violation on political participation is not hard to deduct, while empirical evidence shows that decreasing internet freedom can be correlated with advancements in e-participation (Karlsson, 2013). So the comparison of effect of privacy and security concerns on e-government participation among Shanghai, Singapore and Taipei is yet hard to predict.

In the e-government development, data collection problems, unlawful use and disclosure problems, and security problems (McDonagh, 2002) always confront government and citizens. When individuals feel that e-government threatens their autonomy or privacy, they may be opposed to adopt it (AJ Meijer et al., 2009). Online application for a personal identity card, for example, is provided by only 31 out of 193 countries in 2016. Concerns over privacy and security is believed to hamper the efforts to fully adopt the service (Economic, 2017).

An analysis of **privacy and security towards e-government** (Holzer & Manoharan, 2016) in privacy policies and user authentication illustrates a level contrast between the three municipalities in the present research, among which Shanghai is ranked at 64, Singapore at 19, and Taipei at 40.

In China, there is no systematic legal protection for e-government (Y. Wu, 2014). Such new technologies adopted by e-government as facial recognition (Obi, 2017a) raise privacy and security concerns. In smart city transformation, automatic recognition camera scanning has been widely integrated, although it is controversial that innocent private cars and passengers can be captured by the

cameras. Besides, individuals in more than 80 cities in China are allowed to share their social media or third-party payment platforms with e-government service account, which could lead to risky results (H. Zhang, 2017).

In Singapore, Personal Data Protection Act has been introduced since 2013 to protect individuals' privacy and security. However, concerns still exist as government is granted with a certain immunity and companies are encouraged to use personal date to boost economy (Ma, 2017). Personal information such as family and occupation stored in MyInfo is seen as promising but risky. Digital personal identity SingPass is regarded as complicated to access by double check procedure, as digital security problems become severe (Ma, 2017). Individuals have been allowed to log in official political participation platform Reach with their Facebook account since 2013 (G. o. Singapore, 2018), which can also raise privacy concerns.

In Taiwan, just 31% of respondents believed that their personal information will be well preserved by government and by local telephone service companies according to a Pew research (T.-Y. Huang, 2018). Besides, the same concerns also result from the integration of social media and official political participation platforms: individuals in Taiwan are also allowed to log in e-government platforms with their social media accounts (T.-Y. Huang, 2018).

At last, **Citizenship** is taken under observation. From the narrow version of rational perspective, material benefits are consistently emphasized. However, more respondents report their participation are guided by the sense of citizen duty. The research by the CVM (Verba et al., 1995, p. 116) empirically confirmed that "selective material benefits are quite infrequent and seem inadequate to explain the volume of political activity", especially for women and African-Americans. Therefore, the reported approval of citizenship should be counted as political cognitive stimulus. Still, it is noteworthy that the self-report can be twisted by

social pressure. Respondents might think they should give the approval not due to civic motivations, but because it is socially appropriate.

Three elements of citizenship were emphasized by Marshall (1950): civil, political and social. He explained the three elements as follows: "the civil element, comprising the rights required for individual freedom; the political element, 'the right to participate in the exercise of political power' through membership of a political body, or through electing them; the third element, the social, comprised 'the whole range from the right to a modicum of economic welfare and security to the right to share to the full in the social heritage and to live the life of a civilized being according to the standards prevailing in the society".

There is no doubt that some cultural traits including trust, tolerance, and a willingness to compromise are crucial for citizens' developing civic culture actively (J. Lee, 2002). However, the consensus of citizenship in the East and the West is hard to reach. It is arguable if Protestantism, which is generally identified as a political culture that contains such civic cultural features, is the one and only soil in which such features can take roots. Following this logic, it is explainable that democracy can hardly survive in Asia where the lack of civic culture or Protestant traditions is the reality (François, 1986). There is no wonder that Singapore's former Prime Minister Lee Kwan Yew and Malaysia's Prime Minister Mahathir Mohamad would propagate the "Asian values" as legitimization for their regimes (Fukuyama, 1995). Such values broadly specify Asians as people who choose order or discipline over political strength of party identification.

On contrary to this logic, evidence of compatibility of Asian culture traits with democracy has been raised. Even in Singapore, empirical founding rejects such advocates as the incompatibility of Asian values with liberal democracy (Bell, 2009). One the other hand, Kim (1994), the former president of South Korea,

defended the democratization in his country and drew intellectual resources from East Asian tradition.

The topic citizenship is observable not only cross-culturally but longitudinally within a certain culture. In western, citizenship norms have also undergone a shift since conventional forms of political activity like voting gradually loses individuals' attention and participation (Coffé & van der Lippe, 2010; Oser & Hooghe, 2013)

To answer the question of how to be a good citizen, it seems that various approaches are presented against their culture backgrounds, against the conventional and renovated political participation practice. Still, efforts are paid to bridge the gap between the eastern and the western, the past and the current.

Citizenship norms are defined by Dalton (2008) as "a shared set of expectations about the citizen's role in politics". Under the concept 'being a good citizen', two different categories are identified as the duty-based citizenship (Holm & Robinson, 1978; Miller & Shanks, 1982; Robinson & Fleishman, 1988) and the engaged citizenship (Dalton, 2008; Vrablikova, 2010). Duty-based citizenship emphasizes norms of social order, while engaged citizenship highlights "political action toward direct forms of participation, such as contacting, working with collective groups, boycotts or contentious actions (Dalton, 2008)." Generally speaking, duty-based citizenship is more likely related with engagement in conventional political participation such as voting and campaign participation, while engaged citizenship tends to increase the probability of taking part in unconventional elite-challenging activities.

Correspondent findings can be found in Taiwan which reveal that duty-based citizenship and engaged citizenship present significant differences in their effects on political participation (W.-C. Chang, 2016). Another contribution of Chang (2016) lies in finding the relation between culture traits and citizenship norms. That may shed a new light on the discussion about culture determinism and

democratization. It is interesting to find that the Asian Values exhibited by the cultures of Buddhism, Taoism, and folk religions (which is a mixture of ethical ideology and philosophy of Confucianism, Buddhism, and Taoism), which emphasize authority, virtue governance and collective interests (Berling, 1982; Yao, 2000) and often provide political stability in East Asian countries, still influence the norms of duty-based citizenship.

As to engaged citizenship, empirical work demonstrates that some resources from East Asian intellectual heritage are resourceful to engaged citizenship norms, as the former president Kim (1994) acclaimed. Some Asian culture values like meritocracy from Confucianism are regarded to be able to promote self-determination and engaged citizenship (Berling, 1982; Yao, 2000). Influence of Buddhism on promoting democracy can be perceived in favor of advocating tolerance, freedom of choice and equality.

Therefore, culture might not be destiny but can exert non-negligible influence on citizenship. Moreover, citizenship undergoes constant changes brought about by education and economic liberalization and globalization which are regarded as being in favor of engaged citizenship. Chang (2016) demonstrated empirically that engaged citizenship norms are related to education embodied by individual choices, freedom, and mutual benefits which stem from liberal and communitarian norms. Younger generations nourished by these intellectual resources tend more to approve engaged citizenship and to participate in the mode of elite-challenging behaviors.

Still, it is noteworthy that citizenship can also be measured by combination of two other variables in the present work. Following a two-by-two typology which was created by employing such binary variables as efficacy and trust (Barnidge et al., 2014), such type as dutiful orientation might be statically positively related the above-mentioned duty-based citizenship. Double-check of this typology and citizenship norms might shed new light on citizenship study in future study

Table 10. Political Orientation Typology

	actualizing orientation	dutiful orientation	integrated orientation	non-participatory orientation
efficacy	high	low	high	low
trust	low	high	high	low

Source: (Barnidge et al., 2014)

Therefore, based on the common ground of Asian culture and influence of economic liberalization and globalization in reality, an effective comparison of perceived citizenship in Shanghai, Singapore and Taipei on e-government political participation can be well justified, especially when different ways of demonstrating citizenship are empirically confirmed as incentives for citizens to use e-government (Szkuta et al., 2014).

Engaged citizenship is expected to be a seed of democratization in Shanghai and Singapore which lie in authoritarian hands. Its impact on e-government political participation will be examined. On the other hand, it should not be surprised to find a certain high degree of approval of duty-based citizenship in Taipei, since Taiwan was under an authoritarian dominance for almost 40 years (W. Zhang, 2012). However, as authoritarian governance is still evident and individuals are influenced in everyday life by authoritarian orientation, more approvals towards duty-based citizenship are expected in Shanghai and Singapore, while residents should be more engage-oriented in Taipei which eventually passed over the authoritarian rule and practices democracy for more than two decades.

To sum up, nine variables would be examined for the political psychological engagement: political knowledge, political interest, political efficacy in government and in e-government, trust concerns in government and in e-government, privacy concerns in government and in e-government and citizenship. In some variables, the differentiation of analog government and e-government are scrutinized respectively. As reasoned at the beginning, variables of political psychological engagement are too many to take into consideration, some other variables such as satisfaction and dissatisfaction of political implementation

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(Armingeon, 2007), perceived freedom of speech (Bonsón et al., 2015) and so on are not included in the present because of their less relevance.

2.3.2.3 Recruitment

The starting point of recruitment category lies in the request mechanism of political participation: an individual is positioned into a network to make him or her fulfill a certain political role nurtured by home, civil society and government organizations. In the CVM (Verba et al., 1995), the focus concentrates on civil society which is at the heart piece of democracy.

According to Verba, etc. civil society cultivates civic training by direct requests for activity, on one hand (Verba et al., 1995, p. 377); on the other hand, the American exceptionalism (Verba et al., 1995, p. 385) among the world's democracies waited to be explained no better than through the significant role played by churches in the U.S. Therefore, there is no wonder that non-political institutional settings compose the main and only concern in the recruitment in their work. To be more specific, religious institutions like churches, non-political secular institutions, workplaces are paid great attention to.

It is doubtless to carry on the significant role of civil society in democracy. For holding onto the value against authoritarian countries on one hand, for envisaging it in the already democratized city like Taipei on the other hand, discovering of the influence of non-political institutional settings on political participation ought not to be discarded.

Except the civil society perspective, other locus which recruitment can be undertaken can also be referred from the CVM. The CVM was derived from resource mobilization theory, in which the forms of organizations serve as a pillar (Napoli, 2009). Civil organizations, also termed as non-political secondary institution, are one of the three locus of adult life, while other two loco such as political one and family should also be examined (Verba et al., 1995, p. 79).

Besides, it is essential to expand recruitment into specific updated technological context.

Political organizational settings, for instance, could be seen as supplementary dimension to civil settings. Some scholars (Marien & Christensen, 2013) already applied such an approach to explore political participation. Especially in the present research, the politically authoritarian China and half-authoritarian Singapore require this dimension to enrich recruitment analysis.

Personal world of family and friends is regarded as the last pillar of the three loco of adult life. The consequences of political stimulation at home are proved to be positive on political activity (Verba et al., 1995, p. 436). Besides, political communication among family, friends and strangers is often differentiated.

In the time of digitalization, however, the boundary between friends and strangers is somehow penetrated by the Internet (J. Wu, 2017). Acquainted strangers who get to know each other via Internet bind together and eventually accumulate political power turn out to be daily scenery, not to mention via social media, which attracts academic attention in the cases like Obama election campaign (Luttig & Callaghan, 2016), the Arab Spring (Eltantawy & Wiest, 2011) and hate speech (Ben-David & Matamoros-Fernandez, 2016) in political and social arenas. In research of e-government use, the intertwining of friends and fellow-onliners, the overlapping of private sphere and public sphere are attracting attention increasingly.

Therefore, together with non-political institutional settings, political institutional settings, private non-institutional settings and digital settings are counted as the four recruitment loco in the present work.

Next, the approaches of dealing with the four loco are briefly introduced. The most common way to analyze recruitment tends to be the social capital theory (Putnam, 2001). One crucial approach of it is to unveil how trust stimulates social capital and therefore increases participation (Dalton & Klingemann, 2007;

Putnam, 2001). Another approach emphasizes social network, which is generally applicable to all the four dimensions in loco of adult life (Goldstein & Ridout, 2002; Nagel & ECliffs, 1987; Rosenstone & Hansen, 1993). The social network view is adopted as the main approach for the present work to analyze recruitment as a political participatory factor.

2.3.2.3.1 Political institutional settings

As stated before, the CVM didn't incorporate the political institutional settings into recruitment due to a bunch of implicit reasons. One of the reasons is based on the presumption that the less structurally hierarchical and the more participatory organizations are, the more affiliates are able to learn skills (Verba et al., 1995, p. 336). In this sense, to oversee the impact of political institutions to a certain extent sounds reasonable. However, research results of their own don't even support this presumption: the internal organizational characteristics is not necessarily connected with the possible political stimuli by organizations.

To apply this finding to recruitment, political institutional settings by their nature don't mean to strangulate the likelihood to assist individuals with civic training, neither get mobilized.

When recruitment opportunities could be supplied by political institutions, it is applicable to conduct study of, for example, different effects of recruitments offered by different polities. This possibility is crucial to the present work, because the three cities are selected partly because of their polity differences. Taipei, for example, sets a democratic entity opposite to Shanghai and Singapore. Generally, China is regarded as a communist state, Singapore a parliamentary republic, and Taiwan a multiparty democracy (Obi, 2017b).

Political institutions can set "rules" for individual expression, information transmittal, and social choices (Charles, 1979). Thereafter, socio-political changes can be either speeded up or slowed down (Jackman & Miller, 1995). Political

institutional settings are transnationally and transculturally proved to be influential on political participation (Bimber & Davis, 2003; Boulianne, 2011; K. Chen, 2016; Gibson et al., 2005; Y. M. Kim & Geidner, 2008; Tolbert et al., 2003). Mediated by political attitudes, characteristics of a certain government institution can exert an indirect effect on political participation (Aarts & Thomassen, 2008; Freitag & Bühlmann, 2009; Karp & Banducci, 2007; Norris et al., 2006). The uniqueness of political institution in various nations is also noticed and is found to be related to the level of civil participation (Blais & Dobrzynska, 1998; Coleman & Shane, 2011; Zheng et al., 2014).

For e-government development, political institutions are regarded as so important that they can shape the nature, pace, and spread of technological change (Acemoglu et al., 2014). There is no wonder that every time when e-services promotion is talked about, organizational imperative (Markus & Robey, 1988) seems to gain the priority in the discussion. A direct relationship between organizational, institutional, and environmental factors with successful use of social media in local public administrations has been found (Criado et al., 2017). From this perspective, hindrances of e-government implementation and use have been explored, as well (Eynon & Dutton, 2007; Albert Meijer, 2015).

To gain a further understanding of **political recruitment**, four aspects are detailed as follows: the opportunity structure, the concentration of state power, rule by law, democracy and autocracy. For each aspects the extensive e-government recruitment is also presented.

The openness and the closeness of opportunity structures (Eisinger, 1973) lie at the center at the beginning age of academic research on political recruitment. Channels are examined to see if they are implemented by government to support citizens to get heard and to get involved in the decision-making processes.

A basic question in the sense of openness is if an individual is entitled to be eligible to vote. This point is especially noticeable, because among the three cities

one is more democratic and some others strand in the situation of limited universal suffrage or no universal suffrage at all. It is expected that individuals from a more democratic city would be frequently and genuinely required by the government to engage in decision-making processes.

In the era of internet, ICT is believed to convey the hope of broadening the opportunity window for less liberal political entities. For Anglo-Saxon and Germanic local governments, individuals are less active in discussion on e-government than those from the Southern European municipalities where analog opportunities are regarded as traditionally scarce (Bonsón et al., 2015). The Nordic municipalities seem to deliver an ideal participation prospect with a higher level both in opportunity structures and e-participation.

In China, the closeness of opportunity structure is well-known. Some researchers (C. Li & Li, 2017) indicate that the Chinese government lay more value on propaganda and educational function of e-government, while the government is less proactive in responding to the voice of individuals; more often, online public opinion is treated as interference of power operation and should be led the way the government wants it to go. Relevant material is complemented in the introduction of over-recruitment next.

Besides the opportunity structure approach, concentration of state power could also be a factor influencing political recruitment. The less concentrated the state power is, the more accesses to political participation are expected (H. Kriesi, 1995; Hanspeter Kriesi, 2004). It is well-known that political system in China has been centralized for thousands of years. The development of the Internet alone cannot overturn the situation. The centrifugal forces unleashed by the Internet always undergo the control by the state and is obedient to the political status quo. There is no wonder that investment in a robust ICT infrastructure is used to strengthen the political power base or to propagate the position and prestige of the government in China (Chadwick, 2001; Jaeger, 2005). Chinese experts such as

Yang (2017) point out application and services are neglected by large, while investment and regulation gain priority in China. He advised for e-government development in China that administrative reforms should be carried out to streamline administration and delegate power to the lower levels.

When the perspective is shifted to rule by law, a more complicated picture would emerge among the three cities. That is by no means in favor of democracy in western standard such as Taiwan always praises. Legislation is often counted as one the critical e-government issues (Deakins et al., 2007). A worldwide comparison by Baller (2016) demonstrates that Taiwan hasn't shown great advantage as a democracy. Specific in ICT field, ranking in law relating to ICTs isn't as dramatic as expected for the three cities (49th, 5th and 28th for Shanghai, Singapore and Taipei respectively). The leading role of Singapore in rule by law is remarkable. Form this point of view, it could be demonstrable that some scholars from China and Singapore proclaim that meritocracy and rule by law are crucial in governance, whose value is not less treasurable than democracy (Siong & Geraldine, 2007).

Table 11. Rule by Law Comparison

	China (mainland)	Singapore	Taiwan
judicial independence	67th	23rd	47th
effectiveness of law-making bodies	40th	1st	104th
efficiency of legal framework in settling disputes	50th	1st	56th
efficiency of legal framework in challenging regulations	66th	10th	63rd

Source: (Baller et al., 2016)

In the sense of dichotomous conceptualization of regime type, Stier (2015) made a comparison between democracy and autocracy. According to his empirical research, both in democracies and autocracies "government capacity also grows in importance, as e-government programs have become more technologically sophisticated". The main motivations and goals of autocracies to catch up in e-government are "to enhance pro-regime activism on the internet and legitimize

their rule by improving economic performance". For democracies, the innovation-friendly environment is the principal political source to develop e-government.

The People's Republic of China has been a communistic country since 1949 and a de facto one-party state. The ruling party is the Communistic Party of China (CPC). There is no democratic election in western sense there and no oppositional parties. Eight "democratic parties and groups" (mínzhǔ dǎngpài, 民主党派) have been allowed to exist and is regarded as the "United Front Democratic Parties" by the CPC (Groot, 2004). The Republic of Singapore is a de facto one-party state since its independence. The ruling party in Singapore is known as People's Action Party which has won all the elections ever since, while the opposition parties are only able to win a small amount of seats in the parliament (W. Zhang, 2012). A difference to China is that popular election of parliament is established in Singapore. Still, the Singaporean governance is regarded as authoritarian. Authoritarian democracy is conceptualized by some scholars to character the polity in Singapore (Ortmann, 2009). Taiwan is one of the most advanced democracies in Asia (Chingching Chang, 2009; Wei & Leung, 1998) after the authoritarian regime from 1949 to 1991. Democratic mechanism is regarded as mature after direct presidential election for six times in Taiwan. The two main political parties in Taiwan are pro-unification Kuomintang and pro-independence Democratic Progressive Party (W. Zhang, 2012).

Baller (2016) illustrates that less democratic countries like China and Singapore achieve in international comparisons. In ICT use and government efficiency, China ranks at 41st, Singapore at 2nd; in the e-participation index, China ranks at 33rd, Singapore at 10th. The two authoritarian countries don't fall behind other democratic countries so much; in some cases, they even top other countries. Even for authoritarian countries, e-government is believed to able to bring better service and empower the previously voiceless.

Some of the reasons are offered for the advance of such authoritarian countries. Such autocracies like China invent their model of strategic internet development early (Kalathil & Boas, 2003; Kluver, 2005) and implement their plans with determination. Such measures as performance management system in the Chinese government has been compulsorily implemented (G. Yang, 2017). In Singapore, Commitment from top government officials to support the necessary changes with financial resources and leadership was counted as one of the four factors critical for the creation of a successful e-government infrastructure (Sriramesh & Rivera-Sánchez, 2006). It is observable that Singapore was the first country in the world to employ the Internet to manage population census (Netchaeva, 2002).

Table 12. Comparison of Government Effort in E-government Development

	China (mainland)	Singapore	Taiwan
importance of ICTs to government vision of the future	27th	2nd	11th
government procurement of advanced technology products	9th	4th	29th

Source: (Baller et al., 2016)

Secondly, the absent electoral pluralism in autocracies could be reinforced by equivalent e-government programs "that are designated to instate previously absent two-way-interactions between citizens and political leaders (Stier, 2015)". With the help of the Internet and e-government, authoritarian deliberation turns to be sophisticated in authoritarian countries (B. He & Warren, 2011). Thirdly, particularly market-oriented autocracies tend to develop information technology to promote economic development (Corrales & Westhoff, 2006).

The effect of political institutional settings on (e-)participation can also be found at the meso level. Cultural obstacles in adoption of e-government when practices or views clash with existing norms of an organization (Deakins et al., 2007). These less relevant literature is overlooked in the present research. Meanwhile, it is noteworthy that efforts paid by government must go hand in hand with other stimuli. Otherwise, it would turn to be weakly associated with citizens' adoption (Saglie & Vabo, 2009).

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Recruitment can be conducted by political institutional settings. In this sense, the United Nations (Economic, 2012) places e-government provision on the very beginning of its e-participation index. However, **over-recruitment** can also happen in the political institutional settings for several reasons.

Political institutions themselves often jump into promoting and encouraging e-government use. As a worldwide comparison presented by Baller (2016) demonstrates that the three governments success in ICT promotion with rankings at 39th, 3rd, 16th respectively. In d-government promotion ranking of Waseda University, Singapore ranked at Nr.1 (Obi, 2017a). It can also be questionable if the governments push too hard on e-government promotion.

Symbolically, political institutional settings are often on the brink of over-recruiting individuals, namely blurring privacy and pubic and even invade individuals' privacy and security. To what extent it is appropriate to promote e-government is the question both for authoritarian countries and democratic countries, although some propagations are in need to get e-government heard and make people aware of e-government (Chadwick, 2003; Korac-Kakabadse & Korac-Kakabadse, 1999).

In Chinese mainland, it is observed that individuals would intentionally escape e-government on social media (R. Chen & Y. Liu, 2017). In Singapore, Citizen Connect Centre (CCC), which is governed by the government institution People's Association, is upgraded to CCC+ to help and guide e-government use (Ma, 2017). Besides, sensors and camera systems are installed in a large scale in public places to facilitate e-government in Singapore (Chu et al., 2016). In Taiwan, certain government information service has been proactively delivered to mobile phone and individuals' instant message terminal. A research reported that 74% of respondents regard it as helpful, while some individuals concern about government intruding into private sphere (C.-P. Lee & Hong, 2017).

2.3.2.3.2 Non-political institutional settings

As a central piece of democracy, non-political institutional settings which incarnate civil society is treated as the focus point of the CVM approach. Verba, etc. (1995) are not the only ones value the civil society and its concrete structure and impact. The development of community is also scrutinized by researchers like Putnam (2001). In their studies, workplace, civic organizations and religious participations are often laid in parallel to explain their effects in recruitment in a civil society.

The influence of civil society on cultivating individuals into politics can be highlighted in two categories, according to Verba, etc. (1995, p. 380). The first influence is identified with civic training. Opportunities for civic skills development can be traced back to structures of various religious institutions, for example. Amounts of comparison were made on different civic training effects between churches and non-churches, between catholic churches and protestant churches. For democratic practice, religious domain is regarded as more democratic than democratic polity in the U.S. The other category can be understood as political stimulation. Non-political organizations remain less relevant to the reign of politics. Still, such institutions can take side on public issue and influence their members. It is confirmed that the organizations taking stands on politics dispense more political cues to their members than those that do not. On the contrary, recruitment is much less likely to happen in organizations taking no stands on public issues.

In e-government research, the significance of community also attracts scholars' attention. Non-political institutional setting is seen as social and local anchor which nurtures community affinity and can therefore act as an incentive for citizens to use collaborative e-government (Szkuta et al., 2014)

In a civil society, individuals are granted with the freedom of association. However, this freedom cannot be taken for granted in non-democratic polity, not

to mention civic training and political stimulation which is produced by non-political institutional settings. In China, although public sphere is becoming lively in the post-Mao time and the Internet seems to provide another solution to public building (Tu, 2016), the civil society is not mature enough to support social governance. Citizens cannot take the role of co-governing, while the government takes control of almost all the arenas and links of social governance (B. Zhang, 2017). In Singapore, civil society has been constantly under pressure of the authority since the birth of the republic. NGOs, for example, have been rigidly controlled and their development are less vigorous than those in other countries in Southeast Asia (Hammett & Jackson, 2017). Individuals are afraid of witnessing social instability and economic regression and therefore pin hopes on the authority instead of individuals and civil society in Singapore (Sriramesh & Rivera-Sánchez, 2006). Besides, the ruling party builds up influence on grass-roots organizations which is supposed to be independent of any political party. To conclude, civil society seems less likely to assist political participation in China and Singapore. Some hope can still be reserved under the circumstances that the development of the Internet could make a difference.

In Taiwan, NGOs doubles their amount after martial law was terminated (Su, 2011). Since the earthquake in 1999 in Taiwan, prosperous development of grass-roots organizations characters the civil society. 26.6% of respondents in Taiwan join NGOs, among them 26.6% take part in public welfare groups followed by 23.9% belong to religious groups; besides, 71% is reported being active in NGOs (Chiou, 2010). However, the development of civil society can also be shadowed by politic power, while democratic value loses its priority. NGOs named after China/Chunghwa (中華, zhōnghuá) stand closer to be pro-unification, while those named after Taiwan tend to be pro-independence. After the power transfer for the first time in Taiwan in 2000, cooptation is proved to be a significant ruling method by government. Therefore, the value of civil society can be endangered by its

relation with politic power. To sum up, it is reasonable to believe that civil society would recruit individuals into politics. The role of the Internet and NGOs brings more possibility of a vigorous civil society and corresponding recruitment. At the same time, the intrusion from government (especially from the authoritarian government) and other politic factors can also cripple civil society and its recruitment.

2.3.2.3.3 Private non-institutional settings

The parallel settings of political organizations, non-political organizations and home construct the whole real life, according to Verba, etc. (1995, p. 449) who confirmed that "political stimulation in the home also has consequences for political activity". Under the concept of private non-institutional settings, the impact of family and friends in everyday life on recruitment is to be analyzed. Conventionally, such private recruitment can be traced back to analog setting. With the development of the Internet, such recruitment can also take place online via private contact. What's more, fellow-onliners who come together via the Internet are also worth research attention for private recruitment. Given the new trend, the private recruitment is to review from both the analog and the online perspectives.

Household is seen as a unique unite compared to political and non-political organizations because it can "create and sustain its autonomy and identity (…) as an economic, social and cultural unit. (Silverstone et al., 1994)" The impact of **family and friends on political participation** enjoys a long tradition of academic research. Verba, etc. (1995, p. 156) found that half of political participation requests came from someone whom respondents know personally, while just a quarter come from strangers.

For e-government studies, the role of family and friends are also proved to be important. Family characteristics are found as a determinant of demands for e-

government websites (Y.-T. Choi & Park, 2013), while word-of-mouth effects on e-government adoption is found to be higher than that on e-commerce platforms (Morgeson & Mithas, 2009).

In Singapore where the value of family is proclaimed as a component of the Asian Values and is consistently promoted by the authority, family is incorporated by the government to develop e-participation. Senior citizens are encouraged to learn digital skills from their grandchildren through a collaborative program of government and its school partners. The program is reported being welcome by Singaporean citizens (A. Tan, 2016). In Taiwan, interpersonal influence as well as external influence are found to be critical factors for mobile e-government use (Hung et al., 2013).

The analog social network of family and friends contribute to building **online social network** (Dunbar et al., 2015). With the help of ICT, the previous analog political recruitment from private non-institutional settings partly transfers to online space. Moreover, this change can result in e-participation.

In Chinese mainland, 29% of 151 citizens in a non-representative survey reported that they used to send their views to the family and friends by emails when they had issue with government (Z. Wang & Lim, 2011). For familiar social network members in Taiwan, the ones who had online political discussions with their friends were 24.7 times more likely to articulate their thoughts about politics online and were about 42 times more likely to have online contact with politicians (Y. P. Hsieh & Li, 2014).

Besides the familiar existence in digital settings, **fellow-onliners** from virtual communities can also give rise to private recruitment. Requests from cyber space to participate politically can easily reach target groups. Individuals are encouraged to writing online petitions, for instance. Through social media, latent ties of onliners can be converted into weak ties with increasing social capital (N. B. Ellison et al., 2007). In e-government research, help from virtual fellow-

onliners are found be more understandable than that from bureaucratic jargon (Madsen & Kræmmergaard, 2015). Moreover, transnational recruitment by fellow-onliners becomes reality, thanks to the Internet which tears down the national and geographic boundaries. Activists share the same social repertoire of collective action to boost political activities in a global scale (Tilly et al., 2001). The cases of Obama election in 2008 (Cogburn & Espinoza-Vasquez, 2011) and Arab Spring (Eltantawy & Wiest, 2011) mirror such changes.

When Chinese respondents had issues with the government, 51% of them used to join virtual communities for help and 53% of them used to post comments on non-governmental BBS (Z. Wang & Lim, 2011). A survey in south China demonstrates that information use and political use of SNS were positively associated with such political participation activities as contacting media and joining petitions and demonstrations (Xinzhi Zhang & Lin, 2014).

In Taiwan, the more active individuals use SNS and use it for election information, the more active they take part in online discussion on public affairs and in online conjunctions (T.-L. Wang, 2013). SNS recruitment can also overspill to election turnout: 27.7% of voters in a survey used to send public affair information to others via SNS (T.-Y. Huang, 2018). The ones who were motivated by fellow-onliners to take part in student movement used to be more active and stay in longer for the movement (W.-C. Chen et al., 2016).

While recruitment of online social network is scrutinized, privacy problem is worth of being mentioned once again, because the overlapping and intertwining of privacy and public revelation become bolder in e-participation. Personal details which should be kept concealed from others (Deakins et al., 2007) are now exposed to others (N. B. Ellison, 2007) and even to e-government.

In China mainland, almost 60% of provincial mobile e-government apps can be shared to a third platform which is most likely the SNS (H. Zhang, 2017). However, just 21% of respondents "trust that my personal data will be handled

responsibly on social media platforms" (Kreis eV, 2013). In Taiwan, e-government participation platforms allow individuals to use their social media accounts to log in (T.-Y. Huang, 2018). This should also be debated from the perspective of privacy violation and of convenience support.

By ending the private recruitment, it is worth being mentioned especially for the private online recruitment that the borderline between family online and fellow onliners is so blurred that individuals could get recruited by both sides simultaneously. Therefore, recruitment power is expected to be enlarged and to expand to a broader as well as uncertain arena both online and offline.

2.3.3 Issue engagement

Issue engagement was researched in the CVM but eventually not concluded in the final version of the CVM. However, it is still necessary to introduce this approach, in order to explain political participatory factors thoroughly.

Issue engagement was defined as "policy concerns that arise from citizens' differing needs and preferences (Verba et al., 1995, p. 391)". Two sources of issue engagement were identified. The first source is featured with personal stake in government policy. The other source is characterized by deep commitments about a particular political issue. Research results didn't well support the presumption in the original work. Especially measurement of personal stake in government policy contributed little additional explanatory power in general political participation. Moreover, issue engagement as a kind of political participatory factor is heavily intertwined with political activity subject.

In e-government research, political activity subjects have been widely studied. On Facebook, for example, the most engaging topics on municipality level are "public transport", "housing" and "public works and town planning" (Bonsón et al., 2014). In China, topics associated with municipal management which directly affect citizens' lives are more appreciated by residents (G. Yang, 2017). Besides,

emergencies and applications with special needs are also expected in e-government use (Hetling et al., 2014). These issue-oriented subjects of political participation will be categorized under e-government use as e-government subject matters as follows, while its value as political participatory factors is omitted for the reasons listed above.

2.3.4 Themes of political activity

Subject matters of political activity, which can also be conceptualized as topics content types, are to be elaborated in this section. In the CVM, such matters as economic issues, abortion, social issues, education, environment, crime or drugs were identified as outstanding in political activity (Verba et al., 1995, p. 86). In the present work, the term of subject matters from the CVM is termed as themes in short. To understand the complexity of e-government, such themes of political activity should also be studied (Rodríguez Bolívar et al., 2010; Snead & Wright, 2014; Wimmer & Codagnone, 2007).

In digital time, themes are often analyzed from two perspectives: citizen needs and (e-)government supply. The latter perspective is overwhelmingly studied. In a research, 16 themes of e-government posted on Facebook were distinguished and the majority of them were connected with "cultural activities and sports" and "marketing/city promotion/tourism" (Bonsón et al., 2015). In China, e-government on social media also covers as many as 54 themes by the middle of 2016 (Z. Tang et al., 2017).

Although themes are often descriptively presented (Leston-Bandeira & Bender, 2013), its interaction with participation is understudied (Bonsón et al., 2014; Ramanadhan et al., 2013). A significant impact of themes on political participation could be found (Bonsón et al., 2015): such matters as "public transport", "housing" and "public works and town planning" can involve the most attention of individuals. Those themes which directly affect citizens' lives seem

to be more appreciated. Some other work concentrated on a focus theme and explored around such theme as disaster management (Dransch et al., 2014).

Next, some studies about e-government themes are to be presented. According to order of political participation forms aforementioned, the review of political participation themes is arranged in the same sequence.

For information use, environmental protection, education and health turned to be the most often discussed themes on e-government, while social welfare and employment were the less debated ones (Economic, 2017). In China, information from e-government on Weibo can be categorized into politics, propaganda, society report and public service information (Hou & Chen, 2013). From the perspective of themes, 15 sub-categories can be identified. By analyzing Beijing municipality on social media Weibo, announcement and information disclosure build the main body of posts and take up to 24.9% and 24.5% respectively of all the information (Jia & Zhao, 2017). Besides that, deep concerns from certain time periods are also regarded as themes.

A discrepancy between which themes e-government posts most and which themes individuals read most was found in Shanghai e-government on WeChat (Lv et al., 2017): besides the core theme "Shanghai", such key words as "activities", "culture", "service", "youth", "work", "remind", "security" are presented most by e-government, while individuals prefer reading more about "kids", "high-speed rail", "fraud" and "free of charge". In Singapore, the most searched information falls into the following six areas: housing, education, business, health, transportation, and employment (H. Li et al., 2005). In Taiwan, most wanted information is identified by researchers in twelve categories (C.-P. Lee & Hong, 2017). Besides, an earlier study demonstrated that such items as the traffic and sightseeing, the health care and the education and culture functions enjoyed the highest use frequencies in Taiwan, while such items as the business

and finance, the public administration, the public safety need more improvement for the users (M.-B. Yang & Jan, 2005).

Shifting to the perspective of consultation, one of most frequently observed matters use can be found in individuals' complaining. In South Korea, personal issues and critical attitudes toward government are overwhelmingly posted in e-government on social media (Chung et al., 2014). In Suzhou China, self-initiating was discovered based on data from a complaint website forum (G. Yang, 2017): preambles from public management and infrastructure were reported mostly and occupied 27.95% and 21.64% of all the complaints respectively; personal livelihood issues which was one of the focus point of Chinese e-government development strategy accounted for only 13.27% of all the complaints.

No research about theme preference of decision-making on e-government was found. From the perspective of both grassroots and establishment, the lack of practice (Milakovich, 2012; Tapscott et al., 2008) and study in this field accordingly should be responsible for that.

Compared with the lack of theme research in decision-making, more work is dedicated to transaction service on e-government. In the survey of the UN in 2016 (Economic, 2017), twelve themes are distinguished, among which the setup of personal account was regarded as the most commonly used service, followed by pay for utilities. In China, livelihood service improvement gains its importance in transaction service and is bridged to other newly emerging trends like Smart City. For e-government mobile app development, themes which are closely related to everyday life of individuals have been underscored (H. Zhang, 2017). It is reported that common needs from the livelihood arena have been expected from Chinese e-government (Ma, 2018). According to the China Internet Network Information Center (CNNIC, 2018), transaction service covering thirty themes, within which 9930 items are provided, can be conducted on e-government on WeChat; e-government mobile apps dealing with traffic matter use are the most

downloaded; besides, anti-corruption app is also welcome and occupies the third place of the ranking list.

In Singapore, to improve basic human needs is also underlined as one of the main themes of e-government transaction service. Taxation, which is regarded as one of the sixteen critical e-government issues (Deakins et al., 2007), is among one of the heavily used services in Singapore (H. Li et al., 2005). E-taxation is also well implemented in Taiwan. In 2013, online personal income tax returns filing counted for 80% of the total number of filings; business tax application topped with 99.6% (Council, 2014).

Lastly, one more thing is to be mentioned: the dimension of subject matters as well as themes is considerably similar to the issue engagement in participation factors. They both are centered on issues. However, themes should not be considered as a doppelganger of issue engagement, because issue engagement stresses the perception on certain issues by individuals, while themes shift its emphasis onto the theme field: no matter it is needed or unwanted, citizens would and should use it. Although issue engagement would not be drawn into the present work, it is still necessary to clarify their differences to avoid misunderstandings and confusion with themes.

2.3.5 Volume of political activity

In the CVM, forms of political participation were considered together with their volume. The significance of activity volume was elaborated in two-fold and can be applied to political participation in e-government, as well. Firstly, the volume of political activity is presumably positively related to the attention of decision-makers (Verba et al., 1995, p. 584). The stronger the volume of political participation is, the more significantly the influence of decision-making would be exerted. Actually, the previously analyzed critical approach of political participation is also interpreted from this point of view. Secondly, by answering

how much and how often individuals take part in political participation can predict their use in the future. Political participation is often measured by ex post (report) measure. From it, intended participation (ex ante) would be predicted (Deakins et al., 2007). In some research, both intended participation and reported participation were conducted (Castillo et al., 2014; M. Persson, 2015).

Besides the two rationales elaborated above, another specific status quo in e-government endorses the approach of measuring non-participation. The non-participation can result from either intentional non-participation or a lack of certain supportive infrastructure and mechanism. Especially for the latter one, it would be quite obvious in comparison among the three cities. In China, for example, the volume of e-government use is found to be positively related with trust in politics (C. Hu, 2017). For the three cities, some forms of political participation only exist in politically more liberal city. E-voting for decision making, for example, has been launched in Taipei but is not existent in Shanghai and Singapore. To measure (un-)willingness and fill up the blank of deficiency in forms of participation, it is necessary to measure volume in ex post and ex ante participation. Therefore, both measurement approaches are taken in the present study.

2.4 Technology adoption

Digital aspect of political participation is seldom mentioned in the CVM. Communication technologies listed in their work are limited within mail, telephone calls, faxes, e-mail messages. The only function of information and communication technology (ICT) is to contact for requests. As the ICT is developing unprecedentedly in recent years, its importance to political participation is reiterated by bunches of work. Theories from perspectives of media adoption and media use are advancing. Such theories as technical diffusion,

uses and gratifications, the Technology Acceptance Model enjoy academic attention. Following suit, studies of e-government adoption and use take over the tradition. Like Jho (2015) once stated that technology plays a crucial variable in e-participation.

It is inconceivable to undertake research on political participation on e-government without considering specific digital features. In the present work, technological elements are to be integrated to the modified CVM. These internet-related variables can be found in the part of politically relevant characteristics; e-government features are introduced as recruiting element under digital setting; e-government platforms serve as one of the four cornerstones of the whole work.

Digital Settings

In the previous sections, three kinds of recruitment are illustrated. They are political recruitment from political organizations, public recruitment from non-political organizations and private recruitment (wherein familiar private recruitment from home and fellow-onliner recruitment can be discerned from each other). As digital tools can be employed in all three kinds of recruitment, it is necessary to consider digital settings for these three kinds of recruitment.

For political organizations, digital settings can assist them as a new vehicle to communicate with individuals. Residents can be get reached by political organizations (not necessarily e-government) via digital tools. For non-political organizations, family and friends, the use of Internet can also change and shape the recruitment in a new way. Some researchers find that community collective efficacy is positively related with online civic activities in the U.S. (B. J. Kim, 2015). Besides, shielded by the Internet and the participants mass, social pressure to take part in online political activity is reduced (Anduiza et al., 2010).

From the perspective of digital tools, all these kinds of recruitment can take advantage of them. At the beginning stage of the digital revolution, political E-

mails emerged as a new tool for recruitment (Verba et al., 1995, p. 73). Later on, more channels are at disposal, such as website and social media sites. Some work has been undertaken to explain the mechanism of social networks in e-participation. However, little was done to clarify the role of digital social networks in the participation, as Vicente, etc. (2014) indicate.

To conclude, the Internet creates a new public sphere to recruit individuals into politics. ICT can not only facilitate formation of social networks (Bonsón et al., 2012), but also foster citizen engagement (Ferro et al., 2013; Kent Jennings & Zeitner, 2003). Thus, digital settings are added to political participatory factors of the CVM as a complementary dimension for the above-mentioned three kinds of recruitment. As the role of digital settings for the recruitment is clarified above, the e-government recruitment in digital settings is to be introduced in the following section.

E-government in digital settings

Technology plays a crucial role in e-participation, according to an empirical research (Jho & Song, 2015). Adequate technical infrastructures were regarded as one of the four critical contributors for e-government success in Singapore (Sriramesh & Rivera-Sánchez, 2006). Besides, the Internet seems to revive the hope to increase democracy in both existing democracies and democracies to-be (Dearstyne, 2001). Technology can catalyze a peaceful transition from thin democracies in which very limited avenues of action for citizen expression exist to strong democracies in which engaged citizenry is strongly emphasized (Vragov & Kumar, 2013). Still, the view of technological determinism is always confronted with some critiques, like the lack of a tradition of intercommunication and public discussion which deflects the use of online government sites (Netchaeva, 2002).

From the perspective of individuals, **satisfaction** can serve as a suitable political participatory factor to analyze if one feels recruited by e-government. Especially at the local level, satisfaction has been widely measured for citizen-recognized success in public administration (Piehler et al., 2016). Such satisfaction studies have also been conducted in e-government research. In China mainland, 48.5% of respondents reported that they were satisfied with e-government service; 29.5% reported it as normal; only 8.2% of the respondents were not satisfied with e-government service (CNNIC, 2017). In Singapore, 72.5% of the respondents expressed satisfaction with services; 76.3% of digital government payment users were satisfied or very satisfied (SNDGO & GovTech, 2017). In Taiwan, 75.1% of respondents were satisfied with information on e-government; 73.6% of respondents were satisfied with e-government service (Chu et al., 2016).

There are several satisfaction models at disposal to analyze the recruitment of e-government in digital settings. The European Customer Satisfaction Index (ECSI) is an updated model following the American Customer Satisfaction Index and the Sweden Customer Satisfaction Barometer (M. D. Johnson et al., 2001). Such studies on the e-government quality and satisfaction were conducted in Taipei through the lens of SERVQUAl pattern and so on (S.-H. Liu et al., 2010). In another research the Kano's model was employed, wherein the service quality was examined through one-dimensional qualities (such as accessibility), must-be qualities (such as privacy protection and information security) and attractive qualities (such as online applications and inquiries into application progress) (S.-W. Liang et al., 2014).

Dimensions to evaluate satisfaction are usually abstracted out of these above-mentioned models and form a certain kind of new general bundle (Kiesler et al., 2000; Kling, 2007; Nam, 2014; A. J. Van Deursen & van Dijk, 2009). It is believed that the more individuals are satisfied with e-government digital settings,

the more they feel recruited into e-government use. Following the approach of ECSI, some aspects of e-government digital recruitment are presented as follows.

Image is regarded as one of drivers of individuals' satisfaction. Two factors are analyzed here as image for e-government. The first factor is overall performance. Overall performance is positively associated with satisfaction, even though users visit less frequently e-government (Ma & Zheng, 2016). On the other hand, trust in e-government builds up the other image factor which is already reviewed in psychological political engagement factors. Trust is found to be positively related with e-government service quality. Still, trust in e-government is related to other aspects of e-government qualify: accessibility, information quality and e-service quality of e-government are found to influence trust in government and trust in the local administration (Paulo, 2016). Besides, as long as individuals perceive e-government service as being rapidly delivered and transparent, political trust in government could increase (Moon, 2003; Tolbert & Mossberger, 2006). As the two factors of perceived image were either never mentioned before or can be broken down and integrated into e-government satisfaction index, the image approach is not adopted in the present research.

Expectation as another driver of satisfaction is also regarded as a driver in the Unified Theory of Technology Acceptance and Use of Technology (UTAUT) (Mathieson, 1991; Venkatesh & Davis, 2000). In e-government research, e-government performance expectation is rarely studied. In China, the relation between expectation and satisfaction of e-government is proved to be weak (Z. Li & Xv, 2017). However, for the present work considering use expectation is meaningful in cases where some e-government use platforms or functions unavailable in certain cities. Still, individuals' willingness to use it waits to be discovered.

After explaining two relevant aspects of e-government satisfaction perception, the core elements of the digital settings of perceived e-government recruitment are to

be reviewed. Firstly, **perceived value** is stressed by the ECSI. In e-government implementation, cooperation from citizens should be treasured and their conviction in e-government should be promoted. In accordance with Selznick (2011), citizens' conviction in e-government use is regarded as crucial for e-government adaption. A framework from Canada integrated the dimension valuable in effectiveness in citizens' e-government use (Wesley, 2012). Moreover, perceived value in the Internet and in the local administration is found to be determinant to perceived e-government usefulness (Piehler et al., 2016).

In the ECSI, **perceived quality** is confirmed as a driver of customers' satisfaction. Among all the drivers of satisfaction about e-government, perceived quality is regarded as the most significant one (Z. Li & Xv, 2017). In Singapore, more than 92.0% of the respondents expressed satisfaction with the overall quality of digital government services (SNDGO & GovTech, 2017). In the UTAUT as well as in the Technology Acceptance Model (Davis, 1989), perceived usefulness and perceived ease of use play pivotal roles in measuring perceived quality.

Therefore, the second core element to introduce is the perception of usefulness. **Perceived usefulness** can be understood as "the degree to which a person believes that using a particular system enhances individual performance (Davis, 1989)". In some cases, usefulness is conceptualized as effectiveness of e-government services (Chu et al., 2016). Perceived usefulness is regarded as a determinant of system usage intention (Bhattacherjee, 2001). In e-government studies, it has been tested and proved to have significant impact on e-government adoption and use both internationally and inter-culturally (I.-C. Chang et al., 2005; Floropoulos et al., 2010; Z. Huang & Benyoucef, 2014; Hung et al., 2013; Hung et al., 2006; Madsen & Kræmmergaard, 2015; Ozkan & Kanat, 2011; Shyu & Huang, 2011; Y.-S. Wang, 2003). In Taiwan, the perceived e-government participation functions were studied and demonstrated prediction effect on e-government website use (J. Lo, 2008).

Besides, objective usefulness like current or time sensitive information provision is examined by the Digital Governance in Municipalities Worldwide (2015-16) (Holzer & Manoharan, 2016), in which Shanghai ranked at 48, Singapore at 31 and Taipei at 47. Under perceived usefulness efficiency of e-government use has also been well researched (P.-H. Hsieh et al., 2013) which is understood as "whether certain functions could be performed with minimum resource consumption (Deakins et al., 2007)".

Usually, two kinds of resources are considered for efficiency analysis. The first one is economy efficiency. By conduct the same service in e-government instead of at analog offices, money can be saved in transportation (Venkatesh et al., 2012) and fees reduction (Lean et al., 2009). In China, 69% of respondents suggested that e-government service could help to save money (Ma, 2018). Time-saving is often mentioned as a reason why individuals take ICT measures to take part in political activities (Basu, 2004; Gichoya, 2005; Holmes, 2001; Susanto & Goodwin, 2010). In e-government research, to use e-government to speed up service applications is also found to be significantly relevant to e-government use (Hetling et al., 2014). In China mainland, 82% of respondents agreed that time and extra effort could be saved and 78% of respondents acknowledged that unnecessary errands were avoided through e-government service (Ma, 2018). In Singapore, mobile applications are regarded as a good way to promote efficiency (Chu et al., 2016). In Taiwan, 54% of telephone respondents agreed or definitely agreed that errands can be saved by using e-government (Chu et al., 2016).

The third core element of analyzing e-government digital settings is the **perceived ease of use**. Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free from effort (Davis, 1989)". In Chinese mainland, perceived ease of use, as well as perceived usefulness, is confirmed to have positive impact on e-government use (Yan Li & Zhu, 2017). In Taiwan, getting used to e-government contributes to one of the biggest e-

government use concerns (41.8%) (Wong, 2007); 9.4% of respondents found e-government "too troublesome to operate" (Hung et al., 2013). In recent years, perceived ease of use is improving: 75.6% of respondents agreed that official procedurals became "very easy" or "easy"; 58.9% of respondents admitted that regulation and law search became "very easy" or "easy"; 50.4% of respondents acknowledged that public policy search was "very easy" or "easy" (Chu et al., 2016). Moreover, perceived ease of use is a critical factor in mobile e-government use in Taiwan (Hung et al., 2013). In another study about the effect of perceived usefulness and perceived ease of use on e-government website usage intention, significant positive effects have been found (H.-J. Wang & Lo, 2010). Usability, the key aspect of ease of use (Ozturk et al., 2016), is examined in worldwide municipal comparison (Holzer & Manoharan, 2016), in which Shanghai ranked at 24, Singapore at 26, and Taipei at 32. Such objective usability as traditional Web pages, forms, and search tools are the main subcategories to study.

Under ease of use, **accessibility** is usually studied. Ease of use could be regarded as the first and foremost concern of e-government use (Deakins et al., 2007). Various aspects of accessibility have been examined: unconstrained accessibility featuring opening times of 24/7 (Gilbert et al., 2004); multichannel accessibility which is incarnated by online channels and various devices (Vassilakis et al., 2007); barrier-free accessibility for the visually impaired, the hearing impaired and the elderly (J. Li & Zhang, 2017).

Interactivity, as an important component of ease of use, is also frequently studied. Since individualized services and web 2.0 technology (Hung et al., 2013) are deployed in e-government, interactivity has been studied more frequently (Jiang et al., 2010; McMillan & Hwang, 2002; Sicilia et al., 2005). A study highlights the preferred interactivity with the face-to-face interactions on the basis of phone or desk channels, especially when the communication is cognitive challenging, while the bare electronic platforms may be in short of a sense of social presence

(Simon, 2012). In Taiwan, interaction is found to be critical in e-government social media use (Wong, 2007) and in mobile e-government use (Hung et al., 2013).

To conclude, e-government recruitment in digital settings is mainly scrutinized by the approaches of the European Customer Satisfaction Index and the Unified Theory of Technology Acceptance. Other influential but less relevant approaches include diffusion of innovations and motivational models are therefore not presented here (Davis et al., 1992; Rogers, 2003). Altogether five variables are considered in the final digital settings of e-government recruitment. They are: value, ease of use, usefulness and interactivity, together with perceived e-government promotion.

2.5 Research model and research questions

At the end of the second chapter, research model is to be presented as a result as well as a conclusion of the above-mentioned analysis. Based on the CVM, which was used to explain analogue political participation and stresses the significance of civil society, the research model of citizens' political participation on e-government consists mainly of the original two dimensions of the CVM (political participatory factors, and politically relevant characteristics) within which some variables are modified to suit digital settings and different political settings of the three municipalities. Instead of analogue political participation, e-government political participation and e-government platforms use serve as the dependents variables.

As introduced above, the main concerns of the present work deal with e-government use differences among the three cities; if any, what makes these differences. Therefore, e-government use differences among the three cities are to be explored in the first phase. Here, e-government use is understood in three-

fold: e-government platforms use, the e-government functions use and the e-government themes use. Secondly, the interaction between e-government platforms use and the e-government functions use is to be explored. The third and the last part of e-government use exploration deals with e-government use and use intention. Three research questions can be raised from these three points of research interest. Research questions can be well reflected in the research model. In the bubble of e-government use, the first three research questions are to be answered. Firstly, e-government comparison among the three cities is to be conducted for the platforms use and the functions use. Secondly, the relation between the e-government platforms use and the functions use are to be explored. Thirdly, the research question three about the relation between e-government use and use intention is to be answered.

Next, research interest is shifted to the influencing effect on e-government use. To explore the influencing effect, an explorative model should be identified and constructed. In the present research, the research model is mainly derived from the Civic Volunteering Model and partly from the Technology Acceptance Model. According to the CVM, the influencing effect can be traced back to two categories. The first category is characterized as the predictors (political participatory factors), which include such variable bundles as resource-oriented bundle, political-psychological-oriented bundle and recruitment bundle. The influencing effect of these bundles on e-government use are to be explored. Research question four is raised against the theoretical background. The second category of influencing effect variable bundles, which is also initially derived from the Civic Volunteering Model, is named as politically relevant characteristics. Two bundles are to be identified in this category: the demographic characteristics bundle and the social economical bundle. The research question five is formulated in this logic.

To illustrate these in the research model, the relation between the bubble the e-government use and the bubble the political participatory factors is to be explored:

all the three layers within the political participatory factors are expected to have an influence on e-government use. Thus, the research question four is to be answered. At last, the e-government participation is to be explored in the light of the political relevant characteristics. The fifth research question is to be answered by two means: the internet-oriented characteristics and the demography-socioeconomic-oriented characteristics are separately treated.

Figure 5. Residents' Political Participation on E-government
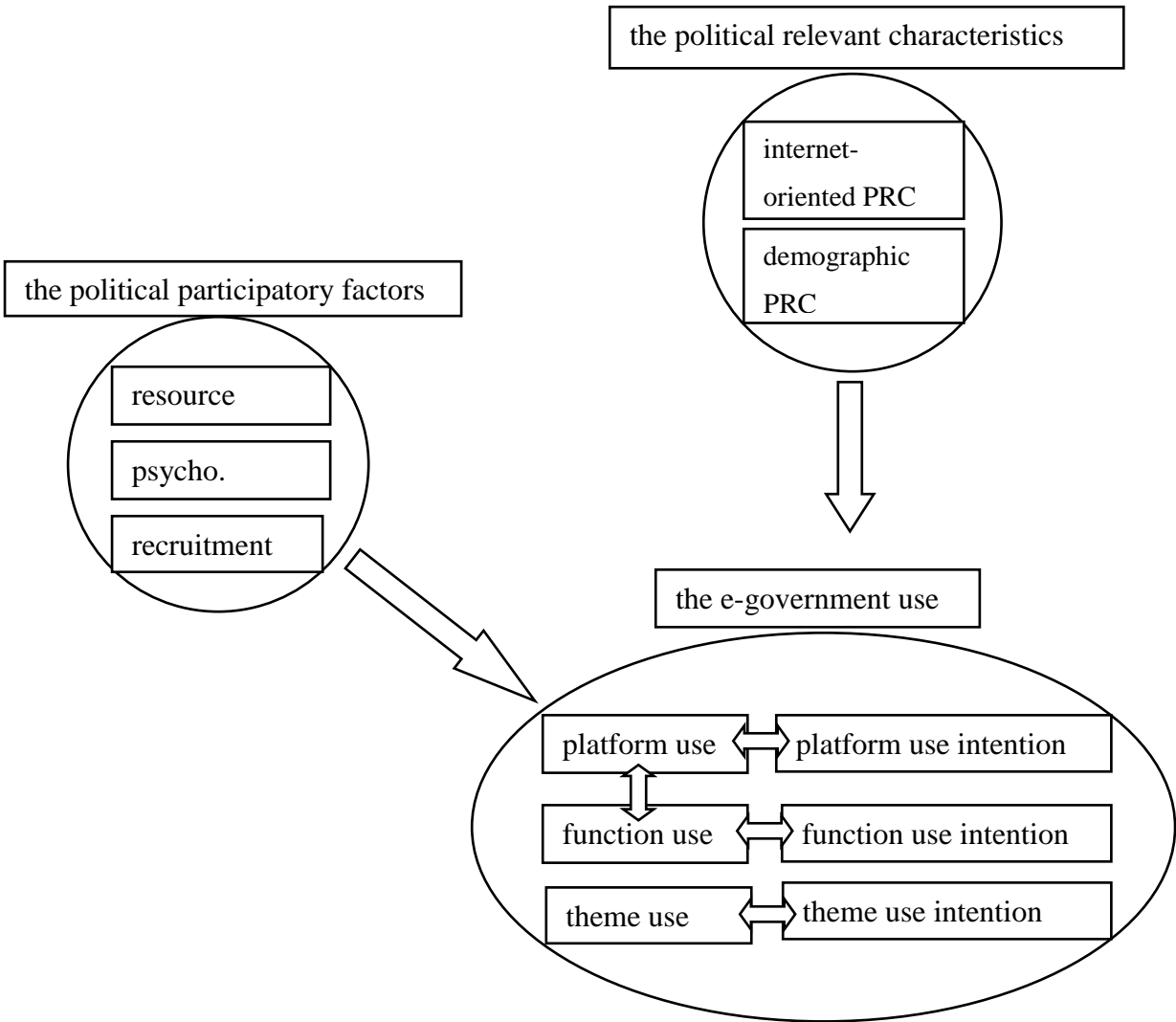
To put it in a more detailed way, the above-mentioned research concerns can be generally manifested and brief introduced in the following five questions.

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Q1: what's the difference of e-government use among Shanghai, Singapore and Taipei?

In Shanghai, Singapore and Taipei, comparisons and rankings of e-government development is emphasized in most studies. However, comparison study on the base of users' survey is seldom conducted. The present research aims to gain an overview in this field. Comparisons between e-government use are to be undertaken in three categories: e-government platforms use, e-government functions use (within which e-government political participation is highlighted) and e-government themes use. Besides, rankings for these three categories are to be produced on the basis of residents' report in the three cities.

Q2: what's the relation between the e-government platforms use and the e-government functions use (political participation)?

With the further implementation and improvement by (e-)government and the help of renewed information and communication technology, new possibilities are opened up for e-government use. The e-government platforms increase in number and the e-government political participation reaches to a broader functions use. Against this background, it is observable that a certain platform is preferably used to favor certain functions. Thus, a further question can be asked on the relation between the platforms use and the functions use. Based on a survey of e-government use, answers are to be found about which kind of platforms are preferred for which kind of political participation. What's more, the relation differences can also be compared among the three cities.

Q3: what's the relation between the e-government use and the use intention?

Moving from the descriptive exploration of e-government use difference and further interaction-oriented exploration between e-government platform use and e-government functions use, the relation between e-government use and use

intention is underscored in the research question three. Questions such as whether a more frequent e-government usage leads to a more intensive use intention (vice versa) remain to be answered. However, it should be pointed out that the research question three is examined exploratively, as less studies have been undertaken before and the related theoretical basis is not that solid for further model building.

Q4: how do the political participatory factors predict e-government use?

As introduced before, the political participatory factors, which are derived from the Civic Volunteering Model, involve three dimensions: the resource dimension, the political psychological engagement dimension and the recruitment dimension. The exploration of their effect on e-government use underscores another key point of the present research. Some highlights are introduced here briefly.

Firstly, many kinds of resources are to be explored in the resource dimension, among which the digital skills are especially introduced into the research model, given the e-government use needs certain degree of digital skills (Murdock & Golding, 1989). Actually, the concept digital divide can also examined under this variable. While some studies stress the information technology accessibility which is closely linked with conventional inequalities in political participation, the digital skills are seldom studied in the light of e-government use. The effect of digital skills on e-government use is to be examined in the present explorative study as well as by three cities comparison.

Secondly, the effect of political psychological predispositions on e-government use is to be studied. As mentioned above in the justification for choosing the three municipalities, the differences of political settings are huge; accordingly, the political predispositions in these three cities are also expected to be different. When the variable like the Chinese culture background is controlled, the influence of political predispositions could reveal more details. That is where one of key interests of the present work lies in: a comparison of e-government use between

authoritarian and democratic political settings from the perspective of residents' perception. What's more, the influence of political settings would be intensively researched in political institutional recruitment.

Thirdly, the effect of recruitment on e-government use is to be scrutinized. Besides political institutional recruitment and private recruitment, the public recruitment and the fellow onliner recruitment can best illustrate how civil society exerts its influence on e-government use. The role of civil society is therefore highlighted in this section. A sound civil society, which serves as backbone of the democracy, serves as an essential piece of a well-functioning democracy. That also holds true in the e-government arena, as well as in the time of digitalization. Even for authoritarian regimes in which liberalization and democracy are always expected to take roots on one hand, control and even fear of the regimes are simultaneously growing on the other hand (Perinova, 2005), civil society is always a highlight in real politics and in academic research. In the present work, the influence of civil society as well as of political institutional influence would be studied by recruitment.

Fourthly, the effect of the e-government features on e-government use is to be explored. A mainstream perspective dealing with e-government adoption and continuous use often derives from the Technology Acceptance Model (TAM) (Davis, 1989) and its updated revisions. It's often considered that the ICT (information and communication technologies) serve not only as a vehicle for e-government, its technological features could also shape e-government use, even though a further step like technology determinism is not made this far. Reported citizen perception towards e-government features would be included in the present study. Such political participatory factors as e-government digital setting are expected to unveil the perceived digital competence of e-government.

Q5: How do the politically relevant characteristics influence e-government use?

The politically relevant characteristics consist of two aspects: the internet-oriented characteristics and the demographics-oriented characteristics. Against the background of intensive and prevalent use of internet in everyday life, the internet-oriented characteristics are highlighted in the present work. What's more, as mobile communication, which is featured with portability and long-lasting batteries, spurs the integration of the Internet into everyday life, e-government use can also be domesticated by screen touching in everyday life. Besides, the relation between internet use (including social media sites use) and e-government platforms use is carefully taken into consideration from the light shed by the online and networked reality. To sum up, the online practice of modern life via Internet surrounding nowadays is generally studied in the present work.

The second aspect deals with demographics-oriented characteristics, which are understood here broadly: socio-economic demographic characteristics are also included in this aspect. Inequalities, under- and over-representation attract research interest constantly. Conventionally, underprivileged such as the less well-off, the elderly, the mobility-impaired are studied. Like consideration by the Civic Volunteering Model (Verba et al., 1995) stated: "participatory inequalities have implications for politics", fair participation also serves as one of the core philosophies of e-government development (Council, 2014). Thus, the demographics-oriented characteristics can help to unveil the effect of demographic inequality on e-government use at individual-level, as well as in comparison among the three cities.

3. METHODOLOGY

As analyzed in the former chapter, dimensions of the present model are renewed and completed on the base of the CVM. In this chapter, the measurement of e-government use, the interaction within e-government use, the explanative variables and their corresponding variable bundles is to be operationalized. Besides, online survey and data preprocessing are to be presented.

3.1 Quantitative approach

When survey is determined as the form to collect data for the present work, techniques of these **survey approaches** should be criticized in the context of the concrete usage. Four of them are specially emphasized here, due to implicit and explicit survey limits and risks.

Firstly, the question of by which vehicle to conduct the survey concerns the outcome. To do a survey, there are following basic vehicles to adopt: face-to-face, mail, telephone, e-mail, online questionnaire (Cegarra et al., 2014; Kunstelj et al., 2009; Porumbescu, 2016a). Due to the advantage of time efficiency and economic reasons, online questionnaire is usually used. However, an incorporation of more than one method is believed to make the measure more representative. The "triangulation method (Susanto & Goodwin, 2013)", which combines regular mail survey, telephone and email, can be found in some research. In previous e-government studies in these three regions, an incorporated method can also be discovered. In Taiwan, for instance, the e-government survey approaches of using telephone, mobile phone or online demonstrate differences in representing the current demography from such aspects as gender, age, education level, occupation. In a recent study about e-government (T.-Y. Huang, 2018), survey via mobile phone call is proved better than telephone to reflect the demography in Taiwan; online survey enjoys a larger access to female, the age group under 40, better

educated, students and internet user. It is noteworthy that result outcome can be biased by different approaches. For relevant research in Singapore, bias caused by online survey attracts attention, too. A report (Baller et al., 2016) points out that online survey alone takes the risk of spelling out 18 percent of the whole population who are offline population.

Secondly, survey always asks for a retrospective view from the respondents. The retrospective way doesn't necessarily mean accurate thoughts and behavior of the recent past. Therefore, responses can be plausible as well as with a nature of after-the-fact reconstructions. The problem bothers almost all the researchers who conduct surveys. When the CVM was under construction, Verba et cetera. (1995, p. 106 - p. 107) also paid great attention to it. Still, it is argued that useful information can be yielded, when recent past and reasons for important matters are asked. For the present survey, this problem is also inevitable.

Thirdly, social desirability bias can result in the gap between reported participation and validated participation. When the context is settled in the political participation area, special attention should be paid to the difference and relationship between intention to vote, reported vote, and validated vote (Quintelier & Blais, 2015). One outstanding problem of self-reported political participation is the overestimation of political behavior. Some scholars attribute it mostly to social desirability bias which emphasizes the evoked embarrassment when someone didn't fulfill their citizen norms (M. Persson & Solevid, 2014). As the e-government political participation can be counted also as a kind of participation, social desirability bias are theoretically unpreventable: an overappraisal could be expected for such citizen norms requiring participation as public hearing and petitioning.

Fourthly, cross-section method is employed in the present work instead of a panel one. Although the panel survey is seldom to read in e-government research, some work conducted as panel studies can still be found: panel studies of citizen e-

government use (Y.-T. Choi & Park, 2013), e-government implementation (Nielsen & Pedersen, 2014), for instance. One disadvantage of not taking the panel approach is that changes in e-government political participation can hardly be measured. Although it is not the main purpose of the present work, it still a pity, given the rapid change and development of e-government in these three municipalities. For the starting point of comparison, a cross-section approach is somewhat applicable to find the differences and similarities among these three cities.

In the model of citizens' political participation on e-government, the question of **causal direction** is unavoidably raised. For one thing, the factors to explain political participation should be causally prior to the participation, as Verba and etc. (1995, p. 274) already pointed out: it is widely observed and tested that the prior political participation can in turn exert its influence on explanative factors (Verba et al., 1995, p. 276); in this occasions, causal arrow may turn the other way around (Verba et al., 1995, p. 336); as an end effect, a reciprocal effect could emerge in the model (Verba et al., 1995, p. 371). To tackle the problem, a cross-sectional data collecting approach is adopted by the present work, which can dilute the original causal directions that are supposed to be found out by the model. To solve the problem of ambiguous arrow directions, two measures can be employed. The first measure is based on the prior theoretical work and empirical testing in relevant fields (Verba et al., 1995, p. 300). As for the model of citizens' political participation, some studies have been done in the previous chapter. The second measure relies on statistical methods. Usually, "ordinary least squares" (OLS) regression analysis is conducted to figure out the relationship between independent and dependent variable (Verba et al., 1995, p. 300). Besides, "two-stage least-squares" (2SLS) can be employed when simultaneous causation is of suspicion (Verba et al., 1995, p. 301).

At last, **test methods** are introduced. For the first research question, differences among cities in e-government use are hypothesized, therefore difference test methods should be employed. For the next two research questions, correlation test methods are to be undertaken: for the second research question, the relation between a certain e-government platform use and a certain kind of e-government political participation are hypothesized; for the third research question, the relation between e-government use and e-government use intention are hypothesized. Besides, stepwise multiple regression analysis is to be adopted to tackle the research question two.

For the fourth research questions, two different test strategies are to be employed to discover how political participative factors can predict e-government use. For categorical explanative variables, correlation test is to be adopted. For explanative variables in continuous data, the hierarchical multiple regression is to be employed, wherein the digital skills are laid on the first level, the psychological engagement on the second level, the general recruitment on the third level and the e-government recruitment on the fourth.

At last, the fifth research question about the impact of political relevant characteristics on e-government use is to be discovered in two different methods: correlation tests are to be conducted between the internet-oriented characteristics and the e-government use, while difference tests are to be undertaken between the demography-socioeconomic-oriented characteristics and the e-government use.

3.2 Variables, measurements and data preprocessing

In the second part of this chapter, variables and their measurements are to be explained; after that, survey processing and data preprocessing are to be introduced.

Measurements are originally formulated in English for Singaporean. Altogether three Chinese versions which are customized for simplified Chinese readers in Singapore and in Shanghai and for traditional Chinese readers in Taipei. The differentiation of versions is not only due to the difference of written language and of conventional wording used in the three jurisdictions, but also can be attributed to some customized measurements which would be explained in necessary case. What's more, to make sure these versions with equal validity, two measures were undertaken: firstly, wording and formulation of these measurements are borrowed directly from pre-existing questionnaires in target language as much as possible and their sources are also given in the following analysis; secondly, an expert and a native speaker were invited to exam the questionnaire in each region.

The survey was conducted online on the website platform unipark.de during April to August 2019 for the residents in Shanghai, Singapore and Taipei. The platform unipark.de was chosen mainly for the reason that such political surveys as the present one are most likely blocked by Chinese service provider; besides, the unipark.de could provide free access for the three political entities. Respondents are reached out via social media and city platforms, upon which invitations were sent out either with a private message or a public post. To increase the response rate, all the qualified participants were rewarded with a coupon worthy of equivalent 1.5 euro (in Shanghai and Taipei) or 4 euro (in Singapore).

The participants filtering was followed as soon as the survey was accomplished. The filtering is conducted according to three criteria: the answering time should at least be above 10 minutes which are the basic time length from the interviewer's experience; the respondents should live at certain cities at least more than 12 months which are the standard time length for the concept residents in certain cities; the respondents should be above 18 years old. Original samples were collect in the amount of 721 for Shanghai, 367 for Singapore and 590 for Taipei.

After the first filtering of 10-minutes-long answering time the number reduces to 464 for Shanghai, 309 for Singapore and 466 for Taipei. After the resident's length were taken into examination, the sample number was trimmed to 441 for Shanghai, 308 for Singapore and 438 for Taipei. After the minimum age is examined, the final samples turn out to be 428 for Shanghai, 306 for Singapore and 438 for Taipei. The average age of the sample was 30.94 (SD = 6.92) in Shanghai, 34.45 (SD = 9.90) in Singapore and 36.67 (SD = 9.65) in Taipei. Male accounted for 51.4% of the sample in Shanghai, 52.0% in Singapore and 40.6% in Taipei.

At the very beginning of the questionnaire (please refer to the appendix for the original version of questionnaire), two screening questions are asked. The first one deals with the duration of an interviewee living in the certain city. In accordance with the definition of residents from the system of national accounts of the United Nations, residents are considered as people who have "actual or intended location for one year or more (Nations et al., 2009)" in certain cities. Admittedly, "the choice of one year as a specific period is somewhat arbitrary (Nations et al., 2009)". To avoid uncertainty and to facilitate international consistency, the measurement of one year is taken for the present research. Still, there are some alternatives in the questionnaire to differentiate the duration from under one year to above four years. In the CVM model, similar question was also asked like "How long have you lived in your present city or town? (Verba et al., 1995, p. 568)"

The second screening question aims to identify eligible voters in certain cities. Compared with residents, a citizen has the right to vote. In the CVM model, "are you an American citizen? (Verba et al., 1995, p. 569)" was asked. Combined with the question of age, eligible voters can be selected out. Here, the right to vote is not directly asked because of the complex voting limits in these cities. For interviewees in Shanghai and Taipei, an extra question about whether their

household is registered in respective cities is asked. Different to a city-state like Singapore, citizens whose household registered in other regions but live in Shanghai or Taipei are allowed to vote in their living regions neither for presidency on the national level nor for the major election or so in their living city. The mechanism definitely excludes such citizens from e-voting. Similar question could be referred to some work like Huang (2018) conducted by asking "in which city and which county is your household registered?" To sum up, through the three screening questions, inhabitants who lived in certain cities less than one year were screened out. Moreover, the duration of residence and the qualification to vote are identified.

As result, in Shanghai the smallest difference between official statistic and statistic from the present survey in terms of the registered citizens and the non-Shanghai citizens are found. In the present survey 64.5% respondents reported themselves as registered Shanghai citizens, while official statistics demonstrates that 60.17% of the inhabitants in Shanghai are Shanghai citizens. In Singapore the proportion of reported citizens (90.5%) are higher than the official statistics (61.38%), while in Taipei the proportion of reported citizens (75.1%) are much lower than the officially announced registered citizens (98.5%). The disproportion from Singapore would lead to the problem that the voice of the non-citizen inhabitants in Singapore is not proportionally heard in the present survey, while the under-representation of the citizens in the survey for Taipei would cause overemphasis of the non-citizen inhabitants in Taipei.

3.2.1 E-government use

In the first section of the questionnaire, use of e-government platforms are inquired. For each kind of e-government usage (T.-Y. Huang & Lee, 2010; Tolbert & Mossberger, 2006), a question about intention to use (J.-S. J. Hu, 2003; V.-H. Lo et al., 2005) is also asked. To simplify the illustration here, only the

questions from the use dimension are presented, while the questions about intention are omitted. Besides, the time period of e-government use is limited within last twelve months which follows the time frame of the CVM research, while such time period of e-government use as last six months can also be observed in some studies (Parent et al., 2005). What's more, non-participation is also included as the first choice option.

Firstly, the **e-government platform use** is scrutinized. Altogether seven kinds of e-government platforms (Economic, 2014) are examined: phone call, e-mail, web portal, mobile application, social media, other e-platforms and other analogue third-party platforms. In the following table, the result of the reliability and the validity tests for e-government platforms use and use intention is demonstrated.

Table 13. Reliability and Validity Tests for E-government Platforms Use and Use Intention

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
platforms use	0.829	0.797	0.796	0.823**	0.816**	0.809**
platforms use intention	0.942	0.939	0.930	0.922**	0.910**	0.913**

** is significant at the 0.05 level

E-government functions use (E-government political participation) is categorized into four categories as being introduced in the last chapter. Firstly, **e-information use** is explored by six question. The first two questions about information browsing and searching for open data are grouped into passive use, while the other four questions about requesting confidential information, information sharing, commenting on information, discussing information are formed together as the less passive use. Secondly, **e-consultation use** is also to be investigated by six questions. The first three about like-dislike, polling and hearing are more initiated by (e-)government, while the last three about protest, petition and crowd founding are conducted more by citizen initiation. Thirdly, **e-decision-making** is featured with two questions: the first one is related to e-voting and e-referendum, while the second one asks about collaborative production use

on e-government. At last, **transactional service** is investigated by two questions: the first one is about procedure service with e-government, while the second one deals with payment services. Because such e-government functions usage as well as activities haven't been systematically examined by any research before, their reliability and validity should be tested. In the table below, the reliability and the validity tests for e-government functions use and use intention is presented.

Table 14. Reliability and Validity Tests for E-government Functions Use and Use Intention

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
information use	0.861	0.784	0.851	0.828**	0.707**	0.789**
information use intention	0.927	0.947	0.925	0.902**	0.863**	0.874**
consultation use	0.870	0.805	0.826	0.827**	0.817**	0.818**
consultation use intention	0.945	0.951	0.929	0.897**	0.904**	0.868**
decision use	0.837	0.825	0.760	-	-	-
decision use intention	0.905	0.937	0.853	-	-	-
transaction use	0.701	0.619	0.781	-	-	-
transaction use intention	0.921	0.944	0.889	-	-	-

** is significant at the 0.05 level

E-government themes use is to be studied as follows. Based on a comprehensive but not exhaustive list of themes on e-government use (CNNIC, 2018; Ding et al., 2014; Economic, 2014; C.-P. Lee & Hong, 2017), 15 items of themes are to be asked whether they are once used. What's more, the intention to take advantage of such themes is also to be inquired. In the table below, the reliability and the validity tests for e-government themes use and use intention is presented.

Table 15. Reliability and Validity Tests for Themes Use and Use Intention

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
themes use	0.892	0.897	0.869	0.920**	0.928**	0.874**
themes use intention	0.983	0.990	0.984	0.977**	0.975**	0.974**

** is significant at the 0.05 level

3.2.2 Politically relevant characteristics

The following dimensions are included in the politically relevant characteristics: firstly, such demography-socioeconomic-oriented characteristics as gender, age, education, occupation and income; secondly, such Internet-based characteristics as access to Internet, intensity of Internet use, devices of Internet use, purpose of Internet use, online platforms use, political efficacy in the Internet, trust in the Internet, privacy and security concerns in the Internet. The Internet-based characteristics were surveyed at the second part of the questionnaire, while the demographic features of interviewees are arranged in the last part of the questionnaire, mainly because the demographic features require less effort and can therefore make way for more demanding tasks.

3.2.2.1 Demographic political relevant characteristics

Gender is often asked as a demographic index. Concerns about gender gap is detailed in the last chapter. Besides, as gender study prospers in western academia, some echo can be heard from the Greater Chinese world (P.-H. Lee, 2016). Especially in Taiwan LGBT issues push relevant social movements and political decisions forward (Fan, 2018). Although it is seldom to read alternative gender choice listed in academic studies from Chinese academia, it is necessary to list an "other" in the questionnaire due to the above-mentioned reasons.

Simple comparison between the gender ratio in the survey and official gender ratio is undertaken to find out if there are gender bias in the present survey. For Shanghai and Singapore, male are somewhat more in the survey than in official statistic. In the present survey 51.4% of the respondents are male in Shanghai, while official 49.56% of the population are male. In Singapore, the gap is larger. In the survey 52.0% are male, while 48.9% male proportion is reported by the official statistic. Taipei is the only city where the proportion of male in the survey (40.6%) is smaller than the official statistic (47.8%).

Age is also often asked as a demographic index. In the present survey the birth year is asked. However, it is still noteworthy that the eligible ages for voting differ from each other in the three cities. For Singapore, 21 years old is regarded as the voting age, while for Shanghai 18 years old and for Taipei 20. However, the case of Taiwan is less clear at one glance, because the referendum age is 18 instead of 20 years old.

The age span is examined. First the span from 18 to 34 are over-represented in the present survey for all the three cities. In Shanghai 20.20% of the Shanghai citizens are between 18 to 34 years, while in the survey 70.5% of the respondents are within this age span. In Singapore 18.1% of the inhabitants are between 18 to 34 years old, while in the survey 54.58% of the respondents reported their ages fell in this span. In Taipei the case is similar, although the over-representation is smaller in comparison to other two cities: official statistic demonstrates that 20.68% of the registered citizens are 20 to 34, while 39.95% of the respondents reported they were between this age span. The age groups between 35 to 59 years old (42.24% in official statistic, 29.2% in the present survey), between 60 and above (37.56% in the official statistic, almost none in the survey) are under-representative. The under-representation of the age group 35 to 59 years old is somewhat less drastic for Singapore (47.36% in official statistic, 41.83% in the survey) and for Taipei (45.52% in official statistic, 57.53% in the survey). The elder group 60 years old and above is overwhelmingly under-representative for both Singapore (26.78% in official statistic, 3.60% in the survey) and Taipei (28.35% in official statistic, 2.5% in the survey).

Although the **education** systems in the three jurisdictions are branded with their own characteristics, they are still comparable. In order to make the interviewees as comfortable as possible, customized measurements are used for the three cities. To illustrate it in a clear way, the form of education systems comparisons is presented on basis of Shanghai Statistics Bureau (2017), Soon etc. (2016) and

Huang (2018). Still, it is at risk of ignoring the illiterate, because the present survey is conducted by reading instead of by verbal (such as face-to-face or via telephone). However, the literacy rates in the three cities are so satisfying (Shanghai: 96.03% in 2009. Singapore: 97.2% in 2017. Taipei: 98.79% in 2017) that the risk could be minor.

Table 16. Education Systems Comparisons

Shanghai	Singapore	Taipei
no formal qualification	no formal qualification	literate without schooling
primary school	primary	primary school
junior middle school	lower secondary	junior middle school
senior middle school, vocational secondary school	secondary	senior middle school, vocational high school
junior college	post-secondary general and vocational, polytechnic diploma, professional qualification and other diploma	junior college
university bachelor	university first degree	university bachelor
university master, PhD	university postgraduate diploma/degree	university master, PhD

A preliminary comparison of the respondents' education level is conducted. While all the three pairs can't pass the same shape assumption of the Mann-Whitney test, bootstrap is adopted to make the comparison. As the result can tell that all the comparisons are statistically significant. This time, Singapore leads with a mean value 7.19, while Taipei follows (mean value 6.47) and Shanghai is left behind with a mean value 5.67. That can be interpreted as follows: the average education level of respondents in Singapore are higher than that in Taipei, while the level of Shanghai is at the last place.

To measure **occupation**, a detailed measurement from Huang (2018) is adopted. In the original CVM, occupations were collected according to the subjective assessments of the interviews and were coupled with corresponding education level on five levels. In most Singaporean cases, occupations are examined in terms of industry branches. In the work of Soon etc. (2016), for example, ten industry branches were identified. The detailed measurement contents 34 options which can be categorized in nine groups such as 1.supervisors, 2.professionals, 3.officer,

4.service personnel, 5.occupations in agriculture, forestry, fisheries and animal husbandry, 6.labor, 7.military and police, 8.home management, 9.students (C.-P. Lee & Hong, 2017). Besides, the possibility of the unemployed and the retired are added to the measurement. Still some information about occupation could be missed out such as whether someone works in a part-time or a full-time manner like Verba etc. researched.

The main goal is to find out which occupational groups are most likely and most unlikely to participate in the present survey. Thus the under-presentation of the survey is examined. Unlike the moderator exploration and the correlation exploration for e-government use previously, the occupational groups are demonstrated in the following tables.

Table 17. The Largest Occupation Groups in the Survey

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
staff from private enterprises	**55**	**12,9**	**56**	**18,3**	**81**	**18,5**
manager of private enterprises (self-employed businessman) with employees	**51**	**11,9**	15	4,9	10	2,3
labor from private enterprises	15	3,5	4	1,3	**49**	**11,2**
executive of private enterprises	**35**	**8,2**	**38**	**12,4**	11	2,5
engineer from private enterprise	13	3,0	**21**	**6,9**	37	8,4
accountant	**31**	**7,2**	18	**5,9**	1	,2
staff from service or hospitality (street vendor, individual services, taxi driver)	**28**	**6,5**	8	2,6	**44**	**10,0**
student	**22**	**5,1**	23	7,5	35	8,0
staff from government or government-operated enterprise	*11*	*2,6*	*19*	*6,2*	*7*	*1,6*

The table 17 showcases some of the largest occupational groups in participating in the survey. The relatively higher proportion is boldfaced in the table. The first group can be identified is the respondents from the private enterprises. The second group is the accountant, wherein the job proportion is tiny in Taipei compared to those in Shanghai and Singapore. The third occupational group comes from service or hospitality, wherein the proportion from Singapore is relatively low. The fourth group is the students who take a big proportion in all the three cities.

The last group staff from government or government-operated enterprise is only relatively large in proportion in Singapore.

Next, the occupational groups in low proportion are unveiled. The first group is staff from army and so. Due to the character of the job, it is understandable that few respondents reveal this job. The second group is made up of housekeeper. For Shanghai and Singapore, the job of housekeeper just makes up for no more than two percentage of the interviewees.

Table 18. The Least Occupation Groups in the Survey

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
staff from army, police and investigation bureau	0	0	1	,3	2	,5
housekeeper with family business without salary	0	0	0	0	2	,5
housekeeper without domestic original design manufacturer	1	,2	0	0	19	4,3
housekeeper with domestic original design manufacturer	2	,5	0	0	1	,2
housekeeper with family business with salary	2	,5	0	0	6	1,4
researcher from private sector (scientist)	1	,2	1	,3	2	,5
writer (writer, journalist, dramatist)	1	,2	0	0	5	1,1
judge, secretary, prosecutor, lawyer	2	,5	0	0	3	,7
researcher from government sector (scientist)	3	,7	4	1,3	1	,2
art specialist (actor, cameraman)	3	,7	2	,7	6	1,4
sport professionals	8	1,9	1	,3	0	0
medical specialist from private enterprise (physician, pharmacist, nurse, medical personnel)	6	1,4	0	0	7	1,6
medical specialist from government-operated enterprise (physician, pharmacist, nurse, medical personnel)	24	5,6	1	,3	10	2,3
agricultural, forestry, fishery and husbandry	4	,9	0	0	1	,2
staff from commercial affairs	7	1,6	1	,3	12	2,7
retired	0	0	10	3,3	7	1,6

However, in Taipei the proportion of housekeeper without domestic original design manufacturer is relatively extraordinarily large. The next group is featured with long-time training or intellect-oriented. The fourth occupational group is the agricultural, forestry, fishery and husbandry which are always under-representative in survey. In the present survey it is no more than one percentage for all the three cities. The fifth job (staff from commercial affairs) proportion is

relatively small in Singapore, compared it in Shanghai and Taipei. The last item retired was not chosen once in Shanghai. It leads to another question: the elderly are underrepresented in Shanghai. Even the proportion of the retired is higher in Singapore and Taipei, they are still underrepresented in the present survey according to some official statistics about retirement in these two municipalities. The measurement of **income** should be customized for the three cities in a ten-scale manner. For Shanghai, the starting point goes from 3500 RMB which is the prior personal income tax threshold. The second scale reaches to 5000 RMB which is the present personal income tax threshold launched from the October 2018. After that an interval of 1000 RMB is set all the way to 12000 RMB. In between the average annual incomes in 2016 of communal enterprise (55815 RMB), of other enterprise (74261 RMB) and of national enterprise (119397 RMB) are covered (Bureau, 2017). For Singapore, 1600 SGD is the starting point of measurement because it is the personal income tax threshold in Singapore. An interval of 1000 SGD is chosen all the way to 9600 SGD and the interval is in accordance with the national taxation scale (2600 SGD is the starting point of the second scale and 3600 SGD is that of the third scale). Still, it is a new trial to measure the financial stand of Singaporeans, while the local academia mostly employs housing types (Soon et al., 2016). For Taipei, it starts from the minimal amount of tax exemption (25500 NTD) and goes on with an interval of 10000 NTD all the way to 105000 NTD. In some research in Taiwan, the borderlines of 30000 NTD and 50000 NTD are often adopted to distinguish low income groups, middle income groups and high income groups (Chiang, 2015). Nevertheless, given the information of income is sensitive in the three cities, an option of "refuse to answer" is offered at the end in case that interviewees would not like to give any information about their income.

The earning of the respondents is examined. Because the earning is difficult to compare between the three cities across different contexts, no city comparison is

made. A basic descriptive statistic comparison is given in the following table. Median earning can be taken as an example to illustrate the earning in the three cities. The reported median earnings are 8000 to 8999 RMB (1141 to 1284 USD) in Shanghai, 4600 to 5599 SGD (3393 to 4130 USD) in Singapore, 35500 to 45499 NTD (1178 to 1510 USD) in Taipei.

Table 19. Earning Description

		Shanghai	Singapore	Taipei
mean		6,25	5.48	3.82
median		6,00	5.00	3.00
Percentiles	25	4,00	3.00	2.00
	50	6,00	5.00	3.00
	75	9,00	8.00	4.00

3.2.2.2 Internet-oriented political relevant characteristics

Next, the Internet-oriented characteristics are to be presented. Internet-based political relevant characteristics contain seven dimensions. The first four dimensions ask about Internet use, while the last three dimensions ask about attitudes towards Internet use. For the first four dimensions, different kinds of internet use modes are to be discerned. The main goal is to find out the bundles within each dimension and lay the basis for further study of the correlations between these bundles and e-government use.

Several examples of **access to internet** can be drawn from e-government studies, among which the fixed broadband and the mobile cellular attract the most attention (Obi, 2017a). As interpreted in the last chapter, public Wi-Fi should share research attention due to its development in the three cities. Another point which should be highlighted here is that the interval setting about internet use frequency are based on the JIM study (Südwest, 2018), although questions dealing with use frequency are overwhelmingly answered on the basis of a week for the most cases in the present research.

Next, **devices of Internet use** are asked about. Altogether four kinds of devices are mentioned as most research did (T.-Y. Huang, 2018). Except for that, an alternative option "other devices" is mentioned: due to the rapid development of technology with smart TV (Eun Yu et al., 2016) and smart watch (Schirra & Bentley, 2015), it seems necessary to leave room for interviewees to choose "other devices". Besides, to sum up these questions, Internet use intensity can be measured instead of asking directly the frequency of Internet use like Huang etc. (2018) once did: in this case, the one who never uses Internet is regarded as non-user; the one using once a week or in 14 days is under-user; the one using several times a week is medium-user; the one using every day or almost every day is super-user.

Five kinds of **purpose of Internet use** are enquired. Based on the conventional communication theory "uses and gratifications", uses for entertainment, social networking, information are highlighted. Besides, uses for convenience service of life and for job are asked due to the integration of Internet use into everyday life: some studies on Internet use have already paid attention to these fields by listing up the Internet activities such as paying off bills, shopping, online courses or training, online auction, online booking and online banking (T.-Y. Huang, 2018).

Online platform use is based on a comprehensive (but not exhaustive) e-government channels list of the survey of the United Nations (Economic, 2014). Out of all together ten channels, seven items are selected out for the present study. They are: e-mail, web portal, mobile applications, SMS and other messaging services, social networking site, interest-based platforms, and intermediaries such as public kiosks. Three of them are not examined due to the following reasons. The channel of counter (face-to-face) service is excluded in the present research, for it is often examined under the perspective of integration of e-government and offline government instead of in the light of e-government alone. The channel of telephone (voice) services and call centers is also not measured because of the

already existing research of mobile phone use and ubiquity of phone-call chances. Intermediaries through public-private partnerships are not the focus of general online platform use but are examined in the part of e-government platform use later. Besides, as social media gradually blurs the boundaries of many platforms, a differentiation of a various social media channels is employed here according to Soon's standards (2016): SMS and other messaging services are regarded here as closed SNS; social networking sites as open SNS; online bulletin boards as Interest-based platforms; what's more, a new kind of social media is added to the list of platform use, namely, the narrowcasting platforms such as blogs or YouTube sites. Thus, under online channels there are totally eight kinds of online platforms are surveyed in the present research.

Next, two questions to understand **political efficacy in Internet** are asked. These two questions and their prior versions have already examined in the context of internet use and offline political efficacy measurement (Morrell, 2003). The first question intends to measure internal efficacy in terms of individuals' understanding politics. To measure internal efficacy, the measurement resource is abundant: for the online political efficacy question like "people get to know more about politics by using the internet" was asked (T.-Y. Huang, 2018); for the political efficacy in everyday life question such as "I wanted to learn about politics and government" can be referred in the CVM (Verba et al., 1995, p. 550). The second question deals with external online efficacy (Chu et al., 2016). Still resources can also be drawn from the above-mentioned two sources, such as by asking "the chance to influence government policy (Verba et al., 1995, p. 550)". Besides, it is worth to mention that to answer such questions as "to what extent…" in the present survey a five-point Likert scale is employed. Interviewees are pushed to speak out their degrees of agreement from strongly disagree to strongly agree. In the following measurement, the model is kept for all the scales and won't be listed below long-windedly.

Trust in Internet is measured through three questions. The first two questions aim to find out trust in fellow-onliner and online information. These two dimensions are regularly measured by some Taiwanese scholars who are specialized in public management (Chu et al., 2016). As online service is growing steadily into the everyday life and because e-government service is one of the key research points, trust in online service is supplemented to the existing question battery. However, as trust in fellow-onliner shares less commonalities with the other two dimension. It was selected out as an individual variable and is named as Trust-Onliner to level up the validity of the variable. Therefore, the newly formed variable is made up from trust in online service and trust in online information. The value of the cumulative extraction sums of squared loadings reaches to 80.281% for Shanghai, 78.045% for Singapore and 74.177% for Taipei. Last variable from the politically relevant characteristics is individuals' **privacy and security concerns in the Internet**. Two general questions about online privacy and online security are asked respectively. Compared with conventional way about privacy and security worry (T.-Y. Huang, 2018), in the present survey wording of questions is turned around and the degree of protection of privacy and security is asked. Besides, as in the last chapter explained, privacy and security are treated as two perceptions which can be differentiated from each other. This is another contrasting point to conventional studies. A third question about expressing safely is employed here. The question is often used to measurement freedom of speech (T.-Y. Huang, 2018). It is also suitable to specify one's presence security in online world. As the result of data preprocessing, a further step is undertaken to level up the validity and discern a factor from the three items. The newly formed privacy-security-online is made up from the first two items. The value of the cumulative extraction sums of squared loadings reaches to 92.276% for Shanghai, 92.050% for Singapore and 93.085% for Taipei. The third

dimension "it's safe to express my political views on the internet" is treated as an individual variable and is named as political-opinions-online or priv plus.

<p style="text-align:center;">Table 20. Reliability and Validity Tests for Internet-oriented PRCs</p>

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
access to internet	0.221	0.513	0.200	0.496	0.551	0.503
devices use	0.511	0.411	0.506	0. 496	0. 551	0.640
purposes of internet use	0. 784	0.783	0.685	0.828	0.814	0.745
online platforms use	0.720	0.795	0.753	0.767	0.814	0.784
political efficacy in internet	0.735	0.581	0.656	-	-	-
trust in internet	0.808	0.706	0.648	0.689	0.610	0.619
privacy and security concerns in internet	0.880	0.816	0.817	0.632	0.610	0.627

3.2.3 Political participatory factors

In the second half of the questionnaire, political participatory factors are surveyed. They are grouped into three parts. In the first part resources are highlighted and exemplify five sources: money, time, civic skills, language skills and digital skills. In second part political psychological engagement is illustrated, under which nine psychological variables are measured. They are: political knowledge, political interest, political efficacy, e-government efficacy, political trust, e-government trust, political privacy and security, e-government privacy and security, and good citizen norms. In the third part recruitment is detailed. Under recruitment, there are altogether five kinds of recruitment. The first three recruitment are political recruitment, public recruitment, and private recruitment. Under each recruitment the offline recruitment, the online recruitment and the recruitment towards e-government use are contained. The fourth recruitment is e-government recruitment, which consists of five variables: e-gov ease, e-gov usefulness, e-gov interactivity, e-gov value, and e-gov promotion. The fifth recruitment is onliner recruitment which contains two dimensions: the online recruitment and the recruitment towards e-government. In the following sections, detailed measurement and data preprocessing are presented.

3.2.3.1 Resources

The resource variable **money** is measured by one question by the conventional course of enquiring whether money is contributed to politics. As the CVM (Verba et al., 1995) did, a yes or no answer is expected without any detailed information such as amount of donation. Respondents should choose one of the options and such alternative as "I don't know" and "I can't remember" are not offered. Political donation from citizens is normally understood as a feature of multiparty democratic system. Therefore, no positive answering for Shanghai is expected. However, the finding is quite surprising: 52.6 percent of interviewees from Shanghai reported they donated in the last twelve months. If their answering is genuine, the astonishing finding may unveil an interesting facet of practicing donation in a non-multiparty political system. What's more, political donation in Shanghai leads that in Taipei and in Singapore to a large extent. Besides, more people in Taipei reported political donation than those in Singapore.

The resource variable **time** is measured also by one question which follows the pattern from the CVM and asks about time contribution to politics. Time as resource is also asked as yes/no question. The results are somewhat similar to the result of money as resource. More than half of the respondents in Shanghai reported that they donated time for politics, while nearly thirty percent of respondents in Taipei reported the time donation. Singapore is left behind with less than five percent of time donation report. Together with the leading role of Shanghai in money donation, the two findings from Shanghai are quite astonishing.

The last resource deals with **civic skills**. In the CVM, civic skills were measured by three variables. The first variable consists of four questions about whether interviewees have experiences in " "writing a letter, going to a meeting where they look part in making decisions, planning or chairing a meeting, and giving a presentation or speech (Verba et al., 1995) ". In the present survey the four

dimensions are compacted into one question. A brief comparison between each two cities is conducted. After assumption test of same shape for Mann-Whitney test is made, only one pair is qualified to undergo the test. The results of civic skills self-evaluation are statistically significantly different for Singapore and Taipei. Respondents from Singapore presented a higher civic skills self-evaluation with a mean rank 391.43, while the mean rank from respondents from Taipei was reported as high as 359.27. Since other two groups of comparisons cannot be conducted by Mann-Whitney test, bootstrap for independent samples test is adopted. The test result shows another two statistically significant differences. According the mean value of each cities, respondents from Shanghai unveil an even higher score with mean value 3.57 than Singapore (3.11) and Taipei (2.99). To sum up, all the three comparisons are statistically significant and Shanghai takes the leading role of self-reported civic skills, followed by Singapore, while Taipei is left in the last place. It is interesting to find out that respondents from the authoritarian polity (in this case, Shanghai) demonstrate higher reported civic skills than those from the semi-democratic polity (in this case, Singapore), while respondents from a democracy reported the lowest self-evaluation of civic skills.

The second variable deals with **language skills**. As the CVM did, the language speaking at home is examined. To better suit to the language circumstances in the three cities, different versions are offered accordingly: for Singaporean, five most spoken languages are listed up; for interviewees in Shanghai, three options of Chinese dialects are offered which include the official language Mandarin, the local language Wu-Shanghainese; for interviewees in Taipei, five options are listed including the aboriginal Formosan languages, three Chinese language dialects branches (Min, Hakka and Mandarin). Different to the measurement in the CVM which surveyed language degrees through ten pairs of synonyms, no further measurement of language scale is tested in the present survey because of

two reasons: the first one goes with the difficulty in comparing language degrees among the three cities, especially when in Singapore English is generally spoken, while in Shanghai and Taipei Mandarin-Chinese is the most widely spoken language; the second reason can be traced back to the measurement of education levels in the demographic variables which regard the language skills and the education levels as equally matched.

Table 21. Language as Resource Comparison

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
English	-	-	150	49,0	-	-
Mandarin Chinese	272	63,6	125	40,8	377	86,1
Wu-Chinese (Shanghainese included)	132	30,8	-	-	-	-
Minnan-Chinese (Taiwanese included)		-	-	-	49	11,2
Hakka-Chinese	-	-	-	-	10	2,3
Other Chinese dialects	19	4,4	17	5,6	1	,2
Malay	-	-	10	3,3	-	-
Tamil	-	-	1	,3	-	-
Formosan languages	-	-	-	-	1	,2
Other languages	5	1,2	3	1,0	-	-
Total	428	100,0	306	100,0	438	100,0

As the compositions of languages in the three cities are at some degree different to each other, the non-spoken or non-chosen languages are filled up with a hyphen in the result report table. There are at least two main languages spoken in Shanghai and Singapore. For Shanghai, the amount of Wu-Chinese speakers equals half the size of Mandarin Chinese speakers. For Singapore, the size of English speakers is somewhat more than that of Mandarin Chinese speakers. However, the difference is smaller than that in Shanghai. For Taipei, the great disparity is not to ignore: Mandarin Chinese is overwhelmingly spoken at home than Minnan-Chinese or Hakka-Chinese. Based on the findings, language as skill resource is to be undertaken between each two main languages. For Shanghai, the Mandarin-Chinese and the Wu-Chinese are chosen. For Singapore, the Mandarin-Chinese

and the English are chosen, For Taipei, the Mandarin Chinese and the other Chinese (Minnan-Chinese and Hakka-Chinese) are chosen.

The third variable of civic skills is introduced from the perspective of digital era. Four kind of **digital civic skills** are surveyed: operational skills, formal skills, informational skills and strategic skills (A. J. Van Deursen & van Dijk, 2009). Still, methodological variances to the original measurement are undertaken. Originally, the four dimensions are measured in an experiment rather than in a survey. Therefore, the method of self-evaluation in the present survey should be cautiously examined for its reliability and validity. However, it's worth to mention that it's not exceptional for the present research to use the self-evaluation to measure digital skills. The method can also be referred in a bunch of research (Gopi & Ramayah, 2007; J.-J. Wu & Tsang, 2008).

The reliability of them is tested. The Cronbach's alpha value for the three cities are 0.869 (Shanghai), 0.954 (Singapore), 0.924 (Taipei) respectively which indicate a high level of internal consistency. For the validity, the Kaiser-Meyer-Olkin measure of sampling adequacy are 0.828 (Shanghai), 0.847 (Singapore), 0.856 (Taipei) and all of them are with the Sig 0.00 (<0.05). It indicates a high level of validity. A brief comparison of three cities in perspective of digital skills is presented: all the comparisons demonstrate statistical significance. Respondents from Singapore reported the highest self-evaluation of digital skill with a mean value of 4.1773, while Shanghai follows with 4.0496 and Taipei with 3.8088.

3.2.3.2 Political psychological engagement

The second part of political psychological engagement is measured through six variables. The first variable tries to explore **political knowledge** (Lin et al., 2017) through four questions. The first two questions ask about surveillance political facts in two areas: the president of South Korea and the respective prime minister

of the three jurisdictions. Two other questions enquiry about taught political facts: the full term of legislator and the meaning of "your vote is secret (Soon et al., 2016)". In the question battery of Lin etc., the last question was asked about the organ which has the right to interpret the constitution, however, there is no specific organ to interpret the Singaporean constitution due to its law system traditions (Neo, 2016). Instead, question about "your voting is secret" is complemented as Singaporean scholars always do. For all the four questions, four options are offered instead of as open-ended questions. A mean value of each respondents is calculated on the base of scoring one point for a right answer. A brief comparison work is done and indicates that the comparison between Singapore and Taipei is of no statistical significance, while respondents in Shanghai (0.7313) overshadow those in Taipei (mean value 0.6781) and those in Singapore (0.6773).

The second variable of political psychological engagement enquires about **political interest**. Like the CVM, the present survey asks two blunt question towards interviewees' political interest in local and national politics and affairs. Additionally, a third question about political interest in international politics and affairs is asked due to a broad information provision in the digital era which can enable individuals to access information from all over the world. Although the international level is seldom measured from the perspective of political interest, enlightening results are expected in the present survey.

The third variable of political psychological engagement investigates **political efficacy**. In general, political efficacy is examined three times in the present survey. The first time is already presented before under the demographic characteristics and tries to demonstrate political efficacy in online circumstances. Here, political efficacy is investigated in the light of the offline circumstances and of the e-government circumstances. The last two kinds of political efficacy are scrutinized in two aspects: the internal efficacy and the external efficacy. For

offline political efficacy, two questions ask about perceived complexity of politics and perceived influence on politics (T.-Y. Huang, 2018); such internal efficacy can also be traced back to the CVM in the evaluation of the questions (Verba et al., 1995, p. 551) as "I find that politics is too complicated for me to understand" and "I find that as one individual, I don't feel I can have an impact, ... do you think that he or she would pay a lot of attention to what you say...". The last two questions explore the perceived willingness of hearing by government and perceived collective influence on government (Soon et al., 2016) in the light of external efficacy. After taking factor analysis, the fourth item is excluded in order to level up the internal consistency, as well as the validity. The reliability is once again tested with the first three items. Besides, the last item is still kept for analysis as political efficacy plus.

What's more, political efficacy is also specifically explored for e-government. Following suit of measurement of online political efficacy, **political efficacy in e-government** is also investigated in two questions. The first one concerning perceived complexity is derived from internal level. The second one concerning perceived governmental respect to public opinions can be traced back to external level.

The forth variable from political psychological engagement is **trust**. Like political efficacy, trust is also allocated both in the demographic characteristics (as online trust) and under the political psychological engagement. The first kind is the trust in government. Two dimensions concerning "quality government" and "people first" are asked (T.-Y. Huang, 2018). The measurement can be traced back to the American National Election Studies in 1958 (Campbell et al., 2016) and counts as classic way of measuring trust in government. The other kind of trust is **trust in e-government**. Unlike other two kinds of trust measurement, trust in e-government is seldom measured (C.-P. Lee & Hong, 2017). Therefore, three blunt questions are formulated in the present survey and ask to what extent interviewees

trust e-government information, consultation and other services (e.g. online administrative procedures and payment transaction).

Next, the variable **privacy and security concerns** is measured. Like the above-mentioned two variables, this variable is also once measured as demographic characteristics. In the present section, two other kinds of concerns are extended: concerns in government and concerns in e-government. Privacy concerns and security concerns towards government are explored with two questions (T.-Y. Huang, 2018). What's more, an extra question is supplemented to ask to what extent interviewees are worried about their presence online being monitored by government. This concern spreads widely and has been empirically texted (Dinev et al., 2008). In order to level up the internal consistency, the third item is singled out. Still, this item is still kept for analysis as privacy and security concerns plus.

Privacy concerns and security concerns towards e-government is explored also in two dimensions, by which perceived privacy violation and perceived security violation are scrutinized in two questions. Similar measurement of privacy and security concerns can be drawn from the research made in Taiwan (H.-J. Wang & Lo, 2010).

The last variable of political perception is **citizenship**. In the CVM, citizenship is measured with such question "I feel it is not my responsibility to participate". Meanwhile, problems were identified during the survey, while respondents could positively evaluate their civic gratifications because of social appropriateness (Verba et al., 1995, p. 612): citizenship in this sense (rather than self-interest) is therefore not legitimate enough to explain its influence on political participation. In the present survey, citizenship is measured by the third person perspective. That means, no direct connection between citizenship and political participation is proposed. Besides, interviewees are not enquired about their own reflection on motivation. Instead, a general tendency about citizen norms is explored through ten questions like Chang (2016) once employed. In accordance with Chang's

analysis in Taiwan, an index of duty-based citizenship which is mostly defined by elect, tax and law and an index of engaged citizenship which is mostly defined by help, world, group, opinion, ethic, and military are to be applied.

Table 22. Reliability and Validity Tests for Political Psychological Engagement

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
political interest	0.859	0.912	0.887	0.726**	0.703**	0.736**
political efficacy (prototype)	0.503	0.332	0.385	0.725**	0.622**	0.506**
political efficacy	0.797	0.666	0.579	0.702**	0.598**	0.539**
political efficacy in e-government	0.702	0.774	0.803	-	-	-
trust in internet	0.787	0.818	0.812	-	-	-
trust in e-government	0.729	0.882	0.847	0.729**	0.736**	0.723**
privacy and security concerns about internet (prototype)	0.442	0.592	0.575	0.495**	0.511**	0.505**
privacy and security concerns towards internet	0.800	0.814	0.831	-	-	-
privacy concerns and security concerns towards e-government	0.783	0.728	0.820	-	-	-
citizenship	0.903	0.847	0.858	0.911**	0.825**	0.849**

** is significant at the 0.05 level

3.2.3.3 Recruitment

Recruitment contains five dimensions. The first three dimensions (the political, the public and the private recruitment) all consist of three layers: the online, the offline and the e-government. The fourth dimension e-government recruitment consists of five variables: e-government ease, e-government usefulness, e-government interactivity, e-government value and e-government promotion. The last recruitment dimension is the onliner recruitment which entails two layers: the online and the e-government. In this section, every variable of the above-mentioned dimension is to be described and comparisons among cities are undertaken.

The measurement of all the dimensions but the e-government recruitment is introduced together because of the similar way of asking questions. Firstly, the time period of recruitment is based on twelve months. Due to the discovery of the CVM, twelve months is a more appropriate time period than seven days. Even if for the online surroundings which promise more intensive recruitment in politics,

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there is still a differentiation between serious and formal recruitment and clicktivism or slacktivism (Morozov, 2011). One more related measurement which is also worth to mention is that some studies (V.-H. Lo et al., 2005) ask about frequency by employing the five-point Likert scale from never to very often. Thirdly, recruitment activities are classified to three layers in the CVM: vote, campaign work, campaign money contribution; contact, protest; and formal chat. It is a relatively comprehensive as well as convenient way to adopt the classification. Based on the political activity research, some details are supplemented to the list such as petition in the contact layer. Thus, for all these recruitment dimensions, three questions are asked about the frequency of recruitment on three issue groups: the voting-related issues, the contact-related issues and the chat-related issues. Besides the issue groups, an extra question is particularly added towards e-government promotion by the political, public, private and fellow-onliner recruitment.

Table 23. Reliability and Validity Tests for Recruitment

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
political recruitment	0.868	0.898	0.868	0.876**	0.898**	0.810**
public recruitment	0.948	0.928	0.911	0.907**	0.849**	0.842**
private recruitment	0.931	0.896	0.886	0.855**	0.819**	0.747**
onliner recruitment	0.868	0.913	0.865	0.733**	0.717**	0.720**

** is significant at the 0.05 level

Political recruitment consists of seven items. Three of them are about political online recruitment; another three are about political offline recruitment; the last item is about political recruitment towards e-government. It indicates a high level of validity. According the result and the strong correlations between offline and online recruitment, it is not necessary to regard online and offline recruitment in two separate categories. The **public recruitment** consists of seven items. It indicates a high level of validity. What's more, correlations between offline items and online items are strong. So, online items and offline items can be treated

together as the public recruitment. **Private recruitment** consist of seven items. These correlations are all in a strong level. Therefore, it is appropriate to consider these six items together as one variable. The **onliner recruitment** consists of four items. It indicates a high level of validity.

The **e-government recruitment** is measured by five aspects: perceived ease of use of e-government, perceived usefulness of e-government, perceived interactivity of e-government, perceived value towards e-government, perceived promotion from e-government. To measure perceived ease of e-government use and perceived usefulness of e-government, two questions are abstracted from prior scholars' work (Carter & Bélanger, 2005; H.-J. Wang & Lo, 2010). **Ease of use** is investigated with three questions. The first question asks about the easiness of using e-government; the second question about procedure simplification; the third question is about the stability and the speed of e-government from the perspective of technology (Iivari, 2005). Data analysis indicates a high level of validity. **Usefulness** is explored by three questions. The first one asks about the availability and the second one about effectiveness. Other two questions about time-reducing and expenditure-saving. Data analysis indicates a high level of validity.

Interactivity of e-government is measured with four questions which are related to bi-directionality, timeliness, mutual-controllability, and responsiveness (Yadav & Varadarajan, 2005). Data analysis indicates a high level of validity. According the expectancy theory, **perceived value** can be measured in three dimensions. Since the instrumentality dimension and expectancy dimension are measured in the section of political activities, here the focus is laid on the valence dimension of perceived value (J.-S. J. Hu, 2003; V.-H. Lo et al., 2005). Three questions are asked from the perspectives of concern, attention and interest.

The last variable in e-government recruitment is e-government **promotion**. Four questions are asked according to prior measurements made by Cho (2004) and

Hong etc. (2013). One question is asked about "perceived goal impediment" of online promotion. Two questions are asked about the perceived ad clutter by investigating whether there is too much promotion online and whether individuals are irritated by online promotions. The last question is a general question dealing with the satisfaction towards e-government promotion in the offline world. The scores of the first three items are calculated in a reverse order. After doing this, these items share less internal consistency and validity with the fourth item. Therefore, they are treated as two different variables in the present analysis.

Table 24. Reliability and Validity Tests for Perceived E-government Features

	Cronbach's alpha value			Kaiser-Meyer-Olkin		
	SH	SG	TP	SH	SG	TP
ease of use	0.854	0.878	0.866	0.733**	0.735**	0.710**
usefulness	0.792	0.791	0.865	0.765**	0.751**	0.812**
interactivity	0.898	0.908	0.897	0.847**	0.847**	0.844**
perceived value	0.850	0.830	0.899	0.731**	0.690**	0.749**
promotion	0.950	0.803	0.911	0.776**	0.691**	0.758**

** is significant at the 0.05 level

At the end of the variables measurement introduction and data pre-processing of the political participative factors, the rankings of cities comparison in terms of all the political participatory factors are presented in the table below. To accomplish the ranking, mean rank or mean value is compared in given demanding situations. Besides, for all the cases below the differences are statistically significant.

Table 25. The Comparison Rankings of Political Participative Factors among Shanghai, Singapore and Taipei

	Shanghai	Singapore	Taipei		Shanghai	Singapore	Taipei
money	1	3	2	pol recruitment	1	3	2
time	1	3	2	pol e-gov recruitment	1	3	2
civil skills	1	2	3	pub recruitment	1	2	1
digital skills	2	1	3	pub e-gov recruitment	1	3	2
pol knowledge	1	2	2	priv recruitment	1	2	1
pol interest	1	2	2	priv e-gov recruitment	1	3	2
pol efficacy	1	3	2	ease	1	2	2
pol efficacy two	1	2	2	usefulness	1	2	2
e-gov efficacy	1	3	2	interactivity	1	3	2
pol trust	1	2	3	value	1	3	2
e-gov trust	1	2	3	promotion online	1	2	2
pol privacy	1	2	3	promotion offline	1	3	2
pol privacy two	2	2	1	onliner recruitment	1	3	2
e-gov privacy	1	2	3	onliner e-gov	1	3	2
duty	1	2	2				
engaged	1	2	2				

4. RESULTS

Research results are presented in this chapter. In accordance with the five research questions, the results report is arranged in that given order. Firstly, e-government use frequency is compared among the three cities from three perspectives: the platforms use, the functions use and the themes use. In the second section, the relation between the platforms use and the functions use (political participation on e-government) is to be analyzed. The relation between e-government use and e-government use intention is to be explored in the third section to answer the third research question. In the fourth and the fifth sections, the prediction effect of political participation factors on e-government use is to be unveiled. The fifth research question is to be answered in the sixth section to examine the influence of politically relevant characteristics on e-government use.

4.1 E-government use comparison

In the present section, the first research question is to answer: what's the difference of e-government use among Shanghai, Singapore and Taipei? To answer the questions, three facets are taken into consideration: e-government use from perspectives of platforms, functions and themes is to be examined separately. Specifically speaking, residents' e-government uses (from perspectives of platforms use frequency, functions use frequency and themes use frequency) are to be studied to find out whether they differ significantly from each other among the three cities (Shanghai, Singapore and Taipei), based on the ordinal assessment ratings of 1 to 5.

4.1.1 Platforms use comparison

In the first part, the following research question is to be answered: does residents' e-government platforms use frequency of such items as hot-lines, e-mail, portals,

mobile apps, SNS, public platforms and third-party mobile apps differs significantly among the three cities (Shanghai, Singapore and Taipei), based on the ordinal assessment ratings of 1 to 5? To answer this question, the data analysis is processed for the above-mentioned seven items.

The Kruskal-Wallis H tests are to be performed at first to check if there is a statistically significant difference among the three cities. Then a closer look is undertaken by employing the Mann-Whitney U tests to check if there is a statistically significant difference between each two cities. To demonstrate the employed method, the first case of e-government platforms use (hot-lines use) is exemplified in details. Demonstrations for other cases are omitted consequently. Instead, Complete results for all these cases are presented and interpreted. What's more, a comparison ranking is demonstrated in the conclusion.

The hot-lines use comparison is taken as an example for e-government platforms use comparison. A statistically significant differences was found among the three cities (Shanghai, Singapore, and Taipei) in regard to mean rank on e-government hot-lines use frequencies, H = 39.992, p = .000. The mean rank is 662.50 for residents in Shanghai, 545.80 for residents in Singapore, and 540.66 for residents in Taipei. The Mann-Whitney U tests indicated that there was a significant difference between Shanghai and Singapore, in regards to their ordinal scores in hot-lines use frequency, U = 52917.000, p = .000. On average, residents in Shanghai reported a more frequent use than residents in Singapore, with a Mean Rank difference equal to 70.43.

Table 26. Kruskal-Wallis H Test Comparing E-government Hot-lines Use

	M	∑N	H	p
			39.992	.000*
Shanghai	662.50	428		
Singapore	545.80	306		
Taipei	540.66	438		

*p<.05

However, the Mann-Whitney U tests indicated that there was no significant difference between Singapore and Taipei, in regards to their ordinal scores in hot-lines use frequency. Besides, the Mann-Whitney U tests indicated that there was a significant difference between Shanghai and Taipei, U = 73769.000, p = .000. On average, residents in Shanghai reported a more frequent use than residents in Taipei with a Mean Rank difference equal to 92.22.

Table 27. Mann-Whitney U Test Comparing E-government Hot-lines Use

	M	∑N	H	p
		734	52917.000	.000*
Shanghai	396.86			
Singapore	326.43			
		744	66900.000	.965
Singapore	372.87			
Taipei	372.24			
		866	73769.000	.000*
Shanghai	480.14			
Taipei	387.92			

*p<.05

After demonstrating the example of analyzing the e-government hot-lines use, other kinds of e-government platforms use comparisons are also conducted. Detailed comparison tables are demonstrated as follows. From the first table it can tell that no statistically significant difference can be identified for the government-run mobile-phone apps use among the three cities, while significance can be indicated for other six kinds of e-government platforms use.

As for differences between each two cities, more details can be identified. Between Shanghai and Singapore six out of seven e-government platforms use are statistically significant in terms of use frequency. Interviewees from Shanghai reported higher use frequency for almost all these significant items except the e-government portal use. Between Singapore and Taipei, only four cases are identified with statistically significant difference. Higher use frequency can be referred from Taipei in these significant items except the e-government portal use.

Between Shanghai and Taipei, four cases can be found with statistically significant difference, from which Shanghai tops Taipei in terms of use frequency. In other words, e-government platforms use frequency in Taipei shows more similarity with Shanghai and Singapore (with only three different cases respectively), while the amount of different cases between Shanghai and Singapore is more outstanding. Besides, it is also interesting to find out that e-government portal use in Singapore is more frequently applied than in other two cities. What's more, a total ranking of platform use frequency comparison is presented in the conclusion part for further exploration.

Table 28. Kruskal-Wallis H Test Comparing E-government Platforms Use

	M	∑N	H	p		M	∑N	H	p
Hotline use			39.992	.000*	**SNS use**			232.886	.000*
Shanghai	662.50	428			Shanghai	715.35	428		
Singapore	545.80	306			Singapore	352.44	306		
Taipei	540.66	438			Taipei	624.11	438		
E-mail use			14.547	.001*	**Public platforms use**			60.591	.000*
Shanghai	617.39	428			Shanghai	649.49	428		
Singapore	530.95	306			Singapore	466.01	306		
Taipei	595.12	438			Taipei	609.12	438		
Portal use			8.979	.011*	**Third-party Apps Use**			55.239	.000*
Shanghai	565.13	428			Shanghai	678.72	428		
Singapore	632.91	306			Singapore	522.43	306		
Taipei	574.95	438			Taipei	541.15	438		
Apps use			5.959	.051					
Shanghai	616.25	428							
Singapore	574.85	306							
Taipei	565.57	438							

*p<.05

Table 29. Mann-Whitney U Test Comparing E-government Platforms Use

	M	∑N	H	p		M	∑N	H	p
Hotline use		734	52917.000	.000*	**SNS use**		734	25524.500	.000*
Shanghai	396.86				Shanghai	460.86			
Singapore	326.43				Singapore	236.91			
		744	66900.000	.965			744	35350.500	.000*
Singapore	372.87				Singapore	269.02			
Taipei	372.24				Taipei	444.79			
		866	73769.000	.000*			866	78542.000	.000*
Shanghai	480.14				Shanghai	468.99			
Taipei	387.92				Taipei	398.82			
E-mail use		734	55872.000	.000*	**Public platforms use**		734	44920.000	.000*
Shanghai	389.96				Shanghai	415.55			
Singapore	336.09				Singapore	300.30			
		744	59629.000	.005*			744	50708.000	.000*
Singapore	348.37				Singapore	319.21			
Taipei	389.36				Taipei	409.73			
		866	90121.000	.287			866	87335.000	.071
Shanghai	441.94				Shanghai	448.45			
Taipei	425.26				Taipei	418.89			
Portals use		734	57850.500	.004*	**Third-party Apps Use**		734	48181.500	.000*
Shanghai	349.66				Shanghai	407.93			
Singapore	392.45				Singapore	310.96			
		744	60445.000	.016*			744	64710.000	.399
Singapore	393.97				Singapore	364.97			
Taipei	357.50				Taipei	377.76			
		866	92220.000	.662			866	71563.000	.000*
Shanghai	429.97				Shanghai	485.30			
Taipei	436.95				Taipei	382.89			
Apps use		734	61102.500	.104					
Shanghai	377.74								
Singapore	353.18								
		744	66196.500	.764					
Singapore	375.17								
Taipei	370.63								
		866	85380.500	.016*					
Shanghai	453.01								
Taipei	414.43								

*p<.05

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4.1.2 Functions use comparison

In the second part of the present section, the following question is to be answered: does residents' e-government functions use frequency (of such items as the information use, consultation use and so on) differ statistically significantly among the three cities (Shanghai, Singapore and Taipei), based on the ordinal assessment ratings of 1 to 5?

To answer this question, all the 16 items are to be individually examined, wherein the information use group (which includes six items), the consultation use group (which includes six items), the referendum use, the collaborative production use, the procedures use and the payment use are detailed. As proceeded before, the first item of e-government functions use (information browsing use) is exemplified and the following 15 items undergo the same process.

The browsing information use comparison among the three cities is demonstrated. The Kruskal-Wallis H tests was performed at first and then the Mann-Whitney U tests. These two steps are applied by the same logic presented in the previous part. A statistically significant difference was found among the three cities in regard to residents' e-government browse information use frequency, $H = 33.894$, $p = .000$. The mean rank is 652.05 for residents in Shanghai, 582.58 for residents in Singapore, and 525.18 for residents in Taipei.

Table 30. Kruskal-Wallis H Test Comparing E-government Information Browsing Use

	M	$\sum N$	H	p
		1172	33.894	.000*
Shanghai	652.05			
Singapore	582.58			
Taipei	525.18			

*p<.05

The Mann-Whitney U tests indicated that there was a significant difference between Shanghai and Singapore, in regards to their ordinal scores in browsing information use frequency, $U = 57544.000$, $p = .003$. On average, residents in

Shanghai reported a more frequent use than residents in Singapore, with a Mean Rank difference equal to 44.5. Also, the Mann-Whitney U tests indicated that there was a significant difference between Singapore and Taipei, in regards to their ordinal scores in browsing information use frequency, U = 60273.500, p = .012. On average, residents in Singapore reported a higher frequent use than residents in Taipei, with a Mean Rank difference equal to 37.42. Besides, the Mann-Whitney U tests indicated that there was a significant difference between Shanghai and Taipei, U = 60273.500, p = .012. On average, residents in Shanghai reported a higher frequent use than residents in Taipei, with a Mean Rank difference equal to 37.42.

Table 31. Mann-Whitney U Test Comparing E-government Information Browsing Use

	M	$\sum$N	H	p
		734	57544.000	.003*
Shanghai	386.05			
Singapore	341.55			
		744	60273.500	.012*
Singapore	394.53			
Taipei	357.11			
		866	73614.500	.000*
Shanghai	480.50			
Taipei	387.57			

*p<.05

After demonstrating the example of analyzing the e-government information browsing use, other 15 kinds of e-government functions use comparisons are also conducted. Detailed comparison tables are presented as follows. In the left part of the following table (except the last two items) e-government information functions comparisons are presented one by one, while in the right part (also except the last two items) the e-government consultation use functions comparisons are arranged. And the last four items of the table deal with decision making use and other use functions. The results deliver a piece of simple message that all these comparisons are statistically significant in use frequency difference.

Table 32. Kruskal-Wallis H Test Comparing E-government Functions Use

	M	∑N	H	p		M	∑N	H	p
Information Browsing		1172	33.894	.000*	**Liking**		1172	231.107	.000*
Shanghai	652.05				Shanghai	728.07			
Singapore	582.58				Singapore	365.12			
Taipei	525.18				Taipei	602.83			
Open Information Searching		1172	20.773	.000*	**Polling**		1172	205.902	.000*
Shanghai	642.97				Shanghai	722.75			
Singapore	557.84				Singapore	382.60			
Taipei	551.34				Taipei	595.81			
Personal Information Searching		1172	63.785	.000*	**Hearing**		1172	187.495	.000*
Shanghai	678.10				Shanghai	730.59			
Singapore	573.25				Singapore	448.41			
Taipei	506.24				Taipei	542.17			
Information Browsing		1172	33.894	.000*	**Liking**		1172	231.107	.000*
Shanghai	652.05				Shanghai	728.07			
Singapore	582.58				Singapore	365.12			
Taipei	525.18				Taipei	602.83			
Information Sharing		1172	100.829	.000*	**Complaining**		1172	75.653	.000*
Shanghai	692.86				Shanghai	653.54			
Singapore	452.84				Singapore	476.69			
Taipei	575.95				Taipei	597.70			
Commenting		1172	269.282	.000*	**Petitioning**		1172	75.871	.000*
Shanghai	762.92				Shanghai	659.90			
Singapore	391.52				Singapore	491.01			
Taipei	550.33				Taipei	581.49			
Discussing		1172	184.702	.000*	**Crowd-funding**		1172	255.607	.000*
Shanghai	742.46				Shanghai	751.96			
Singapore	442.14				Singapore	419.72			
Taipei	534.96				Taipei	541.33			
Referendum		1172	248.730	.000*	**Procedures**		1172	117.175	.000*
Shanghai	698.02				Shanghai	717.00			
Singapore	353.84				Singapore	491.58			
Taipei	640.07				Taipei	525.29			
Collective Production		1172	232.594	.000*	**Payment**		1172	76.132	.000*
Shanghai	739.84				Shanghai	683.23			
Singapore	424.67				Singapore	585.03			
Taipei	549.72				Taipei	493.01			

*p<.05

Next, detailed differences between each two cities are presented in the following table. All cases between Shanghai and Singapore are of statistically significant difference. Respondents from Shanghai reported higher use frequency in all these e-government functions than those from Singapore. Between Singapore and Taipei only one of the 16 cases is not statistically significant. Besides the open information searching frequency Singapore and Taipei differ in all other kinds of e-government functions use. Interviewees from Singapore reported higher use frequency in the first item of information use, in collaboration use and in payment use, while reporters from Taipei demonstrated higher use frequency in other functions use items. Between Shanghai and Taipei, all these cases are of statistically significant difference. Interviewees from Shanghai reported higher use frequency in all of the e-government functions use than those from Taipei.

Table 33.Mann-Whitney U Test Comparing E-government Functions Use

	M	∑N	H	p		M	∑N	H	p
Information Browsing		734	57544.000	.003*	**Liking**		734	25927.500	.000*
Shanghai	386.05				Shanghai	459.92			
Singapore	341.55				Singapore	238.23			
		744	60273.500	.012*			744	38829.000	.000*
Singapore	394.53				Singapore	280.39			
Taipei	357.11				Taipei	436.85			
		866	73614.500	.000*			866	72698.500	.000*
Shanghai	480.50				Shanghai	482.64			
Taipei	387.57				Taipei	385.48			
Open Information Searching		734	56045.500	.001*	**Polling**		734	28713.500	.000*
Shanghai	389.55				Shanghai	453.41			
Singapore	336.66				Singapore	247.33			
		744	66345.500	.806			744	41391.500	.000*
Singapore	374.68				Singapore	288.77			
Taipei	370.97				Taipei	431.00			
		866	78999.500	.000*			866	72185.500	.000*
Shanghai	467.92				Shanghai	483.84			
Taipei	399.86				Taipei	384.31			
Personal Information Searching		734	53513.000	.000*	**Hearing**		734	34423.000	.000*

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	M	∑N	H	p		M	∑N	H	p
Shanghai	395.47				Shanghai	440.07			
Singapore	328.38				Singapore	265.99			
		744	59097.000	.003*			744	55819.000	.000*
Singapore	398.37				Singapore	335.92			
Taipei	354.42				Taipei	398.06			
		866	66497.000	.000*			866	63122.000	.000*
Shanghai	497.13				Shanghai	505.02			
Taipei	371.32				Taipei	363.61			
Information Sharing		734	38922.000	.000*	**Complaining**		734	45867.000	.000*
Shanghai	429.56				Shanghai	413.33			
Singapore	280.70				Singapore	303.39			
		744	52675.500	.000*			744	53030.000	.000*
Singapore	325.64				Singapore	326.80			
Taipei	405.24				Taipei	404.43			
		866	74770.500	.000*			866	84654.500	.000*
Shanghai	477.80				Shanghai	454.71			
Taipei	390.21				Taipei	412.78			
Commenting		734	24877.500	.000*	**Petitioning**		734	46742.000	.000*
Shanghai	462.38				Shanghai	411.29			
Singapore	234.80				Singapore	306.25			
		744	47957.500	.000*			744	56535.000	.000*
Singapore	310.22				Singapore	338.25			
Taipei	416.01				Taipei	396.42			
		866	58831.500	.000*			866	81059.000	.000*
Shanghai	515.04				Shanghai	463.11			
Taipei	353.82				Taipei	404.57			
Discussing		734	32040.000	.000*	**Crowd-funding**		734	27843.500	.000*
Shanghai	445.64				Shanghai	455.45			
Singapore	258.21				Singapore	244.49			
		744	56283.000	.000*			744	53620.500	.000*
Singapore	337.43				Singapore	328.73			
Taipei	397.00				Taipei	403.08			
		866	60426.500	.000*			866	60553.500	.000*
Shanghai	511.32				Shanghai	511.02			
Taipei	357.46				Taipei	357.75			
Referendum		734	28320.500	.000*	**Procedures**		734	40466.500	.000*
Shanghai	454.33				Shanghai	425.95			
Singapore	246.05				Singapore	285.74			
		744	32983.000	.000*			744	.127	.000*
Singapore	261.29				Singapore	359.34			
Taipei	450.20				Taipei	381.69			

Table - 33 Continued (2)

	M	∑N	H	p		M	∑N	H	p
		866	83165.500	.002*			866	62895.000	.000*
Shanghai	458.19				Shanghai	505.55			
Taipei	409.38				Taipei	363.10			
Collective Production		734	30664.500	.000*	**Payment**		734	53848.000	.000*
Shanghai	448.85				Shanghai	394.69			
Singapore	253.71				Singapore	329.47			
		744	52314.000	.000*			744	55829.000	.000*
Singapore	324.46				Singapore	409.05			
Taipei	406.06				Taipei	346.96			
		866	62921.500	.000*			866	63969.500	.000*
Shanghai	505.49				Shanghai	503.04			
Taipei	363.16				Taipei	365.55			

*p<.05

4.1.3 Themes use comparison

In the last part of this section, the following question is to be answered: based on the differentiation of the three cities (Shanghai, Singapore and Taipei), do cities have significant difference upon the residents' e-government themes use regarding whether residents having used, having not used or having no idea of such themes?

Table 34. Chi-Square Test Comparing Taxation Use

	City (%)			total	Pearson Chi-Square value	p
	Shanghai	**Singapore**	**Taipei**			
yes	328(28.0%)	230(19.6%)	269(23.0%)	827(70.6%)	32.431	.000*
no	81(6.9%)	53(4.5%)	137(11.7%)	271(23.1%)		
have no idea	19(1.6%)	23(2.0%)	32(2.7%)	74(6.3%)		
total	428	306	438	1172		

*p<.05

To answer the question altogether 15 use themes is examined in the present study. Here, the first theme use (taxation use) is taken as an example to demonstrate the analysis process. Chi-Square (χ^2) test is to be performed to identify if three types of cities have significantly different effects upon residents' taxation use. The test results indicated that three types of cities have significantly different effects upon

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the residents' taxation use, $\chi^2 = 32.431$, p = .000. Residents from Singapore reported the lowest use experience of both having used and having not used taxation among the three cities.

After demonstrating the example of analyzing the e-government taxation theme use, other 14 kinds of e-government themes use comparisons are also conducted. Detailed comparison table is presented as follows. For all these 15 cases, statistically significant differences can be identified for the three cities. For Shanghai, respondents with experience with these e-government use items always outnumbered those without experience with these themes use. However, the turnout is different in Singapore and Taipei. In these two cities eight and seven cases respectively are featured with more interviewees without experiencing such themes use than with experience. For Singapore, these themes are social welfare use, insurance use, disaster notice use, policy research use, environment protection use, convenience service use, problem complain use and business use. For Taipei, these themes with more no use experience are employment use, insurance use, environment protection use, education use, problem complain use, housing use and business use.

Table 35. Chi-Square Test Comparing E-government Themes Use

	Pearson Chi-Square value	p		Pearson Chi-Square value	p
Taxation	32.431	.000*	**Policies and Regulations**	101.864	.000*
Employment	64.564	.000*	**Environment Protection**	193.305	.000*
Social Welfare	195.507	.000*	**Education and Training**	82.559	.000*
Insurance	261.132	.000*	**Leisure and Entertainment**	109.639	.000*
Transportation	80.765	.000*	**Convenience Services**	169.508	.000*
Disaster Notice and Public Safety	104.027	.000*	**Problem Complain**	140.391	.000*
Medical and Health	64.904	.000*	**Housing**	118.971	.000*
			Business	156.826	.000*

*p<.05

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4.1.4 Conclusion

The questions about use comparison among the three cities is conducted as above through three perspectives: the e-government platforms use, the e-government functions use and the e-government themes use. In the conclusion part, the focus is set on the previous two kinds of e-government use, as the themes use is well interpreted above. The e-government platforms use and e-government functions use are to be observed in the present conclusion in the light of general ranking for the three cities.

Table 36. E-government Platforms Use Frequency Ranking

	SH	SG	TP
hotline	1	2	2
e-mail	1	2	1
portal	2	1	2
apps	1	2	2
SNS	1	3	2
public	1	2	1
other apps	1	2	2

Firstly, the overview of e-government platforms use ranking is presented in the table above. For Shanghai, the leading role is outstanding for six out of seven kinds of platforms use, while the e-government portals use is ranked at the second place. The finding may reveals an interesting question: why in such an authoritarian political entity citizens reported the highest frequency of e-government platforms use in most cases? The observation is then shifted to Singapore. Singapore witnesses one No.1 ranking of the e-government portals use. The rest platforms use frequencies are left behind. The result also leads to a question: why are the citizens in such a half democratic and half authoritarian entity like Singapore seemingly reluctant to use e-government platforms? At last, the rankings for Taipei is taken into overview. Compared with Singapore, Taipei demonstrated two cases in joint No.1 ranking: the e-mail use and the public platforms use. The rest of e-government platforms use frequency cannot compete

with those in Shanghai. Although the use frequency don't and should not serve as the one and only index for e-government platforms use acceptance, the ranking here can still offer some insights especially against the background of different political systems of the three cities.

Next, the e-government functions use is taken into general review. It is obvious for Shanghai that the city is consistently ranked at the first place for all the e-government functions use. The result conforms to the findings from the e-government platforms use which also highlights the first ranking place in all aspects. For Singapore, almost only the first three lower levels of information use are reported with second highest frequent use. Besides, the payment use in Singapore is also ranked at the second place, higher than that in Taipei. When the observation is shifted onto Taipei, it is interesting to find complimentary reflect of rankings of it to those in Singapore: the first three lower levels of information use in Taipei is less or equally frequently used as in Singapore, while from the fourth information use item on residents from Taipei reported a more frequent use. The rankings here do not follow the logic of half democratic and half authoritarian entity following the authoritarian entity and the democratic entity being left behind. Instead, the results demonstrate that hybrid entity (here, Singapore) can only lead at the very beginning of the e-government participation functions, while the democratic entity (here, Taipei) can top the hybrid one from the upper level of e-government functions use.

Table 37. E-government Functions Use Frequency Ranking

	SH	SG	TP		SH	SG	TP
browsing	1	2	3	hearing	1	3	2
open info	1	2	2	complain	1	3	2
pers. info	1	2	3	petition	1	3	2
info share	1	3	2	crowd f.	1	3	2
comment	1	3	2	voting	1	3	2
discuss	1	3	2	co. produ.	1	3	2
like	1	3	2	procedure	1	3	2
polling	1	3	2	payment	1	2	3

4.2 E-government platforms use and e-government functions use

In the second section the research question two is to be answered: what's the relation between the e-government platforms use and the e-government functions use (political participation)? Still, the question can also be understood as follows: how does the residents' e-government functions use contribute to their e-government platforms use? To answer the question, both platforms use and functions use are treated in the form of use factor instead of as individual use item. Thereafter which functions use factors contribute to which platforms use factor is examined by calculating the Pearson correlation coefficient and by employing stepwise multiple regression analysis consequently. By employing the Pearson correlation, collinearity of independent variables can be firstly noticed. By applying the stepwise multiple regression analysis method, weakest correlated independent variables are to be simultaneously removed at each steps and potential collinearity of independent variables can be avoided. In the end the variables that can explain the distribution best are to be remained.

Before answering the research question, e-government use factors are to be identified for both e-government platforms use and e-government functions use. E-government use factors are to be expected by treating use variables items by means of the factor analysis method, while Principal Component Analysis using Varimax with Kaiser Normalization whose rotation converged in 3 iterations is employed. Factors are formed, when their value of the cumulative extraction sums of squared loadings are recommendable to build up such factors.

For e-government platforms use, several explorations steps were conducted until the final factors are identified for all the three cities. In the first table below the result of trials is presented, while in the second table information about the final result factors is demonstrated. Three e-government platforms use factors with ideal cumulative extraction sums of squared loadings can be identified for all the

three cities, while the e-government SNS use stays as an individual kind of e-government platform use.

Table 38. Factor Analysis of E-government Platforms Use

	Shanghai Component			Singapore Component			Taipei Component		
	1	2	3	1	2	3	1	2	3
hot-lines use	-.597			.650			.686		
e-mails use	-.525			.587			.738		
portal use	.090	.836		-.188	.826		.739	.844	
mobile apps use	.005	.813		-.297	.844		.722	.784	
SNS use	.475	.783	.758	-.055	.748	.728	.658	.806	.731
public devices use	.285		.811	-.250		.816	.615		.767
third-party platforms use	.296		.837	-.231		.804	.587		.747
Cumulative Extraction Sums of Squared Loadings (%)	64.863	65.746	64.428	60.119	65.101	61.392	46.240	65.870	56.008

The e-government hot-lines use and e-mails use can be combined together as one factor, which is named as the e-government hotline-and-email use. The second factor is made up from e-government portal use and e-government mobile apps use. The factor is named as the e-government portal-and-apps use. Lastly, the third factor could be made up from the e-government public devices use and the e-government third-party platforms use. The factor is named as the e-government public-and-third-use in short.

Table 39. Cumulative Extraction Sums of Squared Loadings of E-government Platforms Use Factors

Factors	Variables	cumulative extraction sums of squared loadings		
		SH	SG	TP
Hotline-email Use	hot-lines use	84.080%	73.580%	80.541%
	e-mails use			
Portal-mobile Use	portal use	76.699%	78.555%	74.949%
	mobile apps use			
Public-third Use	public devices use	76.939%	75.110%	68.176%
	third-party platforms use			

As for e-government functions use, the same method is employed to identify factors for the three cities. Specifically speaking, factors are to be identified within

e-government information use and e-government consultation use. Results are demonstrated in the following tables.

Table 40. Factor Analysis of E-government Platforms Use

	Shanghai Component		Singapore Component		Taipei Component	
Information Use	1	2	1	2	1	2
open information browsing	.705		-.442		.637	
open information searching	.779		-.415		.575	
personal information requesting	.698		-.165		-.091	
information sharing	.833	.851	.129	.756	-.078	.827
information commenting	.781	.884	.622	.829	-.407	.909
discussion with fellow citizens	.813	.902	.604	.759	-.537	.886
Cumulative Extraction Sums of Squared Loadings (%)	59.276	77.315	68.281	61.188	78.259	76.508
Consultation Use						
making like and dislike	-.489		.768		.771	
taking part in polling	-.465		.719		.636	
taking part in hearing	-.003	.861	.805	.810	-.047	.850
complaining or protesting	.463	.816	.665	.719	-.303	.896
Petitioning	.580	.833	.737	.793	-.338	.909
taking part in crowd funding	-.035	.837	.651	.700	-.221	.873
Cumulative Extraction Sums of Squared Loadings (%)	78.194	70.039	52.729	57.298	79.725	77.821

Table 41. Cumulative Extraction Sums of Squared Loadings of Information Use and E-government Consultation Use

		cumulative extraction sums of squared loadings		
Factors	**Variables**	**SH**	**SG**	**TP**
E-government information use				
Low-effort	open information browsing	83.483%	89.529%	88.963%
	open information searching			
Middle-effort	personal information requesting	74.236%	79.259%	78.207%
	information sharing			
High-effort	information commenting	85.984%	72.983%	87.321%
	discussion with fellow citizens			
E-government consultation use				
Low-effort	making like and dislike	83.712%	77.079%	80.999%
	taking part in polling			
Middle-effort	taking part in hearing	70.039%	72.821%.	77.821%
	petitioning			
High-effort	complaining or protesting		61.256%	
	taking part in crowd funding			

In the first table, the result of two trials for each city is presented, while in the second table the finally formed factors are demonstrated. From the final version it can tell that the formed factors comply with the before-reviewed theory of participation ladder, by which the levels of participation are emphasized. To conclude, these factors from e-government information use are named as e-government low-effort information use, e-government middle-effort information use and e-government high-effort information use; accordingly, these factors from e-government consultation use are termed as e-government low-effort consultation use, e-government middle-effort consultation use and e-government high-effort consultation use.

Still, two discoveries should be clarified in the case of e-government consultation use. Firstly, only two factors are identified in Shanghai and in Taipei, while three factors are found in Singapore. As a result, no factor named as middle-effort consultation use is presented for Shanghai and Taipei. What's more, the high-effort consultation use from Shanghai and Taipei covers a wider spectrum (with four sub items in it) than that from Singapore (with two sub items in it). Secondly, the effort order of petitioning and complaining/protesting is exchanged in the table according to the result from Singapore. This finding can throw a new light on research of consultation participation effort level.

Then, the e-government decision-making use is taken into operation. Although the values are recommendable to form these two kinds of e-government decision-making use as a common factor, the factor forming is discarded mainly for the reason that actual referendum use runs far less than the reported frequency, especially in the cities of Shanghai and Taipei where the reported referendum use is unusually higher than actual practice. For this fact and the estimation that reporters may mistook the referendum as polling-like use, the factor analysis of referendum use and collaborative production use turns out be pointless in the

present research. What's more, in the interest of protecting the data of less misunderstood collaborative production, the two variables are separately treated.

Table 42. Factor Analysis of E-government Decision-making Use and Other E-government Use

decision making use variables	cumulative extraction sums of squared loadings			other e-government functions use variables	cumulative extraction sums of squared loadings		
	SH	**SG**	**TP**		**SH**	**SG**	**TP**
collaborative production Referendum	86.042%	85.114%	80.639%	administrative procedures use payment use	78.392%	72.434%	82.327%

At last, administrative procedures use and payment use serves are analyzed. Although the values are also recommendable to form these two kinds of e-government use as a common factor, they are still treated as individual function use in the present research because of the following reasons: in practice, the provision and the use of a certain service don't necessarily mean the provision and the use of the other service; individual exploration of the these two kinds of service may lead to more detailed insights.

After identifying all the factors for both e-government platforms use and e-government functions use, the relation between them is to be explored next. Following sections are arranged with the focus on four differentiated platforms factors, while the contribution of functions use is to be examined for each e-government platforms use factor as well as for the individual e-government SNS use.

4.2.1 Platforms hotline-email use factor & functions use

In the first part, the question is to be answered: how does the residents' e-government functions use contribute to e-government hotline-email use factor? From the intercorrelation coefficients between the dependent variable (e-government hotline-email use factor) and the independent variables (e-government functions use factors), a medium to high intercorrelation level can be

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identified for Shanghai. Besides, all the intercorrelations between independent variables are statistically significant.

Table 43. Inter-correlations between E-government Hotline-email Use Factor and E-government Functions Use in Shanghai

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
hotline-email	,332**	,499**	,486**	,483**	,622**	,602**	,570**	,522**	,405**
Predictors									
low info	-	,608**	,489**	,555**	,298**	,351**	,264**	,437**	,508**
middle info	-	-	,685**	,606**	,576**	,552**	,520**	,572**	,562**
high info	-	-	-	,772**	,621**	,623**	,584**	,533**	,577**
low consul	-	-	-	-	,608**	,618**	,532**	,527**	,625**
high consul	-	-	-	-	-	,720**	,701**	,565**	,475**
referendum	-	-	-	-	-	-	,721**	,552**	,490**
collaboration	-	-	-	-	-	-	-	,532**	,451**
procedures	-	-	-	-	-	-	-	-	,568**
payment	-	-	-	-	-	-	-	-	-

**correlation is significant at the 0.01 level (2-tailed)

From the result of stepwise multiple regression for Shanghai, five out of nine independent variables demonstrate that their predictability is statistically significant in terms of e-government hotline-email use. The multiple correlation coefficient between these five predictors and the e-government hotline-email factor is 0.687 and coefficient of determination (R^2) is 0.472, which means the five predictors can explain 47% variance of e-government hotline-email use factor.

Table 44. Stepwise Multiple Regression Analysis Test Scores between E-government Hotline-email Use Factor and E-government Functions Use in Shanghai

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,992	
high consul	,622	,387	,387	269,401***	269,401***	,260	,260
referendum	,661	,436	,049	164,602***	37,023***	,198	,193
procedures	,679	,461	,024	120,783***	19,113***	,165	,152
collaboration	,684	,467	,006	92,722***	5,065*	,117	,118
middle info	,687	,472	,005	75,502***	3,996*	,094	,094

* p <0.05 *** p <0.001

Besides, it can tell that the high-effort consultation factor, in which such functions use as hearing, petitioning, protesting, crowd-funding are included, contributes the most to the prediction of e-government hotline-email use with 38.7% of variance explanation effect size. From the Beta value it can tell that all these five predictors exert contribution in positive direction.

Next, the research result is to be introduced for Singapore. From the table below it can tell that the intercorrelations between the dependent variable (hotline-email use) and these predictors are all statistically significant. So are they among these predictors.

Table 45. Inter-correlations between E-government Hotline-email Use Factor and E-government Functions Use in Singapore

Variable	low info	middle info	high info	low consul	middle consul	high consul	referendum	collaboration	procedures	payment
hotline-email	,366**	,378**	,337**	,425**	,420**	,362**	,350**	,331**	,255**	,303**
Predictors										
low info	-	,505**	,286**	,317**	,267**	,213**	,159**	,142*	,440**	,450**
middle info	-	-	,399**	,376**	,391**	,302**	,255**	,293**	,367**	,370**
high info	-	-	-	,531**	,506**	,510**	,472**	,446**	,264**	,275**
low consul	-	-	-	-	,623**	,534**	,427**	,502**	,267**	,311**
mid consul	-	-	-	-	-	,707**	,628**	,641**	,315**	,254**
high consul	-	-	-	-	-	-	,489**	,500**	,249**	,186**
referendum	-	-	-	-	-	-	-	,702**	,215**	,227**
collaboration	-	-	-	-	-	-	-	-	,260**	,167**
procedures	-	-	-	-	-	-	-	-	-	,449**
payment	-	-	-	-	-	-	-	-	-	-

*correlation is significant at the 0.05 level (2-tailed)
**correlation is significant at the 0.01 level (2-tailed)

From all the ten independent variables, three e-government function use factors and one individual function use variable demonstrate that their predictability is statistically significant in terms of e-government hotline-email use in Singapore. The multiple correlation coefficient between these four predictors and the e-government hotline-email factor is 0.536 and coefficient of determination (R^2) is 0.288, which means the four predictors can explain 28.8% variance of e-government hotline-email use factor. Besides, it can tell that the low-effort consultation factor, in which such two functions use as liking/disliking and polling

are included, contributes the most to the prediction of e-government hotline-email use with 18.1% of variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 46. Stepwise Multiple Regression Analysis Test Scores between E-government Hotline-email use Factor and E-government Functions Use in Singapore

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,992	
low consul	,425	,181	,181	67,136***	67,136***	,232	,232
low info	,490	,240	,059	47,900***	23,659***	,188	,188
referendum	,522	,272	,032	37,681***	13,341***	,593	,183
middle info	,536	,288	,015	30,380***	6,442*	,149	,149

$* p < 0.05$ *** $p < 0.001$

At last, the case in Taipei is explored. From the table below it can tell that all the inter-correlations between dependent variables and predictors as well as those among predictors are statistically significant. Almost all of them indicates a medium to strong effect size.

Five out of nine e-government function use factors demonstrate that their predictability is statistically significant in terms of e-government hotline-email use in Taipei. The multiple correlation coefficient between these five predictors and the e-government hotline-email factor is 0.690 and coefficient of determination (R^2) is 0.476, which means these five predictors can explain 47.6% variance of e-government hotline-email use factor. Besides, it can tell that the middle-effort information use factor, in which such two functions use as personal information requesting and information sharing are included, contributes the most to the prediction of e-government hotline-email use with 36.9% of variance explanation effect size. When the result is held true, it is most likely that the personally information request contributes most to e-government hotline-email use, rather than information sharing, which is characterized through interaction between fellow citizens. Lastly, from the Beta value it can tell that all these five predictors exert contribution in positive direction.

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Table 47. Inter-correlations between E-government Hotline-email Use Factor and E-government Functions Use in Taipei

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
hotline-email	,454**	,607**	,533**	,515**	,493**	,517**	,440**	,564**	,441**
Predictors									
low info	-	,564**	,332**	,549**	,155**	,361**	,213**	,394**	,275**
middle info	-	-	,694**	,624**	,551**	,576**	,556**	,583**	,543**
high info	-	-	-	,561**	,670**	,521**	,564**	,526**	,495**
low consul	-	-	-	-	,390**	,677**	,452**	,544**	,453**
high consul	-	-	-	-	-	,533**	,727**	,537**	,548**
referendum	-	-	-	-	-	-	,613**	,598**	,513**
collaboration	-	-	-	-	-	-	-	,574**	,484**
procedures	-	-	-	-	-	-	-	-	,647**
payment	-	-	-	-	-	-	-	-	-

**correlation is significant at the 0.01 level (2-tailed)

Table 48. Stepwise Multiple Regression Analysis Test Scores between E-government Hotline-email Use Factor and E-government Functions Use in Taipei

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,612	
middle info	,607	,369	,369	254,841***	254,841***	,234	,234
procedures	,660	,436	,067	167,904***	51,469***	,229	,203
high consul	,670	,449	,013	117,693***	10,182**	,172	,172
low info	,686	,470	,021	96,004***	17,508***	,177	,177
referendum	,690	,476	,006	78,468***	4,881*	,117	,105

* p <0.05 ** p <0.01 *** p <0.001

To conclude briefly the research results of all the three cities, the effect size of prediction can be found in Shanghai with the largest (0.387), in Taipei with the medium large (0.369) and in Singapore with the weakest (0.181). Although e-government functions use factors with the strongest predictability are different in the three cities (high-effort consultation use in Shanghai, low-effort consultation in Singapore and middle-effort information use in Taipei), some commonality can still be found: the middle-effort information use and the referendum use (which can be probably understood as pooling use) demonstrate predictability for all the three cities; for Shanghai and Taipei both the high-effort consultation use and the

procedures use indicate certain degree of predictability, while for Singapore and Taipei the low-effort information use showcases such commonality.

4.2.2 Platforms portal-apps use & functions use

In the second part, answer to the following question is at target: How do the residents' e-government functions use factors contribute to their e-government portal and mobile apps use factor? The case in Shanghai is taken into examination at first. The correlations between the dependent variable (e-government portal and mobile phone apps use factor) and the independent variables (e-government functions use) as well as those among the independent variables are all statistically significant. Besides, all of them demonstrates effect sizes from medium to large.

Table 49. Inter-correlations between E-government Portal-Apps Use Factor and E-government Functions Use in Shanghai

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
portal-apps	,510**	,567**	,508**	,502**	,456**	,494**	,424**	,493**	,462**

**correlation is significant at the 0.01 level (2-tailed)

Four out of nine e-government function use factors stand out with statistically significant predictability in terms of e-government portals-apps use in Shanghai. The multiple correlation coefficient between these four predictors and the e-government portal-apps factor is 0.650 and coefficient of determination (R^2) is 0.423, which means these four predictors can explain 42.3% variance of e-government portal-apps use factor. Besides, it can tell that the middle-effort information use factor, in which such two functions use as personal information requesting and information sharing are included, contributes the most to the prediction of e-government portal-apps use with 32.2% of variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 50. Stepwise Multiple Regression Analysis Test Scores between E-government Portal-Apps Use Factor and E-government Functions Use in Shanghai

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,778	
middle info	,567	,322	,322	201,991***	201,991***	,226	,226
referendum	,607	,369	,047	124,152***	31,738***	,210	,205
low info	,641	,410	,041	98,322***	29,823***	,237	,237
procedures	,650	,423	,013	77,505***	9,288**	,160	,148

** p <0.01 *** p <0.001

Next, result from Singapore is reported. The correlations between e-government portal-apps use factor and e-government functions use are all statistically significant. However, the effect size is weak in at least six cases. Besides, the inter-correlation among these independent variables are all statistically significant, which is appropriate for stepwise multiple regression analysis in next step.

Table 51. Inter-correlations between E-government Portal-Apps Use Factor and E-government Functions Use in Singapore

Variable	low info	middle info	high info	low consul	middle consul	high consul	referendum	collaboration	procedures	payment
portal-apps	,574**	,418**	,206**	,296**	,246**	,218**	,193**	,190**	,471**	,449**

**correlation is significant at the 0.01 level (2-tailed)

Three of these ten e-government function use factors demonstrate statistically significant predictability in terms of e-government portals-apps use in Singapore. These factors as well as variables are actually those with strongest correlation coefficients with e-government portal-apps use. The multiple correlation coefficient between these three predictors and the e-government portal-apps factor is 0.640 and coefficient of determination (R^2) is 0.409, which means these four predictors can explain 40.9% variance of e-government portal-apps use factor. Besides, it can tell that the low-effort information use factor, in which such two functions use as opening information browsing and open information searching are included, contributes the most to the prediction of e-government portal-apps use with 32.9% of variance explanation effect size. From the Beta

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value it can tell that all these four predictors exert contribution in positive direction.

Table 52. Stepwise Multiple Regression Analysis Test Scores between E-government Portal-Apps Use Factor and E-government Functions Use in Singapore

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,778	
low info	,574	,329	,329	149,357***	149,357***	,402	,402
procedures	,623	,388	,059	96,180***	29,165***	,228	,217
payment	,640	,409	,021	69,747***	10,715*	,169	,171

* p <0.05 *** p <0.001

At last, the case in Taipei is examined. The correlations between the e-government portal-apps use factor and e-government functions use are all statistically significant, so are they among these e-government functions use factors. Besides, the majority of these correlations demonstrates a size effect with or above medium level.

Table 53. Inter-correlations between E-government Portal-Apps Use Factor and E-government Functions Use in Taipei

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
portal-apps	,666**	,558**	,340**	,468**	,258**	,357**	,310**	,408**	,338**

**correlation is significant at the 0.01 level (2-tailed)

Table 54. Stepwise Multiple Regression Analysis Test Scores between E-government Portal-apps Use Factor and E-government Functions Use in Taipei

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						1,027E-16	
low info	,666	,443	,443	346,853***	346,853***	,515	,515
middle info	,701	,492	,049	210,454***	41,687***	,267	,267

* p <0.05 *** p <0.001

Even though at least four correlations cases between these independent variables and the dependent variable indicate an effect size medium and above, only two of these e-government function use factors demonstrate statistically significant predictability in terms of e-government portals-apps use in Taipei. The multiple

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correlation coefficient between these two predictors and the e-government portal-apps factor is 0.701 and coefficient of determination (R^2) is 0.492, which means these two predictors can explain 49.2% variance of e-government portal-apps use factor. Besides, it can tell that the low-effort information use factor, in which such two functions use as opening information browsing and open information searching are included, contributes the most to the prediction of e-government portal-apps use with 44.3% of variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

To make a brief summary, two comparison findings from the three cities are presented: firstly, the independent variable with the largest predictability for Singapore and Taipei on e-government portal and mobile apps use is low-effort information use, which includes opening information browsing and open information searching, while for Shanghai the middle-effort information use can contribute the most to e-government portal-apps use factors (along with low-effort information use which can contribute with less effect to e-government-apps use); procedures use in Shanghai and Singapore can also contribute to e-government portal and mobile apps use with statistical significance, which cannot be testified for Taipei.

4.2.3 Platform SNS use & functions use

In the third part of the present section, the answer to the following research question is to be found: how do the residents' e-government functions use contribute to their e-government SNS use? The case from Shanghai is studied at first. These correlations between e-government SNS use and e-government functions use are all statistically significant, so are those correlations among e-government functions use.

Table 55. Inter-correlations between E-government SNS Use and E-government Functions Use in Shanghai

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
SNS use	,521**	,362**	,378**	,393**	,211**	,274**	,181**	,277**	,325**

<div align="right">**correlation is significant at the 0.01 level (2-tailed)</div>

Table 56. Stepwise Multiple Regression Analysis Test Scores between E-government SNS Use and E-government Functions Use in Shanghai

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						2,862	
low info	,521	,272	,272	159,130***	159,130***	,539	,442
high info	,540	,292	,020	87,615***	11,994**	,198	,162

<div align="right">** $p < 0.01$ *** $p < 0.001$</div>

After running the stepwise multiple regression, however, only two independent variables indicate statistically significant predictability in terms of e-government SNS use in Shanghai. The multiple correlation coefficient between these two predictors and the e-government SNS is 0.540 and coefficient of determination (R^2) is 0.292, which means these two predictors can explain 29.2% variance of e-government SNS use. Besides, it can tell that the low-effort information use factor, in which such two functions use as opening information browsing and open information searching are included, contributes the most to the prediction of e-government SNS use with 27.2% of variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

The case of Singapore is operated and the research result is presented in the following two tables. The correlations between the independent variable and the dependent variables indicate non-exceptionally statistical significance, so do these correlations among dependent variables.

Table 57. Inter-correlations between E-government SNS Use and E-government Functions Use in Singapore

Variable	low info	middle info	high info	low consul	middle consul	high consul	referendum	collaboration	procedures	payment
SNS use	,377**	,371**	,305**	,416**	,418**	,342**	,279**	,314**	,292**	,233**

<div align="right">**correlation is significant at the 0.01 level (2-tailed)</div>

Although only two correlations between the dependent variable and the independent variables indicate medium effect size, four out of ten independent variables demonstrate statistically significant predictability in terms of e-government SNS use in Singapore. The multiple correlation coefficient between these four predictors and the e-government SNS is 0.531 and coefficient of determination (R^2) is 0.282, which means these two predictors can explain 28.2% variance of e-government SNS use. Besides, it can tell that the middle-effort consultation use factor, in which such two functions use as hearing and petitioning are included, contributes the most to the prediction of e-government SNS use with 17.5% of variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 58. Stepwise Multiple Regression Analysis Test Scores between E-government SNS Use and E-government Functions Use in Singapore

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						1,614	
middle consul	,418	,175	,175	64,319***	64,319***	,193	,205
low info	,501	,251	,076	50,677***	30,742***	,193	,206
low consul	,522	,272	,022	37,672***	8,990**	,167	,178
middle info	,531	,282	,010	29,534***	3,998*	,112	,120

* p <0.05 ** p <0.01 *** p <0.001

At last, the prediction effect of e-government functions use on e-government SNS use is researched. The correlations between the dependent variable (e-government SNS use) and e-government functions use are all statistically significant. However, only two cases can be identified with a medium and above effect size. Besides, all the correlations among predictors are statistically significant.

Table 59. Inter-correlations between E-government SNS Use and E-government Functions Use in Taipei

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
SNS use	,601**	,434**	,266**	,559**	,098*	,305**	,189**	,292**	,209**

*correlation is significant at the 0.05 level (2-tailed)
**correlation is significant at the 0.01 level (2-tailed)

Still, three out of nine independent variables demonstrate statistically significant predictability in terms of e-government SNS use in Taipei, although only two correlations between the dependent variable and the independent variables indicate effect size medium and above. The multiple correlation coefficient between these three predictors and the e-government SNS is 0.669 and coefficient of determination (R^2) is 0.447, which means these three predictors can explain 44.7% variance of e-government SNS use. Besides, it can tell that the low-effort information use factor, in which such two functions use as open information browsing and open information searching are included, contributes the most to the prediction of e-government SNS use with 36.2% of variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 60. Stepwise Multiple Regression Analysis Test Scores between E-government SNS Use and E-government Functions Use in Taipei

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						2,550	
low info	,601	,362	,362	247,006***	247,006***	,522	,412
low consul	,661	,437	,075	168,595***	57,93***1	,478	,377
high consul	,669	,447	,011	117,124***	8,425**	-,143	-,113

* p <0.05 ** p <0.01 *** p <0.001

To compare the research result of the present part among the three cities, the contribution of low-effort information use (open information browsing and open information searching) should be highlighted: in Shanghai and Taipei, the low-effort information use contributes the most to e-government SNS use, while in Singapore, the low-effort information use can also explain 7.6% of e-government SNS use variance. Besides, it can be identified in Singapore and Taipei that low-effort consultation use (liking/disliking and polling) contributes to e-government SNS use to a certain degree (2.2% in Singapore and 7.5% in Taipei), while similar contribution cannot be found in Shanghai.

4.2.4 Platforms public-third factor & functions use

In the last part of the present section, the relation between e-government public and third party platforms factor and the e-government functions use is to be discovered. Question as follows is to be answered: how do residents' e-government functions use factors contribute to their e-government public platforms and third-party mobile apps use factor?

The case in Shanghai is examined at first. From the following table it can tell that all these inter-correlations are statistically significant. What's more, it is noteworthy that all the effect size of these correlations, no matter those between dependent variable and independent variables or those among independent variables, are at medium or above medium level.

Table 61. Inter-correlations between E-government Public-third Use Factor and E-government Functions Use in Shanghai

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
public-third use	,575**	,560**	,603**	,585**	,493**	,493**	,422**	,471**	,587**

**correlation is significant at the 0.01 level (2-tailed)

Four out of nine independent variables indicate statistically significant predictability in terms of e-government public devices and third party platforms use in Shanghai. The multiple correlation coefficient between these three predictors and the e-government public-third use factor is 0.722 and coefficient of determination (R^2) is 0.521, which means these three predictors can explain 52.1% variance of e-government public devices and third party platforms use factor. Besides, it can tell that the high-effort information and the low-effort information use factor contribute the most to the prediction of e-government public-third use with 46.7% of total variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 62. Stepwise Multiple Regression Analysis Test Scores between E-government Public-third Use Factor and E-government Functions Use in Shanghai

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,445	
high info	,603	,364	,364	243,446***	243,446***	,229	,229
low info	,683	,467	,103	185,980***	82,143***	,301	,301
payment	,712	,507	,040	145,403***	34,729***	,180	,229
high consul	,722	,521	,014	114,935***	12,106**	,152	,152

** $p < 0.01$ *** $p < 0.001$

The case of Singapore is analyzed next. All the correlations are statistically significant. Three correlations between the dependent variable and the independent variables indicate a medium effect size.

Table 63. Inter-correlations between E-government Public-third Use Factor and E-government Functions Use in Singapore

Variable	low info	middle info	high info	low consul	middle consul	high consul	referendum	collaboration	procedures	payment
public-third use	,501**	,512**	,364**	,371**	,353**	,276**	,253**	,256**	,303**	,521**

**correlation is significant at the 0.01 level (2-tailed)

Still, four independent variables indicate statistically significant predictability in terms of e-government public devices and third party platforms use in Singapore. The multiple correlation coefficient between these four predictors and the e-government public-third use factor is 0.657 and coefficient of determination (R^2) is 0.432, which means these four predictors can explain 43.2% variance of e-government public devices and third party platforms use factor. Besides, it can tell that the payment use and middle-effort information factor contribute the most to the prediction of e-government public-third use with 39.0% of total variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 64. Stepwise Multiple Regression Analysis Test Scores between E-government Public-third Use Factor and E-government Functions Use in Singapore

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,621	
payment	,521	,271	,271	113,285***	113,285***	,302	,306
middle info	,624	,390	,118	96,715***	58,658***	,247	,247
low info	,648	,420	,030	72,767***	15,570***	,205	,205
middle consul	,657	,432	,013	57,303***	6,754*	,124	,124

* $p < 0.05$ *** $p < 0.001$

At last, the case from Taipei is discovered. All the correlations are statically significant. It is noteworthy that almost all the effect sizes of the correlations between dependent variable and independent variables are at medium level.

Table 65. Inter-correlations between E-government Public-third Use Factor and E-government Functions Use in Taipei

Variable	low info	middle info	high info	low consul	high consul	referendum	collaboration	procedures	payment
public-third use	,399**	,572**	,445**	,497**	,418**	,423**	,428**	,465**	,575**

**correlation is significant at the 0.01 level (2-tailed)

Four out of the nine independent variables indicate statistically significant predictability in terms of e-government public devices and third party platforms use in Taipei. The multiple correlation coefficient between these four predictors and the e-government public-third use factor is 0.669 and coefficient of determination (R^2) is 0.447, which means these four predictors can explain 44.7% variance of e-government public devices and third party platforms use factor. Besides, it can tell that the payment use and middle-effort information factor contribute the most to the prediction of e-government public-third use with 42.6% of total variance explanation effect size. From the Beta value it can tell that all these four predictors exert contribution in positive direction.

Table 66. Stepwise Multiple Regression Analysis Test Scores between E-government Portal-apps Use Factor and E-government Functions Use in Taipei

Step	R	R Square	R Square Change	F	F Change	B	Beta
Constant						-,639	
payment	,575	,330	,330	215,078***	215,078***	,354	,357
middle info	,653	,426	,096	161,415***	72,487***	,243	,243
low consul	,665	,442	,016	114,580***	12,429***	,133	,133
low info	,669	,447	,005	87,511***	3,960*	,091	,091

$* p < 0.05 *** p < 0.001$

Comparing the research result of the three cities, three outstanding findings can be drawn out: firstly, both in Singapore and in Taipei the e-government payment use and the e-government middle-effort information use contribute the most to e-government public devices use and third-party platforms use, while in Shanghai the contribution of high-effort information use is remarkable; low-effort information use still plays a notable role in e-government public-third use factor in Shanghai, while its effect in Singapore and Taipei is far less prominent; although consultation use is overshadowed by other stronger effect size independent variables, consultation use of low-effort (in Taipei), middle-effort (in Singapore) and high-effort (in Shanghai) can still be found.

By concluding the present section, the statistical significant contributors to each e-government platforms use are collected in the following table. For all the platforms use, no common prominent contributors are found for all the three cities. However, three cases can be identified with a common strong contributor for two cities. They are: low-effort information use factor to e-government portal-apps use factor in Singapore and in Taipei; low-effort information use factor to e-government SNS use in Shanghai and in Taipei; payment use and middle-effort information use factor to e-government public-third use factor in Singapore and Taipei. From the result it can tell that resident users do accomplish certain e-government function on specific e-government platforms, although preference patterns cannot yet be generalized to all the three cities. However, when the observation unite is concentrated on each individual cities, the use preference is

more obvious: for each city, the strongest e-government function use contributors to each e-government platforms use factors are not always the same ones. This means residents are supposed to choose the most appropriate platforms to fulfill certain e-government functions use.

Table 67. Summary of Statistical Significant Contributor to E-government Platforms Use

Shanghai	R Square	R Square Change	Singapore	R Square	R Square Change	Taipei	R Square	R Square Change
hotline-email factor								
high consul	,387	,387	low consul	,181	,181	middle info	,369	,369
referendum	,436	,049	low info	,240	,059	procedures	,436	,067
procedures	,461	,024	referendum	,272	,032	high consul	,449	,013
collaboration	,467	,006	middle info	,288	,015	low info	,470	,021
middle info	,472	,005				referendum	,476	,006
portal-apps factor								
middle info	,322	,322	low info	,329	,329	low info	,443	,443
referendum	,369	,047	procedures	,388	,059	middle info	,492	,049
low info	,410	,041	payment	,409	,021			
procedures	,423	,013						
SNS use								
low info	,272	,272	middle consul	,175	,175	low info	,362	,362
high info	,292	,020	low info	,251	,076	low consul	,437	,075
			low consul	,272	,022	high consul	,447	,011
			middle info	,282	,010			
public-third factor								
high info	,364	,364	payment	,271	,271	payment	,330	,330
low info	,467	,103	middle info	,390	,118	middle info	,426	,096
payment	,507	,040	low info	,420	,030	low consul	,442	,016
high consul	,521	,014	middle consul	,432	,013	low info	,447	,005

4.3 E-government use and use intention

In the present section, the research question three is to be answered: what's the relation between the e-government use and the use intention? Still, the question can be understood as follows: how are the residents' e-government use and their

use intention correlated with each other? To answer this question, three parts from the database under e-government use (the platforms use, the functions use and the themes use) and their related use intention are drawn out. Unlike the bundled platforms use factors and bundled functions use factors deployed in the last section, here in the present section use items are treated as individuals. The Spearman correlation coefficients are used here as index for the correlation between the platforms and functions use and the use intention, as the analyzed data is ordinal. The Mann-Whitney U test is adopted for the correlation between the themes use and the use intention, as the themes use is binary and the use intention data is ordinal.

4.3.1 Platforms use and use intention

In the first part of the section, the following question is to be answered: how are the residents' e-government platforms use and their use intention correlated with each other? Shanghai is firstly taken into exploration. Altogether seven kinds of e-government platforms use are to be examined. The results of correlations exploration are listed as follows.

Generally speaking, the Spearman correlation coefficients between the e-government platforms use and use intention in Shanghai are all statistically significant. However, the effect sizes are merely medium and below. The largest effect sizes can be traced back to the most traditional rather than newly-coming e-government platforms: the hotline use and the e-mail use. Compared to the newly-coming e-government use platforms, SNS for example which indicates very low degree of effect size and the traditional e-government platforms demonstrate a relative higher use loyalty. This may lead to the question: why do the newly developed e-government platforms enjoy far less effect size of the correlation between usages and use intention. It is worth further research to check if the higher intention is less well contented, while the higher use frequency somehow cannot bring about higher use intention.

Table 68. The Predicted Variance (in %) of E-government Platforms Use by Platforms Use Intention in the Three Cities

	hot-lines	E-mail	portal	apps	SNS	public	third
SH	12.0**	17.1**	5.8**	8.4**	2.2**	7.4**	5.8**
SG	9.6**	9.2**	9.1**	15.7**	13.7**	13.4**	10.0**
TP	17.2**	16.8**	9.9**	10.6**	16.6**	16.2**	11.8**

**correlation is significant at the 0.01 level (2-tailed)

For Singapore, all the Spearman correlation coefficients are statistically significant with a medium effect size. However, unlike the findings from Shanghai which emphasize a relatively larger effect size of the two traditional e-government platforms use (the hot-line and the e-mail), here in Singapore no such cases have been found. That means all the effect size between e-government platforms use and use intention in Singapore share almost similar level of explanatory effect.

For Taipei in the light of correlation between e-government platforms use and the use intention, all the correlations are statistically significant with a medium effect size. For the two traditional e-government platforms (the hot-line and the e-mail), the similar findings have been found as in Shanghai: the correlations for these two platforms witness a larger effect size. The outstanding effect size is followed by that of such newly developed platforms as e-government mobile apps, SNS platforms and public devices. However, the effect size of such other newly developed platforms as e-government portal and other third-party apps is smaller. From the distribution of correlation coefficients from these three cities, a conclusion can be made that the effect size differentiation between conventional and newly-coming platforms is outstanding in Taipei, followed by Shanghai, while in Singapore the least differentiation emerges. The other way around, it may be explained by the adoption and the intention to use such platforms from user' side and by the promotion and development of such platforms from government's side in the three cities.

4.3.2 Functions use and use intention

In the second part of the present section, the question is to be answered: how are the residents' e-government functions use and their use intention correlated with each other? The Spearman correlation coefficients are presented as index to answer the question and the functions are treated as individuals instead of factors. Shanghai is taken into examination firstly and the information use items are presented at the first place, within which six items are included.

Table 69. The Predicted Variance (in %) of E-government Functions Use by Platforms Use Intention in the Three Cities

	browse	research	request	sharing	comment	discuss
SH	7.0**	3.8**	8.7**	6.6**	12.0**	12.5**
SG	11.3**	10.1**	11.5**	4.3**	14.6*	7.3**
TP	6.9**	5.7**	9.9**	8.0**	15.0*	15.1**
	liking	**pooling**	**hearing**	**complain**	**petition**	**funding**
SH	10.9**	7.3**	13.8**	12.6**	14.3**	16.8**
SG	6.3**	7.5**	4.0**	6.0**	8.3**	16.8**
TP	14.9**	10.9**	13.0**	10.3**	10.3**	14.0**
	referendum	**production**	**procedures**	**payment**		
SH	10.3**	13.8**	5.2**	6.7**		
SG	4.1*	3.2**	18.5**	8.6**		
TP	3.0*	7.0**	1.4*	8.0**		

**correlation is significant at the 0.01 level (2-tailed)
*correlation is significant at the 0.05 level (2-tailed)

For Shanghai, it is observable that all but one cases of the e-government information demonstrate a medium effect size. Besides and all the correlations are statistically significant. What's more, the lower levels of information use witness relatively lower effect size, vice versa. Such information functions as commenting and discussing indicate the largest effect size. Besides, all the correlations of e-government consultation are statistically significant with a medium effect size. Still, the same tendency can be found as from the information use: the lower levels of consultation use witness lower effect size, vice versa. For the last four items, all the correlations are statistically significant with a medium effect size and the

decision making use (the first two items) demonstrate a higher effect size than the last two items. The contrast is obvious to observe. It is worth further exploration to find out if the residents' use intention in Shanghai are less well met by their actual use, or the other way around. No matter what the situation is, the differentiation between lower effect size groups and the higher effect size groups is clear to identity.

For Singapore, all the correlations of the e-government information are statistically significant and all but one is with medium effect size. A tendency is also found for the information scales, although it is unlike the one found in Shanghai which stresses the lower level of information comes along with the lower effect size. The tendency here for Singapore is just contrary to that from Shanghai: the lower levels of information enjoy a higher effect size, vice versa and the commenting use even demonstrates a minimal effect size. Besides, although all the correlations of e-government consultation are statistically significant with a medium effect size, there are less differentiation has been found between the consultation items as that in Shanghai. Besides, as the result of the last four items can tell that all the correlations are statistically significant. However, the effect sizes can be differentiated from each other: the decision making group demonstrates a much lower effect size than the last two items. For Shanghai the results are totally the other way around. That is to say that the information use and the other four functions use deliver a contrary result between Shanghai and Singapore in the light of correlation between use and use intention. For Taipei, all the correlations of e-government information are statistically significant with a medium effect size. Still, tendency can be observed for Taipei as that in Shanghai: the lower levels of information use witness lower effect size, vice versa. On the other hand, the tendency shared by Shanghai and Taipei is just on the contrary to that from Singapore. Besides, all the correlations of e-government consultation are statistically significant with a medium effect size.

The tendency is somewhat like that from Singapore which emphasizes that no observable differences between the consultation use are present. The result of the last four functions is different from that both in Shanghai and in Singapore. No tendency between the decision making group and the other group can be identified, while differentiation can be found within the groups. The collaborative production and the payment use from each groups enjoy larger effect size than the rest of use items. Till now, three different patterns have been found from three cities which could advance the research in the future: why do the decision making and the transaction differ so intensely in terms of the correlation between use and use intention for the three cities.

4.3.3 Themes use and use intention

The third and the last aspect to discover for the research question three concentrates on the e-government themes use. The concrete question can be formulated as follows: how are the residents' e-government themes use and their use intention correlated with each other? To answer the question the Mann-Whitney U test is undertaken. All the themes of a certain city are presented for a glance in the following tables. Mann-Whitney U tests were performed to identify if there were significant differences between the different themes use groups (yes use versus no use) for surveyed residents in regard to their ordinal scores in different themes use intention.

The first glance is thrown to the themes use in the light of the use intention in Shanghai. There was a significant difference between the yes or no themes use for the residents surveyed in Shanghai, in regard to their ordinal scores in all the themes use intentions. The result can be interpreted as below: on average, residents reporting yes of certain themes use having higher use intention than residents reporting no use of these themes.

Table 70. Mann-Whitney U Test Comparing E-government Themes Use in Shanghai

	M	U	∑N	p		M	U	∑N	p
taxation		9606.500	409	.000*	**employ**		12401.000	412	.000*
Yes	216.21				**Yes**	221.89			
No	159.60				**No**	166.28			
welfare		11017.000	404	.000*	**insuranc**		11016.000	414	.000*
Yes	213.96				**Yes**	218.10			
No	164.70				**No**	168.78			
transport		8791.000	417	.000*	**disaster**		14280.500	406	.000*
Yes	217.81				**Yes**	222.72			
No	163.78				**No**	170.70			
health		8336.500	417	.000*	**policies**		10854.000	410	.003*
Yes	219.54				**Yes**	213.81			
No	155.82				**No**	172.77			
environm		10897.500	410	.000*	**educatio**		12321.500	408	.000*
Yes	223.03				**Yes**	221.01			
No	155.85				**No**	163.92			
leisure		10966.500	412	.000*	**convien**		8839.000	418	.009*
Yes	234.41				**Yes**	215.67			
No	149.23				**No**	174.06			
complain		15931.000	409	.000*	**housing**		14292.500	412	.000*
Yes	234				**Yes**	223.95			
No	175				**No**	172.59			
business		12361.500	410	.000*					
Yes	248.69								
No	164.36								

*p<.05

Next, cases from Singapore are taken into examination. The result indicates that there was no significant difference between themes use for the sampled residents in Singapore in regard to their ordinal scores in e-government use intention in transport use intention or housing use intention. However, there was a significant difference for the rest cases: that is to say, residents having used such e-government themes demonstrate higher scores than residents reporting no experience with certain e-government themes.

Table 71. Mann-Whitney U Test Comparing E-government Themes Use in Singapore

	M	U	∑N	p		M	U	∑N	p
taxation		4516.500	283	.000*	employ		8055.000	280	.000*
Yes	148.86				Yes	149.78			
No	112.22				No	127.76			
welfare		5675.000	274	.031*	insuranc		5738.500	271	.035*
Yes	155.52				Yes	153.11			
No	131.78				No	130.27			
transport		8844.000	283	.114	disaster		5708.000	275	.018*
Yes	148.81				Yes	157.56			
No	133.64				No	131.57			
health		7295.500	287	.001*	policies		7797.500	283	.001*
Yes	155.28				Yes	158.48			
No	123.23				No	127.80			
environm		5166.500	273	.015*	educatio		8148.500	284	.008*
Yes	158.30				Yes	153.93			
No	130.87				No	128.17			
leisure		7564.500	270	.000*	convien		6705.000	270	.000*
Yes	146.87				Yes	154.70			
No	133.61				No	121.04			
complain		4253.000	272	.001*	housing		9506.000	293	.316
Yes	166.74				Yes	150.89			
No	129.01				No	140.89			
business		3907.500	281	.001*					
Yes	176.09								
No	133.77								

*p<.05

At last, significant differences between two kinds of use experiences (yes use versus no use) for residents in Taipei in regard to their ordinal scores in themes use intention are explored. The result indicates that there was no significant difference in complaining use intention. However, significant difference in all the other themes use can be identified. On average, residents having used such themes reported higher themes use intention than residents having never used these themes.

Table 72. Mann-Whitney U Test Comparing E-government Themes Use in Taipei

	M	U	∑N	p		M	U	∑N	p
taxation		13927.000	406	.000*	employ		18210.000	.001	.001*
Yes	220.23				Yes	230.45			
No	170.66				No	193.40			
welfare		16672.000	412	.006*	insuranc		15885.000	401	.031*
Yes	218.63				Yes	217.72			
No	185.97				No	192.13			
transport		13499.000	423	.001*	disaster		16411.000	410	.000*
Yes	223.87				Yes	226.81			
No	178.22				No	182.23			
health		17077.000	405	.039*	policies		16569.500	398	.006*
Yes	212.19				Yes	213.18			
No	188.17				No	182.59			
environm		16416.000	400	.002*	educatio		16535.500	407	.003*
Yes	219.30				Yes	224.56			
No	184.96				No	190.27			
leisure		13916.500	410	.000*	convien		12474.000	415	.000*
Yes	221.76				Yes	221.00			
No	171.64				No	170.58			
complain		14573.500	390	.685	housing		14732.000	396	.023*
Yes	199.20				Yes	217.00			
No	194.14				No	189.77			
business		6400.000	388	.000*					
Yes	246.21								
No	185.78								

*p<.05

To sum up the difference between e-government themes use in regard to themes use intention: one to two cases demonstrating no significant difference in each city can be found; however, the overwhelming majority cases indicate a significant difference between the use groups and the non-use group. Generally speaking, residents belonging to the yes-use group reported higher score of themes use intention than the residents in no-use group.

4.4 E-government use and categorical/ordinal PPFs

From this section to the next one, the research question four is to be answered: how do the political participatory factors predict e-government use? For political participatory factors consist of three different kinds of data on one hand, too many categorical predictors as dummy variables which could result in multicollinearity in multiple regression can hamper the stability of analysis on the other hand, the analysis of the PPFs data is confronted with a data splitting into at least two parts. In this present section, political participative factors data in forms of categorical and ordinal independent variables are taken into research, while interval data is to be studied in the next section.

The selected political participative factors in the present section consist of two kinds: the categorical PPFs selected out are mostly from the resource category of the PPFs which contains the money contribution, the time contribution, the language spoken at home, and the score groups of the citizen duty and the citizen engagement, while the ordinal PPFs selected out consists of three variables which are the civic skills, the political efficacy plus and the political privacy plus.

To answer the research question four "how do the political participatory factors predict e-government use" with these categorical and ordinal PPFs, two kinds of analysis strategies are employed.

Table 73. Approaches of Analyzing the Influence of Categorical/ordinal PPFs on E-government Use

	Analysis approaches	predictors	response
1.	ordinal polytomous logistic analysis	categorical, ordinal	internal, ordical
2.	independent t-test	categorical	interval
	Mann-Whitney U test		ordinal
	ANOVA or Kruskal-Wallis H test	ordinal	interval
	Kruskal-Wallis H test		ordinal

Firstly, ordinal polytomous logistic regression is applied to identify which PPFs can demonstrate statistically significant prediction on e-government use. Secondly, considering multicollinearity of predictors can still hamper ordinal

polytomous logistic regression and no prediction significance can be consequently determined, the categorical PPFs is studied by the independent t-test when the corresponding dependent variables are interval, while the categorical PPFs is examined by the Mann-Whitney U test when the corresponding dependent variables are ordinal; what's more, the ordinal PPFs are to be analyzed by ANOVA when the e-government use data is interval or by Kruskal-Wallis H test when the test of homogeneity of variance is not satisfied, while the ordinal PPFs is studied by the Kruskal-Wallis H test when the e-government use data is ordinal. A brief visual presentation of these two approaches are showcased in the table above.

Table 74. Factor Analysis of Citizenship Norms

	Shanghai Component		Singapore Component			Taipei Component	
	1	2	1	2	3	1	2
	(engaged)	(duty)	(engaged)	(engaged)	(duty)	(engaged)	(duty)
World	**,867**		**,825**	,216	,145	**,676**	,254
Help	**,864**	,132	**,798**	,165	,328	**,643**	,410
Ethic	**,719**	,322	**,711**	,359	,221	**,754**	,184
Military	**,661**	,288	**,637**		,310	**,672**	-,128
Tax	,192	**,869**	,142		**,892**		**,900**
Law	,141	**,844**	,229		**,854**		**,893**
Elect	,515	,502		,454	**,649**	,185	**,824**
Govt	,562	**,579**		**,793**	,354	,397	**,698**
Group	**,689**	,409	,406	**,703**		**,725**	,138
Opinion	**,679**	,332	,414	**,661**	,171	**,589**	,489

(Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.)

Before taking these approaches, one independent variable, the citizen norms, still should be pre-treated. Factor analysis is undertaken here to find out two kinds of good citizen norms. After extraction these items can be grouped as at least two factors. One of the factors is featured as engaged-oriented, the other one as duty-oriented. Duty-oriented is characterized with tax (never evade taxes), law (always obey laws), elect (always vote). In the case of Singapore, all the three factors can best fit in the factor. Meanwhile, it is interesting to find that the elect factor in

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Shanghai as a duty-based citizen norm is overshadowed a little by that as an engaged norm. Considering a universal suffrage is not a matter of fact there, the founding in Shanghai is reasonable. Besides, in Taipei the factor government (keep watch on the actions of government) belongs more to the duty-bundle, which doesn't conform to the previous study (W.-C. Chang, 2016). The same situation can also be found in the case of Shanghai. It might be caused by mentality change in these two political entities.

Table 75. K-means Clustering Table Comparing Citizen Norms

	Shanghai Cluster		Singapore Cluster		Taipei Cluster	
	1, lower	2, higher	1, lower	2, higher	1, lower	2, higher
Duty-based Citizen Norms						
Tax	4	5	3	5	3	5
Law	4	5	3	5	3	5
Elect	3	4	3	4	3	4
Engaged Citizen Norms						
Govt	4	5	3	4	4	4
Group	3	5	3	3	3	4
Opinion	4	5	3	4	3	4
Ethic	3	5	3	4	3	4
Help	3	4	3	4	3	4
World	3	4	3	4	3	4
Military	3	5	3	4	3	3

However, in the present work the item government is still grouped into engaged norm for three reasons: firstly, in Shanghai the factor government carries just a little more loading in duty-based norm than in engaged norm; secondly, in Singapore it can be undoubtedly grouped to engaged norm; thirdly, in Taipei it was testified in the previously mentioned work that the factor can be grouped to engaged form, although in the present work is not the case. To sum up, two factors are settled down in the present work with three factors for engaged norms, seven for duty norms.

A further step is undertaken here to identify the lower score group and the higher score group in each factor. The mean value of the duty-factor and the mean value

of the engaged-factor are calculated. Thereafter, a lower score group and a higher score group can be identified by adopting k-means clustering. The k-means values of each group are presented in the following table.

4.4.1 E-government platforms use and the categorical/ordinal PPFs

In the first part of the present section, the e-government platforms use is still examined in three factors and one individual SNS use as being already conducted in the section 4.2. Besides, in accordance with the reasoning about analysis approaches above, two kinds of analysis result are reported. Firstly, the result from ordinal polytomous logistic analysis is to be demonstrated for all the three cities in the light of the prediction of categorical and ordinal PPFs on e-government platforms use.

In the following table, key statistics of these logistic analyses are presented. Considering the model fitting significance value ($p < 0.05$) and the parallel fined significance value ($p > 0.05$) in combination, some qualified cases are identified: one case in Shanghai and in Taipei, three cases in Singapore.

For both Shanghai and Singapore, the e-government portal-apps use factor can be predicted by three PPFs. Civic skills can exert positive influence on e-government portal-apps use, while citizen duty can have negative influence on e–government portal-apps use. Furthermore, it is also interesting to observe that people with higher citizen engagement norms in Singapore use e-government portal-apps less frequently.

For both Singapore and Taipei, the e-government public-third use factor can be predicated by some PPFs. However, no common predictive variables are identified. For the interviewees from Singapore, the civic skills plays an important role in positively predicting e-government public-third use.

However, the predictors are different in Taipei. Both money donation and citizen engagement norms can predict e–government public-third use in negative

direction. This reveals that residents with no money donation and with proactive willingness in politics use less frequently public-third platform.

Table 76. Ordinal Polytomous Logistic Analysis of Categorical/ordinal PPFs Prediction on E-government Platforms Use

Response	Model Fitting Sig.	Parallel Lines Sig.	Predictors	Estimate	Sig.
			Significant Parameter Estimates		
Shanghai					
hotline-email	,000	,000	**civic.skills1**	,376	,000
			money	1,608	,000
portal-apps	,000	,626	**civic.skills1**	,307	,002
			money	,814	,000
			citizen.duty	-,695	,003
SNS	,000	,000	**pol.priv.plus**	,302	,000
			money	,574	,012
public-third	,000	,000	**pol.priv.plus**	,213	,010
			time	-,978	,000
			language3	1,877	,046
			citizen.engaged	-,465	,036
Singapore					
hotline-email	,065	,000	**time**	-1,442	,019
portal-apps	,000	,050	**civic.skills1**	,344	,002
			citizen.duty	-,598	,013
			citizen.engaged	-,446	,049
SNS	,001	,999	**-**	-	-
public-third	,001	1,000	**civic.skills1**	,304	,007
Taipei					
hotline-email	,000	,000	**civic.skills1**	,201	,034
			money	-1,040	,000
			time	,969	,000
portal-apps	,000	,000	**money**	-,580	,032
			time	,652	,006
SNS	,000	,000	**time**	,584	,016
			citizen.duty	-,822	,001
public-third	,000	,488	**money**	-,794	,003
			time	,843	,000
			citizen.engaged	-,504	,010

From the result of logistic analysis it can tell that only four out of twelve analyses are statistically significant. Thus, the above-mentioned second approach is to be undertaken to furtherly explore whether there are influence differences from these

categorical variables on e-government platforms use. As the second analysis approach is to be repeatedly applied to four kinds of e-government platforms factors, only the first case is presented below as an example. Research result is to be summarized in the conclusion part of the present section.

Table 77. Independent T Test Comparison of the Categorical PPFs on E-government Hotline-email Use in Shanghai

Variable	M	SD	t	df	p
MoneyContribution			10.444	419.137	.000**
Yes	2.2867	.84320			
No	1.5222	.66805			
TimeContribution			-7.623	418.949	.000**
Yes	1.6111	.67799			
No	2.1935	.89915			
CivicSkillsLanguage			-1.102	402	.271
Mandarin Chinese	1.9118	.84910			
Wu-Chinese	2.0114	.85709			
CitizenDuty			-3.560	426	.000**
lower	1.6917	.78640			
higher	2.0146	.86402			
CitizenEngaged			-4.538	426	.000**
lower	1.7199	.78561			
higher	2.0886	.87367			

$(^{**}p<0.001)$

The hotline-email use factor is examined for Shanghai as an example case. Independent T tests were performed to identify if there were significant differences for money contribution, time contribution, language spoken at home, citizen duty groups and citizen engagement groups for Shanghaier residents in regard to their hotline-email use frequency scores. The result indicates that there was no significant difference between civic language skills for the sampled Shanghaier residents in regard to their hotline-email use. However, there was a significant difference between the money contribution t (419.137) = 10.444, p<0.001, the time contribution t (418.949) = -7.623, p<0.001, the citizen duty t (426) = -3.560, p<0.001 and the citizen engagement t (426) = -4.538, p<0.001. On average, residents reporting each following PPF (money contribution, no time

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contribution, higher citizen duty, or higher citizen engagement) score higher frequency of hotline-email use in Shanghai.

For the rest independent variables of PPFs in form of ordinal data, the one-way analysis of variance is adopted to check if there is a statistically significant difference among these ordinal groups. Due to length limit, no post hoc analysis is presented in the study. For e-government hotline-email use in Shanghai, no statistically significant differences were found among the political efficacy plus, $F_{(3, 423)} = 2.070$, $p = .084$ and the political privacy plus, $F_{(3, 423)} = 1.397$, $p = .234$. However, a statistically significant difference was identified among the civic skills in regard to residents' e-government hotline-email use factor, $F_{(3, 423)} = 10.234$, $p < 0.001$.

Table 78. One-Way ANOVA Summary Table Comparing Different Civic Skills Levels in Regard to E-government Hotline-email Use in Shanghai

	Sum of Squares	df	Mean Square	F	Sig.
Civic Skills					
Between Groups	27.511	4	6.878	10.234	.000**
Within Groups	284.271	423	.672		
Total	311.782	427			

($^{**}p<0.001$)

Table 79. Means and Standard Deviations Comparing Different Civic Skills Levels in Regard to E-government Hotline-email Use in Shanghai

	n	M	SD
Civic Skills			
strongly disagree	12	1.2083	.33428
	48	1.6042	.72902
	140	1.7893	.85045
	141	1.9858	.81928
strongly agree	87	2.3161	.85967

Results of the categorical independent PPFs for all the e-government platforms use factors from the three cities are presented in the following tables. In the first table, result from Shanghai is reported. For almost all these cases (except three

cases of languages spoken at home) statistically significant differences can be identified between the groups within each item.

Table 80. Mann-Whitney U Test and Independent T Test Comparison of the Categorical PPFs on E-government Platforms Use in Shanghai

	E-government Hotline-email Use					Portal-apps Use				
	M	SD	t	df	p	M	SD	t	df	p
Money Contribution			10.444	419.137	.000**			6.387	426	.000**
Yes	2.2867	.84320				2.5489	.85816			
No	1.5222	.66805				2.0025	.91128			
Time Contribution			-7.623	418.949	.000**			-5.228	426	.000**
Yes	1.6111	.67799				2.0455	.92920			
No	2.1935	.89915				2.5000	.86791			
CivicSkillsLanguage			-1.102	402	.271			-1.098	402	.273
Mandarin Chinese	1.9118	.84910				2.2868	.90127			
Wu-Chinese	2.0114	.85709				2.3939	.95716			
CitizenDuty			-3.560	426	.000**			-4.809	426	.000**
lower	1.6917	.78640				1.9542	.88640			
higher	2.0146	.86402				2.4205	.90655			
CitizenEngaged			-4.538	426	.000**			-3.831	426	.000**
lower	1.7199	.78561				2.1021	.94801			
higher	2.0886	.87367				2.4409	.87738			

	SNS Use				Public-devices-and-third-party-apps Use				
	M	U	∑N	p	M	SD	t	df	p
Money Contribution		17900.000	428	.000**			6.445	426	.000**
Yes	236.44				2.8311	1.05556			
No	190.18				2.1798	1.03093			
Time Contribution		19501.000	428	.007*			-8.931	425.432	.000**
Yes	197.99				2.0606	.90198			
No	228.71				2.9196	1.08737			
CivicSkillsLanguage		15824.000	428	.043*			1.038	402	.300
Mandarin Chinese	194.68				2.5790	1.09772			
Wu-Chinese	218.62				2.4583	1.09482			
CitizenDuty		15345.500	428	004*			-4.809	426	.000**
lower	188.38				2.1625	1.06148			
higher	224.68				2.6623	1.07365			
CitizenEngaged		19835.500	428	.021*			-5.497	426	.000**
lower	199.85				2.2094	1.04661			
higher	226.31				2.7743	1.06499			

(*p<0.05, **p<0.001)

Table 81. Mann-Whitney U Test and Independent T Test Comparison of the Categorical PPFs on E-government Platforms Use in Singapore

	E-government Hotline-email Use					Portal-apps Use				
	M	SD	t	df	p	M	SD	t	df	p
Money Contribution			-2.167	304	.031*			-3.257	304	.001*
Yes	1.6586	.77080				2.3741	1.07368			
No	2.0938	.96986				3.2813	1.27761			
Time Contribution			-2.477	13.411	.027*			-2.148	304	.033*
Yes	1.6421	.73534				2.3921	1.08465			
No	2.5000	1.28602				3.0357	1.30773			
CivicSkillsLanguage			2.026	263.020	.044*			2.026	263.020	.044*
English	1.7800	.91130				2.6267	1.21399			
Mandarin Chinese	1.5920	.62017				2.2960	.94846			
CitizenDuty			-1.134	304	.258			-4.200	238.624	.000**
lower	1.6071	.75386				2.0765	.89774			
higher	1.7163	.80086				2.5841	1.15214			
CitizenEngaged			-2.304	303.107	.022*			-3.484	303.341	.001*
lower	1.5714	.68270				2.1893	1.00800			
higher	1.7741	.85557				2.6175	1.14140			

	SNS Use				Public-devices-and-third-party-apps Use				
	M	U	∑N	p	M	SD	t	df	p
Money Contribution		1341.000	306	.001*			-2.884	304	.004*
Yes	150.12				1.9190	.98754			
No	214.69				2.6563	1.13606			
Time Contribution		1109.000	306	.001*			-2.213	304	.028*
Yes	150.30				1.9298	1.00567			
No	220.29				2.5357	.88718			
CivicSkillsLanguage		9329.000	306	.937			1.003	273	.317
English	137.69				2.0333	1.02922			
Mandarin Chinese	138.37				1.9120	.96106			
CitizenDuty		9039.000	306	.069			-2.712	235.756	.007*
lower	141.73				1.7500	.84111			
higher	159.04				2.0553	1.06461			
CitizenEngaged		9758.500	306	.006*			-2.286	304	.023*
lower	140.20				1.7714	.93565			
higher	164.71				2.1145	1.04105			

(*p<0.05, **p<0.001)

Reporters contributing money in politics, devoting no time in politics, demonstrating higher citizen duty norm and higher citizen engagement norms use all kinds of e-government platforms use more frequently than the other group.

Besides, it is interesting to find out that languages spoken at home can differentiate just one e-government platform use form (SNS use) with statistically significance. Interviewees speaking mandarin-Chinese at home use more frequently e-government SNS than those native Wu-Chinese speakers.

Result from Singapore is concluded in the table above. Only two cases from languages spoken at home and two cases from citizen duty norms demonstrate no difference on certain e-government platforms use. Interviewees donating no money in politics, devoting no time in politics and demonstrating higher citizen engagement norms use all these e-government platforms more frequently. Besides, English language speakers reported higher use frequency in hotline-email use and portal-apps use than Mandarin Chinese speakers, while no difference was found for other two kinds of e-government use. Interviewees with higher citizen duty norms demonstrate higher use frequency of e-government portal-apps use and public-third use, while no difference was found on other two kinds of e-government platforms use.

At last, research result from Taipei is presented in the table above. Only the money contribution and time contrition can exert statistically significant difference on all the e-government platforms use items. Respondents reporting no money donation in politics and with time devotion in politics use all these e-government platforms more frequently. Languages spoken at home make no difference on any kind of e-government platform use. Besides, interviewees with lower citizen duty demonstrate a higher e-government hotline-email use and those with higher citizen use indicate a higher SNS use, while those with higher citizen engagement reported more frequent e-government SNS use and public-third use.

Table 82. Mann-Whitney U Test and Independent T Test Comparison of the Categorical PPFs on E-government Platforms Use in Taipei

	E-government Hotline-email Use					Portal-apps Use				
	M	SD	t	df	p	M	SD	t	df	p
Money Contribution			-7.037	436	.000**			-3.650	232.872	.000**
Yes	1.5861	.73504				2.1798	1.00838			
No	2.1589	.72228				2.5187	.77071			
Time Contribution			7.046	436	.000**			3.813	310.185	.000**
Yes	2.0912	.82520				2.5036	.83907			
No	1.5598	.68538				2.1528	1.00078			
CivicSkillsLanguage			-1.104	424	.270			.311	68.297	.756
Mandarin Chinese	1.6976	.75182				2.2639	.99465			
Minnan-Chinese	1.8265	.89298				2.2245	.81049			
CivicSkillsLanguage			-1.466	385	.144			.044	385	.965
Mandarin Chinese	1.6976	.75182				2.2639	.99465			
Hakka-Chinese	2.0500	.68516				2.2500	.58926			
CivicSkillsLanguage			-.746	57	.459			-.094	57	.925
Minnan-Chinese	1.8265	.89298				2.2245	.81049			
Hakka-Chinese	2.0500	.68516				2.2500	.58926			
CitizenDuty			2.021	359.915	.044*			-.363	359.189	.717
lower	1.8233	.57140				2.2406	.71933			
higher	1.6836	.84140				2.2721	1.05664			
CitizenEngaged			-1.189	315.234	.235			-1.189	315.234	.235
lower	1.6846	.59172				1.6846	.59172			
higher	1.7766	.94538				1.7766	.94538			

	SNS Use				Public-devices-and-third-party-apps Use				
	M	U	∑N	p	M	SD	t	df	p
Money Contribution		15495.500	438	.040*			-6.226	200.399	.000**
Yes	212.81				2.0529	.97129			
No	240.18				2.6682	.86041			
Time Contribution		16993.500	438	.002*			6.250	318.964	.000**
Yes	245.96				2.5912	.81398			
No	207.46				2.0266	1.00048			
CivicSkillsLanguage		8899.500	438	.661			-.539	424	.590
Mandarin Chinese	214.39				2.1844	.99325			
Minnan-Chinese	206.62				2.2653	.95253			
CivicSkillsLanguage		1620.500	438	.425			-.840	385	.401
Mandarin Chinese	194.70				2.1844	.99325			
Hakka-Chinese	167.55				2.4500	.64334			
CivicSkillsLanguage		218.500	438	.536			-.584	57	.561
Minnan-Chinese	30.54				2.2653	.95253			
Hakka-Chinese	27.35				2.4500	.64334			

Table - 82 Continued (1)

	M	U	∑N	p	M	SD	t	df	p
CitizenDuty		16917.500	438	.003*			1.819	322.782	.070
lower	194.20				2.3195	.80326			
higher	230.53				2.1525	1.04608			
CitizenEngaged		20963.000	438	.026*			-2.171	382.204	.031*
lower	207.98				2.1100	.89405			
higher	233.59				2.3173	1.06886			

(*p<0.05, **p<0.001)

After presenting the result of category independent variable, e-government platforms use is analyzed in the light of three ordinal PPFs. Research result is demonstrated in these three tables. The cases which can pass the test of homogeneity of variance are demonstrated in the first two tables, while the cases which fail the test of homogeneity of variance are marked with a dash in the first two tables and their result is collected in the third table.

For e-government hotline-email use factor, differences among civic skills groups can be found for all the three cities, while no difference can be identified for political efficacy plus or political privacy plus. For e-government portal-apps use factor, few statistically significant difference can be found: among the civic skills difference can be found for portal-apps use in Shanghai and in Singapore, while among the political efficacy plus groups, difference can be identified for Shanghai; besides, no other statistically significant cases can be identified. For e-government SNS use, only one case is statistically significant in difference among its levels: the civic skills in Shanghai. For the e-government public-third use factor, the civic skills item showcases difference among its levels in all the three cities, while political efficacy plus demonstrates statistical significance in Shanghai. In all, eleven of 36 cases indicate statistically significant differences which are detailed in the following tables for a general and rough comparison overview, while post hoc multiple comparisons are omitted in the present research as the length limit.

Table 83. One-Way ANOVA Summary Table Comparing Different Levels of Ordinal PPFs in Regard to E-government Platforms Use

	Shanghai					Singapore					Taipei				
	S.o. S	df	M.S	F	Sig.	S.o. S	df	M.S	F	Sig.	S.o. S	df	M.S	F	Sig.
Hotline-email Use															
Civic skills															
Between Groups	27.511	4	6.878	10.234	.000**	6.225	4	1.556	2.567	.038*	10.860	4	2.715	4.716	.001*
Within Groups	284.271	423	.672			182.459	301	.606			249.263	433	.576		
Total	311.782	427				188.684	305				260.123	437			
Political efficacy plus															
Between Groups	5.986	4	1.496	2.070	.084	3.518	4	.880	1.430	.224	.405	4	.101	.169	.954
Within Groups	305.796	423	.723			185.166	301	.615			259.718	433	.600		
Total	311.782	427				188.684	305				260.123	437			
Political privacy plus															
Between Groups	4.065	4	1.016	1.397	.234	1.656	4	.414	.666	.616	5.615	4	1.404	2.388	.050
Within Groups	307.717	423	.727			187.028	301	.621			254.508	433	.588		
Total	311.782	427				188.684	305				260.123	437			
Portal-apps Use															
Civic skills															
Between Groups	26.572	4	6.643	8.313	.000**	-	-	-	-	-	9.220	4	2.305	2.504	
Within Groups	338.003	423	.799			-	-	-			398.586	433	.921		
Total	364.575	427				-	-				407.806	437			
Political efficacy plus															
Between Groups	10.093	4	2.523	3.011	.018*	-	-	-	-	-	-	-	-	-	-
Within Groups	354.481	423	.838			-	-	-			-	-	-		
Total	364.575	427				-	-				-	-			
Political privacy plus															
Between Groups	4.649	4	1.162	1.366	.245	4.941	4	1.235	1.018	.398	4.063	4	1.016	1.089	
Within Groups	359.926	423	.851			365.176	301	1.213			403.743	433	.932		
Total	364.575	427				370.118	305				407.806	437			
Public-devices-and-third-party-apps Use															
Civic skills															
Between Groups	25.749	4	6.437	5.628	.000**	-	-	-	-	-	11.256	4	2.814	2.978	.019*
Within Groups	483.790	423	1.144			-	-	-			409.159	433	.945		
Total	509.539	427				-	-				420.416	437			
Political efficacy plus															
Between Groups	18.961	4	4.740	4.087	.003*	4.415	4	1.104	1.089	.362	-	-	-	-	-
Within Groups	490.578	423	1.160			305.032	301	1.013			-	-	-		
Total	509.539	427				309.448	305				-	-			
Political privacy plus															
Between Groups	3.877	4	.969	.811	.519	4.206	4	1.051	1.037	.388	-	-	-	-	-
Within Groups	505.662	423	1.195			305.242	301	1.014			-	-	-		
Total	509.539	427				309.448	305				-	-			

Table 84. Means and Standard Deviations Comparing Different Levels of Ordinal PPFs in Regard to E-government Platforms Use

	Shanghai			Singapore			Taipei		
	n	M	SD	n	M	SD	n	M	SD
Hotline-email Use									
Civic skills									
strongly disagree	12	1.2083	.33428	19	1.4737	.75413	25	1.5000	.90139
↓	48	1.6042	.72902	53	1.6981	.70260	103	1.5437	.64210
	140	1.7893	.85045	129	1.5581	.73322	194	1.7500	.73627
	141	1.9858	.81928	84	1.8571	.82714	85	1.9882	.84859
strongly agree	87	2.3161	.85967	21	1.8810	1.02353	31	1.6452	.86789
	n	M	SD	n	M	SD	n	M	SD
Political efficacy plus									
strongly disagree	6	2.0833	1.53025	12	1.7083	.54181	11	1.5909	.53936
↓	33	1.7121	.89294	22	1.5455	.89853	36	1.6806	.59944
	109	1.8073	.81054	113	1.6062	.66632	169	1.7515	.68817
	195	1.9410	.83441	102	1.8284	.88299	151	1.7152	.84560
strongly agree	85	2.1059	.86291	57	1.6140	.80743	71	1.7324	.90566
Political privacy plus									
strongly agree	80	2.1250	.89124	54	1.6481	.64156	46	1.6196	1.00656
↓	141	1.8582	.85633	85	1.7941	.86360	107	1.8692	.80487
	137	1.8905	.87598	120	1.6417	.77834	199	1.7412	.72968
	47	1.8936	.70662	39	1.6410	.86564	72	1.6111	.67251
strongly disagree	23	1.8913	.82512	8	1.5000	.53452	14	1.3571	.45694
Portals-apps Use									
Civic skills									
strongly disagree	12	1.7083	.54181	54	2.0093	1.04832	25	1.9200	1.06732
↓	48	2.1250	.95928	85	2.1235	.96333	103	2.1262	.91480
	140	2.0929	.89279	120	1.8583	1.02937	194	2.2990	.96482
	141	2.3298	.90993	39	1.8462	.98110	85	2.4765	.85184
strongly agree	87	2.7126	.86814	8	1.8750	.95431	31	2.1774	1.22847
Political efficacy plus									
strongly disagree	6	2.3333	1.25167	-	-	-	-	-	-
↓	33	2.1061	.93339	-	-	-	-	-	-
	109	2.1972	.86340	-	-	-	-	-	-
	195	2.2410	.95024	-	-	-	-	-	-
strongly agree	85	2.5882	.86663	-	-	-	-	-	-
Political privacy plus									
strongly agree	80	2.4313	.87780	-	-	-	46	2.0761	1.14002
↓	141	2.2128	1.00930	-	-	-	107	2.3832	1.01307

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Table - 84 Continued (1)

	Shanghai			Singapore			Taipei		
	n	M	SD	n	M	SD	n	M	SD
	137	2.2190	.83327	-	-	-	199	2.2739	.88712
	47	2.4681	.88098	-	-	-	72	2.2153	.97079
strongly disagree	23	2.3261	1.09346	-	-	-	14	2.0357	1.02777
Public-devices-and-third-party-apps Use									
Civic skills									
strongly disagree	12	2.3333	1.11464	-	-	-	25	1.8800	1.08282
	48	2.2708	1.05164	-	-	-	103	2.0340	.90549
	140	2.2786	1.09655	-	-	-	194	2.2371	.94016
	141	2.6348	1.06046	-	-	-	85	2.4529	.96246
strongly agree	87	2.8966	1.04308	-	-	-	31	2.1290	1.27781
Political efficacy plus									
strongly disagree	6	2.1667	1.47196	12	1.6250	.60772	-	-	-
	33	2.0909	1.10718	22	2.0227	1.05195	-	-	-
	109	2.3073	1.11991	113	1.8451	.91632	-	-	-
	195	2.6179	1.03243	102	2.0343	1.03469	-	-	-
strongly agree	85	2.7706	1.08165	57	2.0877	1.16160	-	-	-
Political privacy plus									
strongly agree	80	2.5250	1.07002	54	2.0093	1.04832	-	-	-
	141	2.4681	1.11197	85	2.1235	.96333	-	-	-
	137	2.4891	1.07865	120	1.8583	1.02937	-	-	-
	47	2.7872	1.08720	39	1.8462	.98110	-	-	-
strongly disagree	23	2.5000	1.15798	8	1.8750	.95431	-	-	-

Table 85. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Platforms Use

	Shanghai		Singapore		Taipei	
			E-government Portals-mobile Use			
			Ranks			
Civic skills	-	-	N	Mean Rank	-	-
strongly disagree	-	-	19	94.95	-	-
	-	-	53	137.16	-	-
	-	-	129	149.89	-	-
	-	-	84	171.67	-	-
strongly agree	-	-	21	197.19	-	-
Total	-		306		-	
			Test Statistics			
Kruskal-Wallis H		-	19.650		-	
df		-	4		-	
Asymp. Sig.		-	.001		-	

Table - 85 Continued (1)

	Shanghai		Singapore		Taipei	
	Ranks					
Political efficacy plus	-	-	N	Mean Rank	N	Mean Rank
strongly disagree	-	-	12	131.42	11	195.68
↓	-	-	22	137.41	36	195.33
	-	-	113	142.44	169	221.35
	-	-	102	159.88	151	232.25
strongly agree	-	-	57	174.88	71	203.94
Total	-		306		438	
	Test Statistics					
Kruskal-Wallis H	-		7.339		4.504	
df	-		4		4	
Asymp. Sig.	-		.119		.342	
	E-government SNS Use					
	Ranks					
Civic skills	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	12	170.96	19	105.05	25	194.64
↓	48	192.07	53	149.97	103	208.04
	140	198.70	129	154.84	194	219.31
	141	228.59	84	162.37	85	240.19
strongly agree	87	235.48	21	162.52	31	222.06
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	10.595		8.924		4.572	
df	4		4		4	
Asymp. Sig.	.032		.063		.334	
	Ranks					
Political efficacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	6	212.67	12	130.75	11	171.86
↓	33	189.03	22	127.41	36	206.71
	109	201.36	113	156.32	169	210.18
	195	219.22	102	161.13	151	239.52
strongly agree	85	230.55	57	149.11	71	212.97
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	4.754		4.831		7.607	
df	4		4		4	
Asymp. Sig.	.313		.305		.107	

Table - 85 Continued (2)

	Shanghai		Singapore		Taipei	
	Ranks					
Political privacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly agree	80	202.78	54	155.46	46	186.18
	141	195.42	85	162.63	107	225.76
	137	229.48	120	154.49	199	222.31
	47	241.13	39	137.24	72	221.94
strongly disagree	23	228.61	8	107.69	14	228.57
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	9.367		5.723		4.074	
df	4		4		4	
Asymp. Sig.	.053		.221		.396	
	Public-devices-and-third-party-apps Use					
	Ranks					
Civic skills	-	-	N	Mean Rank	-	-
strongly disagree	-	-	19	100.55	-	-
	-	-	53	137.98	-	-
	-	-	129	151.93	-	-
	-	-	84	172.72	-	-
strongly agree	-	-	21	173.33	-	-
Total	-		306		-	
	Test Statistics					
Kruskal-Wallis H	-		14.179		-	
df	-		4		-	
Asymp. Sig.	-		.007		-	
	Ranks					
Political efficacy plus	-	-	-	-	N	Mean Rank
strongly disagree	-	-	-	-	11	194.73
	-	-	-	-	36	198.13
	-	-	-	-	169	218.86
	-	-	-	-	151	231.49
strongly agree	-	-	-	-	71	210.19
Total	-		-		438	
	Test Statistics					
Kruskal-Wallis H	-		-		3.288	
df	-		-		4	
Asymp. Sig.	-		-		.511	

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Table - 85 Continued (3)

	Shanghai		Singapore		Taipei	
	Ranks					
Political privacy plus	-	-	-	-	N	Mean Rank
strongly agree	-	-	-	-	46	207.01
	-	-	-	-	107	230.07
⇓	-	-	-	-	199	225.71
	-	-	-	-	72	206.77
strongly disagree	-	-	-	-	14	156.89
Total	-		-		438	
	Test Statistics					
Kruskal-Wallis H		-		-		6.003
df		-		-		4
Asymp. Sig.		-		-		.199

4.4.2 E-government functions use and the categorical/ordinal PPFs

In the second half of the present section, the categorical/ordinal PPFs are to be tested as predictors to e-government functions use. As formed in the section 4.2, e-government functions use is treated as three factors for information use and consultation use each. Besides, other four kinds of e-government functions uses are also examined in the light of prediction of the categorical/ordinal PPFs. Still, two analysis approaches are to be employed in the following research as in the section above.

Firstly, three e-government information use factors is tested for all the three cities. After examining the significance value of model fitting and that of independent variables parallel lines test, two cases in Shanghai, all three cases in Singapore and one case in Taipei are identified as statistically significant in prediction on certain e-government information use.

As for e-government low-effort information use, the cases in Shanghai and in Taipei demonstrate prediction effect. However, effective predictors differ in kinds for these two cities. For Shanghai time contribution and language spoken at home are significant predictors, while civic skills, political security and privacy

concerns plus are of prediction on e-government low-effort information use. Still, citizen duty are of prediction for both cases in Shanghai and in Singapore in negative direction, which implies that interviewees from higher citizen duty group reported lower frequency of e-government open information browsing use and searching use, and vice versa. It is also interesting to find out that interviewees from Shanghai with no time contribution to politics and those from Singapore with lower concerns over government online monitoring turn out to be featured with lower frequency of e-government open information browsing use and searching use.

Regarding e-government middle-effort information use, statistically significant cases can be identified for Singapore and Taipei. Three valid predictors are recognized for each case. However, only one common predictor (engaged citizen norms) is found for both cases. This predictor reveals that respondents belonging to higher engaged citizen norms group demonstrate lower use frequency of e-government information requesting and information sharing. Still, it is puzzling to confront with the result from Taipei that respondents with no time contribution in politics reported higher e-government middle-effort information use frequency than the yes group.

With respect to e-government high-effort information use, predictable cases are found for Shanghai and Singapore. The independent variable time turns out to be the only common feasible predictor for the two cities. Respondents with no time contribution to politics reported lower e-government use frequency in information commenting and in discussing with fellow onliners. It is also note-worthy that interviewees from Shanghai with higher engaged citizen norms reported lower e-government high-effort information use. This implies that residents with higher citizen engagement norms don't necessarily equate those with higher use frequency in e-government high-effort use. A further question can also be asked from the other side: why do residents belonging to the lower engaged citizen

group demonstrate higher e-government high-effort use? Do they stick more to the existing government political participation platform for high-effort information use, while those with higher citizen engagement norms tend to express their opinion on non-government platforms?

Table 86. Ordinal Polytomous Logistic Analysis of Categorical/ordinal PPFs Prediction on E-government Information Use

Response	Model Fitting Sig.	Parallel Lines Sig.	Significant Parameter Estimates		
			Predictors	Estimate	Sig.
Shanghai					
e-gov low-info	,000	,637	time	-,624	,004
			language1	2,044	,024
			language2	2,090	,022
			language3	2,449	,013
			citizen.duty	-,899	,000
e-gov mid-info	,000	,002	civic.skills1	,355	,000
			money	,830	,000
			time	-,547	,012
			language1	2,712	,022
			language2	2,779	,019
			language3	3,054	,014
e-gov high-info	,000	,139	money	1,181	,000
			time	-,865	,000
			language1	19,025	,000
			language2	19,392	,000
			citizen.engaged	-,541	,017
Singapore					
e-gov low-info	,000	1,000	civic.skills1	,331	,003
			pol.priv.plus	-,225	,040
			citizen.duty	-,676	,006
e-gov mid-info	,000	1,000	civic.skills1	,322	,005
			pol.effi.plus	,240	,021
			citizen.engaged	-,620	,008
e-gov high-info	,011	1,000	time	-1,360	,032
Taipei					
e-gov low-info	,000	,000	money	-,738	,007
			citizen.duty	-,732	,001
			citizen.engaged	-,487	,014
e-gov mid-info	,000	,287	money	-1,297	,000
			time	,699	,003

Table - 86 Continued (1)

Response	Model Fitting Sig.	Parallel Lines Sig.	Significant Parameter Estimates		
			citizen.engaged	-,410	,040
e-gov high-info	,000	,000	money	-1,952	,000
			time	,654	,010

Table 87. Ordinal Polytomous Logistic Analysis of Categorical/ordinal PPF Prediction on E-government Consultation Use

Response	Model Fitting Sig.	Parallel Lines Sig.	Significant Parameter Estimates		
			Predictors	Estimate	Sig.
Shanghai					
e-gov low-consul	,000	1,000	pol.priv.plus	,213	,010
			money	1,113	,000
			time	-,928	,000
e-gov high-consul	,000	,910	civic.skills1	,366	,000
			money	1,917	,000
			time	-,955	,000
Singapore					
e-gov low-consul	,000	,000	pol.effi.plus	,243	,038
			language1	20,985	,000
			language2	21,000	,000
			language3	20,141	,000
			language4	20,248	,000
e-gov mid-consul	,000	,000	civic.skills1	,369	,044
			money	-1,204	,053
			time	-1,725	,009
			language1	20,424	,000
			language2	20,438	,000
			language3	19,406	,000
			language4	19,960	,000
e-gov high-consul	,000	,000	civic.skills1	,417	,009
			time	-1,450	,032
Taipei					
e-gov low-consul	,000	,000	money	-,977	,000
			time	,616	,010
			citizen.duty	-,464	,042
e-gov high-consul	,000	,000	civic.skills1	,228	,045
			money	-2,059	,000
			time	1,072	,000
			citizen.duty	,856	,001

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Next, e-government consultation use factors are put under analysis. From the table above it can tell that only the two cases from Shanghai can meet the significance standard. To be more specific, all the cases from Singapore and Taipei fail to pass the predictors parallel lines test. Thereafter, only two cases from Shanghai are to be analyzed. For these two e-government consultation use factors, both money contribution and time contrition can statistically significantly predict these two e-government use factors. The contrast of influence directions of these predictors is sharp for both cases: respondents with no money contribution reported higher use frequency, while those with no time contribution reported lower use frequency. At last, the other four e-government functions use are tested. The result demonstrates that three cases from Shanghai and from Singapore respectively and two cases from Taipei are qualified for further exploration.

E-government referendum use, which should not be literally understood as referendum rather as polling-like behavior (as explained before in details), can be predicted in Shanghai and Taipei. For both cities, money contribution and time contribution are of prediction on e-government referendum use. However, the influence direction of them are in reverse ways. Residents with no money contribution reported higher referendum frequency in Shanghai, while those with no money contribution indicate lower use in Taipei. Similar contrast can also be found for the predictor time contribution: respondents with no time contribution to politics reported lower referendum use frequency in Shanghai, while those with no time contribution demonstrate higher referendum use frequency in Taipei. Besides, such predictors as civic skills, languages spoken at home also demonstrate prediction effect in positive direction in Shanghai.

Regarding e-government collaboration use, both cases from Shanghai and Singapore demonstrate statistically significant prediction. However, no concrete predictors are identified for Singapore. For Shanghai, qualified predictors are similar to those for e-government referendum use in Shanghai.

Table 88. Ordinal Polytomous Logistic Analysis of Categorical/ordinal PPFs Prediction on E-government Other Functions Use

Response	Model Fitting Sig.	Parallel Lines Sig.	Significant Parameter Estimates		
			Predictors	Estimate	Sig.
Shanghai					
e-gov referendum	,000	,204	civic.skills1	,296	,008
			money	1,396	,000
			time	-1,325	,000
			language1	18,372	,000
			language2	18,382	,000
e-gov collaboration	,000	,669	civic.skills1	,460	,000
			money	1,444	,000
			time	-,985	,000
e-gov procedures	,000	,000	civic.skills1	,253	,020
			money	1,015	,000
			language2	2,327	,045
			language3	2,731	,026
e-gov payment	,000	,984	pol.priv.plus	,180	,037
			money	,777	,001
			time	-,530	,019
			citizen.engaged	-,547	,019
Singapore					
e-gov referendum	,000	-	pol.effi.plus	,694	,010
			money	-2,778	,001
			time	-1,909	,018
			language1	-3,254	,031
e-gov collaboration	,014	,933	-	-	-
e-gov procedures	,000	,789	citizen.engaged	-,871	,001
e-gov payment	,000	,762	civic.skills1	,414	,000
Taipei					
e-gov referendum	,000	1,000	money	-1,571	,000
			time	,828	,001
e-gov collaboration	,000	,000	money	-1,690	,000
			time	1,157	,000
			citizen.duty	,819	,010
e-gov procedures	,000	,594	money	,206	,043
			time	-1,018	,001
			civic.skills1	,923	,000
e-gov payment	,000	-	money	-1,481	,000
			time	,846	,001

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With respect to e-government procedures use, both cases from Singapore and Taipei are statically significant in prediction. However, no overlapping of predictors was identified. In Singapore respondents belonging to the higher engaged citizen norms group reported lower use frequency in e-government procedures. In Taipei, interviewees with no money contribution to politics, with higher civic skills and with time contribution to politics reported higher use frequency of e-government procedures.

With regard to e-government payment use, both cases from Shanghai and Singapore demonstrate statistically significant prediction effect. However, no common predictors were identified for both cities. In Shanghai, respondents with higher political security and privacy assurance, time contribution to politics and belonging to the lower group of engaged citizen norms use e-government payment function more frequently. Besides, time contribution to politics as a predictor always indicates a negative influence direction as did in the previous analysis for Shanghai, which means interviewees with no time contribution to politics use such e-government functions more often.

As the above practiced logistic analysis is not able to reveal influence of several cases on e-government functions use, which fail to meet the regression statistical significance, approach two is employed to throw light on more detailed e-government functions use differences which caused by these categorical/ordinal PPFs. Here, procedures of the approach two is exemplified by the influence of categorical/ordinal PPFs on the low-effort information use factors in Shanghai. Procedures for other cases are omitted and their result summary can be referred in the following tables. What's more, an overview of the research result is presented in the conclusion part of this section.

The low-effort information use factor is examined for Shanghai. Independent tests were performed to identify if there were significant differences for money contribution, time contribution, language spoken at home, citizen duty groups and

citizen engagement groups for Shanghaier residents in regard to their low-effort information use frequency scores. Result indicates that there was no significant difference between civic language skills for the sampled Shanghaier residents in regard to their low-effort information use. However, there was a significant difference between the money contribution t (382.691) = 3.437, p<0.05, the time contribution t (426) = -5.324, p<0.001, the citizen duty t (426) = -5.446, p<0.001 and the citizen engagement t (426) = -3.706, p<0.001. On average, residents reporting each following PPF (money contribution, no time contribution, higher citizen duty, or higher citizen engagement) score higher frequency of low-effort information use in Shanghai.

Table 89. Independent T Test Comparison of the Categorical PPFs on E-government Low-effort Information Use in Shanghai

Variable	M	SD	t	df	p
MoneyContribution			3.437	382.691	.001[*]
Yes	2.9822	.97612			
No	2.6084	1.24204			
TimeContribution			-5.324	426	.000[**]
Yes	2.5025	1.13269			
No	3.0652	1.05218			
CivicSkillsLanguage			-.348	402	.728
Mandarin Chinese	2.8143	1.11079			
Wu-Chinese	2.8561	1.17306			
CitizenDuty			-5.446	426	.000[**]
lower	2.3458	1.05678			
higher	2.9838	1.10066			
CitizenEngaged			-3.706	426	.000[**]
lower	2.5838	1.14515			
higher	2.9831	1.07737			

([*]p<0.05, [**]p<0.001)

For the rest independent variables of PPFs in form of ordinal data, the one-way analysis of variance is adopted to check if there is a statistically significant difference among these ordinal groups. Due to length limit, no post hoc analysis is presented in the present study. For e-government information one use in

Shanghai, no statistically significant differences were found among the political efficacy plus, $F_{(3, 423)} = 2.294$, $p = .059$ and the political efficacy plus, $F_{(3, 423)} = 2.228$, $p = .065$. However, a statistically significant difference was identified among the civic skills in regard to residents' e-government low-effort information use factor, $F_{(3, 423)} = 4.266$, $p < 0.05$.

Table 90. One-Way ANOVA Summary Table Comparing Different Civic Skills Levels in Regard to E-government Low-effort Information Use in Shanghai

	Sum of Squares	df	Mean Square	F	Sig.
Civic Skills					
Between Groups	20.936	4	5.234	4.266	.002[*]
Within Groups	519.023	423	1.227		
Total	539.960	427			

([*]p<0.05, [**]p<0.001)

Table 91. Means and Standard Deviations Comparing Different Civic Skills Levels in Regard to E-government Low-effort Information Use in Shanghai

	n	M	SD
Civic Skills			
strongly disagree	12	2.8750	1.55395
	48	2.6250	1.17374
	140	2.5679	1.11111
	141	2.8794	1.04523
strongly agree	87	3.1552	1.09521

Following the above-mentioned analysis method, the result of influence of categorical variables on e-government functions use is presented in the following tables. Firstly, the result for Shanghai is demonstrated. All these subgroups except those from the languages spoken at home demonstrate statistically significant differences on these e-government information use factors and consultation use factors. Respondents with money contribution to politics, but without time devotion in politics, belonging to higher citizen duty group and higher citizen engagement group demonstrate higher frequency of e-government information use and consultation use.

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Table 92. Independent T Test Comparison of the Categorical PPFs on E-government Information and Consultation Use in Shanghai

	M	SD	t	df	p	M	SD	t	df	p
			Low-effort Information Use					**Middle-effort Information Use**		
Money Contribution			3.437	382.691	.001*			8.132	426	.000**
Yes	2.9822	.97612				2.6622	.92299			
No	2.6084	1.24204				1.9532	.87542			
Time Contribution			-5.324	426	.000**			-6.980	426	.000**
Yes	2.5025	1.13269				1.9924	.88770			
No	3.0652	1.05218				2.6130	.94166			
CivicSkillsLanguage			-.348	402	.728			-.701	226.787	.484
Mandarin Chinese	2.8143	1.11079				2.3290	.91885			
Wu-Chinese	2.8561	1.17306				2.4053	1.07386			
CitizenDuty			-5.446	426	.000**			-4.686	426	.000**
lower	2.3458	1.05678				1.9833	.87911			
higher	2.9838	1.10066				2.4594	.96813			
CitizenEngaged			-3.706	426	.000**			-5.041	426	.000**
lower	2.5838	1.14515				2.0707	.90988			
higher	2.9831	1.07737				2.5316	.96444			
			High-effort Information Use					**Low-effort Consultation Use**		
Money Contribution			10.423	426	.000**			9.368	426	.000**
Yes	2.8933	1.02085				2.8911	1.00464			
No	1.8719	1.00289				1.9877	.98684			
Time Contribution			-9.161	426	.000**			-9.173	426	.000**
Yes	1.9141	1.04963				1.9848	.98325			
No	2.8348	1.02527				2.8739	1.01376			
CivicSkillsLanguage			-1.458	227.630	.146			-.495	402	.621
Mandarin Chinese	2.3860	1.08064				2.4688	1.07123			
Wu-Chinese	2.5720	1.25724				2.5265	1.15632			
CitizenDuty			-4.270	426	.000**			-5.119	426	.000**
lower	2.0417	1.07801				2.0417	.99491			
higher	2.5519	1.12300				2.6266	1.08673			
CitizenEngaged			-7.028	426	.000**			-6.768	426	.000**
lower	2.0026	1.00065				2.0838	.93375			
higher	2.7363	1.12891				2.7679	1.11753			
			High-effort Consultation Use							
Money Contribution			13.443	406.581	.000**					
Yes	4.4978	1.60113								
No	2.6970	1.15317								
Time Contribution			-10.097	425.981	.000**					
Yes	2.8611	1.38507								
No	4.3174	1.59876								

Table - 92 Continued (1)

	M	SD	t	df	p	M	SD	t	df	p
CivicSkillsLanguage			.440	402	.660					
Mandarin Chinese	3.7188	1.66607								
Wu-Chinese	3.6402	1.72467								
CitizenDuty			-5.119	426	.000**					
lower	3.1542	1.49901								
higher	3.8344	1.69455								
CitizenEngaged			-6.392	425.796	.000**					
lower	3.1047	1.42239								
higher	4.0781	1.72753								

(*p<0.05, **p<0.001)

In the following table result is reported for Singapore. Money and time contribution demonstrate sub-groups difference on almost all the information and consultation use except for the low-effect information use. Interviewees with no money contribution in politics and without time contribution experience indicate higher use frequency in such e-government information and consultation use cases. Besides, languages spoken at home make no difference in e-government information and consultation use.

Table 93. Independent T Test Comparison of the Categorical PPFs on E-government Information and Consultation Use in Singapore

	M	SD	t	df	p	M	SD	t	df	p
		Low-effort Information Use						Middle-effort Information Use		
Money Contribution			-2.085	15.852	.054			-2.402	304	.017*
Yes	2.5000	1.09576				1.7534	.85369			
No	3.3125	1.53704				2.2813	.89384			
Time Contribution			-1.761	13.807	.100			-2.746	304	.006*
Yes	2.5120	1.11412				1.7517	.84595			
No	3.1786	1.39514				2.3929	1.00343			
CivicSkillsLanguage			1.805	271.946	.072			1.135	270.967	.257
English	2.6967	1.19127				1.8633	.95520			
Mandarin Chinese	2.4520	1.05575				1.7480	.72852			
CitizenDuty			-3.430	217.715	.001*			-1.573	304	.117
lower	2.2398	1.00573				1.6684	.90230			
higher	2.6851	1.16537				1.8341	.83991			
CitizenEngaged			-2.286	304	.023*			-3.432	304	.001*

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Table - 93 Continued (1)

	M	SD	t	df	p	M	SD	t	df	p
lower	2.3821	1.10690				1.6000	.78015			
higher	2.6777	1.14285				1.9337	.90041			
	High-effort Information Use					**Low-effort Consultation Use**				
Money Contribution			-2.917	304	.004*			-4.439	304	.000**
Yes	1.2810	.57888				1.3103	.53613			
No	1.7188	.68237				1.9375	.77190			
Time Contribution			-2.526	13.316	.025*			-5.122	304	.000**
Yes	1.2705	.53927				1.3082	.52354			
No	2.0000	1.07417				2.0714	.89565			
CivicSkillsLanguage			.638	273	.524			.806	273	.421
English	1.3333	.61760				1.3933	.62010			
Mandarin Chinese	1.2880	.54722				1.3360	.54542			
CitizenDuty			-1.415	235.233	.158			.404	304	.686
lower	1.2398	.49860				1.3622	.60828			
higher	1.3341	.62950				1.3341	.54740			
CitizenEngaged			-1.805	299.712	.072			-1.868	303.807	.063
lower	1.2393	.49264				1.2786	.50277			
higher	1.3584	.66023				1.3976	.61180			
	Middle-effort Consultation Use					**High-effort Consultation Use**				
Money Contribution			-3.179	15.370	.006*			-2.915	15.393	.010*
Yes	1.1155	.31884				1.0983	.26600			
No	1.6563	.67623				1.5000	.54772			
Time Contribution			-3.582	13.249	.003*			-3.252	13.375	.006*
Yes	1.1130	.31169				1.0993	.27257			
No	1.7857	.69929				1.5357	.49862			
CivicSkillsLanguage			1.079	272.165	.282			1.537	270.434	.126
English	1.1767	.41828				1.1533	.32225			
Mandarin Chinese	1.1280	.32937				1.0960	.29578			
CitizenDuty			-1.267	215.769	.207			-1.267	215.769	.207
lower	1.1071	.33096				1.1276	.29872			
higher	1.1611	.37977				1.1154	.30081			
CitizenEngaged			-2.707	257.459	.007*			-1.865	290.245	.063
lower	1.0857	.23184				1.0857	.23184			
higher	1.1928	.44266				1.1476	.34496			

(*p<0.05, **p<0.001)

Difference by the dimension citizen duty norms can be identified in only one case (respondents with higher citizen duty use low-effort information use more frequently), while citizen engagement norms can demonstrate use frequency difference for three e-government use cases (interviewees belonging to higher citizen engagement norms group use low-effort and middle-effort information as well as middle-effort consultation use more frequently).

At last, the effect of categorical PPFs on e-government information and consultation use is demonstrated for Taipei in the following table. Respondents without money contribution into politics and with time contribution reported higher e-government use frequency of almost all these information and consultation use factors except in low-effort information use. Besides, languages spoken at home can demonstrate some difference: compared with Mandarin Chinese speakers at home, the Minnan Chinese speakers use more frequently middle-effort information functions, high-effort information and consultation functions; compared with Mandarin speakers, the Hakka Chinese speakers use more frequently high-effort information and consultation functions; compared with Minnan Chinese speakers, the Hakka Chinese speakers use more frequently high-effort consultation functions.

What's more, interviewees belonging to higher citizen norms group use low-effort information function more often, while those belonging to lower group use middle-effort and high-effort information functions and high-effort consultation functions more frequently. The citizen engagement norms groups also deliver similar inconsistent relation between group and use frequency: the higher citizen engagement group use low-effort information functions and high-effort consultation functions more often, while the lower citizen engagement group use low-effort consultation functions more frequently.

Table 94. Independent T Test Comparison of the Categorical PPF on E-government Information Use and Consultation Use in Taipei

	M	SD	t	df	p	M	SD	t	df	p
		Low-effort Information Use					**Middle-effort Information Use**			
Money Contribution			-1.438	212.408	.152			-8.074	436	.000**
Yes	2.3943	1.15247				1.6858	.83815			
No	2.5561	.96233				2.4252	.77643			
Time Contribution			1.541	436	.124			7.266	436	.000**
Yes	2.5547	1.01944				2.2956	.86508			
No	2.3787	1.14648				1.6711	.81943			
CivicSkillsLanguage			.106	424	.916			-1.990	424	.047*
Mandarin Chinese	2.4363	1.12216				1.8249	.87511			
Minnan-Chinese	2.4184	1.11499				2.0918	.94469			
CivicSkillsLanguage			.382	385	.703			-.988	385	.324
Mandarin Chinese	2.4363	1.12216				1.8249	.87511			
Hakka-Chinese	2.3000	.71492				2.1000	.56765			
CivicSkillsLanguage			.321	57	.749			-.026	57	.979
Minnan-Chinese	2.4184	1.11499				2.0918	.94469			
Hakka-Chinese	2.3000	.71492				2.1000	.56765			
CitizenDuty			-5.104	406.329	.000**			2.925	323.068	.004*
lower	2.1053	.69645				2.0338	.71826			
higher	2.5770	1.22197				1.7934	.93627			
CitizenEngaged			-3.804	382.937	.000**			-.905	436	.366
lower	2.2510	1.00221				1.8320	.82776			
higher	2.6574	1.19442				1.9086	.94452			
		High-effort Information Use					**Low-effort Consultation Use**			
Money Contribution			-12.366	436	.000**			-4.388	436	.000**
Yes	1.4124	.73435				1.9124	.98004			
No	2.4626	.84870				2.3832	.91523			
Time Contribution			8.163	229.995	.000**			4.407	436	.000**
Yes	2.1715	.90837				2.3285	.96528			
No	1.4402	.77658				1.8904	.96416			
CivicSkillsLanguage			-2.728	424	.007*			-.300	424	.764
Mandarin Chinese	1.6061	.86411				2.0159	1.00385			
Minnan-Chinese	1.9694	.97044				2.0612	.91647			
CivicSkillsLanguage			-2.518	385	.012*			-.264	385	.792
Mandarin Chinese	1.6061	.86411				2.0159	1.00385			
Hakka-Chinese	2.3000	.67495				2.1000	.51640			
CivicSkillsLanguage			-1.024	57	.310			-.129	57	.898
Minnan-Chinese	1.9694	.97044				2.0612	.91647			
Hakka-Chinese	2.3000	.67495				2.1000	.51640			
CitizenDuty			4.809	436	.000**			.331	304	.741

Table - 94 Continued (1)

	M	SD	t	df	p	M	SD	t	df	p
lower	1.9699	.83203				1.1276	.29872			
higher	1.5377	.87888				1.1154	.30081			
CitizenEngaged			.572	436	.568			-2.103	353.578	.036*
lower	1.6909	.86896				1.9357	.83853			
higher	1.6421	.90919				2.1396	1.13031			
High-effort Consultation Use										
Money Contribution			-12.821	124.382	.000**					
Yes	2.3520	.79152								
No	4.3505	1.54830								
Time Contribution			9.838	178.764	.000**					
Yes	3.8212	1.58200								
No	2.3937	.91578								
CivicSkillsLanguage			-3.240	55.863	.002*					
Mandarin Chinese	2.6976	1.23666								
Minnan-Chinese	3.4592	1.58389								
CivicSkillsLanguage			-4.679	385	.000**					
Mandarin Chinese	2.6976	1.23666								
Hakka-Chinese	4.5500	1.18907								
CivicSkillsLanguage			-2.486	16.297	.024*					
Minnan-Chinese	3.4592	1.58389								
Hakka-Chinese	4.5500	1.18907								
CitizenDuty			7.768	193.901	.000**					
lower	3.6278	1.51714								
higher	2.4967	1.09047								
CitizenEngaged			2.150	432.543	.032*					
lower	2.9627	1.39890								
higher	2.6904	1.24972								

(*p<0.05, **p<0.001)

Next, the three ordinal PPFs are examined in the light of e-government functions use for all the three cities. In the first two tables, results are presented for the cases whose test of homogeneity of variance is satisfied. And in the last two tables, results of the rest cases are demonstrated. For civic skills, thirteen cases of the total sixteen cases demonstrate statistically significant difference among their sub-groups, while for political efficacy plus nine of the total sixteen cases and for political privacy plus seven of the total sixteen cases are statistically significant

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in sub-groups differences. Details can be referred from the following tables. Besides, a summary of all these significant cases can be found in the conclusion part of the present section.

Table 95. One-Way ANOVA Summary Table Comparing Different Levels of Ordinal PPFs in Regard to E-government Information and Consultation Use

	Shanghai					Singapore					Taipei				
	S.o. S	df	M.S	F	Sig.	S.o. S	df	M.S	F	Sig.	S.o. S	df	M.S	F	Sig.
Low-effort Information Use															
Civic skills															
Between Groups	20.936	4	5.234	4.266	.002*	-	-	-	-	-	9.538	4	2.385	1.952	.101
Within Groups	519.023	423	1.227			-	-	-			529.042	433	1.222		
Total	539.960	427				-	-				538.580	437			
Political efficacy plus															
Between Groups	11.465	4	2.866	2.294	.059	-	-	-	-	-	6.244	4	1.561	1.270	.281
Within Groups	528.494	423	1.249			-	-	-			532.335	433	1.229		
Total	539.960	427				-	-				538.580	437			
Political privacy plus															
Between Groups	11.140	4	2.785	2.228	.065	-	-	-	-	-	5.932	4	1.483	1.205	.308
Within Groups	528.820	423	1.250			-	-	-			532.648	433	1.230		
Total	539.960	427				-	-				538.580	437			
Middle-effort Information Use															
Civic skills															
Between Groups	36.530	4	9.132	10.649	.000**	-	-	-	-	-	11.478	4	2.869	3.783	.005*
Within Groups	362.752	423	.858			-	-	-			328.459	433	.759		
Total	399.282	427				-	-				339.937	437			
Political efficacy plus															
Between Groups	17.444	4	4.361	4.831	.001*	2.213	4	.553	.742	.564	-	-	-	-	-
Within Groups	381.838	423	.903			224.617	301	.746			-	-	-		
Total	399.282	427				226.830	305				-	-			
Political privacy plus															
Between Groups	5.802	4	1.450	1.559	.184	6.475	4	1.619	2.211	.068	3.437	4	.859	1.106	.353
Within Groups	393.480	423	.930			220.355	301	.732			336.500	433	.777		
Total	399.282	427				226.830	305				339.937	437			
High-effort Information Use															
Civic skills															
Between Groups	49.978	4	12.494	10.613	.000**	2.778	4	.694	2.011	.093	-	-	-	-	-
Within Groups	497.968	423	1.177			103.957	301	.345			-	-	-		
Total	547.946	427				106.735	305				-	-			
Political efficacy plus															
Between Groups	33.073	4	8.268	6.793	.000**	1.318	4	.330	.941	.440	-	-	-	-	-

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Table - 95 Continued (1)

	Shanghai					Singapore					Taipei				
Within Groups	514.874	423	1.217			105.417	301	.350			-	-	-		
Total	547.946	427				106.735	305				-	-			
Political privacy plus															
Between Groups	10.502	4	2.626	2.066	.084	3.420	4	.855	2.491	.043*	-	-	-	-	-
Within Groups	537.444	423	1.271			103.315	301	.343			-	-	-		
Total	547.946	427				106.735	305				-	-			
Low-effort Consultation Use															
Civic skills															
Between Groups	35.383	4	8.846	7.885	.000**	-	-	-	-	-	-	-	-	-	-
Within Groups	474.519	423	1.122			-	-	-			-	-	-		
Total	509.902	427				-	-				-	-			
Political efficacy plus															
Between Groups	22.488	4	5.622	4.879	.001*	2.101	4	.525	1.649	.162	-	-	-	-	-
Within Groups	487.414	423	1.152			95.870	301	.319			-	-	-		
Total	509.902	427				97.971	305				-	-			
Political privacy plus															
Between Groups	10.378	4	2.595	2.197	.069	-	-	-	-	-	-	-	-	-	-
Within Groups	499.524	423	1.181			-	-	-			-	-	-		
Total	509.902	427				-	-				-	-			
High-effort Consultation Use															
Political efficacy plus															
Between Groups	58.653	4	14.663	5.488	.000**	-	-	-	-	-	-	-	-	-	-
Within Groups	1130.260	423	2.672			-	-	-			-	-	-		
Total	1188.913	427				-	-				-	-			
Political privacy plus															
Between Groups	28.537	4	7.134	2.601	.036*	-	-	-	-	-	-	-	-	-	-
Within Groups	1160.376	423	2.743			-	-	-			-	-	-		
Total	1188.913	427				-	-				-	-			

S.o.S stands for Sum of Squares; M.S stands for Mean Square (**p<0.001) (*p<0.05)

Table 96. Means and Standard Deviations Comparing Different Levels of Ordinal PPF in Regard to E-government Information and Consultation Use

	Shanghai			Singapore			Taipei		
	n	M	SD	n	M	SD	n	M	SD
Low-effort Information Use									
Civic skills									
strongly disagree	12	2.8750	1.55395	-	-	-	25	2.0000	1.19024
↓	48	2.6250	1.17374	-	-	-	103	2.3641	1.04833
↓	140	2.5679	1.11111	-	-	-	194	2.4330	1.09905
↓	141	2.8794	1.04523	-	-	-	85	2.6588	1.09439
strongly agree	87	3.1552	1.09521	-	-	-	31	2.4032	1.28075
Political efficacy plus							25	2.0000	1.19024
strongly disagree	6	2.4167	1.49722	-	-	-	11	2.1364	1.34333
↓	33	2.4697	1.01504	-	-	-	36	2.3333	1.10195
↓	109	2.6468	1.15931	-	-	-	169	2.3284	1.03229
↓	195	2.8795	1.11669	-	-	-	151	2.5695	1.12848
strongly agree	85	2.9941	1.07597	-	-	-	71	2.4930	1.20562
Political privacy plus									
strongly agree	80	2.8500	1.07149	-	-	-	46	2.1196	1.11148
↓	141	2.7482	1.11583	-	-	-	107	2.4486	1.03462
↓	137	2.6679	1.08851	-	-	-	199	2.4950	1.08826
↓	47	3.1809	1.11035	-	-	-	72	2.4792	1.19988
strongly disagree	23	3.0435	1.44531	-	-	-	14	2.2500	1.43781
Middle-effort Information Use									
Civic skills									
strongly disagree	12	1.6667	.74874	-	-	-	25	1.6800	1.07897
↓	48	1.9688	.91910	-	-	-	103	1.7233	.86808
↓	140	2.1321	.90285	-	-	-	194	1.8557	.82374
↓	141	2.4078	.94794	-	-	-	85	2.1706	.88490
strongly agree	87	2.7931	.95098	-	-	-	31	1.7258	.94727
Political efficacy plus									
strongly disagree	6	2.1667	1.50555	12	1.6250	.56909	-	-	-
↓	33	1.9697	.75972	22	2.0682	1.24686	-	-	-
↓	109	2.1697	1.00051	113	1.7522	.82409	-	-	-
↓	195	2.3256	.91401	102	1.7696	.79501	-	-	-
strongly agree	85	2.6765	.98714	57	1.7807	.93071	-	-	-
Political privacy plus									
strongly agree	80	2.4125	.99293	54	1.9630	1.02263	46	1.7174	1.10881
↓	141	2.3121	.93835	85	1.9000	.89243	107	1.9907	.87140
↓	137	2.2555	.93761	120	1.6125	.75721	199	1.8719	.81953
↓	47	2.5638	1.07651	39	1.7692	.81794	72	1.7639	.89981
strongly disagree	23	2.0435	.94042	8	1.8750	.79057	14	1.8571	.88641

Table – 96 Continued (1)

	Shanghai			Singapore			Taipei		
	n	M	SD	n	M	SD	n	M	SD
High-effort Information Use									
Civic skills									
strongly disagree	12	1.4583	.49810	19	1.1579	.50146	-	-	-
	48	2.0313	1.05893	53	1.3113	.51166	-	-	-
	140	2.1536	1.06767	129	1.2326	.48833	-	-	-
	141	2.5851	1.13067	84	1.4464	.71565	-	-	-
strongly agree	87	2.8736	1.10553	21	1.2857	.79955	-	-	-
Political efficacy plus									
strongly disagree	6	1.8333	1.32916	12	1.3750	.52764	-	-	-
	33	1.9545	1.14130	22	1.3864	.63493	-	-	-
	109	2.1147	1.09636	113	1.2257	.47712	-	-	-
	195	2.4949	1.09943	102	1.3676	.67092	-	-	-
strongly agree	85	2.8059	1.09135	57	1.2982	.63989	-	-	-
Political privacy plus									
strongly agree	80	2.5313	1.10906	54	1.2407	.47325	-	-	-
	141	2.3936	1.16620	85	1.3118	.55622	-	-	-
	137	2.2518	1.06778	120	1.2583	.53051	-	-	-
	47	2.7553	1.23303	39	1.3974	.78790	-	-	-
strongly disagree	23	2.3043	1.06322	8	1.8750	1.09381	-	-	-
Low-effort Consultation Use									
Civic skills	12	1.7500	.69085	-	-	-	-	-	-
strongly disagree	48	2.3333	1.10287	-	-	-	-	-	-
	140	2.1786	1.01086	-	-	-	-	-	-
	141	2.5957	1.10019	-	-	-	-	-	-
	87	2.8736	1.08161	-	-	-	-	-	-
strongly agree									
Political efficacy plus	6	1.8333	1.43759	54	1.3704	.60801	-	-	-
strongly disagree	33	1.9545	.88709	85	1.4294	.62751	-	-	-
	109	2.2752	1.04635	120	1.2667	.40446	-	-	-
	195	2.5564	1.12694	39	1.2949	.74972	-	-	-
	85	2.7294	1.01932	8	1.6250	.58248	-	-	-
strongly agree	12	1.7500	.69085	-	-	-	-	-	-
Political privacy plus									
strongly agree	80	2.6000	1.08907	-	-	-	-	-	-
	141	2.3511	1.06527	-	-	-	-	-	-
	137	2.3540	1.04170	-	-	-	-	-	-
	47	2.7447	1.12227	-	-	-	-	-	-
strongly disagree	23	2.7391	1.37237	-	-	-	-	-	-

Table - 96 Continued (2)

	Shanghai			Singapore			Taipei		
	n	M	SD	n	M	SD	n	M	SD
High-effort Consultation Use									
Political efficacy plus									
strongly disagree	6	3.0000	1.58114	-			-	-	- - - -
	33	3.1061	1.41839	-			-		- - - -
	109	3.3761	1.62611	-			-		- - - -
	195	3.6103	1.62912	-			-		- - - -
strongly agree	85	4.3176	1.73522	-			-		- - - -
Political privacy plus									
strongly agree	80	4.1313	1.73341	-			-		- - - -
	141	3.6489	1.69952	-			-		- - - -
	137	3.4015	1.65036	-			-		- - - -
	47	3.6277	1.52682	-			-		- - - -
strongly disagree	23	3.3913	1.36479	-			-		- - - -

Table 97. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Information Use

Singapore			Taipei		
Low-effort Information Use			**Middle-effort Information Use**		
Ranks					**Ranks**
Civic skills	N	Mean Rank	Political efficacy plus	N	Mean Rank
strongly disagree	19	126.53	strongly disagree	11	94.32
	53	135.91		36	208.61
	129	145.67		169	234.97
	84	171.48		151	219.58
strongly agree	21	198.48	strongly agree	71	207.43
Total	306		Total	438	
Test Statistics					
Kruskal-Wallis H		14.715	Kruskal-Wallis H		14.990
df		4	df		4
Asymp. Sig.		.005	Asymp. Sig.		.005
			High-effort Information Use		
Ranks					**Ranks**
Political efficacy plus	N	Mean Rank	Civic skills	N	Mean Rank
strongly disagree	12	139.46	strongly disagree	25	170.36
	22	156.82		103	194.08
	113	133.64		194	224.36
	102	166.82		85	261.11
strongly agree	57	170.71	strongly agree	31	199.10
Total	306		Total	438	
Test Statistics					

Table - 97 Continued (1)

Singapore			Taipei		
Kruskal-Wallis H		11.223	Kruskal-Wallis H		21.407
df		4	df		4
Asymp. Sig.		.024	Asymp. Sig.		.000
Ranks					**Ranks**
Political privacy plus	N	Mean Rank	**Political efficacy plus**	N	Mean Rank
strongly agree	54	165.86	strongly disagree	11	128.05
⬇	85	175.00	⬇	36	204.88
	120	134.31		169	238.47
	39	146.49		151	213.79
strongly disagree	8	163.69	strongly agree	71	208.06
Total	306		Total	438	
Test Statistics					
Kruskal-Wallis H		12.904	Kruskal-Wallis H		12.828
df		4	df		4
Asymp. Sig.		.012	Asymp. Sig.		.012
Middle-effort Information Use					
Ranks					**Ranks**
Civic skills	N	Mean Rank	**political efficacy plus**	N	Mean Rank
strongly disagree	19	99.61	strongly disagree	46	195.54
⬇	53	136.02	⬇	107	239.78
	129	152.12		199	224.85
	84	171.04		72	188.85
strongly agree	21	184.71	strongly agree	14	224.82
Total	306		Total	438	
Test Statistics					
Kruskal-Wallis H		16.093	Kruskal-Wallis H		10.580
df		4	df		4
Asymp. Sig.		.003	Asymp. Sig.		.032

Table 98. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Consultation Use

	Shanghai		Singapore		Taipei	
			Low-effort Consultation Use			
			Ranks			
Civic skills	-	-	N	Mean Rank	N	Mean Rank
strongly disagree	-	-	19	101.55	25	207.50
	-	-	53	151.23	103	207.73
	-	-	129	156.16	194	220.41
	-	-	84	154.98	85	247.40
strongly agree	-	-	21	183.98	31	186.10
Total	-		306		438	
			Test Statistics			
Kruskal-Wallis H			-	12.213		7.897
df			-	4		4
Asymp. Sig.			-	.016		.095
			Ranks			
Political efficacy plus	-	-	N	Mean Rank	N	Mean Rank
strongly disagree	-	-	12	161.88	11	137.86
	-	-	22	152.75	36	219.06
	-	-	113	152.12	169	226.03
	-	-	102	159.26	151	216.25
strongly agree	-	-	57	144.44	71	223.73
Total	-		306		438	
			Test Statistics			
Kruskal-Wallis H			-	1.547		5.543
df			-	4		4
Asymp. Sig.			-	.818		.236
			Ranks			
Political privacy plus	-	-	-	-	N	Mean Rank
strongly agree	-	-	-	-	46	216.54
	-	-	-	-	107	231.98
	-	-	-	-	199	217.75
	-	-	-	-	72	201.35
strongly disagree	-	-	-	-	14	252.04
Total	-		-		438	
			Test Statistics			
Kruskal-Wallis H			-		-	3.738
df			-		-	4
Asymp. Sig.			-		-	.443

Table - 98 Continued (1)

				N	Mean Rank		
Middle-effort Consultation Use							
Ranks							
Civic skills	-		-	N	Mean Rank	-	-
strongly disagree	-		-	19	133.47	-	-
	-		-	53	143.25	-	-
	-		-	129	147.51	-	-
	-		-	84	172.93	-	-
strongly agree	-		-	21	156.55	-	-
Total	-		306			-	
Test Statistics							
Kruskal-Wallis H				-	14.215		-
df				-	4		-
Asymp. Sig.				-	.007		-
Ranks							
Political efficacy plus	-		-	N	Mean Rank	-	-
strongly disagree	-		-	12	149.67	-	-
	-		-	22	146.48	-	-
	-		-	113	146.15	-	-
	-		-	102	159.08	-	-
strongly agree	-		-	57	161.60	-	-
Total	-		306			-	
Test Statistics							
Kruskal-Wallis H				-	4.080		-
df				-	4		-
Asymp. Sig.				-	.395		-
Ranks							
Political privacy plus	-		-	N	Mean Rank	-	-
strongly agree	-		-	54	167.71	-	-
	-		-	85	156.95	-	-
	-		-	120	146.16	-	-
	-		-	39	154.53	-	-
strongly disagree	-		-	8	126.00	-	-
Total	-		306			-	
Test Statistics							
Kruskal-Wallis H				-	7.000		-
df				-	4		-
Asymp. Sig.				-	.136		-

Table - 98 Continued (2)

	High-effort Consultation Use					
	Ranks					
Civic skills	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	12	86.25	19	128.00	25	150.42
	48	165.27	53	158.98	103	189.19
	140	181.60	129	145.67	194	224.16
	141	231.52	84	167.06	85	274.97
strongly agree	87	284.71	21	156.57	31	194.66
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	62.861		11.404		39.574	
df	4		4		4	
Asymp. Sig.	.000		.022		.000	
	Ranks					
Political efficacy plus	-	-	N	Mean Rank	N	Mean Rank
strongly disagree	-	-	12	164.00	11	161.32
	-	-	22	134.55	36	213.35
	-	-	113	151.03	169	238.06
	-	-	102	158.20	151	212.59
strongly agree	-	-	57	155.10	71	202.16
Total	-		306		438	
	Test Statistics					
Kruskal-Wallis H	-		3.747		9.944	
df	-		4		4	
Asymp. Sig.	-		.441		.041	
	Ranks					
Political privacy plus	-	-	N	Mean Rank	N	Mean Rank
strongly agree	-	-	54	156.00	46	182.07
	-	-	85	162.48	107	235.80
	-	-	120	144.60	199	227.35
	-	-	39	159.38	72	205.92
strongly disagree	-	-	8	146.00	14	176.25
Total	-		306		438	
	Test Statistics					
Kruskal-Wallis H	-		5.628		11.473	
df	-		4		4	
Asymp. Sig.	-		.229		.022	

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At last, for the rest four items of e-government functions use, the Kruskal-Wallis H test is also employed to explore whether the among-group differences are statistically significant or not. The result of each functions use items are presented in separate table. For referendum (in practice it could be understood as pooling-like e-government function use), five of all the nine cases demonstrate statistical significance in sub-group differences. Besides, no such case is identified from Singapore. For collaborative production use, four cases with statistical significance can be found. Still, no such case can be identified for Singapore. What's more, no sub-groups difference can be found for e-government collaboration use for all the three cities in the light of political privacy plus.

For procedures use, five statistically significant cases can be found for all the three cities. It is interesting to find out that levels of civic skills demonstrate differences on e-government procedures use: generally speaking, respondents reporting higher self-evaluated civic skills use procedures more often in all the three cities. What's more, to which extent respondents concerning of being monitored online by government demonstrates no statistically significant differences for e-government procedures use. The finding is applicable for all the three cities, which means, even if interviewees are worrisome about being monitored, they still choose to use e-government procedures function. At last, the e-government payment use is analyzed in the light of the three ordinal PPFs. All the cases of civic skills and two cases of political efficacy plus demonstrate sub-group difference with statistical significance. Besides, it is interesting to find out that respondents having different levels of perception of being monitored online by government indicate no use frequency difference in e-government payment use in Shanghai and Taipei, but the difference do exist in Singapore: interviewees with middle-level concerns demonstrate the lowest experience of e-government payment use in Singapore, while those belonging to the middle-high level of concerns group use in fact use the payment use more frequently.

Table 99. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Referendum Use

	Shanghai		Singapore		Taipei	
			Referendum Use			
			Ranks			
Civic skills	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	12	130.13	19	142.50	25	214.60
	48	166.11	53	148.22	103	200.88
	140	190.80	129	151.98	194	216.93
	141	226.60	84	158.86	85	261.91
strongly agree	87	271.37	21	164.67	31	185.13
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H	42.433		5.810		16.954	
df	4		4		4	
Asymp. Sig.	.000		.214		.002	
			Ranks			
Political efficacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	6	194.50	12	142.50	11	203.82
	33	167.41	22	149.39	36	211.31
	109	195.29	113	151.88	169	228.33
	195	218.26	102	158.95	151	209.67
strongly agree	85	250.19	57	150.86	71	225.96
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H	16.643		3.534		2.677	
df	4		4		4	
Asymp. Sig.	.002		.473		.613	
			Ranks			
Political privacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly agree	80	247.11	54	148.11	46	198.64
	141	212.73	85	158.67	107	241.43
	137	194.28	120	150.07	199	221.81
	47	221.78	39	158.32	72	190.37
strongly disagree	23	217.50	8	162.81	14	237.43
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H	10.578		4.367		10.313	
df	4		4		4	
Asymp. Sig.	.032		.359		.035	

Table 100. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Collaboration Use

	Shanghai		Singapore		Taipei	
			Collaboration Use			
			Ranks			
Civic skills	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	12	88.50	19	143.00	25	184.22
	48	177.49	53	148.72	103	187.81
	140	184.09	129	152.48	194	221.93
	141	231.08	84	159.48	85	271.18
strongly agree	87	274.36	21	157.43	31	196.39
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H	54.414		4.509		37.832	
df	4		4		4	
Asymp. Sig.	.000		.342		.000	
			Ranks			
Political efficacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	6	168.42	12	155.63	11	157.00
	33	168.64	22	149.89	36	209.65
	109	196.53	113	156.41	169	236.24
	195	217.79	102	153.60	151	214.79
strongly agree	85	251.06	57	148.50	71	204.35
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H	17.228		1.812		11.315	
df	4		4		4	
Asymp. Sig.	.002		.770		.023	
			Ranks			
Political privacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly agree	80	235.02	54	151.42	46	198.34
	141	206.73	85	157.38	107	231.87
	137	202.57	120	150.57	199	224.08
	47	227.20	39	159.08	72	205.69
strongly disagree	23	235.87	8	143.00	14	200.39
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H	5.897		3.087		5.983	
df	4		4		4	
Asymp. Sig.	.207		.543		.200	

Table 101. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Procedures Use

	Shanghai		Singapore		Taipei	
	Procedures Use					
	Ranks					
Civic skills	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	12	97.75	19	107.50	25	177.28
	48	197.42	53	145.05	103	192.46
	140	192.22	129	147.67	194	223.96
	141	225.91	84	176.49	85	256.21
strongly agree	87	257.39	21	160.26	31	214.84
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	32.902		14.638		17.634	
df	4		4		4	
Asymp. Sig.	.000		.006		.001	
	Ranks					
Political efficacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	6	210.58	12	140.25	11	217.91
	33	173.56	22	137.52	36	232.42
	109	195.68	113	134.76	169	229.13
	195	222.35	102	169.69	151	206.80
strongly agree	85	236.79	57	170.65	71	217.28
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	11.465		14.196		3.426	
df	4		4		4	
Asymp. Sig.	.022		.007		.489	
	Ranks					
Political privacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly agree	80	225.86	54	160.26	46	200.85
	141	209.64	85	159.01	107	238.64
	137	200.97	120	142.05	199	218.53
	47	243.40	39	165.49	72	214.45
strongly disagree	23	226.30	8	162.63	14	174.25
Total	428		306		438	
	Test Statistics					
Kruskal-Wallis H	6.279		4.224		6.336	
df	4		4		4	
Asymp. Sig.	.179		.377		.175	

Table 102. Kruskal-Wallis H Test Comparison of the Effect of Ordinal PPFs on E-government Payment Use

	Shanghai		Singapore		Taipei	
			Payment Use			
			Ranks			
Civic skills	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	12	192.58	19	121.97	25	177.34
	48	191.72	53	134.94	103	202.61
	140	186.65	129	145.14	194	227.04
	141	225.04	84	171.92	85	243.55
strongly agree	87	257.83	21	206.55	31	196.50
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H		22.705		19.871		11.067
df		4		4		4
Asymp. Sig.		.000		.001		.026
			Ranks			
Political efficacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly disagree	6	174.50	12	171.54	11	210.32
	33	169.33	22	138.27	36	193.71
	109	200.26	113	140.18	169	236.10
	195	222.53	102	155.64	151	214.50
strongly agree	85	234.69	57	178.16	71	205.11
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H		10.435		9.535		6.619
df		4		4		4
Asymp. Sig.		.034		.049		.157
			Ranks			
Political privacy plus	N	Mean Rank	N	Mean Rank	N	Mean Rank
strongly agree	80	226.04	54	154.95	46	204.88
	141	206.60	85	172.32	107	232.25
	137	204.88	120	135.93	199	224.31
	47	226.60	39	151.06	72	208.45
strongly disagree	23	255.39	8	219.13	14	158.57
Total	428		306		438	
			Test Statistics			
Kruskal-Wallis H		5.527		15.150		6.813
df		4		4		4
Asymp. Sig.		.237		.004		.146

4.4.3 Conclusion

In the present section, two approaches are employed to analyze the prediction effect of some categorical and ordinal PPFs on e-government use. In the conclusion part, a brief summary overview of the first approach (logistic analysis) is to be demonstrated firstly. Thereafter, a conclusion report of the second approach is to be presented.

In the following table, all the statistically significant prediction cases by the method of the first approach are marked for a quick glance. Generally speaking, the logistic analysis can function for Singapore in most cases, for Shanghai less cases and for Taipei the least cases. What's more, it is remarkable that no single kind of e-government use of all the three cities can be predicted at the same time. Besides, e-government consultation use can far less well predicted by the logistic analysis in comparison to other e-government use factors.

Table 103. Significant Cases by Ordinal Polytomous Logistic Analysis of Categorical/ordinal PPFs Prediction on E-government Use

	SH	SG	TP		SH	SG	TP
E-government platform use				*E-government consultation use*			
e-gov hotline-email				e-gov low-consul	●		
e-gov portal-apps	●	●		e-gov mid-consul			
e-gov SNS		●		e-gov high-consul	●		
e-gov public-third		●	●	*E-government other functions use*			
E-government information use				e-gov referendum	●		●
e-gov low-info	●	●		e-gov collaboration	●	●	
e-gov mid-info		●	●	e-gov procedures		●	●
e-gov high-info	●	●		e-gov payment	●	●	

Next, result of the second approach is to be introduced. The conclusion is firstly drawn for Shanghai. The money contribution and the time contribution are taken as a comparison group. From the table below it is oblivious that all the money contribution cases and all the time contribution cases for e-government use are statistically significant. However, their effect on e-government use are in opposite direction: for the time contribution the no contribution group reported higher e-

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government use, while for the money contribution the money contribution group indicated more frequent e-government use. Then the languages spoken at home is taken into observation. From the table a conclusion can be drawn that the languages skills is not statistically significant overwhelmingly for all these e-government use items. The native Wu-Chinese speakers, however, demonstrated a higher use frequencies in the e-government SNS use and the e-government referendum use.

Table 104. Statistically Significant Comparison of the Effect of Categorical/Ordinal PPFs on E-government Use in Shanghai

	money	time	skills	languages	efficacy plus	security plus	duty	engage
Hotline-email	S	S, no	S	-	-	-	S	S
Portals-apps	S	S, no	S	-	S	-	S	S
SNS	S	S, no	S	S, wu	-	-	S	S
Third-public	S	S, no	S	-	S	-	S	S
Low-info	S	S, no	S	-	-	-	S	S
Mid-info	S	S, no	S	-	S	-	S	S
High-info	S	S, no	S	-	S	-	S	S
Low-consul	S	S, no	S	-	S	-	S	S
High-consul	S	S, no	S	-	S	S	S	S
Referendum	S	S, no	S	S, wu	S	S	S	S
Col. production	S	S, no	S	-	S	-	S	S
Procedures	S	S, no	S	-	S	-	S	S
Payment	S	S, no	S	-	S	-	S	S

S stands for cases with stastistically significant difference;
No for no contribution and Wu for local Wu-Chinese speakers.

Next, the political security and privacy plus is checked. Only two cases of these e-government use cases indicated that there was a statistically significant difference between inner groups. It is reasonable to take the fact in account: the e-government high-effort consultation use and the e-government referendum use (which here could be understood as polling-like use as previously explained) belong to the higher level of political participation for which a certain degree of perceived political security and privacy is required when these participation forms are to be undertaken. At last, the civic skills, the political efficacy plus, the reported citizen duty and the reported citizen engagement are generally in positive

correlation with e-government use. However, expected differences between citizen duty and citizen engagement in terms of e-government use are not found in Shanghai. The results show that the residents belonging to a higher score group of citizen duty or citizen engagement reported frequent e-government use, and vice versa.

An overview from the perspectives of categorical and ordinal PPFs is then presented for Singapore. Firstly, the money contribution and time contribution indicate a different picture from those in Shanghai: residents reporting no money contribution or no time contribution demonstrated higher e-government use frequency for all but the e-government low-effort information use, and vice versa. While the no-time contributors along with higher e-government use frequency are worth further research attention in Shanghai, the no-money and the no-time contributors with higher e-government use frequencies deserve extra research attention in Singapore. The money contribution and the time contribution as traditional political participation indicators may face new challenges in terms of e-government use in Singapore. Next, statistically significant differences from civic skills are common for most e-government use cases except four cases. The similar commonality can also be found for citizen engagement, within which only four kinds of e-government use cases are statistically not significant. However, the citizen duty plays no exclusive role (as expected) to the citizen engagement. Compared with the citizen duty, the citizen engagement seems more capable to differentiate the general e-government use. The findings here offer a closer look for the relation between these two citizenship norms and e-government use, which cannot be acquired from the result in Shanghai.

Next, the languages spoken at home illustrate an interesting result: generally speaking, the languages spoken at home matter not that much for e-government use, while the English speakers did report higher e-government hotline-email use, portals-apps use and payment use. At last, the perceived political efficacy plus

and the perceived political security and privacy plus are examined on the whole. There is no general statistically significant differences for all these e-government use cases. However, for the e-government low-effort information use and the e-government payment use, both the efficacy plus and the security and privacy plus demonstrate difference within groups. A further look from this point of view is worthy being undertaken in future research.

Table 105. Statistically Significant Comparison of the Effect of Categorical/Ordinal PPFs on E-government Use in Singapore

	money	time	skills	languages	efficacy plus	security plus	duty	engage
Hotline-email	S, no	S, no	S	S, Eng	-	-	-	S
Portals-apps	S, no	S, no	S	S, Eng	-	-	S	S
SNS	S, no	S, no	-	-	-	-	-	S
Third-public	S, no	S, no	S	-	-	-	S	S
Low-info	-	-	S	-	S	S	S	S
Mid-info	S, no	S, no	S	-	-	-	-	S
High-info	S, no	S, no	-	-	-	S	-	-
Low-consul	S, no	S, no	S	-	-	-	-	-
Mid-consul	S, no	S, no	S	-	-	-	-	S
High-consul	S, no	S, no	S	-	-	-	-	-
Referendum	S, no	S, no	-	-	-	-	-	-
Col. production	S, no	S, no	-	-	-	-	-	S
Procedures	S, no	S, no	S	-	S	-	S	S
Payment	S, no	S, no	S	S, Eng	S	S	S	S

S stands for cases with stastistically significant difference;
No for no contribution and Eng for English speakers.

At last, an overview is summarized for Taipei from the perspectives of the categorical and the ordinal PPFs. As previously conducted for Shanghai and Singapore, the money and the time contribution are also examined together for Taipei. Surprisingly, the results are different to those from Shanghai and Singapore: although almost all the cases are statistically significant which are similar to those in Shanghai and Singapore, no-money contributors score higher e-government use frequency averagely. Thereafter, the money contribution and the time contribution as traditional indicators for political participation reveal different results when they are applied to e-government use in the three cities.

Next, the languages spoken at home are observed at length. While for e-government platforms use there is no statistically significant difference for languages skill, the languages spoken at home, however, demonstrate inner-group differences for e-government functions use, although no evidence was found for e-government low-effort information use and the low-effort consultation use and the referendum use: generally speaking, residents speaking Minnan-Chinese and Hakka-Chinese at home reported higher e-government functions use frequency. The role which language skills plays is more outstanding compared those from Shanghai and Singapore. The findings might reflect the political awakening and political participation enthusiasm of the non-Mandarin speakers in Taipei as well as in Taiwan.

Table 106. Statistically Significant Comparison of the Effect of Categorical/Ordinal PPFs on E-government Use in Taipei

	money	time	skills	lang1	lang2	lang3	efficacy plus	security plus	duty	engage
Hotline-email	S, no	S	S	-	-	-	-	-	S, low	-
Portals-apps	S, no	S	S	-	-	-	-	-	-	-
SNS	S, no	S	-	-	-	-	-	-	S	S
Third-public	S, no	S	S	-	-	-	-	-	-	S
Low-info	-	-	-	-	-	-	-	-	S	S
Mid-info	S, no	S	S	S, Min	-	-	S	-	S	-
High-info	S, no	S	S	S, Min	S, Hak	-	S	S	S, low	-
Low-consul	S, no	S	-	-	-	-	-	-	-	S
High-consul	S, no	S	S	S, Min	S, Hak	S, Min	S	S	S	S
Referendum	S, no	S	S	-	-	-	-	S	-	-
Col. production	S, no	S	S	S, Min	S, Hak	S, Hak	S	-	-	S, low
Procedures	S, no	S	S	S, Min	S, Hak	-	-	-	S, low	-
Payment	S, no	S	S	S, Min	S, Hak	-	-	-	S, low	-

S stands for cases with stastistically significant difference;
No for no contribution, low for low citizenship group;
Min for Minnan-Chinese speakers and Hak for Hakka-Chinese speakers.

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For political efficacy plus and security-privacy plus the landscape of the inner-group difference is similar to that of the language skills: for e-government platforms use there is no statistically significant cases, while for the e-government functions use (high-effort information use, high-effort consultation use, for example) both efficacy plus and security-privacy plus demonstrate differences.

At last, the citizenship is taken into observation. The citizen duty and the citizen engagement indicate some exclusive effects to each other: only for the e-government SNS use and the e-government high-effort consultation use the higher score of each citizenship reported higher use frequencies and vice versa, while for the rest use items the exclusiveness is outstanding. Residents in Taipei reporting lower citizen duty demonstrate statistically significantly higher e-government use frequency for hotline-email, high-effort information, procedures use and payment use; residents reporting higher citizen engagement demonstrate higher use frequency in e-government public-platforms-and-third-party-apps use; residents with lower citizen engagement reported higher e-government collaborative production use frequency. Still, these findings need further interpretation especially facing the combination of lower citizen engagement and higher e-government collective production use and the combination of lower citizen duty and higher e-government high-effort information use. In all, these new findings from Taipei are worth further exploration.

4.5 E-government use and interval PPF

In the present section, the relation between interval PPFs and e-government use is to be explored. E-government use is still observed from two points of view: the e-government platforms use and e-government functions use. And the factors of e-government use formed before are still used in this section. The interval PPFs stem from four categories which are elaborately detailed in the literature review and relevant theories: the resource, the politically psychological engagement, the

recruitment and the perceived digital features of e-government. To test the prediction effect of all the four categories, the hierarchical multiple regression is adopted.

Before the prediction test, however, variables under each category are to be reduced in amount in order to avoid multiple collinearity. Factor analysis is employed to achieve this goal and corresponding result is presented in the following table. Besides, one point from the last factor in the table should be specially pointed out for Singapore. As exploration reveals that only the ease of use and the interactivity are suitable to bundle together and the perceived value should be left as an individual variable. Thus the factor for Singapore can only be made up from the ease and the interactivity.

Table 107. Cumulative Extraction Sums of Squared Loadings of interval PPFs

Factors	Variables	cumulative extraction sums of squared loadings		
		SH	SG	TP
political-egov-trust-privacy-security	political trust	63.937%	61.813%	59.991%
	e-government trust			
	political privacy and security			
	e-government privacy and security			
political-Public-Recruitment	offline and online political recruitment	74.658%	68.727%	65.987%
	offline and online public recruitment			
private-Onliner-Recruitment	offline and online private recruitment	78.415%	69.273%	71.149%
	onliner recruitment			
political talk	offline and online political talk	74.128%	64.868%	67.372%
	offline and online public talk			
	offline and online private talk			
	onliner talk			
e-government recommendation	political e-government recommendation	72.854%	58.033%	62.927%
	public e-government recommendation			
	private e-government recommendation			
	onliner e-government recommendation			
ease-Interactivity-Value	perceived value of e-government	66.295%	-	65.160%
	perceived ease of use		69.188%	
	perceived interactivity			

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4.5.1 E-government platforms use and the interval PPFs

The e-government platforms use is still observed in five kinds as dependent variables, while the PPFs as independent variables are put into hierarchical multiple regression in four steps. In the final model, one resource variable and three independent variables bundles were included, which encompass the digital skill resource, the psychological engagement bundle, the political-public-private-onliner recruitment bundle and the e-government recruitment bundle.

To meet the regression assumptions, following standards are checked for all these cases: observation independency (it has been verified by Durbin-Watson test that the observation values are independent from each other for all the three cities), equal variance by drawing the scatter plot of the studentized residual and the unstandardized predicted value, regression tolerance values were greater than 0.1 which implied there was no multicollinearity, the outlier test featured with no observations of the external studentized residuals which were 3 times greater than the standard deviation, data leverage values were less than 0.2 and there is no Cook's distance value greater than 1, and Q-Q diagram indicated that the research data could meet the normal hypothesis. In the following table the Durbin-Watson test value which can test the observation independency is presented for each cases.

Table 108. Durbin-Watson Test of Autocorrelation for Hierarchical Multiple Regression of E-government Platforms Use and PPFs

	Shanghai	Singapore	Taipei
Hotline-email use	1.855	1.880	1.848
Portal-apps use	1.855	2.088	2.083
SNS use	1.857	2.089	1.997
Public-third use	1.992	2.070	1.923

Hotline-email use and the interval PPFs

In the following three tables, results for all the three cities are separately reported. Firstly, the final prediction effect of the three cities differs in their effect size from each other. As the R^2 demonstrate: Shanghai leads with .354, followed by

Taipei .249 and Singapore is left far behind with .145 only. Besides, the recruitment bundle which is added in the model three demonstrates the largest increased prediction effect for all the three cities: the ΔR^2 at this model is .226 in Shanghai, .68 in Singapore, .187 in Taipei. The effect from Shanghai and Taipei is greater than that from Singapore.

Table 109. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Hotline-email Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.181**		.690		1.401**		1.730**	
DigitalSkills	.183	.144	-.059	-.046	.002	.002	.015	.012
PoliticalKnowledge			-.030	-.010	.220	.071	.224	.072
PoliticalInterest			.340	.330	.141	.137	.136	.132
PoliticalEfficacy			-.060	-.054	-.060	-.055	-.072	-.066
EgovEfficacy			.112	.101	.010	.009	.004	.004
PoliticalEgovTrust			-.012	-.014	-.030	-.036	-.046	-.054
PrivacySecurity								
PoliticalPublic Recruitment					.233	.273	.212	.248
PrivateOnliner Recruitment					.044	.052	.044	.051
Talk					.177	.208	.190	.222
Egov Recommend					.060	.070	.037	.043
EaseInteractivity Value							.069	.081
PerceivedUsefulness							-.049	-.036
OnlinePromotion							-.027	-.040
R^2	.021		.126		.351		.354	
F	9.053*		10.098**		22.588**		17.465**	
ΔR^2	.021		.105		.226		.003	
ΔF	9.053*		10.113**		36.250**		.603	

(N=428, *<0.05, **<0.001)

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Table 110. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Hotline-email Use in Singapore

Variables	Model 1 C	Model 1 Std. C	Model 2 C	Model 2 Std. C	Model 3 C	Model 3 Std. C	Model 4 C	Model 4 Std. C
Constant	1.332**		.598		.809*		1.368*	
DigitalSkills	.084	.087	.035	.036	.039	.040	.033	.034
PoliticalKnowledge			.014	.004	.040	.012	.051	.015
PoliticalInterest			.027	.035	-.006	-.008	.011	.014
PoliticalEfficacy			.067	.067	.049	.049	.057	.057
EgovEfficacy			.215	.229	.184	.195	.158	.168
PoliticalEgovTrust			-.041	-.052	-.044	-.056	-.047	-.059
PrivacySecurity								
PoliticalPublic Recruitment					.163	.207	.178	.226
PrivateOnliner Recruitment					.043	.055	.024	.031
Talk					.002	.003	.018	.023
Egov Recommend					.033	.042	-.028	-.035
EaseInteractivity							.105	.133
PerceivedValue							-.010	-.011
PerceivedUsefulness							-.028	-.026
OnlinePromotion							-.118	-.117
R^2	.008		.055		.123		.145	
F	2.299		2.887*		4.141**		3.515**	
ΔR^2	.008		.047		.068		.022	
ΔF	2.299		2.990*		5.746**		1.835	

(N=306, *<0.05, **<0.001)

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Table 111. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Hotline-email Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.588**		1.903**		1.424**		1.556**	
DigitalSkills	.036	.037	.002	.002	.124	.127	.138	.142
PoliticalKnowledge			.223	.060	.321	.086	.313	.084
PoliticalInterest			.064	.074	.016	.018	.016	.018
PoliticalEfficacy			-.125	-.123	-.061	-.060	-.063	-.062
EgovEfficacy			-.056	-.057	-.079	-.080	-.071	-.072
PoliticalEgovTrust			.149	.193	.051	.066	.053	.069
PrivacySecurity								
PoliticalPublic Recruitment					.330	.427	.320	.415
PrivateOnliner Recruitment					.123	.159	.122	.158
Talk					-.157	-.203	-.151	-.195
Egov Recommend					.054	.070	.049	.064
EaseInteractivity Value							.017	.022
PerceivedUsefulness							-.047	-.046
OnlinePromotion							-.007	-.008
R^2	.001		.061		.248		.249	
F	.603		4.696**		14.080**		10.817**	
ΔR^2	.001		.060		.187		.001	
ΔF	.603		5.508**		26.489**		.204	

(N=438, *<0.05, **<0.001)

Portal-apps use and the interval PPFs

For the portal-and-apps use in the light of the interval political participative factors, the final prediction effect of the three cities also differs in their effect size from each other. As the R^2 demonstrate: Shanghai leads with .249, followed by Singapore .205 and Taipei is left far behind with .185 only. Besides, the largest increased predictability of the three cities falls in difference bundles: for Shanghai

and Taipei the third layer indicates the highest prediction effect (.102 in Shanghai and .087 in Taipei), while the first layer demonstrates the highest prediction effect in Singapore with .098.

Table 112. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Portals-apps Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	.946**		.897*		1.244*		1.555*	
DigitalSkills	.332	.241	.187	.136	.230	.167	.229	.167
PoliticalKnowledge			.063	.019	.237	.070	.225	.067
PoliticalInterest			.180	.162	.052	.047	.041	.036
PoliticalEfficacy			-.221	-.186	-.211	-.178	-.168	-.142
EgovEfficacy			.183	.151	.130	.108	.084	.069
PoliticalEgovTrust			.014	.016	.020	.022	-.049	-.053
PrivacySecurity								
PoliticalPublic Recruitment					.192	.208	.187	.202
PrivateOnliner Recruitment					-.027	-.030	-.018	-.020
Talk					.180	.195	.183	.198
Egov Recommend					-.028	-.030	-.086	-.093
EaseInteractivity Value							.228	.246
PerceivedUsefulness							-.094	-.065
OnlinePromotion							.046	.063
R^2	.058		.125		.227		.249	
F	26.339**		10.045**		12.264**		10.585**	
ΔR^2	.058		.067		.102		.022	
ΔF	26.339**		6.450**		13.765**		4.083*	

(N=428, *<0.05, **<0.001)

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Table 113. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Portals-apps Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	.653*		.304		.414		-.909	
DigitalSkills	.423	.313	.310	.229	.308	.227	.213	.157
PoliticalKnowledge			-.028	-.006	-.067	-.014	-.049	-.011
PoliticalInterest			.157	.146	.136	.126	.083	.077
PoliticalEfficacy			-.014	-.010	-.012	-.008	-.019	-.014
EgovEfficacy			.127	.096	.121	.091	.087	.066
PoliticalEgovTrust			.075	.068	.087	.079	-.070	-.063
PrivacySecurity								
PoliticalPublic Recruitment					.086	.078	.087	.079
PrivateOnliner Recruitment					-.115	-.105	-.077	-.070
Talk					.170	.155	.168	.153
Egov Recommend					-.034	-.031	-.053	-.048
EaseInteractivity							-.016	-.014
PerceivedValue							.084	.062
PerceivedUsefulness							.410	.272
OnlinePromotion							.059	.042
R²	.098		.147		.165		.205	
F	32.960**		8.571**		5.842**		5.365**	
ΔR²	.098		.049		.019		.040	
ΔF	32.960**		3.430*		1.638		3.647*	

(N=306, *<0.05, **<0.001)

Table 114. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Portals-apps Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.772**		1.322*		.983*		.263	
DigitalSkills	.129	.106	.079	.065	.180	.148	.147	.120
PoliticalKnowledge			.394	.085	.471	.101	.572	.123
PoliticalInterest			.083	.077	.032	.030	.023	.022
PoliticalEfficacy			.008	.007	.061	.048	.092	.072
EgovEfficacy			.028	.023	.004	.003	.009	.007
PoliticalEgovTrust			.180	.186	.097	.100	.112	.116
PrivacySecurity								
PoliticalPublic Recruitment					.290	.300	.299	.309
PrivateOnliner Recruitment					.066	.068	.063	.066
Talk					-.090	-.093	-.101	-.104
Egov Recommend					.052	.053	.086	.089
EaseInteractivity Value							-.190	-.196
PerceivedUsefulness							.260	.201
OnlinePromotion							-.078	-.071
R^2	.011		.075		.162		.185	
F	4.925*		5.807**		8.231**		7.401**	
ΔR^2	.011		.064		.087		.023	
ΔF	4.925*		5.928**		11.054**		4.047*	

(N=438, *<0.05, **<0.001)

SNS use and the interval PPFs

For the SNS use in the light of the interval political participative factors, the final explanatory effect of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .172 and Taipei follows closely with .166 and Singapore with .161 only. The R^2 value demonstrates no high prediction effects for all the three cities. The low prediction effect can also be reflected in the highest ΔR^2 value of each city: for Singapore and Taipei the political attitudes contribute the largest prediction effect with .080 and .073

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respectively, while the e-government recruitment indicates the largest prediction effect for Shanghai with .051.

Table 115. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government SNS Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.608*		1.054		.814		-.098	
DigitalSkills	.310	.171	.153	.084	.163	.090	.099	.054
PoliticalKnowledge			.430	.097	.477	.108	.432	.097
PoliticalInterest			.220	.150	.187	.127	.181	.123
PoliticalEfficacy			-.202	-.129	-.162	-.104	-.021	-.013
EgovEfficacy			.201	.126	.238	.150	.171	.108
PoliticalEgovTrust			-.058	-.048	-.012	-.010	-.084	-.069
PrivacySecurity								
PoliticalPublic Recruitment					-.019	-.016	.065	.053
PrivateOnliner Recruitment					-.105	-.086	-.083	-.068
Talk					.380	.312	.331	.271
Egov Recommend					-.224	-.184	-.238	-.195
EaseInteractivity							.148	.121
Value PerceivedUsefulness							.054	.028
OnlinePromotion							.214	.223
R²	.029		.076		.121		.172	
F	12.770**		5.735**		5.747**		6.627**	
ΔR²	.029		.046		.046		.051	
ΔF	12.770**		4.231*		5.404**		8.524**	

(N=428, *<0.05, **<0.001)

Table 116. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government SNS Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.357**		.667		1.023*		.641	
DigitalSkills	.062	.053	-.055	-.048	-.061	-.053	-.083	-.072
PoliticalKnowledge			.178	.045	.108	.027	.112	.028
PoliticalInterest			.178	.194	.126	.138	.115	.125
PoliticalEfficacy			-.016	-.013	-.029	-.025	-.034	-.029
EgovEfficacy			.176	.157	.146	.130	.144	.128
PoliticalEgovTrust			-.006	-.007	-.015	-.016	-.066	-.071
PrivacySecurity								
PoliticalPublic Recruitment					-.027	-.029	-.024	-.026
PrivateOnliner Recruitment					-.140	-.150	-.131	-.140
Talk					.372	.396	.368	.392
Egov Recommend					.047	.050	.033	.035
EaseInteractivity							.043	.046
PerceivedValue							.065	.056
PerceivedUsefulness							.034	.027
OnlinePromotion							.057	.047
R^2	.003		.083		.156		.161	
F	.867		4.483**		5.435**		3.995**	
ΔR^2	.003		.080		.073		.006	
ΔF	.867		5.194**		6.378**		.488	

(N=306, *<0.05, **<0.001)

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Table 117. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government SNS Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.516**		-.099		-.176		-.473	
DigitalSkills	.272	.170	.175	.109	.252	.157	.210	.131
PoliticalKnowledge			.389	.064	.401	.066	.420	.069
PoliticalInterest			.210	.149	.130	.092	.134	.095
PoliticalEfficacy			.099	.060	.132	.079	.143	.086
EgovEfficacy			.239	.147	.218	.134	.185	.114
PoliticalEgovTrust			.068	.054	.018	.014	.002	.001
PrivacySecurity								
PoliticalPublic Recruitment					.393	.310	.407	.321
PrivateOnliner Recruitment					-.204	-.161	-.203	-.160
Talk					.124	.098	.114	.090
Egov Recommend					.001	.001	-7.370	.000
EaseInteractivity Value							-.027	-.021
PerceivedUsefulness							.155	.091
OnlinePromotion							-.019	-.013
R^2	.029		.102		.162		.166	
F	12.950**		8.115**		8.240**		6.475**	
ΔR^2	.029		.073		.060		.004	
ΔF	12.950**		6.971**		7.674**		.655	

(N=438, $*<0.05$, $**<0.001$)

Public-platforms-and-third-party-apps use and the interval PPFs

For the public-platforms-and-third-party-apps use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .228, followed by Taipei .193 and Singapore is far left behind with .144 only. These R^2 values are not that high and the their largest contributors also demonstrate low prediction effect: for Shanghai and Taipei the recruitment bundle in the third layer indicated the highest increased prediction effect with .092 and

120, while for Singapore the political psychological features contributed the most with .088.

Table 118. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Public-devices-and-third-party-apps Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.579**		1.256*		1.557*		1.431*	
DigitalSkills	.233	.143	-.025	-.015	.011	.007	-.033	-.020
PoliticalKnowledge			-.017	-.004	.140	.035	.101	.025
PoliticalInterest			.132	.100	.000	.000	-.020	-.015
PoliticalEfficacy			-.163	-.116	-.143	-.102	-.094	-.067
EgovEfficacy			.382	.268	.345	.242	.289	.203
PoliticalEgovTrust			.056	.051	.064	.059	-.014	-.013
PrivacySecurity								
PoliticalPublic Recruitment					.053	.048	.063	.057
PrivateOnliner Recruitment					.011	.010	.023	.021
Talk					.325	.297	.321	.294
Egov Recommend					-.075	-.068	-.135	-.123
EaseInteractivity Value							.192	.176
PerceivedUsefulness							.057	.033
OnlinePromotion							.059	.069
R^2	.021		.117		.209		.228	
F	8.929*		9.300**		11.007**		9.408**	
ΔR^2	.021		.097		.092		.019	
ΔF	8.929*		9.203**		12.098**		3.432*	

(N=428, *<0.05, **<0.001)

Table 119. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Public-devices-and-third-party-apps Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.238**		.246		.428		.602	
DigitalSkills	.172	.139	.094	.076	.100	.081	.066	.053
PoliticalKnowledge			-.171	-.040	-.120	-.028	-.115	-.027
PoliticalInterest			-.005	-.005	-.029	-.030	-.026	-.027
PoliticalEfficacy			.067	.053	.044	.034	.045	.035
EgovEfficacy			.407	.337	.371	.308	.340	.282
PoliticalEgovTrust			-.068	-.067	-.087	-.086	-.140	-.139
PrivacySecurity								
PoliticalPublic Recruitment					.090	.089	.106	.105
PrivateOnliner Recruitment					.108	.107	.107	.106
Talk					-.091	-.090	-.078	-.078
Egov Recommend					.085	.085	.038	.038
EaseInteractivity							.075	.075
PerceivedValue							-.060	-.049
PerceivedUsefulness							.155	.112
OnlinePromotion							-.101	-.078
R^2	.019		.107		.129		.144	
F	6.009*		5.975**		4.375**		3.498**	
ΔR^2	.019		.088		.022		.015	
ΔF	6.009*		5.872**		1.871		1.265	

(N=306, *<0.05, **<0.001)

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Table 120. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Public-devices-and-third-party-apps Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.704**		1.407*		.913*		1.111*	
DigitalSkills	.131	.106	.067	.054	.188	.152	.245	.198
PoliticalKnowledge			.123	.026	.270	.057	.291	.062
PoliticalInterest			.083	.076	.047	.043	.038	.034
PoliticalEfficacy			-.026	-.020	.041	.032	.042	.032
EgovEfficacy			.081	.065	.040	.032	.100	.080
PoliticalEgovTrust			.155	.158	.043	.044	.075	.076
PrivacySecurity								
PoliticalPublic Recruitment					.449	.458	.419	.427
PrivateOnliner Recruitment					-.015	-.015	-.018	-.018
Talk					-.207	-.211	-.190	-.194
Egov Recommend					.105	.107	.116	.118
EaseInteractivity Value							-.043	-.044
PerceivedUsefulness							-.124	-.094
OnlinePromotion							-.038	-.034
R^2	.011		.064		.184		.193	
F	4.956*		4.941**		9.620**		7.788**	
ΔR^2	.011		.053		.120		.009	
ΔF	4.956*		4.893**		15.632**		1.558	

(N=438, *<0.05, **<0.001)

4.5.2 E-government functions use and the interval PPFs

In the second half of the present section, the prediction effect of the interval PPFs on e-government functions use is studied. The e-government functions use is still observed from the points of view of functions use factors and four individual functions use items. The assumptions of hierarchical multiple regression analysis are also to be examined as being done in the first half of the section. In the following table, the result of Durbin-Watson test is reported for each case.

Table 121. Durbin-Watson Test of Autocorrelation for Hierarchical Multiple Regression of E-government Functions Use and PPFs

	Shanghai	Singapore	Taipei
Low-info	1.925	1.926	1.809
Middle-info	1.793	2.086	1.891
High-info	1.802	1.997	1.793
Low-consul	1.705	1.820	1.904
Middle-consul	-	1.598	-
High-consul	1.785	1.932	1.816
Referendum	1.596	2.029	2.095
Production	1.485	1.999	2.014
Procedures	1.820	2.083	1.923
Payment	1.821	2.052	1.809

Low-effort information use and the interval PPFs

For the low-effort information use in the light of the interval political participative factors, the final explanatory effect of the three cities differs in their effect size from each other. As the R^2 demonstrate: Shanghai leads with .207, followed by Taipei .175 and Singapore is left behind with .168 only. The R^2 value is not high and for each added-up layer no high prediction effect can be identified. For Shanghai and Singapore the digital skills can contribute the most to the low-effort information use with .54 and .089 respectively, while for Taipei the psychological engagement contributes the most with .084.

Table 122. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Low-effort Information Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.234**		.997		.717		.283	
DigitalSkills	.388	.232	.244	.146	.249	.149	.173	.103
PoliticalKnowledge			.264	.064	.307	.075	.245	.060
PoliticalInterest			.030	.022	.001	.001	-.026	-.019
PoliticalEfficacy			-.197	-.136	-.160	-.111	-.064	-.044
EgovEfficacy			.316	.215	.369	.251	.282	.192
PoliticalEgovTrust			.026	.023	.064	.057	-.053	-.047
PrivacySecurity								
PoliticalPublic Recruitment					-.181	-.161	-.146	-.130
PrivateOnliner Recruitment					.070	.062	.091	.081
Talk					.365	.325	.349	.310
Egov Recommend					-.229	-.204	-.308	-.274
EaseInteractivity Value							.270	.240
PerceivedUsefulness							.104	.059
OnlinePromotion							.127	.143
R²	.054		.103		.157		.207	
F	24.181**		8.088**		7.742**		8.306**	
ΔR²	.054		.050		.053		.050	
ΔF	24.181**		4.662**		6.580**		8.747**	

(N=428, *<0.05, **<0.001)

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Table 123. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Low-effort Information Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	.809*		.147		.222		-.774	
DigitalSkills	.415	.298	.329	.236	.320	.229	.261	.187
PoliticalKnowledge			-.034	-.007	-.061	-.013	-.043	-.009
PoliticalInterest			.096	.086	.081	.073	.050	.045
PoliticalEfficacy			.035	.024	.037	.026	.028	.019
EgovEfficacy			.212	.156	.217	.159	.206	.152
PoliticalEgovTrust			.000	.000	.013	.011	-.118	-.104
PrivacySecurity								
PoliticalPublic					-.008	-.007	-.002	-.002
Recruitment								
PrivateOnliner					.014	.012	.033	.029
Recruitment								
Talk					.121	.107	.113	.100
Egov					-.046	-.041	-.095	-.084
Recommend								
EaseInteractivity							.121	.106
PerceivedValue							.209	.150
PerceivedUsefulness							.068	.044
OnlinePromotion							.140	.096
R^2	.089		.126		.137		.168	
F	29.571**		7.171**		4.684**		4.201**	
ΔR^2	.089		.037		.011		.031	
ΔF	29.571**		2.541*		.960		2.719*	

(N=306, *<0.05, **<0.001)

Table 124. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Low-effort Information Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.651**		1.226*		1.112*		.289	
DigitalSkills	.206	.147	.133	.095	.209	.149	.147	.105
PoliticalKnowledge			.390	.073	.449	.084	.513	.096
PoliticalInterest			.136	.110	.071	.057	.063	.051
PoliticalEfficacy			-.018	-.012	.025	.017	.040	.028
EgovEfficacy			.021	.015	-.018	-.012	-.041	-.029
PoliticalEgovTrust			.240	.216	.166	.149	.175	.158
PrivacySecurity								
PoliticalPublic Recruitment					.238	.214	.290	.261
PrivateOnliner Recruitment					-.004	-.003	-.001	-.001
Talk					.015	.013	-.020	-.018
Egov Recommend					.077	.069	.123	.111
EaseInteractivity Value							-.149	-.134
PerceivedUsefulness							.242	.162
OnlinePromotion							.045	.035
R^2	.022		.106		.159		.175	
F	9.605*		8.506**		8.055**		6.899**	
ΔR^2	.022		.084		.053		.016	
ΔF	9.605*		8.129**		6.704**		2.721*	

(N=438, *<0.05, **<0.001)

Middle-effort information use and the interval PPFs

For the middle-effort information use in the light of the interval political participative factors, the final explanatory effect of the three cities differs in their effect size from each other. As the R^2 demonstrates: Taipei leads with .300, followed by Shanghai with .241 and Singapore with .234. Compared with the former test for low-effort information use, the prediction effect increased its effect size for the three cities in the present case. What's more, the contributors with the largest prediction effect overlap each other for the three cities for the first time of

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testing. The third layer featured with recruitment demonstrates a middle prediction effect for Taipei with .194 and small prediction effect for Shanghai and Singapore with .112 and .087 respectively. The second layer characterized with psychological engagement contributes the second largest prediction effect for all the three cities: Shanghai with .071, Singapore with .077 and Taipei with .099.

Table 125. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Middle-effort Information Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.009**		.842		1.318*		1.772*	
DigitalSkills	.325	.226	.123	.086	.168	.117	.170	.118
PoliticalKnowledge			-.058	-.017	.123	.035	.115	.033
PoliticalInterest			.146	.126	-.002	-.002	-.016	-.014
PoliticalEfficacy			-.128	-.103	-.119	-.096	-.137	-.111
EgovEfficacy			.243	.192	.174	.137	.153	.121
PoliticalEgovTrust			.049	.051	.046	.048	.006	.006
PrivacySecurity								
PoliticalPublic Recruitment					.181	.187	.147	.152
PrivateOnliner Recruitment					-.033	-.034	-.033	-.034
Talk					.222	.230	.244	.253
Egov Recommend					.002	.002	-.050	-.052
EaseInteractivity Value							.135	.140
PerceivedUsefulness							-.024	-.016
OnlinePromotion							-.045	-.059
R^2	.051		.122		.234		.241	
F	22.930**		9.789**		12.740**		10.099**	
ΔR^2	.051		.071		.112		.007	
ΔF	22.930**		6.846**		15.187**		1.226	

(N=428, *<0.05, **<0.001)

Table 126. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Middle-effort Information Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	.868*		-.038		.358		.265	
DigitalSkills	.219	.206	.141	.133	.144	.136	.097	.091
PoliticalKnowledge			-.059	-.016	-.026	-.007	-.015	-.004
PoliticalInterest			.112	.133	.059	.070	.055	.065
PoliticalEfficacy			.109	.099	.072	.066	.071	.064
EgovEfficacy			.209	.202	.153	.148	.121	.117
PoliticalEgovTrust			-.003	-.003	-.033	-.038	-.121	-.140
PrivacySecurity								
PoliticalPublic Recruitment					.053	.061	.071	.082
PrivateOnliner Recruitment					.108	.125	.110	.128
Talk					.057	.066	.066	.076
Egov Recommend					.134	.156	.070	.081
EaseInteractivity							.124	.144
PerceivedValue							.021	.020
PerceivedUsefulness							.134	.113
OnlinePromotion							-.050	-.045
R^2	.043		.119		.206		.234	
F	13.497**		6.761**		7.666**		6.340**	
ΔR^2	.043		.077		.087		.027	
ΔF	13.497**		5.226**		8.065**		2.608*	

(N=306, *<0.05, **<0.001)

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Table 127. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Middle-effort Information Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	2.081**		1.899**		1.535**		1.667**	
DigitalSkills	-.056	-.051	-.117	-.105	.013	.012	.039	.035
PoliticalKnowledge			.211	.050	.342	.081	.361	.085
PoliticalInterest			.015	.016	-.060	-.061	-.060	-.061
PoliticalEfficacy			-.015	-.013	.059	.050	.066	.057
EgovEfficacy			.078	.069	.021	.019	.045	.040
PoliticalEgovTrust			.238	.270	.113	.128	.118	.134
PrivacySecurity								
PoliticalPublic Recruitment					.421	.478	.391	.443
PrivateOnliner Recruitment					.019	.021	.015	.017
Talk					-.105	-.120	-.088	-.100
Egov Recommend					.128	.145	.120	.136
EaseInteractivity Value							-.018	-.020
PerceivedUsefulness							-.018	-.016
OnlinePromotion							-.075	-.075
R^2	.003		.101		.295		.300	
F	1.116		8.114**		17.900**		13.974**	
ΔR^2	.003		.099		.194		.005	
ΔF	1.116		9.492**		29.373**		.922	

(N=438, *<0.05, **<0.001)

High-effort information use and the interval PPFs

For the high-effort information use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .318, followed by Taipei .278 and Singapore is left far behind with .145 only. Besides, the third layer still plays a significant role for added-up prediction effect: for Singapore and Taipei the layer featured with recruitment indicates the largest prediction effect with .077 and .210 respectively, while the dimension contributes

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with the second strongest prediction effect (.119) in Shanghai. What's more, the psychological engagement contributes the most to prediction in Shanghai with .161.

Table 128. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government High-effect Information Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.412**		1.145*		2.072**		2.715**	
DigitalSkills	.246	.146	-.138	-.082	-.087	-.052	-.057	-.034
PoliticalKnowledge			-.062	-.015	.143	.035	.150	.036
PoliticalInterest			.255	.187	.045	.033	.039	.029
PoliticalEfficacy			-.148	-.101	-.151	-.104	-.115	-.079
EgovEfficacy			.374	.253	.249	.168	.210	.142
PoliticalEgovTrust			.135	.119	.093	.082	.029	.026
PrivacySecurity								
PoliticalPublic Recruitment					.121	.107	.103	.091
PrivateOnliner Recruitment					.037	.032	.044	.039
Talk					.248	.219	.256	.226
Egov Recommend					.145	.128	.087	.077
EaseInteractivity Value							.256	.226
PerceivedUsefulness							-.202	-.114
OnlinePromotion							.033	.037
R^2	.021		.182		.301		.318	
F	9.273*		15.649**		17.997**		14.876**	
ΔR^2	.021		.161		.119		.017	
ΔF	9.273*		16.585**		17.777**		3.424*	

(N=428, *<0.05, **<0.001)

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Table 129. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government High-effect Information Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.231**		.482		.658*		.708	
DigitalSkills	.017	.024	.011	.014	.007	.010	-.005	-.006
PoliticalKnowledge			-.086	-.035	-.089	-.036	-.085	-.034
PoliticalInterest			.038	.066	.010	.018	.013	.023
PoliticalEfficacy			.137	.182	.127	.169	.126	.168
EgovEfficacy			.121	.171	.105	.148	.096	.135
PoliticalEgovTrust			-.050	-.085	-.048	-.081	-.075	-.127
PrivacySecurity								
PoliticalPublic Recruitment					.059	.100	.067	.113
PrivateOnliner Recruitment					.035	.059	.033	.055
Talk					.084	.142	.087	.148
Egov Recommend					.004	.007	-.024	-.041
EaseInteractivity							.064	.109
PerceivedValue							.015	.021
PerceivedUsefulness							.006	.007
OnlinePromotion							-.015	-.020
R^2	.001		.059		.136		.145	
F	.174		3.102*		4.642**		3.518**	
ΔR^2	.001		.058		.077		.009	
ΔF	.174		3.686*		6.603**		.749	

(N=306, *<0.05, **<0.001)

Table 130. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government High-effect Information Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.837**		1.660**		1.329**		1.729**	
DigitalSkills	-.044	-.039	-.095	-.085	.035	.032	.092	.083
PoliticalKnowledge			.105	.025	.147	.034	.152	.036
PoliticalInterest			.107	.108	.011	.011	.010	.010
PoliticalEfficacy			-.011	-.009	.052	.045	.054	.046
EgovEfficacy			.002	.001	-.021	-.018	.025	.022
PoliticalEgovTrust			.154	.174	.061	.069	.074	.084
PrivacySecurity								
PoliticalPublic Recruitment					.350	.395	.301	.340
PrivateOnliner Recruitment					.083	.094	.079	.089
Talk					.014	.015	.042	.048
Egov Recommend					.018	.021	.003	.003
EaseInteractivity Value							.012	.014
PerceivedUsefulness							-.124	-.104
OnlinePromotion							-.085	-.084
R^2	.002		.056		.266		.278	
F	.678		4.246**		15.469**		12.579**	
ΔR^2	.002		.054		.210		.012	
ΔF	.678		4.954**		30.555**		2.429	

(N=438, *<0.05, **<0.001)

Low-effort consultation use and the interval PPFs

For the low-effort consultation use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .280, followed by Taipei .211 and Singapore is left far behind with .177 only. The largest prediction contributor in Singapore and Taipei overlap each in the layer recruitment with effect size .107 and .145 respectively, while the layer contributes with the second largest effect size for Shanghai with .106. Besides, the psychological engagement

plays the largest contributor for Shanghai with .123, while for Singapore and Taipei it plays the second largest contributor with .050 and .055 respectively.

Table 131. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Low-effort Consultation Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.495**		1.383*		2.104		1.810*	
DigitalSkills	.239	.147	-.071	-.043	-.021	-.013	-.080	-.049
PoliticalKnowledge			.092	.023	.275	.069	.226	.057
PoliticalInterest			.162	.123	-.013	-.010	-.036	-.027
PoliticalEfficacy			-.169	-.120	-.163	-.116	-.097	-.069
EgovEfficacy			.336	.235	.227	.159	.161	.113
PoliticalEgovTrust			.140	.128	.126	.115	.036	.033
PrivacySecurity								
PoliticalPublic Recruitment					.288	.264	.309	.283
PrivateOnliner Recruitment					-.174	-.159	-.159	-.146
Talk					.257	.235	.248	.227
Egov Recommend					.077	.071	.013	.012
EaseInteractivity Value							.207	.190
PerceivedUsefulness							.091	.053
OnlinePromotion							.084	.098
R²	.022		.145		.251		.280	
F	9.392*		11.855**		13.955**		12.357**	
ΔR²	.022		.123		.106		.029	
ΔF	9.392*		12.103**		14.777**		5.519*	

(N=428, *<0.05, **<0.001)

Table 132. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Low-effort Consultation Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.141**		.688*		.894*		1.018*	
DigitalSkills	.048	.069	.018	.026	.023	.034	.009	.012
PoliticalKnowledge			-.136	-.057	-.143	-.060	-.135	-.056
PoliticalInterest			.090	.163	.057	.103	.060	.108
PoliticalEfficacy			.049	.067	.036	.051	.039	.055
EgovEfficacy			.088	.130	.058	.086	.042	.061
PoliticalEgovTrust			-.037	-.065	-.039	-.069	-.062	-.109
PrivacySecurity								
PoliticalPublic Recruitment					.161	.283	.169	.298
PrivateOnliner Recruitment					-.086	-.152	-.092	-.162
Talk					.104	.183	.111	.196
Egov Recommend					.028	.049	-.009	-.016
EaseInteractivity							.064	.112
PerceivedValue							.016	.022
PerceivedUsefulness							.021	.027
OnlinePromotion							-.048	-.065
R^2	.005		.054		.162		.177	
F	1.471		2.872*		5.688**		4.463**	
ΔR^2	.005		.050		.107		.015	
ΔF	1.471		3.142*		9.427**		1.334	

(N=306, *<0.05, **<0.001)

Table 133. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Low-effort Consultation Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.704**		1.690**		1.436**		1.552*	
DigitalSkills	.085	.068	.008	.006	.124	.100	.114	.092
PoliticalKnowledge			-.160	-.034	-.123	-.026	-.125	-.026
PoliticalInterest			.095	.087	.002	.002	.011	.010
PoliticalEfficacy			-.080	-.062	-.024	-.019	-.015	-.012
EgovEfficacy			.101	.081	.077	.061	.055	.044
PoliticalEgovTrust			.137	.139	.051	.052	.027	.027
PrivacySecurity								
PoliticalPublic Recruitment					.319	.324	.296	.300
PrivateOnliner Recruitment					.058	.058	.055	.056
Talk					.038	.038	.052	.053
Egov Recommend					.025	.025	-.006	-.006
EaseInteractivity Value							.038	.039
PerceivedUsefulness							.065	.049
OnlinePromotion							-.084	-.075
R^2	.005		.060		.205		.211	
F	2.044		4.561**		11.004**		8.721**	
ΔR^2	.005		.055		.145		.006	
ΔF	2.044		5.045**		19.495**		1.086	

(N=438, *<0.05, **<0.001)

Middle-effort consultation use and the interval PPFs

As the middle-effort consultation use factor can only be formed in Singapore, the test is undertaken with one case from Singapore. As the R^2 (.191) value demonstrates that the prediction effect is not strong. The third layer recruitment contributes the most to the prediction with .126, followed by the second layer psychological engagement with .042.

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.039**		.793**		.972**		1.101**	
DigitalSkills	.025	.056	-.006	-.012	-.005	-.012	-.014	-.030
PoliticalKnowledge			.044	.029	.046	.030	.054	.035
PoliticalInterest			.040	.111	.014	.038	.016	.044
PoliticalEfficacy			.020	.044	.007	.016	.012	.025
EgovEfficacy			.055	.125	.033	.075	.019	.044
PoliticalEgovTrust			.010	.027	.003	.008	-.004	-.011
PrivacySecurity								
PoliticalPublic Recruitment					.046	.126	.051	.138
PrivateOnliner Recruitment					.015	.041	.009	.025
Talk					.067	.185	.074	.204
Egov Recommend					.037	.102	.010	.029
EaseInteractivity							.036	.098
PerceivedValue							.015	.032
PerceivedUsefulness							.009	.017
OnlinePromotion							-.046	-.098
R^2	.003		.045		.171		.191	
F	.956		2.369*		6.095**		4.897**	
ΔR^2	.003		.042		.126		.019	
ΔF	.956		2.647*		11.199**		1.747	

(N=306, *<0.05, **<0.001)

High-effort consultation use and the interval PPFs

For the high-effort consultation use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .509, followed by Taipei .439 and by Singapore .170 (case consultation three) only. The outstanding prediction effect from Shanghai and Taipei showcases the highest prediction level, compared with those previously performed cases. What's more, the highest prediction levels are identical in the three cites with recruitment:

Shanghai (.306), Taipei (.282) and Singapore (.101). This effect from Shanghai and Taipei reaches to a high prediction level. However, only the psychological engagement in Shanghai indicates a middle prediction level with .170, while other cases from the three cities demonstrate weak or below prediction effect.

Table 135. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government High-effort Consultation Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	2.140**		1.219		2.278**		3.465**	
DigitalSkills	.371	.150	-.225	-.091	-.063	-.025	-.004	-.002
PoliticalKnowledge			-.610	-.100	.026	.004	.054	.009
PoliticalInterest			.719	.358	.329	.164	.322	.160
PoliticalEfficacy			.061	.028	.064	.030	-.012	-.005
EgovEfficacy			.225	.103	.036	.017	.043	.020
PoliticalEgovTrust			.059	.035	.085	.051	.071	.042
PrivacySecurity								
PoliticalPublic Recruitment					1.027	.615	.946	.567
PrivateOnliner Recruitment					-.137	-.082	-.146	-.088
Talk					.139	.084	.187	.112
Egov Recommend					-.033	-.020	-.087	-.052
EaseInteractivity Value							.132	.079
PerceivedUsefulness							-.168	-.064
OnlinePromotion							-.136	-.103
R²	.022		.192		.498		.509	
F	9.740*		16.669**		41.406**		33.015**	
ΔR²	.022		.170		.306		.011	
ΔF	9.740*		17.673**		63.633**		3.029*	

(N=428, *<0.05, **<0.001)

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Table 136. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government High-effort Consultation Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.005**		.673**		.827**		.831**	
DigitalSkills	.027	.074	.006	.016	.006	.017	.003	.008
PoliticalKnowledge			.017	.013	.016	.012	.019	.015
PoliticalInterest			.041	.139	.019	.066	.019	.063
PoliticalEfficacy			.037	.096	.025	.065	.026	.069
EgovEfficacy			.062	.174	.043	.119	.039	.108
PoliticalEgovTrust			-.015	-.049	-.024	-.081	-.027	-.088
PrivacySecurity								
PoliticalPublic Recruitment					.015	.049	.015	.050
PrivateOnliner Recruitment					.004	.013	.003	.010
Talk					.066	.219	.068	.225
Egov Recommend					.044	.146	.038	.126
EaseInteractivity							.004	.013
PerceivedValue							.007	.019
PerceivedUsefulness							.009	.022
OnlinePromotion							-.011	-.029
R^2	.006		.066		.168		.170	
F	1.689		3.541*		5.943**		4.244**	
ΔR^2	.006		.061		.101		.002	
ΔF	1.689		3.896*		8.979**		.164	

(N=306, *<0.05, **<0.001)

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Table 137. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government High-effort Consultation Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	4.016**		4.376**		3.450**		4.279**	
DigitalSkills	-.309	-.183	-.367	-.217	-.112	-.066	.043	.025
PoliticalKnowledge			.518	.080	.716	.111	.779	.121
PoliticalInterest			.062	.041	-.055	-.037	-.064	-.043
PoliticalEfficacy			-.131	-.074	.003	.002	.023	.013
EgovEfficacy			-.094	-.055	-.151	-.088	-.010	-.006
PoliticalEgovTrust			.359	.268	.151	.113	.198	.148
PrivacySecurity								
PoliticalPublic Recruitment					.707	.528	.567	.423
PrivateOnliner Recruitment					.219	.164	.204	.152
Talk					-.273	-.204	-.194	-.145
Egov Recommend					.124	.092	.097	.072
EaseInteractivity Value							-.059	-.044
PerceivedUsefulness							-.247	-.137
OnlinePromotion							-.286	-.187
R^2	.033		.113		.396		.439	
F	15.058**		9.186**		27.965**		25.547**	
ΔR^2	.033		.080		.282		.043	
ΔF	15.058**		7.778**		49.883**		10.963**	

(N=438, *<0.05, **<0.001)

Referendum use and the interval PPFs

For the referendum use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .362, followed by Taipei .282 and Singapore is left far behind with .167 only. The strongest prediction layers from the three cities are identical with recruitment in Shanghai (.215), Singapore (.097) and Taipei (.199). The prediction effect from Shanghai and Taipei demonstrates a medium prediction size. Besides, the second highest prediction

effect layers are also identical for the three cities and falls in the second layer the psychological engagement.

Table 138. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Referendum Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.406**		.715		1.630**		2.135**	
DigitalSkills	.140	.097	-.159	-.110	-.091	-.062	-.097	-.066
PoliticalKnowledge			-.199	-.056	.078	.022	.062	.017
PoliticalInterest			.345	.293	.113	.096	.092	.079
PoliticalEfficacy			-.034	-.027	-.040	-.032	-.049	-.039
EgovEfficacy			.228	.179	.097	.076	.060	.047
PoliticalEgovTrust			-.021	-.022	-.052	-.054	-.116	-.119
PrivacySecurity								
PoliticalPublic Recruitment					.275	.282	.238	.244
PrivateOnliner Recruitment					.035	.036	.038	.039
Talk					.181	.185	.205	.210
Egov Recommend					.117	.120	.043	.044
EaseInteractivity Value							.201	.206
PerceivedUsefulness							-.021	-.014
OnlinePromotion							-.036	-.047
R^2	.009		.134		.349		.362	
F	4.012*		10.852**		22.396**		18.066**	
ΔR^2	.009		.125		.215		.013	
ΔF	4.012*		12.115**		34.528**		2.712*	

(N=428, *<0.05, **<0.001)

Table 139. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Referendum Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.106**		.769**		.919**		.946**	
DigitalSkills	-.006	-.015	-.023	-.061	-.020	-.052	-.028	-.074
PoliticalKnowledge			.089	.069	.096	.074	.100	.077
PoliticalInterest			.014	.047	-.007	-.023	-.008	-.025
PoliticalEfficacy			.065	.165	.052	.132	.053	.136
EgovEfficacy			.046	.125	.023	.062	.014	.038
PoliticalEgovTrust			.018	.057	.007	.023	-.003	-.009
PrivacySecurity								
PoliticalPublic					.050	.162	.053	.171
Recruitment								
PrivateOnliner					-.006	-.018	-.006	-.021
Recruitment								
Talk					.037	.121	.041	.133
Egov					.050	.163	.038	.123
Recommend								
EaseInteractivity							.012	.040
PerceivedValue							-.003	-.007
PerceivedUsefulness							.035	.083
OnlinePromotion							-.027	-.068
R^2	.000		.061		.158		.167	
F	.073		3.257*		5.546**		4.173**	
ΔR^2	.000		.061		.097		.009	
ΔF	.073		3.893*		8.491**		.779	

(N=306, *<0.05, **<0.001)

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Table 140. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Referendum Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	2.142**		2.416**		2.043**		1.980**	
DigitalSkills	-.093	-.082	-.149	-.131	-.016	-.014	-.015	-.014
PoliticalKnowledge			.082	.019	.130	.030	.171	.039
PoliticalInterest			.014	.014	-.075	-.075	-.073	-.072
PoliticalEfficacy			-.120	-.101	-.058	-.049	-.039	-.033
EgovEfficacy			.049	.042	.030	.026	.034	.030
PoliticalEgovTrust			.190	.211	.099	.110	.094	.104
PrivacySecurity								
PoliticalPublic Recruitment					.405	.449	.375	.416
PrivateOnliner Recruitment					.034	.038	.030	.033
Talk					-.006	-.007	.009	.010
Egov Recommend					.010	.011	-.002	-.002
EaseInteractivity Value							-.045	-.050
PerceivedUsefulness							.102	.084
OnlinePromotion							-.118	-.114
R²	.007		.073		.272		.282	
F	2.934		5.622**		15.922**		12.809**	
ΔR²	.007		.066		.199		.010	
ΔF	2.934		6.125**		29.167**		2.042	

(N=438, *<0.05, **<0.001)

Collaborative production use and the interval PPFs

For the collaborative production use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrates: Taipei leads with .384, so does Shanghai with .368. Singapore is left far behind with .216 only. The largest contributors are identical for the cities with the third layer recruitment in Shanghai (.224) and in Singapore (.167) and in Taipei (.251). The layer alone demonstrates a medium prediction effect size for all the three cities. Besides, the second largest

contributors are also identical for the three cities with political psychological engagement.

Table 141. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Collaborative Production Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.320**		1.100*		2.089**		3.081**	
DigitalSkills	.152	.101	-.137	-.091	-.061	-.041	-.021	-.014
PoliticalKnowledge			-.260	-.071	.046	.013	.059	.016
PoliticalInterest			.361	.296	.114	.094	.102	.084
PoliticalEfficacy			-.070	-.054	-.081	-.063	-.103	-.079
EgovEfficacy			.124	.094	-.019	-.014	-.043	-.033
PoliticalEgovTrust			.055	.054	.018	.017	-.035	-.035
PrivacySecurity								
PoliticalPublic Recruitment					.310	.307	.254	.251
PrivateOnliner Recruitment					.077	.076	.077	.076
Talk					.122	.121	.155	.154
Egov Recommend					.144	.143	.072	.071
EaseInteractivity Value							.234	.232
PerceivedUsefulness							-.178	-.113
OnlinePromotion							-.059	-.074
R^2	.010		.125		.349		.368	
F	4.416		10.016**		22.368**		18.545**	
ΔR^2	.010		.115		.224		.019	
ΔF	4.416*		11.032**		35.913**		4.125*	

(N=428, *<0.05, **<0.001)

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Table 142. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Collaborative Production Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.182**		1.020**		1.182**		1.281**	
DigitalSkills	-.025	-.066	-.046	-.123	-.039	-.106	-.046	-.123
PoliticalKnowledge			.030	.023	.027	.021	.031	.024
PoliticalInterest			.014	.049	-.010	-.033	-.008	-.026
PoliticalEfficacy			.018	.046	.006	.017	.009	.022
EgovEfficacy			.045	.123	.018	.049	.009	.024
PoliticalEgovTrust			.015	.049	.007	.024	.000	-.002
PrivacySecurity								
PoliticalPublic Recruitment					.112	.368	.116	.381
PrivateOnliner Recruitment					-.078	-.256	-.081	-.267
Talk					.070	.231	.075	.246
Egov Recommend					.044	.144	.025	.083
EaseInteractivity							.028	.092
PerceivedValue							.001	.002
PerceivedUsefulness							.013	.032
OnlinePromotion							-.033	-.084
R^2	.004		.035		.203		.216	
F	1.347		1.826		7.498**		5.724**	
ΔR^2	.004		.031		.167		.013	
ΔF	1.347		1.918		15.476**		1.230	

(N=306, *<0.05, **<0.001)

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Table 143. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Collaborative Production Use in Taipei

Variables	Model 1 C	Model 1 Std. C	Model 2 C	Model 2 Std. C	Model 3 C	Model 3 Std. C	Model 4 C	Model 4 Std. C
Constant	1.912**		1.802**		1.349**		1.616**	
DigitalSkills	-.137	-.153	-.173	-.193	-.046	-.051	.018	.020
PoliticalKnowledge			.283	.083	.364	.106	.404	.118
PoliticalInterest			-.002	-.003	-.065	-.082	-.070	-.089
PoliticalEfficacy			-.017	-.018	.048	.051	.060	.064
EgovEfficacy			.031	.034	.010	.011	.073	.080
PoliticalEgovTrust			.184	.258	.087	.122	.111	.155
PrivacySecurity								
PoliticalPublic Recruitment					.338	.474	.280	.392
PrivateOnliner Recruitment					.121	.170	.115	.161
Talk					-.112	-.157	-.080	-.112
Egov Recommend					.040	.057	.035	.049
EaseInteractivity Value							-.051	-.071
PerceivedUsefulness							-.081	-.085
OnlinePromotion							-.127	-.156
R^2	.023		.105		.356		.384	
F	10.434*		8.433**		23.587**		20.341**	
ΔR^2	.023		.082		.251		.028	
ΔF	10.434*		7.869**		41.556**		6.489**	

(N=438, *<0.05, **<0.001)

Procedures use and the interval PPFs

For the procedures use in the light of the interval political participative factors, the final explanatory power of the three cities differs in their effect size from each other. As the R^2 demonstrate: Shanghai leads with .256, while Taipei is left behind with .208 and Singapore with .193 only. The largest contributor can be found in Shanghai (.123) and Taipei (.172) as the recruitment layer, while it is the political psychological engagement in Singapore (.095). Generally speaking, the prediction effect size is not larger than the medium level for all the three cities.

Table 144. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Procedures Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.263**		.833*		1.270*		1.326*	
DigitalSkills	.249	.182	.046	.033	.089	.065	.063	.046
PoliticalKnowledge			-.001	.000	.171	.051	.145	.043
PoliticalInterest			.218	.196	.074	.067	.058	.052
PoliticalEfficacy			-.154	-.130	-.141	-.120	-.107	-.090
EgovEfficacy			.256	.213	.193	.161	.148	.123
PoliticalEgovTrust			-.021	-.023	-.020	-.022	-.086	-.094
PrivacySecurity								
PoliticalPublic Recruitment					.168	.183	.168	.182
PrivateOnliner Recruitment					-.049	-.054	-.040	-.044
Talk					.253	.274	.255	.276
Egov Recommend					-.016	-.017	-.071	-.077
EaseInteractivity							.179	.194
Value								
PerceivedUsefulness							.011	.008
OnlinePromotion							.037	.051
R²	.033		.116		.239		.256	
F	14.517**		9.228**		13.096**		10.960**	
ΔR²	.033		.083		.123		.017	
ΔF	14.517**		7.933**		16.819**		3.160*	

(N=428, *<0.05, **<0.001)

Table 145. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Procedures Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	.679*		-.292		-.064		-1.080	
DigitalSkills	.246	.210	.148	.127	.147	.125	.116	.099
PoliticalKnowledge			.233	.058	.188	.047	.180	.045
PoliticalInterest			.163	.175	.128	.138	.099	.106
PoliticalEfficacy			.168	.139	.160	.132	.144	.119
EgovEfficacy			.100	.087	.078	.068	.094	.082
PoliticalEgovTrust			.104	.109	.101	.106	.019	.020
PrivacySecurity								
PoliticalPublic Recruitment					.038	.040	.032	.034
PrivateOnliner Recruitment					-.123	-.129	-.092	-.096
Talk					.236	.247	.216	.227
Egov Recommend					.024	.025	.056	.059
EaseInteractivity							-.025	-.026
PerceivedValue							.068	.058
PerceivedUsefulness							.116	.089
OnlinePromotion							.174	.142
R^2	.044		.139		.173		.193	
F	14.084**		8.041**		6.175**		4.964**	
ΔR^2	.044		.095		.034		.020	
ΔF	14.084**		6.575**		3.046*		1.772	

(N=306, *<0.05, **<0.001)

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Table 146. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Procedures Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	2.042**		2.137**		1.675**		1.761**	
DigitalSkills	-.073	-.066	-.112	-.100	.020	.017	.028	.025
PoliticalKnowledge			.019	.004	.121	.028	.142	.033
PoliticalInterest			.044	.045	-.018	-.018	-.014	-.014
PoliticalEfficacy			-.063	-.054	.006	.005	.019	.016
EgovEfficacy			.022	.019	-.009	-.008	-.004	-.003
PoliticalEgovTrust			.106	.119	-.002	-.002	-.010	-.011
PrivacySecurity								
PoliticalPublic Recruitment					.375	.423	.342	.386
PrivateOnliner Recruitment					.095	.107	.090	.102
Talk					-.131	-.148	-.113	-.128
Egov Recommend					.066	.075	.047	.053
EaseInteractivity Value							-.009	-.010
PerceivedUsefulness							.047	.040
OnlinePromotion							-.105	-.103
R^2	.004		.029		.201		.208	
F	1.884		2.132*		10.729**		8.578**	
ΔR^2	.004		.025		.172		.007	
ΔF	1.884		2.177		22.973**		1.324	

(N=438, *<0.05, **<0.001)

Payment use and the interval PPFs

At last, the payment use is examined in the light of the interval political participative factors. The final explanatory effect of the three cities differs in their effect size from each other. As the R^2 demonstrates: Shanghai leads with .238, followed by Taipei with .192 and Singapore is left far behind with .132 only. For Shanghai and Taipei the recruitment serves as the strongest contributor with .107 and .159 respectively, while the digital skills turn out to be the strongest contributor with .058 for Singapore. Admittedly, the prediction effect is not strong in the payment case for all the three cities.

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Table 147. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Payment Use in Shanghai

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	1.709**		1.623*		1.953*		1.447*	
DigitalSkills	.189	.100	-.074	-.039	-.023	-.012	-.096	-.051
PoliticalKnowledge			-.069	-.015	.142	.031	.084	.018
PoliticalInterest			.168	.110	.008	.005	-.016	-.010
PoliticalEfficacy			-.256	-.156	-.230	-.140	-.138	-.084
EgovEfficacy			.386	.232	.338	.203	.261	.157
PoliticalEgovTrust			.078	.061	.099	.077	-.002	-.002
PrivacySecurity								
PoliticalPublic Recruitment					.185	.145	.223	.175
PrivateOnliner Recruitment					-.064	-.050	-.045	-.035
Talk					.370	.290	.351	.275
Egov Recommend					-.111	-.087	-.175	-.137
EaseInteractivity							.224	.175
Value								
PerceivedUsefulness							.112	.056
OnlinePromotion							.125	.124
R^2	.010		.099		.206		.238	
F	4.262*		7.692**		10.789**		9.968**	
ΔR^2	.010		.089		.107		.033	
ΔF	4.262*		8.305**		14.009**		5.951*	

(N=428, *<0.05, **<0.001)

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Table 148. Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Payment Use in Singapore

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	.804*		.714		.872		-.339	
DigitalSkills	.300	.241	.256	.206	.256	.206	.188	.151
PoliticalKnowledge			-.097	-.023	-.088	-.021	-.084	-.020
PoliticalInterest			-.010	-.010	-.036	-.036	-.079	-.080
PoliticalEfficacy			-.037	-.029	-.048	-.037	-.061	-.048
EgovEfficacy			.145	.120	.126	.104	.116	.096
PoliticalEgovTrust			.005	.005	.009	.009	-.122	-.121
PrivacySecurity								
PoliticalPublic Recruitment					.122	.121	.122	.120
PrivateOnliner Recruitment					.028	.027	.065	.064
Talk					.036	.036	.025	.025
Egov Recommend					.001	.001	.007	.007
EaseInteractivity							-.016	-.016
PerceivedValue							.065	.053
PerceivedUsefulness							.292	.211
OnlinePromotion							.117	.090
R^2	.058		.073		.102		.132	
F	18.737**		3.912*		3.363**		3.150**	
ΔR^2	.058		.015		.030		.029	
ΔF	18.737**		.950		2.428*		2.450*	

(N=306, *<0.05, **<0.001)

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Table 149.Hierarchical Multiple Regression of the Effect of Interval PPFs on E-government Payment Use in Taipei

Variables	Model 1		Model 2		Model 3		Model 4	
	C	Std. C	C	Std. C	C	Std. C	C	Std. C
Constant	2.060**		2.118**		1.559**		1.816**	
DigitalSkills	-.068	-.053	-.096	-.075	.050	.039	.113	.089
PoliticalKnowledge			.200	.041	.308	.063	.338	.070
PoliticalInterest			.035	.031	-.026	-.024	-.033	-.030
PoliticalEfficacy			-.066	-.049	.008	.006	.015	.011
EgovEfficacy			-.004	-.003	-.029	-.023	.033	.026
PoliticalEgovTrust			.110	.109	-.001	-.001	.026	.026
PrivacySecurity								
PoliticalPublic					.458	.454	.411	.408
Recruitment								
PrivateOnliner					.065	.065	.060	.059
Recruitment								
Talk					-.157	-.155	-.131	-.130
Egov					.048	.048	.049	.049
Recommend								
EaseInteractivity							-.044	-.044
Value								
PerceivedUsefulness							-.107	-.079
OnlinePromotion							-.089	-.077
R²	.003		.021		.180		.192	
F	1.246		1.574		9.402**		7.727**	
ΔR²	.003		.019		.159		.011	
ΔF	1.246		1.637		20.712**		1.940	

(N=438, *<0.05, **<0.001)

4.5.3 Conclusion

By conducting the hierarchical multiple regression, the interval politically participative factors as independent variables are treated in layers to predict e-government use. As the results turned out: all the regressions tested are statistically significant for the three cities; a conclusion is to be made from a higher standing point, namely, the e-government platforms use and the e-government functions use as a whole respectively. At the same time, comparisons from the perspective of effect size are also undertaken among the three cities.

Firstly, the e-government platforms use is taken into observation in the light of the relationship between platforms use and interval politically participative factors. As stated above, all the hierarchical multiple regressions for all the three cities are of statistical significance. For all the four platforms use regressions, Shanghai always takes the lead from the perspective of effect size, among which the largest effect size ($R^2 = .354$) can be found from the e-government hotline-and-email use and lowest ($R^2 = .172$) from the e-government SNS use. From all the four regressions comparisons, Taipei is situated at the second place for three cases. The highest effect size ($R^2 = .249$) and the lowest ($R^2 = .166$) can be identified from the hotline-and-email use and the SNS use, similar to that in Shanghai. Singapore is always ranked at the last place in the comparisons except in the case of portal-and-apps use, from which the highest effect size can be traced ($R^2 = .205$).

Besides, it is also observable that some layers were of no statistical significance in some regressions. The e-government recruitment bundle was of no statistical significance for Shanghai, Singapore and Taipei in the hotline-and-email use; it was also of no statistical significance for Singapore and Taipei in the SNS use; it was of no statistical significance for Singapore in the public-platforms-and-third-party-apps use. The other bundle in the sense of no statistical significance can be found in the political-public-private-onliner recruitment bundle: it was of no statistical significance for Singapore in the portal-and-apps use and the public-platforms-and-third-party-apps use.

Next, the e-government functions use is scrutinized in the light of relationship between functions use and the interval politically participative factors. The information functions use and the consultation functions are singled out firstly, then the four individual functions use are compared. As mentioned above, all the hierarchical multiple regressions were statistically significant in their final models for all the three cities.

From the perspective of effect size comparison, Shanghai always takes the lead except in the case of information use, in which Shanghai takes the second place. Besides, it interesting to observe that for the higher effort levels of functions use effect size indicates stronger scale than for lower levels. The high-effort information use demonstrates an effect size R^2 as high as .318 and the consultation demonstrates as high as .509, which is at same time the strongest effect size for Shanghai. Taipei is always situated as the second place, except in the case of middle-effort information use. Still, the strongest effect size can be found in high-effort consultation use (R^2 = .439), while the second strongest effect size can be identified in the middle-effort information use instead of in the high-effort information use. Singapore is ranked unexceptionally in the third place among all the groups' comparisons. The strongest effect size comes from the middle-effort information use with R^2 = .234. Besides, the middle-effort consultation use showcases a stronger effect size than the low-effort consultation use.

Still, it's observable that the e-government recruitment bundle indicates an overwhelming statistical insignificance for several cases: in the middle-effort information use for both Shanghai and Taipei, in the high-effort information use and in the low-effort consultation use for both Singapore and Taipei, in the middle-effort consultation use and in the high-effort consultation use for Singapore. A further question could be drawn from the observation here: why the e-government recruitment bundle often showcases statistical insignificance for the e-government information and consultation use?

At last, the four individual e-government functions are concluded in the light of relationship between them and the interval politically participative factors. Here again, Singapore is unexceptionally ranked at the last place as before: in the case of collaborative production use the strongest effect size can be identified (R^2 = .216) and in the case of payment use the weakest can be found (R^2 = .132). Shanghai still takes the lead of effect size in almost all the case, except in the

collaborative production use, whereby Shanghai is situated at the second place and the strongest effect size for Shanghai (R^2 = .368) can be identified, however. Taipei always take the second place in perspective of effect size, except in the collaborative production use, whereby Taipei is ranked at the first place and showcases the strongest effect size (R^2 = .384). The weakest effect size can be found in payment for Taipei (R^2 = .192). It interesting to find out that all the strongest effect size and the weakest can be identified from the same functions use respectively.

Besides, the e-government recruitment bundle was of no statistical significance in the referendum use and in the administrative procedures use for both Singapore and Taipei, in the collective production use for Singapore and in the payment use for Taipei. The insignificant cases of the e-government recruitment bundle are once again identified for the e-government functions use as before. What's more, the psychological engagement bundle was found of no statistical significance in several cases, too: in the collaborative production use for Singapore, in the administrative procedures use and the payment for Taipei. For all the cases of e-government platforms use and e-government functions use, the psychological engagement bundle only demonstrates statistically insignificance in these above-mentioned cases.

4.6 E-government use and PRC

In the last section of research result report, the last research question "how do the politically relevant characteristics influence e-government use?" is to be studied. Speciflically speaking, the differentiation of political relevant characteristics which could have impact on e-government use is to be discovered. Differentiations are compared within each political relevant characteristics which consist of two aspects: from the Internet-oriented characteristics (e.g. the Internet accesses, the equipment use, the purposes of Internet use, the Internet platforms

use, the political efficacy online, the Internet trust, and the perceived privacy security online) to the demography-oriented characteristics (e.g. gender, household register, residence length, age, education, and income).

Altogether two analysis approaches are to be adopted to reveal the influence of these political relevant characteristics on e-government use. For the Internet-oriented characteristics, the Pearson correlation coefficients are to be employed. For the demography-oriented characteristics, the independent T test is to be adopted for the binary variables and the ANOVA test is to be adopted for the ordinal variables when the test of homogeneity of variances is qualified, otherwise the Kruskal-Wallis test is to be undertaken.

Just before result report, factor analysis of several Internet-oriented political relevant characteristics should be represented to demonstrate how data is trimmed as well as bundled from single items to certain factors. The cumulative extraction sums of squared loadings of each factor are listed up in the following table.

Table 150. Factor Analysis of Political Relevant Characteristics

political relevant characteristics			cumulative extraction sums of squared loadings		
	Factors	**Variables**	**SH**	**SG**	**TP**
Internet access use	broadband-mobile	broadband	70.622%	82.622%	-
		mobile			
Internet devices use	tablet-other	other devices	70.450%	63.908%	68.274%
		tablet use			
Internet purposes	social-work	socialization	74.321%	68.799%	74.321%
		work			
	info-service	information	74.190%	81.264%	71.753%
		service			
Online platforms use	em-SNS	email	59.449%	67.749%	70.486%
		social networking sites open to general public			
	me-app	message only open to private relationships	70.992%	63.256%	59.802%
		other mobile applications use			
	BBS-Narrow-Public	BBS	59.365%	60.586%	57.134%
		narrowcasting			
		public information equipment			

Two items of Internet access use can be formed as a factor in Shanghai and Singapore, which is named as the Broadband-Mobile access in the present research. For Taipei, however, all the three dimensions of Internet access use should be treated individually. Only two of five kinds of Internet devices use can be singled out and be reduced to a factor, which is a combination of the other devices use and the tablet use and is named as tablet-other use, while other three devices stay still separately treated.

For online purposes, two factors can be identified. The first factor is made up from socialization purpose and work purpose and is named as social-work purposes. The second factor is made up from information purpose and service purpose and is named as info-service purposes. For the next characteristics online platforms use, two factors can be identified. Firstly, the Em-SNS factor is made up from e-mail use and the social networking sites use which is open to general public and the other mobile apps (such as for lifestyle, e-banking). Secondly, the Me-App use is made up from message use (SMS and other messaging services which is only open to private relationships, e.g.) and the other mobile applications use. Thirdly, the rest of online platforms use can be formed as a factor named as BBS-Narrow-Public use.

At last, it is noteworthy that last two variables of the political relevant characteristics are in fact doubled in number. The original variable trust online is split as the trust online and the trust in fellow on-liner, due to variable validity leveling-up. Moreover, the online privacy and security perception is also split into two variables, also due to variable validity. The newly discerned variable is named as political-opinions-online (in short, priv plus) in the following report.

4.6.1 E-government platforms use and the PRC

In the first part of the present section e-government hotline-email use is taken as an example of analyzing e-government platforms use in the light of the PRC. The

Internet-oriented political relevant characteristics are examined at first by the Pearson correlation coefficients. There were statistically significant correlations within Internet-oriented characteristics, among which the equipment use and the Internet platforms use were negatively correlated with the e-government hotline-email use, which meant that residents in Shanghai using more often such equipment and platforms tended to use e-government hotline-email less frequently. Even the daily email and SNS use was negatively correlated with the e-government hotline-email use. Besides, the r values indicate small effect size for the majority of these statistically significant cases, except for the r value of the correlation between the laptop use and the e-government hotline-email use.

Table 151. Pearson Correlation Test between Internet-oriented PRC and E-government Hotline-email Use in Shanghai

	r	p		r	p
BroadbandMobile	.115*	.017	Desktop	-.144**	.003
			Laptop	-.042	.382
Public Wi-Fi	-.071	.145	Mobile-phone	.131**	.007
			TabletOther	-.295**	.000
Entertainment	.184**	.000	EmailSNS	-.106*	.029
SocialWork	.186**	.000	Portals	-.091	.059
InfoService	.155**	.001	MessagingApps	.150**	.002
			BBSNarrowPublic	-.235**	.000
PoliticalEfficacyOnline	.177**	.000			
			TrustOnline	.239**	.000
PrivacySecurityOnline	.291**	.000	TrustOnliner	.255**	.000
PoliticalOpinionsOnline	.279**	.000			

(N = 428, *p<0.05, **p<0.001)

The binary demographic variables (gender and household register) are explored to identify if there were significant differences within such binary variables in regard to e-government hotline-email use. The result indicates that there was no significant difference within gender for the sampled residents in Shanghai, $t(425) = 1.787$, $p = .075$. However, there was a significant difference between the household register for the residents sampled. On average, residents in registered

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household reported higher frequency of the e-government hotline-email use than residents in non-registered household.

Table 152. Independent T Test Comparison of the Household Register on E-government Hotline-email Use in Shanghai

Variable	M	SD	t	df	p
HouseholdRegister			5.452	373.841	.000
Yes	2.0761	.89117			
No	1.6480	.70673			

Table 153. One-Way ANOVA Summary Table Comparing Different Age Levels in Regard to E-government Hotline-email Use in Shanghai

	Sum of Squares	df	Mean Square	F	Sig.
Age					
Between Groups	11.736	7	1.677	2.347	.023
Within Groups	300.046	420	.714		
Total	311.782	427			

Table 154. Means and Standard Deviations Comparing Different Levels of Age Groups in Regard to E-government Hotline-email Use in Shanghai

	n	M	SD
Age			
25 and below	86	1.7907	.78764
26-30	139	1.9496	.85613
31-35	117	1.8462	.80799
36-40	56	2.0714	.87609
41-45	15	2.0333	.74322
46-50	6	2.5000	1.41421
51-55	4	3.1250	1.65202
56-60	5	1.7000	.75829

At last, statistically significant differences are to be found within the residency length, age groups, education level, and income level in regard to residents' e-government hotline-email use. No statistically significant difference was found within residency length, $F (2, 424) = .904$, $p = .492$ and within education, $F (3, 421) = .807$, $p = .521$. A statistically significant difference was found among the age groups. On average, residents in age from 46 to 55 reported higher frequency of the e-government hotline-email use than residents in other age groups.

While the income variable cannot pass the test of homogeneity of variances, the Kruskal-Wallis H test was adopted to analyze this demography-oriented characteristic. A statistically significant difference was found among the income levels in regard to residents' e-government hotline-email use, $H = 38.785$, $P < .001$. Post hoc multiple comparisons are omitted in the present research as the length limit, while a general and rough comparison overview among income levels can be obtained in the following table.

Table 155. Kruskal-Wallis H Test Comparison of the Effect of Income Level on E-government Hotline-email Use in Shanghai

Ranks		
Income	N	Mean Rank
3499 and less	21	183.10
3500 to 4999	31	249.03
5000 to 5999	44	216.67
6000 to 6999	44	234.69
7000 to 7999	43	223.64
8000 to 8999	56	223.36
9000 to 9999	27	225.69
10000 to 10999	46	227.79
11000 to 11999	21	213.79
12000 and more	59	229.42
refuse to answer	36	101.65
Total	428	
Test Statistics		
Kruskal-Wallis H		38.785
df		10
Asymp. Sig.		.000

After the example from Shanghai is demonstrated for analyzing the impact of PRC on e-government hotline-email platform use, the result of other platforms use cases is presented in the following tables for all the three cities. For e-government hotline-email use factor, most significant correlations from Internet access use, Internet devices use, Internet platforms use are in negative direction, while other significant correlations from political efficacy online, online trust and online privacy concerns are in positive direction. The obvious direction

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differences characterized two kinds of PRC: the Internet-use oriented PRC usually demonstrate correlations in negative direction, while the Internet-attitude oriented PRC indicate correlations in positive direction. The rules can be testified for other e-government platforms use factors, too.

Table 156. Pearson Correlation Tests between Internet-oriented PRC

	Shanghai		Singapore		Taipei	
	E-government Hotline-email Use					
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	.115*	.017	-.060	.299	-.081	.090
Mobile	/	/	/	/	.031	.522
Public Wi-Fi	-.071	.145	-.157**	.006	-.259**	.000
Internet Devices						
Desktop	-.144**	.003	-.107	.061	-.153**	.001
Laptop	-.042	.382	-.219**	.000	-.128**	.007
Mobile-phone	.131**	.007	-.030	.605	.073	.125
TabletOther	-.295**	.000	-.225**	.000	-.354**	.000
Internet Purposes						
Entertainment	.184**	.000	-.056	.325	.009	.851
SocialWork	.186**	.000	-.119*	.037	-.100*	.037
InfoService	.155**	.001	-.125*	.029	-.100*	.037
Internet Platforms						
EmailSNS	-.106*	.029	-.158**	.006	-.050	.293
Portals	-.091	.059	-.141*	.014	-.084	.080
MessagingApps	.150**	.002	-.162**	.005	-.107*	.025
BBSNarrowPublic	-.235**	.000	-.157**	.006	-.200**	.000
PoliticalEfficacyOnline	.177**	.000	.124*	.031	.049	.302
Trust online						
TrustOnline	.239**	.000	.137*	.017	.127**	.008
TrustOnliner	.255**	.000	.022	.698	.182**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.291**	.000	.127*	.027	.193**	.000
PoliticalOpinionsOnline	.279**	.000	.068	.234	.142**	.003
	E-government Portals-apps Use					
Internet Access						
Broadband(Mobile)	.006	.902	-.202**	.000	-.049	.305
Mobile	/	/	/	/	.007	.881
Public Wi-Fi	-.023	.639	-.197**	.001	-.178**	.000

Table - 156 Continued (1)

	Shanghai		Singapore		Taipei	
Internet Devices						
Desktop	-.165**	.001	-.063	.275	-.057	.233
Laptop	-.100*	.038	-.301**	.000	-.124**	.010
Mobile-phone	.031	.524	-.157**	.006	.029	.549
TabletOther	-.163**	.001	-.262**	.000	-.190**	.000
Internet Purposes						
Entertainment	.083	.086	-.180**	.002	.037	.439
SocialWork	.079	.101	-.242**	.000	-.174**	.000
InfoService	.010	.840	-.232**	.000	-.101*	.034
Internet Platforms						
EmailSNS	-.112*	.020	-.245**	.000	-.079	.100
Portals	-.150**	.002	-.202**	.000	-.091	.057
MessagingApps	.003	.953	-.210**	.000	-.214**	.000
BBSNarrowPublic	-.087	.072	-.164**	.004	-.192**	.000
PoliticalEfficacyOnline	.172**	.000	.188**	.001	.133**	.005
Trust online						
TrustOnline	.166**	.001	.157**	.006	.203**	.000
TrustOnliner	.123*	.011	-.060	.297	.179**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.155**	.001	-.037	.524	.144**	.003
PoliticalOpinionsOnline	.210**	.000	-.013	.817	.132**	.006
E-government SNS Use						
Internet Access						
Broadband(Mobile)	-.043	.376	-.096	.093	.002	.973
Mobile	/	/	/	/	-.025	.608
Public Wi-Fi	-.040	.414	-.223**	.000	-.070	.146
Internet Devices						
Desktop	-.091	.059	-.056	.328	.025	.607
Laptop	-.129**	.008	-.170**	.003	-.001	.975
Mobile-phone	-.089	.065	-.062	.279	.003	.944
TabletOther	-.051	.297	-.217**	.000	-.107*	.025
Internet Purposes						
Entertainment	-.046	.346	-.097	.091	.003	.942
SocialWork	-.057	.238	-.099	.084	-.142**	.003
InfoService	-.038	.428	-.176**	.002	-.108*	.024
Internet Platforms						
EmailSNS	-.139**	.004	-.136*	.018	-.147**	.002
Portals	-.180**	.000	-.118*	.038	-.057	.232
MessagingApps	-.087	.073	-.183**	.001	-.215**	.000
BBSNarrowPublic	-.014	.765	-.182**	.001	-.176**	.000

Table - 156 Continued (2)

PoliticalEfficacyOnline	.085	.078	.154**	.007	.213**	.000
Trust online						
TrustOnline	-.042	.388	.116*	.043	.180**	.000
TrustOnliner	-.025	.604	.149**	.009	.079	.099
Securtiy&privacy online						
PrivacySecurityOnline	-.027	.579	.123*	.031	.073	.125
PoliticalOpinionsOnline	-.019	.691	.177**	.002	.072	.130
E-government Public-devices-and-third-party-apps Use						
Internet Access						
Broadband(Mobile)	-.018	.705	-.055	.340	-.167**	.000
Mobile	/	/	/	/	.048	.317
Public Wi-Fi	-.090	.062	-.079	.168	-.304**	.000
Internet Devices						
Desktop	-.180**	.000	-.131*	.022	-.103*	.032
Laptop	-.141**	.003	-.204**	.000	-.125**	.009
Mobile-phone	-.013	.796	-.083	.146	.077	.108
TabletOther	-.228**	.000	-.216**	.000	-.257**	.000
Internet Purposes						
Entertainment	.036	.454	-.129*	.024	.079	.097
SocialWork	-.027	.573	-.178**	.002	-.014	.776
InfoService	-.027	.570	-.210**	.000	-.028	.562
Internet Platforms						
EmailSNS	-.096*	.046	-.179**	.002	-.021	.664
Portals	-.124*	.010	-.166**	.004	-.082	.086
MessagingApps	-.010	.832	-.215**	.000	-.161**	.001
BBSNarrowPublic	-.191**	.000	-.231**	.000	-.264**	.000
PoliticalEfficacyOnline	.258**	.000	.133*	.020	.072	.131
Trust online						
TrustOnline	.144**	.003	.086	.134	.214**	.000
TrustOnliner	.131**	.007	.006	.922	.145**	.002
Securtiy&privacy online						
PrivacySecurityOnline	.240**	.000	.087	.130	.237**	.000
PoliticalOpinionsOnline	.250**	.000	.079	.169	.182**	.000

(N in Shanghai= 428, N in Singapore = 306, N in Taipei = 438, $^*p<0.05$, $^{**}p<0.001$)

Next, the binary and ordinal variables of demography-oriented PRC are to be explored in the light of e-government platforms use. All the statistically significant cases are showcased in the following tables. Firstly, the result of household register is reported. Five out of fifteen cases are statistically significant,

among which three cases from Shanghai are outstanding and from Singapore and Taipei there is only one such case respectively. It is obvious that respondents with a registered household in the certain city reported higher use frequency.

Table 157. Independent T Test and Mann-Whitney U Test Comparison of the Household Register on E-government platforms use

	Hotline-email Use in Shanghai					Hotline-email Use in Taipei				
	M	SD	t	df	p	M	SD	t	df	p
HouseholdRegister			5.452	373.841	.000			2.689	436	.007
Yes	2.0761	.89117				1.7827	.74636			
No	1.6480	.70673				1.5550	.82310			
	Portal-apps Use in Shanghai									
HouseholdRegister			3.492	426	.001					
Yes	2.4040	.92776								
No	2.0822	.88296								
	SNS Use in Shanghai					**SNS Use in Singapore**				
	M	U	∑N	p		M	U	∑N	p	
HouseholdRegister		17351.500	428	.002			3081.500	305	.019	
Yes	227.63					156.88				
No	190.65					121.26				

The gender difference can be identified in four out of fifteen cases from the three cities. Male reported higher use frequency in these platforms use items than female. However, an overwhelming gender gap in e-government platforms use cannot be ascertained.

Table 158. Independent T Test and Mann-Whitney U Test Comparison of the Gender on E-government Platforms Use

	Hotline-email Use in Taipei					Portals-apps Use in Shanghai				
	M	SD	t	df	p	M	SD	t	df	p
Gender			2.129	324.849	.034			2.568	425	.011
Male	1.8258	.86717				2.4023	.92071			
Female	1.6595	.69445				2.1739	.91572			
	Portal-apps Use in Singapore					**SNS Use in Shanghai**				
	M	SD	t	df	p	M	U	∑N	p	
Gender			2.845	303	.005		18589.000	427	.001	
Male	2.5881	1.11596				233.00				
Female	2.2329	1.05889				193.80				

Table 159. One-Way ANOVA Summary Table Comparing Different Age Levels in Regard to E-government Platforms Use

	Hotline-email Use in Shanghai					Portal-apps Use in Taipei				
	Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.736	7	1.677	2.347	.023	14.565	8	1.821	1.986	.047
Within Groups	300.046	420	.714			393.241	429	.917		
Total	311.782	427				407.806	437			

Table 160. Means and Standard Deviations Comparing Different Levels of Age Groups in Regard to E-government Platforms Use

	Hotline-email Use in Shanghai			Portals-apps Use in Taipei		
	n	M	SD	n	M	SD
25 and below	86	1.7907	.78764	48	2.0104	.84103
26-30	139	1.9496	.85613	79	2.1203	.89591
31-35	117	1.8462	.80799	78	2.2244	.85146
36-40	56	2.0714	.87609	95	2.3316	1.03299
41-45	15	2.0333	.74322	67	2.5000	.99240
46-50	6	2.5000	1.41421	34	2.4559	1.01778
51-55	4	3.1250	1.65202	19	2.4211	1.03095
56-60	5	1.7000	.75829	9	1.6111	.74068
61and more				9	2.2778	1.52297

Table 161. Kruskal-Wallis H Test Comparison of the Effect of Age Levels on E-government Platforms Use

	Hotline-email Use in Taipei		Portals-apps Use in Shanghai	
		Ranks		
AgeGroup	N	Mean Rank	N	Mean Rank
25 and less	48	164.43	86	190.51
26-30	79	191.25	139	215.85
31-35	78	250.81	117	213.38
36-40	95	237.29	56	255.20
41-45	67	234.54	15	179.27
46-50	34	245.25	6	233.58
51-55	19	228.82	4	343.88
56-60	9	127.22	5	139.20
61and more	9	165.33		
Total	438		428	
	Test Statistics			
Kruskal-Wallis H		30.736		17.560
df		8		7
Asymp. Sig.		.000		.014

In the three tables above, the difference among age groups on e-government platforms use is analyzed. Altogether four statistically significant cases are identified: two cases from Shanghai and two cases from Taipei. No age groups difference can be found for Singapore. In other words, age gap on e-government platforms use is generally minor to all the three cities. Still, more details of the discovered difference in these four cases can be referred in the following three tables.

Income levels are studied next in the light of e-government platforms use. Altogether six out of the fifteen studied cases demonstrate statistically significant difference: the impact of income can be found mostly from Shanghai with three cases, and two cases from Taipei and one case from Singapore. Detailed differences can be referred in the following three tables.

Table 162. Kruskal-Wallis H Test Comparison of the Effect of Income Level on E-government Platforms Use

Hotline-email Use in Shanghai			Hotline-email Use in Taipei		
	N	Mean Rank		N	Mean Rank
3499 and less	21	183.10	24499 and less	75	177.06
3500 to 4999	31	249.03	25500 to 35499	96	205.10
5000 to 5999	44	216.67	35500 to 45499	95	249.11
6000 to 6999	44	234.69	45500 to 55499	67	240.88
7000 to 7999	43	223.64	55500 to 65499	22	260.86
8000 to 8999	56	223.36	65500 to 75499	20	291.90
9000 to 9999	27	225.69	75500 to 85499	12	197.96
10000 to 10999	46	227.79	85500 to 95499	2	190.50
11000 to 11999	21	213.79	95500 to 105499	3	74.00
12000 and more	59	229.42	105500 and more	8	236.63
refuse to answer	36	101.65	refuse to answer	38	182.09
Total	428		Total	438	
Test Statistics					
Kruskal-Wallis H		38.785			36.115
df		10			10
Asymp. Sig.		.000			.000

Table - 162 Continued (1)

Portals-apps Use in Shanghai			Portals-apps Use in Shanghai		
Income	N	Mean Rank		N	Mean Rank
3499 and less	21	152.88	3499 and less	21	194.86
3500 to 4999	31	208.44	3500 to 4999	31	194.44
5000 to 5999	44	211.57	5000 to 5999	44	211.31
6000 to 6999	44	235.61	6000 to 6999	44	189.58
7000 to 7999	43	215.35	7000 to 7999	43	200.23
8000 to 8999	56	223.42	8000 to 8999	56	199.19
9000 to 9999	27	181.07	9000 to 9999	27	221.43
10000 to 10999	46	227.79	10000 to 10999	46	222.01
11000 to 11999	21	199.74	11000 to 11999	21	226.17
12000 and more	59	259.07	12000 and more	59	273.44
refuse to answer	36	162.21	refuse to answer	36	200.26
Total	428		Total	428	
Test Statistics					
Kruskal-Wallis H		24.692			20.689
df		10			10
Asymp. Sig.		.006			.023

Table 163. One-Way ANOVA Summary Table Comparing Different Income Level in Regard to E-government Platforms Use

	Portals-apps Use in Singapore					Public-devices-and-third-party-apps Use in Taipei				
	Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.
Income										
Between Groups	28.875	10	2.888	2.496	.007	19.169	10	1.917	2.040	.028
Within Groups	341.242	295	1.157			401.247	427	.940		
Total	370.118	305				420.416	437			

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Table 164. Means and Standard Deviations Comparing Different Levels of Income Groups in Regard to E-government Platforms Use

E-government Portals-apps Use in Singapore				Public-devices-and-third-party-apps Use in Taipei			
	n	M	SD		n	M	SD
Income				**Income**			
1599 and less	36	2.0556	1.01965	24499 and less	75	1.9400	.89276
1600-2599	32	2.0625	.91361	25500 to 35499	96	2.1667	1.05298
2600-3599	40	2.3375	1.05847	35500 to 45499	95	2.3579	.99644
3600-4599	42	2.4881	1.13421	45500 to 55499	67	2.3507	.94153
4600-5599	31	2.8548	1.14887	55500 to 65499	22	2.2500	.98501
5600-6599	22	2.6364	1.12527	65500 to 75499	20	2.6250	.98509
6600-7599	21	2.8333	1.19722	75500 to 85499	12	1.8750	.80128
7600-8599	9	3.1667	1.32288	85500 to 95499	2	2.2500	1.06066
8600-9599	2	3.5000	2.12132	95500 to 105499	3	2.8333	1.25831
9500 and more	16	2.3750	.99163	105500 and more	8	2.5000	.75593
refuse to answer	55	2.2455	1.00403	refuse to answer	38	1.9079	.91427

At last, the impact of education levels is examined in the light of e-government platforms use. Only three cases can be identified with statistically significant difference in education levels. In Singapore and Taipei the difference can be identified for the portal-apps use factor and in Shanghai the difference can be found for the public-other use.

Table 165. Kruskal-Wallis H Test Comparison of the Effect of Education Level on E-government Platforms Use

Portals-apps Use in Singapore			Portal-apps Use in Taipei		
Education	N	Mean Rank	Education	N	Mean Rank
no formal qualification	1	16.50	lower secondary	5	193.60
primary	5	40.30	secondary	45	181.44
lower secondary	3	47.50	post-secondary general and vocational	40	189.06
secondary	20	110.43	polytechnic diploma	42	195.94
post-secondary general and vocational	21	162.55	university first degree	254	234.83
polytechnic diploma	43	136.63	university postgraduate diploma/degree	51	218.27
professional qualification and other diploma	18	149.58			
university first degree	143	165.63			
university postgraduate diploma/degree	52	168.01			
Total	306		Total	437	
Test Statistics					
Kruskal-Wallis H		26.394			13.217
df		8			5
Asymp. Sig.		.001			.021

Table 166. One-Way ANOVA Summary Table Comparing Different Education Levels in Regard to E-government Public-devices-and-third-party-apps Use in Shanghai

	Sum of Squares	df	Mean Square	F	Sig.
Income					
Between Groups	16.188	4	4.047	3.472	.008
Within Groups	490.752	421	1.166		
Total	506.940	425			

Table 167. Means and Standard Deviations Comparing Different Education Levels in Regard to E-government Public-devices-and-third-party-apps Use in Shanghai

	n	M	SD
Education			
lower secondary	2	1.5000	.70711
secondary	58	2.9655	1.22066
post-secondary general and vocational	56	2.6071	.96160
university first degree	263	2.4430	1.06496
university postgraduate diploma/degree	47	2.4043	1.11627

4.6.2 E-government functions use and the PRC

In the second part of the present section, the PRC are examined one by one for e-government functions use factors. Still, one case from Shanghai is taken as example of processing. For Shanghai, the internet-oriented political relevant characteristics are examined at first by the Pearson correlation coefficients. There were statistically significant correlations between Internet-oriented characteristics which were all in a negative direction. It's noteworthy that the information and service use as a kind of Internet use purpose was also negatively correlated with the low-effort information use. Besides, the r values indicate small effect size for all these statistically significant cases. What's more, only one of the Internet-oriented psychological characteristics was statistically significantly correlated with the e-government low-effort information use.

Table 168. Pearson Correlation Test between Internet-oriented PRC and E-government Low-effort Information Use in Shanghai

	r	p		r	p
BroadbandMobile	-.116*	.016	Desktop	-.086	.074
			Laptop	-.153**	.001
Public Wi-Fi	.014	.765	Mobile-phone	-.065	.179
			TabletOther	-.103*	.034
Entertainment	-.048	.324	EmailSNS	-.135**	.005
SocialWork	-.089	.067	Portals	-.172**	.000
InfoService	-.127**	.008	MessagingApps	-.111*	.021
			BBSNarrowPublic	-.112*	.021
PoliticalEfficacyOnline	.245**	.000			
			TrustOnline	.030	.538
PrivacySecurityOnline	.025	.601	TrustOnliner	-.008	.871
PoliticalOpinionsOnline	.065	.182			

(N = 428, *<0.05, **<0.001)

The binary demographic variables (gender and household register) are explored to identify if there were significant differences within such binary variables in regard to e-government low-effort information use. There was no significant difference for both gender, t (425) = .301, p = .763 and household register, t (426) = .884, p = .377 in Shanghai.

At last, statistically significant differences are explored within the age groups and the education level in regard to residents' e-government low-effort information use. No statistically significant difference was found among the education levels F (3, 421) = .561, p = .691, while a statistically significant difference was found among the age groups, F (6, 420) = 2.131, p = .039. The lowest age group and the groups from 41 to 55 demonstrate the relatively low use frequencies in regard to e-government low-effort information use. What's more, the age groups from 46 to 55 indicate an extraordinary high use frequency.

Table 169. One-Way ANOVA Summary Table Comparing Different Age Levels in Regard to E-government Information One Use in Shanghai

	Sum of Squares	df	Mean Square	F	Sig.
Age					
Between Groups	18.523	7	2.646	2.131	.039
Within Groups	521.436	420	1.242		
Total	539.960	427			

Table 170. Means and Standard Deviations Comparing Different Age Levels in Regard to E-government Information One Use in Shanghai

	n	M	SD
Age			
25 and below	86	2.6860	.92051
26-30	139	2.7266	1.14085
31-35	117	2.8376	1.21384
36-40	56	3.1161	1.14809
41-45	15	2.3667	.81211
46-50	6	3.5833	.97040
51-55	4	3.7500	.95743
56-60	5	2.4000	1.55724

While the residency length and the income variable cannot pass the test of homogeneity of variances, the Kruskal-Wallis H test was adopted to analyze these ordinal demography-oriented characteristics. No statistically significant difference was found among the residency length in regard to residents' e-government low-effort information use, H = 2.393, p = .495. Similarly, no statistically significant difference was found among the income levels in regard to residents' e-government low-effort information use in Shanghai, H =11.149, p = .346.

After presenting the example from Shanghai, all the ten kinds of e-government functions use are examined firstly in the light of ordinal PRC to find out the correlation between these PRC and e-government functions use. The result of these correlations is demonstrated in the following tables.

In the first table, the result is reported for three kinds of e-government information use factors from all the three cities. For all the statistically significant cases, the

correlation direction difference between Internet-use items and Internet-attitude use is sharp: for the Internet-use cases, all these correlations are in negative direction for e-government information use factors, while for the Internet-attitude cases, all these correlations are in positive direction for e-government information use factors. Besides, more detailed information can be referred in the table.

Table 171. Pearson Correlation Test between Internet-oriented PRC and E-government Information Use

	Shanghai		Singapore		Taipei	
	E-government Low-effort Information Use					
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	-.116*	.016	-.080	.163	-.007	.892
Mobile	/	/	/	/	.002	.968
Public Wi-Fi	.014	.765	-.130*	.023	-.096*	.044
Internet Devices						
Desktop	-.086	.074	-.038	.513	-.061	.201
Laptop	-.153**	.001	-.236**	.000	-.005	.915
Mobile-phone	-.065	.179	-.117*	.040	.006	.906
TabletOther	-.103*	.034	-.139*	.015	-.112*	.019
Internet Purposes						
Entertainment	-.048	.324	-.191**	.001	.047	.329
SocialWork	-.089	.067	-.237**	.000	-.123**	.010
InfoService	-.127**	.008	-.264**	.000	-.120*	.012
Internet Platforms						
EmailSNS	-.135**	.005	-.172**	.003	-.077	.106
Portals	-.172**	.000	-.225**	.000	-.105*	.028
MessagingApps	-.111*	.021	-.240**	.000	-.162**	.001
BBSNarrowPublic	-.112*	.021	-.176**	.002	-.144**	.003
PoliticalEfficacyOnline	.245**	.000	.132*	.021	.190**	.000
Trust online						
TrustOnline	.030	.538	.159**	.005	.187**	.000
TrustOnliner	-.008	.871	-.094	.102	.116*	.015
Securtiy&privacy online						
PrivacySecurityOnline	.025	.601	-.046	.423	.133**	.005
PoliticalOpinionsOnline	.065	.182	-.059	.301	.104*	.029

Table - 171 Continued (1)

	Shanghai		Singapore		Taipei	
	E-government Middle-effort Information Use					
Internet Access						
Broadband(Mobile)	.065	.182	.003	.965	-.004	.937
Mobile	/	/	/	/	.070	.146
Public Wi-Fi	-.103*	.033	-.130*	.023	-.334**	.000
Internet Devices						
Desktop	-.157**	.001	-.079	.167	-.131**	.006
Laptop	-.162**	.001	-.194**	.001	-.120*	.012
Mobile-phone	.074	.126	-.013	.815	.128**	.007
TabletOther	-.232**	.000	-.270**	.000	-.391**	.000
Internet Purposes						
Entertainment	.079	.104	-.113*	.049	.062	.199
SocialWork	.094	.052	-.184**	.001	-.027	.568
InfoService	.067	.165	-.213**	.000	-.024	.613
Internet Platforms						
EmailSNS	-.105*	.030	-.133*	.020	.027	.569
Portals	-.139**	.004	-.117*	.040	-.026	.594
MessagingApps	.079	.101	-.171**	.003	-.095*	.047
BBSNarrowPublic	-.240**	.000	-.286**	.000	-.281**	.000
PoliticalEfficacyOnline	.251**	.000	.107	.061	.102*	.034
Trust online						
TrustOnline	.154**	.001	.100	.080	.185**	.000
TrustOnliner	.188**	.000	.029	.611	.208**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.282**	.000	.033	.565	.263**	.000
PoliticalOpinionsOnline	.252**	.000	.111	.053	.248**	.000
	E-government High-effort Information Use					
Internet Access						
Broadband(Mobile)	.042	.382	.022	.702	.056	.239
Mobile	/	/	/	/	.071	.137
Public Wi-Fi	-.052	.279	-.088	.126	-.279**	.000
Internet Devices						
Desktop	-.273**	.000	-.043	.458	-.066	.166
Laptop	-.193**	.000	-.127*	.026	-.185**	.000
Mobile-phone	.015	.761	.043	.450	.158**	.001
TabletOther	-.325**	.000	-.132*	.021	-.383**	.000
Internet Purposes						
Entertainment	.094	.052	-.045	.430	.056	.244
SocialWork	.089	.065	-.108	.058	.040	.399
InfoService	.059	.225	-.133*	.020	.012	.795

Table - 171 Continued (2)

	Shanghai		Singapore		Taipei	
Internet Platforms						
EmailSNS	-.125**	.009	-.109	.058	.001	.984
Portals	-.128**	.008	-.095	.098	-.046	.342
MessagingApps	.089	.066	-.166**	.004	-.054	.258
BBSNarrowPublic	-.358**	.000	-.176**	.002	-.298**	.000
PoliticalEfficacyOnline	.311**	.000	.000	.999	.003	.955
Trust online						
TrustOnline	.186**	.000	-.009	.872	.121*	.011
TrustOnliner	.274**	.000	-.013	.821	.158**	.001
Securtiy&privacy online						
PrivacySecurityOnline	.366**	.000	.018	.760	.153**	.001
PoliticalOpinionsOnline	.375**	.000	.033	.562	.200**	.000

(N in Shanghai= 428, N in Singapore = 306, N in Taipei = 438 *p<0.05, **p<0.001)

For e-government consultation use factors, the correlations with these ordinal PRC are examined. As middle-effort consultation use factor is only formed in Singapore, certain areas are marked with a slash for Shanghai and Taipei. The general findings are identical to those from e-government platforms use and e-government information use: the Internet-use items are in negative direction with e-government consultation use, when the correlations are statistically significant, while the statistically significant cases of Internet-attitudes items and consultation use are in positive direction. One exception can be identified in Shanghai between the high-effort consultation use (which consists of complaining or protesting and crowd funding) and the message-apps use (which includes message only open to private relationships other mobile applications use). As the finding suggests, a further step to discover this e-government use, this Internet platforms use and the third-party mobile applications should earn more attention.

Table 172. Pearson Correlation Test between Internet-oriented PRC and E-government Consultation Use

	Shanghai		Singapore		Taipei	
	E-government Low-effort Consultation Use					
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	-.046	.346	-.016	.779	.034	.472
Mobile	/	/	/	/	.022	.647
Public Wi-Fi	-.049	.308	-.123*	.031	-.160**	.001
Internet Devices						
Desktop	-.198**	.000	-.156**	.006	-.052	.277
Laptop	-.163**	.001	-.095	.097	-.035	.464
Mobile-phone	-.024	.620	.067	.246	.053	.264
TabletOther	-.304**	.000	-.195**	.001	-.269**	.000
Internet Purposes						
Entertainment	.063	.195	.031	.586	-.005	.909
SocialWork	.085	.078	-.113*	.049	-.062	.195
InfoService	.021	.660	-.102	.075	-.080	.096
Internet Platforms						
EmailSNS	-.090	.064	-.084	.144	-.093	.051
Portals	-.118*	.014	-.071	.213	-.069	.152
MessagingApps	.053	.272	-.157**	.006	-.154**	.001
BBSNarrowPublic	-.324**	.000	-.224**	.000	-.210**	.000
PoliticalEfficacyOnline	.336**	.000	.038	.507	.101*	.034
Trust online						
TrustOnline	.191**	.000	.088	.125	.212**	.000
TrustOnliner	.247**	.000	.075	.188	.114*	.017
PrivacySecurityOnline	.281**	.000	.065	.259	.192**	.000
PoliticalOpinionsOnline	.292**	.000	.147*	.010	.121*	.011
	E-government Middle-effort Consultation Use					
Internet Access						
Broadband(Mobile)	/	/	.013	.820	/	/
Mobile	/	/			/	/
Public Wi-Fi	/	/	-.170**	.003	/	/
Internet Devices						
Desktop	/	/	-.150**	.008	/	/
Laptop	/	/	-.087	.127	/	/
Mobile-phone	/	/	.100	.079	/	/
TabletOther	/	/	-.221**	.000	/	/
Internet Purposes						
Entertainment	/	/	-.055	.336	/	/
SocialWork	/	/	-.099	.083	/	/
InfoService	/	/	-.132*	.021	/	/

Table - 172 Continued (1)

	Shanghai		Singapore		Taipei	
Internet Platforms						
EmailSNS	/	/	-.086	.134	/	/
Portals	/	/	-.053	.359	/	/
MessagingApps	/	/	-.096	.093	/	/
BBSNarrowPublic	/	/	-.218**	.000	/	/
PoliticalEfficacyOnline			.053	.352		
Trust online						
TrustOnline	/	/	.090	.115	/	/
TrustOnliner	/	/	.019	.743	/	/
Securtiy&privacy online						
PrivacySecurityOnline	/	/	.096	.095	/	/
PoliticalOpinionsOnline	/	/	.138*	.016	/	/
E-government High-effort Consultation Use						
Internet Access						
Broadband(Mobile)	.169**	.000	.029	.614	-.040	.398
Mobile	/	/	/	/	.163**	.001
Public Wi-Fi	-.064	.186	-.137*	.017	-.381**	.000
Internet Devices						
Desktop	-.159**	.001	-.116*	.043	-.178**	.000
Laptop	-.134**	.005	-.064	.262	-.244**	.000
Mobile-phone	.213**	.000	.120*	.036	.316**	.000
TabletOther	-.296**	.000	-.177**	.002	-.411**	.000
Internet Purposes						
Entertainment	.204**	.000	-.069	.228	.149**	.002
SocialWork	.260**	.000	-.065	.260	.140**	.003
InfoService	.211**	.000	-.130*	.022	.179**	.000
Internet Platforms						
EmailSNS	-.064	.189	-.104	.068	.157**	.001
Portals	-.061	.210	-.073	.205	.034	.477
MessagingApps	.233**	.000	-.116*	.043	.071	.135
BBSNarrowPublic	-.323**	.000	-.194**	.001	-.239**	.000
PoliticalEfficacyOnline	.270**	.000	.127*	.026	-.105*	.028
Trust online						
TrustOnline	.294**	.000	.066	.252	.106*	.027
TrustOnliner	.359**	.000	.110	.055	.253**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.374**	.000	.126*	.027	.238**	.000
PoliticalOpinionsOnline	.362**	.000	.167**	.003	.274**	.000

(N in Shanghai= 428, N in Singapore = 306, N in Taipei = 438 *p<0.05, **p<0.001)

The last four dimensions of e-government functions use are analyzed in the light of ordinal PRC as follows. Generally speaking, the impact direction differences can also be found within the Internet-use variables and the Internet-attitude variables: for the Internet-use variables the statistically significant cases are in majority in negative direction, while for the Internet-use variables these cases are all in positive direction. Still, more exception for Internet-use can be found in the first two e-government functions use items. In Shanghai, respondents with higher purposes in Internet use and with higher frequency of the message-apps use (which includes message only open to private relationships other mobile applications use) reported higher use frequency on voting-like e-government use and collective production use. The positive correlation is also found in the correlation between Internet use purposes and e-government production use in Taipei.

Table 173. Pearson Correlation Test between Internet-oriented PRC and Other E-government Functions Use

	Shanghai		Singapore		Taipei	
	E-government Referendum Use					
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	.095*	.048	-.045	.432	.001	.981
Mobile					.044	.358
Public Wi-Fi	-.037	.442	-.099	.083	-.204**	.000
Internet Devices						
Desktop	-.168**	.000	-.121*	.034	-.081	.089
Laptop	-.129**	.008	-.065	.255	-.083	.081
Mobile-phone	.110*	.023	.077	.181	.150**	.002
TabletOther	-.277**	.000	-.179**	.002	-.324**	.000
Internet Purposes						
Entertainment	.160**	.001	-.021	.718	.062	.196
SocialWork	.165**	.001	-.018	.750	-.022	.650
InfoService	.143**	.003	-.038	.512	-.021	.656
Internet Platforms						
EmailSNS	-.065	.179	-.064	.266	.008	.866
Portals	-.056	.244	-.020	.725	-.081	.089
MessagingApps	.147**	.002	-.053	.355	-.057	.234
BBSNarrowPublic	-.315**	.000	-.161**	.005	-.168**	.000
PoliticalEfficacyOnline	.249**	.000	-.013	.821	.042	.379

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Table - 173 Continued (1)

	Shanghai		Singapore		Taipei	
Trust online						
TrustOnline	.193**	.000	.005	.932	.183**	.000
TrustOnliner	.278**	.000	.105	.066	.191**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.297**	.000	.096	.094	.212**	.000
PoliticalOpinionsOnline	.308**	.000	.073	.205	.157**	.001
E-government Collaborative Production Use						
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	.152**	.002	-.034	.550	-.042	.383
Mobile	/	/	/	/	.145**	.002
Public Wi-Fi	-.089	.067	-.127*	.027	-.358**	.000
Internet Devices						
Desktop	-.245**	.000	-.122*	.033	-.177**	.000
Laptop	-.144**	.003	-.076	.183	-.191**	.000
Mobile-phone	.123*	.011	.079	.166	.288**	.000
TabletOther	-.271**	.000	-.176**	.002	-.388**	.000
Internet Purposes						
Entertainment	.151**	.002	-.017	.768	.136**	.004
SocialWork	.188**	.000	.003	.965	.122*	.011
InfoService	.127**	.009	-.025	.665	.138**	.004
Internet Platforms						
EmailSNS	-.143**	.003	-.028	.623	.155**	.001
Portals	-.104*	.031	-.002	.968	.063	.190
MessagingApps	.132**	.006	-.045	.431	.086	.071
BBSNarrowPublic	-.327**	.000	-.187**	.001	-.174**	.000
PoliticalEfficacyOnline	.236**	.000	.004	.942	-.039	.418
Trust online						
TrustOnline	.201**	.000	-.024	.678	.115*	.016
TrustOnliner	.281**	.000	.075	.190	.229**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.343**	.000	.123*	.031	.278**	.000
PoliticalOpinionsOnline	.314**	.000	.157**	.006	.273**	.000
E-government Collaborative Production Use						
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	.036	.453	-.036	.526	-.117*	.014
Mobile	/	/	/	/	.039	.420
Public Wi-Fi	-.010	.833	-.086	.133	-.218**	.000

Table - 173 Continued (2)

	Shanghai		Singapore		Taipei	
Internet Devices						
Desktop	-.094	.053	-.053	.353	-.088	.064
Laptop	-.111*	.022	.353	306	-.069	.151
Mobile-phone	.025	.613	-.057	.316	.129**	.007
TabletOther	-.200**	.000	-.178**	.002	-.311**	.000
Internet Purposes						
Entertainment	.012	.810	-.133*	.020	.040	.399
SocialWork	.078	.106	-.152**	.008	.005	.921
InfoService	.059	.219	-.167**	.003	.033	.496
Internet Platforms						
EmailSNS	-.079	.104	-.144*	.012	.051	.288
Portals	-.028	.565	-.121*	.034	-.087	.068
MessagingApps	.090	.062	-.153**	.008	-.087	.070
BBSNarrowPublic	-.194**	.000	-.074	.196	-.127**	.008
PoliticalEfficacyOnline	.224**	.000	.178**	.002	.048	.319
Trust online						
TrustOnline	.208**	.000	.103	.072	.178**	.000
TrustOnliner	.176**	.000	-.076	.183	.151**	.001
Securtiy&privacy online						
PrivacySecurityOnline	.206**	.000	-.049	.393	.155**	.001
PoliticalOpinionsOnline	.191**	.000	.026	.645	.170**	.000
E-government Collaborative Production Use						
Internet Access	r	p	r	p	r	p
Broadband(Mobile)	-.052	.280	-.099	.082	-.125**	.009
Mobile	/	/	/	/	-.023	.632
Public Wi-Fi	.009	.858	-.111	.052	-.265**	.000
Internet Devices						
Desktop	-.144**	.003	-.057	.323	-.130**	.006
Laptop	-.105*	.030	-.232**	.000	-.128**	.007
Mobile-phone	-.004	.928	-.143*	.013	.077	.107
TabletOther	-.175**	.000	-.192**	.001	-.360**	.000
Internet Purposes						
Entertainment	-.020	.686	-.178**	.002	.026	.584
SocialWork	.025	.609	-.244**	.000	-.021	.658
InfoService	-.064	.186	-.225**	.000	-.008	.861
Internet Platforms						
EmailSNS	-.112*	.021	-.126*	.027	.056	.239
Portals	-.088	.070	-.160**	.005	-.057	.233
MessagingApps	-.009	.859	-.182**	.001	-.135**	.005
BBSNarrowPublic	-.180**	.000	-.119*	.038	-.201**	.000

Table - 173 Continued (3)

	Shanghai		Singapore		Taipei	
PoliticalEfficacyOnline	.265**	.000	.003	.965	-.036	.458
Trust online						
TrustOnline	.146**	.002	.044	.448	.106*	.026
TrustOnliner	.130**	.007	-.093	.104	.213**	.000
Securtiy&privacy online						
PrivacySecurityOnline	.196**	.000	-.069	.231	.158**	.001
PoliticalOpinionsOnline	.139**	.004	-.067	.245	.163**	.001

(N in Shanghai= 428, N in Singapore = 306, N in Taipei = 438 *p<0.05, **p<0.001)

In the third and last part of result report of the impact of PRC on e-government functions use, the categorical PRC are examined. In the following tables, all the statistically significant cases are presented. Firstly, the impact of household register on e-government functions use is examined and the statistically significant cases are demonstrated in the following table. For all the three cities there are sixteen such cases: eight cases from Shanghai, seven cases from Taipei and one case from Singapore. The larger amount from Shanghai and Taipei could imply that the registered household matters in e-government participation in these two cities. Besides, all the registered household group reported higher e-government functions use than the non-registered group.

Table 174. Independent T Test and Mann-Whitney U Test Comparison of the Household Register Effect on E-government Functions Use

	M	SD	t	df	p	M	SD	t	df	p
			Independent T Test								
	Mid-Info in Shanghai					Mid-Info in Taipei				
			3.612	356.789	.000			2.835	436	.005
Yes	2.4438	1.00703				1.9347	.88921			
No	2.1118	.85195				1.6606	.83022			
	High-Info in Shanghai					High-Info in Taipei				
			3.172	354.828	.002			3.216	217.929	.001
Yes	2.5308	1.18089				1.7401	.91320			
No	2.1875	1.00629				1.4541	.76540			

Table - 173 Continued (1)

	Low-Consul in Shanghai				Low-Consul in Singapore		
	2.400	426	.017		2.078	47.361	.043
Yes	2.5562	1.09275			1.3574	.58396	
No	2.2928	1.07569			1.2069	.34114	
	High-Consul in Shanghai				High-Consul in Taipei		
	3.707	426	.000		6.048	328.545	.000
Yes	3.8623	1.74748			3.0076	1.43426	
No	3.2467	1.43743			2.3349	.81665	

Mann-Whitney U Test

	M	U	∑N	p	M	U	∑N	p
	Referendum Use in Shanghai				Referendum Use in Taipei			
		17462.000	428	.002		13756.000	438	.000
Yes	227.23				232.19			
No	191.38				181.20			
	Production Use in Shanghai				Production Use in Taipei			
		16517.000	428	.000		14494.500	438	.000
Yes	230.66				229.94			
No	185.16				187.98			
	Procedures Use in Shanghai				Procedures Use in Taipei			
		16627.000	428	.000		14354.500	438	.001
Yes	230.26				230.37			
No	185.89				186.69			
	Payment Use in Shanghai				Payment Use in Taipei			
		18226.000	428	.019		13156.500	438	.000
Yes	276				234.01			
No	152				175.70			

The impact of gender on e-government functions use is presented in the following table. No statistically significant case is found from Singapore. However, the impact of gender is more outstanding in Shanghai and Taipei. From all the seven cases from the two cities, the male respondents reported higher use frequency of these items than the female.

Table 175. Independent T Test and Mann-Whitney U Test Comparison of Gender on E-government Functions Use

	M	SD	t	df	p	M	SD	t	df	p
	Low-Consultation in Shanghai					**High-Consultation in Taipei**				
			2.694	416.793	.007			3.211	294.832	.001
Male	220	2.6023				3.1011	1.58414			
Female	207	2.3213				2.6595	1.11271			
	M	U		∑N	p	M	U		∑N	p
	Procedures in Shanghai					**Production in Taipei**				
		20229.500		427	.030		20412.500		435	.016
Male	225.55					231.82				
Female	201.73					208.43				
	Payment in Shanghai					**Procedures in Taipei**				
		19682.500		427	.011		18998.000		435	.001
Male	220					239.77				
Female	207					202.92				
						Payment in Taipei				
							19449.000		435	.004
Male						237.24				
Female						204.68				

In the following three tables, the impact of residency length on e-government functions use is presented. It is interesting to find out that only in Shanghai such statistically significant cases can be identified. In these four cases, interviewees who newly inhabit in Shanghai reported higher use frequency in such high-end functions use as consultation use, collaborative production use than the longtime residents

Table 176. One-Way ANOVA Summary Table Comparing Different Residency Length in Regard to E-government Functions Use

	Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.
	Low-Consultation in Shanghai					**High- Consultation in Shanghai**				
Between Groups	10.151	3	3.384	2.871	.036	37.195	3	12.398	4.564	.004
Within Groups	499.750	424	1.179			1151.718	424	2.716		
Total	509.902	427				1188.913	427			

Table 177. Means and Standard Deviations Comparing Different Residency Length in Regard to E-government Functions Use

	n	M	SD	M	SD
		Low-Consultation in Shanghai		High- Consultation in Shanghai	
13 to 24 months	72	2.7361	1.10687	4.0903	1.77090
25 to 36 months	78	2.5897	.99591	3.9359	1.55914
37 to 48 months	42	2.4405	.99512	3.7738	1.62752
more than 48	236	2.3411	1.12191	3.3877	1.64158

Table 178. Kruskal-Wallis H Test Comparison of the Effect of Residency Length on E-government Functions Use

		Referendum in Shanghai	Production in Shanghai
		Ranks	
Residency	N	Mean Rank	Mean Rank
13 to 24 months	72	243.30	236.89
25 to 36 months	78	230.13	244.92
37 to 48 months	42	213.38	220.94
more than 48	236	200.75	196.47
Total	428		
		Test Statistics	
Kruskal-Wallis H		9.058	13.804
df		3	3
Asymp. Sig.		.029	.003

The impact of age is then reported. In the following three tables six cases with statistically significance within age sub-groups are identified for Taipei, while one case for Shanghai and no such case for Singapore are found.

Table 179. One-Way ANOVA Summary Table Comparing Different Age Levels in Regard to E-government Functions Use

	Low-effort Information in SH					Middle-effort Information in TP				
	Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.523	7	2.646	2.131	.039	13.408	8	1.676	2.202	.026
Within Groups	521.436	420	1.242			326.529	429	.761		
Total	539.960	427				339.937	437			

Table 180. Means and Standard Deviations Comparing Different Age Levels in Regard to E-government Functions Use

	Low-effort Information in SH			Middle-effort Information in TP		
	n	M	SD	n	M	SD
25 and below	86	2.6860	.92051	48	1.5729	.61011
26-30	139	2.7266	1.14085	79	1.7152	.78317
31-35	117	2.8376	1.21384	78	2.0833	.85058
36-40	56	3.1161	1.14809	95	1.8158	.94264
41-45	15	2.3667	.81211	67	2.0224	1.05325
46-50	6	3.5833	.97040	34	1.8088	.78831
51-55	4	3.7500	.95743	19	2.1053	1.00801
56-60	5	2.4000	1.55724	9	1.7222	.71200
61 and more				9	2.1111	.85797

Table 181. Kruskal-Wallis H Test Comparison of the Effect of Age Group on E-government Functions Use in Taipei

		Low-effort Info	High Info	High consul	Referendum	Production
			Ranks			
AgeGroup	N	Mean Rank	Mean Rank	Mean Rank	Mean Rank	Mean Rank
25 and less	48	183.18	209.27	207.95	190.17	194.34
26-30	79	199.35	209.99	217.59	213.58	212.28
31-35	78	234.03	263.61	259.88	260.53	253.84
36-40	95	219.97	200.98	193.72	213.52	205.01
41-45	67	255.10	224.18	213.60	195.93	214.22
46-50	34	222.49	198.81	218.78	206.16	206.79
51-55	19	265.66	261.74	244.76	264.95	259.79
56-60	9	140.56	141.94	160.22	199.06	179.50
61and more	9	164.39	202.44	272.61	285.83	314.61
Total	438					
		Test Statistics				
Kruskal-Wallis H		21.447	22.259	21.301	22.742	27.973
df		8	8	8	8	8
Asymp. Sig.		.006	.004	.006	.004	.000

Next, the impact of education levels on e-government functions use is demonstrated in the following three tables. Four statistically significant cases can be identified for Singapore, three cases for Shanghai and two cases for Taipei. In Singapore, different levels of education indicate a more widely impact on e-government functions use. Besides, education levels can exert statistically significant effect on the payment use for all the three cities.

Table 182. Kruskal-Wallis H Test Comparison of the Effect of Education Levels on E-government Functions Use

		Low-Info	Mid-Info	High-Consul	Payment
			Ranks		
Education in Singapore	N	Mean Rank	Mean Rank	Mean Rank	Mean Rank
no formal qualification	1	14.00	50.50	128.00	46.00
primary	5	49.00	50.50	128.00	125.33
lower secondary	3	58.83	50.50	128.00	147.23
secondary	20	138.45	126.85	135.20	172.76
post-secondary general and vocational	21	165.90	191.83	185.14	145.13
polytechnic diploma	43	131.99	166.26	171.21	129.86
professional qualification and other diploma	18	158.53	136.64	145.33	153.95
university first degree	143	164.94	160.12	151.39	171.04
university postgraduate diploma/degree	52	157.05	143.19	146.16	46.00
Total	306				
			Test Statistics		
Kruskal-Wallis H		20.272	22.439	15.727	14.629
df		8	8	8	7
Asymp. Sig.		.009	.004	.046	.041

		Referendum	Payment				Procedures	Payment
				Ranks				
Education in Shanghai	N	Mean Rank	Mean Rank	**Education in Taipei**	N		Mean Rank	Mean Rank
lower secondary	2	159.25	115.00	lower secondary	5		240.20	259.60
secondary	58	252.72	256.56	secondary	45		185.98	188.70
post-secondary general and vocational	56	221.54	215.36	post-secondary general and vocational	40		197.30	171.08
university first degree	263	211.38	209.24	polytechnic diploma	42		231.05	240.52
university postgraduate diploma/degree	47	169.68	186.17	university first degree	254		231.39	230.31
Total	426			university postgraduate diploma/degree	51		191.45	205.29
				Total	437			
				Test Statistics				
Kruskal-Wallis H		14.089	12.022				11.407	14.991
df		4	4				5	5
Asymp. Sig.		.007	.017				.044	.010

Table 183. One-Way ANOVA Summary Table Comparing Different Education Levels in Regard to E-government High-effort Information Use in Shanghai

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.839	4	3.960	3.137	.015
Within Groups	531.405	421	1.262		
Total	547.244	425			

Table 184. Means and Standard Deviations Comparing Different Levels of Education Levels in Regard to E-government High-effort Information Use in Shanghai

	n	M	SD
lower secondary	2	2.0000	1.41421
secondary	58	2.7931	1.11621
post-secondary general and vocational	56	2.4464	1.12282
university first degree	263	2.3821	1.12881
university postgraduate diploma/degree	47	2.0319	1.09547

In the next three tables, the result of impact of incomes levels on e-government functions use is reported. Altogether fifteen statistically significant cases are identified for the three cities: six cases for Shanghai and Taipei respectively, three cases for Singapore. The amount of significant cases are worth attention. However, it doesn't necessarily mean a gap between the better-off and the worse-off. By checking the mean rank in details, various income groups which prefer a certain kind of e-government functions use can be referred. Besides, it can be found that no such cases can be identified for low-effort use in the three cities, while for Shanghai and Taipei income impact on decision-making use, procedures use, and even payment use is more outstanding than that for Singapore.

Table 185. One-Way ANOVA Summary Table Comparing Different Income Levels in Regard to E-government Middle-effort Information Use

	Shanghai					Taipei				
	Sum of Squares	df	Mean Square	F	Sig.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.410	10	1.741	1.901	.043	28.018	10	2.802	3.836	.000
Within Groups	381.872	417	.916			311.918	427	.730		
Total	399.282	427				339.937	437			

Table 186. Means and Standard Deviations Comparing Different Income Levels in Regard to E-government Middle-effort Information Use

		Shanghai				Taipei	
	n	M	SD		n	M	SD
3499 and less	21	1.8810	.77306	24499 and less	75	1.6733	.77761
3500 to 4999	31	2.3065	1.01388	25500 to 35499	96	1.8646	.93887
5000 to 5999	44	2.2500	.75097	35500 to 45499	95	2.0158	.89755
6000 to 6999	44	2.3182	.91557	45500 to 55499	67	1.9254	.86276
7000 to 7999	43	2.4070	.97135	55500 to 65499	22	2.1818	.80984
8000 to 8999	56	2.4554	.98754	65500 to 75499	20	2.4750	1.03205
9000 to 9999	27	2.1296	.75438	75500 to 85499	12	2.0417	.98761
10000 to 10999	46	2.4348	.94050	85500 to 95499	2	2.0000	.70711
11000 to 11999	21	2.3810	1.23394	95500 to 105499	3	1.1667	.28868
12000 and more	59	2.6017	1.11332	105500 and more	8	1.4375	.62321
refuse to answer	36	1.9306	.90359	refuse to answer	38	1.3553	.53154

Table 187. Kruskal-Wallis H Test Comparison of the Effect of Income Levels on E-government Functions Use

Shanghai		High-consul	Referendum Ranks	Production	Procedures	Payment
	N	Mean Rank	Mean Rank	Mean Rank	Mean Rank	Mean Rank
3499 and less	21	193.00	204.48	168.05	185.50	210.12
3500 to 4999	31	229.05	216.73	224.05	220.39	242.39
5000 to 5999	44	237.64	224.44	220.38	203.14	221.80
6000 to 6999	44	241.51	248.81	247.64	229.56	227.90
7000 to 7999	43	211.19	208.91	225.94	225.56	201.57
8000 to 8999	56	229.13	233.13	218.78	222.08	213.32
9000 to 9999	27	225.17	215.15	226.59	226.78	208.33
10000 to 10999	46	223.48	226.34	232.90	221.39	252.88
11000 to 11999	21	229.69	219.62	192.12	217.12	164.45
12000 and more	59	212.81	214.73	224.72	234.92	221.08
refuse to answer	36	108.88	123.08	129.10	143.83	159.03
Total	428					
Test Statistics						
Kruskal-Wallis H		33.473	28.393	29.817	19.614	19.741
df		10	10	10	10	10
Asymp. Sig.		.000	.002	.001	.033	.032

Table - 187 Continued (1)

Singapore	N	High-info Mean Rank	Mid-consul Mean Rank	Procedures Mean Rank		
			Ranks			
1599 and less	36	145.81	153.61	132.86		
1600-2599	32	145.83	155.28	142.17		
2600-3599	40	172.19	157.95	142.68		
3600-4599	42	143.79	137.31	144.85		
4600-5599	31	181.19	190.73	189.74		
5600-6599	22	124.45	140.02	142.86		
6600-7599	21	153.38	148.00	176.00		
7600-8599	9	128.89	145.50	199.44		
8600-9599	2	270.50	209.25	257.25		
9500 and more	16	154.81	155.69	177.22		
refuse to answer	55	152.27	146.67	145.13		
Total	306					
Test Statistics						
Kruskal-Wallis H		18.841	19.710	21.002		
df		10	10	10		
Asymp. Sig.		.042	.032	.021		

Taipei	N	High-info Mean Rank	High-consul Mean Rank	Production Mean Rank	Procedures Mean Rank	Payment Mean Rank
			Ranks			
24499 and less	75	201.69	192.45	187.47	189.89	174.48
25500 to 35499	96	202.65	215.40	214.25	211.82	215.03
35500 to 45499	95	253.86	255.91	259.52	225.69	243.07
45500 to 55499	67	224.77	222.63	220.34	248.04	235.73
55500 to 65499	22	248.86	275.50	239.18	257.41	260.05
65500 to 75499	20	281.77	241.05	280.65	287.83	267.50
75500 to 85499	12	233.75	196.08	212.42	171.17	204.08
85500 to 95499	2	257.25	206.00	157.00	192.75	332.50
95500 to 105499	3	115.50	131.00	157.00	285.00	273.67
105500 and more	8	150.00	195.63	157.00	169.69	195.75
refuse to answer	38	168.62	163.05	174.50	195.64	183.01
Total	438					
Test Statistics						
Kruskal-Wallis H		32.036	33.118	44.230	24.973	29.353
df		10	10	10	10	10
Asymp. Sig.		.000	.000	.000	.005	.001

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4.6.3 Conclusion

In the present section, the relationship between political relevant characteristics and e-government use is analyzed. Observed from the viewpoint of e-government use in the three cities, the analyses are presented above. In the conclusion part, these political relevant characteristics are to be explored once again from the perspective of characteristics, while the city comparisons are omitted in the conclusion below.

Firstly, the observation is to undertake for Shanghai. Within the Internet access, a sharp differences can be identified between the broadband and mobile use and the Wi-Fi use. The previous Internet access bundle demonstrates four statistically significant cases in positive direction with e-government use, while the Wi-Fi use only indicates one case of statistical significance in negative direction with the e-government middle-effort information use. For the Internet devices use, the relationship between mobile phone use and e-government use is well contrasted to those between other forms of Internet devices use and e-government use, which demonstrate mostly statistically significant cases in negative direction. However, for the relationships between mobile phone use and the consultation two use, the referendum use and the collective production use indicate statistical significance in positive direction. The similar tendency can also be found for the Internet purpose use, wherein the relationships between all the three forms Internet use purposes and the three kinds of e-government use demonstrate statistical significance in positive direction. Besides, the tendency can also be found for the e-government hotline-email use factor from the perspective of Internet purpose use. Generally speaking, little findings of differences can be drawn between the Internet use purposes.

Table 188. The Statistically Significant Correlations and Their Directions Summery between Internet-based PRC and E-government Use in Shanghai

	Internet access		Internet equipment				Internet purpose		
	BM	Wifi	Dt	Lt	M	TO	En	SW	IS
Hotline-email	S	-	S, N	S, N	-	S	S	S	S
Portals-apps	-	-	S, N	S, N	-	S, N	-	-	-
SNS	-	-	-	S, N	-	-	-	-	-
Third-public	-	-	S, N	S, N	-	S, N	-	-	-
Low-info	S, N	-	-	S, N	-	S, N	-	-	S, N
Mid-info	-	S, N	S, N	S, N	-	S, N	-	-	-
High-info	-	-	S, N	S, N	-	S, N	-	-	-
Low-consul	-	-	S, N	S, N	-	S, N	-	-	-
High-consul	S	-	S, N	S, N	S	S, N	S	S	S
Referendum	S	-	S, N	S, N	S	S, N	S	S	S
Col. production	S	-	S, N	S, N	S	S, N	S	S	S
Procedures	-	-	-	S, N	-	S, N	-	-	-
Payment	-	-	S, N	S, N	-	S, N	-	-	-

S stands for cases with statistically significant difference;
N stands for such significance cases in negative direction.

Next, an overview of the relationship between other four kinds of political relevant characteristics and e-government use is presented. Such Internet platforms use as the email and SNS use factor, the portal use, and the BBS use are either statistically insignificantly correlated with e-government use or statistically significantly correlated with e-government use in negative direction. In contrast to that, the messaging apps use and other apps use factor is statistically significantly correlated with some e-government use cases. Lastly, the Internet-oriented psychological characteristics are analyzed for Shanghai. It is obvious that all the three psychological characteristics are correlated with e-government use in a similar pattern: except the e-government SNS use and e-government low-effort information use, other e-government use cases are statistically significantly correlated with these three Internet-oriented psychological characteristics as well as the sub-dimensions within them.

Table 189. The Statistically Significant Correlations and Their Directions Summery between Internet-based PRC and E-government Use in Shanghai

	Internet platform				Onlinp efficacy	Internet trust		Internet privacy	
	Em, SNS	Port	MeApp	BBS	efficacy	TrustO	Trust2	Priv	Priv2
Hotline-email	S, N	-	S	S, N	S	S	S	S	S
Portals-apps	S, N	S, N	-	S, N	S	S	S	S	S
SNS	S, N	S, N	-	-	-	-	-	-	-
Third-public	S, N	S, N	-	S, N	S	S	S	S	S
Low-info	S, N	S, N	S, N	S, N	S	-	-	-	-
Mid-info	S, N	S, N	-	S, N	S	S	S	S	S
High-info	S, N	S, N	-	S, N	S	S	S	S	S
Low-consul	-	S, N	-	S, N	S	S	S	S	S
High-consul	-	-	S	S, N	S	S	S	S	S
Referendum	-	-	S	S, N	S	S	S	S	S
Col. production	S, N	S, N	S	S, N	S	S	S	S	S
Procedures	-	-	-	S, N	S	S	S	S	S
Payment	S, N	-	-	S, N	S	S	S	S	S

S stands for cases with statistically significant difference;
N stands for such significance cases in negative direction.

At last, the demographic political relevant characteristics are taken into overview. It is noteworthy that all the statistically significant cases are all in positive direction, compared to those from above which demonstrate cases both in positive and negative directions. For the residency length in Shanghai, it is interesting to find that the correlations between it and such demographic characteristics from the low-effort consultation use up to the collective production use are statistically significant in positive direction. For the household register, all use forms but the e-government public-platforms-and-third-party-apps use and the e-government low-effort information use indicate statistical significance with the household register condition. What's more the similar findings can be outdrawn from the correlation between income groups and e-government use. As for gender, it demonstrates statistically significant correlations with two e-government platforms use and with four e-government function uses. From age groups, however, the statistic significant cases can be found only in the e-government hotline-email use, the e-government portal-apps use and the e-government low-effort information use. For the majority of e-government functions use, the age

groups demonstrate no statistical significance. Still, education levels indicate four statistic significant cases with e-government use.

Table 190. The Statistically Significant Within-demography-group Comparison Summary for E-government Use in Shanghai

	Resi	HoRe	Gend	Age	Edu	Incom
Hotline-email	-	S	-	S	-	S
Portals-apps	-	S	S	S	-	S
SNS	-	S	S	-	-	S
Third-public	-	-	-	-	S	-
Low-info	-	-	-	S	-	-
Mid-info	-	S	-	-	-	S
High-info	-	S	-	-	S	-
Low-consul	S	S	S	-	-	-
High-consul	S	S	-	-	-	S
Referendum	S	S	-	-	S	S
Col. production	S	S	S	-	-	S
Procedures	-	S	S	-	-	S
Payment	-	S	S	-	S	S

S stands for cases with statistically significant difference.

Next, the relationship between the political relevant characteristics and the e-government use is summarized for Singapore. There is a sharp contrast between the broadband-mobile use and the Wi-Fi use for all the e-government use cases. The Wi-Fi Internet access demonstrates much more statistically significant cases than the broadband-mobile use. It's also noteworthy that almost all these cases are statistically significant in negative direction, while the correlation between the broadband-mobile use and the e-government low-effort consultation use serves as the only case in positive direction.

The negative direction can also be found in the correlation between the Internet devices use and the e-government use: all but one statistically significant cases are in the negative direction. Among them the tablet and other devices use demonstrates all the statistically significant correlations with e-government use. While the laptop use indicates such cases for all the e-government platforms use and the e-government information use, the desktop use indicates such cases for

the rest e-government use: consultation use, referendum use and collective production use. For the mobile phone use, the only statistical significant case in positive direction can be found: the correlation between the mobile phone use and the e-government high-effort consultation use.

Table 191. The Statistically Significant Correlation and Their Directions Summery between Internet-based PRC and E-government Use in Singapore

	Internet access			Internet equipment			Internet purpose		
	BM	Wifi	Dt	Lt	M	TO	En	SW	IS
Hotline-email	-	S, N	-	S, N	-	S, N	-	S, N	S, N
Portals-apps	S, N	S, N	-	S, N	S, N	S, N	S, N	S, N	S, N
SNS	-	S, N	-	S, N	-	S, N	-	-	S, N
Third-public	-	-	S, N	S, N	-	S, N	S, N	S, N	S, N
Low-info	-	S, N	-	S, N	S, N	S, N	S, N	S, N	S, N
Mid-info	-	S, N	-	S, N	-	S, N	S, N	S, N	S, N
High-info	-	-	-	S, N	-	S, N	-	-	S, N
Low-consul	S	S, N	S, N	-	-	S, N	-	S, N	-
Mid-consul	-	S, N	S, N	-	-	S, N	-	-	S, N
High-consul	-	S, N	S, N	-	S	S, N	-	-	S, N
Referendum	-	-	S, N	-	-	S, N	-	-	-
Col. production	-	S, N	S, N	-	-	S, N	-	-	-
Procedures	-	-	-	-	-	S, N	S, N	S, N	S, N
Payment	-	-	-	S, N	S, N	S, N	S, N	S, N	S, N

S stands for cases with statistically significant difference;
N stands for such significance cases in negative direction.

Within the Internet purpose use, the entertainment use and the socialization-work use factor indicate similar results, while the information-service use demonstrates statistically significant cases in negative direction for almost all the e-government use cases except the low-effort consultation use, the referendum use and the collective production use.

In the following table, the rest of the Internet-oriented political relevant characteristics are summarized. It is surprisingly to find out that the correlations between all these Internet platforms use and the e-government use are all statistically significant in negative direction. The same effect can also be found for the e-government low-effort and middle-effort information use, the procedures

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use and the payment use in Singapore. For the rest of e-government functions use, the messaging-apps use and the BBS use demonstrate statistically significant cases in negative direction. The result of psychological political relevant characteristics is quite similar to that in Shanghai: all the statistically significant cases are in positive direction. However, the amount of significant cases is smaller than that in Shanghai.

Table 192. The Statistically Significant Correlation and Their Direction Summery between Internet-based PRC and E-government Use in Singapore

	Internet platform				Online p	Internet trust		Internet privacy	
	Em, SNS	Port	MeApp	BBS	efficacy	TrustO	Trust2	Priv	Priv2
Hotline-email	S, N	S, N	S, N	S, N	S	S	-	S	-
Portals-apps	S, N	S, N	S, N	S, N	S	S	-	-	-
SNS	S, N	S, N	S, N	S, N	S	S	S	S	S
Third-public	S, N	S, N	S, N	S, N	S	-	-	-	-
Low-info	S, N	S, N	S, N	S, N	S	S	-	-	-
Mid-info	S, N	S, N	S, N	S, N	-	-	-	-	-
High-info	-	-	S, N	S, N	-	-	-	-	-
Low-consul	-	-	S, N	S, N	-	-	-	-	S
Mid-consul	-	-	-	S, N	-	-	-	-	-
High-consul	-	-	S, N	S, N	S	-	-	S	S
Referendum	-	-	-	S, N	-	-	-	-	-
Col. production	-	-	-	S, N	-	-	-	S	S
Procedures	S, N	S, N	S, N	-	S	-	-	-	-
Payment	S, N	S, N	S, N	S, N	-	-	-	-	-

S stands for cases with statistically significant difference;
N stands for such significance cases in negative direction.

At last, the demographic political relevant characteristics are summed up in the following table. The relationship between residency length and e-government use is not studied due to the differentiation between residency length is too small to identify in Singapore. Besides, the amount of statistically significant cases is far less than that in Shanghai. Still, it is interesting to find out that such variable as age groups demonstrate no statistically significant difference on e-government use, while such variables as education levels and income levels indicate somehow some statistically significant difference on certain e-government use cases.

Table 193. The Statistically Significant Within-demography-group Comparison Summary for E-government Use in Singapore

	Resi	HoRe	Gend	Age	Edu	Incom
Hotline-email	/	-	-	-	-	-
Portals-apps	/	-	S	-	S	S
SNS	/	S	-	-	-	-
Third-public	/	-	-	-	-	-
Low-info	/	-	-	-	S	-
Mid-info	/	-	-	-	S	-
High-info	/	-	-	-	-	S
Low-consul	/	S	-	-	-	-
Mid-consul	/	-	-	-	-	S
High-consul	/	-	-	-	S	-
Referendum	/	-	-	-	-	-
Col. production	/	-	-	-	-	-
Procedures	/	-	-	-	-	S
Payment	/	-	-	-	S	-

S stands for cases with statistically significant difference.

At last, Taipei is taken for examination under the perspective of political relevant characteristics. Firstly, the Internet access is summarized. Almost all the correlations between Wi-Fi use and e-government use are statistically significant in negative direction, while only two statistically significant correlations in positive direction can be found between the mobile access use and certain e-government functions use. For the Internet devices use, the mobile phone use serves as the only device use demonstrating several statistically significant correlations with e-government use. The result can also be confirmed with those of mobile Internet access use. Besides, other forms of Internet devices use indicate cases in negative direction, as long as statistically significant correlations with e-government use can be identified. The Internet purpose use is illustrated next. The correlations between all the e-government platforms use and the socialization-work use, and the information-service use turn out to be statistically significant in negative direction, while the correlations between all the e-government platforms use and the entertainment use are insignificant. Besides, it is also interesting to

find out that such Internet purposes use are all statistically significantly correlated with e-government high-effort consultation use as well as with e-government collective production use.

Table 194. The Statistically Significant Correlations and Their Directions Summery between Internet-based PRC and E-government Use in Taipei

	Internet access			Internet equipment				Internet purpose		
	Bro-	Mob	Wifi	Dt	Lt	M	TO	En	SW	IS
Hotline-email	-	-	S, N	S, N	S, N	-	S, N	-	S, N	S, N
Portals-apps	-	-	S, N	-	S, N	-	S, N	-	S, N	S, N
SNS	-	-	-	-	-	-	S, N	-	S, N	S, N
Third-public	-	-	S, N	-	-	-	S, N	-	S, N	S, N
Low-info	-	-	S, N	-	-	-	S, N	-	S, N	S, N
Mid-info	-	-	S, N	S, N	S, N	S	S, N	-	-	-
High-info	-	-	S, N	-	S, N	S	S, N	-	-	-
Low-consul	-	-	S, N	-	-	-	S, N	-	-	-
High-consul	-	S	S, N	S, N	S, N	S	S, N	S	S	S
Referendum	-	-	S, N	-	-	S	S, N	-	-	-
Col. production	-	S	S, N	S, N	S, N	S	S, N	S	S	S
Procedures	S, N	-	S, N	-	-	S	S, N	-	-	-
Payment	S, N	-	S, N	S, N	S, N	-	S, N	-	-	-

S stands for cases with statistically significant difference;
N stands for such significance cases in negative direction.

Next, the Internet platforms use are summed up in the light of e-government use. Almost all the statistically significant cases are in negative direction. Most statistically significant cases can be found from the BBS use, while fewer such cases can be found from other kinds of Internet platforms use. It is noteworthy that two statistically significant cases can be found between the Email-SNS use and the high-effort consultation use as well as the collective production use. In the last columns, the psychology-oriented political relevant characteristics are summarized. The results are quite similar to those findings from Shanghai and Singapore: these statistically significant cases are all but one in positive direction. From the table it can tell that the perceived Internet trust and the perceived Internet privacy are correlated with e-government use overwhelmingly, while perceived

online efficacy is not statistically correlated with such e-government use functions as referendum, collective production, procedures and payment.

Table 195. The Statistically Significant Correlations and Their Directions Summery between Internet-based PRC and E-government Use in Taipei

	Internet platform				Online p	Internet trust		Internet privacy	
	Em, SNS	Port	MeApp	BBS	efficacy	TrustO	Trust2	Priv	Priv2
Hotline-email	S, N	S, N	-	-	-	S	S	S	S
Portals-apps	-	-	S, N	S, N	S	S	S	S	S
SNS	S, N	-	S, N	S, N	S	S	-	-	-
Third-public	-	-	S, N	S, N	-	S	S	S	S
Low-info	-	S, N	S, N	S, N	S	S	S	S	S
Mid-info	-	-	S, N	S, N	S	S	S	S	S
High-info	-	-	-	S, N	-	S	S	S	S
Low-consul	-	-	S, N	S, N	S	S	S	S	S
High-consul	S	-	-	S, N	S, N	S	S	S	S
Referendum	-	-	-	S, N	-	S	S	S	S
Col. production	S	-	-	S, N	-	S	S	S	S
Procedures	-	-	-	S, N	-	S	S	S	S
Payment	-	-	S, N	S, N	-	S	S	S	S

S stands for cases with statistically significant difference;
N stands for such significance cases in negative direction.

Table 196. The Statistically Significant Within-demography-group Comparison Summary for E-government Use in Taipei

	Resi	HoRe	Gend	Age	Edu	Incom
Hotline-email	-	S	S	S	-	S
Portals-apps	-	-	-	S	-	-
SNS	-	-	-	-	-	-
Third-public	-	-	-	-	-	S
Low-info	-	-	-	S	-	-
Mid-info	-	S	-	S	-	S
High-info	-	S	-	S	-	S
Low-consul	-	-	-	S	-	-
High-consul	-	S	S	S	-	S
Referendum	-	S	-	S	-	-
Col. production	-	S	S	S	-	S
Procedures	-	S	S	-	S	S
Payment	-	S	S	-	S	S

S stands for cases with statistically significant difference.

In the end, the demographic political relevant characteristics are summarized in the table above. It is obvious that the residency length and the education levels

demonstrate no statistical significance with all kinds of e-government use in Taipei. Compared with gender which indicates three statistically significant cases, the age groups reveal more cases with all kinds of e-government use but the e-government SNS use and the e-government public-platforms-and-third-party-apps use. Still such statistically significant cases can also be found between the house register, the income levels and some e-government use cases.

5. CONCLUSIONS AND DISCUSSION

In the present research, e-government use in Shanghai, Singapore and Taipei is surveyed and analyzed. E-government use is observed in three fields: e-government platforms use, e-government functions use and e-government themes use. Besides, the political participative factors and their prediction effect on e-government use are examined. What's more, the politically relevant characteristics and their effect on e-government use were revealed for the three cities.

Altogether five research questions are asked and answered in the present research. Before these questions and their corresponding research results are concluded here, two findings from the data pre-processing are to highlight. Firstly, the political participation ladder was evidenced in the present research in the light of e-government functions use frequency (please refer to the chapter 4.2). For all the three cities, the e-government information use and the e-government consultation use can be discerned from each other. What's more, within each above-mentioned use categories factors are recognizable. For the e-government information use three rungs of the participation ladder were identified and the differentiation can be applied for all the three cities. For the e-government consultation use two rungs of participation ladder can be identified for Shanghai and Taipei, and for Singapore three rungs. Secondly, the comparisons among the three cities from the perspectives of the political participatory factors (please refer to the conclusion of chapter 3.2) revealed a somewhat surprising results: residents from Shanghai score the highest performance in all the items except the self-report of digital skills and of political privacy plus. Against the background of authoritarian political system in Shanghai, Taipei and Singapore which are featured with democratic and semi-democratic political systems respectively showcase second or third best scores. Although analysis of the score ranking is out of the purpose of the present

research, the results are worth paying attention to when some of those variables were regarded as independent variables in the following research as well as city comparison.

5.1 Summary of research goals

The first question deals with e-government use comparison among the three cities. Comparisons were made for the e-government platforms use, for the e-government functions use and for the e-government themes use. Results demonstrate that residents in Shanghai reported the highest use frequency in six out seven e-government platforms use, while only for e-government portal use residents in Shanghai reported the second high use frequency. Both Singapore and Taipei take five times second place among the seven kinds of e-government platforms use, which means generally they are neck on neck in the comparison. Still, it is noteworthy that residents in Singapore reported a most frequent use of e-government portal, while residents from Taipei reported two most frequent use of e-government e-mail and of e-government public devices respectively.

What's more, e-government functions use comparison was also undertaken among the three cities. The result from this perspective conforms to that from the e-government platforms comparison: based on the reports from residents in Shanghai, Shanghai takes the lead in all the sixteen e-government functions use frequency comparison. Besides, it is interesting to find out that residents from Taipei use higher levels (from sharing information use on) more frequently than residents in Singapore. Still, the e-government payment use is more frequently practiced in Singapore than in Taipei. At last, the comparison among the three cities in perspective of e-government themes use was undertaken. All the comparisons are statistically significant which means the cities have significantly different effects upon the residents' themes use.

The second research question concerns the relation between e-government platforms use and e-government functions use. To answer this question, correlations were studied on the base of the platforms use factors as well as the functions use factors. The platforms were researched from the perspective of three e-government platforms factors and e-government SNS platforms use, while the e-government functions use were studied in the light of the information use category with three factors, the consultation use category with two to three factors and four other single functions use items.

The low-effort information use can be best predicted by the e-government portal-apps use; the middle-effort information use and high-effort information use can be best predicted by the third-party mobile apps and public devices use for Shanghai and Singapore, while for Taipei the best prediction can be traced back to the e-government hotline-email use. The consultation can be best predicted by the hotline-email use in general for all the three cities; it is still noteworthy that low-effort consultation use can be best predicted by e-government third-party mobile apps and public devices use in Shanghai and by e-government SNS use in Taipei respectively. Next, the referendum use and collaborative production use can be unanimously best predicted by the hotline-email use in the three city; apart from the traditional platforms the third-party mobile apps and public devices can also convey the collaborative production. The similar findings can also be found in the e-government administrative procedures use in Shanghai and Taipei: besides the hotline and email use, the third-party apps and public devices use can also predict the e-government procedures use to some extent. The procedures use in Singapore, however, can be best predicted by the e-government portal-apps use. At last, the e-government payment use can be best predicted by the third-party apps and public devices use. According to the findings, the e-government hotline and email use showcases its prediction effect at least for four kinds of function use, which demonstrate the conventional effect of this e-government platform.

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The e-government portal and apps platforms seem less competitive to deliver such functions use except the very basic low-effort information use. Last but not least, the third-party apps and public devices exert its prediction effect not only for the e-government payment use and for the higher levels of information use and for the lower levels of consultation use.

The third research question incorporates the use and use intention into the research. The questions were explored for e-government platforms use, e-government functions use and e-government themes use. For the e-government platforms use, although all the cases were statistically significant, correlations with medium effect size can be rarely identified for Shanghai and Singapore. For each of the two cities, only one such case can be found. However, four such cases can be identified for Taipei. This finding implies that in Shanghai and Singapore the e-government platforms use could be less well predicted by use intention. However, the correlation between the use and the use intention is stronger in Taipei.

For the e-government functions use each functions use items were studied in the light of e-government functions use intention. Although all the correlations were statistically significant, only one case with medium effect size was found. Still some trends can be identified. For Shanghai and Taipei, the higher level of information use demonstrates higher effect size, while the lower level of information use demonstrated higher effect size for Singapore. For Shanghai and Taipei, the correlations between consultation use and use intention indicate similar effect size, while the effect size is generally lower for Singapore and the size distribution is not homogeneous. The effect size of referendum use in Shanghai and that of procedures use in Singapore were outstanding, which imply relatively strong correlations in these cases. Lastly, the correlations for payment demonstrate a similar low effect size for all three cities.

The last level to observe is the e-government themes use and its use intention. For Shanghai, all the cases are statistically significant and the experienced themes use

brings about higher use intention for all the themes. For Singapore, all but two cases are statistically significant and the use experience bring about higher use intention generally. Besides, such themes use as transportation and housing use yields no difference for use intention, no matter residents have experienced such themes or not. Lastly, all but one cases in Taipei were statistically significant. The exception can be found in the complaining use. Considering all the three statistically insignificant cases in Singapore and Taipei, an interpretation can be made: such themes should be so well covered by the offline service that the online experience showcases less importance in use intention. For all the statistically significant cases, an enlightenment may be delivered to the e-government development: it is important to encourage residents to take their first step in themes use, because the first bite can level up their use intention and may lead to further use.

The fourth research question refers to prediction effect of political participative factors on e-government use. E-government use was observed by two categories: the e-government platforms use and the e-government functions use, which are all tested in factors. For political participative factors as independent variable, the categorical and ordinal factors and interval variables are separately tested.

The results for the prediction effect of the categorical and ordinal factors are sometimes identical for two or three cities and sometimes unique by one city alone. For the money and the time contributions, for example, the yes group of money contribution had statistically significant effect and predicted better on all the e-government use items in Shanghai, while in Singapore and Taipei the no group of money contribution exerted the same effect; the yes group of time contribution had statistically significant effect and used more frequently almost all the e-government items in Taipei, while in Shanghai and Singapore the no time contribution group performed the same effect. The results are not consistent for

all the three cities. Next, the result of civic skills showcases that the civic skills are generally statistically significant for the comparison in all the three cities.

One of the most interesting result can be found in the languages as civic skills: in Shanghai and in Singapore two and three cases had statistically significant differences for the native Wu-Chinese speakers or the English speakers respectively. However, the result is different in Taipei: the native Minnan-Chinese speakers and the native Hakka-Chinese speakers reported more frequent use in advanced level of e-government functions use; even for the decision making use, procedures use and payment use the two native language speakers demonstrate more frequent use.

The duty-based and engagement-based groups also indicate different comparison effect in the three cites: in Shanghai both higher duty-based and higher engagement-based groups reported high use frequencies for all the e-government use items, while in Singapore and Taipei the results were different: firstly, not all the comparison cases are statistically significant; secondly, differentiation between duty-based and engagement-based norms as well as differentiation between higher scores and lower scores in each norms can be found. For Singapore, the engagement group can serve as an unique index for such e-government platforms use as hotline-email use and SNS use and for such e-government functions use as the middle-effort consultation use and the collective production use, while in Taipei some lower score groups can be identified as unique index for e-government use: the lower score duty-based group for hotline-email use, high-effort information use, procedures use and payment use and the lower score engagement-based group for collective procedures use. At last, the political efficacy plus exerted more effect differentiation for e-government use in Shanghai than political security plus; while in Singapore and Taipei the effect is similar for both variables.

The second half of political participative factors in form of interval data are examined on their prediction effect on e-government use. The political factors are treated here in four layers and the hierarchical multiple regression is adopted to explore the relations. First and foremost, the research result shows that all the regressions were statistically significant. However, the effect size for these relations can be differentiated from each other. For the e-government platforms use, Shanghai always dwarfed Taipei from the perspective of effect size, while Singapore follows at the end of the ranking. The same situation can also be found for the e-government functions use. Besides, some higher levels of functions use indicate a higher size effect than the lower levels in all the three cities. Still, the same situation is also applicable for the rest individual functions use. Thirdly, some layers were repeatedly of statistical insignificance in some regressions: the e-government recruitment layer, for example. Besides, the detailed statistical insignificance for a certain layer is different from case to case.

At last, the fifth research question specifying the relation between politically relevant characteristics and e-government use are answered. E-government use is still observed from two perspectives: the e-government platforms use and the e-government functions use. The politically relevant characteristics are considered from two perspectives: the Internet-oriented characteristics and the demography-oriented characteristics. Firstly, results for Internet-oriented characteristics are briefly summarized. For the Internet access, the Wi-Fi use demonstrated overwhelmingly negative effect on e-government use in Singapore and Taipei, while its effect was not that outstanding in Shanghai. For the Internet equipment use, the desktop use, the laptop use and the tablet and other devices use demonstrated unexceptionally negative effect on e-government use to various degrees, while the mobile phone use indicates positive effect on some e-government functions use in Shanghai and Taipei. Next, almost all the Internet purposes cannot differentiate themselves from each other from the perspective of

correlation significance and effect directions except some cases. For Internet platforms use, all but one of the correlations between the e-government platforms use and the daily Internet platforms use are statistically significant in positive direction. For the correlation between the e-government functions use and the daily platforms use, few inspirational results can be drawn out. At last, the Internet-based psychological PRC presented their overwhelmingly statistical significance in correlation with e-government use in Shanghai and Taipei, while in Singapore more e-government use items turned out to be immune to such psychological characteristics.

Last but not least, the results for the demography-oriented characteristics comparison are reported. The gaps between residency length, gender and e-government use were outstanding in Shanghai, while in Singapore and in Taipei it was not the case. For Taipei one of the outstanding gaps can be traced back to age. Still, some similarity can be found between cities: for Shanghai and Taipei the household register matters much to e-government use frequency; for all the three cities, income gap plays an important role in e-government use frequency; for Shanghai and Singapore, the education levels have an impact on certain e-government use items, while the impact can be hardy observed in Taipei.

5.2 Limitations, discussions and suggestions for further research

As put above, all the four research questions and their corresponding research questions are illustrated. Still, some research limitations can expose themselves in surveying, variables selection, data analysis and data interpretation. Firstly, the survey is undertaken online. Thereafter, the shortcomings of the online survey can also be found for the present research, such as: the representation of sample, foremost, the people who can be reached out by offline-only means are ruled out; the reliability of self-report, namely, it is open to question to what extent people

take the online survey seriously; and so on. Although the pervasive use of mobile phone and filtering based on answering time are considered in the present research and can somewhat fix the above-mentioned shortcomings, such measures as a combination of online and offline survey can be taken in the future. What's more, the survey is conducted as cross-sectional study which can also results in problems. To take the variable political trust in government as an example, political trust is not a static feature. Therefore, cross-sectional survey cannot explore more from a static perspective, as some studies in Taiwan illustrate (C.-e. Wu, 2007). Political trust in government is positively correlated with partisan inclinations of individuals. A follower of certain opposition parties might trust less in government in the moment of survey. It certainly doesn't mean that the degree of trust stays the same no matter his or her party becomes the governing party. If the cross-sectional trust are not varied for the measurement, it is hard to determine whether the degree of trust can predict e-government use.

Next, variable selections should be rethought, especially when the government use research is conducted for a single case instead for comparisons. Variables in the present research are selected to suit all three cities as well to be potentially generally applicable for e-government use. However, some unique local features which might be crucial to e-government use could be neglected purposely. Several features are mentioned as follows for future research in these regions and as reminder of local specialty in other regions. Firstly, from the perspective of e-government use, e-government platforms could also observed in the combination of brick-and-mortar government branches. As one research result from China illustrated that government in real life with solid presence could prevent individuals from using e-government (J. Liang & Liu, 2015). Secondly, from the perspective of politically relevant characteristics, some local features should be also reviews. In the present research, Internet use is surveyed. However, traditional media use is totally neglected. The abandonment might be fatal for

political participation research. As a study demonstrated that the attention to traditional media can predict more significantly both traditional participation and online participation in comparison with general social media use (Skoric & Poor, 2013). Besides, affiliation with the Chinese Communist Party is usually researched in China, while it is abandoned in the present survey because it is not applicable for other two cities. In reality, affiliation of the only ruling party CCP is a significant predictor of the contacting-lobbying mode of participation and CCP-initiated political activities (Xinzhi Zhang & Lin, 2014).

Thirdly, a local feature in China from the perspective of political participatory factors is also worth mentioning: political trust in government should be differently measured in China. There is a clearly different degree of trust in central and local government in China: the central government enjoys more trust than the local government (E. C. Chang & Chu, 2006). Besides, there is a conflict in the trust towards central government: individuals in China trust in intention of central government more than in capacity of solving problems (L. Li, 2004). In the present survey the political trust towards government is not separated into central and local level. What's more, trust in intention is asked rather than capability of problem solving. Therefore, the measurement of political trust in government could be more accurate and context-based for Shanghai as well as China.

In the data analysis limitations can also be found. Besides e-government use, e-government non-use was surveyed but not individually analyzed. Instead, the e-government non-use was treated as the lowest level of use frequency. Some enlightening findings might be brought about, given the volume of e-government non-use is too large to ignore. Secondly, the exploration of the relation between e-government use and e-government use intention turned out to be less productive, as the correlation coefficients can evidence. In the future research, more explaining variables should be drawn into the analysis, if e-government use intention is to be studied well. Thirdly, efforts can be made in the future research

to bring all the political participation factors together in a regression. Although the split of categorical and interval political participative factors is determined in the present research not without reasoning, especially considering the great volume of dummy variables made up from categorical variables could lead to multi-collinearity. After the statistically insignificant effect of certain categorical variables was testified, the reduced volume of those variables might be feasible to be combined with interval variables into one regression.

Fourthly, the interpretation of city comparison which is based on effect size of the regressions was less formulated against the background of political participatory factors ranking comparison. Although it could be hypothesized that the higher ranking from the PPFs comparisons and from e-government use comparisons for a certain city is not coincidental, further exploration can be undertaken in the future research.

Last but not least, the moderating effects of the political relevant characteristics are supposed to be analyzed in the present research but haven't been accomplished due to the large workload. However, on the basis of fruitful results about the relation between the PRC and e-government use, a research model consisting of e-government use as dependent variables, politically participatory factors as independent variables and politically relevant characteristics is to be expected as a whole in future research.

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APPENDIXES

A. Questionnaire on E-government Use in Singapore

Thank you for joining the survey!

This survey queries your usage and views of **Singaporean e-government/governance**. E-government/governance (hereinafter collectively referred to as **e-government**) refers to government organized by digital means. In most cases, citizens can access e-government services through the internet and on a variety of platforms (such as hotlines, websites, mobile apps, and social media). If you are aged 18 or older and live in Singapore more than one year, I would like to invite you to fill out the questionnaire. Your information will be kept confidential and only for the purpose of academic research.

Your participation is very important to the research. Please take about 20 minutes to complete the survey of four sections. There are no right or wrong answers, so feel free to provide completely open and honest responses. Qualified answering would be rewarded with a five Singapore dollars voucher.

Thank you for your participation!

Yidian CHEN,

Institute for Media and Communication Studies, FU Berlin

Q1.1How long have you lived in Singapore?

□1 to 12 months □13 months to 24 months □25 to 36 months □37 to 48 months □more than 48 months

Q1.2Are you a Singaporean citizen?

□Yes □No

Next, some questions about your e-government use are asked:

Q2.1How often in the past twelve months did you use the following e-government platforms?		Q2.2To what extent would you like to use the following e-government platforms?
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**hotlines to contact with government**	not at all □ □ □ □ □ very much □ have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**e-mail to contact with government**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**e-government web portals**	not at all □ □ □ □ □very much □have no idea

□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**e-government mobile applications**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**e-government on social media**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**e-government self-service platforms/kiosks in public places (such as in public library, in convenience store)**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**other third-party platforms (such as e-banking, e-payment) on your private equipment to contact with government**	not at all □ □ □ □ □very much □have no idea

Q2.3How often in the past twelve months did you use e-government services for the following activities?		**Q2.4To what extent would you like to use e-government services for the following activities?**
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**browse information**	not at all □ □ □ □ □very much □ have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**search for open information**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**request personal information**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**share information from e-government platforms**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**make comments**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**discuss with other citizens**	not at all □ □ □ □ □very much □have no idea

Q2.5 How often in the past twelve months did you use e-government services for the following activities?		**Q2.6 To what extent would you like to use e-government services for the following activities?**
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**make like and dislike**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**take part in polling**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**take part in hearing**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**complain or protest**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**petition**	not at all □ □ □ □ □very much □have no idea

□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**take part in crowd funding**	not at all □ □ □ □ □very much □have no idea

Q2.7 How often in the past twelve months did you use e-government services for the following activities?		Q2.8 To what extent would you like to use e-government services for the following activities?
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**vote in referendums**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**do collaborative production**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**handle administrative procedures**	not at all □ □ □ □ □very much □have no idea
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**do payment transaction**	not at all □ □ □ □ □very much □have no idea

Q2.9Which of the following services have you experienced on e-government platforms?		Q2.10To what extent would you like to be served or to participate on e-government platforms for each of the following areas?
□yes □no □have no idea	**taxation**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**employment**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**social welfare**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**public insurance**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**transportation**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**disaster notice and public safety**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**medical and health service**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**policies and regulations**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**environment protection**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**education and training**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**leisure and entertainment**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**convenience services**	not at all □ □ □ □ □very much □have no idea

□yes □no □have no idea	**problem complain (such as public management, anti-corruption)**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**housing**	not at all □ □ □ □ □very much □have no idea
□yes □no □have no idea	**business**	not at all □ □ □ □ □very much □have no idea

You have already finished 1/4 of the questionnaire! Next, some questions about your internet use are asked in this section:

Q3.1How often do you use…?

fixed broadband at home	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
mobile cellular	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
public Wi-Fi	□everyday/almost everyday □several times a week □once a week □once in 14 days □never

Q3.2How often on do you use…?

desktop	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
laptop	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
mobile phone	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
tablet	□everyday/almost everyday □several times a week □once a week □once in 14 days □never

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other devices (such as smart watch, smart TV) to connect the internet	□everyday/almost everyday □several times a week □once a week □once in 14 days □never

Q3.3How often do you use the internet for the following demands?

entertainment	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
social networking	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
information (such as news, current issues, knowledge, life guide)	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
convenient service for life	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
your job	□everyday/almost everyday □several times a week □once a week □once in 14 days □never

Q3.4How often do you use…?

e-mail	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
web portals	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
SMS and other messaging services which is only open to private relationships	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
social networking sites which is open to general public	□everyday/almost everyday □several times a week

	□once a week □once in 14 days □never
interest-based platforms (such as online bulletin boards, online discussion forums)	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
narrowcasting platforms (such as blogs, YouTube)	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
other mobile apps (such as for lifestyle, e-banking)	□everyday/almost everyday □several times a week □once a week □once in 14 days □never
public information equipment (such as in public libraries, in convenience stores)	□everyday/almost everyday □several times a week □once a week □once in 14 days □never

Q3.5To what extent do you agree with the following statement:

people get to know more about politics by using the internet.

strongly disagree □ □ □ □ □ strongly agree

the government cares about public opinions more when they are expressed online.

strongly disagree □ □ □ □ □ strongly agree

Q3.6To what extent do you trust…?

people online	not at all □ □ □ □ □very much
information online	not at all □ □ □ □ □very much
service online	not at all □ □ □ □ □very much

Q3.7To what extent do you agree with the following statement:

my privacy online is well protected by internet companies and from other internet users.

strongly disagree □ □ □ □ □ strongly agree

my security online is well protected by internet companies and from other internet users.

strongly disagree □ □ □ □ □ strongly agree

it's safe to express my political views on the internet.

strongly disagree □ □ □ □ □ strongly agree

You have already finished half of the questionnaire! Next, some questions about your social perception are asked in this section:

Q4.1Did you contribute money to local/national/international politics (such as political campaigns, political organizations) in the past twelve months?

□ Yes □ No

Q4.2To what extent do you agree with the following statement: it is cheaper for me to do government procedures online.

strongly disagree □ □ □ □ □ strongly agree

Q4.3Did you contribute time to local/national/international politics (such as political campaigns, political organizations) in the past twelve months?

□Yes □No

Q4.4To what extent do you agree with the following statement:

it is more time-saving for me to do government procedures online.

strongly disagree □ □ □ □ □ strongly agree

it is simpler for me to do government procedures online.

strongly disagree □ □ □ □ □ strongly agree

Q4.5To what extent do you agree with the following statement:

I am good at planning meetings, chairing meetings, giving speeches, and co-making decisions.

strongly disagree □ □ □ □ □ strongly agree

Q4.6Which language do you usually speak at home?

□English □Mandarin Chinese □other Chinese dialects □Malay □Tamil □other languages

Q4.7To what extent are you good at…?

using the internet (an internet browser, search engines, submitting a form)	not at all □ □ □ □ □very much
navigating the internet (by using hyperlinks, not becoming disoriented online)	not at all □ □ □ □ □very much
locating required information (defining queries, selecting information, evaluating information)	not at all □ □ □ □ □very much
taking advantage of the internet to reach a particular goal (by taking right actions, taking right decisions)	not at all □ □ □ □ □very much

Some questions about your political perception are asked in this section:

Q5.1Which of the following people is the president of South Korea?

□Park Geun-hye □Mun Jae-in □Ban Ki-moon □Kim Jong-un

Q5.2Which of the following people is the Prime Minister of Singapore?

□Vivian Balakrishnan □Lee Hsien Loong □Halimah Yacob □Chan Chun Sing

Q5.3Which one of the following is the correct meaning of "your vote is secret"?

□You're not allowed to tell other people how you voted including the government.

□Other people are not allowed to ask you whom you voted for.

□The government is not allowed to find out how you voted unless a court order is issued when there is an allegation of electoral fraud.

□The government is allowed to find out how you voted even without a court order.

Q5.4How long is the full term of the Member of Parliament in Singapore?

□2 years □3 years □4 years □5 years

Q5.5To what extent are you interested in…?

local politics and local affairs	not at all □ □ □ □ □very much
international politics and national affairs	not at all □ □ □ □ □very much
international politics and international affairs	not at all □ □ □ □ □very much

Q5.6To what extent do you agree with the following statement:

sometimes politics and government seem so complicated that people like me can't truly understand what's going on.

strongly disagree □ □ □ □ □ strongly agree

people like me have no influence on government policymaking.

strongly disagree □ □ □ □ □ strongly agree

if the government is not interested in hearing what the people think, there is really no way to make them listen.

strongly disagree □ □ □ □ □ strongly agree

the government will respond to the needs of citizens if people band together and demand change.

strongly disagree □ □ □ □ □ strongly agree

Q5.7To what extent do you agree with the following statement:

e-government help people like me to better understand what is going on in politics and government.

strongly disagree □ □ □ □ □ strongly agree

government cares about public opinions more when they are expressed on e-government platforms.

strongly disagree □ □ □ □ □ strongly agree

Q5.8To what extent do you agree with the following statement:

most of what the government does is correct.

strongly disagree □ □ □ □ □ strongly agree

when the government decides on significant policies, it will put the welfare of the people in priority.

strongly disagree □ □ □ □ □ strongly agree

Q5.9To what extent do you trust…?

information from e-government platforms	not at all □ □ □ □ □very much
consultation from e-government platforms	not at all □ □ □ □ □very much
online administrative procedures and payment transaction service from e-government platforms	not at all □ □ □ □ □very much

Q5.10To what extent do you agree with the following statement:

generally, my privacy is well protected by the government.

strongly disagree □ □ □ □ □ strongly agree

it's safe to contact with the government.

strongly disagree □ □ □ □ □ strongly agree

I am worried about my presence online being monitored by the government.

strongly disagree □ □ □ □ □ strongly agree

Q5.11To what extent do you agree with the following statement:

my privacy won't be misused by the e-government.

strongly disagree □ □ □ □ □ strongly agree

it's safe to contact with the e-government.

strongly disagree □ □ □ □ □ strongly agree

Q5.12In being a good citizen to what extent is it important to:

always to vote in elections	not at all □ □ □ □ □very much
never try to evade taxes	not at all □ □ □ □ □very much
always obey laws and regulations	not at all □ □ □ □ □very much
keep watch on the actions of government	not at all □ □ □ □ □very much
be active in social or political associations	not at all □ □ □ □ □very much
try to understand the reasoning of people with other opinions	not at all □ □ □ □ □very much
choose products for political, ethical, or environmental reasons, even if they cost a bit more	not at all □ □ □ □ □very much
help people in your country who are worse off than yourself	not at all □ □ □ □ □very much
help people in the rest of world who are worse off than yourself	not at all □ □ □ □ □very much
be willing to serve in the military in a time of need	not at all □ □ □ □ □very much

You have already finished 3/4 of the questionnaire! Next, some questions about political surroundings are asked in this section:

In the past twelve months how many times have you received…

Q6.1any OFFLINE request from political institutions (such as politicians, political parties, government)…		Q6.2any ONLINE request from political institutions (such as politicians, political parties, government)…
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**to vote, to go for campaign work?**	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more

□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	to contact with (e.g. to protest against, to petition) political institutions?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	to talk about politics or current events with you?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more

Q6.3To what extent do you agree with the following statement: political institutions (such as politicians, political parties, government) encourage me to use e-government.

strongly disagree □ □ □ □ □ strongly agree

In the past twelve months how many times have you received…

Q6.4 any OFFLINE request from people in non-political institutions (such as church, temple, mosque, work place, NGOs)…		Q6.5 any ONLINE request from people in non-political institutions (such as church, temple, mosque, work place, NGOs)…
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	to vote, to go for campaign work?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	to contact with (e.g. to protest against, to petition) political institutions?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	to talk about politics or current events with you?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more

Q6.6To what extent do you agree with the following statement: people from non-political institutions (such as church, temple, mosque, work place, NGOs) encourage me to use e-government.

strongly disagree □ □ □ □ □ strongly agree

In the past twelve months how many times have you received…

Q6.7any OFFLINE request from people in your private relationships (such as neighborhood, friends, acquaintances, family, relatives)…		Q6.8any ONLINE request from people in your private relationships (such as neighborhood, friends, acquaintances, family, relatives)…
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	to vote, to go for campaign work?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more

□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**to contact with (e.g. to protest against, to petition) political institutions?**	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more
□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more	**to talk about politics or current events with you?**	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more

Q6.9To what extent do you agree with the following statement: people in my private relationships (such as neighborhood, friends, acquaintances, family, relatives) encourage me to use e-government.

strongly disagree □ □ □ □ □ strongly agree

Q6.10To what extent do you agree with the following statement:

it is easy to use e-government platforms.

strongly disagree □ □ □ □ □ strongly agree

e-government is technologically fast and stable.

strongly disagree □ □ □ □ □ strongly agree

e-government makes government much available.

strongly disagree □ □ □ □ □ strongly agree

e-government makes government much helpful.

strongly disagree □ □ □ □ □ strongly agree

Q6.11To what extent do you agree with the following statement:

my e-government communication can be described as two-way with messages flowing equally from me and to me.

strongly disagree □ □ □ □ □ strongly agree

to my messages, I receive prompt e-government responses.

strongly disagree □ □ □ □ □ strongly agree

it is easy to manage the e-government communication process.

strongly disagree □ □ □ □ □ strongly agree

messages exchanged using e-government platforms are like a good conversation.

strongly disagree □ □ □ □ □ strongly agree

Q6.12To what extent do you agree with the following statement:

I am very concerned about e-government of Singapore.

strongly disagree □ □ □ □ □ strongly agree

I am serious about contacting e-government of Singapore.

strongly disagree □ □ □ □ □ strongly agree

I am very interested in e-government of Singapore.

strongly disagree □ □ □ □ □ strongly agree

Q6.13To what extent do you agree with the following statement:

online e-government promotion impedes my internet use.

strongly disagree □ □ □ □ □ strongly agree

e-government promotion is overwhelming.

strongly disagree □ □ □ □ □ strongly agree

online e-government promotion irritates me.

strongly disagree □ □ □ □ □ strongly agree

e-government is promoted well offline.

strongly disagree □ □ □ □ □ strongly agree

Q6.14In the past twelve months how many times have you received any request from people you only know from online…

to vote, to go for campaign work?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more
to contact with (such as to complain to, to protest against, to petition) political institutions?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more
to talk about politics or current events with you?	□never □1 to 5 times □6 to 10 times □11 to 15 times □16 times or more

Q6.15To what extent do you agree with the following statement: people whom I have only online interactions with encourage me to use e-government.

strongly disagree □ □ □ □ □ strongly agree

At last, some questions about your demographic features are asked in this section:

Q7.1Which gender are you?

 □male □female □other

Q7.2In which year were you born?

Q7.3What is the highest education level you've achieved?

□no formal qualification □primary □lower secondary □secondary □post-secondary general and vocational □polytechnic diploma □professional qualification and other diploma □university first degree □university postgraduate diploma/degree

Q7.4What is your occupation?

□member of parliament

□government administrator □executive of government-operated enterprise □executive of private enterprises

□manager of private enterprises (self-employed businessman) with employees

□manager of private enterprises (self-employed businessman) without employees

□researcher from government sector (scientist) □researcher from private sector (scientist)

□medical specialist from government-operated enterprise (physician, pharmacist, nurse, medical personnel) □medical specialist from private enterprise (physician, pharmacist, nurse, medical personnel)

□accountant

□teacher from government-operated institute □teacher from private institute

□judge, secretary, prosecutor, lawyer

□religious specialist

□art specialist (actor, cameraman)

□writer (writer, journalist, dramatist)

□engineer from government-operated enterprise □engineer from private enterprise

□sport professionals

□staff from government or government-operated enterprise □staff from private enterprises

□staff from commercial affairs

□staff from service or hospitality (street vendor, individual services, taxi driver)

□agricultural, forestry, fishery and husbandry

□labor from government or government-operated enterprise □labor from private enterprises

□student

□staff from army, police and investigation bureau

□housekeeper with domestic original design manufacturer □housekeeper without domestic original design manufacturer □housekeeper with family business with salary □housekeeper with family business without salary

□unemployed

□retired

□refuse to answer

Q7.5In which category does your gross (before taxes) monthly income fall?

Please include salaries, wages, pensions, dividends, interest, and all other income.

□1599 and less □1600-2599 □2600-3599 □3600-4599 □4600-5599 □5600-6599 □6600-7599 □7600-8599 □8600-9599 □9500 and more □refuse to answer

End of the questionnaire.

If you have any questions or suggestions about the questionnaire, please leave your information here in the blank.

Submit the questionnaire

Thank you very much for your support. Please leave any contact information to win the voucher: (e-mail address_____). We will get back to you as soon as possible.

Submit and close this page.

B. Questionnaire on E-government Use in Shanghai

<div align="center">上海市电子政府使用问卷</div>

欢迎您参加本次问卷!

本问卷想要了解您对上海电子政府的使用和看法。电子政府是相对线下的日常生活中的政府而言的,市民通常通过使用各类平台(比如**热线电话,政府网站,手机应用,社交媒体账号**)能接触到电子政府。

如果您年满十八岁，在上海居住超过一年，我想要邀请您参加本次问卷。您所填的各项信息将会保密对待，且只用于学术研究。

您的参与对本次调查十分重要。请花大概 20 分钟左右时间来完成这份四个板块组成的问卷。答案没有正确错误之分，请放轻松点选、诚恳回答。本问卷为全体 300 位合格的问卷填写者提供每位 10 元人民币现金作为感谢。

谢谢您参加本次问卷。

Yidian Chen
柏林自由大学传媒学院

Q1.1 您在上海居住多长时间了？

□1 至 12 个月□13 至 24 个月□25 至 25 个月□37 至 48 个月□多于 48 个月

Q1.2 您拥有上海户口吗？

□有□没有

接下来想要了解您使用上海电子政府的情况。

Q2.1 在过去的 12 个月内您有多频繁地使用上海市电子政府的以下平台?		Q2.2 您有多想使用这些电子政府平台?
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	热线电话（比如 12345 市民热线）来接触政府	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	电子邮件来接触政府	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	政府网站	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	政府的专门手机应用	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	政府在社交媒体上的账号（比如政府机关的微博账号、微信公众号、今日头条账号）	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	设置在公共空间的其它电子政府自助服务机（比如在图书馆的、在便利商店的）	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	在您私人设备上使用的其它第三方平台（比如电子支付、移动支付）来接触政府	绝不想□□□□□极其想□不清楚

Q2.3 在过去的 12 个月内您有多频繁地使用上海市电子政府的以下功能?		Q2.4 您有多想使用上海市电子政府的这些功能?
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	浏览信息	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	搜寻公开信息	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	请求个人信息	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	分享提供的信息	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	点评	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	与市民讨论	绝不想□□□□□极其想□不清楚

Q2.5 在过去的 12 个月内您有多频繁地使用上海市电子政府的以下功能?		Q2.6 您有多想使用上海市电子政府的这些功能?
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	点赞或点踩	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	参加电子政府举办的投票调查	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	参加电子政府举办的网上听证	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	投诉或抗议	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	请愿或上访	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	参与电子政府平台的众筹募资	绝不想□□□□□极其想□不清楚

Q2.7 在过去的 12 个月内您有多频繁地使用上海市电子政府的以下功能?		Q2.8 您有多想使用上海市电子政府的这些功能?
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	参与全民公决	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	参与协同创作	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	办理手续	绝不想□□□□□极其想□不清楚
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	进行支付	绝不想□□□□□极其想□不清楚

Q2.9 您曾经体验过上海市电子政府的哪些服务？		Q2.10 您有多想获得或参与以下上海市电子政府的以下服务？
□有□无□不清楚	税务	绝不想□□□□□极其想□不清楚
□有□无□不清楚	就业	绝不想□□□□□极其想□不清楚
□有□无□不清楚	福利	绝不想□□□□□极其想□不清楚
□有□无□不清楚	保险	绝不想□□□□□极其想□不清楚
□有□无□不清楚	交通	绝不想□□□□□极其想□不清楚
□有□无□不清楚	灾害报告、公共安全	绝不想□□□□□极其想□不清楚
□有□无□不清楚	个人医疗、公共卫生	绝不想□□□□□极其想□不清楚
□有□无□不清楚	政策规定	绝不想□□□□□极其想□不清楚
□有□无□不清楚	环境保护	绝不想□□□□□极其想□不清楚
□有□无□不清楚	教育培训	绝不想□□□□□极其想□不清楚
□有□无□不清楚	休闲娱乐	绝不想□□□□□极其想□不清楚
□有□无□不清楚	便民服务	绝不想□□□□□极其想□不清楚
□有□无□不清楚	问题报告（比如公共问题、反腐）	绝不想□□□□□极其想□不清楚
□有□无□不清楚	房屋	绝不想□□□□□极其想□不清楚
□有□无□不清楚	经商	绝不想□□□□□极其想□不清楚

您已经完成了 1/4 的问卷！接下来想要了解您网络的使用情况：

Q3.1 您通过以下方式上网的频率如何？

家用宽带	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
随身上网（比如手机卡、无线上网卡）	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
公共热点 Wi-Fi	□每天/几乎每天 □一周若干次

	□一周一次
	□两周一次
	□从不

Q3.2 您用以下设备的频率如何?

台式电脑	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
笔记本电脑	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
手机	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
平板电脑	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
其它设备（比如智能手表，智能电视）	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不

Q3.3 您使用网络以满足以下需求的频率是?

娱乐	□每天/几乎每天
	□一周若干次
	□一周一次

	□两周一次 □从不
社交人脉	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
信息（比如新闻时事、社会动向、新知识、生活资讯等）	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
便利的生活服务	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
工作所需	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不

Q3.4 您使用以下网络平台的频率如何？

电子邮件	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
门户网站	□每天/几乎每天 □一周若干次 □一周一次 □两周一次 □从不
熟人可见的短信和其它信息服务（比如微信）	□每天/几乎每天 □一周若干次

	□一周一次
	□两周一次
	□从不
大众可见的社交媒体（比如微博）	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
兴趣平台（比如网络论坛 BBS、网络讨论版）	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
窄播平台（比如博客、视频网站）	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
其它手机应用（比如生活方式应用、电子支付应用）	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不
公用信息设备（比如设置在公共图书馆的、便利商店的）	□每天/几乎每天
	□一周若干次
	□一周一次
	□两周一次
	□从不

Q3.5 您有多同意以下陈述：

在使用网络后，人民能够更加了解政治。

绝不同意□□□□□极其同意

因为很多民众在用网络表达意见，政府官员更在乎民众的想法。

绝不同意□□□□□极其同意

Q3.6 您有多信任…?

网友	绝不□□□□□极其
网上信息	绝不□□□□□极其
网上服务	绝不□□□□□极其

Q3.7 您有多同意以下陈述：

我的网上隐私被网络公司妥善保护，他人也不易侵害。

绝不同意□□□□□极其同意

我的网上安全被网络公司妥善保护，他人也不易侵害。

绝不同意□□□□□极其同意

在网上表达自己的政治观点是安全的。

绝不同意□□□□□极其同意

您已经完成一半问卷了。接下来想了解您的一些社会感触。

Q4.1 在过去的 12 个月内您曾为地方/国家/国际政治（政治竞选，政治组织）捐款吗？

□有□无

Q4.2 您有多同意以下陈述：

市民网上办理政府手续更省钱。

绝不同意□□□□□极其同意

Q4.3 在过去的 12 个月内您曾为地方/国家/国际政治（政治竞选，政治组织）贡献时间吗？

□有□无

Q4.4 您有多同意以下陈述：

市民网上办理政府手续更省时。

绝不同意□□□□□极其同意

市民网上办理政府手续更简化。

绝不同意□□□□□极其同意

Q4.5 您有多同意以下陈述：

我擅长会议计划、会议主持、发表讲话、合作决策？

绝不同意□□□□□极其同意

Q4.6 您在家通常使用的语言是？

□普通话 □吴语（含上海话）□其它汉语□其它语言

Q4.7 您有多同意以下陈述：

我擅长把握上网操作（使用浏览器、搜索引擎、表格上传）	绝不同意□□□□□极其同意
我擅长把握上网方向感（使用超链接等、不至于失去方向感）	绝不同意□□□□□极其同意
我擅长找到所需信息（确定所需、选择信息、评估信息）	绝不同意□□□□□极其同意
我擅长上网完成特定任务（采取正确行动、做出正确决定）	绝不同意□□□□□极其同意

下面想了解您对时政的了解。

Q5.1 以下哪位是现任的韩国总统？

□朴瑾惠□文在寅□潘基文□金正恩

Q5.2 以下哪位是现任的中国总理？

□刘鹤□李克强□王岐山□习近平

Q5.3 您认为以下哪项是对"不记名投票"的正确理解？

□不允许您对其他人包括政府说你的投票情况。

□不允许其它人问您的投票情况。

□不允许政府探究您的投票情况， 除非法院命令调查开展选举欺诈指控。

□允许政府探究您的投票情况，即便没有法院命令。

Q5.4 上海市人大代表的任期是几年？

□2 年□3 年□4 年□5 年

Q5.5 您对下列各项感兴趣的程度？

地方政治和地方事务	绝无□□□□□极其
国家政治和国家事务	绝无□□□□□极其
国际政治和国际事务	绝无□□□□□极其

Q5.6 您有多同意以下陈述：

对于我们一般民众，有时候政治和政府似乎太复杂了，我们不能真正知道发生了什么。

绝不同意□□□□□极其同意

我们一般民众对政府的决定没有任何影响。

绝不同意□□□□□极其同意

如果政府没兴趣倾听我们一般民众的话，我们也没其它办法使他们倾听。

绝不同意□□□□□极其同意

如果我们一般民众团结一致要求改变的话，政府会对我们的需求作出回应。

绝不同意□□□□□极其同意

Q5.7 您有多同意以下陈述：

电子政府能帮助我们一般民众更好地了解政治和政府发生了什么。

绝不同意□□□□□极其同意

政府更在乎在电子政府平台上表达的民众想法。

绝不同意□□□□□极其同意

Q5.8 您有多同意以下陈述：

政府所做的事大多是正确的。

绝不同意□□□□□极其同意

政府决定重大政策时会把民众的福利放在优先考虑的地位。

绝不同意□□□□□极其同意

Q5.9 您有多信任…？

电子政府平台的信息	绝不□□□□□极其
电子政府平台的咨询	绝不□□□□□极其
在电子政府平台上的手续办理和支付业务	绝不□□□□□极其

Q5.10 您有多同意以下陈述：

总体而言我的隐私被政府妥善保护。

绝不同意□□□□□极其同意

接触政府是安全的。

绝不同意□□□□□极其同意

我担心政府会监视我在网上的举动。

绝不同意□□□□□极其同意

Q5.11 您有多同意以下陈述：

我的隐私不会被电子政府滥用。

绝不同意□□□□□极其同意

接触电子政府是安全的。

绝不同意□□□□□极其同意

Q5.12 对于一个好公民而言，下列各项的重要性如何？

选举都去投票	绝不□□□□□极其
从不逃税	绝不□□□□□极其
总是遵守法律法规	绝不□□□□□极其
随时注意政府的施政作为	绝不□□□□□极其
积极参与社会团体或政治团体	绝不□□□□□极其
尽量去了解不同意见的人的想法	绝不□□□□□极其
基于政治的、道德伦理的或环保的理由去选购商品，哪怕要贵一点点	绝不□□□□□极其
帮助国内生活得比您差的人	绝不□□□□□极其
帮助世界其它地方生活得比您差的人	绝不□□□□□极其
必要时志愿去军中服务	绝不□□□□□极其

您已经完成 3/4 的问卷了。最后想要了解您的政治环境如何。

Q6.1 在过去的 12 个月内您有多频繁地

在*日常生活*被政治机构（比如政治工作者、政党、政府）请求或要求…		在*线上网络*被政治机构（比如政治工作者、政党、政府）请求或要求…
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	**去投票、去选举造势**	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	**去与政治机构接触（比如投诉抗议、上访请愿）**	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	**与您谈论政治或时势**	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上

Q6.2 您有多同意以下陈述：政治机构（比如政治工作者、政党、政府）鼓励我使用电子政府。

绝不同意□□□□□极其同意

Q6.3 在过去的 12 个月内您有多频繁地

在*日常生活*被非政治团体里的人员（比如来自宗教组织、工作场合、非政府组织）请求或要求…		在*线上网络*被非政治团体里的人员（比如来自宗教组织、工作场合、非政府组织）请求或要求…
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	去投票、去选举造势	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	去与政治机构接触（比如投诉抗议、上访请愿）	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	与您谈论政治或时势	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上

Q6.4 您有多同意以下陈述：非政治团体里的人员（比如来自宗教组织、工作场合、非政府组织）鼓励我使用电子政府。

绝不同意□□□□□极其同意

Q6.5 在过去的 12 个月内您有多频繁地

在*日常生活*被私人关系里的人（比如邻居、朋友、熟人、家人、亲戚）请求或要求…		在*线上网络*被私人关系里的人（比如邻居、朋友、熟人、家人、亲戚）请求或要求…
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	去投票、去选举造势	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	去与政治机构接触（比如投诉抗议、上访请愿）	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上	与您谈论政治或时势	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上

Q6.6 您有多同意以下陈述：私人关系里的人（比如邻居、朋友、熟人、家人、亲戚）鼓励我使用电子政府。

绝不同意□□□□□极其同意

Q6.7 您有多同意以下陈述：

上海电子政府容易使用。

绝不同意□□□□□极其同意

上海电子政府在技术上快速且稳定。

绝不同意□□□□□极其同意

上海电子政府可让民众更容易更容易接触到政府。

绝不同意□□□□□极其同意

上海电子政府可让政府更服务大众。

绝不同意□□□□□极其同意

Q6.11 您有多同意以下陈述：

我和上海电子政府的交流可以说是信息的双向流动，我给出的信息和流向我的信息两者是平衡的。

绝不同意□□□□□极其同意

对于我的信息，上海电子政府的回应是敏捷的。

绝不同意□□□□□极其同意

我和上海电子政府的交流过程是容易上手的。

绝不同意□□□□□极其同意

我和上海电子政府交换信息过程像对话一样好。

绝不同意□□□□□极其同意

Q6.12 您有多同意以下陈述：

我对上海电子政府发展很关注。

绝不同意□□□□□极其同意

我认真对待与上海电子政府的接触。

绝不同意□□□□□极其同意

我对上海电子政府发展很有兴趣 。

绝不同意□□□□□极其同意

Q6.13 您有多同意以下陈述：

上海电子政府的网上推广妨碍了我上网。

绝不同意□□□□□极其同意

上海电子政府的推广太泛滥了。

绝不同意□□□□□极其同意

上海电子政府的网上推广让我恼火。

绝不同意□□□□□极其同意

上海电子政府的线下日常推广做得好。

绝不同意□□□□□极其同意

Q6.14 在过去的 12 个月内您有多频繁地被网友请求或要求…

去投票、去选举造势	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
去与政治机构接触（比如投诉抗议、上访请愿）	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上
与您谈论政治或时势	□从未□1-5 次□6-10 次 □11-15 次 □16 次及以上

Q6.15 您有多同意以下陈述：网友鼓励我使用电子政府。

绝不同意□□□□□极其同意

您的答题已近完成。最后 5 个小问题结束本次问卷。

Q7.1 您的性别是？

□男□女□其他

Q7.2 您的出生的年份是？

Q7.3 您的最高学历是？

□无正式学历□小学□初中□高中或中职（含中专、职高）□高职（含高专）

□大学本科□硕士/博士

Q7.4 您的职业是？

□人大代表

□政府行政主管□公营事业主管□民营事业主管

□民营事业公司负责人(自营商人) 有雇佣员工□民营事业公司负责人(自营商人) 没有雇佣员工

□政府部门研究人员（科学家）□私人部门研究人员（科学家）

□公立医疗单位医事技术人员（医生，药剂师，护士，医疗人员）□非公立医疗单位医事技术人员（医生，药剂师，护士，医疗人员）□会计师

□公立教育机构教师□私立教育机构教师

□法官、书记官、检察官、律师

□宗教工作者

□表演工作者（演员、摄影师）

□文字工作者（作家、记者、剧作家）

□公营事业工程师□民营事业工程师

□职业运动专业人士

□政府单位与公营事业部门职员□民营事业职员

□买卖业务人员

□服务、餐旅人员（摊贩、个人服务、出租车司机）

□农林牧渔

□政府单位与公营事业部门劳工□民营事业劳工

□学生

□军警调查人员

□主夫主妇，没有做家庭代工□主夫主妇，有做家庭代工□主夫主妇，有家族事业，帮忙且领薪水□主夫主妇，有家族事业，帮忙不领薪水

□待业中

□退休

□拒绝回答

Q7.5 您的税前月收入符合哪一档呢？请包含薪水、报酬、退休金、红利、利息和其它所有收入。

□3499 及以下□3500 至 4999□5000 至 5999□6000 至 6999□7000 至 7999□8000 至 8999□9000 至 9999□10000 至 10999□11000 至 11999□12000 及以上□拒绝回答

问卷结束

如果您对本问卷有任何疑问和建议，请写在下框。

提交问卷

非常感谢您的参与。请选择填写您的联系账号，获得 10 元奖励：（支付宝）＿＿＿（微信）＿＿＿（电子邮箱-抽奖必填）＿＿＿。我们将会尽快联系您。

提交并关闭此页面

C. Questionnaire on E-government Use in Taipei

臺北市電子化政府的使用問卷

歡迎您參加本次問卷!

本問卷想要瞭解您對臺北市電子化政府和電子治理的使用和看法。與電子化政府和電子治理相近的稱呼還有數位政府、數位化政府、e 政府等，在本問卷中統稱為電子化政府。電子化政府是相對線下的現實生活中的政府及其行為而言的，市民通常透過各類平台（比如**熱線電話，政府網站，手機應用程式，社群媒體專頁帳號**）能接觸到電子化政府。

如果您年滿十八歲，在臺北居住超過一年，我想要邀請您參加本次問卷。您所填的各項資訊將會保密處理，且只用於學術研究。

您的參與對本次調查十分重要。請花大概 20 分鐘左右時間來完成這份分為四個部分的問卷。答案沒有正確錯誤之分，請放輕鬆給出誠懇的回答。合格的問卷填寫每位將獲得全家便利商店價值新臺幣 50 元的咖啡券作為感謝。

謝謝您參加本次問卷。

Yidian Chen

柏林自由大學傳媒學院

Q1.1 您在臺北居住多長時間了？

□1 至 12 個月 □13 至 24 個月 □25 至 25 個月 □37 至 48 個月 □多於 48 個月

Q1.2 您的戶籍登記在臺北嗎?

□有□沒有

接下來想要瞭解您使用臺北市電子化政府的情況。

Q2.1 在過去的 12 個月內您有多頻繁地使用臺北市電子化政府的以下平台?		Q2.2 您有多想要使用這些市政府網路服務平台?
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	熱線電話（比如 1999 市民熱線）來接觸政府	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	電子郵件來接觸政府	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	政府網站	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	政府的專門手機應用程式	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	政府架設在社群媒體上的專頁或賬號（比如政府機關的臉書專頁、臺北市政府 LINE）	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	設置在公共空間的其它政府自助服務機（比如在圖書館的、在便利商店的）	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	使用您私人設備上其它的第三方平台（比如電子支付、行動支付）接觸政府	絕不想□□□□□極其想□不清楚

Q2.3 在過去的 12 個月內您有多頻繁地使用臺北市電子化政府的以下功能?		Q2.4 您有多想要使用臺北市電子化政府的這些功能?
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	瀏覽資訊	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	搜尋公開資訊	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	請求個人資訊	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	分享提供的資訊	絕不想□□□□□極其想□不清楚

□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**進行評論**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**與市民討論**	絕不想□□□□□極其想□不清楚

Q2.5 在過去的 12 個月內您有多頻繁地使用臺北市電子化政府的以下功能?		**Q2.6 您有多想要使用臺北市電子化政府的這些功能?**
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**按讚或按噓**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**參加市電子化政府舉辦的投票調查**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**參加市電子化政府舉辦的公聽聽證**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**投訴或抗議**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**請願**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**參與市電子化政府的群眾募資**	絕不想□□□□□極其想□不清楚

Q2.7 在過去的 12 個月內您有多頻繁地使用臺北市電子化政府的以下功能?		**Q2.8 您有多想要使用臺北市電子化政府的這些功能?**
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**參與公民投票**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**參與協同創作**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**辦理手續**	絕不想□□□□□極其想□不清楚
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**進行付款**	絕不想□□□□□極其想□不清楚

Q2.9 您曾經體驗過臺北市電子化政府的哪些服務?		**Q2.10 您有多想要獲得或參與以下臺北市電子化政府的服務?**
□有□無□不清楚	**稅務**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**就業**	絕不想□□□□□極其想□不清楚

□有□無□不清楚	**福利**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**保險**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**交通**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**災害報告、公共安全**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**個人醫療、公共衛生**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**政策規定**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**環境保護**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**教育培訓**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**休閒娛樂**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**便民服務**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**問題報告（比如公共問題，貪腐問題）**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**房屋**	絕不想□□□□□極其想□不清楚
□有□無□不清楚	**經商**	絕不想□□□□□極其想□不清楚

您已經完成了 1/4 的問卷！接下來想要瞭解您網路的使用情況。

Q3.1 您通過以下方式上網的頻率如何？

家用寬頻	□每天/幾乎每天 □一週若干次 □一週一次 □兩週一次 □從不
行動上網	□每天/幾乎每天 □一週若干次 □一週一次 □兩週一次 □從不
公共熱點 Wi-Fi	□每天/幾乎每天 □一周若干次 □一週一次 □兩週一次 □從不

Q3.2 您使用以下設備的頻率如何？

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桌上型電腦	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
筆記型電腦	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
手機	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
平板電腦	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
其它設備（比如智慧手錶，智慧電視）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不

Q3.3 您使用網路以滿足以下需求的頻率是?

娛樂	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
社群人脈	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次

	□從不
資訊（比如新聞時政、社會動態、新知識、生活資訊等）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
便利的生活服務	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
工作所需	□每天/幾乎每天
	□一周若干次
	□一週一次
	□兩週一次
	□從不

Q3.4 您使用以下網路平台的頻率如何?

電子郵件	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
入口網站	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
面向熟人群組的短訊和其它訊息服務（比如 LINE）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
面向大眾公開的社群媒體（比如臉書, Instagram）	□每天/幾乎每天
	□一週若干次
	□一週一次

	□兩週一次
	□從不
興趣平台（比如電子佈告欄 BBS, 網路討論版）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
窄播平台（比如部落格, 影片網站）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
其它手機應用程式 （比如生活方式, 電子支付）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不
公用資訊設備（比如設置在公共圖書館的, 便利商店的）	□每天/幾乎每天
	□一週若干次
	□一週一次
	□兩週一次
	□從不

Q3.5 您有多同意以下陳述：

在使用網路後, 人民能夠更加瞭解政治。

絕不同意□□□□□極其同意

因為很多民眾在用網路表達意見, 政府官員更在乎民眾的想法。

絕不同意□□□□□極其同意

Q3.6 您有多信任…?

網友	絕不□□□□□極其
線上資訊	絕不□□□□□極其
線上服務	絕不□□□□□極其

Q3.7 您有多同意以下陳述：

我的線上隱私被網路公司妥善保護，他人也不易侵害到。

絕不同意☐☐☐☐☐極其同意

我的線上安全被網路公司妥善保護，他人也不易侵害到。

絕不同意☐☐☐☐☐極其同意

在線上表達自己的政治觀點是安全的。

絕不同意☐☐☐☐☐極其同意

您已經完成一半問卷了。接下來想瞭解您的一些社會感觸。

Q4.1 在過去的 12 個月內您曾為地方/國家/國際政治（比如政治競選，政治組織）捐款嗎?

☐有☐無

Q4.2 您有多同意以下陳述：

市民線上辦理政府手續更省錢。

絕不同意☐☐☐☐☐極其同意

Q4.3 在過去的 12 個月內您曾為地方/國家/國際政治（政治競選，政治組織）貢獻時間嗎?

☐有☐無

Q4.4 您有多同意以下陳述：

市民線上辦理政府手續更省時。

絕不同意☐☐☐☐☐極其同意

市民線上辦理政府手續更簡化。

絕不同意□□□□□極其同意

Q4.5 您有多同意以下陳述：

我擅長會議計劃、會議主持、發表講話、合作決策。

絕不同意□□□□□極其同意

Q4.6 您在家通常使用的語言是？

□國語□閩南語（台語）□客語□其它漢語言

□原住民語（泰雅語，鄒語，排灣語，巴丹語等）

□其它語言

Q4.7 您有多同意以下陳述：

我擅長把握上網操作（使用瀏覽器、搜尋引擎、表格上傳）	絕不同意□□□□□極其同意
我擅長把握上網方向感（使用超鏈接等，不至於失去方向感）	絕不同意□□□□□極其同意
我擅長找到所需資訊（確定所需、選擇資訊、評估資訊）	絕不同意□□□□□極其同意
我擅長上網完成特定任務（採取正確行動、做出正確決定）	絕不同意□□□□□極其同意

下面想瞭解您的對政治的瞭解。

Q5.1 以下哪位是現任的韓國總統？

□朴瑾惠□文在寅□潘基文□金正恩

Q5.2 以下哪位是現任的台灣的行政院長？

□賴清德□蘇貞昌□陳菊□陳其邁

Q5.3 您認為以下哪項是對「不記名投票」的正確理解？

□不允許您對其他人包括政府說你的投票情況。

□不允許其它人問您的投票情況。

□不允許政府探究您的投票情況，除非法院命令調查開展選舉欺詐指控。

□允許政府探究您的投票情況，即便沒有法院命令。

Q5.4 臺北市議員的任期是幾年？

□2 年□3 年□4 年□5 年

Q5.5 您對下列情況的興趣的程度？

地方政治和地方事務	絕無□□□□□極其
國家政治和國家事務	絕無□□□□□極其
國際政治和國際事務	絕無□□□□□極其

Q5.6 您有多同意以下陳述：

對於我們一般民眾，有時候政治和政府似乎太複雜了，我們不能真正知道發生了什麼。

絕不同意□□□□□極其同意

我們一般民眾對政府的決定沒有任何影響。

絕不同意□□□□□極其同意

如果政府沒興趣傾聽我們一般民眾的話，我們也沒其它辦法使他們傾聽。

絕不同意□□□□□極其同意

如果我們一般民眾團結一致要求改變的話，政府會對我們的需求作出回應。

絕不同意□□□□□極其同意

Q5.7 您有多同意以下陳述：

電子化政府能幫助我們一般民眾更好地瞭解政治和政府發生了什麼。

絕不同意□□□□□極其同意

政府更在乎在電子化政府平台上所表達的民眾想法。

絕不同意□□□□□極其同意

Q5.8 您有多同意以下陳述：

政府所做的事大多是正確的。

絕不同意□□□□□極其同意

政府決定重大政策時會把民眾的福利放在優先考慮的地位。

絕不同意□□□□□極其同意

Q5.9 您有多信任…？

電子化政府提供的資訊	絕不□□□□□極其
電子化政府提供的咨詢	絕不□□□□□極其
透過電子化政府辦理手續和付款業務	絕不□□□□□極其

Q5.10 您有多同意以下陳述：

總體而言我的隱私被政府妥善保護。

絕不□□□□□極其

接觸政府是安全的。

絕不□□□□□極其

我擔心政府會監視我在線上的舉動。

絕不□□□□□極其

Q5.11 您有多同意以下陳述：

我的隱私不會被電子化政府濫用。

絕不□□□□□極其

接觸電子政府是安全的。

絕不□□□□□極其

Q5.12 對於一個好公民而言，下列各項的重要性如何？

選舉都去投票	絕不重要□□□□□極其重要
從不逃稅	絕不重要□□□□□極其重要
總是遵守法律法規	絕不重要□□□□□極其重要
隨時注意政府的施政作為	絕不重要□□□□□極其重要
積極參與社會團體或政治團體	絕不重要□□□□□極其重要
盡量去瞭解不同意見的人的想法	絕不重要□□□□□極其重要
基於政治的、道德倫理的或環保的理由去選購商品，哪怕要貴一點點	絕不重要□□□□□極其重要
幫助國內生活得比您差的人	絕不重要□□□□□極其重要
幫助世界其它地方生活得比您差的人	絕不重要□□□□□極其重要
必要時志願去軍中服務	絕不重要□□□□□極其重要

您已經完成 3/4 的問卷了。最後想要瞭解您的政治環境如何。

Q6.1 在過去的 12 個月內您有多頻繁地

在*現實生活中*被政治機構（比如政治工作者、政黨、政府）請求或要求...		在*線上網路*被政治機構（比如政治工作者、政黨、政府）請求或要求...
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**去投票、去選舉造勢**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**去與政治機構接觸（比如投訴抗議、陳情請願）**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**與您談論政治或時事**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上

Q6.2 您有多同意以下陳述：政治機構（比如政治工作者、政黨、政府）鼓勵我使用電子化政府。

絕不同意□□□□□極其同意

Q6.3 在過去的 12 個月內您有多頻繁地

在*現實生活中*被非政治團體裡面的人員（比如來自宗教組織、工作場合、非政府組織）請求或要求…		在*線上網路*被非政治團體裡面的人員（比如來自宗教組織、工作場合、非政府組織）請求或要求…
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**去投票、去選舉造勢**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**去與政治機構接觸（比如投訴抗議、陳情請願）**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**與您談論政治或時事**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上

Q6.4 您有多同意以下陳述：非政治團體裡面的人員（比如來自宗教組織、工作場合、非政府組織）鼓勵我使用電子化政府。

絕不同意□□□□□極其同意

Q6.5 在過去的 12 個月內您有多頻繁地

在*現實生活中*被私人關係裡面的人（比如鄰居、朋友、熟人、家人、親戚）請求或要求…		在*線上網路*被私人關係裡面的人（比如鄰居、朋友、熟人、家人、親戚）請求或要求…
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**去投票、去選舉造勢**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**去與政治機構接觸（比如投訴抗議、陳情請願）**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上	**與您談論政治或時事**	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上

Q6.6 您有多同意以下陳述：私人關係裡面的人（比如鄰居、朋友、熟人、家人、親戚）鼓勵我使用電子化政府。

絕不同意□□□□□極其同意

Q6.7 您有多同意以下陳述：

臺北市電子化政府容易使用。

絕不同意□□□□□極其同意

臺北市電子化政府在技術上快速且穩定。

絕不同意□□□□□極其同意

臺北市電子化政府可讓民眾更容易接觸到政府。

絕不同意□□□□□極其同意

臺北市電子化政府可讓政府更能服務民眾。

絕不同意□□□□□極其同意

Q6.8 您有多同意以下陳述：

我和臺北市電子化政府的交流可以說是資訊的雙向流動，我給出的資訊和

流向我的資訊兩者是平衡的。

絕不同意□□□□□極其同意

對於我的資訊，臺北市電子化政府的回應是敏捷的。

絕不同意□□□□□極其同意

我和臺北市電子化政府的交流過程是容易上手的。

絕不同意□□□□□極其同意

我和臺北市電子化政府交換資訊過程像對話一樣好。

絕不同意□□□□□極其同意

Q6.9 您有多同意以下陳述：

我對臺北市電子化政府的發展很關注。

絕不同意□□□□□極其同意

我認真對待與臺北市電子化政府的接觸。

絕不同意□□□□□極其同意

我對臺北市電子化政府的發展很有興趣。

絕不同意□□□□□極其同意

Q6.10 您有多同意以下陳述：

臺北市電子化政府線上推廣妨礙了我上網。

絕不同意□□□□□極其同意

臺北市電子化政府的推廣太泛濫了。

絕不同意□□□□□極其同意

臺北市電子化政府的線上推廣讓我惱火。

絕不同意□□□□□極其同意

臺北市電子化政府的線下日常推廣做得好。

絕不同意□□□□□極其同意

Q6.11 在過去的 12 個月內您有多頻繁地被網友請求或要求…

去投票、去選舉造勢	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
去與政治機構接觸（比如投訴抗議、陈情請願）	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上
與您談論政治或時政	□從未□1 至 5 次□6 至 10 次□11 至 15 次□16 次及以上

Q6.12 您有多同意以下陳述：網友鼓勵我使用臺北市電子化政府。

絕不同意□□□□□極其同意

您的答題已近完成。最後 5 個小問題結束本次問卷。

Q7.1 您的性別是□男□女□其他

Q7.2 您的出生的（西元）年份是＿＿＿?

Q7.3 您的最高學歷是？

□無正式學歷□小學□國（初）中□高中、高職 □五專、二專、三專□技術學院□大學□碩士/博士

Q7.4 您的工作是？

□民意代表

□政府行政主管□公營事業主管□民營事業主管

□民營事業公司負責人(自營商人) 有雇傭員工□民營事業公司負責人(自營商人) 沒有雇傭員工

□政府部門研究人員（科學家）□私人部門研究人員（科學家）

□公立醫療單位醫事技術人員（醫生，藥劑師，護士，醫療人員）□非公立醫療單位醫事技術人員（醫生，藥劑師，護士，醫療人員）□會計師

□公立教育機構教師□私立教育機構教師

□法官、書記官、檢察官、律師

□宗教工作者

□表演工作者（演員、攝影師）

□文字工作者（作家、記者、劇作家）

□公營事業工程師□民營事業工程師

□職業運動專業人士

□政府單位與公營事業部門職員□民營事業職員

□買賣業務人員

□服務、餐旅人員（攤販、個人服務、出租車司機）

□農林牧漁

□政府單位與公營事業部門勞工 民營事業勞工

□學生

□軍警調查人員

□家管，沒有做家庭代工□家管，有做家庭代工□家管，有家族事業，幫忙且領薪水□家管，有家族事業，幫忙不領薪水

□待業中

□退休

□拒絕回答

Q7.5 您的稅前月收入符合哪一級別呢？請包含薪水、報酬、退休金、紅利、利息和其它所有收入。

□24499 及以下□25500 至 35499□35500 至 45499□45500 至 55499□55500 至 65499□65500 至 75499□75500 至 85499□85500 至 95499□95500 至 105499□105500 及以上□拒絕回答

問卷結束

如果您對本問卷有任何疑問和建議，請寫在下框。

提交問卷

非常感謝您的參與。為獲得 50 元新臺幣咖啡券，請選填寫您的聯繫方

式，（街口）＿＿＿＿（LINE Pay）＿＿＿＿（歐付寶）＿＿＿＿；或者必填（電

子郵箱）＿＿＿＿。

提交並關閉此頁面

D. Comparisons of E-government Platforms Use

Comparison of Hotlines to Contact Government

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	119	27.8	149	48.7	195	44.5
1 to 5 times	215	50.2	105	34.3	197	45.0
6 to 10 times	67	15.7	29	9.5	33	7.5
11 to 15 times	15	3.5	7	2.3	5	1.1
16 times or more	12	2.8	16	5.2	8	1.8

Comparison of E-mail to Contact Government

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	197	46.0	172	56.2	209	47.7
1 to 5 times	148	34.6	112	36.6	166	37.9
6 to 10 times	57	13.3	14	4.6	39	8.9
11 to 15 times	17	4.0	3	1.0	14	3.2
16 times or more	9	2.1	5	1.6	10	2.3

Comparison of E-government Web Portals Use

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	76	17.8	39	12.7	68	15.5
1 to 5 times	192	44.9	132	43.1	215	49.1
6 to 10 times	103	24.1	67	21.9	82	18.7
11 to 15 times	29	6.8	22	7.2	26	5.9
16 times or more	28	6.5	46	15.0	47	10.7

Comparison of E-government Mobile Applications Use

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	118	27.6	114	37.3	150	34.2
1 to 5 times	179	41.8	108	35.3	183	41.8
6 to 10 times	84	19.6	33	10.8	63	14.4
11 to 15 times	28	6.5	24	7.8	16	3.7
16 times or more	19	4.4	27	8.8	26	5.9

Comparison of E-government Use on Social Media

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	36	8.4	181	59.2	77	17.6
1 to 5 times	172	40.2	86	28.1	197	45.0
6 to 10 times	106	24.8	26	8.5	76	17.4
11 to 15 times	43	10.0	2	.7	22	5.0
16 times or more	71	16.6	11	3.6	66	15.1

Comparison of E-government Public Self-service Use

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	102	23.8	146	47.7	130	29.7
1 to 5 times	150	35.0	108	35.3	147	33.6
6 to 10 times	107	25.0	25	8.2	97	22.1
11 to 15 times	25	5.8	7	2.3	27	6.2
16 times or more	44	10.3	20	6.5	37	8.4

Comparison of E-government Use Other Third-party Applications

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	82	19.2	123	40.2	160	36.5
1 to 5 times	161	37.6	106	34.6	158	36.1
6 to 10 times	89	20.8	37	12.1	70	16.0
11 to 15 times	35	8.2	13	4.2	14	3.2
16 times or more	61	14.3	27	8.8	36	8.2

E. Comparisons of E-government Functions Use

Comparison of Browse Information

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	47	11.0	36	11.8	77	17.6
1 to 5 times	152	35.5	147	48.0	218	49.8
6 to 10 times	118	27.6	61	19.9	71	16.2
11 to 15 times	36	8.4	24	7.8	26	5.9
16 times or more	75	17.5	38	12.4	46	10.5

Comparison of Open Information Searching

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	55	12.9	60	19.6	81	18.5
1 to 5 times	159	37.1	135	44.1	208	47.5
6 to 10 times	108	25.2	53	17.3	69	15.8
11 to 15 times	50	11.7	22	7.2	32	7.3
16 times or more	56	13.1	36	11.8	48	11.0

Comparison of Personal Information Request

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	103	24.1	112	36.6	216	49.3
1 to 5 times	184	43.0	135	44.1	144	32.9
6 to 10 times	88	20.6	33	10.8	58	13.2
11 to 15 times	33	7.7	14	4.6	10	2.3
16 times or more	20	4.7	12	3.9	10	2.3

Comparison of Sharing Information from E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	109	25.5	182	59.5	180	41.1
1 to 5 times	152	35.5	85	27.8	141	32.2
6 to 10 times	89	20.8	24	7.8	81	18.5
11 to 15 times	46	10.7	6	2.0	18	4.1
16 times or more	32	7.5	9	2.9	18	4.1

Comparison of Making Comments on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	115	26.9	261	85.3	253	57.8
1 to 5 times	142	33.2	35	11.4	115	26.3
6 to 10 times	97	22.7	6	2.0	53	12.1
11 to 15 times	37	8.6	3	1.0	7	1.6
16 times or more	37	8.6	1	.3	10	2.3

Comparison of Discussing with Fellow Citizens on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	116	27.1	226	73.9	260	59.4
1 to 5 times	130	30.4	50	16.3	81	18.5
6 to 10 times	103	24.1	20	6.5	76	17.4
11 to 15 times	41	9.6	4	1.3	13	3.0
16 times or more	38	8.9	6	2.0	8	1.8

Comparison of Making Like and Dislike on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	89	20.8	231	75.5	155	35.4
1 to 5 times	153	35.7	54	17.6	176	40.2
6 to 10 times	104	24.3	15	4.9	54	12.3
11 to 15 times	34	7.9	3	1.0	15	3.4
16 times or more	48	11.2	3	1.0	38	8.7

Comparison of Polling on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	99	23.1	215	70.3	154	35.2
1 to 5 times	163	38.1	80	26.1	206	47.0
6 to 10 times	101	23.6	8	2.6	42	9.6
11 to 15 times	28	6.5	3	1.0	15	3.4
16 times or more	37	8.6	-	-	21	4.8

Comparison of Public Hearing on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	177	41.4	266	86.9	308	70.3
1 to 5 times	132	30.8	30	9.8	95	21.7
6 to 10 times	79	18.5	8	2.6	26	5.9
11 to 15 times	28	6.5	2	.7	4	.9
16 times or more	12	2.8	-	-	5	1.1

Comparison of Complaining or Protesting on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	253	59.1	268	87.6	296	67.6
1 to 5 times	98	22.9	32	10.5	89	20.3
6 to 10 times	54	12.6	5	1.6	45	10.3
11 to 15 times	12	2.8	1	.3	5	1.1
16 times or more	11	2.6	-	-	3	.7

Comparison of Petitioning on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	267	62.4	275	89.9	327	74.7
1 to 5 times	90	21.0	26	8.5	76	17.4
6 to 10 times	53	12.4	5	1.6	27	6.2
11 to 15 times	10	2.3	-	-	6	1.4
16 times or more	8	1.9	-	-	2	.5

Comparison of Taking Part in Crowd Funding on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	155	36.2	282	92.2	320	73.1
1 to 5 times	155	36.2	21	6.9	52	11.9
6 to 10 times	83	19.4	2	.7	58	13.2
11 to 15 times	20	4.7	1	.3	5	1.1
16 times or more	15	3.5	-	-	3	.7

Comparison of Voting in Referendums on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	160	37.4	284	92.8	186	42.5
1 to 5 times	156	36.4	19	6.2	194	44.3
6 to 10 times	87	20.3	3	1.0	36	8.2
11 to 15 times	13	3.0	-	-	9	2.1
16 times or more	12	2.8	-	-	13	3.0

Comparison of Doing Collaborative Production on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	176	41.1	285	93.1	313	71.5
1 to 5 times	149	34.8	18	5.9	92	21.0
6 to 10 times	67	15.7	3	1.0	23	5.3
11 to 15 times	26	6.1	-	-	8	1.8
16 times or more	10	2.3	-	-	2	.5

Comparison of Doing Administrative Procedures on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	72	16.8	158	51.6	200	45.7
1 to 5 times	222	51.9	108	35.3	169	38.6
6 to 10 times	93	21.7	20	6.5	51	11.6
11 to 15 times	28	6.5	11	3.6	9	2.1
16 times or more	13	3.0	9	2.9	9	2.1

Comparison of Doing Payment Transaction on E-government Platforms

	Shanghai		Singapore		Taipei	
	frequency	percent	frequency	percent	frequency	percent
never	97	22.7	92	30.1	217	49.5
1 to 5 times	171	40.0	147	48.0	130	29.7
6 to 10 times	77	18.0	39	12.7	70	16.0
11 to 15 times	26	6.1	14	4.6	3	.7
16 times or more	57	13.3	14	4.6	18	4.1

F. Comparisons of E-government Themes Use

	City (%)			total
	Shanghai	**Singapore**	**Taipei**	
Taxation				
Yes	328(28.0%)	230(19.6%)	269(23.0%)	827(70.6%)
No	81(6.9%)	53(4.5%)	137(11.7%)	271(23.1%)
have no idea	19(1.6%)	23(2.0%)	32(2.7%)	74(6.3%)
Employment				
Yes	298(25.4%)	162(13.8%)	200(17.1%)	660(56.3%)
No	114(9.7%)	118(10.1%)	221(18.9%)	453(38.7%)
have no idea	16(1.4%)	26(2.2%)	17(1.5%)	59(5.0%)
Social Welfare				
yes	310(26.5%)	66(5.6%)	259(22.1%)	635(54.2%)
no	94(8.0%)	208(17.7%)	153(13.1%)	455(38.8%)
have no idea	24(2.0%)	32(2.7%)	26(2.2%)	82(7.0%)
Insurance				
yes	325(27.7%)	68(5.8%)	139(11.9%)	532(45.4%)
no	89(7.6%)	203(17.3%)	262(22.4%)	554(47.3%)
have no idea	14(1.2%)	35(3.0%)	37(3.2%)	86(7.3%)
Transportation				
yes	349(29.8%)	156(13.3%)	313(26.7%)	818(69.8%)
no	68(5.8%)	127(10.8%)	110(9.4%)	305(26.0%)
have no idea	11(0.9%)	23(2.0%)	15(1.3%)	49(4.2%)
Disaster Notice and Public Safety				
yes	256(21.8%)	68(5.8%)	214(18.3%)	538(45.9%)
no	150(12.8%)	207(17.7%)	196(16.7%)	553(47.2%)
have no idea	22(1.9%)	31(2.6%)	28(2.4%)	81(6.9%)
Medical and Health				
yes	348(29.7%)	186(15.9%)	250(21.3%)	784(66.9%)
no	69(5.9%)	101(8.6%)	155(13.2%)	325(27.7%)
have no idea	11(0.9%)	19(1.6%)	33(2.8%)	63(5.4%)
Policies and Regulations				
yes	327(27.9%)	131(11.2%)	220(18.8%)	678(57.8%)
no	83(7.1%)	152(13.0%)	178(15.2%)	413(35.2%)
have no idea	18(1.5%)	23(2.0%)	40(3.4%)	81(6.9%)
Environment Protection				
yes	303(25.9%)	61(5.2%)	181(15.4%)	545(46.5%)
no	107(9.1%)	212(18.1%)	219(18.7%)	538(45.9%)
have no idea	18(1.5%)	33(2.8%)	38(3.2%)	89(7.6%)
Education and Training				
yes	290(24.7%)	158(13.5%)	163(13.9%)	290(52.1%)

	City (%)			total
	Shanghai	**Singapore**	**Taipei**	
no	118(10.1%)	126(10.8%)	244(20.8%)	488(41.6%)
have no idea	20(1.7%)	22(1.9%)	31(2.6%)	73(6.2%)
Leisure and Entertainment				
yes	277(23.6%)	91(7.8%)	277(23.6%)	645(55.0%)
no	135(11.5%)	184(15.7%)	133(11.3%)	452(38.6%)
have no idea	16(1.4%)	31(2.6%)	28(2.4%)	75(6.4%)
Convenience Services				
yes	356(30.4%)	116(9.9%)	308(26.3%)	780(66.6%)
no	62(5.3%)	154(13.1%)	107(9.1%)	323(27.6%)
have no idea	10(0.9%)	36(3.1%)	23(2.0%)	69(5.9%)
Problem Complain				
yes	234(20.0%)	54(4.6%)	105(9.0%)	393(33.5%)
no	175(14.9%)	218(18.6%)	285(24.3%)	678(57.8%)
have no idea	19(1.6%)	34(2.9%)	48(4.1%)	101(8.6%)
Housing				
yes	272(23.2%)	179(15.3%)	127(10.8%)	578(49.3%)
no	140(11.9%)	114(9.7%)	269(23.0%)	523(44.6%)
have no idea	16(1.4%)	13(1.1%)	42(3.6%)	71(6.1%)
Business				
yes	200(17.1%)	48(4.1%)	56(4.8%)	304(25.9%)
no	210(17.9%)	233(19.9%)	332(28.3%)	775(66.1%)
have no idea	18(1.5%)	25(2.1%)	50(4.3%)	93(7.9%)

Erklärung

Ich versichere, dass ich die von mir vorgelegte Dissertation selbstständig angefertigt, die benutzten Quellen und Hilfsmittel vollständig angegeben und die Stellen der Arbeit, die anderen Werken im Wortlaut oder Sinn nach entnommen sind, in jedem Einzelfall als Entlehnung kenntlich gemacht habe; dass diese Dissertation noch keiner anderen Fakultät oder Universität zur Prüfung vorgelegen hat, dass sie noch nicht veröffentlicht worden ist, dass ich eine solche Veröffentlichung vor Abschluss des Promotions-verfahrens nicht vornehmen werde. Die Bestimmungen der Promotionsordnung sind mir bekannt.

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CHEN Yidian

September 2020

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