Task Complexity and Different Decision Criteria for Online Service Acceptance: A Comparison of Two e-Government Compliance Service Domains[1]

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Abstract

Inspired by ever evolving information technologies and the myriad of successful business cases that reap the benefit of new technologies, many governments around the world have jumped on the bandwagon of electronic government (e-Gov). However, there has been little academic research regarding the types and conditions of e-Gov services that are acceptable to the public. This paper synthesizes a model of e-Gov compliance services acceptance by critically integrating prior research along with the distinctive characteristics of the online government services context. The study posits that different levels of task complexity involved in various e-Gov compliance processes can lead citizens to use different decision criteria and empirically examines the differing acceptance decision patterns of potential e-Government service users in two compliance service domains. The results reveal that citizens do adopt different decision criteria for different levels of task complexity, suggesting that functional usefulness of e-Gov services becomes a more important criterion for online services that involve difficult tasks. In contrast, the service provider's competence in online operations becomes a more important factor for simple tasks. Several other findings and future research directions are also discussed.

Keywords: Electronic Government; User Acceptance of IT; Task Complexity; Compliance Service; Questionnaire Surveys

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1. Introduction

Inspired by ever improving capabilities of information technologies and the myriad of cases where organizations reap the benefit of new technologies to successfully improve their performance, many governments around the world have jumped on the bandwagon of electronic government (e-Gov). Yet, the academic research that articulates the types and conditions of e-Gov services that are readily acceptable to the public is sparse. Considering the heavy investment in e-Gov implementation and the variety of possible public sector online services that citizens expect [12], understanding citizens' interactions with various government organizations in multi-channel service environments is a crucial step in effective service management in the digital society [42]. Governments are facing a particularly tough challenge because they provide an extremely diverse set of services, which require prioritization in online service development for effective budget allocation, yet they cannot easily eliminate costly traditional service channels because of the non-adopters of online services. In order to advance our knowledge about service channel choice and the related characteristics of online service systems and citizen-government interactions, this paper attempts to answer two questions: what are the factors that citizens consider when they make a decision to use a Government-to-Citizen (G2C) e-Gov service? How do these factors differ in their impact across different types and domains of the government services, especially with varying degrees of task complexity across the services?

This study addresses these questions by synthesizing a model of e-Gov compliance service acceptance and by empirically testing the model in different e-Gov service domains that involve different levels of task complexity. The model examines the effect of citizens' perceptions and beliefs on two types of usage intentions (i.e., intention to use a website for information and intention to use a website for transactions) in two compliance service domains (i.e., vehicle/license and taxation). By integrating theories of e-commerce trust and technology acceptance and use, the model covers such issues as the effects of utility values in e-Gov services, the role of trust and risk in government-citizen relationships and the Internet environment, and the interrelationships among these. With our focus on citizens, this study limits its scope to G2C e-Gov services that help citizens comply with government regulations (e.g., vehicle

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registration renewal, tax filing). However, we refer to any legitimate potential user of e-Gov services, [12], as "citizen," regardless of his/her nationality.

Web-based e-Gov services, resembling organizational information technology (IT), provide citizens with an effective way to receive various public services and to conduct mandatory tasks (e.g., filing a tax return, renewing an automobile registration). On the other hand, e-Gov websites also resemble business-to-customer (B2C) e-commerce websites in that the expected users (i.e., citizens) do not have strong control over their e-Gov service providers nor unexpected users (i.e., hackers). Yet, the e-Gov service context is distinct from both the organizational IT and the e-commerce contexts because each e-Gov service provider has monopolistic authority in the domain [48], every service provider is a member of a relatively familiar and reputable national (federal) government, and the use of e-Gov websites is purely voluntary. Given these similarities and dissimilarities, it is important to validate IT adoption theories that have originated in the context of the private sector or to synthesize a new model that can explain citizens' use of e-Gov websites from an integrated perspective. The contributions of this paper are threefold. First, this study integrates previously separate strains of IS acceptance theories: theories focusing on utility values of information systems, typically within an organization, and theories emphasizing the risks involved in the use of information systems and the trustworthiness of the system providers on the Internet. Second, by hypothesizing a moderating effect of the task complexity involved in various compliance processes, this study offers insights into the inconsistent cognitive patterns observed in citizens' online service adoption decisions. Finally, we provide empirical evidence of the hypothesized relationships by applying our model to two domains of online government services that are widely used in the US. In sum, this study furthers understanding regarding improvement of public acceptance of e-Gov services and the relationships among various perceptions and beliefs related to their acceptance.

In the next section, we review the underlying rational and theoretical basis of our research framework, followed by a development of research hypotheses and an analytical model. Then, the research methodology is described, and the results of empirical analysis are presented. The paper concludes with a discussion on the findings and suggestions for future research.

2. Literature Review

In the field of management information systems, researchers have applied various theories in order to predict or explain user acceptance of a new IT. Included in the theoretical foundation are social psychology of human behavior and sociology-based diffusion theories, such as the theory of reasoned action (TRA) [23], the theory of planned behavior (TPB) [3], motivational theory [49], social cognitive theory [8], and the theory of diffusion of innovation [44]. These approaches were mainly concerned with ITs adopted for job performance or competitive work place settings within an organization. Venkatesh, et al. [50] provide a comprehensive review and integrated this class of research into the Unified Theory of Acceptance and Use of Technology (UTAUT). TRA-based theories fit particularly well in the study context because they can explain not only acceptance behaviors (i.e., when no alternatives exist), but also choice behaviors (i.e., acceptance of a particular option when alternatives are available) [46]. Citizens are usually provided with multiple G2C service channels (e.g., in-person, mail, website), which makes our model of interest a choice model. Sheppard et al., have found that existence of choice does not deteriorate the explanatory power of TRA-based [46].

Another strain of user acceptance theory comes from the revival of interest in trust within the e-commerce context [25, 37]. This relatively newer perspective emphasizes the role of trust in commercial relationships on the Internet. E-commerce relationships are often subject to information asymmetry problems [5, 6], and an entity involved in such a relationship lacks familiarity with and strong control over the other entities or the environment [25]. Therefore, trust is considered one of the most important factors for successful e-commerce to reduce uncertainty and complexity in economic and social exchange relationships. As inter-organizational relationships increasingly depend on information systems as the primary channel of interaction, researchers have started to realize the importance of integrating these two strains of theory. Gefen et al. [26] and Lee and Rao [34] are two examples of those who argue the need for an integration of the above-mentioned perspectives in e-commerce and e-Gov contexts, respectively. Their models combined utility value concepts (e.g., perceived usefulness and/or ease-of-use), from technology acceptance model (TAM), and trust concepts (e.g., relational and/or environmental

trustworthiness), from the e-commerce trust literature, to explain intentions to use web-based services. Although they show that both utility value and trust are important antecedents of e-service acceptance, there are some noticeably inherent differences between typical B2C e-commerce environments and e-Gov environments that prohibit direct application of their model in the e-Gov compliance service context. In the following sections, we introduce two behavioral intention measures as our dependent variables and then build our model around the differences between the e-commerce and e-Gov contexts.

2.1. Intention to Use e-Gov Services

This study adopts intention measures for citizens' e-Gov service use. Fishbein and Ajzen's TRA argues that human behavior is a direct function of behavioral intention [23]. The TAM, a widely accepted IT adoption theory rooted in TRA, assumes that behavioral intention is the best predictor of human behavior and uses an intention measure for the dependent variable in the predictive model [17]. In the e-commerce trust literature, McKnight and his colleagues [37] used trusting intention, also based on TRA, as a proxy of trusting behavior in their trust measurement model for e-commerce.

Usage intention measures are particularly useful in the e-Gov service context. One problem with using an actual usage measure in e-Gov research is that government services include a huge collection of heterogeneous services, many of which are irrelevant to many citizens for most of their lives. For example, non-citizen US residents, including international students, will file a tax-return only if they have a taxable income, whereas US citizens who are eligible for earned income credit can file a tax-return every year regardless of their taxable income. Therefore, in some cases, using an actual usage measure can lead to an inaccurate conclusion about the acceptability of e-Gov services. An intention measure, in such cases, is a useful proxy measure of actual behavior because it can be easily designed to extract the possibility of potential use when the needs arise.

In our model, two usage intention measures are used as dependent variables: 1) *intention to use an e-Gov website for information* and 2) *intention to use an e-Gov website for transactions*. In order to embrace the various purposes and tasks of heterogeneous e-Gov services, we chose the dual dependent variable design,

which follows the multi-dimensional trusting intention measures in the e-commerce trust model [37], rather than the UTAUT model [50] that has a single dimensional dependent variable. Intention to use an e-Gov website for information looks at the information flow from the government to users and captures the willingness and likelihood that a potential user would use the government website as the major source of information. Intention to use an e-Gov website for transactions captures the willingness and likelihood that a potential user would carry out an online transaction in which he/she must provide private information to the e-Gov website. Online transaction services require more sophisticated e-Gov systems than do informational distribution services, which will require different levels of systems integration and information assurance. Thus, we expect citizens to use different decision criteria in forming the two usage intentions. Online information searches may be an intermediate step in an online transaction process, and thus our intention measures may be correlated to each other. However, we limit our scope to building a causal model, as opposed to a process model, and do not hypothesize any causal relationship between the two intentions in our model.

2.2. Determinants of IT Acceptance in Literature

The Technology acceptance model (TAM) and a number of other technology adoption theories [50] have put a strong emphasis on the *utility value* of IT, which has been manifested as perceived usefulness, job-fit, relative advantage, outcome expectation, etc. Emphasis on the utility value is also observable from the wide use of customer value metrics by e-Gov service providers [48]. Also included in such a utility-oriented model are *cost factors* and *social factors.* Cost-related factors that have been often examined include effort expectancy, perceived ease-of-use, and compatibility, while perceived subjective norm and peer/supervisor pressure are frequently considered social factors [2]. In addition, TPB [3], a theoretical extension of TRA, argues that *perceived behavioral control* (e.g., facilitating conditions, self-efficacy) affects usage intention as well as actual usage behavior [35].

From the same socio-psychological perspective (i.e., TRA and TPB), McKnight et al. extended and applied an organizational trust model to the e-commerce context, developing an e-commerce trust model

[37]. Trust, according to Mayer et al., is *"a willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" [36:712],* and is determined by a trustor's perception on a trustee's trustworthiness and on a trustor's propensity to trust. Trust leads the trustor to take a risk in the relationship with the trustee [36]. *Trusting beliefs* in the e-commerce trust model are equivalent to the trustor's beliefs in the trustee's trustworthiness (i.e., ability, benevolence, and integrity), and *trusting intention* connotes the trustor's willingness to engage in the risky relationship with the trustee. This TRA-based belief-intention relationship of trust has been supported by empirical tests [11, 37]. Gefen et al. (2003) argued that trust, conceptualized as a set of specific beliefs, has a direct positive effect on intention to use an e-vendor by reducing social complexity in the exchange relationship, and an indirect effect through perceived usefulness by increasing expectation on the future outcome from system use.

Although most of these factors have been rigorously validated, Venkatesh et al.'s (2003) examination revealed that only performance expectancy, which reflects the perceived utility of direct benefits from the system, has consistent and strong positive effects on usage intention, while most other factors tend to be moderated by the situation (e.g., research context, voluntariness) and demographic characteristics (e.g., gender, experience, age) of the potential users [50]. Given these results, it is conceivable that sector differences (i.e., private vs. public), as well as domain differences (e.g., vehicle/license vs. taxation) among various e-Gov services can contradict the effects of the well respected determinants of IT acceptance in the private sector.

2.3. e-Government, e-Commerce, and Organizational IT

Government-to-citizen (G2C) e-Gov systems have some distinctive characteristics that set them apart from B2C e-commerce and/or organizational IT, although they also share many characteristics with other types of information systems.

Task Complexity

One of the most distinctive characteristics of e-Gov systems is the *vast variety and heterogeneity of the functions that e-Gov agencies, and thus their information systems, are designed to support.* G2C e-Gov services take on widely different roles (e.g., taxation, vehicle registration, political campaign) with different purposes and agendas (e.g., improve operational efficiency, assist compliance, induce citizen participation), under a single government hierarchy [14]. Consequently, the complexity involved in different e-Gov tasks can differ widely from one e-Gov service to another. When complexity of an e-Gov task is defined, following [16], as the degree of ambiguity and uncertainty involved in the government-citizen interaction processes and consequences, a vehicle registration renewal, for an example, can be considered as a simple task that will take no longer than an hour to complete. Most car owners already have all the necessary information (e.g., VIN #, Reg #) and understand where to put them on the easy to understand form, printed or web-based. On the other hand, tax-return filing is a significantly more complex task, regardless of the service channel used, because it involves dozens of ambiguous terms and concepts in the filing processes, and most taxpayers can't accurately predict what the result will be, after hours or even days of struggle with seemingly relevant but incomprehensible information. In contrast, the majority of B2C e-commerce services[1] play the same front-end business functionalities, such as providing product information and processing orders for independent entities. Organizational ITs studied in the early IT-acceptance research were usually designed to support a more specific and complex task, such as product design or report generation. In addition, such a new IT was introduced to an organization as a major project, making it unnecessary for the adopting organization to prioritize a number of IT projects or to use different strategies for multiple, ongoing IT adoption projects.

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[1] While some B2C e-services (e.g., online investment) can be quite complex, we do not include such online services in the majority of B2C e-commerce services. Nevertheless, our model may help explain customer acceptance of such complex systems in the private sector.

Relational Risk

Another distinctive characteristic of e-Gov systems is the uncertainties and risks involved in the systems usage behavior. As widely recognized and documented, the risk from uncertain future behavior of unfamiliar vendors (aka relational risk) on the Internet is a paramount concern of e-commerce service users. On the other extreme, organizational ITs usually do not involve any other entity whose future behavior can affect the results of the system's use.

The power asymmetry between government agencies and individual citizens is enormous, compared with the relationships between online stores and online shoppers, yet individuals do not comprehend their operations, and the consequences of unexpected behavior of government agencies are much harder to predict than that of single-purpose (i.e., for profit) online stores. Nevertheless, when the scope is limited to e-Gov compliance services, *citizens' perception of relational risk from e-Gov agencies will be much lower* than that from online vendors because those compliance service providers are well known and repeatedly dealt with agencies such as the Internal Revenue Service (IRS) and the Department of Motor Vehicles (DMV). Furthermore, *use of an e-Gov service will not increase the relational risk* between the agency and citizens because the risk exists in conventional services, too [31].

It is not surprising, given the above-mentioned differences among the e-Gov, e-commerce, and organizational IT contexts, that early IT acceptance studies have emphasized productivity factors of the technology (e.g., task support, usefulness, ease-of-use), and that e-commerce trust studies have focused more on relational risk and trustworthiness of online vendors. Figure 1 depicts the difference in coverage of task complexity (the X axis) and the level of relational risk (Y axis) involved, in the three IT contexts (i.e., e-Gov, e-commerce, and organizational IT).
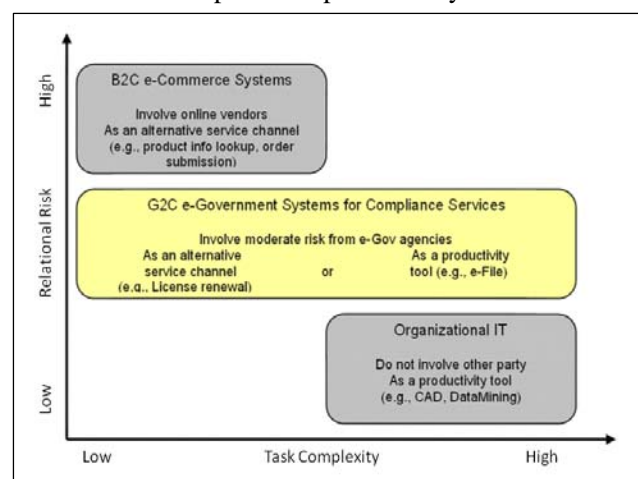

Figure 1. Task Complexity and Relational Risk in Different IT Contexts

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3. Theory Building and Research Model

3.1. Research Approach

Our analytical framework takes three specific beliefs (i.e., *usefulness of the website*, *Internet competence of the service provider*, and *structural assurance of the Internet*) as major determinants of potential users' acceptance of e-Gov compliance services. In addition, *task complexity* is expected to strengthen the role of relative usefulness, making the potential users' decision criteria similar to the early IT acceptance model of organizational IT, as suggested in the previous section. The three specific beliefs are, in turn, explained by external stimuli (i.e., perceived quality of website), more general beliefs (i.e., relational trust), and personal traits (i.e., disposition to trust).

3.2. Task Complexity and Relative Usefulness of e-Gov Compliance Services

Task complexity has been identified as an important contingent factor for information systems success [18] from the inception of the MIS discipline. A complex task is a task that involves high ambiguity and uncertainty, where ambiguity refers to a lack of understanding and uncertainty refers to a lack of necessary information [16]. An information system designed to support a complex task should be able to reduce the ambiguity and uncertainty by providing further definition of relevant problems and additional information [16] in order for the system to help its users properly complete the task.

In Group Decision Support Systems (GDSS) research, task difficulty has drawn attention as an important factor that can influence the impact of information and communication technology on group work [28]. Task difficulty can be defined as the degree of cognitive load required to complete a given task [24, 40], which makes the concept a perceptual counterpart of cognitive complexity [43]. A GDSS may work only as an alternative communication medium for the user group, or it may include decision support tools (e.g., analytical model and computational tools) in addition to communication support tools [24]. Alternative communication mediums can influence sociological aspects of group dynamics, while a decision support

tool can increase information processing capacity in the problem domain [19]. Steeb and Johnston [47] found that use of a GDSS that included both functions (i.e., communication support and decision support) resulted in higher user satisfaction with a decision process that required a difficult planning task (i.e., a counter-terrorism operation). On the other hand, Gallupe, et al. [24] found that use of a communication support-only GDSS for a relatively simple, problem-finding task actually lowered the users' decision confidence and satisfaction with the decision process. These seemingly contradictory results suggest that the value of GDSS use mainly comes from DSS functions and that communication functions offer marginal value for certain types of group activities [28].

The primary objective of e-Gov compliance services is to help citizens comply with regulatory requirements by providing assistance in the compliance process [12]. Like all other "e-" applications, all e-Gov compliance services include communication support functions to utilize an electronic channel (e.g., the Internet). In addition, some e-Gov compliance services include additional task support functions, such as auto-calculation/completion, explanation of terms, process guides, and sample forms, so that more citizens can properly perform the required compliance tasks. In the e-Gov compliance service context, the value of communication support will be limited and dependent upon the available alternative communication channels. That is, a web-based form submission will be valuable for a citizen who otherwise has to drive to the government agency just to submit the form, but the citizen still needs to do the task (i.e., finding out and providing the required information) one way or another. On the other hand, a task support tool can greatly differ from simple to complex tasks, and so will its value. If the task is as simple as placing a purchase order (e.g., purchasing a fishing license or a national park admission ticket), all one can expect from a task support tools is the same as that provided by a full-featured online shopping cart. If the task is as complex as analyzing one's annual income and expenditure (e.g., tax-return filing), good task support tools may be worth as much as one would pay for a professional accounting service. The relative usefulness of an e-Gov website reflects the expected advantages of the e-Gov service channel over alternative service channels and is a major determinant of intentions to use an e-Gov service [33]. Therefore, it is expected that the effect of relative usefulness of an e-Gov compliance service

website on citizens' intention to use the service (H1x in Figure 2) becomes stronger as the complexity of the compliance task increases (H2x in Figure 2).

> **Hypothesis 1a.** *Relative Usefulness of the website increases intention to use website for information.*

> **Hypothesis 1b.** *Relative Usefulness of the website increases intention to use website for transactions.*

> **Hypothesis 2a.** *Task Complexity strengthens the effect of usefulness of the website on intention to use website for information.*

> **Hypothesis 2b.** *Task Complexity strengthens the effect of relative usefulness of the website on intention to use website for transactions.*

3.3. Risks and Counter Beliefs in e-Gov Compliance Service Use

Decision theories from economics and psychology hypothesize that decision making under uncertainty involves subjective assessments of the probabilities associated with possible outcomes of the decision [4]. The natural possibility of having an undesirable outcome, when the probability of the outcome is unknown, can be referred to as *risk*. The expectation of having such a negative outcome, after the probability is subjectively approximated by factoring in relevant information (e.g., the trustor-trustee relationship and institutional safeguards), can be referred to as *perceived risk* [15]. Categorizing the risks that exist in a particular context can help identify counter beliefs that can clarify the relationships between risks and decisions under uncertainty . We can categorize potential negative outcomes (i.e., risk) in the online service context into four types of risks, based on the source of the risks: *1. the risk of using an inferior service channel that will result in lower service quality than an alternative service channel, 2. the risk of using an*
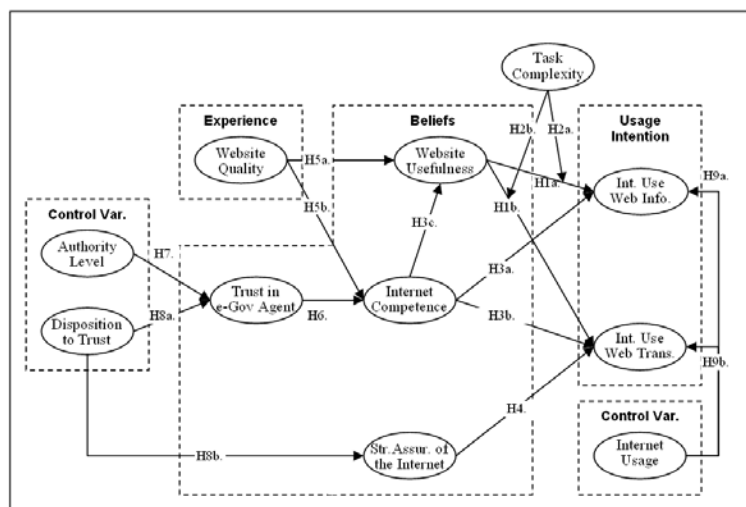

Figure 2. A Structural Model of e-Gov Compliance Service

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unreliable service channel that may have a negative side effect besides the intended purpose (e.g., privacy invasion, identity theft, junk mails), 3. the risk of selecting an opportunistic service provider who will not deliver the promised service, and 4. the risk of selecting an incapable service provider who cannot deliver the promised service (Table 1).

Table 1. Potential Risks in e-Service Relationships

Potential Risk	Counter Beliefs
Risk 1. Risk of selecting a service channel for which results are inferior to an alternative service channel.	Competence in Online Services
Risk 2. Risk of using a service channel that has a negative side effect besides the expected service results (e.g., privacy risk).	Structural Assurance of the Internet
Risk 3. Risk of selecting a service provider who is unwilling to deliver promised service.	Benevolence and Integrity
Risk 4. Risk of selecting a service provider who is incapable of delivering expected service.	Competence in the Service Domain

Internet Competence of e-Gov Service Provider

The first type of risk in Table 1 emerges from the uncertainty of the performance of the e-service channel, compared with other available service channels. The specific data needed to assess this risk are the information about the e-service provider's Internet competence. Internet competence refers to the competence of an entity in conducting online operations [33]. This concept is included in the model as a specific belief separate from relational trusting belief, following Konana et al.'s use of perceived operational competence [7, 30] that had strong effects on online investors' relational trusting belief and satisfaction with online brokers. While operational competence also reflects the ability of an online entity (i.e., online broker) to deliver a high level of performance in its online operations, it actually represents the overall competence of the single-channel (i.e., online-only) entity. Because channel choice is the primary concern in the e-Gov compliance service context, we explicitly limited the scope of our specific belief measure to the competence required for online operations, distinguishing it from the competence in the authoritative service domain (e.g., vehicle/license and taxation) of the traditionally brick-and-mortar government agencies. With our narrow focus on the ability to deliver online services, we hypothesize that Internet competence can increase intentions to choose an e-Gov service channel by reducing the perceived risk involved in using the service channel. Furthermore, perceived risk of an inferior service channel is reflected in the belief of relative usefulness of the e-service systems. Thus, Internet competence of an e-

Gov service provider can also have a positive effect on perceived relative usefulness of the e-Gov service channel. We use citizens' perception of the provider's Internet competence instead of objective Internet competence because such objective data (e.g., VeriSign, BBB Online reports) are often unavailable, and even if they are, we assume that the effects on usage intentions will be mediated by citizens' perception of the Internet competence. H3x in Figure 2 represent the effects of Internet competence of e-Gov service provider:

> **Hypothesis 3a.** *Confidence in e-Gov agency's Internet competence increases intention to use website for information.*

> **Hypothesis 3b.** *Confidence in e-Gov agency's Internet competence increases intention to use website for transactions.*

> **Hypothesis 3c.** *Confidence in e-Gov agency's Internet competence increases relative usefulness of the website.*

Structural Assurance of the Internet

The Internet is an independent infrastructure rather than a service channel specifically designed for e-Gov compliance services. Therefore, citizens are subject to the risks generally applied to Internet users (Risk 2 in Table 1), such as identity theft, network disruption, and malware infection, even if e-Gov service providers are good at doing business online. Citizens' perception of risk from the Internet itself is dependent upon their belief about the structural assurance of the Internet, which refers to technical and legal safeguards that can protect Internet users from the potential problems [38]. Such a belief can foster trusting beliefs in an unfamiliar online entity [7, 26, 37] and increase intentions to engage in a risky relationship (e.g., sensitive information exchange) by lowering perceived risk of Internet security [33, 41]. Therefore:

> **Hypothesis 4.** *Confidence in structural assurance of the Internet increases intention to use website for transactions.*

3.4. Experience and General Trusting Beliefs

Perceived Quality of Website

A citizen can form a perception of the relative usefulness of an e-Gov compliance service system by inferring from his/her confidence in the Internet competence of the service provider, as discussed earlier, or by actually observing the system. The effects from Internet competence will be dominant when potential users do not have enough direct experience with the system, but as experience with the system increases, directly observed information about the quality of the system will start exerting its influence [22]. Bharati and Chaudhury [10] have shown, in a laboratory experiment setting, that system quality can increase user satisfaction, which in turn can increase their usage intention. Perceived website quality has been found to lead to trusting beliefs in the online vendor and to risk taking behavior with the vendor in the e-commerce environment [37], and to have positive impacts on Internet competence belief and perceived usefulness of the website in the e-Gov optional service context [33]. Accordingly, we hypothesize the effects of perceived quality of an e-Gov compliance service website as follows (H5x in Figure 2):

> **Hypothesis 5a.** *Perceived quality of e-Gov website increases relative usefulness of the website.*
>
> **Hypothesis 5b.** *Perceived quality of e-Gov website increases confidence in e-Gov agency's Internet competence.*

General Trusting beliefs in an e-Gov Agency and the Federal Government

Trust has been considered as one of the most critical success factors for e-commerce. In McKnight, et al.'s e-commerce trust model [37], trusting belief, a widely accepted conceptualization of relational trust, is a high-level abstract concept that has three sub-dimensions: integrity, benevolence, and competence beliefs. This abstraction is appropriate for e-commerce research because the three sub-dimensions are the beliefs that can counter the biggest risks in e-commerce relationships: opportunistic future behavior of transaction partners (Risk 3 in Table 1) and the transaction partners' capability to back up their promises (Risk 4 in Table 1).

A positive side of e-Gov services is that, unlike in the e-commerce context, the service providers are reputable government organizations or government contractors who have more incentives to fulfill public accountability rather than their own benefits [20]. This means that the chance of a problem being caused by opportunistic behaviors of a service provider is significantly lower than in the e-commerce environment. In addition, most government organizations hold monopolistic authority in their domains. When a G2C service is provided exclusively by a single government organization, the organization has the highest domain competence by definition, which will significantly lower or even eliminate the possibility of selecting a service provider who is incapable of delivering the promised service. These distinctive characteristics imply that citizens have a relatively high level of familiarity with many e-Gov service providers, understand that the agencies have few reasons to take advantage of them, and know that the agencies have to observe all the applicable laws and regulations under strong control of the national government. Nevertheless, it should be noted that the question in typical e-commerce studies is whether to do business with a certain service provider or not, whereas the question in e-Gov compliance services becomes whether to use the "e" or "non-e" service channel. The abstract relational trust (trusting belief) should not have a direct effect on such a channel choice decision because the effects should be constant across different service channels. Instead, we hypothesize a trust spill-over, a process in which strong general trusting beliefs (e.g., trust in vendors on the Internet) increase the levels of more specific yet related trusting beliefs (e.g., trust in particular vendors on the Internet) [38], especially when other information is unavailable (e.g., initial contact). The trust spill-over will occur between abstract-level relational trust and Internet competence belief (H6 in Figure 2), another relational belief that specifically counters the inferior channel risk (Risk 1 in Table 1) in the channel choice decision. Thus,

Hypothesis 6. *Trusting belief in an e-Gov agency increases confidence in the e-Gov agency's Internet competence.*

3.5. Other Control Variables

In addition to the main constructs presented above, the model includes three peripheral variables: authority level, disposition to trust, and habitual internet usage. While these variables may have measurable effects on one of the main constructs, their effects have already been tested intensively in prior literature or are outside of our focus and thus very briefly discussed below.

Authority Level and Trust in e-Gov Agent

Differences between individual agencies may generate variance if trust in more than one agency is measured and analyzed together. For example, compliance services in the taxation domain can be provided by two agencies: one at the federal level (i.e., IRS and its e-file partners) and the other at the state level (i.e., the New York State Department of Taxation and Finance (NYDTF) for NY residents). In this case, the difference in the agencies' authority levels can result in different levels of trust in the agencies. Therefore, we add authority level in the model (H8 in Figure 2) and hypothesize that:

> **Hypothesis 7.** *Authority level of an e-Gov agency increases trusting belief in the e-Gov agency.*

Disposition to Trust

Disposition to trust refers to a trustor's trait of being inclined to trust other people in general, which is similar to what Mayer et al. called propensity to trust [36]. The e-commerce trust model posits that disposition to trust has a direct effect on trusting beliefs as well as an indirect effect through institution-based trust [37]. Indeed, disposition to trust is expected to influence a wide range of beliefs including trust in governments because the concept is a relatively stable and general personal trait. If that is the case, including trust in government without disposition to trust will cause a spurious correlation between trust in government and trusting beliefs. Thus, we also include disposition to trust in our model (H8x in Figure 2) and argue that:

> **Hypothesis 8a.** *Disposition to trust increases trusting belief in the e-Gov agency.*
> **Hypothesis 8b.** *Disposition to trust increases c in structural assurance of the Internet.*

Habitual Internet Usage and Intention to Use e-Gov Services

Compatibility has been widely studied in previous innovation diffusion research [45]. Compatibility of a new IT innovation can be defined as the degree to which adopting the innovation is compatible with the adopters' way of doing things [29], which can include existing work practice, preferred work style, prior experience, and personal values [1]. Because heavy Internet users may be more willing to use web-based services, we include Internet usage habits in our model as a determinant of e-Gov service usage intentions (H9x in Figure 2).

> **Hypothesis 9a.** *Habitual usage of the Internet increases intention to use website for information.*
> **Hypothesis 9b.** *Habitual usage of the Internet increases intention to use website for transactions.*

4. Research Design and methodology

This study used structured questionnaires to measure individuals' intentions to use e-Gov compliance services and the antecedents of the intentions. Two types of services (i.e., information lookup and transactions) in two service domains (i.e., vehicle/license and taxation) were examined by using three existing government websites: The New York Department of Motor Vehicle (NYDMV) website (www.nydmv.state.ny.us) in the vehicle/license domain, and the IRS website (www.irs.gov) and the NYDTF website (www.tax.state.ny.us) in the taxation domain[2]. Three versions of the questionnaires, one for each website, were developed and administered to undergraduate- and graduate-level business students, including professional MBA students, in a large university in New York State, US. The three versions included equivalent questions, except for items regarding the perceived website quality measure that were not included in the vehicle/license domain questionnaire because of the single website examined. Each participant was randomly assigned to one of three websites. Depending on the assignment, the

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[2] Many citizens believe that their tax-return file is transmitted to IRS directly, since some tax-return preparation SW explicitly say "Your return is securely sent directly to IRS computers." Unfortunately, this line is misleading, since our test (using Wireshark) revealed that at least one leading tax-prep SW (for 2007 tax-year) sends all tax-return data to its vendor's computers (and then may be securely forwarded to IRS computers).

participant was instructed to visit the assigned website, assuming that he/she needed to complete the given task (i.e., vehicle registration renewal or tax-return filing). The vehicle registration renewal task was a low-complexity task, while the tax-return filing task was selected to represent a high-complexity task. Participation in the study was voluntary, and a mixture of three incentive mechanisms was used: no incentive, course credit as optional course assignment, and a small financial reward (gift card).

Although studies using student subjects have been criticized for low external validity, there are several reasons that student samples would not cause significant problems and would indeed be beneficial for this study. Online driver's license renewal was a featured link on the FirstGov[3] website, during the survey period, which leads to 52 state/district DMV websites where citizens could use automated online transactions, such as road test scheduling and driver's license/automobile registration renewal. Online tax filing, another acclaimed online service offered in the FirstGov, was one of the most successful e-Gov services [21]. Students are highly likely to be involved in driver's license or automobile registration processes, partly because of their young age and partly because they are in a transitional stage (e.g., college life in a new town) in their lives. Further, a large number of students need to file a tax-return. Our data shows 62% of the subjects who examined the IRS or NYDTF sites already had done some kind of tax filing, and 100% of them were expecting to file a tax return or to pay taxes for the present or upcoming fiscal year. Therefore, unlike many MIS studies where students are required to pretend to be a manager and assume a specific managerial role, this research examines the student sample as the largest new/prospective customer group of the two e-Gov compliance domains in question.

McKnight et al. [37] also argued that student samples can be a good proxy of the online consumer population who are "generally younger and more highly educated than conventional consumers"[39]. The average age of our dataset was 23, 99% had used the Internet for more than 3 years, and 75% committed 6 or more online transactions in the previous 12 months. Finally, the selection of the e-Gov compliance service domains fits well with the special characteristics of the research site. As a large state university, the dataset included 28% non-US citizen respondents. While many other e-Gov services are only for US

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[3] http://www.firstgov.gov/ or http://www.firstgov.com/

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citizens or not well known to international students or other types of legal residents, driver's license, car registration, and tax filing regulations are applicable to everyone in the US. Indeed, the DMV is one of the first US government agencies that international students deal with. For these reasons, our study design naturally matches two of the most popular e-Gov services and a representative group of potential e-Gov service users. With this research design, the study is expected to compensate for the traditional weaknesses of student subject studies and achieve a high level of external validity.

4.1. Measurement Instrument

In the first wave of survey administration, a paper-based questionnaire was developed and used and then converted into a web-based survey for the second wave of data collection. Most of the questionnaire items used in this study were adopted and/or modified from MIS literature because there was no readily available measure for e-Gov usage intentions and its antecedents. A sample set of measurement items are listed in Appendix A (Table A-1).

The two intention measures were developed based on behavioral intention measures of UTAUT/TAM [50] and trusting intentions of e-commerce trusting measure by McKnight et al. [37]. Our intention measures for the two types of online service usage (i.e., information search and transaction) have slightly different wording from those referred measurement items because UTAUT/TAM uses a single-construct usage intention measure, and the e-commerce trust model uses a three-dimensional trusting intention measure. A relative usefulness measure was based on the recent development of the UTAUT model that combined various previously existing items into one construct, performance expectancy [50].

Confidence in Internet competence, confidence in the structural assurance of the Internet, disposition to trust, and perceived website quality measures were adopted, with minor or no changes in the wordings from the e-commerce trust measures [37]. To measure the abstract relational trust (i.e., trust in e-Gov agent), we first calculated the construct scores of each trusting belief (integrity, benevolence, competence) from the 3-item e-commerce trusting belief measures [37], using partial least square (PLS). Then the three construct scores were used as the reflective indicators of trust in e-Gov agent in the final measurement

model and in the subsequent structural model. This technique is in line with Gefen et al.'s [26] conceptualization and measurement of trust. The levels of the two taxation domain authorities were encoded using a dichotomous variable: 1: state-level (i.e., NYDTF) and 2: federal-level (i.e., IRS). Finally, habitual Internet usage was measured by a question that asked the amount of time that subjects usually spend on the Web.

4.2. Data Collection and Analysis

The first wave of data collection yielded 87 completed questionnaires with a 46.5% response rate. After an automatic and manual inspection[4] of the responses, 79 cases were included for further analyses. The web-based survey system for the second survey logged 107 visitors, of which 71 responses were usable. The data from the two waves of survey administration were combined and re-grouped according to their task difficulty (i.e., service domain), which resulted in 68 and 82 cases for vehicle/license and taxation domains, respectively. The two groups of data were analyzed together for measurement model testing and separately for structural model testing. A partial least square (PLS)-based structural equation modeling (SEM) tool[5] was used for the analyses. The purpose of this study is phenomenological in nature; it is not to estimate accurate parameters in the structural model, but to identify major factors that affect potential users' usage intentions and to compare their cognitive patterns in the two different domains of government services. Therefore, the primary concerns of this study are applicability of the suggested model and relative impact sizes of the possible antecedents, which make a PLS-based approach preferable to the covariance-based SEM technique.

The reliability and validity of the data were also examined by using PLS. The reliabilities of the 35 individual items (including the three construct score items for trust in e-Gov agent), measured by each item's standardized loading on its corresponding construct, were all over the ideal level of 0.70 [9]. The internal consistency of individual constructs was measured by composite reliability, and the lowest

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[4] The responses were examined for inconsistent answers to reverse-worded questions, low variance within a case, and obvious sign of insincere answers.

[5] The statistical analysis package used was PLS Graph v3.0.

composite reliability in the model was 0.800, which is well over the acceptable level of 0.7 [27]. Regarding discriminant validity, every construct achieved an acceptable level in the examination of average variance extracted (AVE) value and inter-construct correlation [6] (Table 2). The high inter-construct correlations between trust in e-Gov agent (TrustAgent) and the three relational trusting beliefs (i.e., Integrity, Benevol*ence*, and Dom*ain*Comp*etence*) are normal because trust e-Gov agent is the second-order construct measured by the construct values of the three trusting beliefs. While the three trusting belief measures were not included in the structural models<mark>, their inter-construct correlations and AVE values are listed in Table 2, showing the strong relationships and discriminant validity of the three trusting belief measures. In addition, the correlation coefficients of the nine individual measurement items are stronger with their respective trusting belief construct than with the other two (Table 3), confirming the nonexistence of problematic cross-loadings between the measurement items.</mark> Habitual Internet usage (IntUsage) and authority level (AuthLevel) have an AVE value of 1 because they are measured by a single measurement item.

Table 2. Inter-construct Correlations (AVE in diagonal)

	UseInfo	UseTran	RelUseful	IntComp	TrustAgent	Integrity	Benevol	DomComp	StrAssu	DispTrust	SiteQlt	IntUsage	AuthLevel
UseInfo	**0.706**												
UseTran	0.660	**0.723**											
RelUseful	0.554	0.615	**0.651**										
IntComp	0.548	0.596	0.645	**0.817**									
TrustAgent	0.483	0.551	0.539	0.767	**0.752**								
Integrity	0.424	0.554	0.505	0.701	0.947*	**0.775**							
Benevol	0.295	0.428	0.425	0.584	0.841*	0.752	**0.844**						
DomComp	0.545	0.444	0.471	0.713	0.806*	0.690	0.426	**0.763**					
StrAssu	0.340	0.465	0.361	0.455	0.433	0.450	0.338	0.330	**0.750**				
DispTrust	0.186	0.157	0.277	0.267	0.312	0.278	0.305	0.227	0.339	**0.573**			
SiteQlt	0.166	0.370	0.667	0.636	0.574	0.525	0.471	0.546	0.353	0.224	**0.608**		
IntUsage	0.154	0.077	0.011	0.119	0.070	0.103	-0.041	0.116	0.096	-0.089	-0.058	**1.000**	
AuthLevel	0.268	0.179	0.031	0.156	0.054	0.099	-0.214	0.258	0.225	0.154	0.134	0.234	**1.000**

* The inter-construct correlations are high because Trust in Agent was measured by the construct values of Integrity, Benevolence, and Domain Competence.

Table 3. Standardized Score Correlations: Trusting Belief Measures

	Integrity	Domain Competence	Benevolence
TBIntegrity1	**.902**	.846	.806
TBIntegrity2	**.692**	.612	.660
TBIntegrity3	**.970**	.897	.897
TBDomComp1	.885	**.971**	.815
TBDomComp2	.771	**.820**	.736
TBDomComp3	.809	**.885**	.779
TBBenevol1	.842	.763	**.907**
TBBenevol2	.803	.725	**.822**
TBBenevol3	.849	.753	**.896**

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[6] Correlations between standardized item scores and construct scores were also checked for potential cross-loadings. The correlation table is available upon request.

5. Results

Figure 3 and 4 show the SEM analysis results for vehicle/license service domain and taxation service domain, respectively. The proposed model explained about 32% and 50% of the variances in the two dependent measures in the vehicle/license domain, and 44% and 50% of those in the taxation domain. In the vehicle/license domain (Figure 3), both, relative usefulness of website and Internet competence of e-Gov agent had significant effects on intentions to use both types of e-Gov services (information search and transactions). Structural assurance of the Internet also showed a significant effect on the transaction intention. In contrast, relative usefulness of website showed much stronger effects on intention to use website for information ($\beta = 0.511$, $p<.01$) and for transaction ($\beta = 0.569$, $p<.01$) in the more complex taxation domain (Figure 5), compared with its effects in the vehicle/license domain ($\beta = 0.297$, $p<.05$ for Information, $\beta = 0.218$, $p<.05$ for Transactions). Neither Internet competence of e-Gov agent nor structural assurance of the Internet had hypothesized effects on the corresponding intentions.
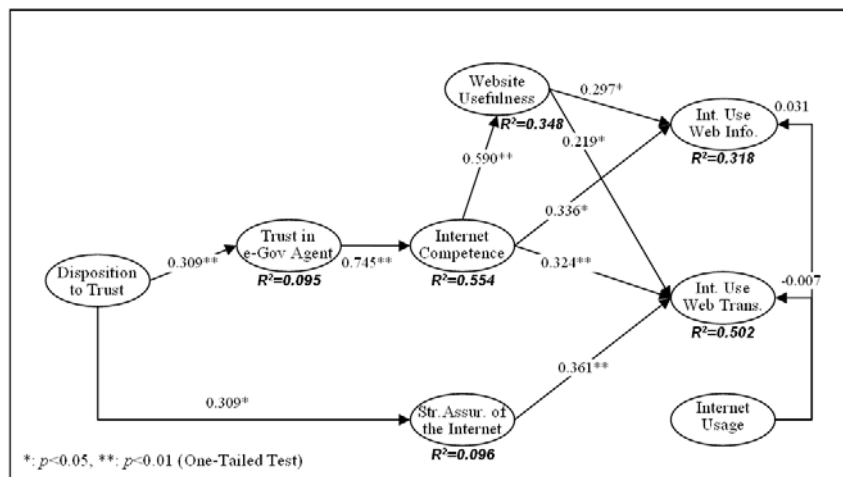
Internet competence belief

Figure 3. Test Results of e-Gov Service Acceptance Model: Vehicle/License Service Domain
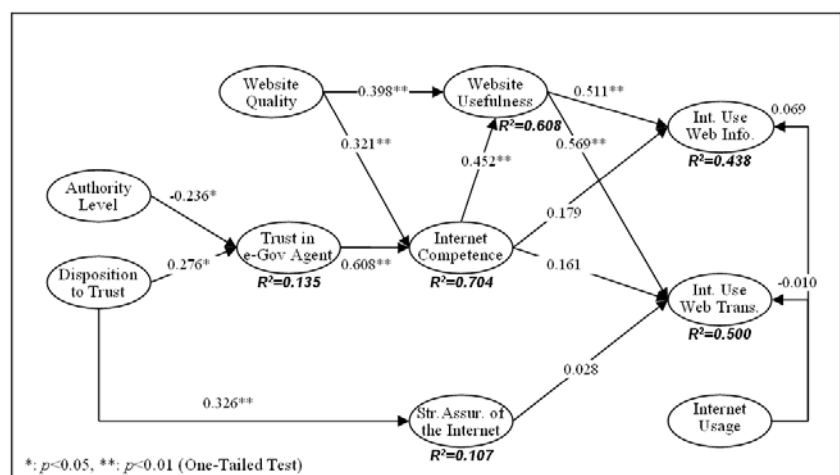
Figure 4. Test Results of e-Gov Service Acceptance Model: Taxation Service Domain

exerted a statistically and substantively significant influence on relative usefulness of website in both domains, even when effects of

direct experience (i.e., perception of website quality) were accounted for. That is, the effects of perception of website quality on usefulness of website ($\beta = 0.398, p<.01$) and Internet competence belief ($\beta = 0.321, p<.01$) were both significant, when tested in the taxation service domain. The effect of trust in e-Gov agency on Internet competence also turned out to be significant in both domains. Specifically, the transfusion of trust ($\beta = 0.608, p<.01$) was as strong as twice the effect of perceived website quality in the taxation domain.

The effects of disposition to trust were significant on both trust in e-Gov agent and structural Assurance of the internet in both domains, conforming previous research. Interestingly, the path coefficient of authority level was in the opposite direction ($\beta = -0.236, p<.05$), meaning people trust the federal level e-Gov agent (i.e., IRS) less than they do the state level counterpart (i.e., NYDTF). The effects of the other control variable, habitual Internet usage, on usage intentions were not significant in both domains. The results are summarized in Table 4.

Table 4. Results of Hypotheses Testing

Hypotheses				Results	
#	Cause	Effect	Result	Vehicle/ License	Taxation
H1a	Usefulness of Website	Increases	Int. to use Web Information	Supported	Supported
H1b		"	Int. to use web Transactions	Supported	Supported
H2a	Task Complexity	Strengthens	H1a in Taxation	Supported	
H2b		"	H1b in Taxation	Supported	
H3a	Internet Competence	Increases	Int. to use Web Information	Supported	Not supported
H3b		"	Int. to use Web Transactions	Supported	Not supported
H3c		"	Usefulness of Website	Supported	Supported
H4	Str.Assur of the Internet	"	Int. to use Web Transactions	Supported	Not supported
H5a	Website Quality	"	Usefulness of Website	Not tested	Supported
H5b		"	Internet Competence	Not tested	Supported
H6	Trust in e-Gov Agency	"		Supported	Supported
H7	*Authority Level*	"	Trust in e-Gov Agency	Not tested	Opposite sign
H8a	*Disposition to Trust*	"		Supported	Supported
H8b		"	Str.Assur of the Internet	Supported	Supported
H9a	*Internet Usage (Habit)*	"	Int. to use Web Information	Not supported	Not supported
H9b		"	Int. to use web Transactions	Not supported	Not supported

Control variables in Italics.

6. Discussions and Conclusion

The present research synthesized a model that explain citizens' acceptance of online compliance services by critically applying two widely accepted information systems adoption approaches into the multi-channel e-Gov service environment. One approach is the traditional utility-oriented view on technology

acceptance, which was originally developed for organizational settings, and the other is the trust-based approach, which has been developed more recently in the e-commerce context. While both approaches have been vigorously tested and have earned considerable respect within their focus area, neither has logical structure readily applicable to an e-Gov context. By combining the two approaches and adapting the model structure to reflect the distinctive characteristics of the e-Gov service context, the proposed model of e-Gov compliance services acceptance offers a useful framework to analyze citizens' acceptance of various government services provided online.

The paper also theorized and empirically tested, using the proposed model, the effects of task complexity on citizens' decision to use e-Gov services. Unlike the B2C e-commerce context where the interactions between online stores and consumers are largely limited to product searches and order placement, or the organizational IT context where employees need to deal with a limited number of job-related information systems, citizens are exposed to a great variety of G2C e-Gov services that involves varying levels of task complexity. Therefore, it is critical to understand how task complexity changes citizens' decision criteria for e-Gov service acceptance.

6.1. Implications of the Study

The results show that the relative usefulness of an e-Gov service website has a much stronger impact on citizens' intentions to use the e-Gov website when the government-citizen interaction involves a complex task (e.g., tax-return filing) than a simple task (e.g., vehicle registration renewal). Furthermore, there seems to exist a complementary, trade-off relationship between usefulness and other trusting beliefs (i.e., Internet competence and structural assurance of the Internet). In the taxation domain, where a more complex task is required, relative usefulness is the only factor, among the four hypothesized direct determinants, that counts in citizens' decision to accept the e-Gov service, yet this single factor explained as much variance in citizens' acceptance intentions as the three factors did together in the vehicle/license domain (a simple task situation). Although this is an exploratory study, and thus the complexity effects are subject to further scrutiny, the evidence from our empirical study strongly suggests that task complexity may have a profound impact on peoples' online service acceptance decision by moderating

not only the usefulness effects, but also a wide range of factors that can influence people's online service usage intentions.

Confidence in Internet competence of e-Gov service providers is an important determinant of citizens' e-Gov service usage intentions when they consider a simple compliance task, but it may not have a significant direct impact on the intentions when the service is for a complex task. Nevertheless, Internet competence of e-Gov service providers is still an important factor that has a considerable indirect effect through relative usefulness. This effect is substantively significant when the direct effects of website quality on both relative usefulness and Internet competence are accounted for. This result is in contrast with a previous study in a non-compliance, simple-task service domain (anti/counter-terrorism) [33] that suggested a spurious relationship between Internet competence and relative usefulness caused by perceived website quality. Clarification of the relationship, especially in conjunction with task complexity and previous experience with the e-Gov service system, will be a good research direction to extend the current study.

The role of structural assurance of the Internet also needs to be clarified. We suspect that task complexity caused citizens to narrowly focus on the usefulness aspect, exhausting their mental resources to pay attention to other factors. However, this reasoning cannot explain the significant effect of Internet safety perception observed by Phang, et al. [41] in a relatively complex (i.e., online financial account management) e-Gov service environment. We may need to bring in the risk aversion factor[7], in addition to task complexity, to explain this inconsistency. With the increasing awareness of information security problems on the Internet, the absence of the structural assurance effect in the complex-task situation is yet surprising and disappointing. One meaningful direction for future research will be finding a moderator that can increase the effect of structural assurance of the Internet on intention to use e-Gov website for transaction, even in a complex-task situation. Such research should also find a way to improve structural assurance of the Internet, in addition to individual disposition to trust, because the disposition accounts

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[7] Phang, et al.'s study examined a service for seniors. Refer to Phang, et al. 2006 article for further information about the characteristics of the e-Gov service examined in their study.

for only about 10% of the variance in structural assurance of the Internet. Using perceived risk from the Internet environment, in place of structural assurance of the Internet, in the model may also alleviate this problem because propensity to take risk and belief about the Internet safety are already reflected in perceived risk.

Effects of control variables are also very interesting. We expected to see a positive relationship between the authority level of a government agency and trust in the agency, but the study results show a significant relationship in the opposite direction. It could be just for the agencies included in our test (i.e., IRS and NYDTF) or could be an interaction with the level of trust in the federal government. In any case, this will be an interesting avenue to explore, especially for inter-disciplinary e-Gov researchers or researchers in the public administration and political science areas. The absence of habitual usage effect is also interesting. It does not seem that habitual use became a condition for relative usefulness because the inter-construct correlation is just 0.011 (Table 2). One explanation would be the similar demographic characteristics in the study sample. This factor should be tested with a larger, heterogeneous sample group. Nevertheless, given that the Web is becoming ever popular, this finding tells what to look at when e-Gov service providers design a service in the future.

Provided the abovementioned findings are confirmed and generalizable, government officials should first assess the task complexities of their interaction processes with citizens before they set the priority and focuses of e-Gov services development projects. If an interaction (e.g., a compliance task) involves ambiguous terms and concepts (e.g., tax law, legal contracts) and uncertainty in the consequence (e.g., a minor disadvantage in benefit consideration, gain or loss of considerable money, or imprisonment?), the e-Gov initiative should focus on the task/decision support functionality of the e-Gov service system. On the other hand, if a G2C interaction process is simple and straightforward, so citizens clearly understand what information/action is required and what the results will be (e.g., paying a traffic fine), the e-Gov service agency also need to demonstrate its capability to flawlessly handle the process over the Internet and the security of the Internet environment, especially in comparison with other available interaction media (e.g., face-to-face, telephone, mail) for the same interaction. An e-Gov service agency can improve

the quality of its website in order to improve citizens' perceptions of the relative usefulness of its e-Gov services. Another effective way to do so is to make them believe its Internet competence. However, Internet competence belief may require a multitude of improvements in citizens trusting beliefs about the e-Gov agency.

6.2. Future Research Needs

The special characteristics of e-Gov compliance services provided us with a great opportunity to clarify some relationships that have been convoluted in the previous e-commerce/technology adoption studies. For example, the compliance service environment allowed us to isolate channel selection problem from vendor selection or entry-exit relationship problems. The e-Gov service context also made sense to compare decision criteria for heterogeneous services. This is the first study, to our knowledge, to compare online services with varying degree of task complexity. While more robust and rigorous research is necessary to validate and extend our findings, the implications of task complexity and changing decision criteria for online service acceptance may be applied to many other online service contexts outside of e-Gov compliance services.

As an exploratory study in a relatively young research area, this study has several limitations as well. The convenient sample and limited number of e-Gov services included in the study do not allow the findings to be generalized to the whole population of potential e-Gov service users. We paid special attention to the research design and targeted one of the largest potential user groups of very popular e-Gov services. While the findings can help e-Gov initiatives to prioritize their G2C e-Gov service projects, such prioritization for efficient resource allocation may not be an appropriate criterion for some public services from equality standpoint. For services targeting seniors or under-represented groups, non-acceptance of e-Gov services may be mainly caused by lack of access to computer, low computer literacy, and lack of financial/legal infrastructure to support online interactions. Such digital divide issues will also have more profound effect in less-developed countries. Therefore, studies with a more representative sample of entire population and more diverse e-Gov services are greatly anticipated. The model itself also needs to be extended to include social factors, including digital divide measures, which will influence people with

heterogeneous demographic characteristics. In the current study, we did not require subjects to actually use a specific e-Gov compliance service. Instead, we just exposed them to the e-Gov website in question and measured how they responded to the hypothetical situation. A longitudinal study may be conducted to track changes in citizens' decision criteria as they repeatedly use a particular e-Gov service. Such a longitudinal study will also confirm the directions of causalities in the model. Another limitation of this study comes from its strength in external validity. We used real e-Gov services, among which task complexity is a prominent difference, to provide a kind of quasi-experimental environment to our survey. As a negative consequence, we could not implement a tight control over other environmental factors that could add a noise in our empirical outcomes. In relation to the limited controllability, the study selected two domains of e-Gov services that are likely to differ in the task complexity, instead of measuring the complexity from a randomly selected e-Gov service samples. Consequently, this study could not adopt the product-indicator approach [13, 31, 32] to test the interaction effect between task complexity and website usefulness on the e-Gov service usage intentions. Instead of adding a new interaction variable as suggested by Chin et al. [13], the current study analyzed the two domains separately, which may put the whole set of hypothesized relationships under the moderating effect of task complexity, not just website usefulness effect. Therefore, a follow up study should be conducted, to rule out potential noise effects, in a more controlled environment (e.g., a lab experiment using hypothetical e-Gov service systems under the same condition except task complexity given as a manipulation). Nevertheless, our research made an important contribution by providing a theoretical foundation with an empirical support for the prominent factor (i.e., task complexity), which in turn allows more focused and scrutinized investigations into the role of moderating conditions in the e-Gov services environment.

We believe that this paper offers much to both academics and practitioners in the e-Gov and e-commerce areas. The theoretical model and empirical results in this paper can provide researchers with a sound foundation for further development of government-citizen interactions and acceptance of online services, especially those with tasks of varying degrees of difficulty under multi-channel service environments. Also, the interesting phenomena found in the empirical testing offer meaningful future research topics for

interdisciplinary researchers in the e-Gov and service management areas. For practitioners, the prescriptive knowledge from our findings offers a set of valuable design principles for online government services, which will lead to an online service portfolio that is more acceptable and covers the sweat spots for the particular channel with right functionalities. Some of our findings may also be applied to other domains in the private sector.

Appendix A: Measurement Items

Table A-1. Measurement Items for IRS Website.

Intention to Use e-Gov. Website for Information
1. If I need federal tax filing related information in the future, the **IRS Website** will be the first place I will go.
2. I would feel comfortable depending on the information provided on the **IRS Website**.
3. For federal tax filing related information, I will rely on the **IRS Website**.
Intention to Use e-Gov. Website for Transactions
1. To file a federal tax return, I will use the e-file service on the **IRS Website**.
2. If I need to pay a federal tax, I would pay it using the electronic payment process on the **IRS Website**.
3. I will not hesitate to give my private information (e.g., DOB, home phone number, home address) to the **IRS Website**.
Relative Usefulness of Website
1. I would find the **IRS Website** useful.
2. Using the **IRS Website** enables me to accomplish tasks (i.e., federal tax filing) more quickly.
3. If I use the **IRS Website**, I will increase my chances of getting a favorable result (e.g., reduced cost, saved time and effort, error free transaction, etc.)
Confidence in Internet Competence of e-Gov service provider
1. **IRS** is capable of carrying out online operations like electronic information processing on the Internet.
2. **IRS** is competent in managing its online store.
3. **IRS** is very knowledgeable about how to provide services on the Internet.
Confidence in Structural Assurance of Internet
1. The **Internet** has enough safeguards to make me feel comfortable using it to transact personal business.
2. I feel assured that legal and technological structures adequately protect me from problems on the **Internet**.
3. I feel confident that current technologies make it safe for me to do critical activities on the **Internet**.
Perceived Website Quality *
1. Overall, the **IRS Website** worked very well technically.
2. Visually, the **IRS Website** resembled other sites I think highly of.
3. The **IRS Website** was simple to navigate.
Trust in e-Gov Agent – Benevolence belief **
1. I believe that **IRS** will act in my best interests whenever it can.
2. If I required any help, **IRS** would do its best to help me.
3. **IRS** is interested in my well-being, not just its own.
Trust in e-Gov Agent – Integrity belief **
1. **IRS** would keep its commitments.
2. I would characterize **IRS** as honest.
3. I believe that **IRS** would not deny its responsibility.
Trust in e-Gov Agent – Domain Competence belief **
1. **IRS** is capable of providing federal tax filing services.
2. **IRS** is competent and effective in providing federal tax filing related services.
3. **IRS** is very knowledgeable about federal tax filing.
Authority Level *
Re-coded from the questionnaire version number (v1: NYDMV, v2: NYDTF, v3: IRS)
v1: State-level, but not applicable (the only site examined in the domain).
v2: State-level, v3: Federal-level

Disposition to Trust
1. In general, people really do care about the well being of others.
2. I think people generally try to back up their words with their actions.
3. Large majority of professional people are competent in their area of expertise.
Habitual Internet Usage (Channel Compatibility)
1. How many hours per week do you spend on the Web?
* Please answer approx. hours/week

*   Included only in the taxation domain questionnaires multi-agency
** Construct scores used as reflective indicators of a second order construct: Trust in e-Gov Agent.
Except authority level and Habitual Internet Usage, all items were measured by a seven-point interval scale.

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