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# Factors Influencing Success in U.S. Resident-Government Online Transactions

Matthew Garcia

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**FACTORS INFLUENCING SUCCESS IN U.S. RESIDENT-  
GOVERNMENT ONLINE TRANSACTIONS**

**by**

**MATTHEW J. GARCIA**

**B.A. ENGLISH,  
UNIVERSITY OF NEW MEXICO, 2008**

**THESIS**

**Submitted in Partial Fulfillment of the  
Requirements for the Degree of**

**Master of Public Administration**

**The University of New Mexico  
Albuquerque, New Mexico**

## **DEDICATION**

This thesis is dedicated to my partner of eight years, without whose dedicated support it would never have been written.

## **ACKNOWLEDGEMENT**

I want to express my deep appreciation for my thesis supervisor, Chih-Wei “Will” Hsieh, who provided patient support, much needed wisdom, and thoughtful encouragement along my journey to examine the barriers involved in accessing government.

I would also like to express my appreciation for my committee members, as well as Arika Sanchez, who selflessly proofread for me, and the UNM School of Public Administration for their continued support.

# **FACTORS INFLUENCING SUCCESS IN U.S. RESIDENT-GOVERNMENT ONLINE TRANSACTIONS**

**BY**

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**B.A., English, University of New Mexico  
M.P.A., Public Administration, University of New Mexico, 2012**

## **ABSTRACT**

This study aims to contribute an additional perspective to the body of e-Government research that may aid future studies by theorists and practitioners to improve and innovate the ways in which they use online systems to engage their constituents. U.S. governments have implemented e-Government systems for 20 years, however little credence has been given to the question of how successful stakeholders are in completing tasks using e-Government systems. Tested factors include socio-demographic and socio-economic characteristics, as well as characteristics of civic participation, citizen feelings about the role of government, Internet access methods, and information channels to highlight the myriad of influences on individual successes when interacting with e-Government systems. This study suggests factors such as citizen feelings about the role of government may play a role in how successful one may be in conducting online transactions with government, and discusses a gap between those who frequent civic participation and those with strong feelings about the role of government.

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## **Chapter 1**

### **Introduction**

For public administrators e-Government provides the interesting challenge of meeting the needs of an ever more technology-driven society to provide the same, or sometimes more efficient, public service while trying to preserve equal access to all residents (Dugdale, Daly, Papandrea, & Maley, 2010). E-Government research in social sciences tends to fall into the categories of the Influence of Managerial Practices, the Influence of Organizational and Individual Characteristics, and the Influence of Subcultures (Titah & Barki, 2008). Conceptually, this study fits into the second of Titah and Barki's categories, but discusses the Influence of Organizational and Individual Characteristics in terms of success rather than adoptability or acceptance. Adoptability, to take up practice, and acceptance, approving of use, are separate concepts from success, a favorable or desired outcome (Merriam-Webster).

Success is rarely studied in e-Government research. Rather, researchers favor the Technology Acceptance Model or the Unified Theory of Acceptance of the Use of Technology, both of which measure not success, but acceptance and adoptability. User success research in e-Government mostly stems from non-American sources, such as New Zealand, where it has been measured as a function of controlled task completion, but not as a function of personal task completion (Cullen & Herndon, 2006). Personal feelings contribute to motivational factors for using expensive e-Government systems,

and researchers who wish to understand American usage cannot ignore success. Nor can it be ignored by practitioners who wish to increase their service usage in efforts to reinforce IT budgets in governments around the U.S. Theorists and practitioners must ask themselves, “Why do people use this system?” Ecological systems theory dictates that many factors are involved in each person’s decision-making processes, therefore, one cannot assume that presumed efficiency on part of the user is the only factor in why he or she chose to go online to conduct business with government. Public administrators, therefore, must investigate possibilities as to the external factors influencing reported successes.

Looking back, government agencies in the U.S. and across the world have been implementing e-Government systems for approximately the past 20 years. In the U.S., the *E-Government Act of 2002*, defines e-Government as,

[t]he use by the Government of web-based Internet application and other information technologies... to enhance the access to and delivery of Government information and services to the public, other agencies, and other Government entities... or bring about improvements in Government operations that may include effectiveness, efficiency, service quality, or transformation. (Hernon, Cullen, & Relyea, 2006, p. 26)

Over the past two decades national, state, and local governments in the U.S. have increasingly provided online information and services, though federalism allows different standards to be used at each level of government. The U.S. national government follows the standards set in the E-Government Act of 2002. In addition to the E-Government Act of 2002, Presidents and executive branch administrators have initiated projects and guidance, such as: Clinton’s Memorandum on E-Government, Bush’s President’s Management Agenda, the Quicksilver Initiatives, Federal Enterprise Architecture Initiative, OMB Lines of Business Initiatives and, most recently, Vivek Kundra’s 25-

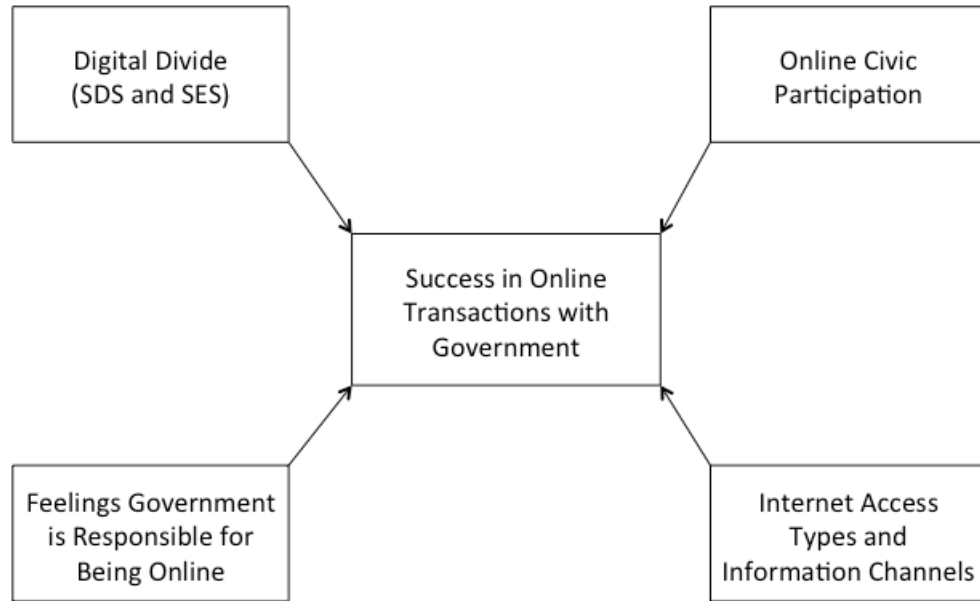
Point Implementation Plan to Reform Federal Information Technology Management (Hernon et al., 2006). State and local governments follow state statutes and comply with national government access legislation such as the Americans with Disabilities Act. Implementing online government systems for users began with information-based web sites, and then extended into the interactive web sites we use today. In U.S. governments standards and strategic plans for e-government usage exist, however no credence has been given to the question of how successful stakeholders are in completing tasks using e-government systems. That success relies not only on users to use a particular e-government system, but also on their motivation to complete the task. Motivations such as civic participation, or even how residents feel about government's responsibilities for implementing and maintaining e-government systems are but two investigated in this study. Still, several factors may influence success prior to the user beginning an e-government process, such as those discussed as part of the digital divide, access mode, or information channels. The conceptual framework for this study was derived from these ideas being influencing factors on the success of in conducting online transactions with government in the U.S. It uses Pew Research Center's Internet and American Life Project data from a 2009 telephone survey gathering information on who accesses government, why and how. Further rationale for choosing this dataset is discussed in Chapter 3: Methodology. This paper aims to contribute an additional perspective to the body of e-government research that may aid future studies by theorists and practitioners to improve and innovate the ways in which they use online systems to engage their constituents.

## **Chapter 2**

### **Literature Review**

Factors influencing user success in online government systems are currently unknown, but we know from the body of research on models such as the Technology Acceptance Model and the Unified Theory of Acceptance of the Use of Technology that the digital divide has played a traditional role in moderating Americans' usage of technology. The digital divide is typically described in terms of socio-demographic and socio-economic characteristics, and includes technology subscriptions like Internet services. In addition to the digital divide, past researchers have identified civic participation and feelings about the government's roles as being influential on individuals using government systems. Likewise, information channels play a role in why individuals seek out specific government services. These concepts contribute to a conceptual framework for understanding influencing factors on success when conducting online transactions with government (Figure 1). Each plays a unique role influencing user motivation.

**Figure 1: Conceptual framework describing factors influencing success in online transactions with government**



The following chapter is divided into four sections discussing the above factors in regard to e-government. First, there is a section describing research pertaining to the digital divide. Following that is a section describing the role of government in e-government. Next, is a section discussing citizen roles in e-government. Lastly, there is a section devoted to the roles of information channels and access types.

### **Who Uses e-Government Systems: Traditions and Exceptions to the Digital Divide**

Researchers seem to agree that the increasing use of Internet and mobile network technologies has placed said technologies as a priority in U.S. residents' lifestyles (Cromer, 2010); however, users experience barriers accessing e-Government systems for

both socio-economic and socio-demographic reasons. These reasons have spawned the multidisciplinary field of digital divide studies. The digital divide describes the gap between those capable and not capable of acquiring and using technology. Traditionally, those on the capable side of the digital divide in the U.S. are White, middle-aged, males who earn an upper middle-class income (Cotton & Jelenewicz, 2006; Dimatrova & Chen, 2006; McNeal, Hale, & Dotterweich, 2008; Sylvester & McGlynn, 2010). Conversely, children, the elderly, females, racial and ethnic minorities, and those with low socio-economic status (SES) are on the other side of the divide (McNeal, et al., 2008). College students tend to act as the traditional exception to the digital divide, due to high accessibility and need (Cotton & Jelenewicz, 2006).

Even from a young age males tend to engage technology more willingly than their female counterparts (Livingston & Helsper, 2007; Quintellier & Vissers, 2008). As they age, males increase their frequency of use (Livingston & Helsper, 2007). In terms of gender binary, male and female users are attracted to different online systems (Royal, 2008). Male users tend to use the Internet to play games (Livingston & Helsper, 2007; Cotton, 2006) and to discuss traditionally male-centric topics (Royal, 2008; Orchard & Fullman, 2008), whereas female users tend to use more social components such as blogs and social media (Cotton & Jelenewicz, 2006; Livingstone & Helsper, 2007; Royal, 2008; Orchard & Fullman, 2010). Interestingly, both genders' usage decreases during late puberty (Livingstone & Helsper, 2007). Some studies defy the gendered digital divide, claiming that female respondents were more likely to engage government online than via other methods due to the lack of confrontation involved in online transactions (McNeal, et al., 2008).

Age plays an important role in understanding technology users. For example, younger people are introduced to Internet technology as a component of everyday life (Livingstone & Helsper, 2007; Quintellier & Vissers, 2008; Sylvester & McGlynn, 2008). There seem to be particular age ranges where Internet usage is higher than others, such as adolescents in their early teens, college students, and professionals who seem to use the Internet frequently (Cotton & Jelenewicz, 2006; Livingstone & Helsper, 2007; McNeal, et al., 2008; Sylvester & McGlynn, 2008). Individuals in developmentally-heavy periods of their lives, such as late puberty and late twenties seem to decrease their usage as their resources are needed elsewhere (Livingstone & Helsper, 2007; McNeal, et al., 2008; Sylvester & McGlynn, 2008). While younger generations tend to use online systems more frequently and with more skill (Quintellier & Vissers, 2008), the elderly are not incapable (Sourbati, 2009). Rather, the elderly in one study considered the Internet a gimmick that, despite its usefulness, was unnecessary (Sourbati, 2009). This gimmick idea is not pervasive in the elderly, with some users referring to it as a life-changing service, but the cost, social investment, and personal dedication to learning a non-essential set of skills and concepts act as barriers (Sourbati, 2009). Though as time moves forward, and today's generations age, there is a higher likelihood of those skills being present in the elderly (McNeal, et al., 2008).

Almost all researchers agree that user educational attainment greatly influences their technology use, adoption, and acceptance (Dimatrova & Chen, 2006; Streib & Navarro, 2006; McNeal, et al., 2008). Educational attainment was found to influence digital literacy (McNeal, et al, 2008). Digital literacy can be learned, but distracts those with low resources from other life needs. Many factors influence digital literacy, such as



individual users' functional literacy (McNeal, et al., 2008) and experience with using the Internet (Mehra, Merkel, & Peterson Bishop, 2004; Livingstone & Helsper, 2007; Thomas & Streib, 2005). Personal need overcomes barriers to digital literacy in college students (Cotton & Jelenewicz, 2006; Dugdale, et al., 2005; Dimatrova & Chen, 2006; Royal, et al, 2008), while time investment deters the elderly (Sourbati, 2009). Still, an Australian shift to online-only services for government assistance programs was enough to aid aboriginal settlements to increase their digital literacy, although government-provided intermediaries often aid individuals (McCallum & Papandrea, 2009). Need also affected the motivation of lower socio-economic class individuals to either learn or find intermediaries to assist them in contacting government (McNeal, et al, 2008; Mehra, et al., 2004). Moreover, in a Canadian homelessness assistance program, digital literacy was successfully taught to an educationally mixed population (Moser, 2009).

Socio-economic status (SES) follows gender, age, and educational attainment as a primary factor contributing to the digital divide (Mehra, et al., 2004; Dugdale, at al., 2005; Dimatrova and Chen, 2006; Livingstone & Helsper, 2007; McNeal, et al., 2008; Sylvester & McGlynn 2008; Moser, 2009). Traditionally, those whose resources are greater have greater personal capability to access the Internet. Current research shows that mobile technologies are changing the impact of the SES factor. For example, low SES users are able to use mobile phones with *smart* capabilities to go online (McNeal, et al., 2008). Similarly, low SES users are utilizing government or community-funded access centers to use technologies they would otherwise be unable to afford (Mehra, et al., 2004; Moser, 2009; McCallum & Papandrea, 2009). Younger users and college students can often find access through educational systems (Cotton & Jelenewicz, 2006;

Livingstone & Helsper, 2008). Recent technological advancement in mobile technologies and increasing amounts of government-provided means to access the Internet seem to mediate SES by providing alternatives to the high initial costs of using technology.

Finally, race, ethnicity, and culture seem to strongly moderate user adoption and acceptance of technology (Mehra, et al., 2004; Cotton & Jelenewicz, 2006; Sourbati, 2009; McNeal, et al., 2008; Duque & Yvalnez, 2009; Moser, 2009; McCallum & Papandrea, 2009; Thomas & Streib, 2005; Sylvester & McGlynn, 2010). Literature suggests a narrowing of the digital divide for race, ethnicity, and culture, but the rate of change is slow. Whites' Internet access and digital literacy tends to be highest, while Hispanics and African Americans tend to have lower rates in most studies where government has not interceded with programming. McNeal, et al., (2008) show Hispanics tend to rely on one family member, typically younger males, to facilitate online needs. Mehra, et al., (2004) illustrate how African American, low SES families increased their digital literacy via government-provided programs that included awarding personal computers to participating households. Though Whites', African Americans', and Hispanics' usage, adoption, and acceptance are widely discussed, many studies avoid discussing Asians, though McNeal, et al., (2008) remarked that Asian Americans "were more likely to perceive that the Internet improved their communications with the local government" (p. 220).

Cultural studies of usage habits describe regional or cultural usage habits similarly to racial and ethnographic studies (Duque & Yvalnez, 2009). In the highly interpersonal culture of the U.S. South, isolating oneself online causes social capital to

decrease, suggesting that other highly interpersonal cultures may have similar reasons for not frequently using the Internet.

In summary, the digital divide, as a social problem, is multifaceted and not necessarily geographically centered. American and non-American post-colonial nations address the same or similar problems by encouraging low SES users to access government online. Likewise, racial, ethnic, and cultural factors highly influence individuals' usage, adoption, and acceptance of online methods. The influence of age and gender on online habits seems to follow consumer media consumption interests and habits. For public administrators, McNeal et al. (2008) concisely describe the influence of the digital divide in that “[e]-government appears to be a double-edged sword, motivating citizen-initiated contact of government for some...while magnifying existing gaps based on other factors” (p. 226). Digital divide research illustrates the complicated nature of understanding how individuals and demographic groups use, accept, and adopt online opportunities, but is highly subject to changes in both the state of technology and living circumstances. Therefore, any study of e-government must include demographic characteristics to ensure the continuation of understanding changes to the state of the digital divide. This study approaches the digital divide from the perspective that challenging digital divide traditions will elucidate changes to the state of the field.

H<sub>1</sub>: Non-White, female, low to median income, younger or older aged, and who have educational attainment less than a bachelor's degree are more likely to achieve success in online transactions with government.

### **The Role of Government in Implementing E-Government**

E-government systems are primarily the responsibility of government. Globally, definitions and actions regarding governments' role in the digital divide are converging

(Rodriguez-Bolivar, Perez, & Lopez-Hernandez, 2006; Stewart, Gil-Ehui, Tian, & Pileggi, 2006). In the U.S., e-government follows several paths dictated by federalism. On the national level, U.S. e-government follows the E-government Act of 2002 (U.S. PL 107-347) and the Office of Management and Budget's *Memorandum for the Heads of Executive Departments and Agencies: Policies for Federal Agency Public Websites* (2004). Federal-level U.S. agencies, as well as other users, have access to guidelines and support on *webcontent.gov*. Great care has been taken to ensure accessibility for those who have disabilities, speak languages other than English, and have lower means to access the Internet.

At the state level, each state designs and implements its own policies, tending to include guidelines on accessibility, information privacy, and information dissemination as mandated by federal legislation. Local governments follow their state guidelines as well as any local initiatives, generally meant to enhance public services (Melitski, Holzer, Kim, Kim, & Rho, 2005). One can imagine many different implementations of e-government given the amount of federal agencies, state, and local governments in the U.S. alone.

Government is responsible to all stakeholders who would access an e-government system. Its primary responsibility is to ensure its information technology (IT) infrastructure can adequately support the e-government initiative. E-government initiatives are often started as reforms and regarded as transformative (Asgarkhani, 2005; O'Neill, 2009). For governments, IT infrastructure acts as the largest barrier to e-government implementation due to its cost, highly technical nature, and the time involved for initial setup and maintenance (Brewer, Beubauer, & Geiselhart, 2006). While a

centerpiece of communication and information, the Internet, and thus the content thereon, is prone to and requires frequent changes and maintenance. Transforming germane government services into e-government services creates challenges in public administration by way of public affairs, IT infrastructure and support, and public security, to name a few. E-government systems and the public administrators involved must possess both long-view concepts and relative agility, however political, structural, administrative, and institutional culture barriers prevent progress (Kernaghan, 2005).

Design carries as much weight with citizens as technology (Coleman, Lieber, Mendelson, & Kurpius, 2008). Large differences in web standards between federal, state, and local governments create a growing need for coordination between levels of government (Brewer, et al., 2006). Moreover, the agencies within each level of government add complexity to models of e-government administration. Some governments have web standards designed for and distributed to their agencies and departments, others allow each agency or department to have an individual design built and administered. This is problematic and inconsistent, creating divides in how citizens view the value of e-services (Turow & Hennessey, 2007; Brainard & McNutt, 2010), though some governments may be working on a maturation rather than a technological adoption model (Brown, 2007). Moreover, Chen (2010) describes government responsibility online as highly influenced by top administrators. Administrators bearing strong management commitment to citizen services are more likely to provide more integrated citizen information systems. This holds true despite administrator or government body technical capacities, however some research suggests otherwise (Brainard & McNutt, 2010).

Complicating these inconsistencies are technological advances, such as Web 2.0 technologies (Cromer, 2010), a technology meme that has made its way into industry, moving from a mostly informational web environment to a highly interactive web environment including social media and mobile technologies (O'Reilly, 2005). Web 2.0 technologies allow users to interact better with all online systems and provide instant feedback to system owners. Cromer (2010) suggests consumer-users are still building trust with Web 2.0 technologies, but nonetheless they are still demanding dynamic and interactive systems allowing convergence of social media and mobile technologies with conventional web sites.

Governments must ensure the implemented e-government system meets the needs of those it is meant to serve. Continuing to understand what technology should be implemented for a particular system means government agencies must also understand what transaction types are necessary for the system. Several transaction types exist, ranging from providing agency and service-related description to service provision and detailed government information, such as financial data (Rodriguez-Bolivar et al., 2004; Brainard & McNutt, 2010). These systems must coincide with public demands for transparency and accountability measures that are easy to find and access. It is in meeting the needs of the people that e-government offers the greatest challenges and opportunities for public administrators to engage stakeholders. Interestingly, between 2005 and 2010, research has shown a dramatic shift in e-government usage habits from information-based user and agency habits to interaction-based user and agency habits (Asgarkhani, 2005; Brainard & McNutt, 2010). Asgarkhani (2005) and O'Neill (2009) note the transformative properties e-government can potentially bring to government-citizen

engagement, and increased government IT capacities may suggest those transformations are closer than anticipated.

Governments must ensure residents are able to access the system and that administrators and employees are trained to use the system. It is no longer enough for government to only place information on web sites and expect stakeholders to be content. Governments must consider citizen users and non-citizen users as customers (Vidler & Clarke, 2005). For citizen-centric service information systems, governments must also request feedback from those who are intended to use the systems (Chen, 2010). Stakeholders demand interaction with government via its web presence. Demand is exacerbated by the correlation that exists between those with low rates of using technology and those who receive government services (Dugdale, et al., 2005). To facilitate those needs, governments are providing technology-training programs and access centers to socio-demographic minorities (Mehra, et al., 2004; Moser, 2009; McCallum & Papandrea, 2009). While these efforts help in some ways, governments also need to provide process and technical training to public administrators and public employees. Some governments show both understanding and commitment to this need (Mehra, et al., 2004; McCallum & Papandrea, 2009), though a gap still exists in the U.S. (Chen, 2010).

In summary, governments' responsibilities in e-government lay in implementation and maintenance. To do so requires public administrators and IT workers to stay current on advancing technologies. But many questions exist regarding governments' roles in e-government. As technology advances, at what rates should governments adopt advancements? Is the Internet a public sphere, as Gerhards & Shafer (2010) suggest, and

how do governments manage their roles in influencing and directing online communication? Researchers agree governments carry a responsibility to create and maintain a web presence, but how do those ideas translate to users? Citizen users treat e-government as customers do private sector online services. How do their feelings about government's responsibility for being online influence their success in conducting online transactions with government?

H<sub>2</sub>: For all respondents, feeling the government is responsible for being online will have a positive relationship to success in online transactions with government.

H<sub>2.a</sub>: Feeling that the government is responsible for providing general information to the public on its website is positively related to the likelihood of achieving success in online transactions with government.

H<sub>2.b</sub>: Feeling that the government is responsible for posting information and alerts on sites such as Facebook or Twitter is positively related to the likelihood of achieving success in online transactions with government.

H<sub>2.c</sub>: Feeling that the government is responsible for allowing people to complete tasks on the website, such as submitting applications or renewing licenses is positively related to the likelihood of achieving success in online transactions with government.

H<sub>2.d</sub>: Feeling that the government is responsible for allowing people to contact agency officials through the website is positively related to the likelihood of achieving success in online transactions with government.

### **The Role of Citizens in Using E-Government**

While governments are responsible for implementing e-government systems, citizens are responsible for using or not using the systems. Coleman, et al., (2008) define civic engagement as “the coming together of interested groups and citizens to discuss and address issues of concern” with its primary tenant being an “opportunity for increasing citizen input on issues of public concern” (p. 181), but what is the citizen's role in e-government? Certainly it is to use and access the system, barriers to which have been discussed in previous sections. Still, despite barriers such as geography, cost, socio-demographic status, and educational attainment, citizens must ensure they learn to utilize



even basic technologies or they will find themselves requiring digital interpreters (McCallum & Papandrea, 2009). But adequate digital literacy only fulfills a portion of citizen responsibility. Citizens whose cultures function highly on social capital will need to become accustomed to the facelessness of e-government contact methods (Vidler & Clarke, 2005).

Citizens must also understand what parts of the system provide the most satisfaction and usefulness. These preferences may dictate their online behavioral interactions with government (Dimatrova & Chen, 2006; Leung, 2009; Orchard & Fullman, 2010). Furthermore, citizens only access government when they have a reason to access government (Dimatrova & Chen, 2006; Thomas & Streib, 2005; McNeal, et al., 2008).

Finally, as government's usage of technology advances toward a virtual state (Kernaghan, 2009), it is the citizens' responsibility to ensure they continue to engage government online. From an early age we can see Internet activities can have a positive impact on political participation online (Quintelier & Vissers, 2008). This may be changing in the future as the Internet is beginning to be thought of as a public sphere (Gerhards & Schafer, 2010).

Citizens' roles in using e-government are as consumers and advisors. Civic participation has long been the method citizens use to modify policies, regulations, and other government actions. Citizens' feelings that government should be online only describe perceptions of government's responsibilities. The other part of that idea is how involved citizens are in shaping government via civic participation.

H<sub>3</sub>: The frequency of online civic participation is positively related to the likelihood of achieving success in online transactions with government.

### **Accessing Government Online**

Citizens contact government in person, by post, by telephone, and more recently via Internet and mobile methods (Mehra, et al., 2004; Dugdale, et al., 2005; McNeal, et al., 2008; Sourbati, 2009; Moser, 2009; McCallum & Papandrea, 2009; Sylvester & McGlynn, 2010). Compared to the conventional methods of in person, post, and telephone, using digital methods to contact government carries prohibitive costs. Two modes of access exist: mobile technologies and conventional technologies. Mobile technologies consist of smart devices on cellular or other networks that access the Internet for one or more functions, as well as cellular phones and texting devices. Conventional technologies are devices that connect to the Internet via dial-up, broadband, or other services, stationed at a specific place, such as a home, school, or office. For both technologies cost acts as the primary barrier for citizens. Furthermore, McNeal, et al., 2008, report a correlation between wealth and ability to access the Internet.

- H<sub>4.a</sub>: Dial-up Internet access is negatively related to the likelihood of achieving success in online transactions with government.
- H<sub>4.b</sub>: Broadband Internet access is positively related to the likelihood of achieving success in online transactions with government.
- H<sub>4.c</sub>: Unknown connection type is positively related to the likelihood of achieving success in online transactions with government.

Information channels act in congress with access modes. Formal information channels and informal information channels, online and offline, reflect a citizen's ability to contact government (Chen & Dimatrova, 2008; McNeal et al., 2008; Cromer, 2010), gather information about political candidates (Latimer, 2008), and generally contact

government for information or other services. Online information channels include information websites (including news websites), using social media websites, and email.

- H<sub>4.d</sub>: Using email is positively related to the likelihood of achieving success in online transactions with government.
- H<sub>4.e</sub>: Using social networking is negatively related to the likelihood of achieving success in online transactions with government.
- H<sub>4.f</sub>: Using websites for information is positively related to the Likelihood of achieving success in online transactions with government.

## **Chapter 3**

### **Methodology**

#### **Data**

In conducting the literature review for this study two research teams utilized data from Pew Research Center. Other e-government researchers have used Pew Research Center data from large telephone surveys (McNeal et al., 2008; Chen & Dimatrova, 2008). Due to the availability and the completeness of the data as expressed in recent articles using Pew Research Center's datasets (McNeal et al., 2008; Chen & Dimatrova, 2008; Thomas & Streib, 2005), the Pew Research Center's Internet and American Life Project's 2009 Government Online survey data was chosen as it best fit the scope of this study.

The Pew Research Center's Internet and American Life Project conducts telephone surveys with U.S. residents to collect data on a variety of Internet use topics. In 2009, Pew Research Center's Internet and American Life Project conducted the Government Online survey (n=2258), composed of 122 questions (including information probes). Questions ranged from demographic information to questions about usage habits and consumer choices. Additionally, questions related to the 2008 election and general civic engagement with federal, state, and local governments in the U.S. were included in the survey. Finally, consumer-related questions regarding connection type and social media preferences and usage were answered as part of the initial Pew Research Center's Internet and American Life Project survey.

The 2009 Government Online dataset matches the needs of this study. First, the dataset is publically available. Second, the dataset includes demographic characteristics of respondents of varying categories. Third, the survey requested access-related questions including connection type and information channel type. Next, the dataset was the best match because it asks respondents to rate the success of their most immediately previous online government transaction. Though many datasets, such as the American Community Survey, were considered, few datasets contained information within these criteria.

According to the Pew Research Center's Internet and American Life Project 2010 Report, the survey was conducted by telephone and cell phone. The Pew Research Center interviewed 2,258 U.S. resident adults (aged 18 or older) between November 30, 2009, and December 27, 2009. Cell phone interviews of 565 individuals were conducted (Pew Research Center, 2010). Interviews were conducted in both English (n=2,197) and Spanish (n=61). According to the methodology from the primary Pew Research Center's Internet and American Life report from this dataset:

A combination of landline and cellular random digit dial (RDD) samples was used to represent all adults in the continental U.S. who have access to either a landline or cellular telephone. Both samples were provided by Survey Sampling International, LLC (SSI) according to PSRAI specifications. Numbers for the landline sample were selected with probabilities in proportion to their share of listed telephone households from active blocks (area code + exchange + two-digit block number) that contained three or more residential directory listings. The cellular sample was not list-assisted, but was drawn through a systematic sampling from dedicated wireless 100-blocks and shared service 100-blocks with no directory-listed landline numbers. (Smith, 2010, p. 45).

In answering the 122 questions of the 2009 Government Online survey, respondents followed scaled responses, ordinal responses, binary responses, non-scaled categorical responses, or continuous responses. Likert scale responses followed either 1-5 or 1-4 modes (more positive to more negative). A majority of the questions were ordinal,

including income, race, and Internet connection type, among others. Binary responses were generally yes or no excepting gender, which was male or female. Non-scaled categorical responses ranged from preferences to whether the respondent interacted with a choice of several forms of government. Age was the only continuous variable in the dataset. Descriptive statistics are available in Table 1.

**Table 1**  
**Descriptive Statistics**

<i>Variable</i>	<i>N Valid</i>	<i>M</i>	<i>SD</i>	<i>S</i>	<i>Minimum</i>	<i>Maximum</i>
Success in Online Government Transactions	1916	2.24	.999	.998	1	4
Hispanic	1904		.259	.067	1	2
Gender	1916		.498	.248	1	2
Age Scale	1916	2.6618	.84237	.710	1.00	4.00
Race	1862		.869	.754	1	6
Income	1684	5.60	2.188	4.787	1	9
Education	1907		1.427	2.036	1	7
Feelings government agency should allow people to contact agency officials through the website.	1898	1.29	.609	.371	1	4
Feelings a government agency should allow people to complete tasks on the website, such as submitting applications or renewing licenses.	1888	1.38	.711	.506	1	4
Feelings it is today for a government agency should post information and alerts on sites such as Facebook or Twitter.	1890	1.40	.724	.524	1	4
Feelings a government agency should provide general information to the public on its website.	1793	2.64	1.075	1.155	1	4
Frequency of Civic Participation	1916	.4034	.75898	.576	.00	4.00
Internet Access Type	1803		1.060	1.124	1	7
Use of the internet to send or read email.	1914	.95	.226	.051	0	1
Use of the internet to look online for news or information about politics.	1907	1.45	.835	.697	1	3
Use of the internet to look for information from a local, state, or federal government web site.	1909	1.59	.912	.831	1	3
Use of the internet to send email to local, state or federal government.	1915	2.26	.967	.935	1	3
Use of the internet to use a social networking site like MySpace, Facebook or LinkedIn.com.	1916	1.95	.999	.998	1	3
Use of the internet to use Twitter or another service to share updates about yourself or to see updates about others.	1911	2.60	.799	.639	1	3

The 2009 Government Online survey was organized around three principles from President Barak Obama's *Open Government Directive* (Smith, 2010, p. 9). First, that government should be transparent. Second, that government should be participatory. And

third, that government should be collaborative. In the Topline Report, Smith (2010) remarks “just 5% said that their most recent government website interaction was completely unsuccessful” (p. 8). Smith (2010) also remarks that “nearly one quarter of users” were classified in an “online participatory class” (p. 32).

### **Dependent Variables**

This study uses one dependent variable: success in online transactions with government.

The dependent variable is classified in the codebook and dataset as question 20: “How much of what you were trying to do on the government site did you succeed in doing... everything you were trying to do... most of it... only some of it... or none of what you were trying to do?” Answers were coded as 1 for everything, 2 for most of it, 3 for some of it, 4 for none of it, 8 for don’t know, and 9 for refused. For analytical purposes, 8 and 9 are treated as missing. Five hundred forty-three respondents (50.23%) were able to accomplish everything they were trying to do on the government site. Three hundred respondents (27.75%) were able to accomplish most of what they were trying to do on the government site. One hundred seventy-nine respondents (16.56%) were able to accomplish some of what they were trying to do on the government site. Fifty-nine respondents (5.46%) were not able to accomplish what they were trying to do on the government site.

### **Independent Variables**

Independent variables included both pointed and demographic responses addressing the factors from Figure 1. SDS variables include race, Hispanic ethnicity, gender, income range, education attainment, and age. Race options in the survey included White, Black or African American, Asian or Pacific Islander, Mixed Race, Native

American/American Indian, and other. Hispanic Ethnicity provides a binary of Hispanic or not Hispanic. Gender options are male and female. Income range stratified income into categories of Less than \$10,000, \$10,000 to under \$20,000, \$20,000 to under \$30,000, \$30,000 to under \$40,000, \$40,000 to under \$50,000, \$50,000 to under \$75,000, \$75,000 to under \$100,000, \$100,000 to under \$150,000, and \$150,000 or more. Age was categorized as 18-24, 25-34, 35-39, 40-59, and 60+. The education variable was stratified into less than high school diploma/GED, high school diploma or GED, post-high school/GED vocational diploma, some college or associates degree, and bachelor's degree or higher. See Table 2 for demographic characteristics of respondents.

**Table 2**  
**Demographic Characteristics of Respondents**

<i>Category</i>	<i>Count</i>	<i>Frequency</i>
Male	993	44.0%
Female	1265	56.0%
Black or African-American	267	12.1%
Asian or Pacific Islander	38	1.7%
Mixed race	32	1.5%
Native American/American Indian	42	1.9%
Other	21	1.0%
White	1806	81.9%
Hispanic	205	9.1%
Not Hispanic	2039	90.9%
18-24	202	10.2%
25-34	273	13.7%
35-39	152	7.6%
40-59	568	28.5%
60+	795	39.9%
Less than High School Diploma/GED	215	9.6%
High School Diploma or GED	664	29.6%
Post-HS/GED Vocational Diploma	69	3.1%
Some College or Associates Degree	532	23.7%
Bachelor's Degree or Higher	764	34.0%
Less than \$10,000	146	7.8%
\$10,000 to under \$20,000	201	10.8%
\$20,000 to under \$30,000	269	14.4%
\$30,000 to under \$40,000	229	12.3%
\$40,000 to under \$50,000	194	10.4%
\$50,000 to under \$75,000	291	15.6%
\$75,000 to under \$100,000	223	11.9%
\$100,000 to under \$150,000	212	11.3%
\$150,000 or more	103	5.5%



Four independent variables were used to understand feelings about government's role in e-government: feelings government agency should allow people to contact agency officials through the website; feelings a government agency should allow people to complete tasks on the website, such as submitting applications or renewing licenses; feelings it is today for a government agency should post information and alerts on sites such as Facebook or Twitter; and, feelings a government agency should provide general information to the public on its website. Online civic participation is a count variable constructed from four questions (Horrigan 2009, Q25a-d) counting the frequency of respondent participation in online town hall meetings; post comments, queries for information on a blog, online discussion, listserv or other online forum about a government policy or public issue; upload photos or videos online about a government policy or public issues; and join a group online that tries to influence government policies.

The independent variable for frequency of civic participation included responses of high civic participation, moderate civic participation, some civic participation, low civic participation, and no civic participation. The variable was constructed from questions 25a through 25d has a minimum of zero and a maximum of four representing the compilation of binary answers to questions 25a through 25d.

Internet access type included one variable with several options: dial-up telephone line, DSL-enabled phone line, cable modem, wireless connection, fiber optic connection, T-1 connection, and other. Finally, information channels were investigated using several variables requesting whether respondents use the Internet to: send or read email, look online for news or information about politics, look for information from a local, state, or

federal government web site, send email to local, state or federal government, use a social networking site like MySpace, Facebook or LinkedIn.com, use Twitter or another service to share updates about yourself or to see updates about others.

Information channels are discussed via several variables. First, a binary variable was available for whether the respondent uses the Internet at all. Second, is a variable for Internet access type. Third, binary variables surrounding e-communication channels such as email, social networking, and mobile device use were included.

Because the initial survey results suffered from underrepresentation in the dependent variable, the survey was weighted to equalize the distribution using the SPSS weight function. According to Groves, et al., (2004), weighting is allowable under survey design principles to adjust for unit non-response.

### **Data Analysis**

Public administration researchers, as well as other researchers from the social sciences, have employed several analytical methods in research similar to this topic. Several researchers have discussed those affected by the digital divide by using qualitative methods such as interviewing and grounded theory observation (Mehda et al., 2004; Orchard & Fullman 2010). Still others wrote case studies regarding particular social groups, (Livingstone & Helsper, 2007; Royal, 2008; Sourbati, 2009). Perhaps the quantitative researchers have made the largest impression due to their use and understanding of data to express attitudes, actual users, and trends (McNeal et al., 2008). Still, quantitative analysis has yet to be fully explored in this area. Scholars such as Chen and Dimatrova (2008) used ordered logit and other regression methods. Many scholars

used ordinary linear regression methods (Cotton & Jelenewicz, 2006; Livingstone & Helsper, 2007; Sylvester & McGlynn, 2010). Segovia et al. (2010) used a mostly quantitative approach, including Spearman's Rho, Wilcoxon T-Test, and Mann-Whitney U.

The dependent variable, success in online transactions with government, is ordinal in nature. Ordinal variables "are used widely in survey research and to represent poorly measured constructs" (Hoffman, 2004), such as individuals' ratings of their personal success attainment in an online transaction with government. Due to the nature of the dependent variable, ordered logistic regression (ordered logit) was chosen as the primary analysis method. In addition to conducting the ordered logit analysis, tests for goodness of fit, Pearson's Chi-Squared, and tests of parallel lines were conducted. Furthermore, Pseudo- $R^2$  tests for Cox and Snell  $R^2$ , Nagelkerke's  $R^2$ , and McFadden's  $R^2$  were conducted.

Models were constructed using the framework in Figure 1 as well as the hypotheses from the previous section. Four major models were constructed using the characteristics of each main hypothesis. Additional tests were conducted for hypothesis variations. The first model tests the likelihood of achieving success in online transactions with government for non-White, female, low income, median income, and those whose educational attainment is less than bachelor's degree. The second model tests the likelihood feelings that government is responsible for being online will have a positive relationship to success in online transactions with government. This model includes the hypotheses variations: posting information and alerts on sites such as Facebook or Twitter, allowing people to complete tasks on the website, such as submitting

applications or renewing licenses, allowing people to contact agency officials through the website, and providing general information to the public on its website. The third model tests the likelihood that achieving success in online transactions with government will be supported by frequency of online civic participation. The fourth model tests the relationship between information channels and success in online transactions with government. This model includes tests for the hypotheses variations: dial-up users, broadband users, users who don't know their connection type, email users, and social networking users.

Prior to ordered logit analysis the models underwent tests of homoscedasticity. Using SPSS the procedure involved conducting a Levene Test for variance for each model and model variation. Some models passed the homogeneity of variance test, however due to the large sample size this may or may not have an impact on the design. Model 1 mostly passed the Levene test with most variables returning insignificant, therefore the model contains homogeneity of variance. Model 2 passed the homogeneity of variance test at  $p=0.085$ . Model 3 did not pass the homogeneity of variance test for three variables, but did pass for one. Model 4 partially passed the Levene test. Another method using SPSS would be to compare box plot graphs; however interpreting homoscedasticity using the Levene test is more precise. In addition to the Levene tests, tests for parallel lines were conducted to test the assumption "that the relationships between the independent variables and the logits are the same for all the logits" (Norusis, 2012, p. 74).

Ordered logit analysis was conducted via the SPSS Polytomous Universal Model (PLUM) ordinal regression procedure. SPSS PLUM yields results in the form of what it

calls estimates. Estimate outputs from SPSS for PLUM OLS (Logit) can be interpreted by running each estimate through the equation (Hosmer & Lemeshow, 2009, p. 302):

$$\widehat{OR} = \exp(Estimate)$$

Furthermore by subtracting “1” from  $\widehat{OR}$ , the comparable likelihood percentage can be revealed. Likelihood percentages should be interpreted in comparison to the last response for each variable. Therefore, if the variable has four responses, SPSS PLUM will perform ordered logit on responses one through three, but not four. The likelihood percentages computed from the estimates output would be compared to the fourth response.

## Chapter 4

### Results

Results of the SPSS PLUM analysis can be seen in Tables 3, 4, 5, and 6, which are described in this section. Several test results were not significant ( $p > 0.05$ ). Tests are reported below in terms of the hypotheses.

Model 1 investigated socio-demographic and socio-economic characteristics as factors influencing success with e-Government. As can be seen in Table 3, no potential factors were significant ( $p = 0.05$ ), except that for those between the ages of 35-39, which has a significance just under the p-value. The likelihood ratio for those 35-39 was 0.6181, or they were 61.81% more likely than those aged 60 and older to experience success in online transactions with government. Those with “Some College or Associates Degree” were near significant at 0.077. Though there were not many significant tests for this model, there were some interesting results, namely, that there were many largely insignificant results. Gender and income carried the least significant results for all SDS and SES terms, challenging some predispositions coming into the study. Racial results were also largely insignificant, with Asian/Pacific Islanders and Mixed Race individuals being the least significant terms among the races tested. The test for Hispanic ethnicity success yielded a moderately insignificant result.

**Table 3**  
**Results for Model 1: Socio-Demographic and Socio-Economic Factors**

<i>Factor</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>	<i>Likelihood Ratio</i>
Female	.022	0.1367	0.0249	1.0000	.875	1.0218
Male	0 <sup>a</sup>			0.0000		
Black or African-American	.307	0.2188	1.9688	1.0000	.161	1.3593
Asian or Pacific Islander	-.303	0.5224	0.3356	1.0000	.562	0.7388
Mixed race	.286	0.5325	0.2885	1.0000	.591	1.3312
Native American/American Indian	.611	0.4356	1.9693	1.0000	.161	1.8429
Other	-.345	0.7178	0.2309	1.0000	.631	0.7083
White	0 <sup>a</sup>			0.0000		
Hispanic	.410	0.2755	2.2125	1.0000	.137	1.5065
Not Hispanic	0 <sup>a</sup>			0.0000		
18-24	.284	0.2458	1.3376	1.0000	.247	1.3288
25-34	-.127	0.1890	0.4503	1.0000	.502	0.8809
35-39	-.481	0.2421	3.9508	1.0000	.047	0.6181
40-59	.301	0.2059	2.1429	1.0000	.143	1.3518
60+	0 <sup>a</sup>			0.0000		
Less than High School Diploma/GED	-.307	0.4688	0.4292	1.0000	.512	0.7355
High School Diploma or GED	-.192	0.1932	0.9843	1.0000	.321	0.8256
Post-HS/GED Vocational Diploma	.264	0.4028	0.4281	1.0000	.513	1.3015
Some College or Associates Degree	.294	0.1665	3.1221	1.0000	.077	1.3422
Bachelor's Degree or Higher	0 <sup>a</sup>			0.0000		
Less than \$10,000	-.026	0.4102	0.0039	1.0000	.950	0.9748
\$10,000 to under \$20,000	.457	0.3871	1.3927	1.0000	.238	1.5790
\$20,000 to under \$30,000	-.231	0.3316	0.4847	1.0000	.486	0.7939
\$30,000 to under \$40,000	.214	0.3279	0.4244	1.0000	.515	1.2381
\$40,000 to under \$50,000	.165	0.3191	0.2669	1.0000	.605	1.1792
\$50,000 to under \$75,000	.017	0.2851	0.0035	1.0000	.953	1.0170
\$75,000 to under \$100,000	-.003	0.2946	0.0001	1.0000	.992	0.9969
\$100,000 to under \$150,000	.069	0.2905	0.0564	1.0000	.812	1.0714
\$150,000 or more	0 <sup>a</sup>			0.0000		

*p*=0.05

Table 4 shows significant results for model 2. Each factor was analyzed by way of the degree to which respondents answered, therefore responses are further categorized for this model. Terms were compared to those who thought government's responsibility for being online was "not important at all." Terms in three factor categories with strong feelings concerning government's role being online (those who considered it "very important") were found significant, with likelihood ratios of 360.66%, 34.87%, and 48.57% for those who thought government's responsibility was "very important" for allowing people to contact agency official through the website, for allowing people to complete tasks on the website, and for posting information and alerts on sites such as Facebook or Twitter, respectively. Likewise, two factors had significant degrees of "somewhat important." Those who felt government agencies should allow people to contact agency officials through the website had a likelihood ratio of 368.13%, while those who felt the government agencies should allow people to complete tasks on the website had a likelihood ratio of 36.67%. Those who felt government agencies had a "not too important" responsibility to allow people to contact agency officials through the website had a likelihood ratio of 456.82%.



**Table 4**  
**Results for Model 2: Feelings About Government's Responsibility to Be Online Factors**

<i>Factor</i>	<i>Degree</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>	<i>Likelihood Ratio</i>
Feelings government agency should allow people to contact agency officials through the website.	Very important	1.2828	0.6517	3.8749	1	0.0490	3.6066
	Somewhat important	1.3033	0.6598	3.9018	1	0.0482	3.6813
	Not too important	1.5191	0.6975	4.7429	1	0.0294	4.5682
	Not important at all	0 <sup>a</sup>			0		
Feelings a government agency should allow people to complete tasks on the website, such as submitting applications or renewing licenses.	Very important	-1.0537	0.4247	6.1552	1	0.0131	0.3487
	Somewhat important	-1.0031	0.4300	5.4407	1	0.0197	0.3667
	Not too important	-0.1007	0.5350	0.0354	1	0.8507	0.9042
	Not important at all	0 <sup>a</sup>			0		
Feelings it is today for a government agency should post information and alerts on sites such as Facebook or Twitter.	Very important	-0.7221	0.3517	4.2159	1	0.0400	0.4857
	Somewhat important	-0.4378	0.3655	1.4351	1	0.2309	0.6454
	Not too important	-0.1643	0.4759	0.1192	1	0.7299	0.8485
	Not important at all	0 <sup>a</sup>			0		
Feelings a government agency should provide general information to the public on its website.	Very important	0.3015	0.1884	2.5600	1	0.1096	1.3519
	Somewhat important	0.1728	0.1686	1.0505	1	0.3054	1.1886
	Not too important	0.2828	0.1659	2.9072	1	0.0882	1.3269
	Not important at all	0 <sup>a</sup>			0		

*p*=0.05

Model 3 showed vastly insignificant tests for all types of civic participation. The likelihood ratios computed, despite significance, illustrate a gradation toward possible higher success for those with less civic participation (Table 5).

**Table 5**  
**Results for Model 3: Civic Participation Factors**

<i>Factor</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>	<i>Likelihood Ratio</i>
High Civic Participation	.132	0.7258	0.0329	1.0000	.856	1.1407
Moderate Civic Participation	.198	0.7350	0.0726	1.0000	.788	1.2190
Some Civic Participation	.149	0.7555	0.0387	1.0000	.844	1.1602
Low Civic Participation	.467	0.8221	0.3223	1.0000	.570	1.5948
No Civic Participation	0 <sup>a</sup>				0.0000	

*p*=0.05

Model 4 (Table 6) contained only insignificant tests, with one test approaching 1 at a significance of 0.949 (uses the internet to look online for news or information about politics). All access type tests were insignificant, but those who reported using dial-up had the highest likelihood of success. Of all information channel likelihood ratios computed, though insignificant, a higher likelihood of success for those who search for information online and those who use Twitter was observed.

**Table 6**  
**Results for Model 4: Access Type and Information Channel Factors**

<b>Factor</b>	<b>Estimate</b>	<b>Std. Error</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Likelihood Ratio</b>
Dial-up telephone line	-.319	0.6150	0.2698	1.0000	.603	0.7266
DSL-enabled phone line	-.486	0.5883	0.6828	1.0000	.409	0.6150
Cable modem	-.383	0.5865	0.4273	1.0000	.513	0.6815
Wireless connection (either AirCard, land-based or satellite)	-.668	0.6015	1.2325	1.0000	.267	0.5128
Fiber optic connection	-.615	0.6575	0.8752	1.0000	.350	0.5406
T-1 connection	-.842	0.9479	0.7885	1.0000	.375	0.4310
Other (SPECIFY)	0 <sup>a</sup>			0.0000		
Uses the internet to send or read email.	-.209	0.3015	0.4814	1.0000	.488	0.8113
Does not use the internet to send or read email.	0 <sup>a</sup>			0.0000		
Uses the internet to look online for news or information about politics.	.010	0.1599	0.0040	1.0000	.949	1.0102
Does not use the internet to Look online for news or information about politics.	0 <sup>a</sup>			0.0000		
Uses the internet to look for information from a local, state, or federal government web site.	.138	0.1461	0.8871	1.0000	.346	1.1475
Does not use the internet to look for information from a local, state, or federal government web site.	0 <sup>a</sup>			0.0000		
Uses the internet to send email to local, state or federal government.	-.179	0.1300	1.8881	1.0000	.169	0.8364
Does not use the internet to send email to local, state or federal government.	0 <sup>a</sup>			0.0000		
Uses the internet to use a social networking site like MySpace, Facebook or LinkedIn.com.	-.159	0.1307	1.4868	1.0000	.223	0.8527
Does not use the internet to use a social networking site like MySpace, Facebook or LinkedIn.com.	0 <sup>a</sup>			0.0000		
Uses the internet to use Twitter or another service to share updates about yourself or to see updates about others.	.245	0.1625	2.2679	1.0000	.132	1.2773
Does not use the internet to use Twitter or another service to share updates about yourself or to see updates about others.	0 <sup>a</sup>			0.0000		

*p*=0.05

## **Chapter 5**

### **Discussion and Conclusions**

#### **Challenging the Digital Divide**

Hypothesis 1 suggested the likelihood of achieving success in online transactions with government will have a negative relationship for individuals who are non-White, female, low income or median income, or who have attained an educational level less than a bachelor's degree. The model supported the hypothesis, suggesting that those in the U.S. who are not affected by the digital divide are either just as likely or less likely to achieve success in online government transactions. One category, those aged 35-39, was found significant and those respondents saw a 61.8091% higher likelihood of success in online transactions with government than other age groups.

In terms of digital divide e-Government studies, socio-demographic and socio-economic characteristics are important factors for acceptance and adoptability; however, SDS and SES are not supported as factors in determining success in online transactions with government. These findings have some interesting implications. First, women are not significantly more likely to successfully navigate online transactions with government than men. In that regard, to check findings, additional tests were done with findings that men are not significantly more likely to successfully navigate online government transactions than women. The uniformity present redefines some digital divide scholarship because while males tend to engage technology more willingly (Livingston & Helsper, 2007; Quintellier & Vissers, 2008) they are not any better at using it to navigate

e-Government than their female counterparts. Next, racial and ethnic minorities are not significantly more likely to successfully navigate online transactions with government than their White counterparts. Literature suggests a narrowing of the digital divide in terms of racial and ethnic minorities, but the findings of this study cannot support prior scholarship because no race carried a significantly higher likelihood over another in measuring user success with e-Government systems. Additionally, neither education nor income make a person more likely to navigate online transactions with government. Traditional digital divide studies claim there are many disadvantages to technology acceptance and adoptability for those who generate lower household incomes and have lower educational attainment. This study implies those disadvantages play a role only in the matter of one gaining access. Age plays a small role, presumably due to those aged 35-39 caring for middle-adolescent children and managing mid-career goals. This study suggests that the digital divide plays less of a role after technology adoption and acceptance.

### **The Role of Government Online**

Hypothesis 2 suggested that for all respondents, feeling that the government is responsible for being online would have a positive relationship to success in online transactions with government. This model was partially supported. Respondents who felt government should allow people to contact agency officials via its website was supported, as were respondents who felt government should allow people to complete tasks on its website, as well as those who felt the government should post information and alerts on sites such as Facebook and Twitter. The part of the model in which the most support was expected returned insignificant; respondents who felt government is

responsible for providing general information to the public on its website was unsupported by the analysis. Feeling that the government is responsible for allowing people to complete tasks online and communicate with government online, as evidenced by their increased likelihood of success in conducting online government transactions, comply with Gerhards and Shafer's (2010) claim that the Internet is a public sphere. Interestingly, feeling that the government should provide general information online was not a factor in achieving success in online government transactions. This may be due to the U.S. national government's long standing web presence. It also suggests that Americans have grown accustomed to general information about government being available online since the mid-1990's.

#### **No Need for Civic Participation**

Hypothesis 3 suggested that for all respondents, the likelihood of achieving success in online transactions with government would have a positive relationship to the frequency of online civic participation. While the expectation for those reporting substantial civic participation was that they would achieve higher success in online government transactions, this was not the case. Rather, no higher likelihood was found for those with higher or lower civic participation. The literature indicates civic participation as a goal for e-Government programs: governments use e-Government systems as a form of outreach, citizens participate with feedback, and government makes reasonable adjustments. In fact, one recent study even describes civic participation as an influencing activity in residents' use of e-Government systems (Chen and Dimatrova, 2008). This may be due to separate skill sets being involved in civic participation and using Internet communication technologies; civic participation does not necessarily qualify one as

proficient in navigating e-Government. Another possible explanation is that the majority of respondents were over 45 years of age, which is a group with traditionally mixed digital literacy skills. The results for model 3 present a potential problem for public administrators who would like to use e-Government as a primary citizen-government contact method. For participation to be successful e-Government systems must be easily navigable. That civic participation did not qualify as a factor for measuring success in conducting online government transactions suggests navigability is an issue because those who care most deeply about interacting with government are unable to do so successfully.

### **Access Types vs. Information Channels**

In terms of access type, none qualify as factors in measuring the success of those completing online government transactions. In terms of the hypotheses for this study, dial-up users were not expected to have a positive relationship with completing online government transactions. Most websites accessible today are too large for dial-up to be an option when attempting access. That broadband access types were not supported as factors in measuring success is interesting because broadband provides the least data interruptions available to most citizens for currently available access types. Social media usage was not hypothesized to qualify as a factor in measuring success, and the hypothesis was supported. This could be for several reasons that prompt further study including typical age of social media usership as well as the role of social reliance in navigating online systems. Neither email users nor those who perform basic web navigation for information were supported as factors measuring success, suggesting there may be additional digital literacy skills involved in navigating e-Government systems.

**Table 7**  
**Hypotheses and Results Matrix**

<i>Description of Hypothesis</i>	<i>Results</i>
<b>H<sub>1</sub>: Non-White, female, low to median income, younger or older aged, and who have educational attainment less than a bachelor's degree are more likely to achieve success in online transactions with government.</b>	<b>Supported</b>
<b>H<sub>2</sub>: For all respondents, feelings the government is responsible for being online will have a positive relationship to success in online transactions with government.</b>	<b>Partially Supported</b>
Feeling that the government is responsible for providing general information to the public on its website is positively related to the likelihood of achieving success in online transactions with government	Unsupported
Feeling that the government is responsible for posting information and alerts on sites such as Facebook or Twitter is positively related to the likelihood of achieving success in online transactions with government.	Supported
Feeling that the government is responsible for allowing people to complete tasks on the website, such as submitting applications or renewing licenses is positively related to the likelihood of achieving success in online transactions with government.	Supported
Feeling that the government is responsible for allowing people to contact agency officials through the website is positively related to the likelihood of achieving success in online transactions with government.	Supported
<b>H<sub>3</sub>: The frequency of online civic participation is positively related to the likelihood of achieving success in online transactions with government.</b>	<b>Unsupported</b>
<b>H<sub>4</sub>: For all respondents, Information channels will have a positive relationship to success in online transactions with government.</b>	<b>Partially Supported</b>
Dial-up Internet access is negatively related to the likelihood of achieving success in online transactions with government.	Supported
Broadband Internet access is positively related to the likelihood of achieving success in online transactions with government.	Unsupported
Unknown connection type is positively related to the likelihood of achieving success in online transactions with government.	Unsupported
Using email is positively related to the likelihood of achieving success in online transactions with government.	Supported
Using social networking is negatively related to the likelihood of achieving success in online transactions with government.	Supported
Using websites for information is positively related to the Likelihood of achieving success in online transactions with government.	Unsupported

## **Limitations**

Limitations include the lack of comparison to local data. Pew Research Center's datasets tend to be descriptive rather than prescriptive for generalizing to all American life. Using a local dataset, such as that used by Dimatrova and Chen (2006), would allow for additional analysis and a fuller critique of interactions between civic participation, feelings government is responsible for being online, and access types/information channels to respondent success in online government transactions. Similarly, using such a large dataset may cause problems for using a Levene test for variance to understand homogeneity of variances, so using a more local dataset may provide for less variation.



The alternative, a Bartlett test, would have been inappropriate in this study, however, because the data was not normal. Finally, the dependent variable used during this study does not specify what kind of online transaction respondents were trying to accomplish, which leads to some ambiguity in determining results.

### **Conclusions**

This study yielded some interesting implications for public administration theorists and practitioners. The demographic categories in the study parallel many of those used in the literature, but do not support the common claim of the digitally illiterate female, lower income, low-educated, non-White individual, as a factor in measuring success in e-Government transactions. Rather, they point to a possible equity of inability and perhaps a changing digital divide. Though it might not be a factor influencing success, the digital divide still plays a large role in understanding if standards of equality have been met in the U.S.

Similarly, those with broadband Internet access were not significantly more likely to achieve success in online transactions with government than dial-up users or those who did not know their access type. The access speed disadvantage between dial-up users and broadband users has been studied in the past with results favoring broadband users; however, this study suggests that access type, which has been recognized as socio-economic ability to acquire technology, has little to do with digital literacy. In fact, basic Internet user skills were also assessed for likelihood of success with e-Government during this study, resulting in no support for those who report being able to access web sites for basic information and those who use email. Moreover, prior to this study, those who access social media, such as Facebook and Twitter, would be considered to possess

higher digital literacy, but there is little to suggest their ability to navigate social media translates to success in using e-Government.

Civic participation was not a factor in measuring success in online government transactions as expected; however feelings about government's responsibility to be online were factors in measuring success. A tension between these results implies unknown additional influences between at least two, likely overlapping, populations. Moreover, those who feel the government is responsible for being online seem to be more likely than those who do not feel the government has a responsibility for being online to achieve success in online government transactions.

### **Recommendations**

Further research analyzing the effects of digital divide characteristics on digital literacy, digital competence, and success in online transactions will further this study's efforts. Furthermore, future studies should also focus on targeting a larger array of user feelings about government's responsibility for being online and the divide between perceptions of the roles of citizens and the roles of government. Additional studies may also investigate the role of social media, social capital, and relationships in navigating e-Government systems. Finally, this study's efforts would be greatly furthered by investigating other categories and factors relating to navigating e-Government and completing transactions using e-Government systems.

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