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Evaluating Citizen Adoption and Satisfaction of E-government in Mississippi

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EVALUATING CITIZEN ADOPTION AND SATISFACTION OF E-GOVERNMENT IN MISSISSIPPI

By

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Governments at all levels are faced with the challenge of transformation and the need to reinvent government systems in order to deliver efficient and cost effective services, information, and knowledge through information and communication technologies. Electronic government, or e-government, is defined as a way for governments to use the most innovative information and communication technologies, particularly web-based Internet applications, to provide citizens and businesses with more convenient access to government information and services, to improve the quality of the services, and to provide greater opportunities to participate in democratic institutions and processes. E-government presents a tremendous impetus to move forward in the 21st century with higher quality, cost-effective, government services, and a better relationship between citizens and government. Notwithstanding the tremendous potential of e-government applications to deliver public sector services more efficiently and effectively, the citizenry must adopt and continually leverage these virtual offerings, such as renewing a driver's license, for measurable value to be gained. In the process of

designing and developing Web-based services which offer citizens both appropriate information and worthwhile services that are more convenient than traditional government transactions, public sector agencies must thoroughly recognize the elements that impact citizen adoption of and satisfaction with e-government. This research considers theoretical foundations from the Technology Acceptance Model (TAM), the Web Trust Model (WTM), and SERVQUAL to form a parsimonious model of citizen adoption and satisfaction for e-government services. This theory-oriented framework unites three research areas by asserting that an amalgamation of factors – technology adoption, trust, and service quality – influence an individual's adoption propensity and service quality perception. Significant findings suggest usefulness, or end-user convenience, to be the principal determinant of e-government adoption and satisfaction, unaffected even when controlling demographic variables such as race, income, and education are introduced. Additionally, future implications of this research are discussed.

DEDICATION

For Amanda and Natalie, the two people whom I strive to impress most.

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CHAPTER 1

INTRODUCTION

Too often, citizens view government as hopelessly ineffective and lacking in skill to deliver services in the same way that a bottom-line focused private sector business is able to effectively do. This view often informs a marked decline in political participation and lack of confidence in public sector agencies (Hetherington 1998; Norris 1999). Ebbing public confidence in government is related to the perception that the public sector is unable to solve problems in an effective and efficient manner. As a response, contemporary public administrators have been tasked with government "reinvention" as a way of increasing bureaucratic effectiveness and efficiency (Osborne and Gaebler 1992). Some scholars have begun to view information technology as a critical component for creating a more capable government, one capable of providing better service and thus increasing citizen confidence in public sector management (Norris 2001).

Electronic government (e-government) has in recent years attracted much attention as scholars have suggested that by leveraging cutting-edge information technology, government may reap benefits of increased efficiency, effectiveness, and citizen communication with public sector agencies (Chadwick and May 2003; Ho 2002; Melitski 2001; West 2004). E-government can be defined as the application of information technology to make available Internet-based services between public sector agencies and citizens, private sector organizations, employees, and other

nongovernmental agencies (Carter and Belanger 2004, 2005). E-government offers potential impact on the business of government in two fundamental, yet crucial, ways: by improving service delivery, including costs; and by improving communication between citizens and government (Fountain 2001). Participatory forms of e-government, such as on-line public hearings or e-voting, are less common than informational uses or on-line transactions, such as tax e-filing. Carter and Belanger (2004, 2005) note that public sector agencies at all levels of government have leveraged e-government applications to foster buying goods and services, the dissemination of information and forms, and the acceptance of bids and proposals (GAO 2001). Arguably, both the public sector and the citizenry benefit from the implementation of e-government services. As public sector agencies reduce costs and improve efficiency, citizens receive quicker, better aligned services from a more focused and streamlined government (Kettl 2000).

Implementation and acceptance of e-government on-line services, such as renewing a driver's license, are dependent upon the readiness of citizens to adopt these web-based services. In recent years, various scholars have sought to understand how and why consumers continued to utilize electronic commerce (e-commerce) offerings (Gefen, Elena, and Straub 2003; McKnight, Choudhury, and Kacmar 2002). In a similar analytical vein, though to a much lesser degree, research designs are being proposed to study foundational elements directly influencing citizen adoption of e-government services (Warkentin et al. 2002). In 2001, an e-government survey dispensed to executive administrators at government agencies found that 74.2% of the public sector managers noted that their agencies had established a Web presence; however, an inordinate number, 90.5 %, of these government agencies had not conducted a survey to

better understand what impels citizens to adopt a specific e-government application or service (Norris, Fletcher, and Holden 2001).

Purpose of the Dissertation

The primary objective of this research is to analyze theoretical foundations from well-known models in e-commerce scholarship, specifically the Technology Acceptance Model (TAM) (Gefen, Elena, and Straub 2003; Gefen and Straub 2000; Moon and Kim 2001), the Web Trust Model (WTM) (Gefen, Elena, and Straub 2003; Belanger, Hiller, and Smith 2002; McKnight, Choudhury, and Kacmar 2002), and SERVQUAL (Devaraj, Ming, and Kohli 2002; Parasuraman, Berry, and Zeithaml 1988; Parasuraman, Berry, and Zeithaml 1991) to form a model of the essential components that inform citizen adoption and satisfaction of e-government services. SERVQUAL, perhaps the most frequently used service quality measurement scale, is comprised of five service quality dimensions (tangibles, reliability, responsiveness, assurance, and empathy) that apply across traditional, i.e. not online, industries (Zeithaml et al. 1996). Specifically, the work of Carter and Belanger (2004, 2005) linking the Technology Acceptance Model and the Web Trust Model is uniquely leveraged to form a heuristic model which theoretically associates antecedents of e-government adoption with a citizen-based assessment of on-line service quality – a connection heretofore not advanced in the scholarly literature. Though this research is newly conceived, the desire is for public administrators to have a reliable model from which government agencies can more fully understand what impels citizens to adopt a specific e-government application or service, as well as understand what constitutes service quality. Clearly, while the body of knowledge regarding e-

government is burgeoning, the focus is nebulous and generally lacking in substance regarding the impact of e-government on public organizations. The lack of a rigorous model from which to measure the impact of e-government programs on public organizations represents a methodological lapse in the existing body of knowledge.

Research Framework

Carter and Belanger (2004, 2005) call for the development of a prudent model of e-government adoption. The authors write that "while there seems to be substantial growth in the development of e-government initiatives, it is not clear whether citizens will embrace those services" (Carter and Belanger 2005, 6). Indeed, the "success and acceptance of e-government initiatives, such as online voting and license renewal, are contingent upon citizens' willingness to adopt these services" (Carter and Belanger 2005, 6). A burgeoning research stream has utilized academic studies of user adoption of e-commerce (Gefen, Elena, and Straub 2003; McKnight, Choudhury, and Kacmar 2002) to inform research focused on analyzing essential elements impacting citizen adoption of e-government services (Carter and Belanger 2004, 2005; Warkentin et al. 2002).

Similarly, in recent years, research has focused on the relevance of trust as a decisive precursor to online activity, principally due to the consumer's confidence that the transaction will occur as expected (Gefen 2000). As with technology adoption research, scholars have leveraged the import of the trust relationship in e-commerce transactions, and conducted trust-centric studies in the e-government context (Belanger, Hiller, and Smith 2002; CEG 2003; Chadwick 2001; GAO 2001; Hiller and Belanger 2001; Hoffman, Novak, and Peralta 1999). In addition to technology adoption and trust,

scholars have centered attention on service quality in the e-commerce context, leveraging one of the most widely used service quality measurement scales, SERVQUAL (Parasuraman, Berry, and Zeithaml 1988), to operationalize consumers' perceived service quality through reliability, responsiveness, empathy, and assurance of e-commerce applications (Carr 2002).

This dissertation unites the three research areas in order to investigate the impact of Web-based tools on e-government adoption and satisfaction. Based on the aforementioned literature, this research proposes an integrated framework of e-government satisfaction and adoption. This framework suggests that a combination of factors – technology adoption, trust, and service quality – influence an individual's adoption propensity and service quality perception (See Figure 1). While researchers have continued to document differences between e-commerce and e-government (Jorgensen and Cable 2002; Warkentin et al. 2002), e-commerce models continue to be utilized to examine adoption of on-line services in the public sector (Carter and Belanger 2004, 2005). Indeed, certain scholars have specifically called for an interdisciplinary approach to more fully realize the impact of Internet technology on e-government participation (Tolbert and McNeal 2003).

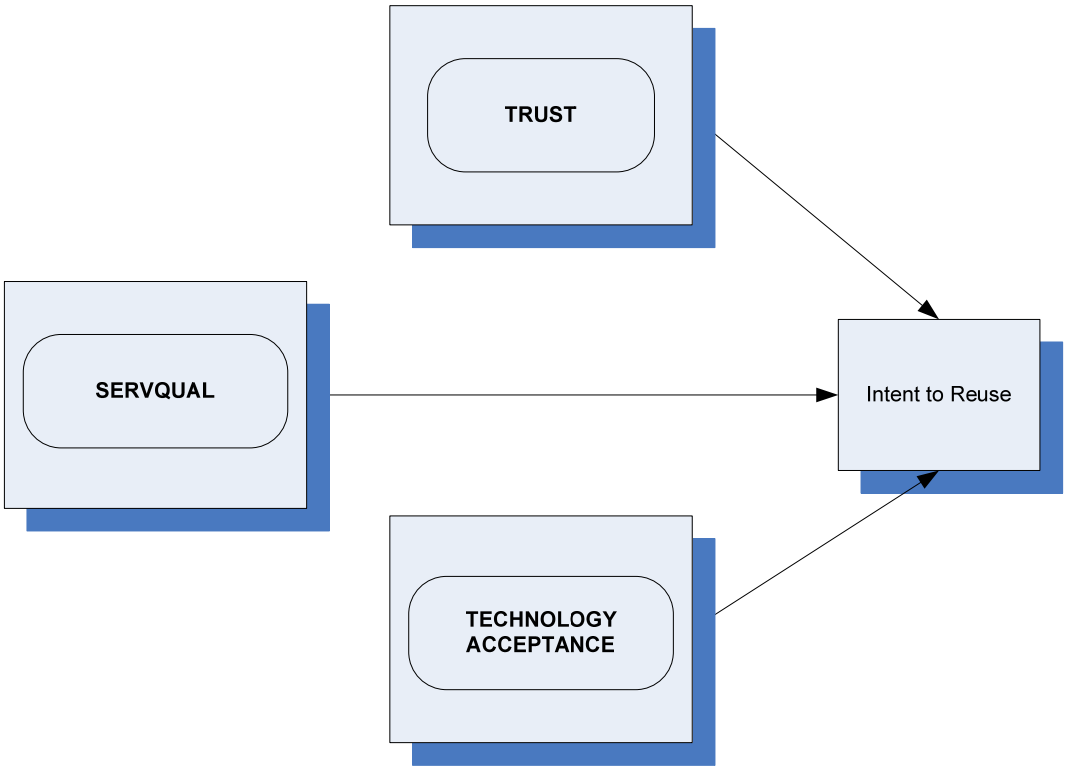

FIGURE 1: THEORETICAL RESEARCH FRAMEWORK

Research Question

An extensive exploratory schedule can be developed from the proposed e-government adoption and satisfaction framework (Figure 1). Given the recent focus of research examining e-government program development (Cohen and Eimicke 2001; Fountain 2001; Ho 2002; Moon 2002; Thomas and Streib 2003), as well as research probing user adoption of e-commerce (Gefen, Elena, and Straub 2003; McKnight, Choudhury, and Kacmar 2002; Carter and Belanger 2004, 2005) in combination with the escalating push to develop innovative e-government services (Horrigan 2004; Norris, Fletcher, and Holden 2001), the question of interest is:

What technology adoption, trust, and service quality factors influence an individual's general proclivity to adopt e-government services and an individual's perceptions of e-government service quality?

Much recent scholarship has been devoted to understanding the impact of e-government on the ability of public sector agencies to deliver services with increased efficiency and effectiveness (Chadwick and May 2003; Fountain 2001; Ho 2002; Melitski 2001; West 2004, 2005). That e-government services, delivered via advanced information technology solutions, can provide benefits of enhanced efficiency, effectiveness, and citizen communication with public sector agencies is advantageous to elected officials, public managers, as well as to the citizenry. Indeed, as government agencies increase efficiency and ameliorate operating costs, citizens are increasingly able to access on-line services from an attentive, citizen-centric government (Kettl 2000). Thus, while research has indicated that a vast majority of government agencies have an inadequate working knowledge of what drives citizen adoption of e-government services (Norris, Fletcher, and Holden 2001), the desire in this research is to offer insight into what impels e-government adoption, as well as to understand what constitutes acceptable service quality.

Independent Variable Constructs

The theoretical constructs which comprise the research model were chosen based on inclusion in foundational scholarly studies, as well as on personal research interests. This section succinctly examines the technology adoption factors, trust factors, and service quality factors that impact e-government adoption and satisfaction.

Technology Acceptance Model

The Technology Acceptance Model (TAM), first developed by Davis (1989) is a theoretical offshoot of the theory of reasoned action, expectancy theory, and self-efficacy theory (Fishbein and Ajzen 1975; Robey 1979b; Bandura 1977). The Theory of Reasoned Action and TAM are both embodied with considerable behavioral elements, and presume that when an individual forms an objective to act, that action will occur in the absence of restraint. TAM conceives that perceived usefulness and perceived ease of use establish an individual's intent to utilize an information system. Efforts by scholars to broaden the theoretical impact of TAM have occurred via the introduction of factors from associated models, and through the assessment of precursors and moderators of perceived usefulness and perceived ease of use (Wixom and Todd 2005). With the rise of Internet-based commerce, academicians have employed TAM to investigate user adoption of e-commerce (Gefen, Elena, and Straub 2003; Gefen 2000; Moon and Kim 2001); more current and relevant research efforts have leveraged TAM to examine adoption of Internet-based transaction offered by government agencies (Carter and Belanger 2004, 2005; Warkentin et al. 2002). To that end, TAM was included in this dissertation.

Trust

Within the context of Internet-based activity, academic scholarship has focused on the foundational nature of trust in on-line, e-commerce transactions. This vein of research, built with an institutional focus, led to the maturity of a multifaceted trust model (Gefen 2000; Meyer and Goes 1988; McKnight, Choudhury, and Kacmar 2002;

Rousseau et al. 1998; Tan and Thoen 2001). This institutional focus was highlighted as a primary construct contained in the multifaceted trust model, as institution-based trust has developed into the foremost indicator of on-line transactions (McKnight and Chervany 2002; McKnight, Choudhury, and Kacmar 2002). In recent research, scholars have leveraged the institutional component of trust to investigate adoption of e-government transactions offered by public sector agencies (Carter and Belanger 2004, 2005). Heretofore, E-government oriented trust scholarship focuses more heavily on Internet security and the safeguarding of personally identifiable information (Belanger, Hiller, and Smith 2002; CEG 2003; Chadwick 2001; GAO 2001; Hiller and Belanger 2001; Hoffman, Novak, and Peralta 1999). Consequently, with a firm academic base established in e-commerce scholarship, and more current research investigating the role of trust in e-government transactions, the construct was included in this dissertation.

SERVQUAL

The concept of service quality has long maintained importance in marketing research literature, primarily due to the challenge posed to researchers in quantifying and accurately measuring quality in the service sector (Wisniewski 2001). Myriad definitions of service quality abound in the literature; however, a generally accepted definition suggests that service quality is the extent to which a service meets customers' needs or expectations (Asubonteng et al. 1996; Dotchin and Oakland 1994; Lewis and Mitchell 1990; Wisniewski and Donnelly 1996). One of the most cited models for studying service quality is SERVQUAL, a validated measurement scale comprised of five service quality dimensions (Parasuraman, Berry, and Zeithaml 1988). At its inception,

SERVQUAL was utilized in marketing research with application geared toward measurement of service quality in the retail sector. Since that time, and with the rise of information technology and Internet-based applications, scholars have adapted SERVQUAL to asses service quality in an information technology context (Kettinger and Lee 1994; Pitt, Watson, and Kavan1995), with later scholarly work focused on the evaluation of World Wide Web search utilities (Liu and Arnett 2000; Xie, Wang, and Goh 1998). Specific to the focus of this dissertation, more recent research has been undertaken to leverage the SERVQUAL dimensions to operationalize consumers' perceived service quality of e-commerce (Carr 2002). With no identified research utilizing SERVQUAL in an e-government environment, the inclusion of this construct in the research model represents an exploratory feature of the dissertation.

Research Model

The prior research demonstrates an opportunity for the development of an inclusive view of e-government adoption and satisfaction that assimilates essential theoretical constructs from recognized models in e-commerce scholarship, specifically the Technology Acceptance Model (Gefen, Elena, and Straub 2003; Gefen and Straub 2000; Moon and Kim 2001), the Web Trust Model (Gefen, Elena, and Straub 2003; Belanger, Hiller, and Smith 2002; McKnight, Choudhury, and Kacmar 2002), and SERVQUAL (Devaraj, Ming, and Kohli 2002; Parasuraman, Berry, and Zeithaml 1988; Parasuraman, Berry, and Zeithaml 1991). The work of Carter and Belanger (2004, 2005) connecting the Technology Acceptance Model and the Web Trust Model is advanced via the introduction of SERVQUAL to form a model which theoretically links antecedents of

e-government adoption with a citizen-based assessment of on-line service quality – an association as yet not examined in the scholarly literature (See Figure 2). The constructs discussed in this section are examined in greater detail in the following chapters. In chapter two, the literature reviews contains details for each construct, while chapter three presents the precise measurements for each construct.

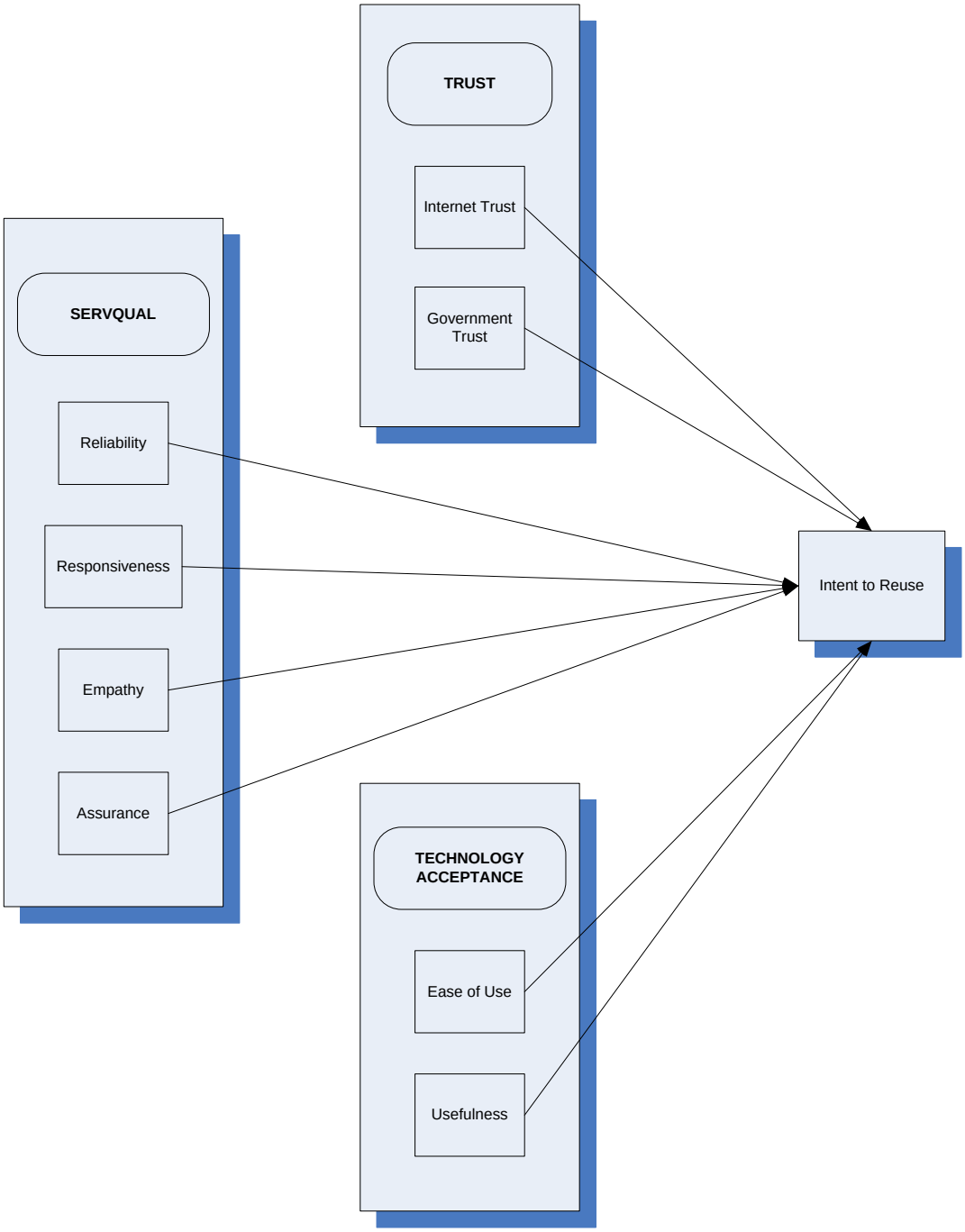

FIGURE 2: E-GOVERNMENT ADOPTION AND SATISFACTION RESEARCH MODEL

Expected Contributions

This dissertation integrates three research streams for the purpose of examining the impact of Internet technology on e-government adoption and satisfaction. This study argues that a unique set of features – technology adoption, trust, and service quality – serve to influence an individual's adoption inclination and service quality sensitivity. As governments at all levels advance e-government implementation, expediency is prudent to identify the specific characteristics that will continue to attract e-government users and retain those that have utilized on-line services in the past. A critical understanding of the key elements which influence a citizen's choice to use an e-government system, such as ease of use, usefulness, assurance, empathy, responsiveness, reliability, and trust can aid government agencies as they solicit and operate e-government services.

The proposed research model seeks to integrate three research streams into one parsimonious model of e-government adoption and satisfaction. This inclusive framework has potential to more fully explicate the impact of Internet technology on e-government participation (Tolbert and McNeal 2003). Even as scholars continue to note distinctions between e-commerce and e-government (Jorgensen and Cable 2002; Warkentin et al. 2002), it is hoped that this model will prospectively enable future research on e-government adoption and satisfaction. Subsequent to ascertaining the foundational precursors of e-government adoption and satisfaction, scholars can then perform time series studies to investigate how or if these features vary with time. Indeed,

this dissertation takes a step toward answering the call for the development of a prudent model of e-government adoption (Carter and Belanger 2004, 2005).

Dissertation Overview

The remainder of this document is organized as follows: chapter two contains a review of the literature with main sections on theory-based models of e-government adoption, Technology Acceptance Model (TAM), Trust, SERVQUAL, and e-government in Mississippi; the dissertation research design and methodology are discussed in chapter three; an analytical summary of the data gathered for the dissertation is presented in chapter four; chapter five presents an exhaustive review of the study results and their implications; lastly, chapter six discusses the implications and conclusions of the study, as well as future research recommendations and concluding comments.

CHAPTER 2

LITERATURE REVIEW

In order to execute the proposed research, a multi-theoretical outlook is taken presenting scholarly views from technology adoption, trust, and service quality literature. This chapter is organized as follows: first, the research framework is more plainly defined by identifying the fundamental elements of e-government evolution and maturation over the last decade; then the predominant theoretical models used to assess e-government adoption are examined; the following section identifies the most prominent features of technology adoption; the next section analyzes the myriad facets of trust to categorize factors that have an impact on e-government participation; the following section describes key components of service quality which impact an individual's perception of Internet-based transactions; the final section presents an overview of e-government in Mississippi.

E-Government Comes of Age

The impact of information technology upon public sector agencies began to be studied in earnest at the beginning of the 1990s. The publication in 1986 of a special issue of the *Public Administration Review* focusing on technology sparked, in surveying the body of research, an increased interest in the study of the design, development, and implementation of information technology at all levels of government, though primarily at the federal and state levels. One such research effort was structured to examine the

hypothesis that the management of information technology in the public sector differed fundamentally from that in the private sector (Bretschneider 1990). In studying more than 1,000 public and private sector organizations, Bretschneider documented a list of differences between public and private sector organizations that potentially could alter the ability of the organization to properly manage information technology. Additional research, published in 1990, described the control of information technology at the state government level (Caudle 1990). Conducted by Sharon Caudle of Syracuse University, the study documented various organizational structures, planning processes, and policy formulation activities. These activities were studied in relation to the acquisition, use, and management of information technology, and concluded that information itself was a valuable resource that needed to be managed (Caudle 1990). Two years later the General Accounting Office (GAO) published the first of many reports on the state of information technology in the federal government. In a 1992 analysis and subsequent report, GAO found that a majority of agencies experienced cost overruns, schedule delays, and poor system performance; cost overruns totaled $7 billion and some delays surpassed 12 years (GAO 1992). Interestingly, the 1992 GAO report attributed the difficulties experienced by the federal agencies to poor management, ineffective planning, and lack of user involvement in implementation (GAO 1992). And lastly, a study compiled at the University of California at Irvine presented data that suggested that the targeted benefits of implementing information technology, such as more accurate information for planning and managerial control, were never attained (Northrop et. al. 1990).

E-commerce, from an information technology perspective, is closely related to e-government. Both, in a narrow sense, are conceived upon technology innovations of the

last 15 years (primarily focused on Internet technology), and are designed to assist the exchange of goods, services, and information between multiple parties. The characterization of e-commerce as the profit-oriented utilization of Web-based technology is often viewed in a more narrow sense than e-government. In their text, *Essentials of Management Information Systems*, Ken and Jane Laudon (2003) document three types of e-commerce: business-to-consumer (B2C), business-to-business (B2B), and customer-to-customer (C2C). Analogous to e-commerce, which allows businesses to transact with each other more efficiently (B2B) and brings customers closer to businesses (B2C), similar types of transactions have been identified for e-government.

However, e-government transactions have come to be defined in more robust categories, reflecting a more complex operating environment than that of e-commerce. The GAO (2001) notes types of e-government transactions similar in nature to those defined in the e-commerce model: government-to-citizen (G2C), government-to-employee (G2E), government-to-government (G2G), and government-to-business (G2B). Similarly, the Office of Management and Budget (OMB) also categorizes e-government into four types: G2C, G2B, G2G, and IEE (Internal Efficiency and Effectiveness), a substitute for G2E. OMB's inclusion of IEE raises questions as to consistency in the federal government's e-government program, though operationally G2E and IEE are very similar. OMB defines IEE initiatives as implementing "modern technology to reduce costs and improve quality of federal government agency administration, by using industry best practices in areas such as supply-chain management, financial management and knowledge management" (OMB 2002, 4).

Representing a fuller model, Hiller and Belanger (2001) organize e-government into six categories: Government Delivering Services to Individuals (G2IS), Government to Individuals as a Part of the Political Process (G2IP), Government to Business as a Citizen (G2BC), Government to Business in the Marketplace (G2BMKT), Government to Employees (G2E), and Government to Government (G2G). Leveraging concepts developed by other scholars, Hiller and Belanger suggest that e-government can include "electronic relationships between the government and different levels of constituents" (2001, 14); thus, Hiller and Belanger offer a more nuanced view of the multifaceted "relationships between governments and the entities with which they interact" (2001, 14). Government Delivering Services to Individuals (G2IS) outlines a model where "the government establishes or maintains a direct relationship with citizens in order to deliver a service or benefit" (Hiller and Belanger 2001, 14). An example of G2IS service delivery would include the Veterans Administration in its delivery of benefits. Government to Individuals as Part of the Political Process (G2IP) involves a relationship between the government and citizens dealing specifically with the political process; the most prominent highly debated example would be on-line voting. Government to Business as a Citizen (G2BC) deals with the relationship between businesses and the government, which is similar to G2IP. Examples cited by Hiller and Belanger (2001) include providing Securities and Exchange Commission filings on-line and paying taxes on-line. Government to Business in the Marketplace (G2BMKT) suggests, "while businesses can receive many on-line services from government, a major portion of on-line transactions between the government and businesses involve procurement" (Hiller and Belanger 2001, 14). Government to Employees (G2E), following earlier definitions,

suggests a relationship between government agencies and their employees. And lastly, the Government–to–Government (G2G) model suggests relationships among public sector agencies allowing for collaboration and inter-agency service provision. Often savings can be realized from utilizing G2G services, especially when intergovernmental collaboration occurs between public sector agencies. An excellent example of a G2G e-government service, cited by Hiller and Belanger (2001), is the National Science Foundation's on-line application for academic research funding.

As seen below in Figure 3, Hiller and Belanger (2001) present the five stages of e-government, which show the level of technical complexity and communication with citizens. In this model, adopted from Hiller and Belanger (2001), Stage 1 describes the most basic from of e-government, which utilizes the Internet for disseminating information, by posting information or data on Web sites for citizens to access. The next stage, Stage 2, affords citizens the opportunity to make straightforward requests and changes via email systems as well as information and data-transfer technologies into its Web sites. Stage 2 communication is described as two-way, interactive information transfer. An example is the Social Security Administration's Web site, which allows the agency to receive new Medicare card applications and benefit statement requests, then process and respond to service requests on-line (Hiller and Belanger 2001). In Stage 3, the government allows on-line service and financial transactions by completely replacing public servants with "web-based self-services" (Hiller and Belanger 2001, 15). This "transaction-based e-government" can be partially achieved by "putting live database links to on-line interfaces" (Layne and Lee 2001, 125). Through this on-line service and financial transaction, for example, citizens are able to renew professional licenses, pay

taxes, and register an automobile (Hiller and Belanger 2001; Layne and Lee 2001). In many aspects Stage 4 represents the most challenging and complex on-line services; government attempts, in Stage 4, to integrate various back-office government services "vertically (inter-governmental integration) and horizontally (intra-governmental integration) for the enhancement of efficiency, user friendliness, and effectiveness" (Moon 2002, 426). Cited as an example of Hiller and Belanger (2001) is the federal government's portal site, FirstGov.gov (http://www.firstgov.gov). Layne and Lee (2001) note that by integrating back-office government services both vertically and horizontally, information and data sharing among different functional units and levels of governments provide more robust and fully-featured on-line public services. Lastly, Stage 5 represents a more political-centric approach to e-government services, and features.

STAGES OF E-GOVERNMENT

Type of Government	Stage 1 Information	Stage 2 Two-way communication	Stage 3 Transaction	Stage 4 Integration	Stage 5 Political participation
Government to Individual – Services	Description of medical benefits	Request and receive individual benefit information	Pay taxes on-line	All services and entitlements	N/A
Government to Individual – Political	Dates of elections	Receive election forms	Receive election funds and disbursements	Register to vote	Voting on-line
Government to Business – Citizen	Regulations on-line	SEC filings	Pay taxes on-line Receive program funds (SBA, etc.) Agricultural allotments	All regulatory information on one site	Filing comments on-line
Government to Business – Marketplace	Posting Requests for Proposals (RFPs)	Request clarifications or specs	On-line vouchers and payments	Marketplace for vendors	N/A
Government to Employees	Pay dates, holiday information	Requests for employment benefit statements	Electronic paychecks	One-stop site for employee information, etc.	N/A
Government to Government	Agency filing requirements	Requests from local governments	Electronic funds transfers		N/A

SOURCE: HILLER AND BELANGER (2001)

FIGURE 3: E-GOVERNMENT STAGES FRAMEWORK

Scholars have, despite documented likenesses, noted three qualifying distinctions between e-commerce and e-government: access, structure, and accountability (Jorgensen and Cable 2002). The authors point out that in the e-commerce realm, customers have the ability to select a business to make a purchase. Often the selection is competitive in nature (an example being a customer's selecting Barnes and Noble instead of Amazon to purchase a book). Despite challenges presented by the digital divide, in the public sector governmental agencies are mandated to provide access to information and on-line

services to all eligible citizens, including those citizens in lower economic strata and with disabilities. The term "digital divide" describes the fact that the world can be divided into people who do and people who don't have access to – and the capability to use – modern information technology, such as the Internet. In a 1999 study by the United States Department of Commerce, 86% of Internet delivery was to the 20 largest cities in America. Additionally, managerial norms, specifically the authority and responsibility to execute decisions, is federated in the public sector and more often centralized in private sector organizations. The federated approach to decision making is perceived as an impediment to the design, development, and implementation of Internet-based government services. Furthermore, accountability is noted as a primary differentiation in delineating distinctions in e-commerce and e-government, whereby public sector agencies are mandated to apportion resources and offer services in the best overall interest of the citizenry, not solely for the purpose of generating financial profits (Jorgensen and Cable 2002). Furthermore, Warkentin et al. (2002), in acknowledging the political nature of public sector organizations, note the exclusivity of e-government relationships, where citizens are afforded only a single provider of a specific Web-based service. Although e-commerce and e-government differ in terms of access, structure, accountability (Jorgensen and Cable 2002), and mandatory relationships (Warkentin et al. 2002), e-commerce models can be utilized to analyze adoption of on-line services in the public sector. Prior scholarly research has established that core components from the Technology Acceptance Model (TAM) impact an individual's utilization of e-commerce in the private sector (Belanger, Hiller, and Smith 2002; Gefen and Straub 2000; Gefen, Elena, and Straub 2003; Moon and Kim 2001). Warkentin at al. (2002) have documented

similar relationships in the core components from the Technology Acceptance Model (TAM) and citizen adoption of e-government.

Theory-Based Models of E-Government Adoption

While a large number of research studies have been conducted that analyze how public sector organizations use information technologies for internal operational needs (Bretschneider and Wittmer 1993; Nedovic-Budic and Godschalk 1996; Norris and Kraemer 1996; Pandey and Bretschneider 1997; Ventura 1995), and more current studies have been published which document the increase in e-government program development (Cohen and Eimicke 2001; Fountain 2001; Ho 2002; Moon 2002; Thomas and Streib 2003), few studies focus on the question of what organizational and environmental factors drive the decision to adopt e-government features and online services. In recent years, scholars have worked to frame the new field of e-government by applying well-founded and accepted theories. By way of example, Scholl (2001) has employed stakeholder theory to study e-government research, Bardach (2002) has utilized network theory to examine information technology as a tool for government collaboration, and Lazer (2002) has focused on diffusion of innovations theory to research the impact of information technology on innovation in public sector agencies (Jain 2004). Additionally, various scholars have leveraged research of user adoption of electronic commerce or e-commerce (Gefen, Elena, and Straub 2003; McKnight, Choudhury, and Kacmar 2002; Carter and Belanger 2004, 2005) to conduct research analyzing the foundational elements directly influencing citizen adoption of e-government services (Warkentin et al. 2002). Although e-commerce and e-government differ with respect to

access, structure, accountability (Jorgensen and Cable 2002), and mandatory relationships (Warkentin et al. 2002), e-commerce models can be utilized to analyze adoption of on-line services in the public sector (Carter and Belanger 2004, 2005).

By leveraging the widely accepted Technology Acceptance Model (TAM), developed by Davis (1989), various researchers have suggested a role in user acceptance of e-commerce in the private sector (Belanger, Hiller, and Smith 2002; Gefen and Straub, 2000; Gefen, Elena, and Straub 2003; Moon and Kim 2001; Carter and Belanger 2004, 2005). The TAM is comprised of variables designed to measure the acceptance of software applications by an organization's employees. Carter and Belanger (2004, 2005) note that these measures have been studied and proved valid for users of varying skill sets, and multiple applications, as well as gender (Chua 1996; Doll, Hendrickson, and Deng 1998; Jackson, Simeon, and Leitch 1997; Karahanna and Straub 1999; Venkatesh et al. 2003). Similarly, Carter and Belanger (2004, 2005) document several studies which have also used TAM to evaluate user adoption of e-commerce (Gefen, Elena, and Straub 2003; Gefen 2000; Moon and Kim 2001). Considering the similarities between e-commerce and e-government, the constructs used to study e-commerce adoption are also applicable to e-government adoption (Warkentin et al. 2002; Carter and Belanger 2004, 2005).

Additional research has been conducted in the area of the Web Trust Model (WTM). According to a 2003 survey conducted by the Council for Excellence in Government (CEG), citizens possess a firm grasp on the potential benefits that e-government could bring to the public sector, but they have "concerns about sharing personal information with the government over the Internet, fearing that the data will be

misused and their privacy diminished" (CEG 2003, 2). Carter and Belanger (2004, 2005) note that privacy (Hiller and Belanger 2001; Hoffman, Novak, and Peralta 1999) and security (GAO 2001; Belanger, Hiller, and Smith 2002; Chadwick 2001) are recurring issues in e-commerce and e-government research. As noted by Lee and Turban (2001), a citizen's decision to actively pursue the use of on-line government services requires that the citizen trust the government agency providing the service, as well as trust the web-based technology utilized to accomplish the transaction. In this vein, newly published research investigates the role of trust in IT adoption in different cultures where dissimilar concepts of socially acceptable behavior exist; this study compares trust-related perceptions of an emerging IT (i.e., electronic voting) between the United States of America and the Republic of South Africa (Gefen et al. 2005).

However, a recent research proposal by Mete Yildiz (2003) offers an opportunity to examine the motivations of e-government from an institutional theory perspective. Arguably, from the vantage point of the public organization, the use of institutional theory affords the prospect of understanding the initiation of e-government projects and the impact of these projects on the government agency. Institutional theory aids in the understanding of organizational reactions to conventions of the institutional environment. Thus, institutional theory requires the inclusion of components of decision-making such as concerns of legitimacy, stability, and survival (Meyer and Rowan 1977). After cautioning the use of the "measures and methods of the institutional theory, since it is argued that the theory itself has not institutionalized yet" (Yildiz 2003, 2), Yildiz argues that institutional theory may aid public management scholars and practitioners in the understanding of e-government programs in public agencies. Yildiz suggests that from

an "institutional theory perspective, government organizations go online because of legitimization needs and resulting isomorphic pressures" (2003, 3).

DiMaggio and Powell (1983) write of three main types of isomorphic processes: coercive, mimetic, and normative. According to the coercive isomorphic process, public organizations have adopted and implemented e-government programs as the result of a pointed managerial directive and/or as a result of unofficial pressure by other public sector organizations that have already begun an e-government program. In the coercive model, the decision to implement e-government would be made by political appointees and career civil servants for reasons of perceived legitimacy and anticipated efficiency. Using the mimetic isomorphic process, public organizations mimic other successful and legitimate public sector organizations. Yildiz notes that by imitating these other organizations, which already use e-government successfully, "they enhance their legitimacy by demonstrating that at least the organization is trying to improve the conditions of its service and/or information provision" (2003, 3). And lastly, using the normative isomorphic process, public organizations use e-government due to the "newly emerging professional norms of public service – online interactivity, virtual service, transparency and accountability" (Yildiz 2003, 4).

Technology Acceptance Model

The Technology Acceptance Model, or simply TAM, is derived from the theory of reasoned action, expectancy theory, and self-efficacy theory (Fishbein and Ajzen 1975; Robey 1979b; Bandura 1977). TAM is an often-cited theoretical model used by scholars to predict an individual's intent to utilize and formally accept information

technology. Originally developed by Davis (1989), the measures utilized in TAM have been tested and validated for various users with a range of understanding, a myriad of system types, and gender (Chua 1996; Doll, Hendrickson, and Deng 1998; Jackson, Simeon, and Leitch 1997; Karahanna and Straub 1999; Venkatesh et al., 2003). Several studies have also used TAM to evaluate user adoption of e-commerce (Gefen, Elena, and Straub 2003; Gefen 2000; Moon and Kim 2001). TAM proposes that the perceived ease of use and the perceived usefulness are underlying causes for an individual's attitude toward a specific technology or information system. Davis defines perceived usefulness as, "the degree to which a person believes that using a particular system would enhance his or her job performance" (1989, 320). Further, Davis defines perceived ease of use as, "the degree to which a person believes that using a particular system would be free of effort" (1989, 320). The attitude toward a specific technology or information system consequently informs an individual's intent to adopt that technology or system, and is similarly a predictor of the individual's eventual acceptance of the technology (Bhattacherjee 2001: Davis, Bagozzi, and Warshaw 1989; Lucas and Spitler 1999; Moon and Kim 2001; Venkatesh and Davis 2000).

Trust

In an economic exchange of goods and services, trust is the belief that the parties involved in the transaction will ethically meet expected commitments dependably and in a socially appropriate manner (Hosmer 1995; Kumar et al. 1995; Luhmann 1979; Zucker 1986). Belanger, Hiller, and Smith define trustworthiness as "the perception of confidence in the electronic marketer's reliability and integrity" (2002, 247).

Specifically, trust is important in scenarios where the trusting party is dependent on this behavior, as is generally believed to be the case in e-commerce transactions (Gefen 2000; Meyer and Goes 1988; and Rousseau et al. 1998). Scholars researching relationships in e-commerce transactions note the significance of trust as a critical antecedent to online activity, primarily due to the consumer's belief that the transaction will occur as expected (Gefen 2000). Specifically, due to the fact that online transactions are, at least to a certain degree impersonal, trust becomes an even greater predictor of behavior, as in the online environment retailers can engage in unethical behavior, particularly in the handling of an individual's personally identifiable information (Gefen 2000; Kollock 1999; Reichheld and Sasser 1990). Given the importance of the trust relationship in e-commerce transactions, when this trust is broken, or simply not established, consumers will avoid doing initial or repeat business with a particular retailer (Gefen 2000; Jarvenpaa and Tractinsky 1999; Reichheld and Sasser 1990). In the e-government context, while many Americans believe the e-government potentially can improve government service delivery, trust is stunted due to privacy and security issues, both revolving around the sharing and potential misuse of personal information (Belanger, Hiller, and Smith 2002; CEG 2003; Chadwick 2001; GAO 2001; Hiller and Belanger 2001;Hoffman, Novak, and Peralta 1999).

Various scholars have focused research toward the understanding of the institutional view of trust within the e-commerce context (McKnight, Choudhury, and Kacmar 2002; Tan and Thoen 2001). Within this context institutional trust is specifically referred to as the institutional structures which enable the transacting to interact successfully. Scholars have suggested that since organizations are comprised of

individuals, institutional trust has a direct influence on organizational trust (Zaheer, McEvily, and Perrone 1998). In a study conducted in 1986, Zucker argued that institutional trust is the most essential means by which trust is produced in an impersonal economic setting lacking familiarity and similarity. Taking into consideration the scholarship produced by various scholars (Mayer, Davis, and Schoorman 1995; McKnight and Cummings 1998; McKnight, Choudhury, and Kacmar 2002; Zucker 1986), particular measures have been constructed with the goal of developing a model of multi-dimensional trust in e-commerce, with specific attention given to users' initial trust in a Web vendor (McKnight, Choudhury, and Kacmar 2002). McKnight et al. (2002) identify one of the four major constructs as institution-based trust, and classify it as a significant part of Internet-based transactions (McKnight and Chervany 2002). Structural assurance and situational normality are the two dimensions which comprise this construct. First, structural assurance asserts that, "one believes structures like guarantees, regulations, promises, legal recourse or other procedures are in place to promote success" (McKnight, Choudhury, and Kacmar 2002, 339). Second, situational normality refers to beliefs that success is probable, specifically due to a normal environment – an environment whereby the interacting parties have the attributes of competence, benevolence, and integrity (McKnight, Choudhury, and Kacmar 2002). Typically, in the e-commerce context, situational normality will presume security safeguards such as confidentiality, integrity, authentication, non-repudiation, availability and access control mechanisms (Ratnasingam and Pavlou 2002). Thus, as accurately noted by Carter and Belanger, "the decision to engage in e-government transactions requires citizen trust in

the government agency providing the service and citizen trust in the technology through which electronic transactions are executed – the Internet" (2005, 10).

SERVQUAL

Varying scholars have noted that quality service is a personal appraisal by an individual customer that the service received is the service that was expected (Parasuraman, Zeithaml, and Berry 1985; Watson, Pitt, and Kavan 1998). In the traditional retail market, service quality is concerned with the appearance of the store, as well as the quality of the relationship between the service providers and the customer. In this context, one of the most widely used service quality measurement scales, SERVQUAL (Parasuraman, Berry, and Zeithaml 1988), was developed. SERVQUAL is comprised of five service quality dimensions that apply across traditional, i.e. not online, industries (Zeithaml et al. 1996). These five service quality dimensions constructs are listed in Table 1 below.

TABLE 1: SERVQUAL CONSTRUCTS

Construct	**Definition**
Tangibles	Facilities, equipment, personnel, and communication materials
Reliability	Ability to perform service dependably and accurately
Responsiveness	Willingness to help and respond to customer need
Assurance	Ability of staff to inspire confidence and trust
Empathy	Extent to which caring individualized service is given

Until more definitive studies were conducted, researchers remained split regarding the applicability of the SERVQUAL scale to an e-commerce, on-line transaction, though a small group of scholars sought to leverage the dimensions of SERVQUAL within the information technology context (Kettinger and Lee 1994; Pitt,

Watson, and Kavan1995). Though criticized by many scholars, the work of these early studies focused on the use of SERVQUAL to measure the service quality of the information technology function within organizations (Kettinger and Lee 1997; Pitt, Watson, and Kavan 1997; Carr 2002; Van Dyke, Prybutok, and Kappelman 1999). As e-commerce research surged in the late 1990s, researchers have since applied service quality measures in order to assess the quality of search engines (Xie, Wang, and Goh 1998) and specific features associated with Web site success (Liu and Arnett 2000). SERVQUAL, as originally developed, was designed to measure the difference between expected service and perceived service in order to assess what was termed the "service gap." While this "gap appraisal" is a distinctive feature of the SERVQUAL scale, its precision and value within the information technology, and specifically e-commerce context, has been disputed (Van Dyke, Kappelman, and Prybutok 1997). Due to the fact that perception is the consequence of the assessment process of the service and expectation, the dual-survey approach may not be necessary in the e-commerce realm (Kettinger and Lee 1997; Van Dyke, Kappelman, and Prybutok 1997). Recent research has specifically utilized the SERVQUAL dimensions in a single survey to operationalize consumers' perceived service quality through reliability, responsiveness, empathy, and assurance of e-commerce applications.

E-Government in Mississippi

According to the Mississippi Department of Information Technology Services (ITS), Mississippi.gov (www.mississippi.gov) is the gateway to e-government in Mississippi for citizens, businesses, and state employees. The goal of Mississippi.gov is

seamless government: making government information and services readily available to all Mississippi citizens at all times in a way that emphasizes government as an "enterprise," not a bureaucracy. Government as an enterprise is centered on the needs of citizens and businesses, not the political and organizational infrastructure. The ability to obtain government services through nontraditional electronic means, enabling access to government information and the completion of government transactions online, offers the potential to reshape the public sector and build relationships between citizens and the government. Mississippi.gov serves as the single access point to state government. It provides a view of government that is "citizen-centric" through an intention-based design approach, which allows users to look for information according to the tasks they want to perform (e.g., obtaining a business license), instead of searching for the department or agency responsible for the service. Mississippi.gov currently receives visits from an average of 11,000 visitors each day (ITS 2006).

The Mississippi.gov infrastructure is designed to enable state agencies to move government services online by providing hardware, software, and services that can be shared across multiple agencies, reducing the costs for each agency. When Mississippi government is viewed as one entity, techniques learned and programs developed while deploying one application can be leveraged in subsequent applications, potentially lessening development time and increasing the likelihood of success. Services like those allowing agency applications to accept electronic payments can be developed and secured once, decreasing potential access points into the data. Moving repetitive, labor intensive tasks online and enabling constituent self-service often has benefits for all parties involved. Constituents can have access to the information or processes they need

or want when they need or want it and governments can provide services on demand without additional staff, often at a reduced cost (ITS 2006).

In Fiscal Year 2006, extending from July 1, 2005 through June 30, 2006, the Mississippi Department of Information Technology Services (ITS 2006) compiled the following e-government usage statistics:

- ✓ Over 41,000 Mississippi sportsmen renewed their hunting, fishing, and boating licenses electronically using the Department of Wildlife, Fisheries, and Parks' online licensing application.
- ✓ The Department of Public Safety's Online Driver's License renewal application averaged more than 4,700 renewals each month.
- ✓ More than 45,000 students applied for Financial Aid using the Institutions of Higher Learning's online application.
- ✓ Over 25,000 transactions took place using the Secretary of State's online applications (UCC Filing, Certificate of Existence, Public Land, and Certificate of Fact).
- ✓ Approximately 7,100 physicians renewed their professional licenses using the Board of Medical Licensure's online renewal application.
- ✓ Approximately 5,000 nurses renewed their professional licenses using the Board of Nursing's online renewal application.

CHAPTER 3

METHODOLOGY

Methodology

The research goal of this dissertation is to synthesize theoretical foundations from well-known models in e-commerce scholarship, specifically the Technology Acceptance Model (TAM) (Gefen, Elena, and Straub 2003; Gefen and Straub 2000; Moon and Kim 2001), the Web Trust Model (WTM) (Gefen, Elena, and Straub 2003; Belanger, Hiller, and Smith 2002; McKnight, Choudhury, and Kacmar 2002), and SERVQUAL (Devaraj, Ming, and Kohli 2002; Parasuraman, Berry, and Zeithaml 1988; Parasuraman, Berry, and Zeithaml 1991) to form a model of the essential components that inform citizen adoption and satisfaction of e-government services. This research represents a newly conceived approach with interest among researchers seeking to understand e-government adoption as well as service quality (Warkentin et al. 2002). The objective of this newly conceived approach is for practitioners of e-government programs to have a reliable model from which government agencies can more fully recognize what motivates citizens to adopt a specific e-government application or service. The dissertation hypotheses are first documented followed by presentation of the design of the study. The remaining section presents an overview of the research instrument; lastly processes related to survey development and administration are presented.

Research Hypotheses

Consideration is now given to the specific formulation of testable hypotheses and the operationalization of variables relevant to this research study. The following hypotheses will be tested in this dissertation briefly outlined above and described in the Table 2 below.

TABLE 2: PROPOSED HYPOTHESES

H_1	An increase in Internet Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications.
H_2	An increase in Government Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications.
H_3	An increase in the Ease of Use of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications.
H_4	An increase in the Usefulness of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications.
H_5	An increase in the Service Quality Reliability of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual.
H_6	An increase in the Service Quality Responsiveness of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual.
H_7	An increase in the Service Quality Empathy of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual.
H_8	An increase in the Service Quality Assurance of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual.

Research Design

According to Brown and Brudney, researchers have documented that "attitudinal and perceptual measures" (1998, 338) have been found to be preferred measures for determining benefits realized from the implementation of information technology systems and applications. Robey (1979a) and Rivard (1987) cited a shift from quantitative measures toward perceptual measures for assessing information technology

and system benefits. Components previously identified in the Technology Acceptance Model (TAM) (Gefen, Elena, and Straub 2003; Gefen and Straub 2000; Moon and Kim 2001), the Web Trust Model (WTM) (Gefen, Elena, and Straub 2003; Belanger, Hiller, and Smith 2002; McKnight, Choudhury, and Kacmar 2002), and SERVQUAL (Devaraj, Ming, and Kohli 2002; Parasuraman, Berry, and Zeithaml 1988; Parasuraman, Berry, and Zeithaml 1991) were operationalized for this research study.

TABLE 3: VARIABLE QUESTION MAPPING AND FORMATION

Theoretical Construct	**Variable**	**Variable Transformation Equation**
SERVQUAL	Reliability	Q1 + Q5 + Q9 + Q13
SERVQUAL	Responsiveness	Q2 + Q6 + Q10
SERVQUAL	Empathy	Q3 + Q7 + Q11
SERVQUAL	Assurance	Q4 + Q8 + Q12
TAM	Reuse Intent	Q14 + Q17 + Q20 + Q23 + Q26
Web Trust	Trust in Internet	Q29 + Q31 + Q33
Web Trust	Trust in Government	Q30 + Q32 + Q34 + Q35
TAM	Ease of Use	Q16+ Q19+ Q22 + Q25 + Q28
TAM	Usefulness	Q15 + Q18 + Q21 + Q24 + Q27

The dependent variable (Reuse Intent), the intermediate variables (Trust in Internet, Trust in Government, Ease of Use, and Usefulness) and independent variables (Reliability, Responsiveness, Empathy, and Assurance Reuse Intent) were be made operational in a technique utilized by Cats-Baril and Thompson (1998) through standardizing and summing the responses to survey responses (see Table 3). Table 4 depicts the operational variables.

TABLE 4: OPERATIONAL VARIABLES

Name	Description	Scale	Theoretical Construct
Reliability (Independent)	Assesses service quality reliability of MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**SERVQUAL**
Responsiveness (Independent)	Assesses service quality responsiveness of MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**SERVQUAL**
Empathy (Independent)	Assesses service quality empathy of MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**SERVQUAL**
Assurance (Independent)	Assesses service quality assurance of MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**SERVQUAL**
Reuse Intent (Dependent)	Assesses reuse intent of the citizen utilizing MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**TAM**
Trust in Internet (Independent)	Assesses internet trust of the citizen utilizing MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**Web Trust**
Trust in Government (Independent)	Assesses government trust of the citizen utilizing MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**Web Trust**
Ease of Use (Independent)	Assesses ease of use of MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**TAM**
Usefulness (Independent)	Assesses usefulness of MISSISSIPPI.GOV e-government applications. Variable operationalized by standardizing and summing the responses.	7-Point Likert	**TAM**

Research Instrument

According to Nesbary (2000), the process of survey research is bounded by the collection of data from a representative sample of a population for the express purpose of specifically defining characteristics of the population. Thus, the primary role of the survey in academic research is the accurate estimation of certain defined traits of the whole population via the compilation and analysis of a significantly smaller, representative sample of the entire population (Dillman 2000). An online e-government adoption and satisfaction survey was administered to identify a consistent model from which public sector managers can more completely understand what impels citizens to adopt a specific e-government application or service, as well as understand e-government service quality.

The population for this survey consisted of citizens who have utilized on-line government transactions via the Mississippi.gov portal. This population was selected due to two primary considerations. First, nine of eleven on-line transactions offered via the Mississippi.gov portal are payment-based, thus the majority of citizens interacting with government on-line are submitting a payment. Second, if a citizen does not utilize a payment-based on-line transaction, that interaction is not recorded in a transaction log, thus the record of interaction is not maintained beyond the point of transaction – simply put, the data does not exist. A list of interactive, real-time applications was provided by the Mississippi Department of Information Technology Services (ITS). On-line government transactions that did not have a payment component were not included in the

population. Thus, the sampling frame consisted of all citizens who have utilized on-line government transactions via the Mississippi.gov portal, as summarized in Table 5.

TABLE 5: SUMMARY OF MISSISSIPPI.GOV ON-LINE GOVERNMENT TRANSACTIONS

Architecture Professional Licensing
Boating Registration Renewal
Driver's License Renewal
Fishing Licenses Online
Hunting Licenses Online
Motor Vehicle Report
Nurse's Online License Renewal
Physician's Online License Renewal
Uniform Commercial Code (UCC) Filing Online

The sample population was extracted from the sampling frame. For this dissertation, the sampling frame included approximately 200,000 Mississippi citizens, who have completed an on-line transaction via the Mississippi.gov portal from July 2005 through July 2007. Of vital importance to the researcher is both the quality of the sample, as well as the size of the sample. The quality of the sample is significant to justify the generalization of the analytical results, a feature of what is often considered successful research (Patten 2004). In addition the size of the sample is also of significance; with larger sample sizes, the more likely the sample will mirror the population at large (Nesbary 2000). However, in addition to the size of the sample, which in and of itself does not ensure generalizability, collecting an unbiased sample is also critical in appraising the satisfactoriness of the sample (Patten 2004). Vital to the collection of an unbiased sample is the randomness in which the sample is generated from the population at large; indeed, each population constituent is to have an identical prospect of being included in the sample. Thus, random sampling was utilized in this

research to obtain an equitable sample population. Still, due to the fact that random sampling may initiate sampling errors, attempts were made to diminish sampling errors, and as a consequence enhance accuracy, by escalating the sample size.

Patten (2004) suggests that a researcher should first consider obtaining an unbiased sample and then seek a relatively large number of participants. Patten (2004) provides a table of recommended sample sizes. A table of recommended sample sizes (n) for populations (N) with finite sizes, developed by Krejcie and Morgan and adapted by Patten (2004), was utilized to determine estimated sample size. According to the table, and for purposes of this study, with an estimated population size N = 200,000, a sample size for the 95% confidence interval of n = 384 was the goal. In 1998, according to Nesbary (2000), web-based surveys were almost non-existent in the public sector. Nesbary (2000) then conducted three surveys to compare response rate and response time of web-based surveys to regular mail surveys. Survey results and respondent feedback of all three surveys indicated that web-based surveys were more cost effective, easier to use, and had quicker response rates and greater responses. Of those surveyed, respondents indicated a strong preference for use of technology to take advantage of speed and convenience. For this dissertation, a web-based survey was utilized to gather data relevant to citizen acceptance of e-government applications.

In conducting survey research, it is crucial that participation is completely voluntary. However, voluntary participation can sometimes conflict with the need to have a high response rate. Low return rates can introduce response bias (Dillman 2000). In order to encourage a high response rate, Dillman (2000) suggests multiple contacts. For this study, up to five contacts were made per potential participant. The first email

contact (Appendix A) was sent a few days preceding the survey to not only verify email addresses, but also to inform possible participants of the importance and justification for the study (Dillman 2000). The second email contact (Appendix A) represents the actual email cover letter explaining the study objectives in more depth (Dillman 2000). This email consisted of a link to the web-based survey. By clicking on the link provided, the participant indicated agreement to participate in the research study. The third email contact (Appendix A) was sent a week later reminding those who have not responded (Dillman 2000). The fourth email contact (Appendix A) was sent two weeks after the actual survey email reemphasizing the importance of citizens' providing input to the study (Dillman 2000). The fifth and final email contact (Appendix A) was sent three weeks after the actual survey email to inform citizens that the study was drawing to a close and that their input was valuable to the results of the study (Dillman 2000).

In addition, the protection of the respondent's identity is of crucial importance in the survey procedures. This was accomplished by exercising anonymity and confidentiality. A survey is anonymous when a respondent cannot be identified on the basis of a response. A survey is confidential when a response can be identified with a subject, but the researcher promises not to disclose the individual's identity. To avoid confusion, the cover email clearly identified the survey as being confidential in regards to responses and the reporting of results. Participant identification was kept confidential and was only used in determining who had not responded for follow-up purposes. No personally identifiable information was retained in the final dataset. Theoretical constructs and scale items are depicted in Appendix B, with a textual presentation of the web-based e-government adoption and satisfaction survey presented in Appendix C.

The web-based survey was conducted using surveymonkey.com, a survey software program offered online. For a small fee, the program offered many features including unlimited number of survey questions, ability to add a personalized logo, custom redirects, result filtering, and the capability to export data for statistical analysis. The program provided a list management tool where responses can be tracked by their email addresses, which proved to be very useful for follow-up emails. The program also provided security, including the option to turn on SSL (Secure Sockets Layers) to utilize data encryption and provide data protection. Responses to the survey were recorded, exported in a spreadsheet, and transferred to SPSS, a statistical software package, for in-depth analysis. An instrument is valid if it measures what it is intended to measure and accurately achieves the purpose for which it was designed (Patten 2004). Patten (2004) emphasizes that validity is a matter of degree and discussion should focus on how valid a test is, not whether it is valid or not. According to Patten (2004), no test instrument is perfectly valid; rather, the researcher needs some kind of assurance that the instrument being used will result in accurate conclusions. Validity involves the appropriateness, meaningfulness, and usefulness of inferences made by the researcher on the basis of the data collected (Patten 2004). Validity can often be thought of as judgmental. According to Patten (2004), content validity is determined by judgments on the appropriateness of the instrument's content. Patten (2004) identifies three principles to improve content validity: 1) use a broad sample of content rather than a narrow one, 2) emphasize important material, and 3) write questions to measure the appropriate skill. These three principles were addressed when validating the survey items. To provide additional content validity of the survey instrument, a focus group was formed consisting

of practitioner-based and academic experts in the field of technology adoption who provided input and feedback on survey items. According to Patten, ". . . validity is more important than reliability" (2004, 71). However, reliability does need to be addressed. Reliability relates to the consistency of the data collected (Patten 2004). Cronbach's coefficient *alpha* was used to determine the internal reliability of the instrument. In addition, validity testing was conducted to ascertain multidimensionality of concepts, particularly for the four dimensions of SERVQUAL. To accomplish this validity testing, a correlation matrix of the 13 SERVQUAL items was utilized. Similarly, five other correlation matrices, for the two TRUST and the three TAM dimensions, were utilized. This analysis is contained in the following chapter.

Research Model

To form the basis for analysis, and thus create a model of the essential components that inform citizen adoption of e-government services, nine total variables were utilized. A graphical depiction of the model is presented in Figure 4.

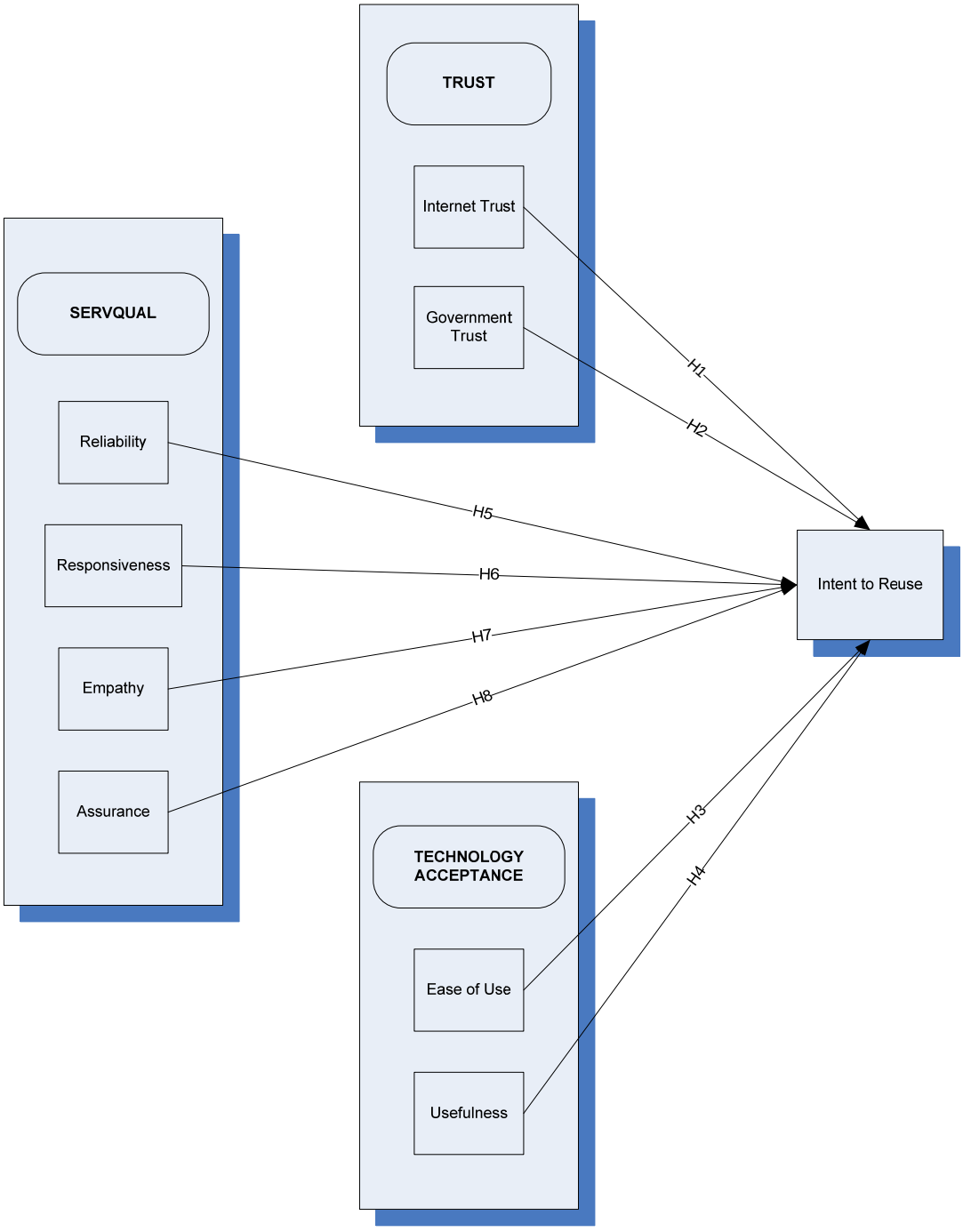

FIGURE 4: MODEL OF E-GOVERNMENT ADOPTION AND SATISFACTION

CHAPTER 4

RESULTS

In order to develop the survey mechanism utilized in this dissertation existing scales were combined with other relevant items from scholarly literature. Chapter four documents a thorough account of the results from this dissertation. The following chapter presents the findings of the bivariate and multivariate regression. Contained in chapter six is a discussion of the contributions of this research, as well as a presentation of the limitations recommendations for ongoing research. Chapter four presents an explanatory analysis of the data, followed by a summary of the dependent variable used in this research. The following section presents an overview of the independent variables used in this dissertation. The final section concludes with an item and scale analysis.

Explanatory Analysis of the Data

The e-government adoption and satisfaction survey was delivered securely via the Internet utilizing surveymonkey.com, a Web-based survey software program. The survey was administered to 10,000 prior users of the Mississippi.gov e-government portal between the dates of August 6, 2007 through September 6, 2007. Of the 10,000 surveys initially delivered, it was discovered that nearly 12 percent of the email address utilized were invalid, thus rendering approximately 1,200 potential respondents unapproachable. Overall, 795 surveys were received via the Web-based survey tool. Of this response set, 147 incomplete surveys were eliminated due to invalid or predominantly incomplete

responses, yielding an overall response rate of 7.36 percent. Hence, 648 surveys were used for the initial data analysis, although of this set of responses only 508 cases contained a complete response set.

To deal with the 140 cases of incomplete response sets, it is imperative to address the concerns raised by missing data that affect the generalizability of the results. In this situation, the researcher's principal challenge is to recognize the patterns and relationships underlying the incomplete response data with the goal of maintaining as close as possible the original distribution of values when any data imputation method is applied (Hair et al., 2006). As noted by Hair et al. (2006), the impact of missing data on the analysis has a practical component, that is incomplete response sets reduce the available sample size for analysis; in addition, the impact of missing data on the analysis has a substantive perspective, which suggests that resulting statistical analysis rendered from an incomplete response set could be biased.

Thus, it is incumbent on the researcher to conclude if the quantity of deficient response data will impact analytical results. Hair et al. (2006) outline two rudimentary guidelines to aid in this determination. First, incomplete response data less than 10% for a specific case can usually be overlooked, except when the incomplete response data occurs in a noted nonrandom fashion (Malhotra 1987; Raymonds and Roberts 1987). Second, individual variables with only 15 percent of incomplete response data can be targeted for omission, but greater levels of incomplete response data, up to 30 percent, can often be restored (Hertel 1976). The 140 individual cases with incomplete response data met these threshold guidelines, thus allowing the employment of an imputation technique without concern for biasing the analytical results. A myriad of data imputation

techniques are available to researchers, each with distinctive advantages and disadvantages (Little and Rubin 2002; Roth 1994; Schafer 1997). The technique selected for this study, imputation by using replacement values, involves substituting incomplete response data with estimated values based on other information accessible in the sample. The "principal advantage is that once the replacement values are substituted, all observations are available for use in analysis" (Hair et al. 2006, 63). The most common method of imputation by using replacement values is mean substitution, which substitutes the incomplete response data values for a variable with the mean value of that variable calculated from all valid responses. The justification for this technique is that the mean is the best single replacement value (Hair et al. 2006). Of 22,680 total, individual data values in the response set, only 248, or 1.09 percent, were replaced. For any specific variable, the percentage replaced ranged from a low of .15 percent to a high of 2.62 percent.

After data cleansing and the application of imputation by using replacement values, 648 cases remain in the response set. The survey was designed to control for acquiescence bias, the "tendency for people to agree with all items regardless of content" (Spector 1992, 10). Two questions were coded to control for acquiescence response: USE3 – The content of the MISSISSIPPPI.GOV web site is useless to me; and EOU5 – I find the MISSISSIPPPI.GOV web site difficult to use (See Appendix B). Research has been conducted on several sources of bias in responding to scales, that is, the tendency for subjects to respond to items systematically. The inclusion of positively and negatively-worded items in the response elicitation has long been advocated as a means to provide some control for acquiescence bias (Herche and Engelland 1996). In assessing

the response set for acquiescence bias, that is, a case with high acquiescence response will score high on all items of a scale, 5 cases were omitted, leaving the data set with 643 valid cases.

None of the six demographic variables were specifically included in the research model. However, the demographic variables were leveraged as control variables in the final confirmatory regression model contained in the following chapter. The age span of respondents was 18 – 65+ with a plurality of respondents (17.5%) documenting age within the span of 45 – 49. A majority of respondents (68.1%) earned a university degree and the documented household income is high, with a preponderance of respondents (56.7) in the topmost income group (Over $70,000). The following tables (Table 6 - Table 11) present the distribution for every demographic characteristic. Additionally, a majority of respondents were male (55.7%). A preponderance of the survey participants were Caucasian (91.9%). While 1.1 percent of the respondents did not document ethnicity, a mere 1.7 percent of respondents combined were documented as Hispanic, Asian, and Native Americans. And still a distinct minority was African-Americans, accounting for 5.2 of reporting respondents. And lastly, 93.4 percent of respondents reported use of a computer at home to access the Internet or World Wide Web.

TABLE 6: DISTRIBUTION OF DEMOGRAPHIC VARIABLES: AGE

Demographic Variables: Age			
	Age		
Category	**Frequency**	**Percent**	**Cumulative %**
18 -19	2	.3	.3
20-24	11	1.7	2.1
25-29	33	5.1	7.3
30-34	48	7.5	14.8
35-39	54	8.4	23.3
40-44	81	12.6	36.1
45-49	112	17.5	53.8
50-54	95	14.8	68.8
55-59	86	13.4	82.3
60-64	56	8.7	91.2
65+	56	8.7	100

TABLE 7: DISTRIBUTION OF DEMOGRAPHIC VARIABLES: INCOME

Demographic Variables: Household Income			
	Income		
Category	**Frequency**	**Percent**	**Cumulative %**
Under $10,000	6	1.0	1.0
$10,000 - $20,000	10	1.7	2.7
$20,000 - $30,000	20	3.4	6.0
$30,000 - $40,000	47	7.9	13.9
$40,000 - $50,000	46	7.7	21.6
$50,000 - $60,000	59	9.9	31.5
$60,000 - $70,000	51	8.6	40.1
Over $70,000	338	56.7	96.8
Don't Know	19	3.2	100

TABLE 8: DISTRIBUTION OF DEMOGRAPHIC VARIABLES: EDUCATION

Demographic Variables: Education			
	Education		
Category	**Frequency**	**Percent**	**Cumulative %**
Grades 11 or Less	2	.3	.3
12th Grade	38	6.0	6.3
Some College	161	25.5	31.9
Graduated College	216	34.2	66.1
Some Graduate Work Completed	52	8.2	74.3
Graduate Degree	162	25.7	100

TABLE 9: DISTRIBUTION OF DEMOGRAPHIC VARIABLES: RACE

Demographic Variables: Race			
	Race		
Category	**Frequency**	**Percent**	**Cumulative %**
Caucasian	579	91.9	91.9
African-American	33	5.2	97.1
Hispanic	5	.8	97.9
Native American	2	.3	98.3
Asian	4	.6	98.9
Other	7	1.1	100

TABLE 10: DISTRIBUTION OF DEMOGRAPHIC VARIABLES: INTERNET USAGE

Demographic Variables: Internet Usage			
	Internet Usage		
Category	**Frequency**	**Percent**	**Cumulative %**
Yes	593	93.4	93.4
No	42	6.6	100

TABLE 11: DISTRIBUTION OF DEMOGRAPHIC VARIABLES: GENDER

Demographic Variables: Gender			
	Gender		
Category	**Frequency**	**Percent**	**Cumulative %**
Male	353	55.7	55.7
Female	281	44.3	100

Dependent Variable

The sole dependent variable utilized in this research (Reuse Intent) was made operational in a technique utilized by Cats-Baril and Thompson (1998) through standardizing and summing the responses to survey responses (see Table 3). Table 4 depicts the operational variables.

Reuse Intent

The single dependent variable (Reuse Intent) sought to assess the reuse intent of the citizen utilizing MISSISSIPPI.GOV e-government applications. The variable was measured via survey on a 7-point Likert scale ranging from 1 = "Strongly Disagree" to 7 = "Strongly Agree." A frequency distribution for each of the nine scales, including Reuse Intent is included in Appendix D.

Independent Variables

The theoretical constructs which encompass this dissertation were selected based on inclusion in academic studies, as well as on personal research interests. As was the case with dependent variable, the independent variables used in this dissertation (Trust in Internet, Trust in Government, Ease of Use, Usefulness, Reliability, Responsiveness, Empathy, and Assurance) were be made operational in a technique utilized by Cats-Baril and Thompson (1998) through standardizing and summing the responses to survey responses (see Table 3). Table 4 depicts the operational variables.

SERVQUAL Variables

With respect to service quality, one of the most widely used measurement scales, SERVQUAL (Parasuraman, Berry, and Zeithaml 1988), consists of five service quality dimensions. Early studies sought to investigate the significance of the SERVQUAL scale within an information technology context (Kettinger and Lee 1994; Pitt, Watson, and Kavan1995), with later research centered on the assessment of search engines (Xie, Wang, and Goh 1998) and particular functions related to Web site success (Liu and Arnett 2000). Current research has expressly employed the SERVQUAL dimensions to

operationalize consumers' perceived service quality (Carr 2002). With no known research leveraging SERVQUAL in an e-government context, the inclusion of the independent variables (Reliability, Responsiveness, Empathy, and Assurance) of this construct represents an exploratory aspect of this dissertation. A frequency distribution for each of the nine scales, including Reliability, Responsiveness, Empathy, and Assurance is included in Appendix D.

Trust Variables

As with the Technology Acceptance Model (TAM), trust has been recognized through research as a vital forerunner to on-line activity, especially given the impersonal nature of e-commerce transactions (Gefen 2000; Meyer and Goes 1988; and Rousseau et al. 1998). Trust, as studied in the e-government context, is equally compelling with respect to the protection of personally identifiable information (Belanger, Hiller, and Smith 2002; CEG 2003; Chadwick 2001; GAO 2001; Hiller and Belanger 2001; Hoffman, Novak, and Peralta 1999). Overall, trust-oriented scholarship has specifically examined the institutional view of trust within the e-commerce context (McKnight, Choudhury, and Kacmar 2002; Tan and Thoen 2001), with focused attention granted to the development of a multi-dimensional trust model (McKnight, Choudhury, and Kacmar 2002). One of the four major constructs acknowledged by McKnight, Choudhury, and Kacmar (2002), institution-based trust has become a leading indicator of on-line transactions (McKnight and Chervany 2002). Only in current research has a Web trust model been included in research examining e-government transaction (Carter and Belanger 2004, 2005). Hence, with a solid theoretical foundation rooted in e-commerce

literature, and more recent research exploring the impact of trust in e-government transactions, the variables (Trust in Internet and Trust in Government) were utilized in this study. A frequency distribution for each of the nine scales, including Trust in Internet and Trust in Government is included in Appendix D.

Technology Acceptance Model (TAM) Variables

Often cited in scholarly literature dealing with technology adoption research, the Technology Acceptance Model (TAM), developed by Davis (1989), is a derivative of the theory of reasoned action, expectancy theory, and self-efficacy theory (Fishbein and Ajzen 1975; Robey 1979b; Bandura 1977). Core components of TAM suggest that perceived ease of use and perceived usefulness inform an individual's mind-set regarding a particular information technology system. Only recently have scholars leveraged TAM to appraise user adoption of e-commerce (Gefen, Elena, and Straub 2003; Gefen 2000; Moon and Kim 2001); the most recent research utilizes TAM to consider adoption of on-line services in the public sector (Carter and Belanger 2004, 2005; Warkentin et al. 2002). Given the prevalence of TAM in adoption research, the TAM variables (Ease of Use and Usefulness) were utilized in the study. A frequency distribution for each of the nine scales, including Ease of Use and Usefulness is included in Appendix D.

Item and Scale Analysis: Reliability and Validity

In order to validate the items and scale utilized in the research, validity testing was conducted to ascertain multidimensionality of concepts, particularly for the four dimensions of SERVQUAL. To accomplish this validity testing, a correlation matrix of the 13 SERVQUAL items was utilized. Similarly, five other correlation matrices, for the

two TRUST and the three TAM dimensions, were utilized. If any item was not correlated with the other items, then it was excluded from the scales.

Scales used to measure all variables were created through standardizing and summing the responses to survey responses (see Table 3). In Table 12 below, all of the variables are shown with a question summation list. This table depicts results for reliability analyses using Cronbach's alpha. In addition, Table 13 presents average correlation scores are presented along with high and low correlation scores, as well as factor scores. A correlation matrix and factor analysis was developed for each scale. All variable scales presented high, positive, and significant correlations, as well as high cumulative factor loadings, thus, no deletions were made.

TABLE 12: VARIABLE FORMATION AND RELIABILITY ANALYSIS (SEE TABLE 3 FOR VARIABLE MAPPING TABLE)

Variable	Question Summation	No. of Items	Alpha
Reliability (REL)	Q1 + Q5 + Q9 + Q13	4	.881
Responsiveness (RES)	Q2 + Q6 + Q10	3	.760
Empathy (EMP)	Q3 + Q7 + Q11	3	.735
Assurance (ASR)	Q4 + Q8 + Q12	3	.759
Reuse Intent (REUSE)	Q14 + Q17 + Q20 + Q23 + Q26	5	.912
Trust in Internet (TRI)	Q29 + Q31 + Q33	3	.888
Trust in Government (TRG)	Q30 + Q32 + Q34 + Q35	4	.927
Ease of Use (EOU)	Q16+ Q19+ Q22 + Q25 + Q28	5	.938
Usefulness (USE)	Q15 + Q18 + Q21 + Q24 + Q27	5	.920

TABLE 13: VARIABLE FORMATION AND SCALE VALIDATION

Variable	Question Summation	Average Correlation	High Correlation	Low Correlation	Factor Loadings Cumulative %
Reliability (REL)	Q1 + Q5 + Q9 + Q13	.671	.749	.604	75.37%
Responsiveness (RES)	Q2 + Q6 + Q10	.520	.597	.444	68.10%
Empathy (EMP)	Q3 + Q7 + Q11	.503	.589	.449	66.96%
Assurance (ASR)	Q4 + Q8 + Q12	.538	.689	.440	69.48%
Reuse Intent (REUSE)	Q14 + Q17 + Q20 + Q23 + Q26	.704	.897	.483	77.25%
Trust in Internet (TRI)	Q29 + Q31 + Q33	.734	.763	.718	82.28%
Trust in Government (TRG)	Q30 + Q32 + Q34 + Q35	.776	.828	.724	83.34%
Ease of Use (EOU)	Q16+ Q19+ Q22 + Q25 + Q28	.755	.814	.695	80.41%
Usefulness (USE)	Q15 + Q18 + Q21 + Q24 + Q27	.705	.841	.605	76.57%

Table 14 presents correlation coefficients, means, and standard deviations. Although generalizability has been a preferred method of research for quite some time, transferability is a more challenging concept. It is important to note that generalizability and transferability are not necessarily mutually exclusive; they can overlap. From a research design for an empirical study to a case study, researchers transfer the methods, results, and ideas from the research to a particular context. Therefore, a generalizable study can also be transferable. For example, as in the case of this study, the results may be generalized for the survey of 643 citizens in a state to the population of Mississippi.gov e-government users as a whole; researchers may apply, or transfer, the results to their own studies.

TABLE 14: CORRELATION COEFFICIENTS, MEANS, AND STANDARD DEVIATIONS

	Y_{REUSE}	X_{RES}	X_{EMP}	X_{ASR}	X_{REL}	X_{TRI}	X_{TRG}	X_{EOU}	X_{USE}
Reuse Intent (Y_{REUSE})	1.00								
Responsiveness (X_{RES})	.628** p=.0001	1.00							
Empathy (X_{EMP})	.729** p=.0001	.766** p=.0001	1.00						
Assurance (X_{ASR})	.769** p=.0001	.743** P=.0001	.832** p=.0001	1.00					
Reliability (X_{REL})	.764** p=.0001	.767** p=.0001	.849** p=.0001	.874** p=.0001	1.00				
Trust in Internet (X_{TRI})	.554** p=.0001	.437** p=.0001	.483** p=.0001	.539** p=.0001	.515** p=.0001	1.00			
Trust in Government (X_{TRG})	.705** p=.0001	.569** p=.0001	.625** p=.0001	.691** p=.0001	.694** p=.0001	.807** p=.0001	1.00		
Ease of Use (X_{EOU})	.762** p=.0001	.689** p=.0001	.730** p=.0001	.722** p=.0001	.777** p=.0001	.487** p=.0001	.641** p=.0001	1.00	
Usefulness (X_{USE})	.898** p=.0001	.673** p=.0001	.780** p=.0001	.804** p=.0001	.828** p=.0001	.506** p=.0001	.682** p=.0001	.846** p=.0001	1.00
N	643	643	643	643	643	643	643	643	643
Range	30	18	18	18	24	18	24	30	30
Min/Max	5/35	3/21	3/21	3/21	4/28	3/21	4/28	5/35	5/35
Mean	28.39	14.93	16.49	16.68	22.36	15.54	21.77	27.46	28.76
Standard Deviation	4.61	2.79	2.69	2.66	3.90	3.28	3.83	5.12	4.76

NOTE: P value indicates 2-tailed significance.

**p < .01

*p < .05

Preliminary Outlier Detection

After completing required data imputation techniques, and controlling for acquiescence response, the data were tested for outliers. Outliers can fundamentally modify the result of statistical analysis and are also breaches of normality. As such, outliers are observations with a distinctive mixture of features identifiable as markedly dissimilar from the other observations (Hair et al. 2006). It is noted that "outliers cannot be categorically characterized as either beneficial or problematic, but instead must be viewed within the context of the analysis and should be evaluated by the types of information they may provide" (Hair et al. 2006, 73).

To identify and eliminate outliers, the Mahalanobis D^2 measure was utilized. Since a multivariate analysis was to follow the bivariate analysis, bivariate methods for outlier detection rapidly become insufficient for several reasons. As noted by Hair et al. (2006), bivariate methods for outlier detection necessitate a large number of graphs, and are restricted to two variables. The Mahalanobis D^2 measure, a multivariate appraisal of each case across a set of variables, measures each case's "distance in multidimensional space from the mean center of all observations, providing a single value for each observation no matter how many variables are considered" (Hair et al. 2006, 73). For interpretation purposes, the Mahalanobis D^2 divided by the number of variables involved (D^2/df) is approximately dispersed as a t-value, thus allowing for significance testing. Hence, it is recommended that threshold levels for the D^2/df measure should be conservative (.005 or .001), resulting in values of 2.5 (small samples) versus 3 or 4 in larger samples (Hair et al. 2006, 75).

Utilizing the Mahalanobis D^2 measure, 19 cases were identified as potential outliers with $p < .001$. Before a decision was made as to whether cases were to be omitted or retained, careful consideration was granted in understanding why the case was earmarked as an outlier. To that end, a comparison of the mean and standard deviation for each variable was made of each potential outlier case. Many researchers espouse the philosophy that outliers "should be retained unless demonstrable proof indicates that they are truly aberrant and not representative of any observations in the population' (Hair et al. 2006, 76). As outliers are omitted, the researcher faces the dilemma of developing a model with overall better fit, but inhibiting generalizability. Of the 19 cases designated as potential outliers, only 2 were selected for deletion. Both cases had, across all of the 9 composite variables, consistently varied combinations of values when compared to the mean and standard deviation for each variable.

Preliminary Assessment of Normality

Testing for normality is also essential at the onset of the analysis. The assumption of normality makes reference to the shape of the data distribution for a specific variable as it compares to the normal distribution. If the disparity from the normal distribution is amply large, "all resulting statistical tests are invalid, because normality is required to use the *F* and *t* statistics" (Hair et al. 2006, 79). Normality is judged based on kurtosis, the "peakedness" or "flatness" of the distribution compared with the normal distribution, and skewness, the balance of the distribution (Hair et al. 2006, .80). For sample sizes with less than 50 individual cases, lack of normality can potentially impact statistical results; these prospective impacts are mitigated in sample

sizes greater than 200. To analyze normality, a visual examination was made of the normal probability plot, which allowed an evaluation of the collective distribution of the actual data values with the collective distribution of a normal distribution (Daniel and Wood 1999). In addition to examining the normal probability plot, statistical tests based on skewness and kurtosis values were leveraged to assess normality. As noted by Hair et al. (2006) if either calculated *z* value exceeds the specified critical value, from a *z* distribution, then the assumption of normality is not maintained. The critical value used in this analysis ranged from 2.58 to -2.58 (.01 significance level).

Table 15 below contains the observed measures for the variables in the data set. Of the 9 variables, all show a deviation from normality in the overall normality tests, including significant deviations for skewness and kurtosis when viewing the shape characteristics. Table 15 also suggests the appropriate remedy for each of the variables. All variables except for Responsiveness (RES) were transformed by taking the square root. While Responsiveness (RES) met the critical value criteria for being transformed, when transformed by taking the square root, the subsequent values were practically unchanged. Thus, only Responsiveness (RES) could not be transformed to improve on its distributional characteristics. For the other eight variables, their tests of normality were now markedly improved to more acceptable levels. Table 15 below demonstrates the effect of the transformation on the eight variables, excluding Responsiveness (RES), in achieving normality. This variable, Responsiveness (RES), will be used in its original form (Hair et al., 2006, p.89).

TABLE 15: DISTRIBUTIONAL CHARACTERISTICS, TESTING FOR NORMALITY, AND POSSIBLE REMEDIES

	Skewness		Kurtosis		Applicable Remedies	Skewness		Kurtosis	
Variable	**Statistic**	**z value**	**Statistic**	**z value**	**Transformation**	**Statistic**	**z value**	**Statistic**	**z value**
Reliability (REL)	-1.12	-11.55	1.99	10.33	Square Root	.132	1.36	.279	1.45
Responsiveness (RES)	-.289	-2.98	.887	4.59	None	–	–	–	–
Empathy (EMP)	-.939	-9.68	1.67	8.68	Square Root	.106	1.09	.299	1.55
Assurance (ASR)	-1.09	-11.26	2.47	12.81	Square Root	.163	1.68	.544	2.82
Reuse Intent (REUSE)	-1.34	-13.81	3.38	17.49	Square Root	.171	1.76	.586	3.04
Trust in Internet (TRI)	-.887	-9.14	.972	5.04	Square Root	.080	.825	.206	1.07
Trust in Government (TRG)	-.896	-9.24	1.46	7.58	Square Root	-.053	-.546	.368	1.91
Ease of Use (EOU)	-1.21	-12.42	2.16	11.19	Square Root	.164	1.69	.402	2.08
Usefulness (USE)	-1.36	-14.01	2.64	13.65	Square Root	.299	3.08	.315	1.63

NOTE: The z values are derived by dividing the statistics by the appropriate standard errors .097 (skewness) and .193 (kurtosis). The statistic value (z) for the skewness value is calculated as: $z_{skewness}$ = skewness/$\sqrt{6}$/N. The statistic value (z) for the kurtosis value is calculated as: $z_{kurtosis}$ = kurtosis/$\sqrt{24}$/N.
Critical Value: If either calculated z value exceeds the specified critical value, then the distribution is nonnormal in terms of that characteristic.

Preliminary Assessment of Homoscedasticity, Multicollinearity, and Linearity

After completing required data imputation techniques, controlling for acquiescence response, and testing for outliers and normality, the assumption of homoscedasticity was evaluated, along with a test for multicollinearity, and linearity. Homoscedasticity refers to the supposition that dependent variable(s) display equivalent levels of variance across the independent variables. For the researcher, "homoscedasticity is desirable because the variance of the dependent variable being explained in the dependence relationship should not be concentrated in only a limited range of the independent variables" (Hair et al. 2006, 83). Leveraging White's Test, evidence of heteroscedasticity[1] (Fox 1991) was not found. Tests for multicollinearity[2], conducted using two statistics: Tolerance and Variance Inflation Factor (VIF) (Hair et al. 2006; Fox 1991; Berry and Feldman 1985), did not reveal specific initial concerns; however, as can be seen later in this chapter, multicollinearity remains a diagnostic concern throughout the analysis. Lastly, an inherent assumption of all multivariate techniques based on correlational measures of association, is linearity (Hair et al. 2006). In the case of individual variables, "linearity relates to the patterns of association between each pair of variables and the ability of the correlation coefficient to adequately

[1] White's Test was utilized (Fox, 1991). [chi-square = nR^2 = 640(.003) = 1.92; chi-square critical (.05, 8) = 15.51, thus since chi-square < chi-square critical (1.92 < 15.51), heteroscedasticity does not exist.

[2] Tolerance and VIF, where: Tolerance → 0 – 1 and Tolerance = 1- Rj2 and VIF → 1 – ∞ and VIF = 1/1-Rj2 or 1/Tolerance. In testing for multicollinearity, the following parameters are used as guides: If VIF > 10 and Tolerance < .1 → multicollinearity may exist. If VIF < 4 → multicollinearity should not exist. Thus, as tested using the VIF and Tolerance statistics, none of the independent variables (Reliability (REL), Responsiveness (RES), Empathy (EMP), Assurance (ASR), Trust in Internet (TRI), Trust in Government (TRG), Ease of Use (EOU), and Usefulness (USE)) have a multicollinearity problem.

represent the relationship" (Hair et al. 2006, 94). For this initial analysis of the data, a visual assessment of scatterplots was utilized to resolve whether nonlinear relationships were present. This examination of the scatterplots did not expose any obvious nonlinear relationships. Thus, transformations to achieve linearity are not deemed essential (Hair et al. 2006).

CHAPTER 5

BIVARIATE AND MULTIVARIATE ANALYSIS

Chapter five documents the bivariate and multivariate analysis completed for this dissertation. The subsequent chapter offers a statement of contributions for this dissertation, as well as a presentation of potential limitations and recommendations for ongoing research. Chapter five, in the opening section, provides a detailed bivariate analysis of the theoretical research model used in this study. The following section contains a multivariate analysis, and the final section presents the results of analysis and hypotheses testing.

Bivariate Analysis

To begin, bivariate analysis, the examination of two variables at the same time, is presented. The primary concern in this introductory analysis is simply focused on the mathematical relationship between two variables. To accomplish this cross tabulation analysis, presented in Tables 16 – 23, variables were trichotomized. Cutting points for the trichotomized scales are presented in Appendix D.

Hypothesis 1: Internet Trust and Reuse Intent

Hypothesis 1 (see Table 16) of the model argues that an increase in Internet Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications. In the E-Government Adoption and Satisfaction Survey, 57.1%

of respondents in the High Internet Trust category were within the High Reuse Intent category, whereas, a decrease to 21.9% of respondents in the Medium Internet Trust category is noted for High Reuse Intent and only 13.3% of respondents in the Low Internet Trust category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 73.8% of respondents in the Low Internet Trust category were within the Low Reuse Intent category. The Gamma value of .606 reflects a strong positive relationship between Internet Trust and Reuse Intent. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in Internet Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications is supported.

TABLE 16: REUSE INTENT AND INTERNET TRUST IN E-GOVERNMENT ADOPTION

		Internet Trust		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	73.8%	48.1%	18.8%
	Medium (2)	12.9%	30.0%	24.1%
	High (3)	13.3%	21.9%	57.1%
N		240	210	191
Gamma		.606		
Chi-squared		156.48*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*****p < .05

Hypothesis 2: Government Trust and Reuse Intent

Hypothesis 2 (see Table 17) of the model argues that an increase in Government Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications. In the E-Government Adoption and Satisfaction Survey, 63.9% of respondents in the High Government Trust category were within the High Reuse Intent

category, whereas, a decrease to 23.3% of respondents in the Medium Government Trust category is noted for High Reuse Intent and only 8.2% of respondents in the Low Government Trust category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 76.1% of respondents in the Low Government Trust category were within the Low Reuse Intent category. The Gamma value of .736 reflects a strong positive relationship between Reuse Intent and Government Trust. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in Government Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications is supported.

TABLE 17: REUSE INTENT AND GOVERNMENT TRUST IN E-GOVERNMENT ADOPTION

		Government Trust		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	76.1%	43.2%	13.9%
	Medium (2)	15.7%	33.6%	22.3%
	High (3)	8.2%	23.3%	63.9%
N		293	146	202
Gamma		.736		
Chi-squared		239.42*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Hypothesis 3: Ease of Use and Reuse Intent

Hypothesis 3 (see Table 18) of the model argues that an increase in the Ease of Use of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications. In the E-Government Adoption and Satisfaction Survey, 70.6% of respondents in the High Ease of Use category were within the High Reuse Intent category, whereas, a decrease to 21.0% of respondents in the Medium Ease of Use category is noted for Low Reuse Intent and only 4.0% of respondents in the High Ease of Use category falls within the Low Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 78.4% of respondents in the Low Ease of Use category were within the Low Reuse Intent category. The Gamma value of .788 reflects a strong positive relationship between Reuse Intent and Ease of Use. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in the Ease of Use of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications is supported.

TABLE 18: REUSE INTENT AND EASE OF USE IN E-GOVERNMENT ADOPTION

		Ease of Use		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	78.4%	42.6%	13.4%
	Medium (2)	17.6%	36.4%	15.9%
	High (3)	4.0%	21.0%	70.6%
N		278	162	201
Gamma		.788		
Chi-squared		306.45*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Hypothesis 4: Usefulness and Reuse Intent

Hypothesis 4 (see Table 19) of the model argues that an increase in the Usefulness of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications. In the E-Government Adoption and Satisfaction Survey, 84.0% of respondents in the High Usefulness category were within the High Reuse Intent category, whereas, a decrease to 17.4% of respondents in the Medium Usefulness category is noted for High Reuse Intent and only 0.9% of respondents in the Low Usefulness category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 88.0% of respondents in the Low Usefulness category were within the Low Reuse Intent category. The Gamma value of .890 reflects a strong positive relationship between Reuse Intent and Usefulness. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in the Usefulness of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications is supported.

TABLE 19: REUSE INTENT AND USEFULNESS IN E-GOVERNMENT ADOPTION

		Usefulness		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	88.0%	42.9%	5.9%
	Medium (2)	11.1%	39.7%	10.1%
	High (3)	0.9%	17.4%	84.0%
N		225	247	169
Gamma		.890		
Chi-squared		442.04*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Hypothesis 5: Service Quality Reliability and Reuse Intent

Hypothesis 5 (see Table 20) of the model argues that an increase in the Service Quality Reliability of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications. In the E-Government Adoption and Satisfaction Survey, 71.2% of respondents in the High Reliability category were within the High Reuse Intent category, whereas, a decrease to 23.4% of respondents in the Medium Reliability category is noted for High Reuse Intent and only 6.0% of respondents in the Low Reliability category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low Medium components. Notably, 72.0% of respondents in the Low Reliability category were within the Low Reuse Intent category. The Gamma value of .736 reflects a strong positive relationship between Reuse Intent and Service Quality Reliability. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in the Reliability of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications is supported.

TABLE 20: REUSE INTENT AND RELIABILITY IN E-GOVERNMENT ADOPTION

		Reliability		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	72.0%	41.4%	14.6%
	Medium (2)	22.0%	35.1%	14.1%
	High (3)	6.0%	23.4%	71.2%
N		332	111	198
Gamma		.736		
Chi-squared		281.36*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Hypothesis 6: Service Quality Responsiveness and Reuse Intent

Hypothesis 6 (see Table 21) of the model argues that an increase in the Service Quality Responsiveness of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications. In the E-Government Adoption and Satisfaction Survey, 46.7% of respondents in the High Responsiveness category were within the High Reuse Intent category, whereas, a decrease to 20.8% of respondents in the Medium Responsiveness category is noted for High Reuse Intent and only 6.6% of respondents in the Low Responsiveness category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 77.3% of respondents in the Low Responsiveness category were within the Low Reuse Intent category. The Gamma value of .592 reflects a strong positive relationship between Reuse Intent and Responsiveness. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in the Responsiveness of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications is supported.

TABLE 21: REUSE INTENT AND RESPONSIVENESS IN E-GOVERNMENT ADOPTION

		Responsiveness		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	77.3%	52.6%	30.4%
	Medium (2)	16.0%	26.6%	22.9%
	High (3)	6.6%	20.8%	46.7%
N		181	154	306
Gamma		.592		
Chi-squared		123.89*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Hypothesis 7: Service Quality Empathy and Reuse Intent

Hypothesis 7 (see Table 22) of the model argues that an increase in the Service Quality Empathy of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications. In the E-Government Adoption and Satisfaction Survey, 70.1% of respondents in the High Empathy category were within the High Reuse Intent category, whereas, a decrease to 25.0% of respondents in the Medium Empathy category is noted for High Reuse Intent and only 5.2% of respondents in the Low Empathy category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 76.5% of respondents in the Low Empathy category were within the Low Reuse Intent category. The Gamma value of .732 reflects a strong positive relationship between Reuse Intent and Empathy. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in the Service Quality Empathy of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications is supported.

TABLE 22: REUSE INTENT AND EMPATHY E-GOVERNMENT ADOPTION

		Empathy		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	76.5%	40.3%	16.9%
	Medium (2)	18.3%	34.7%	13.0%
	High (3)	5.2%	25.0%	70.1%
N		268	196	177
Gamma		.732		
Chi-squared		259.46*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Hypothesis 8: Service Quality Assurance and Reuse Intent

Hypothesis 8 (see Table 23) of the model argues that an increase in the Service Quality Assurance of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications. In the E-Government Adoption and Satisfaction Survey, 79.2% of respondents in the High Assurance category were within the High Reuse Intent category, whereas, a decrease to 26.7% of respondents in the Medium Assurance category is noted for High Reuse Intent and only 4.5% of respondents in the Low Assurance category falls within the High Reuse Intent category. This positive, direct relationship is also seen in the Low components. Notably, 77.4% of respondents in the Low Assurance category were within the Low Reuse Intent category. The Gamma value of .804 reflects a strong positive relationship between Reuse Intent and Assurance. In addition, the Chi-squared statistic is significant at the 95% level, or $p \leq .05$. Hence, the hypothesis that an increase in the Service Quality Assurance of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications is supported.

TABLE 23: REUSE INTENT AND ASSURANCE IN E-GOVERNMENT ADOPTION

		Assurance		
		Low (1)	**Medium (2)**	**High (3)**
Reuse Intent	**Low (1)**	77.4%	38.5%	8.4%
	Medium (2)	18.2%	34.9%	12.3%
	High (3)	4.5%	26.7%	79.2%
N		292	195	154
Gamma		.804		
Chi-squared		321.37*		

NOTE: Percentages total 100% down each column.
Source: E-Government Adoption and Satisfaction Survey.
*p < .05

Multivariate Analysis

The initial assumptions required for multiple regression analysis, linearity, homoscedasticity, and normality, have already been assessed at the close of the previous chapter. For the multivariate analysis, the stepwise estimation procedure was utilized; the stepwise procedure maximizes the incremental explained variance at every stage of the model development process. To begin, the highest bivariate correlation (also the highest partial correlation since no other variables are in the equation) was selected (Hair et al. 2006). Table 24 displays all the correlations among the 8 independent variables and their correlations with the dependent variable, Reuse Intent (Y_{REUSE}). These correlation coefficients differ slightly in value from those in Table 14 because of the exclusion of the two extreme outlier cases.

TABLE 24: CORRELATION COEFFICIENTS, MEANS, AND STANDARD DEVIATIONS

	Y_{REUSE}	X_{RES}	X_{EMP}	X_{ASR}	X_{REL}	X_{TRI}	X_{TRG}	X_{EOU}	X_{USE}
Reuse Intent (Y_{REUSE})	1.00								
Responsiveness (X_{RES})	.610** p=.0001	1.00							
Empathy (X_{EMP})	.715** p=.0001	.755** p=.0001	1.00						
Assurance (X_{ASR})	.750** p=.0001	.732** P=.0001	.800** p=.0001	1.00					
Reliability (X_{REL})	.764** p=.0001	.752** p=.0001	.828** p=.0001	.838** p=.0001	1.00				
Trust in Internet (X_{TRI})	.558** p=.0001	.427** p=.0001	.497** p=.0001	.544** p=.0001	.521** p=.0001	1.00			
Trust in Government (X_{TRG})	.705** p=.0001	.544** p=.0001	.616** p=.0001	.666** p=.0001	.679** p=.0001	.809** p=.0001	1.00		
Ease of Use (X_{EOU})	.787** p=.0001	.667** p=.0001	.726** p=.0001	.718** p=.0001	.776** p=.0001	.517** p=.0001	.663** p=.0001	1.00	
Usefulness (X_{USE})	.897** p=.0001	.645** p=.0001	.763** p=.0001	.783** p=.0001	.806** p=.0001	.519** p=.0001	.618** p=.0001	.850** p=.0001	1.00
N	641	641	641	641	641	641	641	641	641
Range	4.57	18	3.36	3.36	4	3.36	4	4.57	4.48
Min/Max	1/5.57	3/21	1/4.36	1/4.36	1/5	1/4.36	1/5	1/5.57	1/5.48
Mean	2.63	14.93	2.27	2.23	2.46	2.45	2.58	2.78	2.54
Standard Deviation	.800	2.75	.559	.555	.735	.638	.707	.856	.843

NOTE: P value indicates 2-tailed significance.

**p < .01

*p < .05

Model 1

In the development of Model 1, careful inspection of the correlation matrix (see Table 24) shows that Usefulness (X_{USE}) has the highest bivariate correlation with the dependent variable Reuse Intent (Y_{REUSE}) (.897). The first model developed under the stepwise procedure requires a regression equation using just this single independent variable (Hair et al. 2006). The results of this first model appear as shown in Table 25. A comprehensive set of tables for Model 1 multivariate regression results is contained in Appendix E. From Table 25 questions pertaining to both overall model fit as well as the stepwise estimation of the regression model can be addressed.

TABLE 25: MODEL 1 OF MULTIVARIATE REGRESSION

Dependent Variable: Intent						
Independent Variable	**B**	**Std. Error**	**Beta**	***T***	**Tolerance**	**VIF**
(Constant)	.464	.044		10.442*		
USE	.850	.017	.897	51.283*	1.00	1.00

NOTE: $R^2 = .805$
Adj. $R^2 = .804$
F = 2629.969*
*p < .05

As this initial model is built, the Multiple R is identical to the bivariate correlation (.897) since the equation is comprised of only a single variable. R square ($R^2 = .805$), referred to as the coefficient of determination, indicates that 80.5 percent of the total variation of Reuse Intent (Y_{REUSE}) is explained by the regression model consisting of Usefulness (X_{USE}). The standard error of the estimate (.354) is another measure of the accuracy of the predictive power of the model (see Appendix E), and can be viewed as

the standard deviation of the prediction errors, thus becoming a measure to evaluate the unconditional size of the prediction error (Hair et al. 2006; Neter et al. 1996). The *F* ratio, provided in the Analysis of Variance (ANOVA) output, contains the statistical test for the overall model fit. For Model 1, as can be found in Appendix E, the total sum of squares (409.641) is the squared error that would occur if only the mean of the dependent variable were utilized to predict Reuse Intent (Y_{REUSE}). Using the values of Usefulness (X_{USE}) reduces this error by 80.45 percent (Hair et. al 2006). This reduction is considered statistically significant with an *F* ratio of 2629.969 and a significance level of .0001 (see Table 23). The value .850 is the regression coefficient (b_{USE}) for the independent variable Usefulness (X_{USE}). The predicted value for each observation is the intercept (.464) plus the regression coefficient (.850) times its value of the independent variable, thus rendering the following regression equation for Model 1:

$$Y_{REUSE} = \text{intercept} + b_{USE}(X_{USE})$$

where,

$$Y_{REUSE} = .464 + .850(X_{USE}).$$

The standardized regression coefficient, or beta value, of .897 is calculated from standardized data. The beta value compares the effect of the independent variable Usefulness (X_{USE}) on the dependent variable Reuse Intent (Y_{REUSE}) to the effect of other independent variables on Reuse Intent (Y_{REUSE}) as each model is built in the stepwise process, because this "value reduces the regression coefficient to a comparable unit, the number of standard deviations" (Hair et al. 2006, 238). The standard error of b_{USE} is .017, indicating that the 95% confidence interval for b_{USE} would be .850 ± (1.96 x .017), or varying from a low of .82 to a high of .88. The value of b_{USE} divided by the standard

error (.850 ÷ .017 = 51.28) is the calculated *t* value for a *t*-test of the hypothesis b_{USE} (Hair et al. 2006). The *t* value is utilized in the stepwise regression process to analyze the feasibility of eliminating a specific variable from the model at the time an additional independent is added. The calculated level of significance is compared to the threshold level set by the researcher for dropping the variable. For this research, a .10 threshold level of significance was utilized as a benchmark for eliminating variables. The critical value for a significance level of .10 with 98 degrees of freedom is 1.658. As additional variables were included in the regression model, each variable was verified against the threshold of significance greater than .10; if the threshold was exceeded, the variable was eliminated from the regression equation, and the model was reconstituted. In this research, the *t* value is 51.283, which is statistically significant at the .0001 level. This indicates a high level of assurance that the coefficient is not equal to zero and can be assessed as a predictor of Reuse Intent (Y_{REUSE}) (Hair et al. 2006).

In the first model generated in the stepwise regression process, the zero-order correlation, the partial correlation, and the part correlation all are identical (.897) because no other variables are in the equation. As variables are added in subsequent models, these values will differ, each reflecting their perspective on each independent variable's contribution to the regression model (Hair et al. 2006). Also, in Table 25, both collinearity measures, Tolerance and VIF, are reported to assess the impact of collinearity on the independent variables in the regression model. Since, in this initial model, only one variable has been included, the Tolerance is 1.00, as is expected. Also, the VIF is 1.00, signifying a total absence of multicollinearity (Hair et al. 2006).

As can be seen in Table 26, for this analysis, the values of partial correlations range from a high of .290 to a low of -.091. Trust in Government (X_{TRG}), with the highest value of .290, is slated as the next variable to be included in the stepwise regression, as the partial correlation is found to be statistically significant. Yet, as can be seen in Table 14, X_{TRG} had only the sixth highest bivariate correlation with Y_{REUSE}. The variables with the second, third and fourth highest correlations with Y_{REUSE} were X_{EOU} (.787), X_{REL} (.764), and X_{ASR} (.750). Both X_{EOU} and X_{ASR} had high correlations with X_{USE}, reflected in their somewhat low tolerance values of .278 and .387, respectively. Finally, X_{EMP}, the fifth highest bivariate correlation with Y_{REUSE}, has a correlation with X_{USE} of .763, enough to make the partial correlation lower than that of X_{TRG}. If X_{TRG} is added, then the R^2 value should increase by the partial correlation squared times the amount of unexplained variance (Change in $R^2 = .290^2$ x .195 = .0164). Because 80.5 percent was already explained by X_{USE}, X_{TRG} can explain only 1.64 percent of the remaining variance. (Hair et al. 2006)

TABLE 26: VARIABLES NOT ENTERED INTO MODEL 1

Variables Not Entered	Beta In	*T*	Partial Correlation	Tolerance	VIF
TRG	.175	7.66*	.290	.536	1.867
TRI	.127	6.39*	.245	.731	1.368
EOU	.088	2.67*	.105	.278	3.598
ASR	.123	4.44*	.173	.387	2.585
EMP	.074	2.75*	.108	.418	2.391
RES	.053	2.30	.091	.584	1.714
REL	.071	2.40	.095	.350	2.854

NOTE: *p < .05

In Table 26 above, X_{TRG}, the variable with the highest partial correlation also has the highest Beta coefficient if entered. With a magnitude of .175, this is compared with the

beta for the variable now in the model (X_{USE} with a beta of .897), indicating that X_{TRG} will play a modest role in the regression model as well as its analytical potential (Hair et al. 2006).

Lastly, in investigating the *t* values not included in the model, if this *t* value does not surpass a specified significance level (.05), the variable will not be allowed to enter the equation. The tabled *t* value for a significance level of .05 with 97 degrees of freedom is 1.98. In examining the *t* values in Table 26 above, it is clear that the seven remaining variables (X_{TRG}, X_{TRI}, X_{EOU}, X_{ASR}, X_{EMP}, X_{RES}, and X_{REL}) surpass this value and thus are considered for inclusion in the regression model. Yet, of the seven remaining variables, five (X_{TRG}, X_{TRI}, X_{EOU}, X_{ASR}, and X_{EMP}) are significant, and according to stepwise methodology, the variable included in the model will have the highest partial correlation, Trust in Government (X_{TRG}). In the first analysis of the regression model, a noteworthy fraction of the variance in the dependent variable (Y_{REUSE}) is explicated by X_{USE}; however, the stepwise methodology specifies that including X_{TRG}, the variable with the with the highest partial correlation coefficient, with the dependent variable and a *t* value that is significant at the .05 level, the analytical power of the overall regression model will be enhanced. Thus, the next model will utilize both X_{USE} and X_{TRG} (Hair et al. 2006).

Model 2

As was noted at the close of the discussion regarding Model 1, X_{TRG} was the next variable to be included in the regression model in the stepwise procedure. The multiple *R* and R^2 values have both increased with the inclusion of X_{TRG} (see Table 27 below). The

R^2 increased by 5.66 percent, the amount originated via multiplying the partial correlation coefficient from X_{TRG} of .290 and the 19.5 percent of variation that was not explained as a result of Model 1 by the partial correlation squared (19.5 x .290 = 5.66). Subsequently, of the 19.5 percent inexplicable with X_{USE}, $(.290)^2$ of this variance was clarified by the inclusion of X_{TRG}, resulting in a total variance explained (R^2) of .821. Similarly, the adjusted R^2 also increased to .820 and the standard error of the estimate decreased from .354 to .338; each of these measures indicate an improvement, though slight, in the overall model fit (Hair et al. 2006). Thus, the following regression equation is rendered for Model 2:

$$Y_{REUSE} = \text{intercept} + b_{USE}(X_{USE}) + b_{TRG}(X_{TRG})$$

where,

$$Y_{REUSE} = .240 + .737(X_{USE}) + .198(X_{TRG})$$

TABLE 27: MODEL 2 OF MULTIVARIATE REGRESSION

Dependent Variable: Intent						
Independent Variable	**B**	**Std. Error**	**Beta**	***T***	**Tolerance**	**VIF**
(Constant)	.240	.052		4.640*		
USE	.737	.022	.777	33.975*	.536	1.867
TRG	.198	.026	.175	7.661*	.536	1.867

NOTE: $R^2 = .821$
Adj. $R^2 = .820$
F = 1463.06*
*p < .05

The regression coefficient for X_{TRG} is .198 and the beta weight is .175. Although smaller than the beta for X_{USE} (.777), X_{TRG} nonetheless provides explanatory power in the overall regression model. The coefficient is statistically significant and multicollinearity is minimal with X_{USE}. Thus, Tolerance is satisfactory with a value of

.536 demonstrating that 46.4 percent of either variable is explained by the other (Hair et al. 2006). The comparative lack of multicollinearity in Model 2 is indicative of the trivial change for either the value of b_{USE} (.737) or the beta of X_{USE} (.777) in Model 1. The general lack of multicollinearity likewise indicates that variables X_{USE} and X_{TRG} are relatively independent (the simple correlation between the two variables is .681). If the impact of X_{TRG} on Y_{REUSE} were wholly exclusive of the effect of X_{USE}, the b_{USE} coefficient would remain unchanged. The *t* values specify that both X_{USE} and X_{TRG} are statistically significant predictors of Y_{REUSE}. The *t* value for X_{USE} is now 33.975, whereas it was 51.283 in Model 1. The *t* value for X_{TRG} depicts the involvement of this variable since X_{USE} is already in Model 2 (Hair et al. 2006). Complete regression results for Model 2 are contained in Appendix F.

TABLE 28: VARIABLES NOT ENTERED INTO MODEL 2

Variables Not Entered	Beta In	*T*	Partial Correlation	Tolerance	VIF
TRI	.037	1.308	.052	.344	2.904
EOU	.037	1.147	.045	.265	3.775
ASR	.069	2.455*	.097	.354	2.824
EMP	.035	1.33	.053	.401	2.495
RES	.022	.980	.039	.563	1.776
REL	.006	.280	.008	.319	3.137

NOTE: *p < .05

Lastly, in analyzing the partial correlations for the variables not included in Model 2 in Table 28 above, X_{ASR} has the highest partial correlation (.097), which is also statistically significant at the .014 level. This variable would explicate .94 percent of the previously unexplained variance ($.097^2 = .0094$), or .17 percent of the total variance ($.097^2$ x .179). This slight explanatory element is in fact a smaller amount than the

incremental contribution of X_{TRG}, the second variable included in the stepwise methodology (Hair et al. 2006).

Model 3

Model 3, as depicted below in Table 29, is presented with X_{ASR} added to the regression model. The value of R^2 increases by .20 percent (.823 - .821 = .002). In addition, adjusted R^2 increases to .822, and the standard error of the estimate decreases slightly to .338. Again, as was the case with X_{TRG} in the previous stepwise stage, the new variable entered (X_{ASR}) makes a minor contribution to overall model fit (Hair et al. 2006). The inclusion of X_{ASR} introduced a third statistically significant predictor of Reuse Intent (Y_{REUSE}) into the regression model. The regression weight of .099 is complemented by a beta weight of .069, the lowest among the three variables in the model (following the .158 of X_{TRG} and .735 of X_{USE}) (Hair et al. 2006). Thus, the following regression equation is rendered for Model 3:

$$Y_{REUSE} = \text{intercept} + b_{USE}(X_{USE}) + b_{TRG}(X_{TRG}) + b_{ASR}(X_{ASR})$$

where,

$$Y_{REUSE} = .170 + .697(X_{USE}) + .179(X_{TRG}) + .099(X_{ASR})$$

TABLE 29: MODEL 3 OF MULTIVARIATE REGRESSION

Dependent Variable: Intent						
Independent Variable	**B**	**Std. Error**	**Beta**	***T***	**Tolerance**	**VIF**
(Constant)	.170	.059		2.889*		
USE	.697	.027	.735	25.726*	.341	2.934
TRG	.179	.027	.158	6.646*	.490	2.039
ASR	.099	.040	.069	2.455*	.354	2.824

NOTE: $R^2 = .823$
Adj. $R^2 = .822$
F = 985.063*
*p < .05

Multicollinearity remains low, even as the third variable (X_{ASR}) is included into the regression model. The lowest Tolerance value is for X_{USE} (.341), signifying that 65.9 percent of variance of X_{USE} is represented by the other two variables. The way the variables are systematically loaded into the regression model via the stepwise methodology is expected, when considered with respect to the correlation matrix completed at the onset of the analysis (see Table 24). From initial results, it is apparent that the three variables currently in the regression model (X_{USE}, X_{TRG}, and X_{ASR}) are each components of different theory-based constructs, Technology Acceptance Model, Trust, and SERVQUAL, respectively. Since variables, as components contained in the same theory-based construct, demonstrate elevated multicollinearity, it is anticipated that as soon as one variable from a construct enters the regression model, the likelihood of an additional variable from the identical construct being included in the model is relatively small. And, as noted by Hair et al. (2006), if two variables from the same theory-based construct are included in the model, "the impact of both variables will be reduced due to

multicollinearity" (246). Complete regression results for Model 3 are contained in Appendix G.

TABLE 30: VARIABLES NOT ENTERED INTO MODEL 3

Variables Not Entered	Beta In	*T*	Partial Correlation	Tolerance	VIF
TRI	.032	1.139	.045	.343	2.920
EOU	.029	.901	.036	.262	3.816
EMP	.006	.189	.008	.310	3.225
RES	.003	.136	.005	.449	2.227
REL	-.043	-1.254	-.050	.232	4.304

NOTE: *p < .05

With Model 3 developed as part of the stepwise methodology, none of the remaining variables (X_{TRI}, X_{EOU}, X_{EMP}, X_{RES}, and X_{REL}) has the statistically significant partial correlations at the .05 level essential for insertion in the regression model (see Table 30). In evaluating the bivariate correlations of each of the independent variables with Y_{REUSE} in Table 24, it is noted that every one of the 8 original independent variables maintained significant bivariate correlations with the dependent variable. Thus X_{TRI}, X_{EOU}, X_{EMP}, X_{RES}, X_{REL} all have significant bivariate correlations, nevertheless their partial correlations are currently not significant. In the case of X_{EOU}, the noteworthy bivariate correlation of .787 was impacted noticeably by multicollinearity. The Tolerance value of .262 signifies that less than one quarter of the initial extrapolative influence remains. For the remaining four variables, X_{REL}, X_{EMP}, X_{RES}, X_{TRI}, and, their relatively lower bivariate correlations (.764, .715, -.610, and .558) have been impacted by multicollinearity a sufficient amount to not be significant. Furthermore, all of the variables in Model 3 remain statistically significant, thus truncating the step of reducing the number of variables in the regression model. Consequently, no additional variables

are deemed appropriate for inclusion or deletion and the model fitting process is concluded (Hair et al. 2006).

Regression Summary

Table 31 below presents a progressive review specifying the measures of overall fit for the regression model used in predicting Reuse Intent (Y_{REUSE}). Each of the three independent variables added to the model provided increased explanatory power to the overall model, with upward changes reflected in the R^2 and Adjusted R^2, as well as downward changes reflected in the standard error of the estimate. With the first three variables, 82 percent of the variation in Reuse Intent (Y_{REUSE}) is explained (Hair et al. 2006).

TABLE 31: MODEL SUMMARY OF STEPWISE MULTIPLE REGRESSION MODEL

Model Summary									
	Overall Model Fit				**R^2 Change Statistics**				
Step	***R***	***R^2***	**Adjusted *R^2***	**Std. Error of the Estimate**	***R^2* Change**	***F* Value of *R^2* Change**	***df*1**	***df*2**	**Significance of *R^2* Change**
1	.897	.805	.804	.35399	.805	2629.969	1	639	.0001
2	.906	.821	.820	.33902	.016	58.693	1	638	.0001
3	.907	.823	.822	.33769	.002	6.026	1	637	.014
Step 1: Usefulness (USE)									
Step 2: Usefulness (USE), Trust in Government (TRG)									
Step 3: Usefulness (USE), Trust in Government (TRG), Assurance (ASR)									

Concluding Assessment of Linearity, Homoscedasticity, and Normality

At this point in the analysis, individual variables have been examined to ensure that regression assumptions are present. Still, as noted by Hair et al. (2006), an examination must also be conducted to appraise the variate for meeting the regression assumptions as well. The assumptions to scrutinize are linearity, homoscedasticity, and normality. The chief measure used in examining the regression variate is the residual; that is, the disparity between the actual dependent variable value and its predicted value. For this assessment, the studentized residuals, a form of standardized residuals, was employed (Hair et al. 2006).

In investigating final assumptions in the regression analysis, linearity was examined via an analysis of residuals and partial regression plots for each independent variable in the analysis (X_{USE}, X_{TRG}, and X_{ASR}). Partial regression plots for each independent variable in the model were examined (see Appendix H). The relationship for X_{USE} is moderately well characterized as linear; that is, X_{USE} has a strong and significant effect in the regression model. Variables X_{TRG} and X_{ASR} are less well characterized in both slope and scatter of the points; thus, the less significant impact of these two independent variables in the regression model is clarified. This finding is substantiated by the smaller coefficient, beta value, and significance levels. For all three variables, no nonlinear pattern is shown, thus meeting the assumption of linearity for each independent variable (Hair et al. 2006).

As was discussed earlier in this chapter, homoscedasticity refers to the supposition that dependent variable(s) display equivalent levels of variance across the

range of independent variables. As noted by Hair et al. (2006), "homoscedasticity is desirable because the variance of the dependent variable being explained in the dependence relationship should not be concentrated in only a limited range of the independent variables" (83). Again, using White's Test, heteroscedasticity[3] (Fox 1991) was not found. Focusing on the assumption of normality, Table 32 below contains the observed measures depicting the shape of the distribution. Of the 4 variables, only two, Reuse Intent (Y_{REUSE}) and Usefulness (X_{USE}), show mild departures from normality, including deviations for skewness and kurtosis when analyzing the shape characteristics. Investigatory conversions were developed for both Reuse Intent (Y_{REUSE}) and Usefulness (X_{USE}); nevertheless, while these variables met the critical value criteria for being converted, when converted by taking the square root the resulting values were virtually unaffected. Thus, no conversions were suggested for the variables listed in Table 32 below (Hair et al. 2006). At the onset of the data analysis tests for normality were conducted on all nine variables (See Table 15). In that analysis, all variables showed a deviation from normality. Only Responsiveness (RES) could not be converted to improve on its distributional features and was used in its original form for the stepwise regression (Hair et al. 2006).

[3] [chi-square = nR^2 = 640(.001) = .64; chi-square critical (.05, 3) = 7.82, thus since chi-square < chi-square critical (.64 < 7.82), heteroscedasticity does not exist.

TABLE 32: DISTRIBUTIONAL CHARACTERISTICS, TESTING FOR NORMALITY, AND POSSIBLE REMEDIES

	Skewness		Kurtosis		Applicable Remedies	Skewness		Kurtosis	
Variable	**Statistic**	**z value**	**Statistic**	**z value**	**Transformation**	**Statistic**	**z value**	**Statistic**	**z value**
Reuse Intent (Y_{REUSE})	.171	1.76	.586	3.03	None	-	-	-	-
Usefulness (X_{USE})	.299	3.08	.315	1.63	None	-	-	-	-
Trust in Government (X_{TRG})	-.053	-.54	.368	1.91	None	-	-	-	-
Assurance (X_{ASR})	.163	1.68	.193	1.00	None	-	-	-	-

NOTE: The z values are derived by dividing the statistics by the appropriate standard errors .097 (skewness) and .193 (kurtosis). The statistic value (z) for the skewness value is calculated as: $z_{skewness}$ = skewness/$\sqrt{6/N}$. The statistic value (z) for the kurtosis value is calculated as: $z_{kurtosis}$ = kurtosis/$\sqrt{24/N}$. Critical Value: If either calculated z value exceeds the specified critical value, then the distribution is nonnormal in terms of that characteristic.

Concluding Outlier Detection

Lastly, for the final analysis, identification was made of observations that have an inconsistent impact on the regression results and determination was made whether these observations should be excluded from the final analysis. Again leveraging the Mahalanobis D^2 measure, a multivariate assessment of each observation across a set of variables, and beginning with 641 specific cases, 17 individual cases were identified as potential outliers with $p < .001$. By way of utilizing a comparative approach, the stepwise regression methodology was repeated with the 17 outlier cases deleted. Table 33 below contains results for the regression model with influential outliers deleted. With slight, non-significant impact to the regression model noted, the 17 individual cases denoted as outliers will remain in the model. This conservative approach was employed to preserve generalizability of the analysis. In many instances, by deleting influential observations, the resulting multivariate analysis can be optimized; yet, this optimization comes at a cost of reducing confidence in the generalizability of the results (Hair et al. 2006).

TABLE 33: MODEL SUMMARY OF STEPWISE MULTIPLE REGRESSION MODEL (WITH OUTLIERS DELETED)

Model Summary									
	Overall Model Fit				**R^2 Change Statistics**				
Step	***R***	***R^2***	**Adjusted *R^2***	**Std. Error of the Estimate**	***R^2* Change**	***F* Value of *R^2* Change**	***df*1**	***df*2**	**Significance of *R^2* Change**
1	.894	.799	.798	.34375	.799	2466.951	1	622	.0001
2	.902	.813	.812	.33156	.014	47.573	1	621	.0001
3	.903	.816	.815	.32923	.003	9.822	1	620	.002
Step 1: Usefulness (USE)									
Step 2: Usefulness (USE), Trust in Government (TRG)									
Step 3: Usefulness (USE), Trust in Government (TRG), Assurance (ASR)									

Model 4

As noted by Hair et al. (2006), a complementary approach to confirming the results of the stepwise methodology suggests that the independent variables entered into the regression model are specified manually. In utilizing this confirmatory approach, the researcher retains complete control over the regression variate in terms of both prediction and explanation" (Hair et al. 2006, 259).

TABLE 34: MODEL 4 OF MULTIVARIATE REGRESSION

Dependent Variable: Intent						
Independent Variable	**B**	**Std. Error**	**Beta**	***T***	**Tolerance**	**VIF**
(Constant)	.108	.206		.526		
USE	.687	.036	.725	19.250*	.196	5.092
TRG	.153	.039	.136	3.953*	.237	4.220
ASR	.120	.051	.083	2.379*	.227	4.405
REL	-.062	.042	-.057	-1.478	.185	5.414
RES	.001	.008	.002	.079	.355	2.819
EMP	.027	.049	.019	.561	.242	4.132
EOU	.036	.032	.039	1.131	.240	4.169
TRI	.036	.036	.028	.991	.340	2.945

NOTE: $R^2 = .824$
Adj. $R^2 = .822$
F = 369.605*
***p** < .05

For this confirmatory step in the process of finalizing the regression model, this corroborative perspective is inclusive of all eight independent variables in the model, added manually. As can be seen in Table 34 above, these primary variables are considered in the stepwise methodology, however, in this confirmatory stage the variables are each directly entered into the regression model. This procedural step allows an analysis of the prospective role impact of multicollinearity on the selection of independent variables and the effect on overall model fit from including all eight

variables Hair et al. 2006). With the inclusion of all eight independent variables the overall model fit decreases; however, the coefficient of determination increases (.907 to .908), and the Adjusted R^2 is virtually unchanged (.822). This is suggestive of the negligible results obtained by including several independent variables that were analyzed as not significant in the regression model. While these supplementary independent variables impact the overall R^2 value, the impact on the Adjusted R^2 is negligible. As noted by Hair et al. (2006), this "change illustrates the role of the Adjusted R^2 in comparing regression variates with differing numbers of independent variables" (261). Normally, through the addition to the regression model of multiple variables that were considered not significant, the anticipation would be for the Adjusted R^2 to decrease slightly. Additionally, the diminutive increase in the standard error of the estimate (SEE) from .338 to .339 is indicative of the generally inferior fit of the confirmatory model. As can be seen in Table 34 above, the three independent variables in the confirmatory model which are shown to be statistically significant (X_{USE}, X_{TRG}, and X_{ASR}), are the identical independent variables which were shown to be significant in the stepwise regression model (Hair et al. 2006). Complete regression results for Model 4 are contained in Appendix I.

Model 5

As a follow-on to the development of Model 4 above, and as the final confirmatory model in the multivariate analysis, Model 5 is presented with the addition of three demographic variables as control variables: Income, Education, and Race. As noted by Hair et al. (2006), a vital factor in the selection and application of appropriate

multivariate techniques is the measurement properties of the independent and dependent variables. As the selected demographic variables (Income, Education, and Race) are nonmetric, dichotomous variables were developed as replacement variables for the three nonmetric variables. As depicted in Tables 35 – 37, the demographic variables Income, Education, and Race were first recoded to minimize the number of categories, thus lessening the final number of dummy variables that are created, and thereby mitigating any potential problems of model parsimony. As noted by Hair et al. "any nonmetric variable with *k* categories can be represented as *k* – 1 dummy variables" (2006, 96).

Table 35 presents the recoding scheme and dummy variable creation for the demographic variable Income. Of the three dummy variables created (Loincome, Medincome, and Hiincome), Hiincome is utilized as the reference category (Hair et al. 2006).

TABLE 35: RECODING OF DEMOGRAPHIC VARIABLES: INCOME

Demographic Variables: Household Income				
	Income			
Category	**Original Coding**	**Category**	**Recoded**	**Dummy Variable**
Under $10,000	1	Under $10,000 - $30,000	1	Low Income = 1, else Low Income = 0 (LOINCOME)
$10,000 - $20,000	2			
$20,000 - $30,000	3			
$30,000 - $40,000	4	$30,000 - $60,000	2	Medium Income = 1, else Medium Income = 0 (MEDINCOME)
$40,000 - $50,000	5			
$50,000 - $60,000	6			
$60,000 - $70,000	7	Over $60,000	3	High Income = 1, else High Income = 0 (HIINCOME)
Over $70,000	8			
Don't Know	9			

Table 36 presents the recoding scheme and dummy variable creation for the demographic variable Education. Of the two dummy variables created (Hischool and College), College is utilized as the reference category (Hair et al. 2006, 96).

TABLE 36: RECODING OF DEMOGRAPHIC VARIABLES: EDUCATION

Demographic Variables: Education				
	Education			
Category	**Original Coding**	**Category**	**Recoded**	**Dummy Variable**
Grades 11 or Less	1	High School	1	High School = 1, else High School = 0 (HISCHOOL)
12th Grade	2			
Some College	3			
Graduated College	4	College	2	College = 1, else College = 0 (COLLEGE)
Some Graduate Work Completed	5			
Graduate Degree	6			

Table 37 presents the recoding scheme and dummy variable creation for the demographic variable Race. Of the three dummy variables created (Caucasian, Afamercn, and Other) Caucasian is utilized as the reference category (Hair et al. 2006, 96).

TABLE 37: RECODING OF DEMOGRAPHIC VARIABLES: RACE

Demographic Variables: Race				
	Race			
Category	**Original Coding**	**Category**	**Recoded**	**Dummy Variable**
Caucasian	1	Caucasian	1	Caucasian = 1, else Caucasian = 0 (CAUCASIAN)
African-American	2	African-American	2	African-American = 1, else African-American = 0 (AFAMERCN)
Hispanic	3	Other	3	Other = 1, else Other = 0 (OTHER)
Native American	4			
Asian	5			
Other	6			

In this instance, only Afamercn was included in Model 5, since Whites and African Americans comprise nearly 100% of the variance in the dataset.

For this concluding confirmatory step in the process of finalizing the regression model, this iteration is inclusive of all eight independent variables in the model, added manually, as well as three demographic variables, added as control variables. As can be seen in Table 38 below, the inclusion of three demographic control variables allows for the creation of dummy variables intended to indicate deviations from the comparison group on the dependent variable (Hair et al. 2006).

TABLE 38: MODEL 5 OF MULTIVARIATE REGRESSION

Dependent Variable: Intent						
Independent Variable	**B**	**Std. Error**	**Beta**	***T***	**Tolerance**	**VIF**
(Constant)	.124	.207		.601		
USE	.687	.036	.725	19.188*	.196	5.103
TRG	.150	.039	.133	3.864*	.236	4.235
ASR	.120	.051	.084	2.370*	.225	4.445
REL	-.065	.043	-.060	-1.530	.182	5.483
RES	.000	.008	-.002	-.060	.348	2.878
EMP	.029	.049	.020	.601	.241	4.141
EOU	.036	.032	.039	1.129	.240	4.171
TRI	.038	.036	.030	1.044	.339	2.953
AFAMERCN	-.054	.130	-.007	-.413	.986	1.014
HISCHOOL	.017	.030	.010	.575	.928	1.078
LOINCOME	-.060	.059	-.017	-1.020	.961	1.041
MEDINCOME	.021	.032	.011	.655	.939	1.065

NOTE: $R^2 = .825$
Adj. $R^2 = .821$
F = 245.876*
*p < .05

With the inclusion of the three demographic control variables (Income, Education, and Race) in addition to the eight independent variables, the overall model fit remains virtually unchanged. While the coefficient of determination remains static (.908), the Adjusted R^2 only decreases slightly (.822 to .821). As was the case in the analysis of Model 4, the inclusion of the three demographic control variables points toward negligible results obtained in the analysis of Model 5. These additional independent variables (Income, Education, and Race), included specifically as control variables, impact the overall R^2 value and Adjusted R^2; however, the impact is inconsequential. Indeed, none of these demographic characteristics are statistically significant in affecting Reuse Intent. Furthermore, and most importantly, as can be seen in Table 38 above, the three independent variables in the final confirmatory model which are shown to be statistically significant (X_{USE}, X_{TRG}, and X_{ASR}), are the same independent

variables which were shown to be significant in the stepwise regression model (Hair et al. 2006). Complete regression results for Model 5 are contained in Appendix J.

Multiple Regression Results Overview

With the development of the regression models, the amount of variance explained equals about 82 percent, thus attaining a noteworthy level of predictive capability. Additionally, with the standard error of the estimate of .388, the anticipated error rate for any calculation of Reuse Intent (Y_{REUSE}) at the 95% confidence level (±1.96 x standard error of the estimate) is about ±.66. It is noted that these results, in conjunction with the results validating model soundness, suggest that the regression models are high in predictive value and accurateness as a foundation for understanding e-government adoption and satisfaction (Hair et al. 2006). Both the stepwise methodology and the confirmatory regression models portray similar analytical frameworks in finding three principal influences: X_{USE}, Usefulness; X_{TRG}, Government Trust; and X_{ASR}, Assurance. Although the impact of X_{USE} (Usefulness) is the strongest of the three significant independent variables, an increase in any of these variables results in an increase in e-government adoption and satisfaction. In particular, an increase of one point in the user's perception of Usefulness (X_{USE}) will produce an average increase of nearly seven-tenths (.697) of a point on the 7-point e-government adoption and satisfaction scale. Analogous outcomes are observed for the remaining significant independent variables. However, concerning the two other significant independent variables (X_{TRG}, Government Trust and X_{ASR}, Assurance), Reuse Intent (Y_{REUSE}) is not as definite. While these two variables were statistically significant inclusions in the stepwise methodology as well as the

confirmatory model, their collective explained variance was only .018 out of an overall model R^2 of .823. Thus, future efforts focused on refining the e-government adoption and satisfaction model ought to consider perhaps excluding these variables (X_{TRG}, Government Trust and X_{ASR}, Assurance) from deliberation as influences on e-government adoption and satisfaction.

It is noteworthy to point out that the three chief influences (X_{USE}, Usefulness; X_{TRG}, Government Trust; and X_{ASR}, Assurance) are primary components of the perceptual constructs acknowledged at the inception of this study – the Technology Acceptance Model, Trust, and SERVQUAL, respectively. These analytical constructs, which are theorized to characterize measures of citizen opinions of e-government adoption and satisfaction, ought to be well thought-out in any conclusions. To argue that these three independent variables are exclusive influences on citizen adoption and satisfaction of e-government would be to understate the multifaceted patterns of collinearity between variables. To that end, these influential variables have greater interpretive power when considered as part of perceptual constructs recognized at the initiation of this research – the Technology Acceptance Model, Trust, and SERVQUAL, respectively, in conjunction with the remaining variables from the constructs in any conclusions reached via this research. Public sector administrators charged with the management of information technology now have research results which measure precise influences of essential variables, as well as the theoretical constructs which should be the basis for strategic planning with respect to policy and program development targeted at positively impacting user adoption and satisfaction of e-government.

Expected Research Results

By way of expected results, a brief discussion is included that outlines the findings which were expected, with comments on each of the hypotheses. Regarding the first hypothesis (**H_1:** An increase in Internet Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications), it was expected that from the data collected and analyzed a moderate, positive relationship would exist between Internet Trust and Reuse Intent. It was expected that this relationship would be statistically significant and the hypothesis would be upheld. Regarding the next hypothesis (**H_2**: An increase in Government Trust will increase the Reuse Intent of an individual to utilize MISSISSIPPI.GOV e-government applications), the data collected and analyses performed were expected to show a strong, positive relationship between Government Trust and Reuse Intent. In similar fashion, it was expected that this relationship would be statistically significant and the hypothesis would be upheld. With respect to the third hypothesis (**H_3**: An increase in the Ease of Use of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications), it was expected that from the data collected and analyzed that a strong, positive relationship exists between Ease of Use and Reuse Intent. It was expected that this relationship would be statistically significant and the hypothesis would be upheld. For the fourth hypothesis (**H_4**: An increase in the Usefulness of MISSISSIPPI.GOV e-government applications will increase the Reuse Intent of an individual to utilize the applications), it was expected that a moderate, positive relationship would exist between Usefulness and Reuse Intent. It was expected that this relationship would be statistically significant and the hypothesis would be upheld. With respect to the fifth hypothesis (**H_5**:

An increase in the Service Quality Reliability of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual.), it was expected that the data collected and analysis performed would show a moderate, positive relationship between Service Quality Reliability and Reuse Intent. In similar fashion, it was expected that this relationship would be statistically significant and the hypothesis would be upheld. For the sixth hypothesis (**H_6**: An increase in the Service Quality Responsiveness of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual), it was expected that a moderate, positive relationship would exist between Service Quality Responsiveness and Reuse Intent. It was expected that this relationship would be statistically significant and the hypothesis would be upheld. Regarding the next hypothesis (**H_7**: An increase in the Service Quality Empathy of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual), the data collected and analysis performed were expected to show a weak, positive relationship between Service Quality Empathy and Reuse Intent. It was expected that this relationship would be statistically significant and the hypothesis would be upheld. And lastly, with respect to the final hypothesis (**H_8**: An increase in the Service Quality Assurance of MISSISSIPPI.GOV e-government applications will result in an increase of the Reuse Intent of an individual), the data collected and analyses performed were expected to show a strong, positive relationship between Service Quality Assurance and Reuse Intent. In similar fashion, it was expected that this relationship would be statistically significant and the hypothesis would be upheld.

Bivariate Hypotheses Testing

A cross tabulation analysis, displaying the joint distribution of two variables, was utilized as an introductory method to test the hypotheses contained in this dissertation. As a cross tabulation analysis does not identify a causal relationship between the two values, chi-square was utilized to establish statistical significance of the cross tabulations, and gamma was employed to test the strength of association of the cross tabulations. Table 39 below depicts results of hypotheses testing based on the cross tabulation analysis.

TABLE 39: BIVARIATE HYPOTHESES TESTING

Hypothesis	Variable	Gamma	Chi-squared	Support
H1	Internet Trust	.606	156.48*	YES
H2	Government Trust	.736	239.42*	YES
H3	Ease of Use	.788	306.45*	YES
H4	Usefulness	.890	442.04*	YES
H5	Reliability	.736	281.36*	YES
H6	Responsiveness	.592	123.89*	YES
H7	Empathy	.732	259.46*	YES
H8	Assurance	.804	321.37*	YES

NOTE: *p < .05

Multivariate Hypotheses Testing

As a secondary and more robust analysis tool, multiple regression analysis was utilized in order to scrutinize the influence of specific variable drawn from Technology Acceptance Model, Trust, and SERVQUAL constructs, upon e-government adoption and satisfaction perceptions. Multiple regression analysis is suitable when there is a sole dependent variable measured at interval or ratio level and multiple independent variables are present (Hair et al. 2006). The purpose is to conclude if the independent variables can be used to predict the dependent variable's value. Table 40 below depicts results of hypotheses testing based on the multiple regression analysis.

TABLE 40: MULTIVARIATE HYPOTHESES TESTING

Hypothesis	Variable	B	*T*-Value	Support
H1	Internet Trust	.036	.991	NO
H2	Government Trust	.153	3.953*	YES
H3	Ease of Use	.036	1.131	NO
H4	Usefulness	.687	19.250*	YES
H5	Reliability	-.062	-1.478	NO
H6	Responsiveness	.001	.079	NO
H7	Empathy	.027	.561	NO
H8	Assurance	.120	2.379*	YES

NOTE: *p < .05

Reconstituted Research Model

As originally outlined in the first chapter, the research framework and proposed research model were proposed based on a distinct prospect for the establishment of a wide-ranging view of e-government adoption and satisfaction that conflates fundamental theoretical constructs from known models in e-commerce scholarship, specifically the Technology Acceptance Model (TAM) (Gefen, Elena, and Straub 2003; Gefen and Straub 2000; Moon and Kim 2001), the Web Trust Model (WTM) (Gefen, Elena, and Straub 2003; Belanger, Hiller, and Smith 2002; McKnight, Choudhury, and Kacmar 2002), and SERVQUAL (Devaraj, Ming, and Kohli 2002; Parasuraman, Berry, and Zeithaml 1988; Parasuraman, Berry, and Zeithaml 1991). The scholarly research of Carter and Belanger (2004, 2005) linking the Technology Acceptance Model and the Web Trust Model is further developed via the inclusion of SERVQUAL to form a model which hypothetically associates antecedents of e-government adoption with a citizen-based appraisal of on-line service quality – a connection as yet not examined in the scholarly literature (See Figure 2 and Figure 4). The reconstituted research model, as represented in Figure 5 below, depicts the combined findings based on both the bivariate and multivariate analysis contained in this dissertation.

The central assertion of this research was that e-government adoption and satisfaction would be dependent upon the collective effects of three factors: technology acceptance, trust, and service quality. This inclusive viewpoint can provide a basis for ongoing research on e-government adoption and satisfaction. The research hypotheses suggested that eight variables would predict intention to reuse an e-government application offered via the Mississippi.gov Web portal. After analyzing the research

model documented in the opening chapter of this dissertation, three variables were established as significant, as is depicted in Figure 5 below. A sole technology adoption factor, Usefulness, had a significant impact on e-government adoption and satisfaction. Only one trust factor, Government Trust, was found to be a significant predictor of e-government adoption and satisfaction. And while none of the demographic variables were specifically included in the research design, but rather were used as control variables, one of the service quality factors was significant, Assurance. Ongoing research efforts should investigate the viewpoints of e-government users to corroborate the conclusions of this research study.

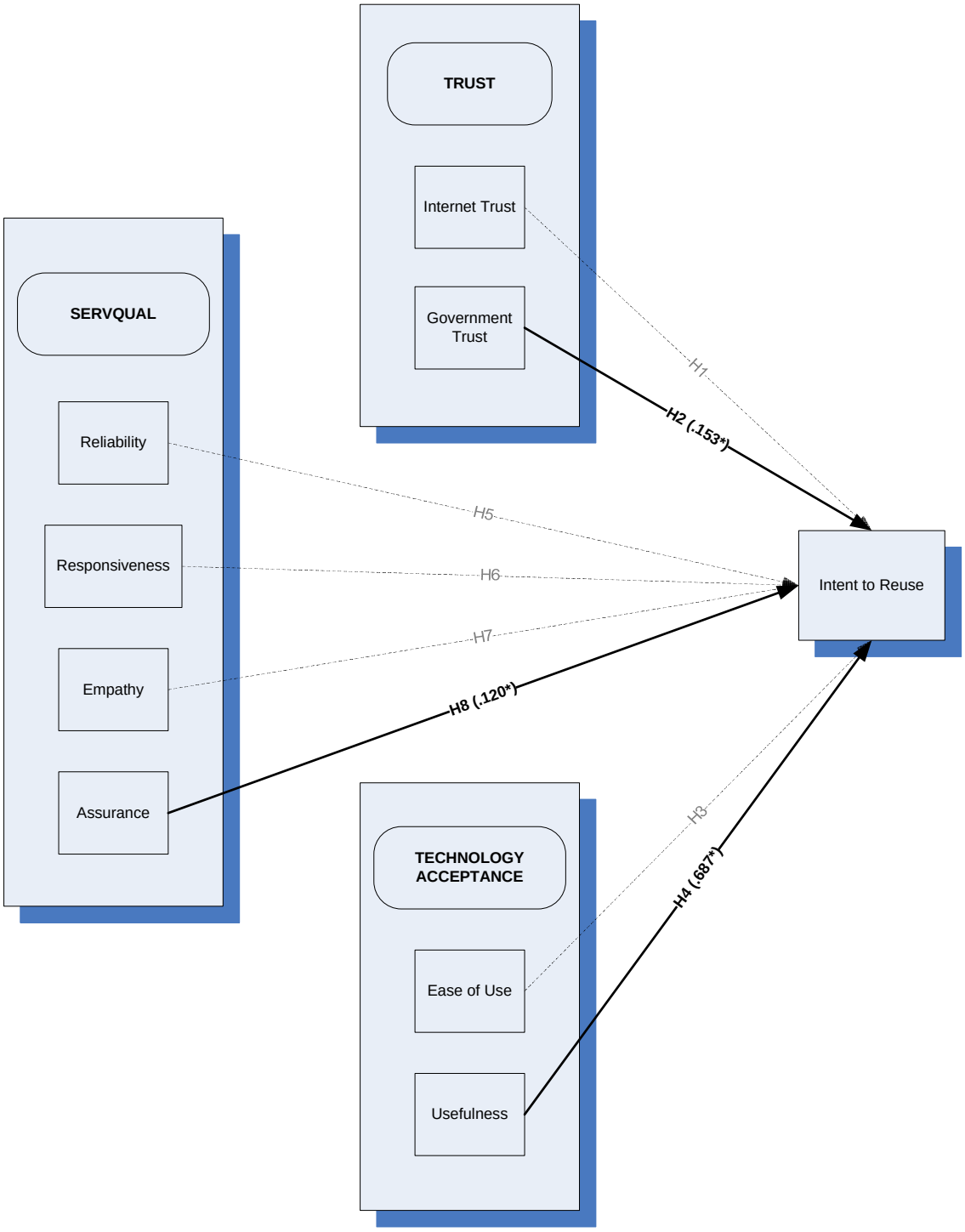

FIGURE 5: RECONSTITUTED MODEL OF E-GOVERNMENT ADOPTION AND SATISFACTION

(Note: * indicates statistically significant unstandardized regression coefficient.)

CHAPTER 6

DISCUSSION

This study investigated the determinants of e-government adoption and satisfaction by assessing the role of technology acceptance, trust, and service quality factors on reuse intention of an e-government application portal. The primary theoretical constructs hypothesized to have an effect on e-government adoption and satisfaction were: Internet Trust, Government Trust, Ease of Use, Usefulness, Reliability, Responsiveness, and Empathy. To date, an empirical study has not been designed which focused on the integration of these variables with the goal of developing a wide-ranging view of e-government adoption and satisfaction. Thus, this dissertation was designed to aid in the improvement of a model oriented towards assessing the impact of the inclusion of service quality factors in previous research, focused primarily on technology adoption and trust (Carter and Belanger 2004, 2005).

Chapter six offers a summary of the dissertation outcomes and implications. The opening section of this chapter presents the dissertation's noteworthy findings. The following section discusses the implications and conclusions of the dissertation; and the final section explores limitations and recommendations for future research.

Summary

The data for this research study was collected via on-line survey administered to 10,000 prior users of the Mississippi.gov e-government Web portal for a two-year period

spanning from 2005 through 2007. Early in the survey process, it was discovered that nearly 12 percent of the email address utilized were unsound, thus nearly 1,200 of the originally delivered surveys were returned undeliverable. This research provides interesting insight into e-government use, especially considering that at the time of this study no other statewide survey of e-government adoption and satisfaction had been undertaken. This dissertation found in surveying 10,000 users of the Mississippi.gov government Web portal, that the ages of respondents were evenly distributed, with a plurality of respondents (17.5%) reporting age in the range of 45 – 49. This survey result was anticipated, as many users of on-line government services are active individuals leading full lives; for these individuals e-government represents an opportunity for efficiency. The survey responders also appear to be well-educated with 68.1 percent indicating that they possess a college degree. In addition to educational status, the sample also reported economic prosperity, with a majority of respondents (56.7) in the uppermost income category (Over $70,000). As significant, while the sample is nearly evenly divided on gender, an overwhelming majority of the respondents were Caucasian (91.9%). Similar affluence was noted in the 93.4 percent of respondents reporting use of a computer at home to access the Internet or World Wide Web.

At the onset of the analysis, a cross tabulation process was employed, displaying the joint distribution of two variables as a technique to test the hypotheses contained in this dissertation. As the use of the cross tabulation technique does not recognize a causal relationship between the two values, chi-square was used to ascertain statistical significance of the cross tabulations, and gamma was utilized to test the strength of

association of the cross tabulations (See Table 39). The results of this analysis found all hypotheses to be strongly supported.

Following the establishment of bivariate correlations, multiple regression analysis was employed in order to examine the influence of specific variable drawn from Technology Acceptance Model, Trust, and SERVQUAL constructs, upon e-government adoption and satisfaction perceptions. In the development of Model 1 by using the stepwise regression methodology, Usefulness (X_{USE}) is the sole independent variable included in the model, as this variable has the highest bivariate correlation with the dependent variable Reuse Intent (Y_{REUSE}) (.897). R square (R^2= .805), referred to as the coefficient of determination, indicates that 80.5 percent of the total variation of Reuse Intent (Y_{REUSE}) is explained by the regression model consisting of Usefulness (X_{USE}). The *F* ratio of 2629.969 is considered statistically significant at a level of .0001. Also, each of the collinearity measures, Tolerance (1.00) and VIF (1.00), depict a lack of multicollinearity.

In constituting Model 2, X_{TRG} was the next variable to be included in the regression model in the stepwise procedure. The multiple *R* and R^2 values have both increased with the inclusion of X_{TRG} in the regression model. Suggestive of an increase to overall model fit, the R^2 increased by 5.66 percent, the adjusted R^2 also increased to .820, and the standard error of the estimate decreased from .354 to .338. The relative absence of multicollinearity in Model 2 indicates that variables X_{USE} and X_{TRG} are comparatively independent. The *t* values specify that both X_{USE} and X_{TRG} are statistically significant predictors of Y_{REUSE}.

For the formulation of Model 3, X_{ASR} is added to the regression model. The value of R^2 increases by .20 percent, the adjusted R^2 increases to .822, and the standard error of the estimate decreases slightly to .338. As was shown in the compilation of Model 2, with the addition of X_{TRG}, the variable X_{ASR} contributes to overall model fit as the third statistically significant predictor of Reuse Intent (Y_{REUSE}) into the regression model. Multicollinearity remains minimal, even as the third variable (X_{ASR}) is included into the regression model. Each of the three independent variables included in Model 3 afforded enhanced clarity to the overall model, with increases in the R^2 and Adjusted R^2, as well as decreases in the standard error of the estimate. With Model 3, inclusive of X_{USE}, X_{TRG}, and X_{ASR}, 82 percent of the variation in Reuse Intent (Y_{REUSE}) is explained. Model 4 was formulated as a confirmatory step to validate the results of the regression model. Model 4 includes all eight independent variables, and as a corroborative model, the three independent variables in the confirmatory model depicted statistically significant (X_{USE}, X_{TRG}, and X_{ASR}), are the same statistically significant independent variables in the stepwise regression Model 3. As a follow-on to the development of Model 4, and as the final confirmatory model in the multivariate analysis, Model 5 was formulated with the addition of three demographic variables as control variables: Income, Education, and Race. With the inclusion of the three demographic control variables (Income, Education, and Race) in addition to the eight independent variables, the overall model fit remained virtually unchanged. As was the case in the analysis of Model 4, the inclusion of the three demographic control variables points toward negligible results obtained in the analysis of Model 5. Most importantly, the three independent variables in the final confirmatory model which are shown to be statistically significant (X_{USE}, X_{TRG}, and

X_{ASR}), are the same independent variables which were shown to be significant in the stepwise regression model (Hair et al. 2006).

The regression analysis and confirmatory models suggest three prime influences on e-government adoption and satisfaction: X_{USE}, Usefulness; X_{TRG}, Government Trust; and X_{ASR}, Assurance. The strongest of these influences is X_{USE} (Usefulness), with the two other significant independent variables (X_{TRG}, Government Trust and X_{ASR}, Assurance) providing less of an impact on Reuse Intent (Y_{REUSE}). It is notable that the three principle influences (X_{USE}, Usefulness; X_{TRG}, Government Trust; and X_{ASR}, Assurance) are key components of the theoretical frameworks discussed at the initiation of this research: the Technology Acceptance Model, Trust, and SERVQUAL, respectively. Reasoning which suggested that these three independent variables are exclusive influences on citizen adoption and satisfaction of e-government would be negating the enhanced interpretive influence of these variables when considered as part of the larger theoretical frameworks; thus in reaching for conclusions one must consider not only the three statistically significant variables in the regression models, but also the other factors contained within these frameworks. Arguably, government managers vested with responsibility for the design, development and implementation of e-government information systems now can leverage these research results by planning policy and program development aimed at constructively influencing user adoption and satisfaction of on-line public sector services.

Implications and Conclusions

The movement to e-government, at its heart, is changing the way citizens and businesses interact with government. E-government offers a huge potential in seeking innovative ways to reach the ideal of government of people, by people and for people. The primary objective of this research study was to analyze theoretical foundations from well-known models in e-commerce scholarship, specifically the Technology Acceptance Model (TAM) (Gefen, Elena, and Straub 2003; Gefen and Straub 2000; Moon and Kim 2001), the Web Trust Model (WTM) (Gefen, Elena, and Straub 2003; Belanger, Hiller, and Smith 2002; McKnight, Choudhury, and Kacmar 2002), and SERVQUAL (Devaraj, Ming, and Kohli 2002; Parasuraman, Berry, and Zeithaml 1988; Parasuraman, Berry, and Zeithaml 1991) to form a model of the essential components that inform citizen adoption of and satisfaction with e-government services. Though this research is newly conceived, the desire is for public administrators to have a reliable model from which government agencies can more fully understand what impels citizens to adopt a specific e-government application or service, as well as understand what constitutes service quality. Clearly, while the body of knowledge regarding e-government is burgeoning, the focus is nebulous and generally lacking in substance regarding the impact of e-government on public organizations. The lack of a rigorous model from which to measure the impact of e-government programs on public organizations represents a methodological lapse in the existing body of knowledge. This analysis provided a basic view for guidelines and frameworks that address e-government's adoption. It should also conceptually give impetus for resources that enable e-government's planning, design, and implementation through reviewing the primary factors impacting citizen adoption and satisfaction. The

issues of public administration uncovered by e-government need to be analyzed systematically and further studied especially in the electronic, digital, and virtual world in which scholars and practitioners in this field are currently working.

Specifically, this dissertation is premised on the call from Carter and Belanger (2004, 2005) for the maturation of a practical, theoretical-based model of e-government adoption. Despite expansive growth in the design, development, and implementation of e-government services by government managers, "it is not clear whether citizens will embrace those services" (Carter and Belanger 2005, 6). To that end, a rapidly increasing amount of public administration research has leveraged academic studies of user adoption of e-commerce (Gefen, Elena, and Straub 2003; McKnight, Choudhury, and Kacmar 2002) to inform research focused on analyzing fundamental elements impacting citizen adoption of e-government services (Carter and Belanger 2004, 2005; Warkentin et al. 2002). Correspondingly, recent research has focused on the bearing of trust as an influential precursor to online activity, principally due to the consumer's confidence that the transaction will occur as expected (Gefen 2000). As with technology adoption research, scholars have utilized the trust relationship in e-commerce exchanges, and performed trust-centric studies in the e-government context (Belanger, Hiller, and Smith 2002; CEG 2003; Chadwick 2001; GAO 2001; Hiller and Belanger 2001; Hoffman, Novak, and Peralta 1999). Lastly, in addition to technology adoption and trust, scholars have concentrated attention on service quality in the e-commerce context, utilizing SERVQUAL, a widely used service quality measurement scales (Parasuraman, Berry, and Zeithaml 1988), to operationalize consumers' perceived service quality through

reliability, responsiveness, empathy, and assurance of e-commerce applications (Carr 2002).

This dissertation strove to unite the three theory-centric research areas in order to investigate the impact of Web-based tools on e-government adoption and satisfaction. Based on the aforementioned literature, this dissertation proposed an integrated framework of e-government satisfaction and adoption. This theoretical framework suggested that a combination of factors – technology adoption, trust, and service quality – influence an individual's adoption propensity and service quality perception. In assessing the theoretical impacts of this research, and despite the continued use of e-commerce models to examine adoption of on-line services in the public sector (Carter and Belanger 2004, 2005), the specific call by scholars for an interdisciplinary approach to more fully realize the impact of Internet technology on e-government participation (Tolbert and McNeal 2003) has been achieved. Indeed, a great deal of recent scholarship has concentrated on understanding the impact of e-government on the capacity of government agencies to offer services with enhanced efficiency and effectiveness (Chadwick and May 2003; Fountain 2001; Ho 2002; Melitski 2001; West 2004, 2005). Specifically, while academic research has documented that a majority of government agencies have a derisory working knowledge of what drives citizen adoption of e-government services (Norris, Fletcher, and Holden 2001), the aspiration for this research was to offer theoretical insight into what impels e-government adoption, as well as to understand what constitutes acceptable service quality.

This dissertation was executed in part by utilizing existing empirically validated measures from the technology adoption literature (Davis 1989; Gefen 2000; Moon and

Kim 2001; Gefen, Elena, and Straub 2003) and applying these measures specifically to the e-government realm. These measures were applied to a broad sample of e-government users from across the state of Mississippi. The results indicate that of the existing technology adoption measures (Ease of Use and Usefulness), Usefulness is significant and a reliable indicator in the research model, which sought to understand both adoption and satisfaction with service quality. From an implications perspective, the overwhelming impact of Usefulness in addressing both willingness to adopt and service quality satisfaction, addresses the fact that fiscal resources are one of the primary limiting aspects in information technology innovation within the public sector. As noted by West (2005), "[n]ew technology costs money, and it takes jurisdictions with substantial revenues to develop electronic government" (58). Thus, the fiscal shortfalls experienced by many governments may be offset by citizens increasingly willing to pay for enhanced usefulness of e-government systems. Indeed, funding e-government through "commercial ads on government websites, charging user fees (or convenience fees) to access specific services, or levying premium charges to enter particular website sections where business data are available" (West 2005, 58) may warrant greater attention.

Furthermore, this dissertation was accomplished in part by leveraging existing empirically validated measures from trust literature (Gefen 2000; Meyer and Goes 1988; McKnight, Choudhury, and Kacmar 2002; Rousseau et al. 1998; Tan and Thoen 2001) and applying these measures specifically to the e-government realm. An institutional focus was noted as a principal construct contained in the multifaceted trust model, as institution-based trust has evolved into the leading gauge of on-line transactions

(McKnight and Chervany 2002; McKnight, Choudhury, and Kacmar 2002). In recent research, scholars have utilized the institutional component of trust to examine adoption of e-government transactions offered by government agencies (Carter and Belanger 2004, 2005). The results of the dissertation indicate that of the existing trust measures (Trust in Government and Trust in Internet), Trust in Government is significant and a reliable indicator in the research model, which sought to understand both adoption and satisfaction with service quality. From an implications perspective, the impact of Trust in Government in addressing both the willingness to adopt and service quality satisfaction is a theoretical finding which opposes recent research. Research, comprehensive research by West (2005) reported no statistically significant relationship between the use of government websites and views about trust, confidence, or government effectiveness. Indeed, West (2005) reported that "[e]-government users are no more likely than nonusers to be trusting or confident about government or to believe the government is effective in solving problems" (134). From the policy implication perspective, as well as from a theory-based standpoint, while West (2005) suggests that e-government has not altered citizen attitudes of government, the research presented in this dissertation suggests that e-government is associated with enhancing levels of trust and beliefs about the effectiveness of government problem solving.

Lastly, this dissertation was accomplished in part by leveraging one of the most cited models for studying service quality, SERVQUAL, a validated measurement scale comprised of five service quality dimensions (Parasuraman, Berry, and Zeithaml 1988). Specific to the focus of this dissertation, more recent research has been undertaken to leverage the SERVQUAL dimensions to operationalize consumers' perceived service

quality of e-commerce (Carr 2002). With no identified research utilizing SERVQUAL in an e-government environment, the inclusion of this construct in the research model represented an exploratory feature of the dissertation. The results of the dissertation indicate that of the existing SERVQUAL measures (Reliability, Responsiveness, Empathy, and Assurance), Assurance is significant and a reliable indicator in the research model, which sought to understand both adoption and satisfaction with service quality. However, the challenge in documenting policy implications is "the absence of an agreed-upon consensus as to what constitutes successful performance" (West 2005, 44). Rather, what is clear is that while Assurance is a significant predictor of e-government adoption and service quality satisfaction, it is an insipid predictor, and the remaining SERVQUAL measures (Reliability, Responsiveness, and Empathy) are of no significant predictive value. Indeed, from a theoretical implications perspective, this dissertation furthers the work of Carter and Belanger (2004, 2005) connecting the technology acceptance measures and trust measures via the introduction of SERVQUAL to form a model which links antecedents of e-government adoption with a citizen-based assessment of on-line service quality – an association as yet not examined in the scholarly literature. However weak the remaining SERVQUAL measures (Reliability, Responsiveness, and Empathy) perform in the model, it is notable that the three chief influences (Usefulness, Government Trust, and Assurance) are primary components of the perceptual constructs acknowledged at the inception of this study – the Technology Acceptance Model, Trust, and SERVQUAL, respectively.

Limitations and Recommendations for Future Research

As the data collected and analyzed will be relevant only to users of the Mississippi.gov Internet portal, it is noted that interpretations of results should be cautious with respect to generalizability. The varied dimensions of the independent variables in the model represent a distinct strength; that is, the model presents a diverse means of interpreting the effect of perceived service quality on adoption antecedents of e-government applications. Conversely, it could be argued that any one of the conceptualizations of the variables could be handled differently. Garnering behaviors from attitudinal surveys can be difficult, and the creation of a theoretically solid scale designed to measure a latent construct takes a great deal of effort and expertise. Thus, that this model is built upon established research is a plus.

At a time in history when many Americans possess a distinct lack of interest in politics generally and the administration of government specifically, many committed public sector managers are seeking innovative means for citizens to access government services in a manner complimentary of a modern, technologically-savvy society. E-government is representative of an ongoing initiative that may provide the citizenry more efficient and effective access to government services offered via the Internet. Given the vast, untapped potential of e-government services, future research should explore specific factors which enhance adoption and drive service quality. This dissertation sought to shed light on only a sliver of this latent potential, though via the analysis conducted, additional research subjects of interest were created. This concluding section offers several ideas for ongoing research leveraging additional data collected in this dissertation and data to come from future research projects.

At the outset of this dissertation, the overall research framework was presented and discussed. In the context of this research agenda three primary frameworks were noted: technology acceptance, trust, and service quality. As is the case in much research, there existed the potential for many different models to be proposed and studied. With respect to this model, with a focus on institution-based trust, it is plausible for future research to focus instead on characteristic-based trust and disposition to trust. Both of these constructs have been the focus of recent research into e-government adoption (Carter and Belanger 2005; Pavlou 2003; Warkentin et al. 2002). While the core focus of institution-based trust is related to an individual's attitudes toward technology, characteristic-based trust, on the other hand, is related to an individual's attitudes toward the service provider. However, as Trust in Government was found to be significant in assessing e-government adoption and satisfaction, it is suggested that this element be explored further.

Additionally, data collected for this research would be useful in a study which coupled e-government adoption and satisfaction with research on the digital divide. Researchers have found recently that notwithstanding increases in e-government usage, the digital divide remains a steep hurdle to e-government adoption for many individuals (Mossenburg et al. 2003; Norris 2001; Thomas and Streib 2003). The digital divide presents a gap between individuals who have access to the Internet and sufficient proficiency to appropriately and efficiently use this technology, with individuals who possess neither access nor the required technical competencies. For these disenfranchised citizens, the inability to access the Internet coupled with remedial technical skills renders the government's attempt to offer services on-line ineffective. In

general, it is common for demographic characteristics such as income, education, and race to inform those individuals wedged in the digital divide. Hence, adoption of e-government is constrained to individuals who have access to the Internet and are able to successfully make use of it. This dissertation found in surveying 10,000 users of the Mississippi.gov government Web portal, 68.1 percent of responders possess a college degree, 56.7 percent earn over $70,000 per year, and a vast majority of the respondents were Caucasian (91.9%). This data collected would provide an excellent foundation for future research. In the provisioning of Web-based services to those individuals fortunate enough to have access to the Internet and technical savvy, public sector agencies have foregone the occasion to engage with and garner opinions from a substantial segment of the citizenry. Leveraging recent research in a concept coined the democratic digital divide may also yield an intriguing research effort. The democratic digital divide is focused on the political disenfranchisement which occurs to an individual or groups of persons due to rapidly evolving advances in information technology (Mossenburg et al. 2003). Will particular segments of the population garner benefits from utilizing e-government at the expense of their fellow citizens? As information technology continues to alter the way government agencies offer services, will socio-economic standing endure as a discriminating factor for those who can effectively utilize these on-line services? These and other pertinent questions have great potential for informing future research with respect to e-government adoption and satisfaction. Additionally, as was discussed earlier, the survey for this dissertation noted that 93.4 percent of the sample has access to the Internet at home. This fact, often rightly seen as a sign of affluence, can also be leveraged to research the fundamental transformation of the method by which individual

citizens interact with government at all levels. Future studies should investigate the actual effects of utilizing government services at home via the Internet.

Concluding Comments

Notwithstanding the limitations of this research, this dissertation strove to leverage to make theoretical foundations from well-known models in e-commerce scholarship to fashion a model of the necessary elements that inform citizen adoption of and satisfaction with of e-government services. To that end, this research endeavors to make contributions to the fields of public administration and information systems. Expressly, this research suggests that a blend of technology acceptance, trust, and service quality factors unite to impact e-government adoption and satisfaction. The findings encapsulated in this dissertation can provide impetus for future research on e-government adoption and satisfaction. Given that the provisioning of e-government services is evolving at a rapid pace, scholars should take a more comprehensive approach to evaluating e-government applications by including both political and technical factors in e-government adoption and satisfaction models. Additionally, public sector agencies should mull over the societal impacts of e-government on how citizens interact with both elected officials and the bureaucratic structures of government. While the potential exists for e-government to enhance interaction among certain segments of the population, the potential also exists for it to disenfranchise other population segments. Research into e-government will, no doubt, continue to unsheathe challenges in public management; these challenges offer the opportunity for both scholars and practitioners of public

administration to continue to discover, analyze, and respond to the striking changes wrought by the persistent march of information technology.

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APPENDIX A

SURVEY CORRESPONDENCE

Pre-letter (email) to E-government Survey

Dear Citizen,

A few days from now you will receive by email a request to fill out an Internet questionnaire for an important project conducted by the Mississippi Department of Information Technology Services (ITS) in association with Craig Orgeron, a doctoral student at Mississippi State University completing dissertation research.

I am writing in advance because many people like to know ahead of time that they will be contacted. The study is an important one that will attempt to determine what impels citizens to reuse a specific e-government application or service, as well as assess e-government service quality. The Internet in general has the potential to help government better serve the needs of its citizens.

Thank you for your time and consideration. It's only with the generous help of citizens like you that a project of this kind can be successful.

Sincerely,
Craig Orgeron
Enterprise Architect, ITS

Cover Letter (email)

Dear Citizen,

My name is Craig Orgeron, Enterprise Architect at the Mississippi Department of Information Technology Services in Jackson, Mississippi. As a doctoral student at Mississippi State University, I am working on a dissertation research project entitled "Evaluating Citizen Adoption and Satisfaction of E-Government in Mississippi." The study will require input from a group of citizens through a web-based survey. I would be very grateful if you could take a few minutes to respond to the web-based survey questionnaire.

By participating in this research study, it is not anticipated that you will experience any personal risks. Your valuable input in this study will help identify major components in citizen e-government acceptance. The results of the study will be beneficial for improving the quality of applications developed and offered on-line by governmental agencies, which, in turn, will aid the government in providing services better, cheaper, and faster.

Participation in this research study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the Mississippi state government. Your decision will not result in any loss of benefits to which you are otherwise entitled.

The e-government acceptance questionnaire will take 10-15 minutes to complete. It will consist of questions regarding the use of on-line government transactions, as well as a few demographic questions. There are no right or wrong answers, this is not a test, and you can skip any question you're uncomfortable with. All responses will be confidential and will be used only for this study. The findings of this research may be subject to possible publication in the future. Participant identity will be protected in the reporting of results. Your name will not be associated with any results.

If you have any questions about this study, please contact Craig Orgeron at (601) 359 – 2689 or email orgeron@its.state.ms.us or you may contact the Mississippi State University Office of Regulatory Compliance (662-325-5220). Your completion of the web-based questionnaire will be greatly appreciated. If you are interested in receiving a summary of the results of this study, please contact Craig Orgeron. This six week study should be completed by September 2007. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study. Please retain a copy of this e-mail for your records.

Here is a link to the survey:
http://www.surveymonkey.com/e-government_survey

Your password is: egovsurvey

If you have any questions or comments about this study, I would be happy to talk with you. My contact information is below.

Thanks again for your valuable input,
Craig Orgeron,
Enterprise Architect, ITS
Email: orgeron@its.state.ms.us
Phone: (601) 359 – 2689

NOTE: If for any reason you prefer not to participate in this study and do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
http://www.surveymonkey.com/e-government_survey opt out

Thank You and Reminder (email)

Dear Citizen,

My name is Craig Orgeron, Enterprise Architect at the Mississippi Department of Information Technology Services in Jackson, Mississippi. As a doctoral student at Mississippi State University, I am working on a dissertation research project entitled "Evaluating Citizen Adoption and Satisfaction of E-Government in Mississippi." The study will require input from a group of citizens through a web-based survey. I would be very grateful if you could take a few minutes to respond to the web-based survey questionnaire.

Last week an Internet questionnaire seeking your opinions about e-government was emailed to you. If you have already completed and submitted the questionnaire, please accept my sincere thanks. If not, I encourage you to respond and will be especially grateful for your help. It is only by asking citizens like you to share their opinions and experiences that we can fully understand and improve on-line government transactions.

Participation in this research study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the Mississippi state government. Your decision will not result in any loss of benefits to which you are otherwise entitled.

The e-government acceptance questionnaire will take 10-15 minutes to complete. It will consist of questions regarding the use of on-line government transactions, as well as a few demographic questions. There are no right or wrong answers, this is not a test, and you can skip any question you're uncomfortable with. All responses will be confidential and will be used only for this study. The findings of this research may be subject to possible publication in the future. Participant identity will be protected in the reporting of results. Your name will not be associated with any results.

This six week study should be completed by September 2007. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study. Please retain a copy of this e-mail for your records. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study.

Here is a link to the survey:
http://www.surveymonkey.com/e-government_survey

Your password is: egovsurvey

If you have any questions about this study, please contact Craig Orgeron at (601) 359 – 2689 or email orgeron@its.state.ms.us or you may contact the Mississippi State

University Office of Regulatory Compliance (662-325-5220).

Thanks again for your valuable input,
Craig Orgeron,
Enterprise Architect, ITS
Email: orgeron@its.state.ms.us
Phone: (601) 359 – 2689

NOTE: If for any reason you prefer not to participate in this study and do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
http://www.surveymonkey.com/e-government_survey opt out

Second Reminder and Thank You Letter (email)

Dear Citizen,

My name is Craig Orgeron, Enterprise Architect at the Mississippi Department of Information Technology Services in Jackson, Mississippi. As a doctoral student at Mississippi State University, I am working on a dissertation research project entitled "Evaluating Citizen Adoption and Satisfaction of E-Government in Mississippi." The study will require input from a group of citizens through a web-based survey. I would be very grateful if you could take a few minutes to respond to the web-based survey questionnaire.

About two weeks ago I sent an email with an Internet questionnaire link asking your opinions about e-government. If you have already responded to this questionnaire, thank you very much. It is only by asking citizens like you to share their opinions and experiences that we can fully understand and improve on-line government transactions.

Participation in this research study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the Mississippi state government. Your decision will not result in any loss of benefits to which you are otherwise entitled.

The e-government acceptance questionnaire will take 10-15 minutes to complete. It will consist of questions regarding the use of on-line government transactions, as well as a few demographic questions. There are no right or wrong answers, this is not a test, and you can skip any question you're uncomfortable with. All responses will be confidential and will be used only for this study. The findings of this research may be subject to possible publication in the future. Participant identity will be protected in the reporting of results. Your name will not be associated with any results.

This six week study should be completed by September 2007. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study. Please retain a copy of this e-mail for your records. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study.

Here is a link to the survey:
http://www.surveymonkey.com/e-government_survey

Your password is: egovsurvey

If you have any questions about this study, please contact Craig Orgeron at (601) 359 – 2689 or email orgeron@its.state.ms.us or you may contact the Mississippi State

University Office of Regulatory Compliance (662-325-5220).

Thanks again for your valuable input,
Craig Orgeron,
Enterprise Architect, ITS
Email: orgeron@its.state.ms.us
Phone: (601) 359 – 2689

NOTE: If for any reason you prefer not to participate in this study and do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
http://www.surveymonkey.com/e-government_survey opt out

Final Contact (email)

Dear Citizen,

My name is Craig Orgeron, Enterprise Architect at the Mississippi Department of Information Technology Services in Jackson, Mississippi. As a doctoral student at Mississippi State University, I am working on a dissertation research project entitled "Evaluating Citizen Adoption and Satisfaction of E-Government in Mississippi." The study will require input from a group of citizens through a web-based survey. I would be very grateful if you could take a few minutes to respond to the web-based survey questionnaire.

During the last month I have been collecting data on an important research study I am conducting for improving the quality of e-government applications offered to citizens on-line. The study will attempt to determine what impels citizens to adopt a specific e-government application or service. The study is drawing to a close, and this is the last contact that will be made with citizens.

Participation in this research study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the Mississippi state government. Your decision will not result in any loss of benefits to which you are otherwise entitled.

The e-government acceptance questionnaire will take 10-15 minutes to complete. It will consist of questions regarding the use of on-line government transactions, as well as a few demographic questions. There are no right or wrong answers, this is not a test, and you can skip any question you're uncomfortable with. All responses will be confidential and will be used only for this study. The findings of this research may be subject to possible publication in the future. Participant identity will be protected in the reporting of results. Your name will not be associated with any results.

Finally, I appreciate your willingness to consider the request as I conclude this effort to better understand e-government acceptance. This six week study should be completed by September 2007. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study. Please retain a copy of this e-mail for your records. By clicking on the link provided and logging into the secure site, you are agreeing to participate in this research study.

Here is a link to the survey:
http://www.surveymonkey.com/e-government_survey

Your password is: egovsurvey

If you have any questions about this study, please contact Craig Orgeron at (601) 359 –

2689 or email orgeron@its.state.ms.us or you may contact the Mississippi State University Office of Regulatory Compliance (662-325-5220).

Thanks again for your valuable input,
Craig Orgeron,
Enterprise Architect, ITS
Email: orgeron@its.state.ms.us
Phone: (601) 359 – 2689

NOTE: If for any reason you prefer not to participate in this study and do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
http://www.surveymonkey.com/e-government_survey opt out

APPENDIX B

THEORETICAL CONSTRUCTS AND SCALE ITEMS

Trust

Trust of the Internet (TRI)

1. The Internet has enough safeguards to make me feel comfortable using it to interact online with the MISSISSIPPI.GOV website.
2. I feel assured that legal and technological structures adequately protect me from problems on the Internet.
3. In general, the Internet is now a robust and safe environment in which to transact with the MISSISSIPPI.GOV website.

Trust of State Government (TRG)

1. I think I can trust the administrators of the MISSISSIPPI.GOV website.
2. The MISSISSIPPI.GOV website can be trusted to carry out online transactions faithfully.
3. In my opinion, the MISSISSIPPI.GOV website is worthy of my trust.
4. I trust the administrators of the MISSISSIPPI.GOV website to keep my best interests in mind.

Technology Acceptance Model (TAM)

Reuse Intentions (REUSE)

1. I will continue to use the Web for gathering information from the MISSISSIPPI.GOV website.
2. I will continue to use MISSISSIPPI.GOV services provided over the Web.
3. Interacting with MISSISSIPPI.GOV over the Web is something that I will continue to do.
4. I will not hesitate to provide information to the MISSISSIPPI.GOV website.
5. I will continue to use the Web to inquire about MISSISSIPPI.GOV online services.

Usefulness (USE)

1. The MISSISSIPPI.GOV web site enables me to complete transactions more quickly.
2. I think the MISSISSIPPI.GOV web site provides a valuable service for me.
3. The content of the MISSISSIPPI.GOV web site is useless to me.
4. The MISSISSIPPI.GOV web site enhances my effectiveness in searching for and using MISSISSIPPI.GOV services.
5. I find the MISSISSIPPI.GOV web site useful.

Ease of Use (EOU)

1. Learning to interact with the MISSISSIPPI.GOV web site has been easy for me.
2. I believe interacting with the MISSISSIPPI.GOV web site is a clear and

understandable process.
3. Interaction with the MISSISSIPPI.GOV web site provides user-friendly navigation.
4. It has been easy for me to become skillful at using the MISSISSIPPI.GOV web site.
5. I find the MISSISSIPPI.GOV web site difficult to use.

SERVQUAL

Reliability (REL)

1. I believe that the MISSISSIPPI.GOV website is reliable.
2. I believe that what I ask for is what I get when using the MISSISSIPPI.GOV website.
3. I think that the MISSISSIPPI.GOV website performs online services accurately.
4. I rely on the MISSISSIPPI.GOV website to deliver online services promptly.

Responsiveness (RES)

1. I believe the MISSISSIPPI.GOV website is responsive to my needs.
2. In the case of any problem, I think the MISSISSIPPI.GOV website offers prompt service.
3. The help desk functions available through the MISSISSIPPI.GOV website will address any concerns that I have.

Empathy (EMP)

1. I can access the MISSISSIPPI.GOV website at my convenience in order to transact business.
2. The MISSISSIPPI.GOV website can address the specific needs of each user.
3. I am satisfied with the payment options (e.g., different credit cards) offered through the MISSISSIPPI.GOV website.

Assurance (ASR)

1. My decision to use the MISSISSIPPI.GOV website was a good one.
2. I feel safe in my transactions with the MISSISSIPPI.GOV website.
3. The MISSISSIPPI.GOV website had answers to many of my questions about online services.

APPENDIX C

E-GOVERNMENT ADOPTION AND SATISFACTION SURVEY

Part 1: Introduction:

Dear Citizen:

Thank you for volunteering to complete this survey on e-government adoption and satisfaction. This is part of a project conducted by the Mississippi Department of Information Technology Services (ITS) in association with Craig Orgeron, a doctoral student at Mississippi State University completing dissertation research.

By participating in this research study, it is not anticipated that you will experience any personal risks. Please be assured that your participation is entirely confidential. Also, please also be assured that your participation is entirely voluntary. You are free to decide not to participate in this study or to withdraw at any time. There are no right or wrong answers, this is not a test, and you can skip any question you're uncomfortable with.

However, we believe your input is very valuable to our efforts in identifying important factors of e-government adoption and service quality. The e-government acceptance questionnaire will take 10-15 minutes to complete. We thank you sincerely for agreeing to spend a few minutes to help in our research project.

If you have any questions about this study, feel free to call Craig Orgeron (601-359-2689) or you may contact the Mississippi State University Office of Regulatory Compliance (662-325-5220).

To proceed with the survey, scroll down and begin.

Special Instructions:

MISSISSIPPI.GOV is a collection of online, payment-based services consisting of the following applications:

Architecture Professional Licensing
Boating Registration Renewal
Driver's License Renewal

Fishing Licenses Online
Hunting Licenses Online
Motor Vehicle Report
Nurse's Online License Renewal
Physician's Online License Renewal
Uniform Commercial Code (UCC) Filing Online

When completing the survey, consider the use of any <u>one</u> or <u>more</u> of these services as part of MISSISSIPPI.GOV.
Part 2: Mississippi.gov Usage.

Approximately how many times have you submitted an inquiry to MISSISSIPPI.GOV in the last four years?	
Approximately how many times have you executed an on-line transaction via MISSISSIPPI.GOV in the last four years?	

Please indicate your agreement with the next set of statements using the following rating scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neither Disagree Nor Agree	Somewhat Agree	Agree	Strongly Agree

Part 3: Please rate the extent to which you agree or disagree with the statements about the service quality of MISSISSIPPI.GOV.

		Strongly Disagree						Strongly Agree
1	I believe that the MISSISSIPPI.GOV website is reliable.	1	2	3	4	5	6	7
2	I believe the MISSISSIPPI.GOV website is responsive to my needs.	1	2	3	4	5	6	7
3	I can access the MISSISSIPPI.GOV website at my convenience in order to transact business.	1	2	3	4	5	6	7
4	My decision to use the MISSISSIPPI.GOV website was a good one.	1	2	3	4	5	6	7
5	I believe that what I ask for is what I get when using the MISSISSIPPI.GOV website.	1	2	3	4	5	6	7
6	In the case of any problem, I think the MISSISSIPPI.GOV website offers prompt service.	1	2	3	4	5	6	7
7	The MISSISSIPPI.GOV website can address the specific needs of each user.	1	2	3	4	5	6	7
8	I feel safe in my transactions with the MISSISSIPPI.GOV website.	1	2	3	4	5	6	7
9	I think that the MISSISSIPPI.GOV website performs online services accurately.	1	2	3	4	5	6	7
10	The help desk functions available through the MISSISSIPPI.GOV website will address any concerns that I have.	1	2	3	4	5	6	7

11	I am satisfied with the payment options (e.g., different credit cards) offered through the MISSISSIPPI.GOV website.	1 2 3 4 5 6 7
12	The MISSISSIPPI.GOV website had answers to many of my questions about online services.	1 2 3 4 5 6 7
13	I rely on the MISSISSIPPI.GOV website to deliver online services promptly.	1 2 3 4 5 6 7

Part 4: Please rate the extent to which you agree or disagree with the statements about what you expect from MISSISSIPPI.GOV.

		Strongly Disagree						Strongly Agree
14	I will continue to use the Web for gathering information from the MISSISSIPPI.GOV website.	1	2	3	4	5	6	7
15	The MISSISSIPPI.GOV website enables me to complete transactions more quickly.	1	2	3	4	5	6	7
16	Learning to interact with the MISSISSIPPI.GOV website has been easy for me.	1	2	3	4	5	6	7
17	I will continue to use MISSISSIPPI.GOV services provided over the Web.	1	2	3	4	5	6	7
18	I think the MISSISSIPPI.GOV website provides a valuable service for me.	1	2	3	4	5	6	7
19	I believe interacting with the MISSISSIPPI.GOV website is a clear and understandable process.	1	2	3	4	5	6	7
20	Interacting with MISSISSIPPI.GOV over the Web is something that I will continue to do.	1	2	3	4	5	6	7
21	The content of the MISSISSIPPI.GOV website is useless to me.	1	2	3	4	5	6	7
22	Interaction with the MISSISSIPPI.GOV web site provides user-friendly navigation.	1	2	3	4	5	6	7
23	I will not hesitate to provide information to the MISSISSIPPI.GOV website.	1	2	3	4	5	6	7
24	The MISSISSIPPI.GOV website enhances my effectiveness in searching for and using MISSISSIPPI.GOV services.	1	2	3	4	5	6	7
25	It has been easy for me to become skillful at using the MISSISSIPPI.GOV website.	1	2	3	4	5	6	7
26	I will continue to use the Web to inquire about MISSISSIPPI.GOV online services.	1	2	3	4	5	6	7
27	I find the MISSISSIPPI.GOV website useful.	1	2	3	4	5	6	7
28	I find the MISSISSIPPI.GOV website difficult to use.	1	2	3	4	5	6	7

Part 5: Please rate the extent to which you agree with the statements about MISSISSIPPI.GOV.

		Strongly Disagree						Strongly Agree

29	The Internet has enough safeguards to make me feel comfortable using it to interact online with the MISSISSIPPI.GOV website.	1 2 3 4 5 6 7
30	I think I can trust administrators of the MISSISSIPPI.GOV website.	1 2 3 4 5 6 7
31	I feel assured that legal and technological structures adequately protect me from problems on the Internet.	1 2 3 4 5 6 7
32	The MISSISSIPPI.GOV website can be trusted to carry out online transactions faithfully.	1 2 3 4 5 6 7
33	In general, the Internet is now a robust and safe environment in which to transact with the MISSISSIPPI.GOV website.	1 2 3 4 5 6 7
34	In my opinion, the MISSISSIPPI.GOV website is worthy of my trust.	1 2 3 4 5 6 7
35	I trust the administrators of the MISSISSIPPI.GOV website to keep my best interests in mind.	1 2 3 4 5 6 7

Part 6: Personal Characteristics: Please select the appropriate category:

Gender (please select)	M / F
Race (please select)	White (Caucasian), Black (i.e., African-American), Hispanic, Native American, Asian or Pacific Islander, Other
Age group (please select)	18-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65+
What was the last grade in school that you completed? (please select)	Grades 11 or Less 12th Grade Some College Graduated College Some Graduate Work Completed Graduate Degree Don't Know
Last year, what was your total family income, before taxes? (please select)	Under $10,000 Between $10,000 AND $20,000 Between $20,000 AND $30,000 Between $30,000 AND $40,000 Between $40,000 AND $50,000 Between $50,000 AND $60,000 Between $60,000 AND $70,000 Over $70,000 Don't Know
Do you use a computer at home to access the Internet or World Wide Web? (please select)	Yes / No

Part 7: Suggestions for Future Enhancements: Please provide any additional feedback or ideas for future services offered through MISSISSIPPI.GOV.

Thank you for your participation.

APPENDIX D

SCALE FREQUENCY DISTRIBUTIONS

TABLE D.1: SCALE FREQUENCY DISTRIBUTIONS

	Y_{REUSE}	X_{RES}	X_{EMP}	X_{ASR}	X_{REL}	X_{TRI}	X_{TRG}	X_{EOU}	X_{USE}
N	641	641	641	641	641	641	641	641	641
Range	30	18	18	18	24	18	24	30	30
0 – 5	1	3	1	2	2	5	2	3	0
6 – 10	4	22	8	6	4	39	2	3	4
11 – 15	2	346	168	146	16	237	18	11	6
16 – 20	46	253	438	456	137	329	180	62	46
21 – 25	76	17	26	31	388	31	376	87	58
26 – 30	344	0	0	0	94	0	63	339	302
31 – 35	168	0	0	0	0	0	0	136	225
Min/Max	5/35	3/21	3/21	3/21	4/28	3/21	4/28	5/35	5/35
Mean	28.39	14.93	16.49	16.68	22.36	15.54	21.77	27.46	28.76
Median	29	15	17	17	24	16	24	29	30
Mode	30	14	18	18	24	18	24	30	30
Standard Deviation	4.61	2.79	2.69	2.66	3.90	3.28	3.83	5.12	4.76
Trichotomized Percentiles (33.33%)	28	14	16	16	22	15	21	27	28
Trichotomized Percentiles (33.33%)	30	16	18	18	24	18	24	30	31

NOTE: **Reuse Intent = (Y_{REUSE}); Responsiveness = (X_{RES}); Empathy = (X_{EMP}); Assurance = (X_{ASR}); Reliability = (X_{REL}); Trust in Internet = (X_{TRI}); Trust in Government = (X_{TRG}); Ease of Use = (X_{EOU}); Usefulness = (X_{USE}).**

APPENDIX E

MODEL 1 OF MULTIPLE REGRESSION

TABLE E.1: MODEL 1 MULTIPLE REGRESSION RESULTS

Variable Entered : USE	
Multiple R	.897
Coefficient of Determination (R^2)	.805
Adjusted R^2	.804
Standard Error of the Estimate	.354

Analysis of Variance					
	Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
Regression	329.57	1	329.567	2629.969	.0001
Residual	80.07	639	.125		
Total	409.64	640			

Variables Entered into Regression Model										
	Regression Coefficients			***Statistical Significance***		***Correlations***			***Collinearity Statistics***	
Variables Entered	**B**	**Std. Error**	**Beta**	***t***	**Sig.**	**Zero-order**	**Partial**	**Part**	**Tolerance**	**VIF**
(Constant)	.464	.044		10.442	.0001					
USE	.850	.017	.897	51.283	.0001	.897	.897	.897	1.00	1.00

		Statistical Significance			***Collinearity Statistics***	
Variables Not Entered	**Beta In**	***T***	**Sig.**	**Partial Correlation**	**Tolerance**	**VIF**
TRG	.175	7.66	.0001	.290	.536	1.867
TRI	.127	6.39	.0001	.245	.731	1.368
EOU	.088	2.67	.008	.105	.278	3.598
ASR	.123	4.44	.0001	.173	.387	2.585
EMP	.074	2.75	.006	.108	.418	2.391
RES	.053	2.30	.022	.091	.584	1.714
REL	.071	2.40	.017	.095	.350	2.854

APPENDIX F

MODEL 2 OF MULTIPLE REGRESSION

TABLE F.1: MODEL 2 OF MULTIPLE REGRESSION RESULTS

Variable Entered : TRG	
Multiple R	.906
Coefficient of Determination (R^2)	.821
Adjusted R^2	.820
Standard Error of the Estimate	.339

Analysis of Variance					
	Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
Regression	336.31	2	168.16	1463.06	.0001
Residual	73.33	638	.115		
Total	409.64	640			

Variables Entered into Regression Model										
	Regression Coefficients			***Statistical Significance***		***Correlations***			***Collinearity Statistics***	
Variables Entered	**B**	**Std. Error**	**Beta**	***T***	**Sig.**	**Zero-order**	**Partial**	**Part**	**Tolerance**	**VIF**
(Constant)	.240	.052		4.640	.0001					
USE	.737	.022	.777	33.975	.0001	.897	.803	.569	.536	1.867
TRG	.198	.026	.175	7.661	.0001	.705	.290	.128	.536	1.867

		Statistical Significance			***Collinearity Statistics***	
Variables Not Entered	**Beta In**	***T***	**Sig.**	**Partial Correlation**	**Tolerance**	**VIF**
TRI	.037	1.308	.191	.052	.344	2.904
EOU	.037	1.147	.252	.045	.265	3.775
ASR	.069	2.455	.014	.097	.354	2.824
EMP	.035	1.33	.184	.053	.401	2.495
RES	.022	.980	.328	.039	.563	1.776
REL	.006	.208	.836	.008	.319	3.137

APPENDIX G

MODEL 3 OF MULTIPLE REGRESSION

TABLE G.1: MODEL 3 OF MULTIPLE REGRESSION RESULTS

Variable Entered : ASR	
Multiple R	.907
Coefficient of Determination (R^2)	.823
Adjusted R^2	.822
Standard Error of the Estimate	.338

Analysis of Variance					
	Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
Regression	337.00	3	112.333	985.063	.0001
Residual	72.64	637	.114		
Total	409.641	640			

Variables Entered into Regression Model										
	Regression Coefficients			***Statistical Significance***		***Correlations***			***Collinearity Statistics***	
Variables Entered	**B**	**Std. Error**	**Beta**	***T***	**Sig.**	**Zero-order**	**Partial**	**Part**	**Tolerance**	**VIF**
(Constant)	.170	.059		2.889	.004					
USE	.697	.027	.735	25.726	.0001	.897	.714	.429	.341	2.934
TRG	.179	.027	.158	6.646	.0001	.705	.255	-.111	.490	2.039
ASR	.099	.040	.069	2.455	.0014	.750	.097	.041	.354	2.824

		Statistical Significance			***Collinearity Statistics***	
Variables Not Entered	**Beta In**	***T***	**Sig.**	**Partial Correlation**	**Tolerance**	**VIF**
TRI	.032	1.139	.255	.045	.343	2.920
EOU	.029	.901	.368	.036	.262	3.816
EMP	.006	.189	.850	.008	.310	3.225
RES	.003	.136	.892	.005	.449	2.227
REL	-.043	-1.254	.210	-.050	.232	4.304

APPENDIX H

STANDARDIZED PARTIAL REGRESSION PLOTS

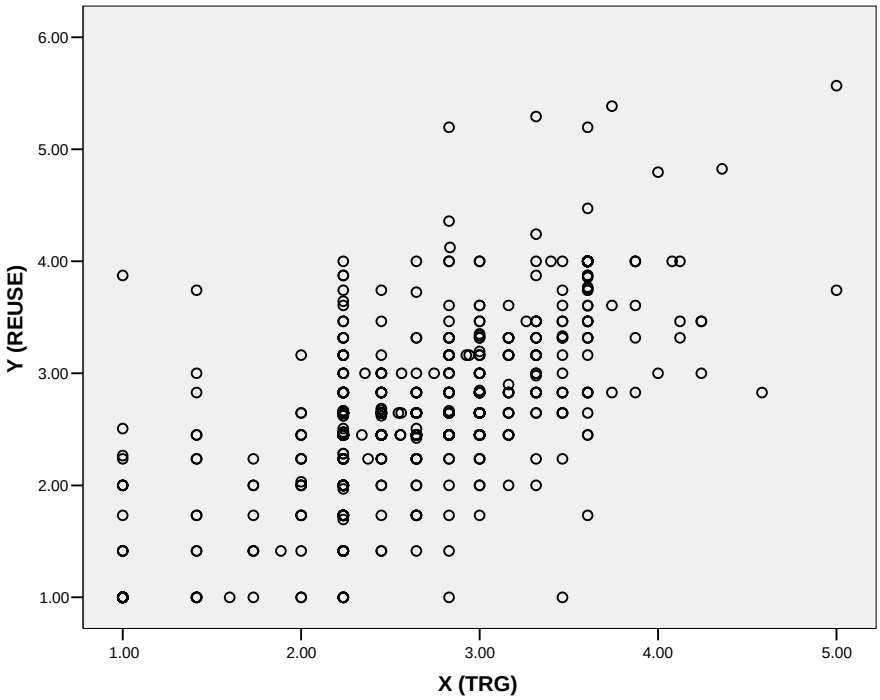

FIGURE H.1: SCATTERPLOT OF REUSE AND TRG

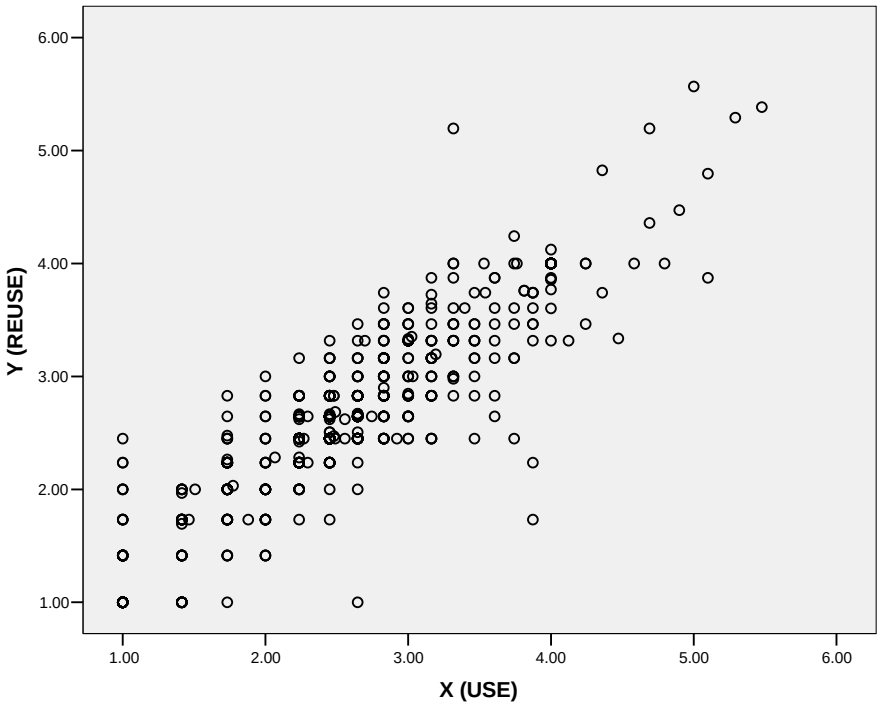

FIGURE H.2: SCATTERPLOT OF REUSE AND USE

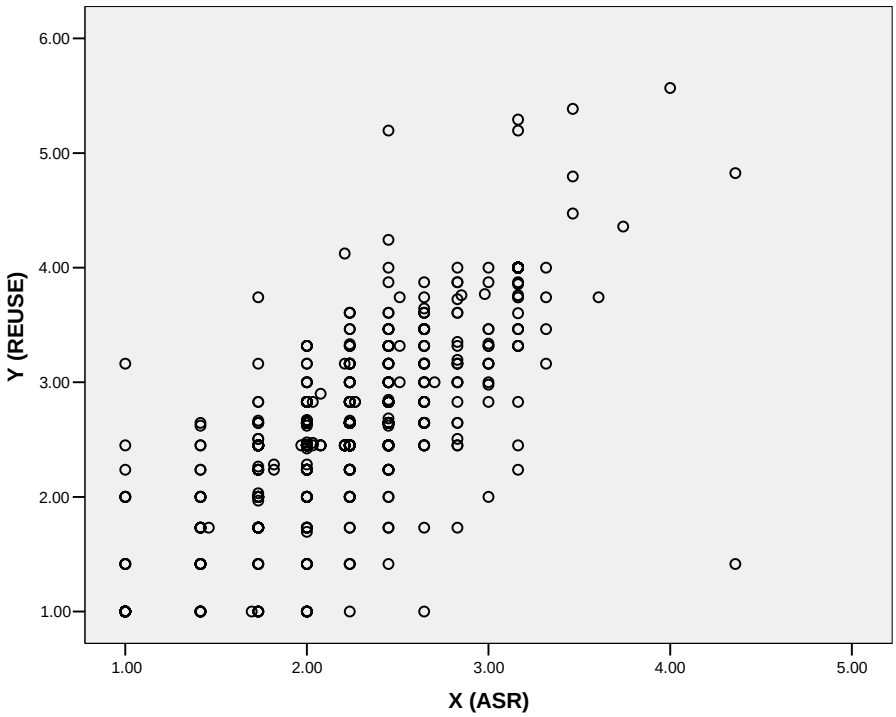

FIGURE H.3 SCATTERPLOT OF REUSE AND ASR

APPENDIX I

MODEL 4 OF MULTIPLE REGRESSION RESULTS

TABLE I.1: MODEL 4 OF CONFIRMATORY MULTIPLE REGRESSION RESULTS

Confirmatory Specification with 8 Variables	
Multiple R	.908
Coefficient of Determination (R^2)	.824
Adjusted R^2	.822
Standard Error of the Estimate	.339

Analysis of Variance					
	Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
Regression	337.50	8	42.188	369.605	.0001
Residual	72.138	632	.114		
Total	409.641	640			

Variables Entered into Regression Model

	Regression Coefficients			***Statistical Significance***		***Correlations***			***Collinearity Statistics***	
Variables Entered	**B**	**Std. Error**	**Beta**	***t***	**Sig.**	**Zero-order**	**Partial**	**Part**	**Tolerance**	**VIF**
(Constant)	.108	.206		.526	.599					
USE	.687	.036	.725	19.250	.0001	.897	.608	.321	.196	5.092
TRG	.153	.039	.136	3.953	.0001	.705	.155	.066	.237	4.220
ASR	.120	.051	.083	2.379	.018	.750	.094	.040	.227	4.405
REL	-.062	.042	-.057	-1.478	.140	.748	-.059	-.025	.185	5.414
RES	.001	.008	.002	.079	.937	-.610	.003	.001	.355	2.819
EMP	.027	.049	.019	.561	.575	.715	.022	.009	.242	4.132
EOU	.036	.032	.039	1.131	.259	.787	.045	.019	.240	4.169
TRI	.036	.036	.028	.991	.322	.558	.039	.017	.340	2.945

APPENDIX J

MODEL 5 OF MULTIPLE REGRESSION RESULTS

TABLE J.1: MODEL 5 OF CONFIRMATORY MULTIPLE REGRESSION RESULTS

Confirmatory Specification with 8 Variables	
Multiple R	.908
Coefficient of Determination (R^2)	.825
Adjusted R^2	.821
Standard Error of the Estimate	.338

Analysis of Variance					
	Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
Regression	337.75	12	28.146	245.876	.0001
Residual	71.889	628	.114		
Total	409.641	640			

Variables Entered into Regression Model										
	Regression Coefficients			***Statistical Significance***		***Correlations***			***Collinearity Statistics***	
Variables Entered	**B**	**Std. Error**	**Beta**	***t***	**Sig.**	**Zero-order**	**Partial**	**Part**	**Tolerance**	**VIF**
(Constant)	.124	.207		.601	.548					
USE	.687	.036	.725	19.188	.0001	.897	.608	.321	.196	5.103
TRG	.150	.039	.133	3.864	.0001	.705	.152	.065	.236	4.235
ASR	.120	.051	.084	2.370	.018	.750	.094	.040	.225	4.445
REL	-.065	.043	-.060	-1.530	.126	.748	-.061	-.026	.182	5.483
RES	.000	.008	-.002	-.060	.952	-.610	-.002	-.001	.348	2.878
EMP	.029	.049	.020	.601	.548	.715	.024	.010	.241	4.141
EOU	.036	.032	.039	1.129	.259	.787	.045	.019	.240	4.171
TRI	.038	.036	.030	1.044	.297	.558	.042	.017	.339	2.953
AFAMERCN	-.054	.130	-.007	-.413	.680	-.032	-.016	-.007	.986	1.014
HISCHOOL	.017	.030	.010	.575	.565	.014	.023	.010	.928	1.078
LOINCOME	-.060	.059	-.017	-1.020	.308	-.009	-.041	-.017	.961	1.041
MEDINCOME	.021	.032	.011	.655	.513	-.021	.026	.011	.939	1.065

APPENDIX K

MISSISSIPPI STATE UNIVERSITY IRB APPROVAL

Mississippi State University

July 25, 2007

Craig Orgeron
141 Trace Ridge Drive
Ridgeland, MS 39157

RE: IRB Study #07-191: Evaluating Citizen Adoption and Satisfaction of E-Government in Mississippi

Dear Mr. Orgeron:

The above referenced project was reviewed and approved via administrative review on 7/25/2007 in accordance with 45 CFR 46.101(b)(2). Continuing review is not necessary for this project. However, any modification to the project must be reviewed and approved by the IRB prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project. The IRB reserves the right, at anytime during the project period, to observe you and the additional researchers on this project.

Please refer to your IRB number (#07-191) when contacting our office regarding this application.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact Christine Williams at cwilliams@research.msstate.edu or 325-5220.

Sincerely,

Christine Williams
IRB Compliance Administrator

cc: Doug Goodman

Office for Regulatory Compliance
P. O. Box 6223 • 8A Morgan Street • Mailstop 9563 • Mississippi State, MS 39762 • (662) 325-3294 • FAX (662) 325-8776