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ANALYZING THE DEMAND AND SUPPLY OF E-GOVERNMENT SERVICE:

A CASE OF BILINGUAL SERVICE BY CALIFORNIA

CITIES AND COUNTIES

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A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Public Administration

by

Shan-Ju Ho

June 2013

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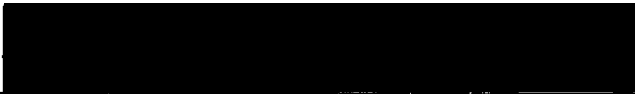San Bernardino
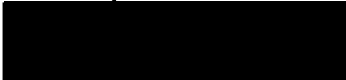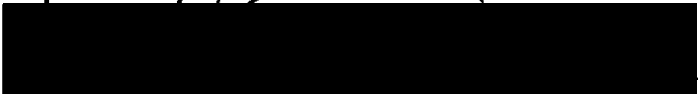
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by

Shan-Ju Ho

June 2013

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ABSTRACT

Constrained by available resources, local governments are not developing the e-services that meet the demands of their non-English speaking constituencies. The 2011 US Census shows that the Hispanic population comprises 16.7% of the US population. The Hispanic population has dramatically grown in the state of California, becoming 38.1% of the total population, whereas, government agencies have not developed high quality bilingual e-services to meet the needs of the Spanish-speaking population. By using the Ordinary Least Square method (OLS) and logistic regression, this research tests the hypothesis that the current e-services provision for 478 California cities and 58 California counties is more supply-driven than demand-driven. Information technology capacity at the county level and population size at the city level would seem to reveal the needs and abilities of bilingual e-services; this research also provides insights into two cities: San Rafael and Antioch. Despite San Rafael not having a significant Hispanic population when compared to Antioch, the city of San Rafael provides high quality web-based bilingual services, while Antioch provides no bilingual services. This research not only

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provides recommendations for the future research on other

e-government services or other jurisdictions, but also

points out practical lessons for public practitioners to

improve e-service delivery.

ACKNOWLEDGEMENTS

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CHAPTER ONE

INTRODUCTION

The Development of E-Government: Importance and Trend

E-government is the application of Information Communication Technologies (ICTs) by government agencies to deliver information and services for the benefit of citizens, businesses, and public servants. E-government services are designed to serve constituents' needs via convenient access to public information and services at any time, any place, or any form. The development of e-government represents the ICT-revolution. In fact, it also significantly integrates multidimensional operations into a cohesive digital nerve system. IT infrastructure enables the 'organism' to become more flexible, dynamic, efficient, and transparent by creating a network for people, communities, and businesses in response to citizen demand, by strengthening government agencies as leading providers of risk management services in response to financial crisis, and by meeting citizens' expectations of delivering more services.

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Technological advancements have propelled web service development all over the world, which in turn has resulted a fundamental e-government framework. This existing framework has several focuses, including: information security, e-government policy, legislation, and so forth. E-government service development, as valued by the United Nations e-government Survey in 2013, focuses on e-government as a crucial tool to promote economic growth, government reinvention, prosperous industries, and increased productivity. Current trends, for example, include the technology of electronic identification/recognition in Europe and internet security in the United States and South Korea. Current research discussions focus on barriers to extend services and access, including individual privacy protection, information security, and government records management (Alshehri & Drew, 2010; Nkwe, 2012).

Despite any experienced variances within e-government development, there has been a consistent emphasis on the citizen centric approach, which argues that e-government service development should accommodate public perspectives. Aldrich, Bertot,

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McClure (2002) maintain that the development of e-government shows a tendency toward the citizen-centered strategy. In such a strategy, initiatives focus on the problem of incorporating citizen needs to develop integrated, rather than stovepipe systems, and to create single-window, rather than multiple-window, service providers. Further, e-governments take the initiative in promoting information sharing, instead of acting as isolated entities. As those initiatives are implemented, deployment of information technology and internet services facilitates the democratic process, thereby allowing citizens to participate in the rule-making process or provide comments for future development in electronic issues. In addition, the perception of usefulness and ease of use become crucial to achieving the needs of the citizens and to adopting government e-services (Warkentin et al., 2012; Horst, Kuttschreuter & Gutteling, 2007). For example, the education and inclusion of individuals with disabilities are special concerns, as noted by Jaeger and Thompson (2003). Many studies currently reveal concerns about e-government development at the local

level (Al-Khouri, 2011; Norris and Reddick, 2013).
Local government has achieved incremental growth toward
this end, but this has not been recognized as
sufficient.

Current Understanding of Demand and Supply of E-Government Services

It is not possible to transfer the business logic
of the private sector into the provisions for
electronic services in public sector. The literature
review concerning demand and supply in e-government
services for the public sector generally support the
understanding that these mechanisms act as the fibrous
central part of e-government (Grant and Chau, 2005). A
role of government at the state, local, municipal, and
national level is as a provider of capacity and power
of IT, just as governments, citizens, and businesses
are receivers of service delivery. Another feature
which puts the concept of demand and supply into a
current electronic service perspective appears when
measuring the quality of the provision of e-services.
The purpose here is to evaluate a government's work
based on citizens' expected standards such as

efficiency, responsiveness, preciseness, etc. (Deursen, Dijk and Ebbers, 2006). However, not including citizens' consideration in e-services is a failure of "top-down" e-government design. Many governments worldwide are conscious of using a bottom-up design in enhancing service delivery, citizen engagement, self-sustainable operations, and digital transformation (Anthopoulos, Siozos, Nanopoulos, Tsoukalas, 2006).

The Importance of Offering Citizen-Oriented Services

Jaeger (2003) considers the importance of offering citizen-oriented services to be a crucial objective of e-government. E-government plays a metaphoric role as an endless wire, which refers to its thread services delivery through citizens, business, and governments at all levels. Further, a secondary goal of e-government is to achieve greater citizen participation in the democratic process. Luarn and Lin (2003) assert that users' attitude is the successful key to deliver electronic services. Jaeger and Thompson (2004) reinforces that the usage of e-government information should be applicable to the users' practical needs. As

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a result, citizens have confidence in the quality of services, government competence, and the precision and safety of transactions. Citizens find themselves ready and able to easily accept e-services, if delivery of those services is compatible and beneficial to them. Providing citizen-centered services leads to a win-win strategy. On one hand, it creates a willingness among potential users, resulting in effective adoption of e-service. On the other hand, citizens benefit by enjoying the convenience of saving money and time by accessing an online payment system. Citizen participation and ICT are two important elements of e-democracy, which gives citizens multiple opportunities to participate in the process of rule-making by utilizing information communication technology. Also, e-democracy can be considered a modern approach for improving the democratic process of enhanced citizen involvement (Mahrer and Krimmer, 2005). E-voting, for instance, should develop detailed procedures, purposes, methods on the basis of the citizen centric approach. Rabaiah and Vandijck (2009) emphasize the importance of a customized strategy to offer online services. This strategy ensures that resource allocation and government investments to

serve the public to a greater extent are best appropriated.

The Importance of Bilingual Services

One important determinant in the quality of a webpage is the bilingual service provision. According to Segovia and Jennex (2006), language-translation services for bilingual populations increase citizens' confidence in e-government performance. The composition of the population itself creates a demand for bilingual services. Multilingual websites have become more and more necessary because of a growing number of races existing in some countries, such as India, Switzerland, China, Russia, Spain, and the U.K. The case of the US also demonstrates a growing need for bilingual services, especially when addressing the issue of 'digital divide'. Bilingual services are beneficial when addressing and bridging the digital divide among diverse populations (Graham, 2002). Unfortunately, despite the importance of bilingual service, the study of the bilingual service provision on government websites is very limited.

The Purpose of the Research and
Structure of the Paper

This research has three objectives: (a) to gain theoretical understanding about e-service provision rationale, (b) to test the hypothesis that the current e-service provision is more supply-driven than demand-driven, and (c) to provide practical lessons for public practitioners to improve e-service delivery.

This research is organized into nine chapters followed with several focal points. The first chapter introduces the development of e-government and illustrates how the popularity of advanced technology advances services delivery toward the comparable and competitive advantages. By measuring levels of supply and demand for e-services, this research stresses the importance to citizen-oriented services offered by government websites for bilingual populations. The second chapter identifies e-government and its purposes. Understanding three purposes leads to come closer in time to the citizen centric approach. The third chapter presents the demand and supply of e-government services. By involving this theoretical model (supply and demand) we establish a solid foundation for our research

analysis. Furthermore, this model breaks the adoption of e-services down into two parts: the supply side and the demand side, for the sake of explaining various supply and demand factors, as well as for testing the hypothesis. The fourth chapter addresses bilingual e-government services. Starting with demographic change, this research highlights the greater demand for bilingual services. The fifth chapter presents the research's methodology. This research uses California as an example for evaluating our hypothesis. In addition, this research conducted web evaluations as well as statistical analysis in logistic regression and the ordinary least square (OLS). The sixth and seventh chapters show the research results, along with lessons and recommendations. The eighth chapter analyzes two cases in California cites. The last chapter concludes this research.

CHAPTER TWO

DEFINING E-GOVERNMENT

Governments everywhere find themselves confronted

with reengineering services for the purpose of

effectiveness and efficiency to achieve desired results

without wasting energy and restricted resources.

Although there are great variety of e-governance models

across the globe, eight different models of e-

government are often cited in literature (Hai, 2007):

Government-to-citizen (G2C); Citizen-to-Government

(C2G); Government-to-Business (G2B); Business-to-

Government(B2G); Government-to-Government(G2G);

Government-to-Nonprofit(G2N); Nonprofit-to-

Government(N2G); and Government-to-Employee(G2E).

Regardless of the models referred to above, most e-

governments are centered on four basic layers of

services[1]: The first layer provides accessible

information from private entities to citizens. The

second layer uses a platform, such as the process of

Application Programming Interface (API), which

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[1] Gartner: an international research and consultancy
firm. http://www4.gartner.com/Init

increases communication across the board for more effective and efficient one-stop portals and digital information exchanges. The third layer establishes centralized databases, similar to the US Census, for such thing as stolen cellphones and fraud-detection data mining systems. This layer firmly ensures citizens of a reliable data source and effective government assistance in resolving crimes. The fourth layer makes information and services available to government-wide agencies, businesses, and the general public at any time, at any place, and in a variety of ways.

Various Definitions

There is not a universally accepted definition of the concept of the e-government (Halchin, 2004). In Halchin's (2004) article, for instance, e-government is defined as a way of doing "more or less," transferring power to citizens, and ensuring better delivery of public services to citizens through the use of information communication technology (ICT). In addition, the term e-government has much to do with use of internet technology and public accessibility. Another definition can be found in Reddick's (2005)

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article. The author views e-government as a way of integrating interactions between government and citizens, companies, customers, and public institutions through the application of modern information and communication technologies. E-government in industrialized countries tends to pay attention to transforming of government service delivery for better access, while e-government in developing countries emphasizes means and processes to establish a platform. From an industrialized perspective, Hwang, Choi & Myeong (1999) illustrate South Korea as an example in order to refine e-services through improving technical operations. From the developing country perspective, Bensghir and Yildiz (2002), however, define e-government in Turkey with respect to creating websites, rather than using any specialized technology.

In this paper, e-government is defined as the use of new information and communication technologies, including web-based Internet applications, to give citizens and businesses easier access to government information and services; likewise, e-government aims to provide better quality services, and allow more

opportunities to participate in democratic institutions (Fang, 2002).

The Purpose of E-Government Services

Electronic government applies a standard of universal usability, accessibility, and democratic participation to e-government services. The first intended outcome of e-government services is universal usability; that is, to make services available to everyone, relating to users' capacities, education, age, and so on. Shneiderman's (2000) defines universal usability as "having more than 90% of all households as successful users of information and services at least once a week" (p.85). The vital key that controls the success of universal usability is to recognize diverse users and their needs (Lazar, 2007). It is every user, not the "average" user upon whom the information and communication system should be based. This point has been broached in several ways, including by choice of web design and by methods employed to satisfy users' preferences. Researchers (Nantel and Glaser, 2008) provide evidence of the need to increase usability on websites, especially with regard to native language and

culture. Websites should be designed to be capable of being used by every user. Baker (2006) further reinforces that user's ability is much more than just enhanced web usability; it is a way of giving needed help via online services, user-assistance, navigation, legitimacy, information architecture, and accessibility accommodation. In their work, Lazar (2006) and Horton (2006) propose a user-centered design approach as a possible choice to deal with meeting the needs of all users.

The second desired outcome of e-government services is accessibility. "Accessibility" references the test run to determine whether users have an issue with 'digital divide,' or, as more clearly defined by Belanger and Carter (2009), a lack of access and skills. A majority of people find themselves restricted by access, rather than competence, when it comes to internet use (Reddick, 2012). Therefore, it is essential to better enable citizens to interact more readily with government service portals twenty-four hours a day, seven days a week. Additionally, accessibility is strongly related to universal design, which is not a part of usability. Riley-Huff (2012) has

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shown that a desire to achieve web usability goals derives more from a better understanding of current standards for web accessibility than from building an inaccessible website. He illustrates that using flash to build web content creates barriers, or restricts users altogether from accessing websites. Developing accessible websites that are more user-friendly for everyone is necessary. It is often the case that unless web designers understand the user's needs, they may not appropriately address them when establishing a webpage. Some observers of web accessibility believe that internet service delivery could transform government information and delivery services into a nonhierarchical or two-way interaction (Gore, 1993; West, 2004). Brown and Brudney (2004) conclude that recommendations to improve accessibility have demonstrated that "hierarchical, top-down, control-oriented approaches" are not optimal at pinning down users' needs or reducing costs. Stowers (2002) has emphasized the importance of looking at the problem of 'digital divide,' which essentially outlines how effective e-service will ultimately be. However, Shneiderman (2000) develops a model with three

challenges, suggesting that changing technology, diverse users, and user knowledge can play crucial roles regarding accessibility within government websites.

The idea that one must first determine the user and his/her abilities plays a significantly bracing factor in the universal usability and web accessibility of e- government services. Bertot and Jaeger (2006) point out three major obstacles. First, a supporting role in handling a broad range of hardware, software interference, and network access is a daunting hurdle to both users and e-governments. With the rapid development of information communication technology, users are discouraged from catching or keeping up with advances in hardware, operating systems, and network protocols. Second, it is challenging to accommodate diverse users within a variety of backgrounds, knowledge, skills, ages, genders, disabilities, conditions, incomes, and so forth. To help web developers address individual differences, web contents are posited to accommodate those needs. Third, it is problematic when users' actual knowledge falls below

what required for them to use specific information technology.

The third reason for which e-government services to exist is for greater democratic participation. Democratic participation, as defined by Finkel (1985), is a practice of participating in various public activities and empowerment in decision making and public work. Web-based participation is regarded as a way of democratic governance (Moon, 2002). Democratic participation, according to Warren (2002), consists of providing equal opportunities to participate in education, decision-making, voting, and the like. E-government services are highly correlated with citizen's satisfaction in public activities. One study criticizes the fact that not all government website designers pay attention to the bottom-up approach (or user-centered design), which focuses on not only on users with disabilities, but on all users. This is a clear indication that research about the "digital divide, digital literacy, and digital inclusion" is not addressing the technology that is accessible on the internet, but rather is promoting citizen engagement in the necessary skills required for technology (Jaeger,

Bertot, Thompson, Katz, & DeCoster, 2012). Jaeger,

Bertot, Thompson, Katz, & DeCoster (2012) focus on

serving the needs of all users. Others are concerned

about the "digital divide," that obstacle of disparity

in usage caused by language barriers, individual

purchasing power, or profound problems in using

technology, in addition to organizational factors

(Sipior & Ward, 2005; Nantel & Glaser, 2008; Helbig et

al., 2009). The driving force of user satisfaction with

e-services lies in bridging the "digital-divide" gap

and creating an easy entry point for multiple users to

employ e-services multiple times. Kotamraju and Geest

(2011), however, encourage a shift in research

direction from an information-driven concept of access

to ICT to a user-driven concept of concerns about

users' abilities. Sipior & Ward (2005) describe how

gaps between internet access, the use of technology,

and computer skills are decreasing when provision of

access to IT and training in computer skills are

accounted for. The digital divide, according to Ferro,

Helbig, & Gil-Garcia (2011), is described as a gap

between supply (how e-government initiatives are

implemented) and demand (the differences among people

in why and how, and when they use e-government services).

E-participation engages users in different levels of policy-making. In other words, citizens' interactions vary by the degree of e-participation and policy-making process. While Macintosh (2004) provides a useful framework for considering e-participation, there is not much research in the area. For example, there is no comprehensive analysis of using ICT to estimate actual cost in the promotion of e-participation; nor has there been evaluation methodology based on clear assessment criteria and participation indicators; finally, a better understanding of the factors that contribute to E-participation success and failure could inform others as they deploy 'enabling, engaging, and empowering' adaption in their practices. Furthermore, e-participation has a significant connection with education. Saglie and Vabo (2009) show that citizen involvement in political activities increases with age and education. Other applications are based on the idea that involvement generates types of social media for citizen engagement. Therefore, electronic government

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requires educating people before moving forward in

order to reach the greatest degree of e-participation.

CHAPTER THREE

THE DEMAND AND SUPPLY OF
E-GOVERNMENT SERVICES

Literature about the Adoption of
E-Government Services

A multitude of studies examine the adoption of e-government and elaborate on the practice of online services with regard to e-government offerings. Early researchers were interested in discussing the issue of the supply side of e-government offerings. Moon (2002) criticizes the adoption of e-government services on the shortage of information technology specialists. Edmiston (2003) shows that e-government services are restricted by the financial costs associated with the purchase of technological operations or marketing. Reddick (2005) demonstrates that government interaction with citizens has changed and finds that even if electronic services have visible operations, or readily available information about convenient services, they are scarcely used. Holden, Norris, and Fletcher (2003) look at local government and notice that adoption of e-

services depends on the supply side of government offerings.

A lot of research investigates the adoption of e-government services in regard to the supply side. Reddick (2005) concentrates on how e-government offers services to government (G2G), business (G2B), and citizens (G2C). Schwester (2009) examines the factors that most impede the adoption of e-government applications. His findings show that municipalities with higher operating budgets, more full-time IT staff, and technical resources are more likely to implement a comprehensive e-government platform. Moon's (2002) study also examines e-government at the municipal level, using a data-base of 2000 e-government surveys. The author analyzes how 'size' and 'type of government' contribute to greater financial and technical support, as well as greater personnel capacities and privacy concerns. The author concludes that many municipal e-governments are still in their infancy and have not performed up to their expected outcomes due to cost savings, downsizing, etc. Edmiston (2003), states that adopting e-services has a beneficial effect that improves government services. It reduces costs and

enhances the democratic process. Holden, Norris and Fletcher (2003) employ a survey developed by Moon (2002) to evaluate the adoption of e-government, and compare larger municipalities from e-government at the local level, and conclude that e-government at this level is still 'muddling through.' Based on his analysis of city websites and his surveys of web development officials, Ho (2002) demonstrates that the adoption of e-services in many cities encompasses one-stop shopping and customer-oriented web design. The article also establishes that external collaboration and networking is used over technology in the website development process. Ho's article analyzes the socioeconomic and organizational factors that are related to cities' progressiveness in web development. The factors identified by the study include insufficient staff, lack of funding, and the problem of digital divide among racial groups.

The Importance of Analyzing the Demand Side

In order to study the demand side of e-government services, it is important to analyze the willingness of citizens to use government websites along with the

quality of government website design. Web-based
interaction enhances citizens' perception of e-
government. Citizens desire to experience easy access
as well as free access to those services (Goings, Young,
Hendry, 2003). Technology could serve to bridge this
gap between government and citizens for addressing
users' needs. Kumar, Mukerji, Butt, and Persaud (2007)
perceived usefulness, ease of use, trust, and perceived
risk as four determinants to citizen's interaction and
recognized that those factors will influence whether
citizens will use e-services or not. A case study,
presented by Kumar, Mukerji, Butt, and Persaud (2007),
revealed that the vast majority of Canadians visit
government websites to obtain information, rather than
interact or transact directly with the government
personnel. To conclude, a better understanding of why
and how citizens use government websites, and their
general dispositions towards e-government, is an
important research issue and should be a focal point
for the e-government adoption strategy.
Much recent research examines the quality of web pages
using different perspectives. Tseng, Hsu, & Chuang
(2012) argue that most websites are not suitable for

users over fifty-years old. Empirical data from another study concludes that citizens are inclined to use the internet on the basis of information exchange (Liu, Liao, Sung & Peng, 2012). The success of the web design is determined by the extent to which all users are engaged.

The demand for e-services is positively related to the development of e-government: the recognition of current trends and the demands of residents. Based on Kumar, Mukerji, Butt, and Persaud's (2007) model, e-government begins by distributing information, followed by the transaction process. The transformation of e-government has tended to react in an interactive way with citizens. Schwester (2009) adds a participatory framework that reemphasizes the offering of internet applications which connect citizens with public administrators, decision-makers, and even elected officials. Citizens are the central focus of e-government services. Islam (2009) views citizen-centricity and the integration of different layers of federal, state, local governments as two points on which to concentrate to increase users' satisfaction with e-government services.

The Theoretical Model

Several research studies have been based on the theoretical model of supply and demand to assess whether e-government services had made the shift from supply factors to demand factors. Dimitrova and Chen (2006) emphasize supply in their research, and place the focus on the citizen-government relationship using demographic, psychological, and political features as demand factors. E-government is successful for addressing both supply and demand factors, but it is necessary to introduce more development processes into the mix in order to achieve a greater, cohesive e-democracy and to improve connections between citizens and governments (Watson and Mundy, 2001).

As shown in Table 1, many variables have been identified toward interactions in the government websites. Although some factors are used differently over time, most of them have a similar purpose. One of the most used factors is population size, chosen by various authors for several reasons: reduction of shared rate per cost, more resources, and status of facilities (Moon, 2002; Reddick, 2009; Patel and Jacobson, 2008; Rana, Williams & Kumar, 2012). E-

government services cannot exist in isolation.

Financial factors and IT staffs are extremely important to consider (Nurdin, Stockdale, and Scheepers, 2012; Schwester, 2009). Additionally, cost-effectiveness and consistency have positive effects on centralized technology, generally controlled by a City-Manager or Mayor's government (Ho and Ni, 2004; Patel and Jacobson, 2008). Recently, the demands of a growing Hispanic population have increased attention in this area (Prieger and Hu, 2008).

Outsourcing is rarely studied as a defining factor of e-government service adoption, but it becomes a common practice in government agencies. However, the Hispanic speaking population is the primary group referenced when discussing bilingual online government services. Table 1 presents government offerings in websites as they pertains to six sub-categories based on the supply model, and deals with available resources regarding government capacities for providing bilingual services. Additionally, Table 1 describes the needs for non-English language speakers as they fall into one sub-category, depending upon whether or not the demand model deals with those regarding bilingual service

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needs. This study emphasizes the demand-factors (as opposed to the supply-factors) that influence e-government adoption. Each variable is defined and justified (See Table 5).

Table 1

A Classification of Theoretical Model

Interactions In the Government Websites		
Supply factors	Population Size	Moon (2002), Reddick (2004), Patel and Jacobson (2008), Rana, Williams, Kumar Dwivedi (2012)
	Revenue	Nurdin, Stockdale, and Scheepers (2012);
	IT Employees	Schwester (2009)
	Centralized IT Department	Ho (2002)
	Outsourcing	(No research found)
	Form of Government	Ho (2002), Holden, Norris, and Fletcher (2003); Patel and Jacobson (2008)
Demand factors	The Hispanic population	Prieger and Hu (2008)

The Hypotheses

This paper uses the supply and demand analysis to develop two hypotheses for adoption of e-government services. Those hypotheses are interrelated with supply and demand theory, a term used by economists to characterize the bilingual services provision where the amount of resources dedicated to represent e-governments' capacities. Consequently, when there is a shift toward more demand, than increase results in a greater bilingual services provision. The first hypothesis states:

H_0: There is no relationship between resources and provision of bilingual services.

H_1: Governments with more resources for e-services Will be more likely to provide bilingual services.

The logic is that government provision of bilingual services is resource driven. If resources are limited, bilingual services provisions will be immediately reflected in e-government services at the city and county level, resulting in less government-citizen interaction, little to no online transaction, and less transparent governance.

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Despite limited resources, bilingual services should still be effective and efficient. Based on the actual needs of non-English language users, e-government will reach target populations only when bilingual services function productively. For example, governments can provide more effective services by focusing on sophisticated in web designs in order to be more competitive.

The first hypotheses (H_0 & H_1) have been discussed by academic professionals. According to Moon (2002), for example, it is generally believed that e-government service adoption is affected by available resources such as size, type, and personnel capacities of the government in question. The view is that there are different supply-side factors; accordingly, governments provide e-services, make those services available on the internet, offer online transactions, involve citizens in decision making such as e-voting, and meet all needs in a timely manner. The second hypothesis states:

H_0: There is no correlation between the need for bilingual services and the provision of bilingual services.

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And the alternative indicates:

H$_1$: Governments facing a need for bilingual

Services are more likely to provide bilingual

services.

The second hypotheses (H$_0$&H$_1$) have drawn much research' attention, but lacks empirical support. For example, Kumar, Mukerji, Butt, and Persaud (2007) stress that it is necessary to first establish the connection between provision of services and the needs of users. Their study shows that knowing the reason and the method of citizens' experiences with government websites provide better results ,for successful e-government adoption. The view here is that all the demand-side factors (ease of use, the usage behavior, users' perception, users' intention, users' preferences such as free access to e-government offerings, etc.) facilitate government enhancement of e-services for all citizens.

The Dymally-Alatorre Bilingual Services Act of 1999 requires that "state agencies that serve a substantial number of non-English-speaking people employ a sufficient amount of bilingual persons in order to provide certain information and render certain

services in a language other than English"

(http://www.bsa.ca.gov/pdfs/reports/99110.pdf). Several

studies have shown that the delivery of e-government

services lag behind when it comes to recognizing the

growing needs of bilingual employees who provide a

variety of services to individual whose first language

is not English. Those services include Paralingual web

design suggested by Segovia, Jennex, Beatty (2009), and

bilingual selections proposed by Al-Omari (2006).

Few studies have researched the extent to which

bilingual services can be offered by e-government or

the bilingual resources and services currently

available in government. Thus, there is lack of in-

depth information that web developers can use to design

web services to meet users' demand.

CHAPTER FOUR

BILINGUAL E-GOVERNMENT SERVICES

Demographic Changes

Analyzing demographic data allows researchers to identify statistical characteristics of a given population. One aspect used by researchers is the historical change in a population over time. This change includes the analysis of gender, age, total resident population, race and ethnicity, language, disability, mobility, home ownership, employment status, median household income, and so forth.

The American population has been growing larger and more diverse (Mackun & Wilson, 2011). In 2010, the US population grew to 4.5 percent of the world's total population and ranked third for overall world population. Also, the change in population rose by 9.7 percent (27.3 million) from 2000 to 2010. The Western and Southern regions of the United States grew by 10.5 % when compared to the Midwest and Northeast. On a state level, California has the largest population with 37.3 million (US Census Bureau, 2010). On the county level, Los Angeles County in California is the most

populous with 9.8 million residents, compared with

Harris County of in Texas (4 million residents) and

Cook County, Illinois (5 million residents). Further,

at the city level, Los Angeles, San Diego, and San Jose

had the greatest population increases from 2000 to 2010.

Hispanic populations in this country continue to

grow, while the white populations are decreasing overall.

From 2000 to 2009, the population increase for the

nation was 25,582,000 persons of the total population,

while the increase for the Hispanic population was

13,113,000 (8,050,000 individuals aged 16 to 64 years,

and 2,311,000 aged 55 years and over) (US Census Bureau,

2012). Before exploring the growth of Hispanic

population, we touch momentarily on relatively recent

California history. Mexico deeded the United States

ownership of California through a treaty after the

Mexican-American war ended at the end of the 1840s. It

is because of this history and because of its close

affiliation with a Hispanic culture that we have seen a

constant and rising number of Hispanics in California.

From 2000 to 2010, California's Hispanic population

grew by 13,654,969 people (US Census Bureau, 2013).

Compared to the Hispanic population, California's White

population has increased by 3,528,334 (US Census Bureau, 2013). The White population in the United States is set to fall to minority status at same point in the next generation.

As shown in Figure 1, the White and Hispanic populations made up the biggest percentage increase from 2000 to 2009. Together they comprised over half the US population.

U. S. Demographic Change 2000-2009

⬚White alone

◼Black or Africa Amiercian alone

▨American Indian, Alaska Native alone

◼Asian alone

▧Native Hawaian, Other Pacific Islander alone
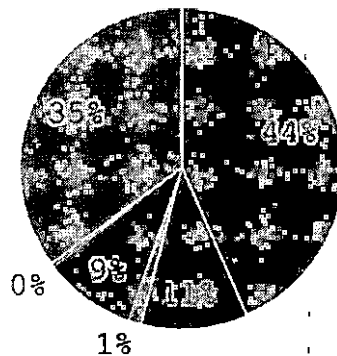
▨Hispanic origin

Figure 1. US demographic change 2000-2009.

US Census Bureau. Table 10. Resident population by race,
    Hispanic origin, sex and age 2000 and 2009.
    Retrieved October 8, 2011, from
    www.census.gov/compendia/statab/2012/tables/12s001
    0.pdf.

In Table 2, the White population accounted for 75% of population in 2000; this dropped by 1% in 2011. However, the Hispanic population grew slightly, rising from 13% in 2000 to 17% in 2011.

Table 2

Race and Hispanic or Latino of U. S. Total Population

	White	Hispanic	Black	Asian	Other non-Hispanic
2011	74%	17%	13%	5%	0.1%
2000	75%	13%	12%	4%	0.1%

Source: United States Department of Commerce. (2013).

Race and Hispanic or Latino in the United States.

Retrieved from

http://factfinder2.census.gov/faces/nav/jsf/pages/

community_facts.xhtml

Other areas changed significantly. The number of Asian people in the overall population has gradually increased, climbing from 4% to 5%. The number of Black and Africa American slowed slightly, up from 12% in

2000 to 13% in 2011. Some areas remained relatively unchanged. American Indian and Alaska Native populations are approximately the same, as are Native Hawaiian and other Pacific Islanders.

Demand for Bilingual Services

Bilingual services are provided to ensure equal opportunities and access to public information and services for those whose primary language is not English. The emphasis on bilingual services is for effective communication, for equal human rights for non-English language speakers, and for public services that are approachable to all.

One reason for the emphasis on demanding bilingual service might be explained by the needs of Hispanics employees to operate in a government system without barriers or hindrances of any kind, and to have better, effective communication. According to the US Labor force in 2011, Hispanics comprised 15% of the US labor force in public services, understanding the point that bilingual service should not be neglected. Another reason for the increased demand for bilingual services is the growing trend for bilingual service websites.

Many perspectives from Anthopoulos, Siozos, Tsoukalas (2007) focus on bilingual services research and contributions in web design. Those studies reinforce the special demand in California for bilingual services.

California is noted for its diverse population and the largest Hispanic population in the US. California, the most populous state, is located on the West Coast. Its capital city is Sacramento, and Los Angeles is its largest city. California has 58 counties and 397 county subdivisions, which contain 459 cities and 21 towns. In 2011, the Hispanic population was 16.7 percent of the US total, and that growth occurred dramatically in the state of California. This one demographic characteristic alone reveals a significant demand for bilingual services.

CHAPTER FIVE

RESEARCH METHODS

Testing Hypotheses with California
Counties and Cities

In order to analyze the provision of bilingual services (PBS) and bilingual service usability (BSU), this research uses California government websites (counties and cities) to test the hypothesis that government provides more bilingual services based on the amount of resources for e-services and the demand for bilingual services rising from an ever-increasing bilingual population.
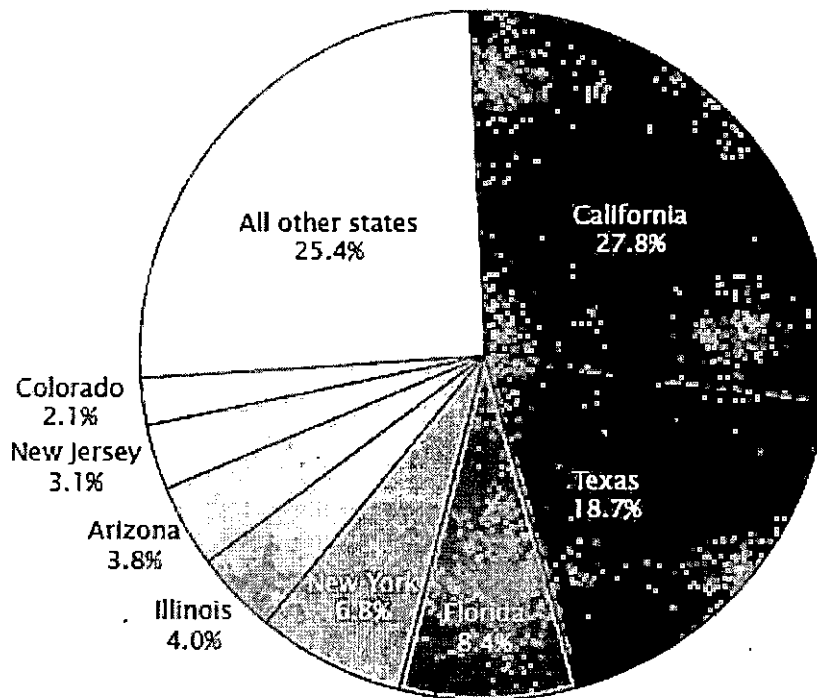
Reasons to Study California

This research paper uses California because of its Hispanic population size and the fact that it is the largest state. California has the largest percent distribution of the Hispanic population as shown in Figure 2. According to the 2010 Census, 27.8 percent of the Hispanic population lived in California as compared to other states (Texas 18.7%, Florida 8.4%).

Percent Distribution of the Hispanic Population by State: 2010
(For more information on confidentiality protection, nonsampling error, and definitions, see *www.census.gov/prod/cen2010/doc/sf1.pdf*)

Source: U.S. Census Bureau, *2010 Census Summary File 1.*

Figure 2. The Hispanic population by state: 2010.

Ennis, S. R., Rios-Vargas, M. and Albert, N. G. (2011).
The Hispanic population: 2010. *U S Census Bureau,
May 2011.* Retrieved from
http://www.census.gov/prod/cen2010/briefs/c2010br-
04.pdf

As discussed above, the Hispanic population comprised 16.7% of the US total population and the shift is trend is becoming ever more dramatic, especially in the state of California. Hispanics encompass 38.1% of California's total population. The total Hispanic population in 2011 had increased more than 4% from 2000. With over 12% of the total US population, California is the largest state, and ranks as the third largest area in the United States. California's large population brings with it a number of unique characteristics, including its diversity. California's diversity presents a variety of races. In the 2011 US Census, California's "two or more races" rate was 2.3 % higher than the national rate. The "two or more races" rate in California is 4.2% compared to the national rate of 2.4%.

Research Methods

This research uses three methods to study the bilingual services offered in California cities and counties. Web evaluation is one of the basic approaches used to analyze the quality of bilingual services in websites, so we start by considering the provision of

bilingual services (PBS) as the dependent variable,
illustrated by two categories: functional (1) and
dysfunctional services (0). Functional bilingual
services represent the accessible, operational,
performing channels including translators, electronic
bilingual documents, parallel websites, and so forth.
Services include, for example, translating official web
pages and documents (applications, notices,
regulations) into a number of different languages, and
ensuring that those internal or external documents have
been constantly updated or safeguarded by the
Information Technology Department. Dysfunctional
services are those that fail to fulfill functional
bilingual services. The goal is to examine the use of
bilingual services based on the 1 & 0 scale.

Based on Lynch and Horton's (2009) concept of
usability, we also use this content analysis to
investigate different levels of bilingual services as a
measure of the effectiveness of website usability.
Bilingual service usability (BSU) is the second
dependent variable. The five stages of bilingual
service usability (BSU) include:

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0) no provision for bilingual services,

1) one-button translation without functions,

2) Spanish description tag with reading comprehension,

3) bilingual translation document,

4) primary homepage translation, and

5) an English-Spanish or a parallel website.

The bilingual usability data was taken from California government websites and was rated using the 0-5 scale described above to evaluate the effectiveness of bilingual services offerings. The primary websites for California counties are presented in appendix A. Included in the analyses is data from 40 countries' websites. The secondary websites for California cities are 195 government websites listed in appendix B.

Searching county/city websites, this research was carried out in Feb 2013. We found that 13 of 58 California counties have bilingual services rooted in their official websites. California cities account for 81 of 485 bilingual websites. The relative frequency rate of the provision for bilingual services in California cities is 5% less than California counties. The percentage offering bilingual services is 17% for

city websites and 22% for county websites. Data from both counties and cities shows a less than 25 % provision of bilingual services in 2012. For bilingual service usability, the most effective web design, a 5 on the web usability scale, is less than 5% for both county and city websites (cities: 5%; counties: 3%)(See Tables 3 and 4).

Table 3
Frequency Distribution for the Provision of Bilingual Services in 2012

Provision of Bilingual Services (PBS)	Frequency			
	Cities		Counties	
Yes (1)	81	17%	13	22%
No (0)	404	83%	45	78%
Total	485	100%	58	100%

Table 4

Frequency Distribution for Bilingual Service Usability in 2012

Bilingual Service Usability (BSU)	Frequency			
	Cities		Counties	
0	404	83%	43	74%
1	17	4%	1	2%
2	36	7%	7	12%
3	2	0%	3	5%
4	3	1%	2	3%
5	23	5%	2	3%
Total	485	100%	58	3%

This research requires several explanatory variables which depend on interviews and secondary data, including the Census Bureau and the Cities Annual Report. In Table 5, centralized IT Department (CIT), outsourcing (OUT), and form of government (FoG) are explanatory variables used to evaluate the supply factors through reviewing government web sites and conducting interviews via phone and email.

Table 5

Summary of Variables and Descriptions of Counties/Cities

Variables name	Description
Dependent variable	
Provision of Bilingual Services (PBS)	1=Provision of bilingual services 0=No provision of bilingual services
Bilingual Service usability (BSU)	Measurement scales for the quality of bilingual service usability (0-5): 0=No provision for the bilingual services 1=One-button translation without functions 2=Offering Spanish description tag for the pages that would not be correctly understood or well received by Spanish speakers 3=Making bilingual documents available on the website 4=Translating entire current English website content page into Spanish 5=Creating an English-Spanish or a parallel website
Explanatory variables *Demand factors*	
The Hispanic population (HPOP)	Percentage of Hispanic or Latino (of any race) population in counties of California
Supply factors	
Size of country (POP)	Total population
Revenue (per capital) (REV)	Local government finance in 2007
Centralized IT department (CIT) (city only)	1=Centralized IT department ; 0=No centralized IT department
IT employees (ITE) (county only)	Total amount of IT employees in counties of California
Outsource (OUT)	1=Outsource counties' website ; 0=Design counties' website by their own
Form of government(FoG)	0=Mayor-council government; 1=Council-manager government

Those variables are represented by binary data (0 or 1). Centralized IT Department (1) and (0) refer to the presence of a centralized IT Department in government (1) and in-house web design is represented by (0). Outsourcing (OUT) is represented by others' web design (1) and self-design (0). In terms of form of government (FoG), 0 stands for the mayor-council government and 1 stands for council-manager government. Getting the accurate read of IT employees was not easy due to a sensitive issue in relation to the unemployment /employment situation. Another reason why interviewees found it difficult to provide an exact number of IT employees is that some people work as non-IT employees doing actual IT jobs, while some play roles of temporary supports for web design. Therefore, this research gathers the approximate numbers of IT employees with interviewees in county government. In addition, this research includes three explanatory variables, i.e., the Hispanic population (HPOP), size of population (POP), and revenue per capita (REV). The size of population (POP) is defined as the total population in counties or cities. Both the Hispanic population and size of population were collected from

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the 2010 Census, along with the 2010 American Community

Survey (ACS) 1 year estimates. This research also

collects revenue data from the Cities Annual Report

published by the California State Controller's Office.

Revenue per capita (REV) refers to the income that

governments receive from taxes. The Hispanic population

is defined as the percentage of Hispanic or Latino

population as well as the only demand factor in this

research. Table 5 summarizes these variables.

Because some independent variables of the cities

and counties are unavailable, the county sample was

reduced from 58 to 40 and the city sample from 485 to

195 as shown in Table 6 and Table 7.

Table 6

Descriptive Statistics of California Counties

Variable Name	N	Means	STDEV	Min	Max
Dependent variable					
Provision of Bilingual Services (PBS)	40	0.30	0.46	0	1
Bilingual Service Usability (BSU)	40	1	1.55	0	5
Independent variables					
Demand factors					
% Hispanic Population (HPOP)	40	32.66	16.73	8.50	80.40
Supply factors					
Size of Population (POP in thousands)	40	104	179	7	1071
Revenue (per capital) (Rev in thousands of $)	40	1.60	0.50	0.70	3
Centralized IT Department (CIT)	40	0.90	0.30	0	1
IT Employees (ITE)	40	58.35	116.01	0	700
Outsourcing (OUT)	40	0.23	0.42	0	1
Form of government (FoG)	40	1.45	0.50	1	2

Data sources:
2010 U.S. Census Bureau & Chiang, J. (2011). *2009-2010 Cities Annual Report.*
Retrieved from http://www.sco.ca.gov/Files-ARD-Local/LocRep/0910cities.pdf.

Table 7

Descriptive Statistics of California Cities

Variable Name	N	Means	STDEV	Min	Max
Dependent variable					
Provision of Bilingual Services (PBS)	195	0.18	0.39	0	1
Bilingual Service Usability (BSU)	195	0.51	1.29	0	5
Independent variables					
Demand factors					
% Hispanic Population (HPOP)	194	39.13	24.90	5.10	96.70
Supply factors					
Size of Population (POP in thousands)	195	88	314	0.70	4094
Revenue (per capital) (Rev in thousands of $)	195	233	1361	1	16275
Centralized IT Department (CIT)	194	0.20	0.40	0	1
outsourcing (OUT)	195	0.59	0.49	0	1
Form of government (FoG)	195	0.57	0.5	0	1

Data sources: 2010 U.S. Census Bureau & State of California: Cities Annual Report, Fiscal Year 2009-2010

CHAPTER SIX

RESULTS

County Analysis

This research uses logistic regression to investigate the probability of the occurrence of explanatory variables for the provision of bilingual services (PBS) in county websites. This research evaluates the following regression equation.

$$PBS_i = \alpha_0 + \alpha_1 HPOP_i + \alpha_2 POP_i + \alpha_3 FoG_i + \alpha_4 REV_i + \alpha_5 OUT_i + \alpha_6 ITE_i + \epsilon_i$$

$$(1)$$

Where

i denotes the forty counties.

PBS=Provision of Bilingual Services

HPOP= Hispanic population

POP=Population size

FoG=Form of government

Rev= Revenue

OUT=Outsourcing

ITE=IT Employees

The outcomes of binary logistic regression analysis establish the significant relationship between Hispanic population, form of government and whether the

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government website provides bilingual services. Among the county sample on Table 8, the Hispanic population (HPOP) and form of government (FoG) exhibit significantly positive coefficients. The coefficient for the variable Hispanic population (HPOP) is 0.103 and the efficient for the variable of the form of government (FoG) is 1.991. The findings thus show that government with more resources for e-services are more likely to provide bilingual services. The findings also show that offering a bilingual website is based on the form of government (FoG) and Hispanic population (HPOP). Furthermore, a higher provision of bilingual services can be explained by a higher percentage of Hispanic or Latino population, and a council-manager form of government.

The ordinary least square method (OLS) is also used to examine the relationship between the dependent variable and six independent variables as stated previously. In this research, the 0-5 scale is developed to measure level of bilingual services or bilingual usability in government websites (BSU) by the equation (2).

$$BSU_i = \beta_0 + \beta_1 HPOP_i + \beta_2 POP_i + \beta_3 FoG_i + \beta_4 REV_i + \beta_5 OUT_i + \beta_6 ITE_i + \epsilon_i$$

(2)

Where

i denotes the forty counties.

BSU=Bilingual Service Usability

HPOP= Hispanic population

POP=Population size

FoG=Form of government

Rev= Revenue

OUT=Outsourcing

ITE=IT Employees

Table 8 presents the significant positive coefficient of Hispanic population (0.058) and the significant negative coefficient of outsourcing (OUT). The results exhibit higher quality of bilingual offerings in county government websites when the county has a majority population of Hispanics. However, the negative value for outsourcing indicates a negative relationship between the quality of bilingual web service and outsourcing. Given these results, this research cannot reject the hypothesis, stating that governments facing a greater need for bilingual

services are more likely to provide bilingual services. The findings lead us to conclude that county government has taken the Hispanic population factor into consideration when deciding to provide bilingual services, but that outsourced government websites are less likely to provide quality bilingual services.

Table 8

The Results of the Ordinary Least Square and Logistic Regression for Counties

Dependent variable	PBS_COUNTIES (Logistic Regression) N=40	Dependent variable	BSU_COUNTIES (OLS) N=40
Explanatory variables		Explanatory variables	
Constant	-6.677(0.035)**	Constant	-1.039(0.340)
Demand factors		*Demand factors*	
Hispanic Population (HPOP)	0.103(0.016)**	Hispanic Population (HPOP)	0.058(0.000)***
Supply factors		*Supply factors*	
Size of Population (POP)	0.004(0.173)	Size of Population (SP)	0.001 (0.398)
Form of Government (FoG)	1.991(0.055)**	Form of Government (FG)	0.709(0.112)
Revenue (REV)	0.707(0.520)	Revenue	0.035(0.934)
Outsourcing (OUT)	-2.157(0.115)	Outsourcing (OUT)	-1.312(0.031)**
IT Employees (ITE)	-0.001 (0.832)	IT Employees (ITE)	-0.001(0.607)
Centralized IT Department (CIT)		Centralized IT Department (CIT)	
		Observations	
Omnibus test	0.018	Adjust R^2	0.316
-2LL	33.598	F-test	4.003
Cox & Snell R^2	0.317	p-value	0.040

Note: *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

City Analysis

The logistic regression and OLS model are again used to investigate the probability of the occurrence of explanatory variables for the provision of bilingual services (PBS) in city websites. The original variable of IT Employees (ITE) is replaced with the variable of the centralized IT Department (CIT). The logistic model is examined by the following equation.

$$PBS_i = \alpha_0 + \alpha_1 HPOP_i + \alpha_2 POP_i + \alpha_3 FoG_i + \alpha_4 REV_i + \alpha_5 OUT_i + \alpha_6 CIT_i + \epsilon_i$$
(3)

Where

i denotes the one hundred and ninety five cities.

PBS=Provision of Bilingual Services

HPOP=Hispanic population

POP=Population size

FoG=Form of government

Rev=Revenue

OUT=Outsourcing

CIT=Centralized IT Department

Table 9 presents the significantly positive coefficient of the Hispanic population (HPOP), the size of population (POP) and the centralized IT department

(CIT). The coefficients for the variable Hispanic population (HPOP), the size of population (POP) and the centralized IT department (CIT) are equal to 0.016, 0.06 and 0.952, respectively. The t Statistic shows that these variables are significant at the usual level of 5 %. These findings exhibit that whether or not to provide bilingual services is determined by the higher percentage of Hispanic or Latino population, the larger overall population size, and a centralized government with a single Information Technology department. Thus, this research provides evidence that the provision of bilingual services is resource driven and demand driven. Bilingual service provision can be explained by cities with a larger percentage of the Hispanic population, large population, and a centralized IT Department.

To examine the usability of bilingual services, this research performs OLS using the following regression:

$$BSU_i = \beta_0 + \beta_1 HPOP_i + \beta_2 POP_i + \beta_3 FoG_i + \beta_4 REV_i + \beta_5 OUT_i + \beta_6 CIT_i + \epsilon_i$$

(4)

Where

i denotes the one hundred and ninety five cities.

BSU=Bilingual Service Usability

HPOP= Hispanic population

POP=Population size

FoG=Form of government

Rev=Revenue

OUT=Outsourcing

CIT=Centralized IT Department

Table 9 presents the significant positive coefficients of the size of population size (POP) and centralized IT department (CIT). The coefficient of population size (POP) is 0.001 and the coefficient of centralized IT department is 0.442. Thus, this research cannot reject the hypothesis, stating that quality of bilingual web services in city governments depends on resource availability. Furthermore, population size and centralized IT Department can influence the quality of bilingual web services. In other words, a large population has a higher capacity of supplying more resources, and a centralized IT Department can advise city governments to offer high quality of bilingual

services. In addition, a city with a centralized IT department designs higher quality bilingual web services, compared to those who don't have a single office to handle city government websites. The lack of significant coefficient in the demand side has remained a challenge for bilingual web provision at the city level of government.

Table 9
The results of the Ordinary Least Square and Logistic Regression for Cities

Dependent variable	Provision of Bilingual service (Logistic Regression)N=195	Dependent variable	Bilingual Service Usability (OLS) N= 195
Explanatory variables		Explanatory variables	
Constant	-2.984(0.000)***	Constant	0.157(0.543)
Demand factors		*Demand factors*	
Hispanic Population (HPOP)	0.016(0.052)*	Hispanic Population (HPOP)	0.004(0.352)
Supply factors		*Supply factors*	
Size of Population (POP)	0.006(0.041)**	Size of Population (SP)	0.0010.085)*
Form of Government (FoG)	0.208(0.618)	Form of Government (FG)	0.185(0.34)
Revenue (REV)	-0.002(0.12)	Revenue (REV)	0.000(0.117)
Outsourcing (OUT)	0.421(0.311)	Outsourcing (OUT)	-0.053(0.786)
IT Employees (ITE)		IT Employees (ITE)	
Centralized IT Department (CIT)	0.952(0.042)**	Centralized IT Department (CIT)	0.442(0.071)*
		Observations	
Omnibus test	0.029	Adjust R^2	0.023
-2LL	171.627	F-test	1.758
Cox & Snell R^2	0.07	p-value	0.11

Note: *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

CHAPTER SEVEN

DISCUSSIONS

Limitations of the Research

Various limitations deserve to be mentioned.

Sample bias is considered the greatest limitation of

this research. Data acquisition is especially difficult,

because the access to official documents is both time-

consuming and often not available to the public.

Because of data limitation, we cannot provide a

complete study of government websites in all California

cities and counties. This leads to a convenience sample

which may be biased. Since only cities and counties in

California are studied, our findings may be only valid

for California and cannot be applied to cities and

counties in other states.

Major Findings: Lessons/Recommendations

The purpose of this research is to assist the

government in better developing and operating websites.

For this reason, this research has selected the state

of California and analyzed government websites in county and city levels. Many governments did not provide bilingual services through their websites, despite a strong demand from a large group of Hispanics. Further, bilingual service provision is defined by resource availability. At the county level, IT capacity is critical to service provision, whereas size of population is vital to bilingual service offerings at the city level. To ensure bilingual service usability, governments have developed bilingual infrastructure support services. However, some cities do not develop bilingual web services, while other cities fail to design citizen-oriented websites. Additionally, outsourcing may affect the quality of bilingual service provision by way of cutting costs and streamlining operations; professional managers may affect the outcomes of service provisions by way of affecting goals and trainings or dealing with financial issues. Nevertheless, the service will never be used if it does not meet citizen's needs. Providing user-needed services results in the success of e-government adoption. In this case, many cities and counties did not provide bilingual services despite the fact that

the provision of those services would reduce the digital divide. Therefore, focusing on improving the bilingual service usability, city and county government not only makes the website look "professional" to avoid blame, but also strive to do more with less, and provide the maximum practical involvement of citizens in the development of web design for the desired services. Meeting citizens' demands can be achieved by coordinating and monitoring, in conjunction with users, management, and information technology. Indeed, there is a need for government to hold vendors of public services accountable for the quality of web services. For example, public practitioners are recommended to annually assess web functions available for bilingual users to ensure website efficiency and maintainability. Governments may consider a systematic database management for editing and updating data, as well as conduct needs assessment prior to alteration of the service flow chart. Also, there is a need for government to establish a call center, where contact support and customer services are readily available if users have any questions raised during e-services use. Citizens also can contact service representatives via

email. A further suggestion for public managers would be to supervise expansion of interconnection between agency processes by disseminating best practices.

Indeed, there is a need for IT professionals to implement secure and continual service improvement, and a future need for governments to focus on the practice of governmental information-sharing, increasing the sharing between greater numbers of public agencies and improving the relay system, which enhances transparency. A future need for public professional organizations is to promote citizen participation and enhance democratic governance with across the board communication and information sharing. Governments may need to enhance internet networking and PC penetration rates in order to reduce the issue of digital divide.

CHAPTER EIGHT

AN ANALYSIS OF TWO CITIES

Compare Two Cities:
San Rafael and Antioch

This chapter compares two cities to illustrate the

variance of bilingual service provision. This research

reviews demographic profiles for California cities and

this section only focuses on two cities: San Rafael and

Antioch. This research analyzes the provision of

bilingual services by discussing the similarities and

differences between San Rafael and Antioch in

California. As shown in Table 10, a comparison between

San Rafael and Antioch shows one big difference and

some major similarities.

Both city governments have the centralized IT and

both outsource their web designs. In addition, these

cities have Councils/Managers. They are also

neighboring cities. San Rafael is 48.5 miles from

Antioch. The former is in Marin County and the latter

is in Contra Costa County. Although the two cities have

similarities in demographics, there is one big

difference: San Rafael has 14.5% fewer Hispanic people

than Antioch. For example, for every 100 residents, there are 22 Hispanics in San Rafael, compared with 32 for every 100 residents living in Antioch. Despite the number of Hispanic people being less in San Rafael than in Antioch, San Rafael provides not only bilingual services, but also the best quality of bilingual service usability. For example, the San Rafael city government established an English-Spanish website, while Antioch does not provide bilingual services. Additionally, San Rafael conducted a city satisfaction survey about overall satisfaction with services, while Antioch did not.

It is clear to perceive the Antioch city government may well be facing a digital divide in light of the growing demand for bilingual service provision for an increasing Hispanic population. Bilingual services seem relatively easy to provide, considering today's simple technology of adding translation search engines. Antioch shares a lot of similarities with San Rafael, but one of the exceptions is the lack of outstanding bilingual service provision and bilingual service usability. With these two communities being so closed to each other, it would be logical that more

information sharing needs to occur. San Rafael may well

be a future best practices benchmark for Antioch.

Table 10
A Case in Comparison with Two Cities in California

	San Rafael City	Antioch City
Provision of Bilingual Service	1	0
Bilingual Service Usability	5	0
Hispanic Population	26.7	41.2
Spanish Spoken at Home	21.8	32.1
Centralized IT	1	1
Outsourcing	0	0
Form of Government	1	1

Source: 2010 U. S. Census Bureau & Website
Evaluations

CHAPTER NINE

CONCLUSION

The current e-services provision could not meet the demands of citizens. The 2011 US Census shows that the Hispanic population comprised 16.7% of the population. The shift is dramatic, especially in the state of California. In general, the majority of the government agencies in California counties and cities have not developed bilingual e-services in response to this shift. By using the logistic regression and OLS analysis, this research concludes that many governments did not provide bilingual services in spite of the rising bilingual demands. Resource availability has been identified as the primary key for bilingual service provision. When evaluating bilingual service offerings and usability for California county and city government websites, this research concludes that IT capacity is most the critical of resources at the county level, whereas population size is regarded as the most important asset at the city level. Although the findings exhibit citizen-centric awareness

regarding current bilingual e-services provision for 195 California cities and 40 California counties, the quality of bilingual service is still not guaranteed. Outsourcing and council manager driven government are two factors that affect better bilingual services in response to internet users' needs and digital divides. The implications of the alignment between user, management, and IT highlight public administration in the evolution of e-services adoption. From the democratic governance perspective, e-government adoption is necessary in order to put emphasis on both the supply and demand sides. The aim of e-government is not only in the offerings of services, but also in the accountability that follows to create service usability, to make services efficient, and to ensure that e-governance is effective. In addressing citizen demand, the involvement of citizens in the process of web development has been given primary focus in e-government reform. In order to make services available to every citizen, public administrators need to bridge the digital divide by enhancing internet networking and PC penetration rates. In addition, implementing secure

and continual service improvements become crucial issues for New Public Administration.

This research analyzes the supply and demand of bilingual e-government services. The findings point to continued future research efforts in several directions. First, the application of the research framework can be extended to other e-government services in a way to enhance service quality. Second, the study of bilingual service provisions can be extended to other jurisdictions such as other states within the US, or even other countries; likewise, further comparative research can be conducted. Third, additional demand or supply factors of e-government can be investigated. The study also demonstrates the need to develop best practices to inform practitioners in providing citizen oriented e-government services.

APPENDIX A

COUNTY SAMPLES

Name	Provision of Bilingual Services	Bilingual Service Usability	Websites
Alameda	0	0	http://www.acgov.org
Butte	0	0	http://www.buttecounty.net
Contra Costa	1	3	http://www.co.contra-costa.ca.us
El Dorado	0	0	http://www.edcgov.us
Fresno	0	0	http://www.co.fresno.ca.us
Humboldt	0	0	http://co.humboldt.ca.us
Imperial	1	4	http://www.co.imperial.ca.us
Kern	1	5	http://www.co.kern.ca.us
Kings	0	3	http://www.countyofkings.com
Lake	0	0	http://www.co.lake.ca.us
LA	1	2	http://lacounty.info
Madera	0	5	http://www.madera-county.com
Marin	0	0	http://www.marincounty.org
Mendocino	0	0	http://www.co.mendocino.ca.us
Merced	1	2	http://www.co.merced.ca.us
Monterey	0	0	http://www.co.monterey.ca.us/
Napa	0	0	http://www.countyofnapa.org/
Nevada	0	0	http://www.mynevadacounty.com
Orange	0	0	http://ocgov.com/
Placer	0	0	http://www.placer.ca.gov/
Riverside	0	0	http://www.countyofriverside.us
Sacramento	1	3	http://www.saccounty.net/
SB	0	0	https://www.sbcounty.gov/
San Diego	0	0	http://sdpublic.sdcounty.ca.gov
SF	0	0	http://www.sfgov.org/
San Joaquin	1	1	http://www.sjgov.org/
San Luis	1	2	http://www.slocounty.ca.gov/
San Mateo	0	0	http://www.co.sanmateo.ca.us/
Santa Barbara	1	2	http://www.countyofsb.org
Santa Clara	0	0	http://www.sccgov.org/
Santa Cruz	1	4	http://www.co.santa-cruz.ca.us/
Shasta	0	0	http://www.co.shasta.ca.us
Solano	0	0	http://www.co.solano.ca.us/
Sonoma	0	0	http://www.sonoma-county.org/
Stanislaus	0	0	http://www.co.stanislaus.ca.us
Sutter	0	0	http://www.co.sutter.ca.us/
Tulare	1	2	http://co.tulare.ca.us/

Ventura	1	2	http://portal.countyofventura.org
Yolo	0	0	http://www.yolocounty.org
Yuba	0	0	http://www.co.yuba.ca.us

APPENDIX B

CITY SAMPLES

City Name	Provision of Bilingual Services	Bilingual Service Usability	Cities Website
Agoura Hills	0	0	http://www.ci.agoura-hills.ca.us
Alameda	0	0	http://www.cityofalamedaca.gov
Alturas	0	0	http://www.cityofalturas.org
Anaheim	1	5	http://www.anaheim.net
Angels	0	0	http://www.angelscamp.gov
Antioch	0	0	http://www.ci.antioch.ca..us
Arcata	0	0	http://www.cityofarcata.org
Arroyo Grande	0	0	http://www.arroyogrande.org
Arvin	0	0	http://www.arvin.org
Atwater	0	0	http://www.atwater.org
Auburn	0	0	http://www.auburn.ca.gov
Avenal	0	0	No official website
Bakersfield	0	0	http://www.bakersfieldcity.us
Barstow	0	0	http://www.barstowca.org
Berkeley	0	0	http://www.cityofberkeley.info
Big Bear Lake	0	0	http://www.citybigbearlake.com
Biggs	0	0	http://www.biggs-ca.gov
Bishop	0	0	http://www.ca-bishop.us
Blythe	0	0	http://www.cityofblythe.ca.gov
Brawley	0	0	http://www.brawley-ca.gov
Calexico	0	0	http://www.calexico.ca.gov
Calipatria	0	0	http://www.calipatria.com
Calistoga	1	2	http://www.ci.calistoga.ca.us
Camarillo	0	0	http://www.ci.camarillo.ca.us
Carmel-by-the-Sea	0	0	http://ci.carmel.ca.us/carmel
Carpinteria	0	0	http://www.carpinteria.ca.us
Cathedral	0	0	http://www.cathedralcity.gov
Chico	0	0	http://www.chico.ca.us
Chowchilla	0	0	http://www.ci.chowchilla.ca.us
Clearlake	0	0	http://clearlake.ca.us
Cloverdale	1	2	http://www.cloverdale.net
Coachella	1	5	http://www.coachella.org
Coalinga	0	0	http://www.coalinga.com
Colfax	0	0	http://www.colfax-ca.gov
Compton	0	0	http://www.comptoncity.org
Corcoran	1	2	http://www.cityofcorcoran.com/

Corning	0	0	http://www.corning.org
Corona	0	0	http://www.discovercorona.com
Crescent	0	0	http://www.crescentcity.org
Davis	0	0	http://cityofdavis.org
Delano	0	0	http://www.cityofdelano.org
Desert Hot Springs	0	0	http://www.cityofdhs.org
Dinuba	1	1	http://www.dinuba.org
Dixon	0	0	http://www.ci.dixon.ca.us
Dos Palos	0	0	No official website
Downey	1	5	http://www.downeyca.org
Dunsmuir	0	0	http://ci.dunsmuir.ca.us
El Centro city/Contra Costa	0	0	http://www.cityofelcentro.org
Elk Grove	0	0	http://elkgrovecity.org
Escalon	0	0	http://cityofescalon.org
Etna	0	0	No official website
Eureka	0	0	http://www.ci.eureka.ca.gov
Exeter	0	0	http://cityofexeter.com
Fairfield	1	2	http://www.fairfield.ca.gov
Ferndale	0	0	http://ci.ferndale.ca.us
Fillmore	0	0	http://www.fillmoreca.com
Firebaugh	0	0	http://www.ci.firebaugh.ca.us
Fort Jones	0	0	No official website
Fontana	0	0	http://www.fontana.org
Fowler	0	0	http://www.fowlercity.org
Fremont	1	3	http://www.fremont.gov
Fresno	1	5	http://www.fresno.gov
Galt	1	1	http://www.ci.galt.ca.us
Gonzales	0	0	http://www.ci.gonzales.ca.us
Grass Valley	0	0	http://www.cityofgrassvalley.com
Greenfield	1	1	http://ci.greenfield.ca.us
Gridley	0	0	http://www.gridley.ca.us
Guadalupe	0	0	http://ci.guadalupe.ca.us
Gustine	1	2	http://cityofgustine.com
Half Moon Bay	0	0	http://www.half-moon-bay.ca.us
Hanford	1	1	http://www.ci.hanford.ca.us
Hayward	1	1	http://www.hayward-ca.gov
Healdsburg	1	1	http://cityofhealdsburg.net
Hemet	1	1	http://www.cityofhemet.org
Hollister	0	0	http://www.hollister.ca.gov

Holtville	0	0	http://ww.holtville.ca.gov
Hughson	0	0	http://hughson.org
Huron	0	0	http://webconnections.net
Inglewood	0	0	http://www.cityofinglewood.org
Irvine	0	0	http://www.cityofirvine.org
Isleton	0	0	No official website
Jackson	0	0	http://www.ci.jackson.ca.us
Kerman	0	0	http://www.cityofkerman.net
King	0	0	http://www.kingcity.com
Kingsburg	0	0	http://cityofkingsburg-ca.gov
Lakeport	0	0	http://www.cityoflakeport.com
Lemoore	0	0	http://www.lemoore.com
Lincoln	0	0	http://www.ci.lincoln.ca.us
Lindsay	0	0	http://www.lindsay.ca.us
Live Oak	0	0	http://www.liveoakcity.org
Livermore	0	0	http://www.cityoflivermore.net
Livingston	0	0	http://www.livingstoncity.com
Lodi	0	0	http://www.lodi.gov
Lompoc	0	0	http://www.cityoflompoc.com
Long Beach	0	0	http://www.longbeach.gov
Los Angeles	0	0	http://www.lacity.org
Los Banos	0	0	http://www.losbanos.org
Madera	0	0	http://www.cityofmadera.org
Mammoth Lakes	0	0	http://www.ci.mammoth-lakes.ca.us
Manteca	0	0	http://www.ci.manteca.ca.us
Marysville	0	0	http://www.marysville.ca.us
Mendota	0	0	http://ci.mendota.ca.us
Merced	1	5	http://www.cityofmerced.org
Mission Viejo	0	0	http://cityofmissionviejo.org
Modesto	0	0	http://www.modestogov.com
Montague	0	0	http://cityofmontague.org
Moorpark	0	0	http://ci.moorpark.ca.us
Mount Shasta	0	0	http://www.ci.mt-shasta.ca.us
Murrieta	0	0	http://www.murrieta.org
Napa	1	5	http://www.cityofnapa.org
Needles	0	0	http://www.cityofneedles.com
Nevada	0	0	http://www.nevadacityca.gov
Norco	0	0	http://www.ci.norco.ca.us
Novato	0	0	http://www.ci.novato.ca.us
Oakdale	0	0	http://www.ci.oakdale.ca.us

Oakland	0	0	http://www2.oaklandnet.com
Oceanside	0	0	http://www.ci.oceanside.ca.us
Ojai	0	0	http://www.ci.ojai.ca.us
Ontario	1	2	http://www.ci.ontario.ca.us
Orange Cove	1	2	http://www.cityoforangecove.com
Orland	0	0	http://www.cityoforland.com
Oroville	0	0	http://www.cityoforoville.org
Oxnard	0	0	http://www.cityofoxnard.org
Palm Springs	0	0	http://www.palmsprings-ca.gov
Palos Verdes Estates	0	0	http://www.pvestates.org
Paradise	0	0	http://www.townofparadise.com
Parlier	0	0	http://www.parlier.ca.us
Pasadena	0	0	http://www.cityofpasadena.net
Patterson	0	0	http://www.ci.patterson.ca.us
Perris	1	2	http://www.cityofperris.org
Petaluma	1	2	http://cityofpetaluma.net
Placerville	0	0	http://www.cityofplacerville.org
Porterville	1	2	http://www.ci.porterville.ca.us
Portola	0	0	http://www.ci.portola.ca.us
Rancho Cordova	0	0	http://www.cityofranchocordova.org
Red Bluff	0	0	http://www.ci.red-bluff.ca.us/
Redding	0	0	http://ci.redding.ca.us
Reedley	0	0	http://www.reedley.com
Rio Vista	0	0	http://www.riovistacity.com
Ripon	0	0	http://www.cityofripon.org
Riverside	0	0	http://www.riversideca.gov
Rocklin	0	0	http://www.ci.rocklin.ca.us
Roseville	1	5	http://www.roseville.ca.us
Sacramento	1	5	http://cityofsacramento.org
St. Helena	0	0	http://www.ci.st-helena.ca.us
Salinas	1	2	http://www.ci.salinas.ca.us
San Bernardino	1	1	http://www.ci.san-bernardino.ca.us
San Fernando	0	0	http://www.ci.san-fernando.ca.us
San Francisco	0	0	http://www.sfgov.org/index.asp
Sanger	0	0	http://www.ci.sanger.ca.us
San Joaquin	0	0	http://www.cityofsanjoaquin.org
San Jose	0	0	http://www.sanjoseca.gov
San Juan Bautista	0	0	http://www.sanjuancapistrano.org

San Luis Obispo	0	0	http://www.slocity.org
San Rafael	1	5	http://www.cityofsanrafael.org
Santa Cruz	0	0	http://www.cityofsantacruz.com
Santa Maria	0	0	http://www.ci.santa-maria.ca.us
Santa Paula	0	0	http://www.ci.santa-paula.ca.us
Santa Rosa	1	5	http://ci.santa-rosa.ca.us
Seaside	0	0	http://www.ci.seaside.ca.us
Sebastopol	1	1	http://ci.sebastopol.ca.us
Selma	0	0	http://www.cityofselma.com
Shafter	0	0	http://www.shafter.com
Simi Valley	0	0	http://www.simivalley.org
Soledad	0	0	http://www.ci.soledad.ca.us
Solvang	0	0	http://www.cityofsolvang.com
Sonoma	0	0	http://www.sonomacity.org
Sonora	0	0	http://www.sonoraca.com
South Gate	0	0	http://www.sogate.org
South Lake Tahoe	1	2	http://www.cityofslt.us
South San Francisco	0	0	http://www.ssf.net
Sutter Creek	0	0	http://www.ci.sutter-creek.ca.us
Tehachapi	0	0	http://www.liveuptehachapi.com
Thousand Oaks	0	0	http://www.toaks.org
Torrance	1	1	http://www.torranceca.gov
Tracy	0	0	http://www.ci.tracy.ca.us
Tulare	0	0	http://www.ci.tulare.ca.us
Turlock	0	0	http://www.ci.turlock.ca.us
Twentynine Palms	0	0	http://www.ci.twentynine-palms.ca.us
Vacaville	0	0	http://www.cityofvacaville.com
Vallejo	0	0	http://www.ci.vallejo.ca.us
Victorville	0	0	http://www.cityofvacaville.com
Visalia	1	2	http://www.ci.visalia.ca.us
Wasco	0	0	http://www.ci.wasco.ca.us
Waterford	1	5	http://cityofwaterford.org
Watsonville	0	0	http://cityofwatsonville.org
Wheatland	0	0	http://www.wheatland.ca.gov
Whittier	0	0	http://www.cityofwhittier.org
Willows	0	0	http://www.cityofwillows.org
Winters	0	0	http://www.cityofwinters.org
Woodlake	0	0	http://www.cityofwoodlake.com
Woodland	1	5	http://www.cityofwoodland.org

Yreka	0	0	http://ci.yreka.ca.us
Yuba	0	0	http://www.yubacity.net
Yucaipa	0	0	http://www.yucaipa.org

Note: the web evaluation was conducted in Feb 2013.

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