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THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND ITS EVALUATION TOOLS

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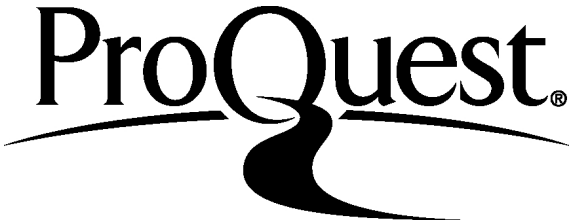
A Dissertation Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Business Administration with a major in Information Systems



I certify that I have read this dissertation and that in my opinión it meets the academia and professional standards required by the University as a dissertation for the degree of Doctor in Business Administration with a major in Information Systems titled “THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND ITS EVALUATION TOOLS.”

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THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND ITS EVALUATION TOOLS

By

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Oscar Vazquez Melendez - Director

Dedication

I dedicate my dissertation to my mother, Ana Blas, for always being there for me and encouraging me to get ahead and not look back no matter what the circumstances. You have been a very special part of my success. You have celebrated my successes and helped me through my failures. I also dedicate this dissertation to our savoir Jesus Christ, when I have needed him most he has always been there for me.

Mom, I have accomplished what you have taught me throughout the years…

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I would like to give special thanks to a very special friend that helped me with the numbers in our Economics class, and who is not with us now… Dr. Luis Quiñones, you were a real friend, thank you buddy. Also a huge hug and a special thank you to my two

sons Edward Jr. who was with me through the hardest part of my doctoral program, and the little one Edward Alberto (Edwardito) for knocking at the door of my office to bring me coffee.

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Abstract

In the modern world, information and speed are paramount. Governments and businesses alike compete not only with one another but to better serve the public. Governments around the world are using more and more technology to reach those that are not capable of traveling to the nearest cities or do not have the resources for technology. Governments with smaller budgets or in third world countries are looking at technology as an option to do more with less. This new trend is referred to as eGovernment, or electronic government. Through this new breakthrough, governments may improve service hours, lower costs, and allow citizens to interact more with them.

This investigation will illustrate worldwide trends of doing governance utilizing more businesslike applications, such as enterprise software and network architecture. In addition, we found many good reasons to use electronic government solutions within the island of Puerto Rico in order to reduce operating costs and increase productivity. After a thorough analysis of the basic necessities of the four principal groups that demand services from any government, the ideal model for carrying out electronic government in Puerto Rico was created.

CHAPTER 1: INTRODUCTION

Background of the Problem

Technology has evolved to a much needed commodity in the 21st Century and it is no longer optional for any modern organization. Like the telegraph, modern computer programs and electronic equipment have transformed the way business is carried out and information is shared (Alsohybe, 2007). The traditional style of government offices and layouts is being challenged by new and modern settings, fast computers, and a more demanding public (Sohal, 2005, p. 4).

The technology needs of our constituents have changed dramatically in the last century. Our youngest generation is one that is very familiar with Wikipedia.com, Facebook.com, and YouTube.com. Our new approach to eGovernment should be one that exploits that know-how. As mentioned by Sayani (2008), "A wiki can increase public participation in several ways. First, as an online tool, it allows users who are unable to attend local meetings to still have a say and contribute. Second, it affords users enough power to have some say in the decision making process if they are given the ability to fully edit. Lastly, the responsibility of editing implies ownership of content and therefore encourages increased participation."

In the 21st Century, governments have new challenges such as terrorism, the threat of a recession, budget cuts, government downsizing, globalization, economic alliances, and most importantly, the need for fast and precise information. This turn of events adds to the need of technology capable of supplying the huge demand for an enormous and diverse amount of data. The Internet and web based Information Technologies (IT) provide new channels of communication for government and the

opportunity to reorganize business processes of government agencies through the application of IT based solutions (Settle, 2007). However, an article by The Economist stated that, “technology on its own cannot compensate for the mistakes of bureaucrats and politicians” (Lucas, 2008).

Electronic procedures that normally were introduced and used in businesses around the world are now being implemented in the government, thus a new word has also been added to our vocabulary… eGovernment (Reece, 2006, p. 1). EGovernment is the new way of delivering government services to the people twenty-four hours a day and seven days a week utilizing Information and Communication Technology (ICT) and the Internet as its principal means of communication (Mena-Hernandez, 2002, p. 32).

Developing countries are investing heavily in any form of eGovernment. According to Rupanagunta (2006) countries such as India, China, and North Korea have recognized that the use of the right technology can make governments more efficient, and by being efficient governments can save money. In retrospect, governments that have good financial management systems can rake in benefits by earning good and stable ratings when adventuring in the bond market.

A study done in Tarrant County, Texas revealed that IT usage was driven by gains in operational benefits which include a reduction in paper work, a reduction in labor cost, improved productivity, a reduction in inventory, a reduction in rework, and a reduction in operational cost (Umezurrike, 2007). This is the main reason smaller governments around the world are doing more with less.

In Europe millions of man hours and euros have been saved by a true online tax service. Furthermore, web based applications have been implemented in Denmark that

have helped reduce the administrative staff by 12% and increased the customers served by 15% (I-Ways Digest of Electronic Commerce Policy and Regulations [IWDECPR], 2005, p. 94).

Advances in technology and the Internet are here to stay. Most businesses have adapted to the new means of communication among suppliers, business partners, and clients. Many new terminologies have emerged to describe the new trends, such as, ebusiness, ecommerce, WebPages, Websites, and many more. Technology has changed the way we conduct business and soon the way a government interacts with its people.

Many governments around the world are looking to downsize, save money and building trust among their citizens. While technology opens the door to many new opportunities, it also brings responsibilities and numerous challenges (McClure, 2001). Many state and municipal governments in the United States (US) have adopted the Internet as the means to provide paperless systems. Among the services provided by these governments are the dissemination of government documentation, the purchase and sale of goods, bid submission, and license applications (McClure, 2001).

Within the United States, the federal government has funded many initiatives to convert federal agencies to more efficient e-agencies that have been started or are about to start (McClure, 2001). There were 1,589 new initiatives in 2001. Of these initiatives 570 were Government to Citizens, 356 Government to Employee, 348 Government to Government, and 315 Government to Business. This new trend of eGovernment has brought many new challenges and many mistakes have been made in the past (McClure, 2001), and as in Puerto Rico, many promising new projects have

failed too. Projects such as PRIFAS, PRITAS, RHUM and PRSTARNET are either not fully operational or disappeared.

Another government agency looking to cut back and reduce its expenses is the US Navy. Butler (2006) stated that “the Navy is following corporate America in seeking to become lean under the title Sea Enterprise.” In addition to savings, the Navy intends to improve the human capital and intelligence capital (Butler, 2006).If the US Navy is saving time and money by correctly implementing technology, it is logical that municipal governments will also benefit.

Many studies indicate that governments are abandoning centralized systems to convert to a client server scheme (Umezurrike, 2007). Traditional and bureaucratic top-down decision making are now inadequate to cope with modern urban problems and also lack on reaction time (Sohal, 2005, p. 5). This is also happening in municipal governments that have some sort of Information Technology (IT) infrastructure. But what happens when municipal governments, as is the case of Puerto Rico, do not have an IT infrastructure to compare or to move from? That is why this research is so important for the development of municipalities in Puerto Rico.

Puerto Rico’s government has been contemplating the idea of eGovernment in recent years and, as mentioned by the Comptroller of Puerto Rico, Manuel Diaz Saldaña in his 2007-2008 Strategic Plan: “We want every agency to conduct transactions through the Internet”. One of the problems in doing so is the absence of a model that could be applied to Puerto Rico’s diverse and unique procedures. Another problem is the lack of standardization of information systems within the 78 municipalities of Puerto Rico and the central (State) government (Díaz-Saldaña, 2007). Countries

around the world have established new agencies or departments dedicated to developing and implementing eGovernment initiatives and / or the standardization of ICT (Torres, Pina, & Royo, 2005, p. 545). However, Puerto Rico does not have plans for the development and standardization of an e-Government.

Statement of the research problem

This research focuses on discovering new and standardized methods for implementing technology within governments at a municipal level. Even though it centers on the municipal level, the intent is to connect all state government agencies that have presence in the municipalities to the municipal network. This way information and data can flow adequately between the two levels of governments. Many initiatives have been done in the past with less than ideal results. Many of those projects started for the wrong reasons and without clear goals. Politics in Puerto Rico plays a key role when it is time to make decisions, and this can adversely affect the outcome of the project. Some of the most pressing questions that the researcher intends to answer are:

1) Is there a difference in technology knowledge among stakeholders in Puerto Rico?
2) Is there a difference in eGovernment acceptance among the four groups of stakeholders?
3) Does Internet use influence eGovernment acceptance?
4) Is there a difference in service demand among the four groups of stakeholders?

This research was designed to create a uniform implementation model to transform municipal governments into eGovernments. This transformation is expected to impact

communications, culture, learning, human resources, job placement, job descriptions, and much more.

Purpose of the Study

The purpose of this study is to determine how the end users, citizens, and Government Employees will influence the implementation of eGovernment and identify the time spent by stakeholders utilizing technological resources. This study will help all other future eGovernment initiatives on the island of Puerto Rico since it is contemplating the behavior of subjects with regards to ICT technology. E-Government is a common word utilized freely by politicians, but the truth is that they know little about this topic. In a study conducted at the University of Arkansas, Lofton (2006) stated that "eGovernment does not support accountability that allows an exchange of ideas because of the limited interactive aspect of the system." Furthermore, with no set of rules established and no agency leading the effort, it would be very hard to implement such a project. Puerto Rico's special circumstances, such as political, cultural, and customs barriers would also affect the outcome of the project. This study will enable the government of Puerto Rico to effectively plan the technological features that will affect the Island in the near future in light of the globalization phenomena.

This research project was designed to enable municipal governments to save on implementation costs that normally take place when endeavors start from zero. Many methods and theories developed around the world will be examined and scrutinized as a means to create a model applicable to Puerto Rico's political and social uniqueness.

In addition, this study will contribute the most to information technologists around the world that would like to come to Puerto Rico and do business. This will assist foreign

investors / companies in understanding special characteristics of Puerto Rico's way of governing. As stated by Rod Bager in a conference, "government should lead by example through the provision of government information and services online wherever this is appropriate" (Badger, 2000). This will make it much easier to do business in Puerto Rico.

Hypothesis

The driving force behind this research is the success of real eGovernment initiatives around the world. This success made this researcher think of the possibilities of implementing such projects in Puerto Rico. Being involved in many government projects before at different levels has enabled this researcher to gain a perspective of how governments in Puerto Rico work and behave. Puerto Rico's municipal governments, as in many other countries, have a very unique working culture that will impact the outcome of any project of this magnitude. This understanding has led to the following hypothesis:

Hypothesis A: An eGovernment implementation in Puerto Rico can be successful.

Hypothesis B: Stakeholders in Puerto Rico demand electronic services from the government.

Study Limitations

The limitations of the present study are few but very important. There are 76 other municipal governments in Puerto Rico with different points of view and opinions. Other limitations that could affect the precision of the study are the amount of independent variables (users) in two different environments (Vega Alta and Vega Baja

municipalities). The findings of this study are also time dependent, 2008 is an election year and if one mayor loses the election the outcome of this research could be jeopardized by shortening the time available to conduct the study. Last but not least, Puerto Rico is a tropical island vulnerable to hurricanes, and this could add some time to the study.

Organization of the study

Chapter two includes a literature review that highlights research on e-Government carried out around the world. This chapter also depicts different models and initiatives that appeared to have the same needs as Puerto Rico. In addition, this chapter will help us analyze the needs and relationships that create the new 21st Century society.

Chapter three describes the research methodology, and analyzes the feasibility of implementing an eGovernment in Puerto Rico at the municipal level. This chapter also describes the tools utilized in this research and describes the methods to be used in the statistical analysis.

CHAPTER 2: Literature Review

Introduction

Chapter two details all the documentation researched to sustain the hypotheses in chapter one. In addition, this chapter will allow the reader to understand where the ideas, methods, and models mentioned throughout this research have come from. It also illustrates reasons, justifications, and examples of world wide eGovernment initiatives that suppport this research.

A brief History of e-Government

The beginning of e-Government dates back to the 1960's (Yagmurcu, 2007). Federal government funding of projects such as ARPANET (Advanced Research Projects Agency Network), marked the beginning of what we know today as the Internet (Settle, 2007, p. 6). The Internet is the backbone technology for e-Government operatation (Settle, 2007). Advances in new technologies have prompted the emergence of e-Governments. The ability to make information, services, and resources available online 24 hours a day is what e-government is about (Settle, 2007, p. 7).

Alsohybe (2007) explained that new business method, proven business strategies, and the demand by citizens for governments to reform the way we interact with the government are factors in governance (p. 15). In addition to making processes cheap, technology can provide transparency to government transactions which in return can help build citizens' trust in government, added Alsohybe. In addition, conducting online transactions such as e-business, online banking, utilizing Google™, Internet cafés, E-Bay™, and online universities have led citizens to expect more from the

government in terms of the use of technologies (Ebrahim & Irani, 2005, p. 591). Moreover, since the late 1970's, the telecommunications sector has evolved to newer and faster equipment that deliver information to the end user (Sohal, 2005, p. 8).

What is e-Government?

Governments can become e-Governments when they adapt information and communications technologies (ICT) to conduct their day to day operations (Ebrahim & Irani, 2005). Public sector organizations that see and use the Internet as the primary means to communicate and disseminate information to its citizen can also be seen as e-Governments (Ebrahim & Irani, 2005). The adoption of web-based technologies to deliver services to citizens and government administration reforms including such practices and technologies are also included in e-Government (Torres, Pina, & Royo, 2005, p. 531).

The term *eGovernment* could be defined as the use of technology, particularly Web-based Internet applications, to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and entities (McClure, 2001, p. 1).

E-Government initiatives around the world

Due to the increase in ICT (Information & Communication Technology) demand, most of today's organizations have evolved or have plans to implement such systems. Governments follow such initiatives to be competitive and compatible with modern businesses (Alsohybe, 2007).

Yemen

The Republic of Yemen is an Arab country located in the southern part of the Arabian Peninsula. On the northern border is Saudi Arabia and to the south, the Arabian Sea. To the west of Yemen is Oman and to the west is the Red Sea. The Republic of Yemen comprises about 527,970 square kilometers or about the size of the state of Wyoming (World Atlas [WA], 2008).

The Republic of Yemen has initiated plans to start with five ministries to implement e-Government tactics. The reason for this endeavor is to improve economical growth and to provide its citizens fast and accurate services (Alsohybe, 2007). One of the long term goals is to develop a reliable and efficient government administration by improving and reforming its ministries to deliver better and cheaper services to the public, so it can gain recognition around the world (p. 5).

India

India is located in Asia. It extends from the Himalayan Mountains in the north, south into the tropical reaches of the Indian Ocean, and has a population of about 1,080,264,400 people (WA, 2008). As other countries around the world, India is adapting to the new trends of technology and government.

Sohal (2005) explained that growing information and communication technology (ICT) needs led to the creation of the Ministry of Information Technology (MIT) in the year 2000, now called the Department of Information Technology (DIT) (p. 38). This initiative was created to support the penetration of ICT emphasizing the Internet as the main communication tool, and computer technologies within the government.

In 1999, the Government of India decided to set up the National Institute of Smart Government. This consisted of creating kiosks to deliver technology to the common people who did not have the purchasing power for computers. The Indian Government also re-engineered government processes leading to governance, and launched a mass campaign on information technology (IT) awareness (Sohal, 2005, p. 40). Also in 2003, India approved the National E-Government Action Plan for implementation from 2003 to 2007.

European Union-Germany

Germany is located in the middle of Europe; its neighbors to the west are France, Belgium, and Luxemburg. To the east its neighbors are Poland and the Czech Republic; to the south Austria and Italy, and to the north Denmark and the North and Baltic Seas. Germany has 357,021 sq km of land and the largest population in Europe of 18,211,500 (WA, 2008).

Germany is currently implementing the largest health care information network and the most secure in the world. It is considered Germany's largest information technology project ever (Balaban, 2007, p. 26). It is expected to lower fraud and at the same time it will lower costs for the insurance companies. This network will be comprised of over 300 semi-public insurers, 2,200 hospitals, 21 pharmacies, and 200,000 doctors, dentists and pharmacists. It is expected to cost close to 1.8 billion euros and a trial of 100,000 cards is expected to start in late 2008, the rollout is expected to start in 2009 (Balaban, 2007, p. 29).

European Union-Portugal

Portugal is located in the most western tip of Europe. Its only neighbor is Spain to the east and it faces the Atlantic Ocean to the west. It has a population of approximately 10,366,000 and a land area of 91,950 sq km (WA, 2008).

Currently Portugal is undergoing a national ID card project. The focus of this project is that all Portuguese citizens have an ID card of the size of a credit card with built in biometrics (Wireless News [WN], 2007, p. 1). It is expected to replace older ID card systems such as the civil identification, taxpayer, social security, health care, and soon the elector card. The card will work with a secret pin number in conjunction with a biometrics identifier such as the fingerprint.

Egypt

Egypt is located in the north of Africa, a population of 78,887,007 and a land area of approximately 995,450 sq km. In the town of Oseem, the government is founding a new initiative for its remote areas. Intel and the Egyptian government are joining to digitalize medical records and communications. This will enable people from remote areas to access specialists throughout Egypt (Africa & Middle East Telecom [AMET], 2007).

Furthermore, by the year 2010 Egypt and Intel plan to train over 650,000 teachers on how to utilize and maximize technology in the classroom. The government is also promoting the use of technology by its people by creating kiosks, electronic libraries, public schools with computer labs, mobile government, municipal governmental buildings, and mobile health care centers (AMET, 2007).

European Union-Belgium

Belgium is located to the west of Germany. It has a population of 10,339,000 and a land area of about 32,820 sq km (WA, 2008). In the city of Hasselt, which is very close to Brussels, the Belgian government and the private sector (HP, Cisco, Microsoft, Telnet, and Siemens) are experimenting with a futuristic initiative, the i-City (Middleton, 2007, p. 1). The project consists of monitoring 4,000 citizens equipped with HP's i-Paq who will freely roam around the town interacting with lots of Wi-Fi hotspots that are available throughout the city. Citizens will interact with their surroundings according to the location and services available. People could know where their friends might be, access discount coupons as they pass establishments that are Wi-Fi capable, access government services such as maps if they are at a bus stop, and make VoIP (Voice over Internet Protocol) phone calls.

United States

The County of Oakland, Michigan has launched a web site that will allow access from mobile electronic devices. This eGovernment on the go was developed by the County's eGovernment staff and students at Michigan State University. The system would format web site information for smaller screens on cell phones and PDAs. Fluker (2006) explained that county residents with browsers on their mobile devices will soon be able to access the system to get emergency alerts, telephone numbers, tax information and other information from the county's site.

On the western coast, IJobs, is an online tool that allows California state retirees to search for work. The web site was launched by the California Public Employees' Retirement System and the Department of General Services' Statewide eGovernment

Initiatives Office. Retirees who want to go back to work can search for jobs posted on this website. State retirees interested in positions can register with iJobs, create a virtual resume of their work history online, search for jobs by area of the state, and contact potential state employment agencies via email. More than a dozen state agencies have signed on to use the site to post job openings and search for potential retired annuitants (Worldwide Videotex Update [WVU], 2002).

Agencies such as the United States General Accounting Office (GAO) have initiatives directed at improving government services utilizing new technologies. The Office of Personnel Management (OPM) has e-government initiatives intended to serve as a complete set of electronic support tools for the federal government's human capital functions, including recruitment, security clearances, personnel records, training, and payroll (Koontz, 2003). Among the many initiatives, we can find projects such as Recruitment One-Stop, eClearance, Enterprise Human Resources, eTraining, and ePayroll.

a) Recruitment One-Stop is a collaborative effort between OPM and its federal agency partners to develop a comprehensive web site (www.usajobs.opm.gov) to aid applicants in finding employment with the federal government (Koontz, 2003, p. 9).
b) The e-Clearance project is designed to improve processing of security clearances for federal employees. It focuses on consolidating and increasing access to information to improve efficiency in granting or locating previous clearances or investigations. OPM intends for the e-Clearance project to help streamline data collection and case scheduling by making it easier to locate

existing investigations and clearances, and providing for almost immediate retrieval of archived records as they are needed (Koontz, 2003, p. 11).

c) The purpose of the Enterprise Human Resources Integration (EHRI) initiative is to facilitate human capital management activities by providing storage, access, and exchange of standard electronic information, through development of a data repository of standardized core human capital data for all 1.8 million executive branch employees. This data will be in the form of an Official Electronic Record, which is intended to replace the current paper based Official Personnel File (Koontz, 2003, p. 13).

d) The purpose of the e-Training initiative is to create a government wide e-Training environment—the Gov On-line Learning Center (www.golearn.gov)—which will support the development of the federal workforce and provide a single source for on-line training and strategic human capital development for all federal employees (Koontz, 2003, p. 14).

e) The goal of the e-Payroll initiative is to substantially improve federal payroll operations by standardizing them across all agencies, integrating them with other human resource functions, and making them easy to use and cost-effective (Koontz, 2003, p. 16).

Mexico

In the province of Sinaloa, a study was conducted to identify to what level technology has emerged in agriculture. One of the conclusions was that technology can help in the decision making process and contribute to connectivism with suppliers, clients, and maybe the government (DeJesús López Meza, 2002).

El Salvador

Small Latin American countries such as El Salvador are contemplating going electronic as depicted in a study conducted by Mena-Hernández in 2002. The researcher concluded that while there are not many people that have Internet services in El Salvador, the most relevant issue was to keep to a minimum the people visiting the physical offices. By offering online services to those who had computers and Internet services there would be more time to attend to those visiting the offices. Eventually the number of those with Internet connection will grow in part because of the government's implementation of Internet kiosksMena-Hernández also concludad that this was an effort of a community in which every sector had to get involved in order for it to be successful. He also mentioned that the most important links in this puzzle were the connectivity or infrastructure, the applications, and web based services (p. 87).

Benefits

The most important benefits of implementing e-Government are the speed with which things can get done, the delivery of services, and the substantial savings that can be attained because of less time spent on face to face interaction with citizens, and the possibility of spending more time on other important tasks. Furthermore, people can access agencies' resources and documentation online 24 hours a day without visiting any governmental agency (Sohal, 2005). This in turn can improve communication between government and the rural communities that have no means of transportation. In order to take advantage of this new way of government, new ICT infrastructures have to be installed.

A byproduct of eGovernment is eDemocracy. This will allow citizens take part in government activities such as voting on issues that affect the community, expressing opinions on future laws, keeping track of legislators, and a wide range of other communications between government and citizens. The environment can also be impacted positively by minimizing the use of paper products, lowering gas emissions, and less use of the roads, which means less road maintenance. Information about municipal recycling operations can also be disseminated through government information and communication technology (ICT) to reach all citizens (Sohal, 2005, p. 25).

Models of e-Government

Top Down Approach

There are many models for implementing eGovernment. The traditional and bureaucratic top-down decision making processes are now inadequate to cope with modern urban problems and also lack in reaction time. As depicted in Figure 1, the top down approach is imposed by the upper level of government and it could be inefficient because of the lack of involvement of the lower layers of government (Sohal, 2005). The top down approach examines the role of top level government officials and statutory variables (Settle, 2007, p. 13). Theorists of the top-down approach view policy designers as the central actors and view compliance with policy directives as an indicator of success.

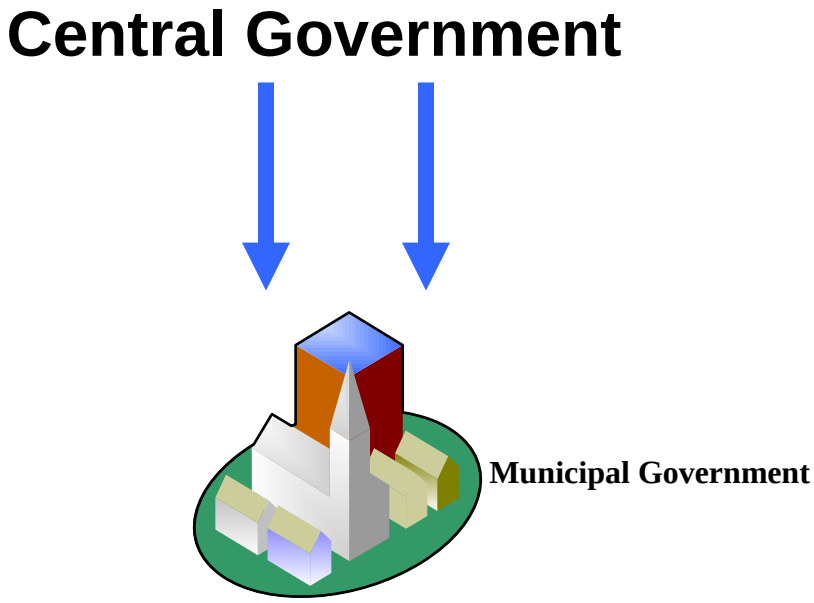


Figure 1 – Top Down Approach (Settle, 2007)

Bottom – Up Approach

While the top down approach analyzes top government officials with regards to government functions, the bottom up approach starts with the lower form of government (Street level bureaucrats). This will enable the researcher to examine the actions and processes of policy and program implementation (Settle, 2007, p. 13).

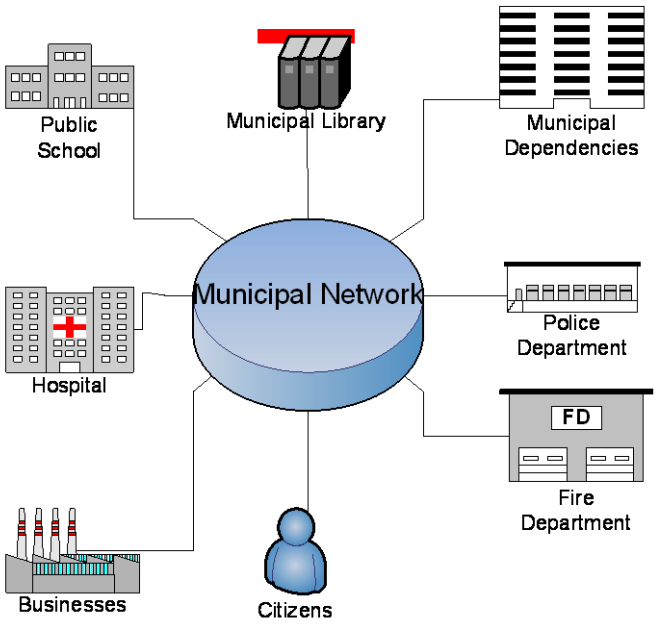


Figure 2 – Bottom-Up Approach (Settle, 2007)

Maturity Model

Another model being used by the United States Department of Labor is the Booz Model (Chao, 2003, p. 26). This model is comprised of four levels that illustrate the agencies' readiness for eGovernment as depicted in Figure 3.

Level 1: Creating eGovernment Awareness - At this level, the organization is beginning to think about eGovernment and may have a few notable eGovernment initiatives under way. There is no clear view of how to implement eGovernment or what each agency needs. The overall eGovernment infrastructure has not been established and a comprehensive, integrated approach to eGovernment has not been defined and implemented.

Level 2: Building the eGovernment Foundation - At this level, the organization has initiated concrete efforts to establish a framework for identifying and managing eGovernment projects. Evidence of a systematic approach to eGovernment is readily ascertainable.

Level 3: Managing toward the eGovernment Vision - At this level, organizations have a clearly defined eGovernment vision and are actively working toward that vision. The organization can demonstrate compliance with at least Stage 3 of the General Accounting Office (GAO) Information Technology Investment Management (United States General Accounting Office [USGAO], 2004, 17) maturity model and the appropriate level of the Federal IT Security Assessment Framework. The organization can verify progress in implementing its eGovernment workforce plan. The organization has also identified a target architecture and is successfully implementing its migration plan toward the target.

Level 4: Providing Sustained Delivery of Digital Services - At this level of the eGovernment maturity model, the organization is operating at the highest levels of the GAO, Information Technology Investment Management framework and the CIO Council Federal IT Security Assessment Framework. The agency has gone electronic. It has a CRM (Customer Relationship Management) system in place and / or an ERP (Enterprise Resource Planning) system.

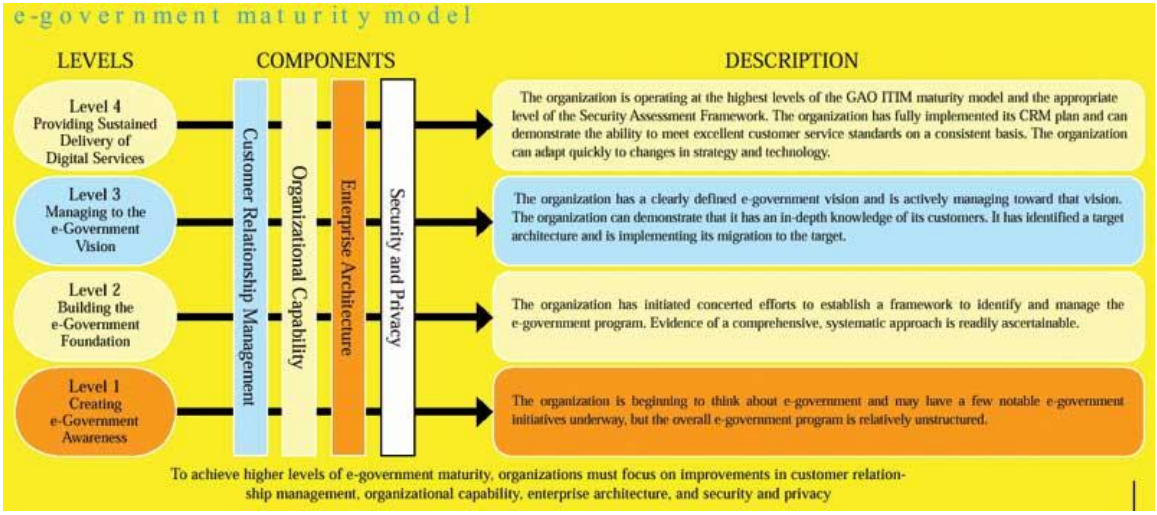


Figure 3 – Maturity Model, (Booz Allen Hamilton, Inc. [BAHI], 2008)

Meta-Model

According to this model there are two dimensions to eGovernment, Human Activity Infrastructure and the Informatics Infrastructure, as depicted in Figures 4.1 and 4.2. Also this model is derived from a business model concepts (Beynon-Davies, 2007, p. 9) in which businesses are mere chains of human activities that relate to the IT infrastructure. This means that organizations are a complex chain or network that exchanges production and distribution (Beynon-Davies, 2007, p. 10). Hence businesses, schools, hospitals, and governments can be seen as organizations in which this model could be applied.

Each government service will use given inputs of resources such as finance, staffing, equipment, and property and will produce outputs in terms of units of service delivered to customers or citizens, see Figure 4. The Human Activity Infrastructure for

eGovernment is the relationship between the government and other government agencies, and businesses, citizens, and employees.

In Figure 5 we can see how the Informatics Infrastructure is comprised of many layers that relate and support Human Activity Infrastructure. It is then possible to say that we need four layers of infrastructure to have an eGovernment (Beynon-Davies, 2007, p. 16):

1. Human activity systems infrastructure. - This constitutes the organization of activity supporting the creation and distribution of value.
2. Information infrastructure. - This comprises the information necessary to support the human activity systems infrastructure.
3. Information systems infrastructure. - This consists of the information systems needed to support organizational activity in the areas of information collection, storage, dissemination and use.
4. ICT infrastructure. - This consists of the hardware, software, communication facilities, and ICT knowledge and skills available to the organization.

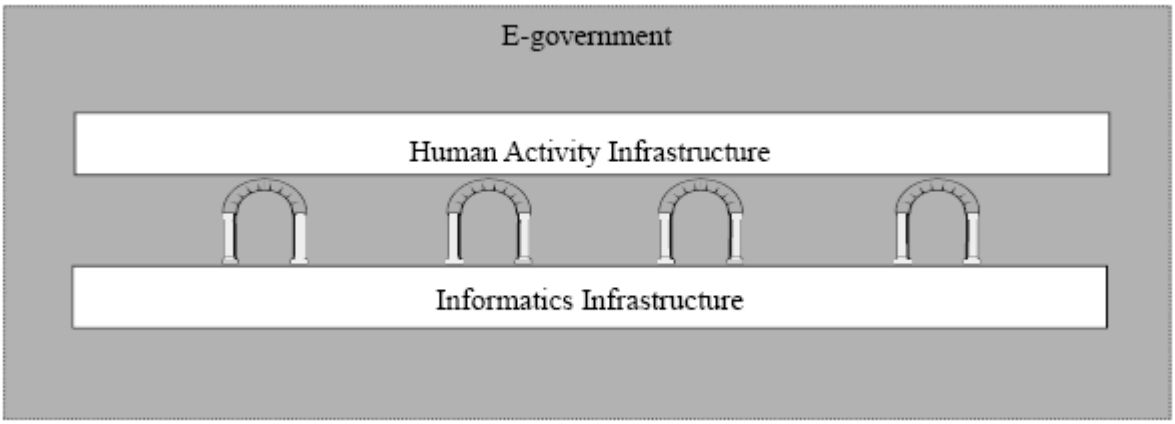


Figure 4.1 – Meta Model - Two levels of infrastructure of eGovernment (Beynon-Davies, 2007, p. 9)

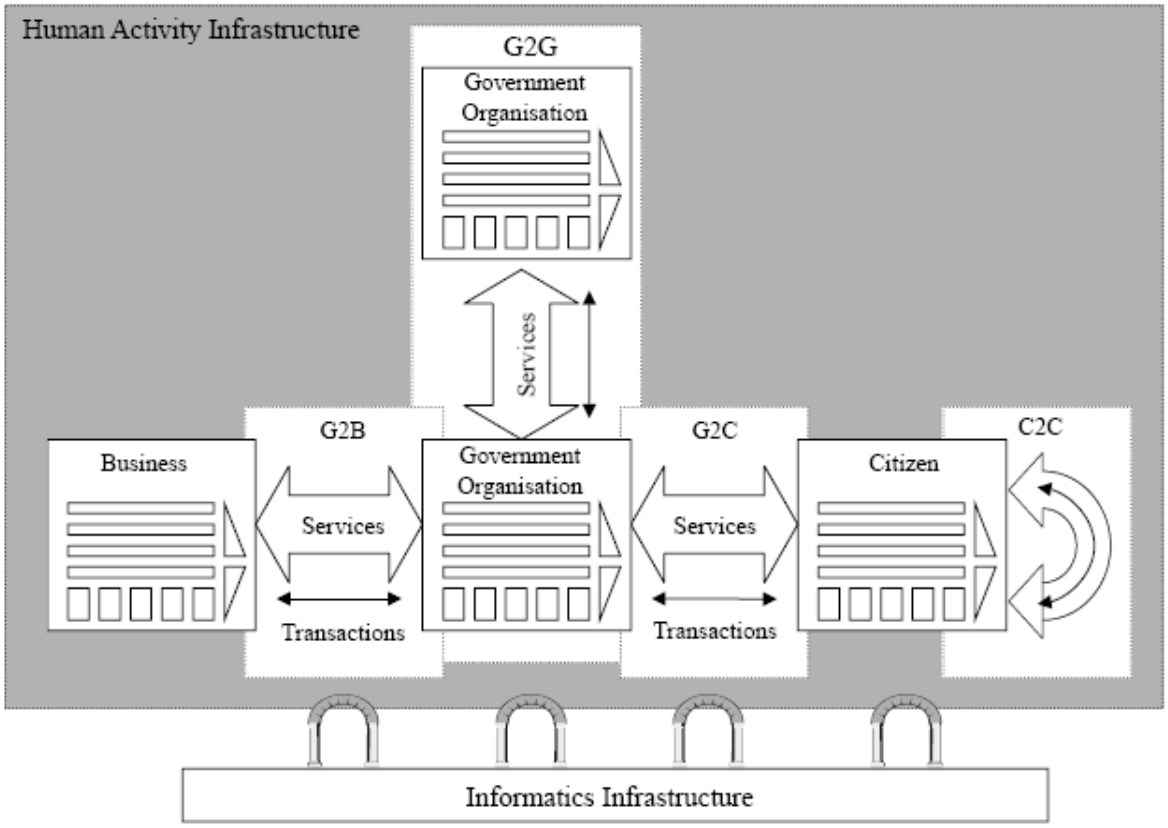


Figure 4.2 – Meta Model -Human activity infrastructure of eGovernment (Beynon-Davies, 2007, p. 12)

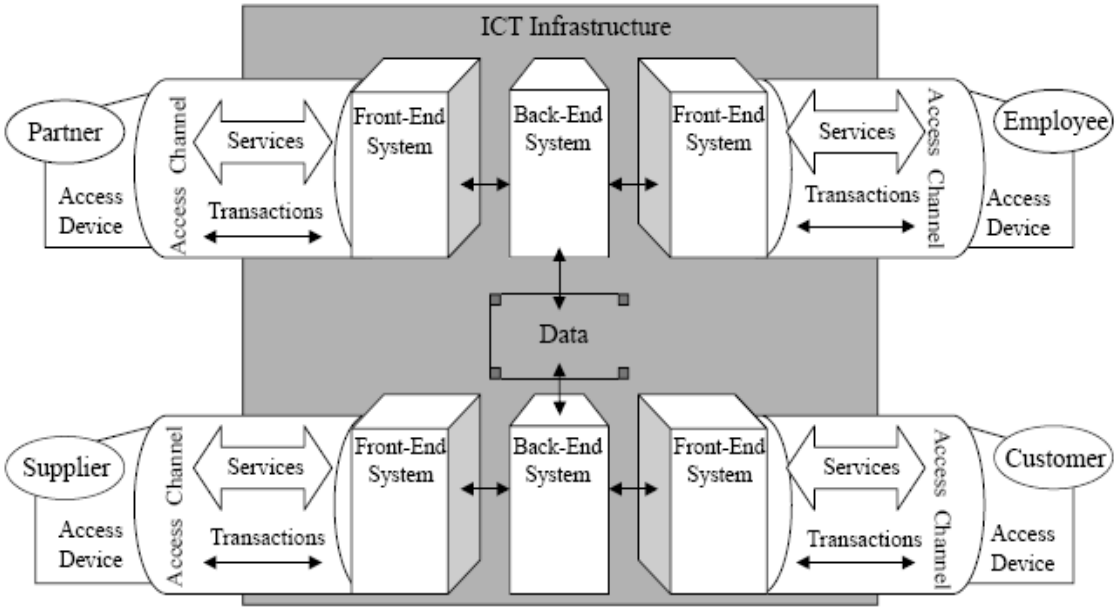


Figure 5 – Meta Model - Informatics infrastructures for e-service delivery (Beynon-Davies, 2007, 17)

Politics and e-Government

A perception that public services are failing and of poor quality is the rule for the 21st Century. There is a feeling that technology has widened the distance between citizens and government. The constant search of new styles of governance is being implemented around the world to improve trust in governments by its citizens (Torres et al., 2005, p. 532). Also, many governments around the world are evolving by being less bureaucratic and more open to the public. Movements and changes to electronic forms of government is a sign of reinventing government (Mena-Hernández, 2002).

Results of e-Government

Many governments around the world have benefited from the implementation of eGovernment initiatives. Many have reduced employees, reduced operating expenses, reduced consumable expenses, reduced paper consumption, incremented productivity, incremented office hours (virtual offices 24 hours a day), incremented citizens' trust, and incremented citizens' involvement in government operations. There are many good reasons why governments should go electronic, but it comes with a price tag. Many e-government initiatives remain in secluded servers in some computer room and are never implemented although there were very expensive projects.

E-Government in Puerto Rico

In Puerto Rico there is a law in place that addresses the use of technology, the Law of Electronic Government (Law Num. 151, June 22, 2004). The purpose of this law

is to promote efficiency, transparency, accountability, and speed in government procedures at a lower cost (Laws of PR Num. 151, [GPR], 2004, 2). The law emphasizes the need for a robust IT infrastructure to develop an efficient eGovernment and states that Puerto Rico has the intention of becoming an eGovernment leader throughout Latin America. The law also mentions that an agency (Oficina de Gerencia y Presupuesto, OGP) will be responsible for the promotion of such initiatives by creating the government's webpage (www.gobierno.pr) and the education of citizens on how to use such new technologies.

The services to be promoted by the OGP agency are:

1. Applications for marriage and birth certificates.
2. Applications for penal discrepancies and good conduct
3. Filing for new corporations and brand registration.
4. Applications for government loans from the Retirement System.
5. Applications for loans from the Government Bank (Desarrollo Económico).
6. Employment search in all government agencies.
7. Reservations for Government transportation (Autoridad de Transporte Marítimo).
8. Reservations for Government Vacation Centers.
9. Requests for Proposals.
10. Access to electronic documentation in the State Legislature.
11. Child Support payments (ASUME).
12. eTraining and Knowledge Management.
13. Electronic Tax Filing.

14. Application for unemployment benefits.
15. Permits (ARPE).
16. Retirement requests (Administración de los Sistemas de Retiro).
17. Video and audio conferencing at the State Legislature.
18. Payment of Traffic Tickets.
19. eDMV (Obras Publicas) – Drivers Licenses
20. Hunting and Boating Permits, (eDepartamento de Recursos Naturales y Ambientales).
21. Teleconferencing in the State Legislature.
22. Government Stamps for permits and certificates.

As shown in the literature review, many countries around the world are moving towards an electronic form of government. Many of the benefits already stated in this chapter include government downsizing, cheaper and faster transactions, increase in productivity, improving citizens' trust in the government, and allowing citizens to contribute to the health of government finances. It has been demonstrated that in countries around the world people are able to access government services twenty-four hours a day, seven days a week, thus indirectly improving family and social life.

Several models were discussed in this chapter, and the intention of this researcher is to determine which one is appropriate for Puerto Rico and its municipalities. The details of the Puerto Rican community, tradition, and history that could affect the outcome of any ITC project have been previously mentioned.

CHAPTER 3

Introduction

Chapter two we addressed different models of eGovernment and many eGovernment initiatives around the world, along with their benefits. Chapter three will describe the methodology utilized by this researcher to prove the hypotheses and to answer the research questions established in chapter one.

Objectives

The present study will reveal if the implementation of e-Government in Puerto Rico is any different from any other place on earth. Also, the researcher will provide a standardized model for Puerto Rico's regional municipal governments. The objectives of the present study are:

1- Find specific needs for local business owners

2- Find specific needs for civilians

3- Find specific needs for government employees

4- Find specific needs for agencies

5- Determine the level of computer awareness among government employees

Methodology

As described in chapter one, the purpose of this research is to create a model for implementing eGovernment at the municipal level and to create validation tools. This study is focused on the island of Puerto Rico and may not be applicable to other regions of the world. Puerto Rico has many particularities that make it unique, thus other existing models will have to be tailored in order for them to work in Puerto Rico.

The Island has a Spanish heritage while it is part of an English speaking nation, the United States of America. The history of the Island, its geographical location, and traditions contribute to its uniqueness. Puerto Rico is a Spanish speaking island that is part of an English speaking nation, located in the Caribbean, and seen by many as part of Latin America. The formula for understanding how things really work in Puerto Rico is indeed complicated.

The populations to be examined in this research belong to the municipal governments of two towns in the northern area of Puerto Rico. These two towns were selected based on size and location, since these municipalities are medium size in relation to the capital, San Juan, and Ponce, the second largest municipality, and are also are very close to one another. These two municipalities represent 2.6% of the total municipalities of Puerto Rico.

The questionnaires that were used in this research are in English and there is also a Spanish version. Since Puerto Rico has two official languages and not all of the citizens speak English, the questionnaire was translated into Spanish. Although Puerto Rico is a Commonwealth of the United States of America, most islanders do not speak English fluently. Before participants were given the questionnaires, the researcher explained basic technological terms such as LAN, LAN servers, eGovernment, eDemocracy, and Internet.

The Subjects

The subjects are divided into groups: the civilian subjects, business owners, managerial government employees, and regular government employees. Approximately 200 subjects were interviewed individually by the researcher. The researcher requested

a written consent from the Mayors and only after doing so were the subjects approached. Subjects who agreed to participate in the study had to comply with the following:

1- Subjects must read and sign the consent form provided by the IRB

2- Subjects must be over the age of eighteen

3- Subjects must be employed by either municipality

4- Subjects must be in their work place at the time of the approach

Place of Study

There are four groups of interest, citizens, business owners, managerial municipal employees, and regular employees. The interviews were carried out in differet settings, depending on the group. Citizens were interviewed in public places such as plazas and streets. Business owners were approached in their respective place of business. On the other hand, municipal employees were approached at their regular work setting which could vary depending on their job description. Employees assigned to public works and sanitation had to be approached on the street and/or before departing to their routes. Office employees were approached at their desks during normal working hours.

Recruitment Procedures

Recruitment procedures were as follows:

a) Civilian subjects – Civilian subjects were approached by the researcher in public areas such as plazas, streets, and shopping areas. Civilian subjects were asked to read and sign the consent form provided by the IRB and they had to be over the age of eighteen.

b) Business owners – Business owners were approached by the researcher at their respective establishments. Business subjects were asked to read and sign the consent form provided by the IRB and they had to be over the age of eighteen.

c) Managerial government employees – The researcher scheduled interviews at the convenience of department directors. Municipal management subjects were asked read and sign the consent form provided by the IRB and they had to be over the age of eighteen. All management subjects had to be employed by either municipality and they had to be at their work place at the time of the approach.

d) Regular government employees - After obtaining the approval of the mayor and informing their respective directors, the researcher approached subjects one at a time in their offices. Municipal subjects were asked to read and sign the consent form provided by the IRB and they had to be over the age of eighteen. Municipal subjects had to be employed by either municipalities and they had to be at their work place at the time of the approach.

Informed Consent Procedure

At the time of the approach the researcher had a copy of the original Informed Consent Form provided and certified by the IRB. The researcher was present while the subject read the document to make sure that the subject understood everything regarding the research. The researcher clarified any doubts that came up after reading the material, such as terms, risk factors, and purpose of the study. The consent form

was given to participants during regular working hours at their working area and/or public places.

Disposal of Confidential Material

During the data gathering phase of the present study, the researcher kept all identifying data in a locked cabinet at his home office. Only the researcher and mentor have had access at any time to the data collected by the researcher. After the data collection phase was completed, the quantitative analysis phase began. During this phase the researcher also kept all identifying material, such as the Informed Consent form in a secure place. After completing the research, the physical and digital data will be kept for a period of five (5) years and only after that period has expired will the data be destroyed. All papers will be shredded and all data in digital format will not just be deleted and destroyed.

Subject Risks

People subjected to this study will face minimal risk and the only adverse effect of this study could be boredom due to the length of the Informed Consent and questionnaires.

Subject Benefits

Subjects could benefit from this study by fully understanding new technological terms. Subjects also had the opportunity to learn about emerging technologies and the possibility of those technologies being implemented by their local government agencies. Another key benefit was that subjects would know their level of computer literacy, and this could potentially help the agency to schedule future training sessions on the subject.

Instruments of the study

This study is comprised of two parts, as describe by its title ***"****The development of a model for municipal E-Government in Puerto Rico and its evaluation tools"*. The first part will focus on the creation of a model for implementing an eGovernment in Puerto Rico. To accomplish this, the researcher created a questionnaire and a scale to determine the status of a given municipality within eGovernment. After interviewing the management of the agency, it was possible to determine the level of technology the agency had and the steps to be followed in order to achieve full eGovernment functionality. As discussed at the beginning of this chapter, the questionnaire was intentionally translated into Spanish so employees could understand it clearly.

Questionnaire MEG-01-0006, takes a snapshot of the level of technology available to implement eGovernment. The document is divided into five sections, Network, Core Switch, Department Switch, Servers, and PBX. In each section there are sub divisions. Ten points are assigned for each one, later to be added for a maximum total of one hundred and forty points. These points will be added to the points obtained in questionnaire MEG-01-0007 (Connectivism Questionnaire) for a maximum of four hundred points. The points obtained will be compared to the scale that ranges from zero to four hundred. These two questionnaires were filled out by the researcher upon visiting and interviewing key personnel such as the Mayor, IT Director, and Advisors.

Infrastructure Questionnaire

- Network – Identifies the type of cable, frequency, VLANS, and Power over Ethernet (PoE) capabilities. A maximum of thirty points will be allocated for this section.
- Core Switch – Identifies the speed capable and the total of ports available, in this section a maximum of twenty points will be allocated. One questionnaire will be filled out for each device, and then an average will be calculated.
- Department Switch - Identifies the speed capability and the total of available ports, in this section a maximum of twenty points will be allocated. One questionnaire will filled out for each device, and then an average will be calculated.
- Servers – Identifies the CPU, Memory, disk space available, CPU usage, and LAN interface in order to determine scalability of the server.In this section a maximum of sixty points will be allocated. One questionnaire will filled out for each device, and then an average will be calculated.
- PBX – This is the most important part of the puzzle since it is the principal means of communication. A maximum of ten points will be allocated to this section.

The goal in the Connectivism Questionnaire is to determine the level of connectivity of the agency. This questionnaire is divided into six sections that are also sub divided for a total of two hundred and sixty (260) points, which will be added to the result of the Infrastructure Questionnaire. The divisions are Connectivism, Security, Documentation, Technology Usage, Mechanization, and Applications.

- Connectivism – Measures the level of Web technology presence in three different sections Web Page, eCommerce, and eTraining. Then this information is

matched against four options which are None, Extranet, Intranet, and Internet. A maximum of thirty points will be allocated to this section.

- Security – Passwords, Encryption, Home Directories, and Public Folders are analyzed and a maximum of forty points will be allocated to this section.
- Documentation – In this section four categories (Disaster Recovery, Procedures, Policies, and Data Backup Plan) are matched up against four options (In Place, In Process, In Plans, and Not in Plan).
- Technology Usage - In this section three categories (Level of Expertise, Knowledge Management, and Document Management) are matched up against five options (Expert, Above Average, Average, Below Average, and None). To determine the level of expertise of the government agency a questionnaire was developed (Form MEG-01-0005) which will be discussed later in this chapter.
- Mechanization - In this section two categories (Procedures and Processes) are matched up against four options (In Place, In Process, In Plans, and Not in Plan).
- Applications - In this section four categories (CRM, ERP, Financial, and Human Resources) are matched up against four options (In Place, In Process, In Plans, and Not in Plan).

Levels of Expertise

Questionnaire MUN-01-0005 will allow the researcher to have a technology usage picture of the agency. Its primary goal is to identify areas where training needs to be emphasized. This document covers the areas and applications most commonly used to do business around the world. The measured areas are as follows; the Internet, applications such as Microsoft Word, Excel, Power Point, Access, Outlook, web based

email such as Gmail or Hotmail, general computer literacy, and there is a blank space for the employee to mention any other tool or application. After the employee selects the area, there are tour options that show the level of knowledge in that particular tool or application (See figure 3.1)

☐ Internet	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Word	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Excel	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Access	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Power Point	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Outlook	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Web Email	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Using the PC	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Other _____	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ IT Policy	☐ I know about it	☐ I don't know about it		
☐ eGovernment	☐ I know about it	☐ I don't know about it		

Figure 3.1a – Technology Literacy Questionnaire

eGovernment Relationships

One of the eGovernment's distinctive characteristics is the capacity to interact with many sectors of society. Before handing the subject any of the questionnaires, the researcher will explain basic technological terms such as LAN, LAN, servers, eGovernment, eDemocracy, and Internet. These relationships were discussed in chapter one and they are:

- Government to Government (Form MEG-01-004) –The purpose of this document was to verify the need and the vision of eGovernment of government agencies. This document was completed by high level government employees, such as the Mayor, Dependencies Directors, Administrative Directors, or Vice Mayor.

- Government to employee (Form MEG-01-002) - The purpose of this document was to verify the need and the vision of eGovernment of employees. This document was completed by al levels of government employees.

- Government to Business (Form MEG-01-003) - The purpose of this document was to verify the need and the vision of eGovernment of local businesses that do some sort transaction with government agencies. This document was completed by local business owners who do business in the area close to the agency being examined.

- Government to Citizen (Form MEG-01-001) - The purpose of this document was to verify the need and the vision of eGovernment of local citizens that do some sort of transaction with government agencies. This document was completed by local citizens who live in the urban and rural area of the city under study.

Study Variables

As discussed in this chapter there are two parts of this research, the first is focused on the agency's level of technology and the second part identifies and justifies the need of eGovernment in Puerto Rico. In the first part the variables are:

Dependent variable

Total Points – It could be influenced by other independent variables (Sekaran, 2003, p. 88). In addition, it is the primary interest of the researcher since it will place the agency within the Technology Scale (Document MEG-01-0010).

Independent Variables

The independent variables in this study are many and they influence the dependent variable (Sekaran, 2003, p. 89). On the forms MEG-01-0007 and MEG-01-0006 the independent variable are as follows: Network, Core Switch, Department

Switch, Servers, PBX, Connectivism, Security, Documentation, Technology Usage, Mechanization, and Applications.

Moderating Variables

Moderating variables are the ones that influence the relationship between independent and dependent variables (Sekaran, 2003, p. 91). In this research project the level of technology in place is what will influence the relationship between independent and dependent variables.

In the second part of this research there are four questionnaires. The variables are as follows:

Form MEG-01-0004, (Government to Government Tool), form MEG-01-0003, (Government to Business Tool), form MEG-01-0002, (Government to Employee Tool), and form MEG-01-0001, (Government to Citizen Tool).

The need for eGovernment is the dependant variable, services required and willingness to use the technology are the independent variables, and the moderating variable is the use of the Internet.

Operational Procedures

It is assumed that before any interview is conducted the researcher has obtained the approval of the IRB, and his mentoring professor, and has been granted permission by the mayors of the municipalities. The researcher visited all the dependencies in the two municipalities of the northern area of Puerto Rico. Once there, the researcher interviewed the respective Mayor's and Agencies Directors of the town in order to

complete forms MEG-01-0006 and MEG-01-0007. Once this fundamental step was completed the researcher visited all employees to complete form MEG-01-0002 (Government to Employee Tool). At the same time the researcher had the Directors fill out form MEG-01-0004 (Government to Government Tool). Once the government part was completed, the researcher headed out to ask civilians to fill out forms MEG-01-0001 (Government to Citizen Tool) and MEG-01-0003 (Government to Business Tool). These two forms were handed out in all rural and urban parts of the respective towns. The subjects were selected based on location, groups (citizen, government employee or business owner), age, and availability.

Statistical Analysis

The analysis of the collected data was subjected to descriptive and inferential tests. In the descriptive test the researcher established numeric codes to the text to establish sequences of categorized variables. Within the distribution of frequencies the researcher established an analysis of the organized data, for a later graphical representation utilizing statistical software such as SPSS (Statistical Package for Social Sciences) or SAS (Statistical Analysis Systems). The main purpose of the graphical representation is to present the data in pictorial form, utilizing piecharts and bar graphics.

As for the inferential analysis, the data was subjected to correlation tests among the variables of the subjected population. Those variables whose natural state are nominal and / or have few indicators were subjected to the chi-square test and significance level. Those variables within a continued scale were subjected to a

regression test. The coefficient of determination established the magnitude of the correlation among the factors.

CHAPTER 4

Results of the Study

The results in this chapter support the feasibility of implementing an eGovernment system on the island of Puerto Rico. This statement is based on a study conducted in the northern part of the island. Subjects were divided in four categories based on their relationship with the government. The groups analyzed in this study are: Government to Citizen, Government to Employee, Government to Business, and Government to Government.

The goal was to analyze if there is a correlation among the four variables mentioned in chapter three. The need for eGovernment is the dependent variable, services required and willingness to use the technology are the independent variables and the moderating variable is the Internet use.

Government to Citizen Analysis

A correlation analysis was performed on the data gathered from a sample of sixty (60) subjects. The questionnaire used was the MEG – 01-0001 and the questions representing the variables are as follows: Question four (4) is for Internet use, question five (5) represents eGovernment, question six (6) represents service, and question nine (9) represents willingness to implement eGovernment.

As mentioned by Newbold, Carlson, & Thorne (2003) “although the use of chi-square test is for association, it may indicate that there is a relationship between two variables, this procedure does not indicate the direction or strength of the relationship”, (Newbold, Carlson, & Thorne, 2003, p. 572).

The correlations analyzed were among the dependent variable and the other three variables; two are independent and one moderating variable. The hypotheses used to verify this are:

eGovernment and Internet use

H0: eGovernment and Internet use are not correlated

H1: eGovernment and Internet use are correlated

Results show that there is no evidence of a correlation between the variables eGov and Internet Use. This indicates that citizens don't relate the Internet with eGovernment. Therefore, even though they may not use the Internet regularly, they recognize the need and potential for an electronic form of government. Thus, I reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

Table 4.1 Contingency Table eGovernment and Internet use

		Internet use		
eGov		Yes	No	Total
	Yes	22	24	46
	No	0	2	2
	Don't know	3	9	12
Total		25	35	60

Table 4.2 Results eGovernment and Internet use

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Internet use	3.518	.172	.242	.172	.235	.172

eGovernment and Services

H0: eGovernment and Services are not correlated

H1: eGovernment and Services are correlated

Results show that there is evidence of a correlation between the variables eGov and Services. This means that citizens recognize the need for the government to provide electronic services.Thus, I reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

Table 4.3 Contingency Table eGovernment and Services

		Services			
eGov		Yes	No	Don't Know	Total
	Yes	42	3	1	46
	No	1	0	1	2
	Don't know	7	0	5	12
Total		50	3	7	60

Table 4.4 Results eGovernment and Services

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Service	17.760	.001	.385	.001	.478	.001

eGovernment and Willingness

H0: eGovernment and Willingness are not correlated

H1: eGovernment and Willingness are correlated

Results show that there is evidence that there could be some correlation between the variables eGov and Willingness.This means that citizens recognize the need for electronic services and are willing to accept an electronic form of government. Therefore I reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

Table 4.5 Contingency Table eGovernment and Willingness

		Willingness		
eGov		Yes	No	Total
	Yes	44	2	46
	No	1	1	2
	Don't know	10	2	12
Total		55	5	60

Table 4.6 Results eGovernment and Willingness

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Willingness	6.593	.037	.331	.037	.315	.037

Government to Business Analysis

A correlation analysis was performed on the data gathered from a sample of thirteen (39) subjects. The questionnaire used for this part of the research was the MEG – 01-0003 and the questions representing the variables are as follows: Question four (4) is for eGovernment, question three (3) represents Internet use, question five (5) represents service, and question six (6) represents willingness to implement eGovernment.

The correlations analyzed were among the dependent variable and the other three variables; two are independent and one moderating variable. The hypotheses used to verify this are:

eGovernment and Internet use

H0: eGovernment and Internet use are not correlated

H1: eGovernment and Internet use are correlated

Results show that there is evidence of a correlation between the variables: eGov and Internet Use. This indicates that the business sector is a user of the Internet and perceives that the eGovernment is an option for them. Therefore, I therefore reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

Table 4.7 Contingency Table eGovernment and Internet use

		Internet use		
eGov		Yes	No	Total
	Yes	27	5	32
	No	3	4	7
Total		30	9	38

Table 4.8 Results eGovernment and Internet use

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Internet use	7.879	.005	.778	.005	.614	.005

eGovernment and Services

H0: eGovernment and Services are not correlated

H1: eGovernment and Services are correlated

Results show that there is evidence of a correlation between the variables: eGovernment and Services. Therefore, I reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597). This means that business owners recognize the need for electronic services to be provided by the government.

Table 4.9 Contingency Table eGovernment and Services

		Services		
eGov		Yes	No	Total
	Yes	30	2	32
	No	3	4	7
Total		33	6	39

Table 4.10 Results eGovernment and Services

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Service	13.00	.000	1.00	.000	.707	.000

eGovernment and Willingness

H0: eGovernment and Willingness are not correlated

H1: eGovernment and Willingness are correlated

Results showed that an analysis of the relationship between the variables eGov and Willingness could not be performed since all of participants agree that an eGovernment is needed and that they are willing to use such service if it were available. Although the use of the chi-square test for association may indicate that there is a relationship between two variables, this procedure does not indicate the direction or strength of the relationship (Newbold, Carlson, & Thorne, 2003, p. 572).

Table 4.11 Contingency Table eGovernment and Willingness

		Willingness		
eGov		Yes	No	Total
	Yes	30	2	32
	No	7	0	7
Total		37	2	39

Table 4.12 Results eGovernment and Willingness

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Willingness	0	0	0	0	0	0

Government to Employee Analysis

A correlation analysis was performed on the data gathered from a sample of seventy-seven (77) subjects. The questionnaire used for this part of the research was MEG – 01-0002 and the questions representing the variables are as follows: Question six (6) is for eGovernment, question three (3) represents Internet use, question four (4) represents service, and question eight (8) represents willingness to implement eGovernment.

The correlations analyzed were among the dependent variable and the other three variables; two are independent and one moderating variable. The hypotheses used to verify this are:

eGovernment and Internet use

H0: eGovernment and Internet use are not correlated

H1: eGovernment and Internet use are correlated

Results show that there is no evidence of a correlation between the variables: eGov and Internet Use. Therefore, I reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

This indicates that government employees are users of the Internet and they think that an eGovernment is not an option for them.

Table 4.13 Contingency Table eGovernment and Internet use

		Internet use			
eGov		Yes	No	Don't Know	Total
	Yes	58	10	1	69
	No	4	1	0	5
	Don't Know	2	1	0	3
Total		64	12	1	77

Table 4.14 Results eGovernment and Internet use

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Internet use	.949	.917	.078	.917	.110	.917

eGovernment and Services

H0: eGovernment and Services are not correlated

H1: eGovernment and Services are correlated

Results show that there is no evidence of a correlation between the variables: eGov and Services. Therefore, I reject hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

This means that government employees do not recognize the need for electronic services to be provided by the government.

Table 4.15 Contingency Table eGovernment and Services

		Services		
eGov		Yes	No	Total
	Yes	41	28	69
	No	2	3	5
	Don't Know	1	2	3
Total		44	33	77

Table 4.16 Results eGovernment and Services

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Service	1.441	.487	.137	.487	.136	.137

eGovernment and Willingness

H0: eGovernment and Willingness are not correlated

H1: eGovernment and Willingness are correlated

Results show that the correlation between the variables: eGov and Willingness is the highest of the study. This fact illustrates that although government employees do not perceive services pertaining to them as critical, they are willing to participate in an initiative to implement such a system. Therefore, the researcher rejects hypothesis H0 according to the test of independence or homogeneity (Mann, 1995, p. 597).

Table 4.17 Contingency Table eGovernment and Willingness

		Willingness			
eGov		Yes	No	Don't Know	Total
	Yes	57	3	9	69
	No	3	1	1	5
	Don't Know	1	0	2	3
Total		61	4	12	77

Table 4.18 Results eGovernment and Willingness

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Willingness	8.863	.065	.240	.065	.321	.065

Government to Government Analysis

A correlation analysis was performed on the data gathered from a sample of thirty-six (36) subjects. The questionnaire used for this part of the research was MEG – 01-0004 and the questions representing the variables are as follows: Question five (5) is for eGovernment, question four (4) represents Internet use, question nine (9) represents service, and question eleven (11) represents willingness to implement eGovernment.

The correlations analyzed were among the dependent variable and the other three variables; two are independent and one moderating variable. The hypotheses used to verify this are:

eGovernment and Internet use

H0: eGovernment and Internet use are not correlated

H1: eGovernment and Internet use are correlated

Based on the results on the relationship between the variables, eGovernment and Internet Use among the government staff it was found that they could not be analyzed because the variable eGovernment is constant. This illustrates the independent use of the Internet. Government staff members recognize the need for such a system. Although the use of the chi-square test for association may indicate that there is a relationship between two variables, this procedure does not indicate the direction or strength of the relationship (Newbold, Carlson, & Thorne, 2003, p. 572).

Table 4.19 Contingency Table eGovernment and Internet use

		Internet use		
eGov		Yes	No	Total
	Yes	28	8	36
	No	0	0	0
Total		28	8	36

Table 4.20 Results eGovernment and Internet use

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Internet use	0	0	0	0	0	0

eGovernment and Services

H0: eGovernment and Services are not correlated

H1: eGovernment and Services are correlated

Based on the results on the relationship between the variables, eGovernment and Services among the government staff it was found that they could not be analyzed because the variable eGovernment is constant. This illustrates that government staff members recognize the need for electronic services and that such a system is needed. Although the use of the chi-square test for association may indicate that there is a

relationship between two variables, this procedure does not indicate the direction or strength of the relationship (Newbold, Carlson, & Thorne, 2003, p. 572).

Table 4.21 Contingency Table eGovernment and Services

		Services		
eGov		Yes	No	Total
	Yes	36	0	36
	No	0	0	0
Total		36	0	36

Table 4.22 Results eGovernment and Services

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Service	0	0	0	0	0	0

eGovernment and Willingness

H0: eGovernment and Willingness are not correlated

H1: eGovernment and Willingness are correlated

Based on the results on the relationship of the variables eGovernment and Willingness among the government staff it was found that they could not be analyzed because the variable eGovernment is constant. This illustrates that government staff members not only recognize the need for electronic services, but that they are also

willing to initiate efforts that would lead to an electronic government. Although the use of the chi-square test for association may indicate that there is a relationship between two variables, this procedure does not indicate the direction or strength of the relationship (Newbold, Carlson, & Thorne, 2003, p. 572).

Table 4.23 Contingency Table eGovernment and Willingness

		Willingness		
eGov		Yes	No	Total
	Yes	36	0	36
	No	0	0	0
Total		36	0	36

Table 4.24 Results eGovernment and Willingness

Variable	Chi Square	P-Value	Cramer's V	P-Value	Contingency Coefficient	P-Value
eGov / Willingness	0	0	0	0	0	0

Connectivism and Infrastructure Analysis

In this part of the research the connectivity and ICT infrastructure were measured utilizing questionnaires MEG-01-0007 and MEG-01-0008. As explained in chapter three, each questionnaire will yield a total of points based on the level of technology already

implemented in the agency. Then these two values would be added and looked up on the eGovernment Scale form MEG-01-0010 to gives the researcher and /or the implementer a clue on what level he should begin the steps to turn the agency into an electronic government agency.

There were two governmental entities analyzed in the northern part of Puerto Rico. They will be referred to as: Entity One and Entity Two. Entity One obtained a score of 135 which places the agency in the category of Project Training. This reflects that the agency has some technology but it does not know how to convert to or the importance of eGovernment. The second entity or Entity Two obtained a score of 221; this illustrates a higher understanding of the implementation of ICT within regular government processes.

Table 4.25 Results of the eGovernment Scale

Entity One	
Infrastructure	**85**
Connectivism	**50**
Total	**135**
Entity Two	
Infrastructure	**66**
Connectivism	**155**
Total	**221**

Results of Computer Literacy

The results in this segment support the feasibility of implementing an eGovernment system on the island of Puerto Rico based on the level of understanding of existing business software and techniques. This is based on a study conducted in the northern part of the island. Subjects were divided in four categories based on their

relationship with the government. These groups were: Government to Citizen, Government to Employee, Government to Business, and Government to Government.

The goal was to analyze frequency of basic computer skills among all four groups. Participants voluntarily answered questionnaire MEG-01-0005 in which they expressed their level of aptitude with regards to common business software and basic computer skills. Learning more about computer literacy can help predict the learning curve for such an ambitious implementation. These results can help support the researcher's hypotheses and the correlation results.

Citizen Analysis

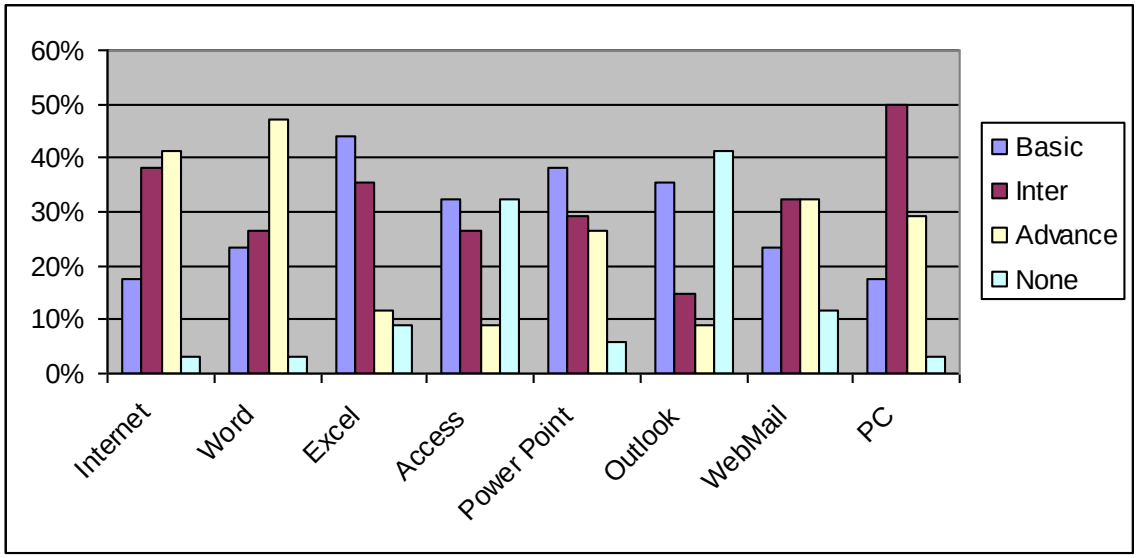
Amongst citizens of the northern part of the island of Puerto Rico, the frequency results show that 97% of the subjects have basic computer skills including Internet use. This is very important to know when governments want to implement electronic services. On the one hand, this also suggests that it would be easy to train citizens to use government online services since they already have basic computer skills. On the other hand, with regard to business applications, the results show that a Word processor is very common for this group, but as the applications get more complicated, such as Spreadsheets, Databases, and Email, those percentages start to decline. Questions to citizens about MS Outlook yielded the highest percentage of no skills (41%). Since eGovernments revolves around ERP systems that behave similar to an email system, this gives us a warning that training is need for this group to improve their skills.

Another fact is that citizens don't seem to know about computer policy and eGovernments. But in the correlation, results demonstrated that citizens are willing to try and be part of the eGovernment system.

Table 4.26 Citizens Computer Literacy

	Internet	Word	Excel	Access	Power Point	Outlook	Web Mail	PC		Policy	eGov
Basic	6	8	15	11	13	12	8	6	Yes	2	4
Inter	13	9	12	9	10	5	11	17	No	32	30
Advance	14	16	4	3	9	3	11	10			
None	1	1	3	11	2	14	4	1			
	34	34	34	34	34	34	34	34		34	34
Basic	18%	24%	44%	32%	38%	35%	24%	18%	Yes	6%	12%
Inter	38%	26%	35%	26%	29%	15%	32%	50%	No	94%	88%
Advance	41%	47%	12%	9%	26%	9%	32%	29%			
Non	3%	3%	9%	32%	6%	41%	12%	3%			
Total	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%

Figure 4.1a Citizens Computer Literacy



Business Analysis

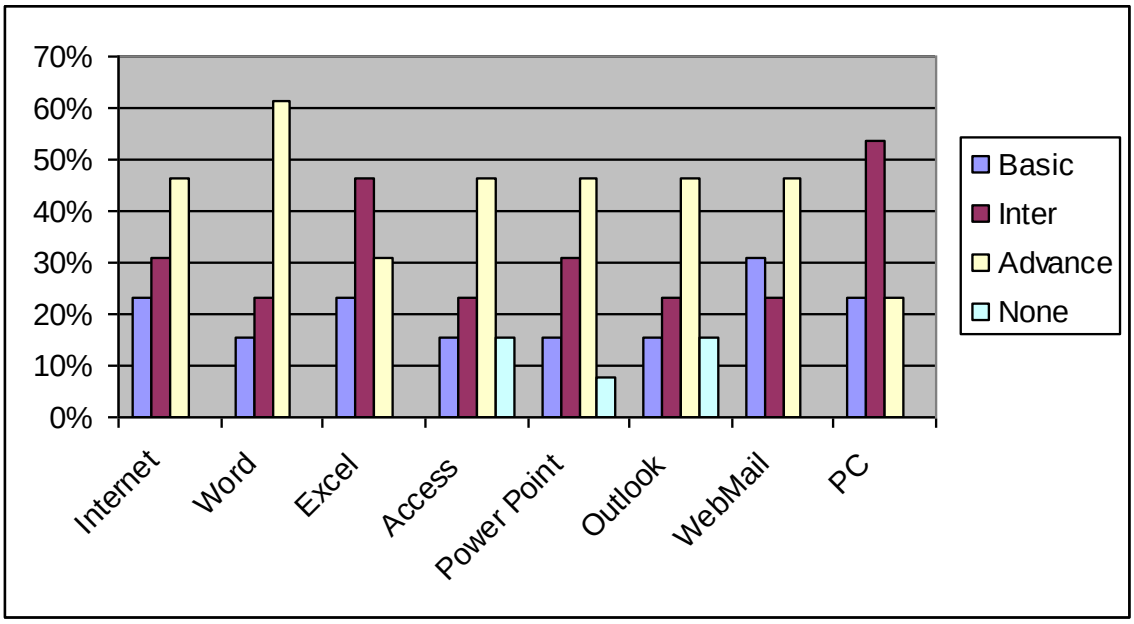
Amongst business owners of the northern part of the island of Puerto Rico, frequency results show that 100% of the subjects have basic computer skills, Internet use, word processors, spreadsheet, and Web Mail mastery. This is the group with the highest correlation for willingness according to the researcher's results, discussed at the beginning of this chapter. This also indicates that business owners most likely will use eGovernment services if they were available and that their learning curve is not as steep as that of other groups.

In addition, in this group 69% does not know about IT Policy and 62% does not know about eGovernments. The intriguing part is that, as mentioned before, this group had the highest correlation of the need for eGovernment, Services, and Willingness to implement it.

Table 4.27 Business Owners Computer Literacy

	Internet	Word	Excel	Access	Power Point	Outlook	Web Mail	PC		Policy	eGov
Basic	3	2	3	2	2	2	4	3	Yes	4	5
Inter	4	3	6	3	4	3	3	7	No	9	8
Advance	6	8	4	6	6	6	6	3			
Non	0	0	0	2	1	2	0	0			
	13	13	13	13	13	13	13	13		13	13
Basic	23%	15%	23%	15%	15%	15%	31%	23%	Yes	31%	38%
Inter	31%	23%	46%	23%	31%	23%	23%	54%	No	69%	62%
Advance	46%	62%	31%	46%	46%	46%	46%	23%			
None	0%	0%	0%	15%	8%	15%	0%	0%			
	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%

Figure 4.2a Business Owners Computer Literacy



Government Analysis

Amongst the government staff of the northern part of the island of Puerto Rico, the frequency results show that a high percentage of that group (17%) lacks basic computer skills and fourteen percent (14%) lacks Internet skills. This is curious when compared to the results of the correlation, which indicated that this group agreed that an eGovernment is extremely necessary, that electronic services will help improve the government, and they showed they are very willing to implement such a system.

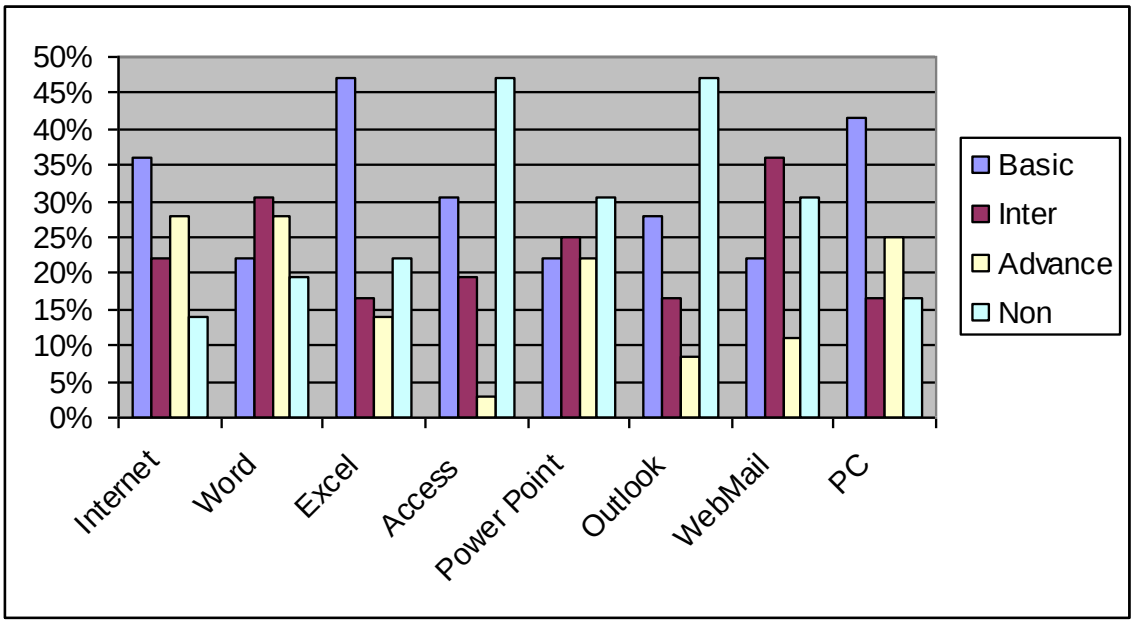
On the other hand the frequency results also reflect that if such an endeavor is undertaken by any government administration, extra attention should be paid to computer training to improve those computer skills. Another aspect that is extremely important is that ERP applications such as SAP or Oracle are very similar in their layout

to MS Outlook. This group has one of the highest percentages of no skill with that application. Also, this group revealed that half of the government staff does not know about the Government IT Policy nor about eGovernments.

Table 4.28 Government Computer Literacy

	Internet	Word	Excel	Access	Power Point	Outlook	Web Mail	PC		Policy	eGov
Basic	13	8	17	11	8	10	8	15	Yes	18	17
Inter	8	11	6	7	9	6	13	6	No	18	19
Advance	10	10	5	1	8	3	4	9			
Non	5	7	8	17	11	17	11	6			
	36	36	36	36	36	36	36	36		36	36
Basic	36%	22%	47%	31%	22%	28%	22%	42%	Yes	50%	47%
Inter	22%	31%	17%	19%	25%	17%	36%	17%	No	50%	53%
Advance	28%	28%	14%	3%	22%	8%	11%	25%			
Non	14%	19%	22%	47%	31%	47%	31%	17%			
	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%

Figure 4.3a Government Computer Literacy



Employee Analysis

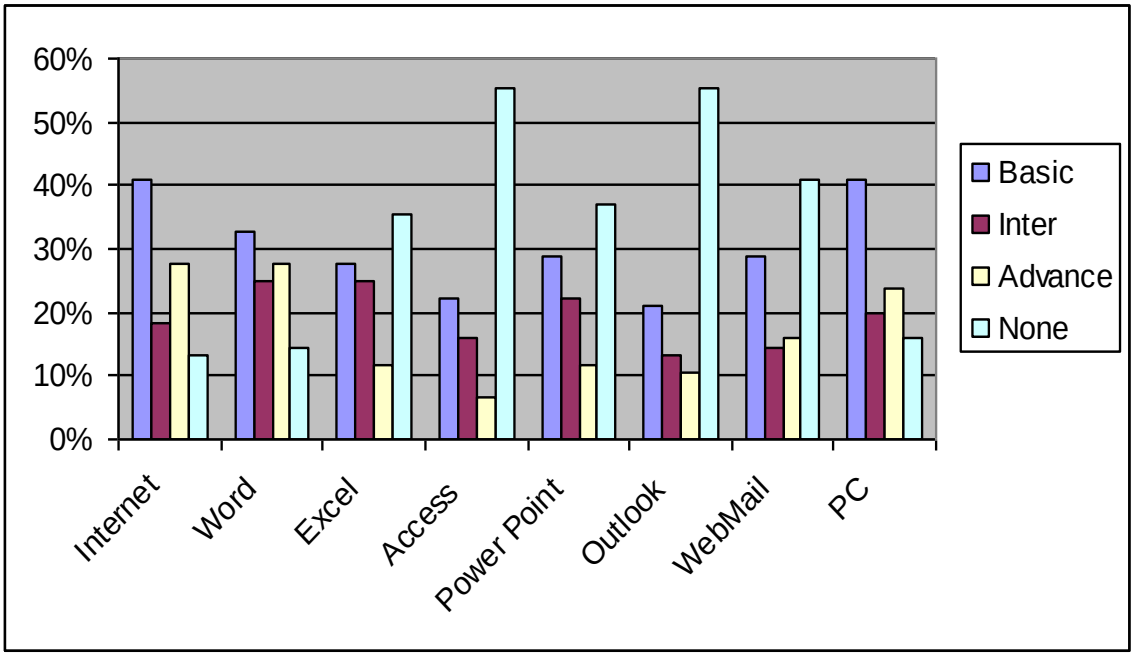
Amongst government employees of the northern part of the island of Puerto Rico the frequency results show that a high percentage of that group (16%) lacks basic computer skills and fourteen percent of them (14%) lacks Internet skills. When compared to the correlation results, these results shows that this group needs considerable training. This group did not seem too enthusiastic about eGovernment services but it is willing to be part of an eGovernment initiative, thus recognizing the importance and benefits that one can obtain from such a system.

Another curious fact is that in this group 78% said they did not know about IT Policy and 76% said they did not know about eGovernments. The paradigm is that even though they do not know about eGovernments they recognize the benefits that they could bring.

Table 4.29 Government Employees Computer Literacy

	Internet	Word	Excel	Access	Power Point	Outlook	Web Mail	PC		Policy	eGov
Basic	31	25	21	17	22	16	22	31	Yes	17	18
Inter	14	19	19	12	17	10	11	15	No	59	58
Advance	21	21	9	5	9	8	12	18			
Non	10	11	27	42	28	42	31	12			
	76	76	76	76	76	76	76	76		76	76
Basic	41%	33%	28%	22%	29%	21%	29%	41%	Yes	22%	24%
Inter	18%	25%	25%	16%	22%	13%	14%	20%	No	78%	76%
Advance	28%	28%	12%	7%	12%	11%	16%	24%			
Non	13%	14%	36%	55%	37%	55%	41%	16%			
	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%

Figure 4.4a Government Employees Computer Literacy



Conclusion

As found in this research, all four groups of subjects who participated recognize eGovernment as a much needed service, even though people do not know exactly what it is or how it works. All government staff members agreed that eGovernment is an option to lower operating costs and that its benefits surpass any obstacle; but they also recognized that they need to improve basic computer skills such as PC usage, Internet skills, and common business programs (MS Office).

This research also shows that the average citizen and business owner obtained higher percentages in basic computer skills when compared to government employees

and government staff members. This reveals that if an initiative should take place in the future to implement any form of an electronic government, training is paramount. This is also extremely important for any system implementation within the government.

CHAPTER 5

Introduction

This study had two goals; the first was to determine the need, feasibility, and willingness of the four groups of participants to support the implementation of an electronic government system. The second mission was to develop a set of evaluation tools that would help evaluate the current eGovernment level according to the tool created by this researcher, form MEG-01-0010, in conjunction with connectivism and infrastructure tools, forms MEG-01-01-0005 and MEG-01-0006.

The four groups researched revealed that there is a desire for more electronic services to be provided by the local government and that there is a need for continued education in Internet use, PC usage, and Business applications, such as Microsoft Office.

Research answers

Hypotheses

At the beginning of this research two hypotheses were established and four (4) research questions were formulated. For the dissertation committee, these were too many. The researcher saw the need to answer all of these questions, and there are many more to answer in future investigations. In chapter one the following Hypotheses were established by the researcher.

Hypothesis A: An eGovernment implementation in Puerto Rico can be successful.

Hypothesis B: Stakeholders demand electronic services from the government in Puerto Rico.

Based on the results of this research and a statistical analysis of the data gathered, an eGovernment initiative can be successfully implemented in Puerto Rico because all the groups analyzed had a relatively high correlation between the two variables, eGovernment and Willingness. This demonstrates that most participants are willing to be part of an eGovernment initiative. Another statistical fact is that the P-value that measures the margin of error was well below .05 or very close to .05 (when the variables Willingness and eGovernment are measured), thus indicating that the confidence level of the data gathered is very high.

As for hypothesis B, which was intended to demonstrate the demand for electronic services, the researcher found that most groups demanded more electronic services from the government. However, there was one curious fact. When the employee group data was analyzed there did not seem to be much correlation between the two variables: eGovernment and Services. This left open a lot of questions such as: why do employees reject electronic services but are willing to be part of an eGovernment implementation? Do employees see electronic services as a form of monitoring system? These questions could only be answered in future investigations.

Research Questions

Question #1:Is there a difference in technology knowledge among stakeholders in Puerto Rico?

This study revealed that there is a difference in IT knowledge when all four groups are compared with regard to: PC usage, Microsoft Word, Microsoft Excel, Microsoft Power Point, Internet use, Microsoft Access, Microsoft Outlook, and

Webmail. These basic computer skills were analyzed utilizing a frequency test with the form MEG-01-0005. A lot of interesting facts emerged from this study, such as:

a. Government employees know less about technology than citizens and business owners
b. All of the business owners interviewed have basic Internet skills, email, and PC skills

More than half of government employees don't know how to send an email–

Question #2: Is there a difference in acceptance among the four groups of stakeholders?

This study revealed an opposing point only revealed by employees. All four groups are willing to be part of the implementation of an eGovernment but this group somewhat rejected electronic services. As mentioned in chapter four this opens up possibilities for future investigations.

–Question #3: Does Internet use influence eGovernment acceptance?

The correlation between the variables eGovernment and Internet Use for Citizens revealed that there was very little correlation between them two. Even though eGovernments rely heavily on Internet technology ordinary citizens don't see the relationship between these two variables. People that answered "yes" to using the Internet did not answer "yes" to the need for eGovernment. Also, government employees did not recognize the relationship among the two variables. But when the frequency analysis was observed the researcher noticed that the lowest computer

literacy results came precisely from that group. This issue opens the door for future investigations to be developed in each group that participates in eGovernment.

2) –Question #4: Is there a difference in service demand among the four groups of stakeholders?

There is difference in demand for services among the four groups that were analyzed in this study. All four groups accepted that there is a need for electronic services but one, Employees. This was demonstrated when the variable eGovernment was correlated with the variable Services. The statistical analysis returned a correlation of .478, .707, .136, and 1. These values are for Citizens, Business, Employees, and Government respectively.

Conclusion

Local business owners demand more electronic services from the government. Eighty-two percent of all business owners interviewed are in favor for more electronic services and 69% of them want service 24 /7. Another fact is that 62% of businesses would like to have more electronic services to avoid having to travel to any government office.

The specific needs of business owners are more efficient communication between them and the government, more electronic services available, and more technical training (Computer & application use). These needs will help local businesses improve their financial situation since time is money, and these services will give them the tools to do more with less.

Similarly, 83% of Civilians interviewed for this research expressed the need for more electronic services. Also, 67% of them said that what most that attracts them to the idea of electronic services is the 24/7 availability of government agencies.

The specific needs of the citizens are similar to those of the business owners, more efficient communication between them and the government, more electronic services available, and more technical training (Computer & application use). However, the services citizens asked for did not only have to do with availability of easier ways to pay, but also with availability of information and educational resources. We may have to establish a standardized infrastructure that will allow us to connect libraries with public schools in order to implement the theories of Connectivism.

Government employees have a different approach with regards to electronic services; only 57% of those interviewed showed interest in the topic. When specific services were analyzed, the researcher found that only 27% of the employees would use an electronic form to request office material, but 60% would use electronic services for looking for a better job and 68% would use eTraining.

When analyzed this group revealed very specific and special needs. In order to comply with its needs the government would have to make them part of any eGovernment development. This group's specific needs are similar to those of the business owners and citizens. More efficient communications between them and the government, more electronic services available (HR type of services), and more technical training (Computer & application use). However, this group differed from the other two groups in that it saw a difference between Human Resources electronic

services and work related electronic services. This opens up a new area for future investigations. Why does this group accept one kind of service and reject the other?

The agencies' specific needs are the core of the system, agencies need to standardize, control, and centralize communications in order to fulfill the needs of the government staff. . When this group was analyzed, 100% of those interviewed agreed that the government should provide more electronic services. But what seemed intriguing was the percentage that government staffers obtained with respect to other agencies. When asked to which agency they ought to be connected, 47% said they needed a connection to the federal government, 86% to the state government, 44% to the legislature, and 58% to the municipal government. This indicates that efforts should be concentrated in connecting municipalities to the state government.

The government is the core of any eGovernment initiative, so the last objective was to determine the level of expertise of government employees with regards to technology use. This study revealed that there is a greater need for basic computer skills, including basic office applications, amongst government employees and staffers than among citizens and business owners. This incredible fact helps us better understand the real needs of Puerto Rico's government with regards to technology. Improving skill seems more pressing than improving the technology because otherwise it would be a tin box with Christmas's lights.

Recommendations

In light of this new knowledge, all governments on the island of Puerto Rico should be looking into more efficient ways of running their government, whether it is at a

municipal level or at a state level. When citizens were asked about what attracted them more to the idea of an eGovernment 76% answered “Having services 24/7”, 79% answered “Access to government information”, and 76% answered “Not having to travel to a government agency”. Another supportive argument is that when citizens were asked about what they thought would be the greatest contribution of an eGovernment, 61% of the citizens answered “Lowering government expenditure”. These results lay the groundwork for the future eGovernment initiatives in Puerto Rico and the researcher’s recommendations.

Standardization

As stated in Chapter 2 most governments around the world are recognizing the need to standardize government operations. Systems and data need to be standardized in order to have efficient systems. Data must be communicated among devices in a single computer system and among other computer systems; this is to ensure correct and efficient data transmission. Data formats must be suitable for a wide variety of devices and computer systems (Burd, 2006, p. 77). Countries such as India recognized the growing trend of information and communication technology (ICT) and this led to the creation of the Ministry of Information Technology (MIT) in the year 2000, now called the Department of Information Technology (DIT) (Sohal, 2005, p. 38).

The Republic of Yemen is expected to start implementing eGovernment tactics in five of its ministries (Alsohybe, 2007, p. 4). They believe that this will improve government efficiency by improving and reforming its ministries to deliver better and cheaper services to the public (Alsohybe, 2007, p. 5).

One of the problems in Puerto Rico is that its government agencies do not communicate with one another. It is clearly recognized by the governor elect's Proposal Platform (Partido Nuevo Progresista, 2008, p. 51). Efforts have been carried out in the past by the government of Puerto Rico, such as PR StarNet. But as explained in chapter two this effort had a Top-Down approach. This study revealed that most of the problems and services are located closer to the citizen and business owners, thus a bottom-up approach is more efficient and beneficial.

Connectivism

As revealed in this study most local governments lack communication tools, equipment, and know how. The two municipal governments of the northern area of Puerto Rico chosen for this research showed the continuous use of obsolete communication and networking equipment. This practice minimizes the opportunity for growth of its network and makes it difficult to integrate other departments to its network, thus making it more difficult to share documents, data, and hinders communication amongst its peers and /or departments. This can also lead to higher operating costs and a higher use of paper.

New emerging technologies and strategies can remedy this situation. In the business sector a new term has been coined, collaborative commerce or c-commerce. This refers to the interrelationships between multiple e-Businesses that use Internet technologies to work together to form "trading communities" in which information about development of products and services can be exchanged between trading partners

(Napier, Judd, Rivers, & Adams, 2003, p. 406). This practice can be applied to governments to minimize expenses and duplicated systems.

Another effort developed for business that can be applied to governments is the Internet2. The Internet2 project was developed by 34 scientists and researchers to solve the alarming traffic on the Internet. Their proposed solution was a separate high-speed network for scientists, researchers, and educators to work together in real time (Napier, et al., 2003, p. 409). A similar approach may be useful when we look into the government needs for communications.

The survey carried out by this researcher in the towns of the northern area of Puerto Rico revealed that close to 76% of those surveyed use the Internet. This shows that people have a good idea of how to use a computer and it also reflects on the willingness to use future eGovernment services.

Table 5.1 Internet use

Internet Use	Population	Yes
Citizen	60	25
Business	13	11
Employees	77	69
Government Staff	36	36
Totals	186	141
Percentage		76%

Municipal Government Network Proposal

Government networks are being developed to minimize operating costs, to maximize resources, and to improve government services (Mena-Hernandez, 2002, p. 32). Businesses also have the same goal. ECommerce initiatives are undertaken to reduce costs or to improve customer service (Schneider, 2007, p. 107). In addition to this, (Napier, et al., 2003, p. 2) explained that millions of people use the Internet to shop for goods and services, listen to music, view artwork, conduct research, get stock quotes, keep up to date with current events, and communicate with others. Also, more and more businesses are using the Internet to conduct their business activities.

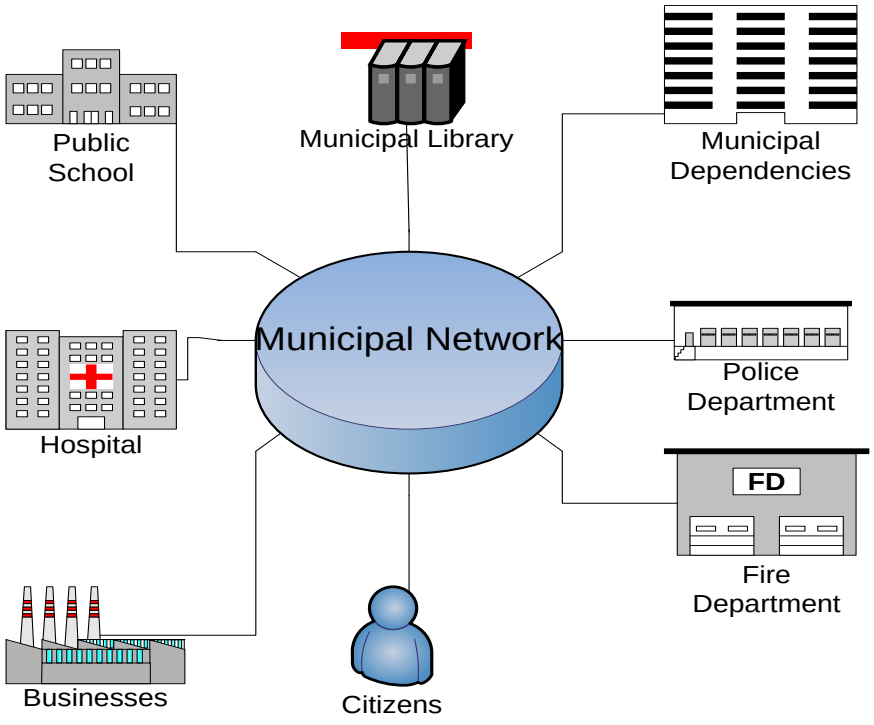


Figure 5.1 – Conceptual Municipal Network

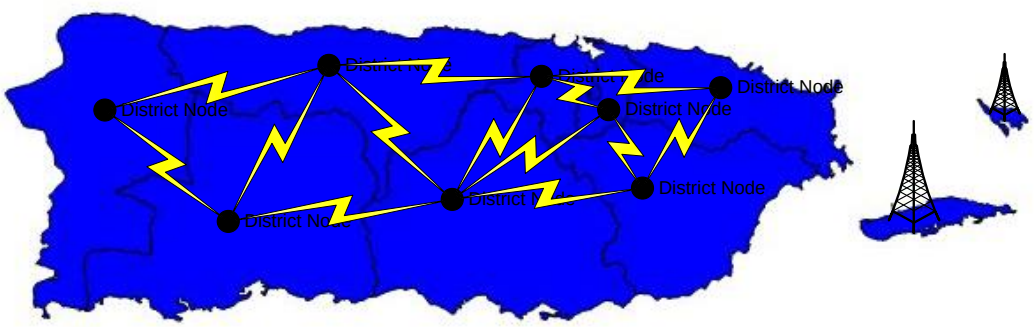
Recommendations

Municipal governments should be the technology providers for the towns. By centralizing communications and technology, management disasters pertaining to data, documents, and most important communications can be improved.. The key is the continuity of services. Businesses that need to successfully manage business continuity during a disaster and restore normal operations need a centralized and coordinated disaster recovery plan needs (Erbschloe, 2003, p. 1). Governments also need continuity in order to maintain services and communications. Instead of calling it business continuity, we will call operation continuity.

Businesses and governments around the world are taking advantage of the vast Internet use on behalf of the world populations. According to a survey, the numbers in March 2002 showed that over 567 million people worldwide were online (Napier, et al., 2003, p. 415). Contrary to the claims that video games, Facebook, and constant text-messaging have robbed today's young of the ability to think, a research revealed that "Net Geners" are the "smartest generation ever" (The Economist, 2008, p. 2). The experience of parents who grew up watching television is misleading when it comes to judging the 20,000 hours on the internet and 10,000 hours playing video games already spent by a typical 20-year-old American today (The Economist, 2008). Governments should tap into this skills and take advantage of this new trend of the digitalization of the most recent generations. In addition, an organization cannot achieve excellent customer service merely by sending memos that encourage employees to be nice to customers (Erbschloe, 2003, p. 3). The desire for customer satisfaction runs from top to bottom in an organization, therefore in order for employees to start perpetuating this

spirit, the process will have to begin when employees are hired and trained (Erbschloe, 2003, 3).

Municipal governments should be the sole technical providers for schools, hospitals, state and local governments, local businesses, and citizens. Creating the largest government network, with the municipal infrastructure, can guarantee a constant monitoring and upkeep of the network, thus maintaining constant communications within all the segments that compose society. Only after successfully establishing a sophisticated and stable municipal network, municipalities can then share resources by interconnecting the town's networks to form the Puerto Rico Government Network as shown in Figure 5.2.



Proposed Government Network

Figure 5.2 – Conceptual Puerto Rico Government Network (PRGN)

Another business-like technology that can be utilized in regular government operations is Enterprise Resource Planning or commonly known as ERP software. An ERP is a system software used to link individual applications such as accounting,

human resources, and inventory into a single application that shares data and integrates processes of an entire operation (Napier, et al., 2003, p. 309).

Summary

A few key elements have been mentioned in this study that will allow an efficient and effective eGovernment system. First it was discovered that there is a need for more electronic services on behalf of all four groups surveyed in this study. There is also a significant willingness in all four groups to take part in such an endeavor, and there is high Internet usage in Puerto Rico that governments should tap into in order to provide a more efficient way of governance.

Based on these findings the researcher believes that new and proven technologies that have been successful in businesses in lowering operating costs and providing 24 / 7 services should be implemented within the government. Applications such as ERP's that provide data sharing and efficient communication could be incorporated in everyday government affairs. But in order for this kind of application to run municipal governments need to invest more in their network infrastructure. As found in this study, the sample of municipal governments scored very low in the eGovernment Chart developed to identify the technological attributes of the given government agency.

Another new technology identified by this researcher that will assist in lowering operational costs of any government is Voice over IP or better known as VoIP. VoIP technology can help municipal governments share their network infrastructure with public school to grant them voice communication. It is of public knowledge in Puerto Rico that most public schools only have one or two phone lines and that they are

located in the principal's office. This is contrary to today's technological innovations and dissemination of information.

In other words, we should embrace change, technology is here to stay and municipal governments should look at technology as another public service, as demonstrated by the surveys in this research. The general public sees the municipal government as a first response government facility. Therefore it should provide the technological expertise for the local government, and provide the state government with presence in their towns, and ongoing contact with business owners, health care providers, and ordinary citizens.

Last but not least, all of these technological advances are doomed if training is not incorporated in any eGovernment implementation. The desire for customer satisfaction runs from top to bottom in an organization, therefore employees, in order to start perpetuating this spirit, the process will have to begin when employees are hired and trained (Erbschloe, 2003, p. 3).

Future Investigations

Future investigations should include a more detailed examination of how efficient eGovernment initiatives have been in Puerto Rico. This could be done by a thorough analysis ofrelationships such as government – government, government – citizen, government – business, and government – employee.

Another area for future investigation should be to quantify in dollars and cents the misuse of technology within the government of Puerto Rico. It would be beneficial for many government officials to know how much the misuse of technology is costing the

government of Puerto Rico. This can include systems that do not communicate with one another or agencies whose management refuses to incorporate technology as a viable means of communication.

References

Africa & Middle East Telecom (2007). Intel chairman unveils Egypt's first 'digital village'. *Africa & Middle East Telecom*, *8*(1), 4-5.

Alsohybe, N. T. (2007). The Implementation of e-Government in the Republic of Yemen: As Empirical Evaluation of the Technical and Organizational Readiness. Minneapolis, Minnesota: ProQuest Information and Learning Company.

Badger, R. (2000). *The 21st Century Information Environment*. Australia: ALIA.

Balaban, D. (2007). Germany's Giant Health Card Project Begins to stir. *Card Technology*, *12*(2), 26-30.

Beynon-Davies, P. (2007). Models for e-Governments. *Transforming Government: People, Process and Policy*, (1), 7-28.

Booz Allen Hamilton, Inc. (2008, Spring). Our Ideas. Retrieved April 11, 2008, from http://www.boozallen.com/publications/reports_studies?o9002123=

Burd, S. D. (2006). *Systems Architecture* (5th ed.). Boston, Massachusetts: Thomson Course Technology.

Butler, M. (2006). Developing of the knowledge-based sailor: A guide for the development and training of sailors through the use of Navy knowledge online. Carson, California: ProQuest Information and Learning Company.

Chao, E. L. (2003). US Department of Labor, E-Government Strategic Plan: Transforming into a Digital Department. Washington, D.C.: US Department of Labor.

Davison, R. M., Wagner, C., & Ma, L. C. (2005). From government to e-government: a transition model. *Information Technology & People*, *18*(3), 280-299.

DeJesús López Meza, J. (2002). Análisis De La Situación Actual De Los Sistemas De Información En Las Regiones Agrícolas. Mexico: Instituto Tecnológico y de Estudios Superiores de Monterrey.

Díaz-Saldaña, M. (2007, October 2). Plan Estratégico 2008-2009. Oficina del Contralor de Puerto Rico, 1-22.

Ebrahim, Z., & Irani, Z. (2005). E-government adoption: architecture and barriers. *Business Process Management Journal*, *11*(5), 589-611.

Erbschloe, M. (2003). *Guide to Disaster Recovery*. Boston, Massachusettes: Thomson Course Technology.

Fluker, A. (2006). Oakland County to launch mobile access to Web site.. *Crain's Detroit Business*, 22(41), 36--36.

Government of Puerto Rico (2004). Ley de Gobierno Electronico (Ley Num. 151 ed.). San Juan: Gobierno de Puerto Rico.

Hinkle, D., Wiersma, W., & Jurs, S. (2003). *Applied Statistics for the Behavioral Sciences* (5th ed.). Boston: Houghton Mifflin Company.

I-Ways Digest of Electronic Commerce Policy and Regulations (February 12, 2008). eGovernment in the European Union: Online Availability of Public Services. I-Ways Digest of Electronic Commerce Policy and Regulations, 2008 (28), 92-95.

Institute of Electrical and Electronics Engineers (2008). About Us. Retrieved March 2, 2008, from http://www.ieee.org/web/aboutus/home/index.html

International Organization for Standardization (2008). About Us. Retrieved March 2, 2008, from http://www.iso.org/iso/about.htm

Kasubiene, L., & Vanagas, P. (2007). Assumptions of E-government Services Quality Evaluations. *Engineering Economics 5* (55), 68-73. Retrieved March 01,2008, from http://web.ebscohost.com/ehost/results?vid=2&hid=2&sid=a8623d59-1552-48c9-8ddf-f4ada73285ff%40sessionmgr7

Koontz, L. D. (2003, September 23). Testimony Before the Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, Committee on Government Reform, House of Representatives "ELECTRONIC GOVERNMENT Progress and Challenges in Implementing the Office of Personnel Management's Initiatives". General Accounting Office, GAO-03-1169T, pp 1-34.

Lofton, J. C. (2006). A case study: The impact of electronic government services on civic participation in one medium-sized city in the mid-south United States. *University of Arkansas,* 131.

Lucas, E. (2008, February 17). The Electronic Bureaucrat. The Economist, Feb 2008, . Retrieved February 10, 2008, from http://www.economist.com/specialreports

Mann, P. (1995). *Statistics for Business and Economics*: John Wiley & Son.

McClure, D. L. (2001). *ELECTRONIC GOVERNMENTChallenges Must BeAddressed With Effective Leadership and Management*. Washington, DC: United States General Accounting Office.

McClure, D. L. (2001, July 11). Electronic Government: Challenges Must Be Addressed With Effective Leadership and Management. Testimony before the Committee on Governmental Affairs, US Senate, GAO-01-959T, 1-37.

Mena-Hernandez, J. O. (2002). E-Government Para El Gobierno De El Salvador. Mexico: Instituto Tecnológico Y De Estudios Superiores De Monterrey.

Merriam-Webster (2008). Network. Retrieved March 2, 2008, from http://www.merriam-webster.com/dictionary

Middleton, J. (2007). Freedom of the i-City. Mobile Communications International, April (140), 1.

Monk, E., & Wagner, B. (2006). *Concepts in Enterprise Resource Planning* (2nd ed.). Boston, Massachusetts: Thompson Course Technology.

Napier, H. A., Judd, P. J., Rivers, O. N., & Adams, A. (2003). *E-Business Technologies*. Boston, Massachusettes: Thomson Course Technology.

Newbold, P., Carlson, W. L., & Thorne, B. (2003). *Statistics for Business and Economics* (5th ed.). New Jersey: Prentice Hall.

Partido Nuevo Progresista (2008, March). Propossed Government Platform, p. 50-54. Retrieved November, 11, 2008, from http://www.fortunogobernador.com/images/PLANDEGOBIERNOPNP2009-2012.pdf

Reece, B. (2006). *E-Government Design and Equity*. Ann Arbor, MI: UMI Microform.

Reference.com (2008). E-Government. Retrieved March 2, 2008, from http://www.reference.com/browse/wiki/E-Government

Rupanagunta, K. (2006, December). E-Government in Public Financial Management: An Overview. IIMB Management Review, 2006, December, 403-413.

Sayani, A. (2008). *WikiPlanning - Exploring the use of a Collaborative Tool in Communicative Planning Processes*. Canada.

Schneider, G. (2007). *Electronic Commerce* (7th ed.). Boston, Massachusetts: Thomson Course Technology.

Schwalbe, K. (2006). *Information Technology Proyect Management* (4th ed.). Boston, Massachusettes: Thomson Course Technology.

Schwarz, B., & Clarke, G. E. (2005). *Mike Ma=eyers' Certification Passport* (2nd ed.). Emeryville, California: McGraw Hill Osborne.

Sekaran, U. (2003). *Research Methods for Business* (4th ed.). New Jersey: John Wiley.

Sekaran, U. (2003). *Research Methods for Business: A skill Building Approach* (4th ed.). New York, NY: John Wiley & Sons, Inc..

Settle, A. M. (2007). E-Government Implementation. Delaware: ProQuest Information and Learning Company.

Sohal, G. (2005). ICT Enabled Municipal Government Innovation: Comparative study of E-Government in Tampa, Florida and South Delhi, India. Ontario, Canada: Library and Archives Canada.

The Economist (2008, November 13). The net generation: The kids are alright. *The Economist, November*, . Retrieved December 8, 2008, from http://www.economist.com.ezproxy.apollolibrary.com/books/displaystory.cfm?story_id=12591038

Torres, L., Pina, V., & Royo, S. (2005, May). E-government and the transformation of public administrations in EU countries: Beyond NPM or just a second wave of reforms? *Online Information Review*, 29(5), 531-553.

Umezurrike, A. I. (2007). Evaluating Information Technology Usage in a Municipal Government: An Exploratory Case Study of Functional Department Maturity. March, 1-141.

United States General Accounting Office (2004). INFORMATION TECHNOLOGY INVESTMENT MANAGEMENT: A Framework for Assessing and Improving Process Maturity (GAO-04-394G ed.). Washington, DC: General Accounting Office.

Wireless News (2007, February 19). Gemalto Chosen for the National Identification Project of Portugal. Wireless News, 2007, February, 1. Retrieved March 13, 2008, from http://proquest.umi.com.ezproxy.apollolibrary.com/pqdweb?did=1218916271&sid=13&Fmt=3&clientld=13118&RQT=309&VName=PQD

World Atlas (2008, March). World Altlas Travel. Retrieved March 14, 2008, from http://www.worldatlas.com

Worldwide Videotex Update (2002, October). IJobs Matches California State Retirees with State Jobs. Worldwide Videotex Update, 21(10), 00p.

Yagmurcu, A. (2007). Correlates of E-Government use in County Governments. Tallahassee, Florida: ProQuest Information and Learning.

Yin, R. K. (2003). Case Study Research: Design and Methods (3rd ed.). Thousand Oaks, Ca: Sage Publications, Inc..

Appendix

Definitions

This section will help any person who is not technologically savvy understand my study.

- E-Government – refers to government's use of information technology to exchange information and services with citizens, businesses, and other branches of government (Reference.com [R], 2008).
- Network - a system of computers, peripherals, terminals, and databases connected by communications lines (Merriam-Webster [MW], 2008).
- LAN - a network of personal computers in a small area (as an office) for sharing resources (as a printer) or exchanging data (MW, 2008)
- WAN - a network of computers (as the Internet) in a large area (as a country or the globe) for sharing resources or exchanging data (MW, 2008).
- ISP – Internet Service Provider (MW, 2008)
- Information Technology - the technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data (MW, 2008)
- IEEE - (Institute of Electrical and Electronics Engineers) a non-profit organization, IEEE is the world's leading professional association for the advancement of technology. (Institute of Electrical and Electronics Engineers [IEEE], 2008)
- ISO - (International Organization for Standardization) is the world's largest developer and publisher of International Standards (International Organization for Standardization [ISO], 2008).

eGovernment Scale

Training	eGovernment	POINTS LOW	POINTS HEIGH
Computer training	**Introduction to IS**	0	30
Level 1	**Acknowledge technology**	31	61
Introductive training	**What is eGovernment?**	62	92
Level 2	**Project is on the way**	93	123
Project Training	**What needs to be done?**	124	154
Level 3	**Infrastructure / Connectivity**	155	185
Knowledge Training	**Policies, Procedures**	186	216
Level 4	**Mechanization / Applications**	217	247
Application Training	**Ho to use it**	248	278
Level 5	**Using technology**	279	309
Distribution training	**With the citizens**	310	340
Level 6 eGov Training	**Connect the City**	341	371
	What can we do now?	372	400

Questionnaires

Infrastructure

NETWORK	**CABLES**		**CAT 3**	**CAT 3e**	**CAT 5**	**CAT 5e**	**CAT 6**	**CAT 6e**	**POINTS**
		CAT							
		Frequency							
			Yes	**No**					
		VLANS							
		PoE							
CORE SWITCH[1]		**<10Mbps**	**10 Mbps**	**100 Mbps**	**1Gbps**	**10Gbps**			
	SPEED								
				Available					
		0 - 10	**11 - 15**	**16 - 20**	**21-25**	**>26**			
	PORTS								
	TYPE								
	LAYER								
DEPARTMENT SWITCH[2]		**<10Mbps**	**10 Mbps**	**100 Mbps**	**1Gbps**	**10Gbps**			
	SPEED								
			PORTS AVAILABLE						
		0 - 10	**11 - 15**	**16 - 20**	**21-25**	**>26**			
	PORTS								
	TYPE								
	LAYER								
TOTAL PAGE-1									

[1] Contains the average, this section will be filled out one per equipment.
[2] Contains the average, this section will be filled out one per equipment.

SERVERS [3]		**< Pentium 4**	**Xeon 3000**	**Xeon 5000**	**Xeon 7000**	**Itanium 9000**
	PROCESSORS					
		512 MB	**1 GB - 2GB**	**3GB-5GB**	**6GB-12GB**	**>13 GB**
	MEMORY					
		<10GB	**11- 20 GB**	**21-60 GB**	**61-120 GB**	**>121GB**
	DISK SPACE					
		<10%	**10-15 %**	**16-25 %**	**26 - 35 %**	**>36%**
	% MEMORY USED					
		<10%	**10-15 %**	**16-25 %**	**26 - 35 %**	**>36%**
	% CPU USED					
		<10 Mbps	**10 Mbps**	**100 Mbps**	**1Gbps**	**10Gbps**
	CONNECTIVITY (LAN)					
PBX						
	TYPE	**Analog**	**Digital**	**VoIP**		

TOTAL PAGE - 1	
TOTAL PAGE - 2	
TOTAL	

[3] Contains the average, this section will be filled out one per equipment.

Connectivism

Connectivism[4]					
	None	**Extranet**	**Intranet**	**Internet**	**POINTS**
Web Page					
E-Commerce					
E-Training					
	Domain	**Workgroup**	**Standalone**		
Environment					
Security[5]					
	Strong	**< 8 Char**	**< 4 Char**	**Blank**	**None**
Passwords					
	Yes	**No**			
Encryption					
Home Directories					
Public Folder					

[4] Questions to be answered by the LAN Administrator or equivalent.
[5] Questions to be answered by the IT Director or equivalent

Documentation[6]					
	In place	**In Process**	**In Plans**	**Not In Plan**	
Disaster Recovery					
Procedures					
Policies					
Data Backup Plan					

Technology Usage[7]					
	Expert	**Above Average**	**Average**	**Below Average**	**None**
Level of Expertise[8]					
Knowledge Management					
Document Management					

[6] Questions to be answered by the IT Director or equivalent
[7] Questions to be answered by the IT Director or equivalent,and the Mayor.
[8] This an average obtained from the user questionnaire.

Mechanization[9]				
	In place	**In Process**	**In Plans**	**Not In Plan**
Procedures				
Processes				
Applications[10]				
	In place	**In Process**	**In Plans**	**Not In Plan**
CRM				
ERP				
Financial				
Human Resources				

[9] Questions to be answered by the IT Director or its equivalent and /or the Mayor.
[10] Questions to be answered by the IT Director or its equivalent and /or the Mayor.

Relationships[11]					
	In place	In Process	In Plans	Not In Plan	
Government to Government					
Government to Employees					
Government to Business					
Government to Citizens					
Citizen to Citizens					
Business to Business					
Total for this Page					
Total Points Page 1					
Total Points Page 2					
Total Points Page 3					
Total Points					

[11] Questions to be answered by the IT Director or its equivalent and /or the Mayor.

ITC Literacy (Spanish)

Cuestionario de Evaluación de Destrezas y Necesidades del Empleado

Para el estudio titulado: THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND IT'S EVALUATION TOOLS

El propósito de este cuestionario es poder identificar en qué nivel básico se encuentra usted con respecto a la computadora en general y sus programas. Al llenar este cuestionario podrá identificar qué áreas usted domina y cuáles necesita mejorar. Esto le puede ser muy beneficioso cuando vaya a solicitar educación continua a su supervisor.

Destrezas

Seleccione las aplicaciones y/o áreas a las que por lo menos ha estado expuesto, sea lo más especifico posible.

☐ Internet	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Microsoft Word	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Microsoft Excel	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Microsoft Access	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Microsoft Power Point	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Microsoft Outlook	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Web Email	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Uso y manejo de PC	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Otros _____	☐ Básico	☐ Intermedio	☐ Avanzado	☐ No la conozco
☐ Política de Informática	☐ La conozco	☐ No la conozco		
☐ Gobierno Electrónico	☐ Lo conozco	☐ No lo conozco		

ITC Literacy (English)

Computer Literacy Questionnaire

Of Study Titled: THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN
PUERTO RICO AND IT'S EVALUATION TOOLS

The purpose of this questionnaire is to identify your level of basic computer knowledge. By answering this questionnaire you will find out which areas of technology you master and which areas you might need to brush-up on. In addition this will help you identify your continuing education needs.

Computer Application Skills

Please mark your level of expertise in each area.

☐ Internet	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Word	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Excel	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Access	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Power Point	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Microsoft Outlook	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Web Email	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Using the PC	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ Other _____	☐ Basic	☐ Intermediate	☐ Advanced	☐ I don't know about it
☐ IT Policy	☐ I know about it	☐ I don't know about it		
☐ eGovernment	☐ I know about it	☐ I don't know about it		

Government to Citizen (Spanish)

Herramienta de Medición de la Relación - Gobierno a Ciudadano
Para el studio titulado: THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND IT'S EVALUATION TOOLS

1. Edad:
    a. 18 – 25
    b. 26 – 35
    c. 36 – 45
    d. 46 – 55
    e. 56 – 65
    f. Más de 65

2. Ocupación:
    a. Empleado
    b. Desempleado
    c. Negocio propio
    d. Ama de Casa
    e. Estudiante
    f. Otro

3. ¿Desde dónde accede a Internet?
    a. Casa
    b. Trabajo / Negocio
    c. Cibercafé
    d. Universidad / Escuela
    e. Hot Spots / Blue Zone
    f. No tengo
    g. No hace falta
    h. Otro

4. ¿Alguna vez ha accedido a un portal de Internet de alguna agencia de gobierno?
    a. Sí
    b. No

5. ¿Cree usted que todas las agencias de gobierno debieran estar conectadas?
    a. Sí
    b. No
    c. No Sabe

6. ¿Cree que le beneficiaría que el gobierno ofrezca sus servicios por Internet? Como pago del IVU, planillas, solicitud de servicios (Recogido de Escombros, Ayuda al Ciudadano, Focos Fundidos, etc.…) obtención de información (económica, gastos de gobierno, turismo, etc.):
    a. Sí
    b. No
    c. No Sabe

7. ¿Identifique algún inconveniente a que el gobierno use Internet como herramienta de comunicación para ofrecer sus servicios? Puede elegir mas de una opción:
    a. La mayoría de la población no tiene acceso a Internet
    b. Falta de confianza en la seguridad y privacidad de las transacciones
    c. El gobierno no tiene los recursos tecnológicos adecuados
    d. La tecnología de Internet en Puerto Rico es deficiente
    e. La velocidad de conexión en general es muy lenta
    f. Otro... Especifique: _____
    g. No lo conozco
    h. Ninguno

8. ¿A qué rama de gobierno le interesaría tener acceso a través de Internet? Puede elegir mas de una opción:
    a. Gobierno Estatal
    b. Gobierno Municipal
    c. Legislatura Estatal
    d. Legislatura Municipal
    e. Agencias de Gobierno
    f. Todas las anteriores
    g. Ninguno

9. ¿Qué le atrae más con respecto a los beneficios que pueda ofrecer eGovernment? Puede elegir mas de una opción:
    a. Solicitar servicios 24 horas al día / 7dias a la semana
    b. Acceder a información del gobierno mas rápida y fácilmente
    c. No tener que viajar a las oficinas de gobierno
    d. Comunicarse con el gobierno más fácilmente
    e. No tener que hablar con alguien
    f. Otro... Especifique: _____
    g. Ninguno

10. ¿Cuáles cree usted que serían los beneficios para el gobierno? Puede elegir mas de una opción:
    a. Que el gobierno sea mas responsable ante los ciudadanos
    b. Que el gobierno sea mas eficiente
    c. Minimizar gastos del gobierno
    d. Darle poder al pueblo a fiscalizar al gobierno
    e. Mejorar la imagen del Gobierno ante el pueblo
    f. Otro... Especifique: _____
    g. Ninguno
    h. No sabe

11. ¿Cuáles servicios de gobierno le gustaría acceder a través de Internet? Puede elegir mas de una opción:
    a. Pago de impuestos, multas u otros
    b. Solicitud de servicios
    c. Tener acceso a los gastos del gobierno (central y/o municipal)
    d. Acceder a información económica y financiera del municipio y/o país
    e. Acceder a información turística / histórica
    f. Acceder a información sobre proyectos de Ley (central y/o municipal)
    g. Acceder a otro tipo de información (censos, mapas, salud, educación, etc.)
    h. Llenar planillas, IVU, CRIM, etc...
    i. Comunicarse con el gobierno (24 / 7)
    j. Participar en foros sobre temas del gobierno
    k. Buscar oportunidades de empleo
    l. Hacer negocios con el gobierno
    m. Otros... Especifique: _____
    n. Ninguno

12. De ser necesario, ¿le gustaría solicitar todas las certificaciones requeridas por el gobierno vía el Internet?
    a. Sí
    b. No
    c. No sabe

13. Si estuvieran disponibles, ¿Qué servicios solicitaría por Internet? Puede elegir mas de una opción:
    a. Certificación de Planillas
    b. Certificación de ASUME
    c. Certificación de CRIM
    d. ARPE
    e. Patente Municipal
    f. Pago del IVU
    g. Certificado de Buena Conducta
    h. Certificado de Nacimiento y/o Matrimonio
    i. Pago de Multas
    j. Ninguna
    k. Otro, especifique _____

14. ¿Cuál de las opciones siguientes le parece que sería más conveniente?
    a. Que todas las instituciones de gobierno tengan su propio portal (WebPage)
    b. Acceder a todos los servicios de gobierno (central o municipal) desde un solo portal
    c. Indiferente

15. ¿Accede a servicios de Banca Electrónica?
    a. Sí
    b. No

16. Si contesto SÍ a la pregunta anterior, ¿Qué tipo de servicios de Banca Electrónica accede? Puede seleccionar mas una opción:
    a. Consultas
    b. Transferencias
    c. Pago de servicios (Luz, Agua, Teléfono, etc.…)
    d. Pago de planilla
    e. Pago de préstamos y otros relacionados
    f. Otro... Especifique: _____

Government to Citizen (English)

1. Age:
    a. 18 – 25
    b. 26 – 35
    c. 36 – 45
    d. 46 – 55
    e. 56 – 65
    f. Over 65

2. Occupation:
    a. Employed
    b. Unemployed
    c. Business owner
    d. House wife
    e. Student
    f. Other _____

3. From where you access the Internet?
    a. Home
    b. Work / Business
    c. Cybercafé
    d. University / School
    e. Hot Spots / Blue Zone
    f. I don't access it
    g. I think its not necessary
    h. Other

4. Have you accessed a government website before?
    a. Yes
    b. No
    c. I don't know

5. Do you think that all government agencies should be connected?
    a. Yes
    b. No
    c. I don't know

6. Dou you think it would be beneficial if you had electronic access to pay taxes online, request government services online such as government programs, complaints, and government financial information?
    a. Yes
    b. No
    c. I don't know

7. Which of the following do you think may be an obstacle for the implementation of government electronic services? Select all that apply:
    a. Most citizens don't have access to the Internet
    b. Identity theft
    c. The government doesn't have an adequate IT infrastructure
    d. Internet technology in Puerto Rico is deficient
    e. Slow Internet connection
    f. Other: _____
    g. None

8. Which government branch you think you might needs to have electronic services? Select all that apply:
    a. State Government
    b. Municipal Government
    c. State Legislature
    d. Municipal Legislature
    e. State Agencies
    f. All of the above
    g. None of the above

9. What attracts you the most about electronic government services? Select all that apply:
    a. 24 /7 Service
    b. Access to government information
    c. Not traveling to the government agency
    d. Communication with the government is simplified
    e. Not having to speak with a person
    f. Other: _____

10. How may government benefit from having electronic services? Select all that apply:
    a. The government may improve its image
    b. The government will be more efficient
    c. Minimize operating costs
    d. Empowerment of the people
    e. More presence in remote areas
    f. Other: _____
    g. None
    h. I don't know

11. Which government services would you use if they were available electronically? Choose all that apply:
    a. Paying taxes, traffic violations, etc…
    b. Requests forgeneral services
    c. Browse government expenses
    d. Gain access to the economy's information
    e. Tourist information / local traveling
    f. Monitor legislative bills (Legislative Projects)
    g. Government statistics
    h. Filling Taxes
    i. Communicate with the government (24 / 7)
    j. Online forums
    k. Job search
    l. Do business with the government
    m. Other: _____
    n. I don't know

12. Would you request all government certifications online? (Certificate of Good Conduct, ASUME, CRIM, ARPE, and others)
    a. Yes
    b. No
    c. I don't know

13. If they were available, which government document would you request? Choose all that apply:
    a. Certification of Taxes
    b. ASUME Certification
    c. CRIM Certification
    d. ARPE
    e. Municipal Patent
    f. Pay IVU
    g. Good Conduct Certificate
    h. Birth and/or Marriage Certificate
    i. Pay traffic violations
    j. None
    k. Other _____

14. Which of the following options do you think would be most convenient for citizens?
    a. All government agencies should have a Webpage
    b. The government should have a central Website
    c. Indifferent

15. Do you use Internet banking?
    a. Yes

b. No

16. What kind of banking transactions do you do online? Choose all that apply:
    a. Request information
    b. Transferences
    c. Pay government services (Energy, Water, Telephone, etc.…)
    d. Pay Income Tax
    e. Loan payments
    f. Other: _____

Government to Business (Spanish)

Herramienta de Medición de la Relación - Gobierno a Negocio
Para el estudio titulado: THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND IT'S EVALUATION TOOLS

1. Tamaño de su Empresa:
    a. Pequeña
    b. Mediana
    c. Grande

2. Sector Económico:
    a. Manufactura
    b. Ventas al Detal
    c. Medicina o Salud
    d. Construcción
    e. Transporte
    f. Restaurante / Cafetería
    g. Financiero
    h. Alimentos
    i. Otro... Especifique: _____

3. ¿Accede su organización al sitio de Internet de alguna agencia de gobierno?
    a. Sí
    b. No

4. ¿Le beneficiaría a su organización el hecho de que el gobierno ofrezca servicios también por Internet? Tales como pago de Patente Municipal, pago del IVU, CRIM, solicitud de servicios, obtención de información, etc.:
    a. Sí
    b. No
    c. No Sabe

5. ¿De tener la oportunidad en su empresa, pagaría la Patente Municipal vía el Internet?
    a. Sí
    b. No
    c. No sabe

6. De ser necesario, ¿le gustaría solicitar todas las certificaciones requeridas por el gobierno vía Internet?
    a. Sí
    b. No
    c. No sabe

7. Si estuviera disponible, ¿Qué servicios solicitaría por Internet? (Puede seleccionar más de una)
    a. Certificación de Planillas
    b. Certificación de ASUME
    c. Certificación de CRIM
    d. ARPE
    e. Patente Municipal
    f. Pago del IVU
    g. Certificado de Buena Conducta
    h. Certificado de Nacimiento y/o Matrimonio
    i. Pago de Multas
    j. Ninguna

8. ¿Tiene algún inconveniente con que el gobierno use Internet para prestar sus servicios? Puede elegir más de una opción:
    a. La mayoría no tiene acceso a Internet
    b. Falta de confianza en la seguridad y privacidad de las transacciones
    c. El gobierno no tiene los recursos tecnológicos adecuados
    d. La tecnología de Internet en Puerto Rico es deficiente
    e. La velocidad de conexión en general es muy lenta
    f. Otro... Especifique: _____
    g. Ninguno

9. ¿A qué rama de gobierno le interesaría a su organización tener acceso a través de Internet?
    a. Gobierno Estatal
    b. Gobierno Municipal
    c. Legislatura Estatal
    d. Legislatura Municipal
    e. Agencias de Gobierno
    f. Todas las anteriores
    g. Ninguno

10. Para su organización ¿Qué le atrae mas con respecto a los beneficios que pueda ofrecer eGovernment?
    a. Solicitar servicios 24 horas al día / 7dias a la semana
    b. Acceder a información del gobierno mas rápida y fácilmente
    c. No tener que viajar a las oficinas de gobierno
    d. Comunicarse con el gobierno más fácilmente
    e. No tener que hablar con alguien
    f. Otro... Especifique: _____
    g. No lo conozco
    h. Ninguno

11. ¿Cuáles servicios del gobierno le beneficiaría a su organización que fueran a través del Internet? Puede elegir más de una opción.
    a. Pago de impuestos, multas u otros
    b. Solicitud de servicios
    c. Hacer negocios con el gobierno (Suplir materiales)
    d. Subastas electrónicas
    e. Acceder a información económica y financiera del país
    f. Acceder a información sobre planes de gobierno
    g. Ver futuros proyectos de ley
    h. Acceder a otro tipo de información (censos, mapas, salud, educación, etc.)
    i. Radicar planillas (Estatal, municipal, etc.)
    j. Comunicarse con el gobierno (central y/o municipal)
    k. Otros... Especifique: _____
    l. Ninguno

12. ¿Qué beneficio, si alguno, le puede brindar que el gobierno ofrezca servicios a través del Internet?
    a. Que el gobierno sea mas responsable con los fondos públicos
    b. Mejorar la eficiencia del gobierno
    c. Disminuir gastos del gobierno
    d. Transparencia de las acciones del gobierno
    e. Otro... Especifique: _____
    f. Ninguno

13. ¿De qué forma le parece que debieran ser los portales de las instituciones gubernamentales?
    a. Que todas las instituciones de gobierno tengan su propio portal (WebPage)
    b. Acceder a todos los servicios de gobierno (central o municipal) desde un solo portal
    c. Indiferente

14. ¿Utiliza su organización servicios de Banca Electrónica por Internet?
    a. Sí
    b. No

15. Si contestó SÍ a la pregunta anterior, ¿Qué tipo de servicios de Banca Electrónica por Internet utiliza su organización? Puede seleccionar más una opción:
    a. Consultas
    b. Transferencias
    c. Pago de servicios (Luz, Agua, Teléfono, etc.…)
    d. Pago de planilla
    e. Pago de préstamos y otros relacionados
    f. Otro... Especifique: _____

Government to Business (English)

1. Size of your business:
    a. Small
    b. Medium
    c. Large

2. Business field:
    a. Manufacturing
    b. Sales
    c. Healthcare
    d. Construction
    e. Transportation
    f. Restaurant (Food)
    g. Finance
    h. Grocery
    i. Other: _____

3. Does your business access any government Webpage?
    a. Yes
    b. No

4. Would your organization benefit from the government having online services? Such as: Municipal Patent, paying IVU, CRIM, request of services, or information:
    a. Yes
    b. No
    c. I don't know

5. If you had the opportunity to pay your Municipal Patent online, would you do it?
    a. Yes
    b. No
    c. I don't know

6. Would you request all government certifications online? (Certificate of Good Conduct, ASUME, CRIM, ARPE, and others)
    a. Yes
    b. No
    c. I don't know

7. If they were available, which government documents would you request? Choose all that apply:
    g. Certification of Taxes
    h. ASUME Certification
    i. CRIM Certification
    j. ARPE
    k. Municipal Patent
    l. Pay IVU
    m. Good Conduct Certificate
    n. Birth and/or Marriage Certificate
    o. Pay traffic violations
    p. None
    q. Other _____

8. Which of the following do you think may be an obstacle for the implementation of government electronic services? Select all that apply:
    a. Most citizens don't have access to the Internet
    b. Identity theft
    c. The government doesn't have an adequate IT infrastructure
    d. Internet technology in Puerto Rico is deficient
    e. Slow Internet connection
    f. Other: _____
    g. None

9. Which government branch you think you might needs to have electronic services? Select all that apply:
    a. State Government
    b. Municipal Government
    c. State Legislature
    d. Municipal Legislature
    e. State Agencies
    f. All of the above
    g. None of the above

10. What attracts you the most about electronic government services? Select all that apply:
    a. 24 /7 Service
    b. Access to government information
    c. Not traveling to the government agency
    d. Communication with the government is simplified
    e. Not having to speak with a person
    f. Other: _____

11. Which government services would you use if they were available electronically? Choose all that apply:
    a. Paying taxes, traffic violations, etc…
    b. Requests for general services
    c. Browse government expenses
    d. Gain access to the economy's information
    e. Tourist information / local traveling
    f. Monitor legislative bills (Legislative Projects)
    g. Government statistics
    h. Filling Taxes
    i. Communicate with the government (24 / 7)
    j. Online forums
    k. Job search
    l. Do business with the government
    m. Other: _____
    n. I don't know

12. How may the government benefit from having electronic services? Select all that apply:
    a. The government may improve its image
    b. The government will be more efficient
    c. Minimize operating costs
    d. Empowerment of the people
    e. More presence in remote areas
    f. Other: _____
    g. None

13. Which of the following options do you think would be the most convenient for citizens?
    a. All government agencies should have a Webpage
    b. The government should have a central Website
    c. Indifferent

14. Does your organization use Internet banking?
    a. Yes
    b. No

15. What kind of banking transactions do you do online? Choose all that apply:
    a. Request Information
    b. Transferences
    c. Pay government services (Energy, Water, Telephone, etc.…)
    d. Pay Income Tax
    e. Loan payments
    f. Other: _____

Government to Employee (Spanish)

Herramienta de Medición de la Relación - Gobierno a Empleados
Para el studio titulado: THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND IT'S EVALUATION TOOLS

1. Edad:
    a. 18 – 25
    b. 26 – 35
    c. 36 – 45
    d. 46 – 55
    e. 56 – 65
    f. Más de 65

2. Puesto:
    a. Gerencial
    b. No Gerencial

3. ¿Desde dónde accede a Internet?
    a. Casa
    b. Trabajo / Negocio
    c. Cibercafé
    d. Universidad / Escuela
    e. Hot Spots / Blue Zone
    f. No tengo
    g. No hace falta
    h. Otro

4. ¿Alguna vez ha accedido a un portal de Internet de alguna agencia de gobierno?
    a. Sí
    b. No

5. ¿Conoce el concepto de gobierno electrónico?
    a. Sí
    b. No

6. ¿Cree usted que todas las agencias de gobierno debieran estar conectadas?
    a. Sí
    b. No
    c. No Sabe

7. ¿Qué Servicios accedería por la red? Puede elegir mas de una opción:
    a. Búsqueda de plazas disponibles
    b. Actualizar archivos de Recursos Humanos
    c. Ver talonario de pago
    d. Solicitar Vacaciones
    e. Adiestramientos
    f. Solicitar suministros o repuestos

8. ¿Cree usted que un sistema de gobierno electrónico mejoraría su desempeño como empleado?
    a. Si
    b. No
    c. No sé

9. ¿Cómo se comunicaría usted con sus superiores? Puede elegir mas de una opción:
    a. Teléfono
    b. E-mail
    c. Mensajes de texto
    d. Chat
    e. Celular
    f. Personal
    g. Video Conferencia
    h. Otro, especifique _____

10. ¿Cómo se comunicaría usted con sus compañeros de trabajo? Puede elegir mas de una opción:
    a. Teléfono
    b. E-mail
    c. Mensajes de texto
    d. Chat
    e. Celular
    f. Personal
    g. Video Conferencia
    h. Otro, especifique _____

Government to Employee (English)

1. Age:
    a. 18 – 25
    b. 26 – 35
    c. 36 – 45
    d. 46 – 55
    e. 56 – 65
    f. Over 65

2. Employment level:
    a. Managerial
    b. Non Managerial

3. From where you access the Internet?
    a. Home
    b. Work / Business
    c. Cybercafé
    d. University / School
    e. Hot Spots / Blue Zone
    f. I don't access
    g. I think its not necessary
    h. Other

4. Have you accessed a government website before?
    a. Yes
    b. No

5. Do you know what eGovernment is?
    a. Yes
    b. No

6. Do you think that all government agencies should be connected?
    a. Yes
    b. No
    c. I don't know

7. What online services would you use at work? Choose all that apply:
    a. Job seeking
    b. Update your personnel file
    c. See my pay slip
    d. Request vacations
    e. Training
    f. Request supplies

8. If your agency would go totally electronic, would your performance improve?
    a. Yes
    b. No
    c. I don't know

9. Which means of communication would you use to reach your supervisor if your agency was electronic? Choose all that apply:
    a. Telephone
    b. E-mail
    c. Text messages
    d. Chat
    e. Cellular
    f. In person
    g. Video Conference
    h. Other _____

10. How would you communicate with your co-workers if your agency was electronic? Choose all that apply:
    a. Telephone
    b. E-mail
    c. Text messages
    d. Chat
    e. Cellular
    f. In person
    g. Video Conference
    h. Other _____

Government to Government (Spanish)

Herramienta de Medición de la Relación - Gobierno a Gobierno
Para el studio titulado: THE DEVELOPMENT OF A MODEL FOR MUNICIPAL E-GOVERNMENT IN PUERTO RICO AND IT'S EVALUATION TOOLS

1. Edad:
    a. 18 – 25
    b. 26 – 35
    c. 36 – 45
    d. 46 – 55
    e. 56 – 65
    f. Más de 65

2. Puesto:
    a. Gerencial
    b. No Gerencial

3. ¿Desde donde accede a Internet?
    a. Casa
    b. Trabajo / Negocio
    c. Cibercafé
    d. Universidad / Escuela
    e. Hot Spots / Blue Zone
    f. No tengo
    g. No hace falta
    h. Otro

4. ¿Alguna vez ha accedido a un portal de Internet de alguna agencia de gobierno?
    a. Si
    b. No

5. ¿Cree usted que todas las agencias de gobierno debieran estar conectadas?
    a. Sí
    b. No
    c. No Sabe

6. ¿Qué servicios accedería por la red? Seleccione todas las que aplique.
    a. Estado Financiero del Municipio o Agencia
    b. Información de Recursos Humanos
    c. Estatus de trabajos (Solicitudes de Servicios)
    d. Comunicación con otras ramas de gobierno
    e. Video Conferencias
    f. Otros, Especifique _____

7. ¿Con qué agencia entiende usted que ameritaría tener conexión? Seleccione todas las que aplique.
    a. ASUME
    b. CRIM
    c. ARPE
    d. Autoridad de Tierras
    e. Policía
    f. Fortaleza
    g. Legislatura
    h. OCAM
    i. OGP
    j. Justicia
    k. Municipios
    l. Otro, especifique _____

8. ¿Qué tipo de transacción haría a través del Internet?
    a. Pagos y/o Transferencias de fondos
    b. Informes
    c. Someter documentación
    d. Comunicación con las demás agencias
    e. Informes Financieros (Bonos)
    f. Colocación de Puestos
    g. Propuesta Federales
    h. Otro, especifique _____

9. ¿Con qué rama gubernamental entiende usted que le urge más a su agencia conectarse?
    a. Gobierno Federal
    b. Gobierno Estatal
    c. Gobierno Municipal
    d. Agencias Estatales
    e. Dependencia Municipales
    f. Legislatura Estatal
    g. Legislatura Municipal
    h. No es necesario
    i. Otro especifique _____

10. ¿Cuál entiende que sería el mayor reto de hacer transacciones electrónicas entre gobierno?
    a. Costo
    b. Conocimiento sobre el tema
    c. Aplicabilidad
    d. Complejidad
    e. Invasión a la privacidad
    f. Mal uso del sistema
    g. Infraestructura de la Informática
    h. No sé
    i. Otro, especifique _____

11. ¿Cuál entiende que sería el mayor beneficio de hacer transacciones electrónicas entre gobierno?
    a. Reducción de gastos
    b. Reducción de nomina
    c. Aumento de la producción
    d. Adjudicar responsabilidad
    e. Mejorar la relación con los ciudadanos
    f. Aumentar los ingresos
    g. No se
    h. Otro, especifique _____

Government to Government (English)

1. Age:
    a. 18 – 25
    b. 26 – 35
    c. 36 – 45
    d. 46 – 55
    e. 56 – 65
    f. Over 65

2. Employment level:
    a. Managerial
    b. Non Managerial

3. From where do you access the Internet?
    a. Home
    b. Work / Business
    c. Cybercafé
    d. University / School
    e. Hot Spots / Blue Zone
    f. I don't access it
    g. I think its not necessary
    h. Other

4. Have you accessed a government website before?
    a. Yes
    b. No

5. Do you think that all government agencies should be connected?
    a. Yes
    b. No
    c. I don't know

6. What services would you use on the web? Select all that may apply.
    a. The Agencies Financial Statement
    b. Human Resources Data
    c. Job openings
    d. Communication with other agencies
    e. Video Conferences
    f. Other _____

7. With what agency do you think it would be most important to connect to? Select all that may apply
    a. ASUME
    b. CRIM
    c. ARPE
    d. Autoridad de Tierras
    e. Police
    f. Fortaleza
    g. Legislature
    h. OCAM
    i. OGP
    j. Justice Department
    k. Other Municipalities
    l. Other, specify _____

8. What kind of transactions would your agency carry out if you were connected to the Internet?
    a. Payments or Transferences
    b. Reports
    c. Online documentation
    d. Communication with other agencies
    e. Financial Statements
    f. Job postings and recruitment
    g. Federal Proposals (Grants)
    h. Others _____

9. Which governmental branch do you think should be a priority to connect to?
    a. Federal Government
    b. State Government
    c. Municipal Government
    d. State Agencies
    e. Municipal Agencies
    f. State Legislature
    g. Municipal Legislature
    h. Not necessary
    i. Other _____

10. What would be the greatest threat to eGovernment development?
    a. Cost
    b. Knowledge of eGovernment
    c. Applying it
    d. Complexity
    e. Privacy threat
    f. System miss use
    g. IT Infrastructure
    h. Don't know
    i. Other _____

11. What do you think would be the greatest asset of eGovernment?
    a. Lower operating costs
    b. Reduction in labor force
    c. Higher production
    d. Accountability
    e. Improving public opinion
    f. Higher income
    g. Don't know
    h. Other _____

SPSS Data Analysis

Crosstabs-Gov-Citizen

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * INTERNET	60	100.0%	0	.0%	60	100.0%

EGOV * INTERNET Crosstabulation

			INTERNET		
			SI	NO	Total
EGOV	SI	Count	22	24	46
		Expected Count	19.2	26.8	46.0
	NO	Count	0	2	2
		Expected Count	.8	1.2	2.0
	NO SABE	Count	3	9	12
		Expected Count	5.0	7.0	12.0
Total		Count	25	35	60
		Expected Count	25.0	35.0	60.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.518[a]	2	.172
Likelihood Ratio	4.325	2	.115
Linear-by-Linear Association	2.440	1	.118
N of Valid Cases	60		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .83.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.000	.000	.[c]	.[c]
		EGOV Dependent	.000	.000	.[c]	.[c]
		INTERNET Dependent	.000	.000	.[c]	.[c]
	Goodman and Kruskal tau	EGOV Dependent	.039	.042		.099[d]
		INTERNET Dependent	.059	.044		.177[d]
	Uncertainty Coefficient	Symmetric	.055	.039	1.348	.115[e]
		EGOV Dependent	.056	.039	1.348	.115[e]
		INTERNET Dependent	.053	.039	1.348	.115[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.242			.172
	Cramer's V	.242			.172
	Contingency Coefficient	.235			.172
Interval by Interval	Pearson's R	.203	.117	1.582	.119[c]
Ordinal by Ordinal	Spearman Correlation	.218	.116	1.697	.095[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * SERVICE	60	100.0%	0	.0%	60	100.0%

EGOV * SERVICE Crosstabulation

			SERVICE			
			SI	NO	NO SABE	Total
EGOV	SI	Count	42	3	1	46
		Expected Count	38.3	2.3	5.4	46.0
	NO	Count	1	0	1	2
		Expected Count	1.7	.1	.2	2.0
	NO SABE	Count	7	0	5	12
		Expected Count	10.0	.6	1.4	12.0
Total		Count	50	3	7	60
		Expected Count	50.0	3.0	7.0	60.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.760[a]	4	.001
Likelihood Ratio	15.532	4	.004
Linear-by-Linear Association	12.457	1	.000
N of Valid Cases	60		

a. 6 cells (66.7%) have expected count less than 5. The minimum expected count is .10.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.167	.083	1.671	.095
		EGOV Dependent	.286	.148	1.671	.095
		SERVICE Dependent	.000	.000	.[c]	.[c]
	Goodman and Kruskal tau	EGOV Dependent	.243	.106		.000[d]
		SERVICE Dependent	.178	.109		.000[d]
	Uncertainty Coefficient	Symmetric	.217	.094	2.094	.004[e]
		EGOV Dependent	.203	.094	2.094	.004[e]
		SERVICE Dependent	.234	.099	2.094	.004[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.544			.001
	Cramer's V	.385			.001
	Contingency Coefficient	.478			.001
Interval by Interval	Pearson's R	.460	.138	3.940	.000[c]
Ordinal by Ordinal	Spearman Correlation	.412	.144	3.448	.001[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * WILLING	60	100.0%	0	.0%	60	100.0%

EGOV * WILLING Crosstabulation

			WILLING		Total
			SI	NO	
EGOV	SI	Count	44	2	46
		Expected Count	42.2	3.8	46.0
	NO	Count	1	1	2
		Expected Count	1.8	.2	2.0
	NO SABE	Count	10	2	12
		Expected Count	11.0	1.0	12.0
Total		Count	55	5	60
		Expected Count	55.0	5.0	60.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.593[a]	2	.037
Likelihood Ratio	4.381	2	.112
Linear-by-Linear Association	2.668	1	.102
N of Valid Cases	60		

a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is .17.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.000	.000	.[c]	.[c]
		EGOV Dependent	.000	.000	.[c]	.[c]
		WILLING Dependent	.000	.000	.[c]	.[c]
	Goodman and Kruskal tau	EGOV Dependent	.050	.056		.054[d]
		WILLING Dependent	.110	.127		.039[d]
	Uncertainty Coefficient	Symmetric	.079	.081	.936	.112[e]
		EGOV Dependent	.057	.059	.936	.112[e]
		WILLING Dependent	.127	.128	.936	.112[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.331			.037
	Cramer's V	.331			.037
	Contingency Coefficient	.315			.037
Interval by Interval	Pearson's R	.213	.147	1.657	.103[c]
Ordinal by Ordinal	Spearman Correlation	.241	.149	1.894	.063[c]
N of Valid Cases		60			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs-Gov-Employee

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * INTERNET	77	100.0%	0	.0%	77	100.0%

EGOV * INTERNET Crosstabulation

			INTERNET			Total
			SI	NO	No Sabe	
EGOV	SI	Count	58	10	1	69
		Expected Count	57.4	10.8	.9	69.0
	NO	Count	4	1	0	5
		Expected Count	4.2	.8	.1	5.0
	NO SABE	Count	2	1	0	3
		Expected Count	2.5	.5	.0	3.0
Total		Count	64	12	1	77
		Expected Count	64.0	12.0	1.0	77.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.949[a]	4	.917
Likelihood Ratio	.905	4	.924
Linear-by-Linear Association	.366	1	.545
N of Valid Cases	77		

a. 7 cells (77.8%) have expected count less than 5. The minimum expected count is .04.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.000	.000	.[c]	.[c]
		EGOV Dependent	.000	.000	.[c]	.[c]
		INTERNET Dependent	.000	.000	.[c]	.[c]
	Goodman and Kruskal tau	EGOV Dependent	.007	.017		.901[d]
		INTERNET Dependent	.009	.027		.839[d]
	Uncertainty Coefficient	Symmetric	.013	.026	.502	.924[e]
		EGOV Dependent	.015	.029	.502	.924[e]
		INTERNET Dependent	.012	.023	.502	.924[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.111			.917
	Cramer's V	.078			.917
	Contingency Coefficient	.110			.917
Interval by Interval	Pearson's R	.069	.125	.603	.549[c]
Ordinal by Ordinal	Spearman Correlation	.074	.129	.639	.525[c]
N of Valid Cases		77			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * SERVICE	77	100.0%	0	.0%	77	100.0%

EGOV * SERVICE Crosstabulation

			SERVICE		Total
			SI	NO	
EGOV	SI	Count	41	28	69
		Expected Count	39.4	29.6	69.0
	NO	Count	2	3	5
		Expected Count	2.9	2.1	5.0
	NO SABE	Count	1	2	3
		Expected Count	1.7	1.3	3.0
Total		Count	44	33	77
		Expected Count	44.0	33.0	77.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.441[a]	2	.487
Likelihood Ratio	1.428	2	.490
Linear-by-Linear Association	1.365	1	.243
N of Valid Cases	77		

a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is 1.29.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.049	.067	.709	.478
		EGOV Dependent	.000	.000	.[c]	.[c]
		SERVICE Dependent	.061	.083	.709	.478
	Goodman and Kruskal tau	EGOV Dependent	.013	.023		.362[d]
		SERVICE Dependent	.019	.030		.491[d]
	Uncertainty Coefficient	Symmetric	.017	.028	.600	.490[e]
		EGOV Dependent	.023	.038	.600	.490[e]
		SERVICE Dependent	.014	.023	.600	.490[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.137			.487
	Cramer's V	.137			.487
	Contingency Coefficient	.136			.487
Interval by Interval	Pearson's R	.134	.112	1.171	.245[c]
Ordinal by Ordinal	Spearman Correlation	.136	.113	1.190	.238[c]
N of Valid Cases		77			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * WILLING	77	100.0%	0	.0%	77	100.0%

EGOV * WILLING Crosstabulation

			WILLING			
			SI	NO	NO SABE	Total
EGOV	SI	Count	57	3	9	69
		Expected Count	54.7	3.6	10.8	69.0
	NO	Count	3	1	1	5
		Expected Count	4.0	.3	.8	5.0
	NO SABE	Count	1	0	2	3
		Expected Count	2.4	.2	.5	3.0
Total		Count	61	4	12	77
		Expected Count	61.0	4.0	12.0	77.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.863[a]	4	.065
Likelihood Ratio	6.112	4	.191
Linear-by-Linear Association	5.772	1	.016
N of Valid Cases	77		

a. 7 cells (77.8%) have expected count less than 5. The minimum expected count is .16.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.042	.070	.579	.563
		EGOV Dependent	.000	.000	.[c]	.[c]
		WILLING Dependent	.063	.105	.579	.563
	Goodman and Kruskal tau	EGOV Dependent	.056	.059		.076[d]
		WILLING Dependent	.070	.065		.031[d]
	Uncertainty Coefficient	Symmetric	.077	.066	1.120	.191[e]
		EGOV Dependent	.099	.082	1.120	.191[e]
		WILLING Dependent	.063	.055	1.120	.191[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.339			.065
	Cramer's V	.240			.065
	Contingency Coefficient	.321			.065
Interval by Interval	Pearson's R	.276	.149	2.483	.015[c]
Ordinal by Ordinal	Spearman Correlation	.250	.140	2.238	.028[c]
N of Valid Cases		77			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs-Gov-Business

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * INTERNET	13	100.0%	0	.0%	13	100.0%

EGOV * INTERNET Crosstabulation

			INTERNET		Total
			SI	NO	
EGOV	SI	Count	10	1	11
		Expected Count	8.5	2.5	11.0
	NO	Count	0	2	2
		Expected Count	1.5	.5	2.0
Total		Count	10	3	13
		Expected Count	10.0	3.0	13.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.879[b]	1	.005		
Continuity Correction[a]	3.590	1	.058		
Likelihood Ratio	7.343	1	.007		
Fisher's Exact Test				.038	.038
Linear-by-Linear Association	7.273	1	.007		
N of Valid Cases	13				

a. Computed only for a 2x2 table

b. 3 cells (75.0%) have expected count less than 5. The minimum expected count is .46.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.600	.392	1.041	.298
		EGOV Dependent	.500	.612	.585	.559
		INTERNET Dependent	.667	.272	1.537	.124
	Goodman and Kruskal tau	EGOV Dependent	.606	.292		.007[c]
		INTERNET Dependent	.606	.250		.007[c]
	Uncertainty Coefficient	Symmetric	.583	.250	1.748	.007[d]
		EGOV Dependent	.658	.199	1.748	.007[d]
		INTERNET Dependent	.523	.280	1.748	.007[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.778			.005
	Cramer's V	.778			.005
	Contingency Coefficient	.614			.005
Interval by Interval	Pearson's R	.778	.189	4.114	.002[c]
Ordinal by Ordinal	Spearman Correlation	.778	.189	4.114	.002[c]
N of Valid Cases		13			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * SERVICE	13	100.0%	0	.0%	13	100.0%

EGOV * SERVICE Crosstabulation

			SERVICE		
			SI	NO	Total
EGOV	SI	Count	11	0	11
		Expected Count	9.3	1.7	11.0
	NO	Count	0	2	2
		Expected Count	1.7	.3	2.0
Total		Count	11	2	13
		Expected Count	11.0	2.0	13.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.000[b]	1	.000		
Continuity Correction[a]	6.453	1	.011		
Likelihood Ratio	11.162	1	.001		
Fisher's Exact Test				.013	.013
Linear-by-Linear Association	12.000	1	.001		
N of Valid Cases	13				

a. Computed only for a 2x2 table

b. 3 cells (75.0%) have expected count less than 5. The minimum expected count is .31.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	1.000	.000	1.537	.124
		EGOV Dependent	1.000	.000	1.537	.124
		SERVICE Dependent	1.000	.000	1.537	.124
	Goodman and Kruskal tau	EGOV Dependent	1.000	.000		.001[c]
		SERVICE Dependent	1.000	.000		.001[c]
	Uncertainty Coefficient	Symmetric	1.000	.000	2.517	.001[d]
		EGOV Dependent	1.000	.000	2.517	.001[d]
		SERVICE Dependent	1.000	.000	2.517	.001[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. Sig.
Nominal by Nominal	Phi	1.000		.000
	Cramer's V	1.000		.000
	Contingency Coefficient	.707		.000
Interval by Interval	Pearson's R	1.000	.000[c]	
Ordinal by Ordinal	Spearman Correlation	1.000	.000[c]	
N of Valid Cases		13		

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Crosstabs

Warnings

No measures of association are computed for the crosstabulation of EGOV * WILLING. At least one variable in each 2-way table upon which measures of association are computed is a constant.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * WILLING	13	100.0%	0	.0%	13	100.0%

EGOV * WILLING Crosstabulation

			WILLING	
			SI	Total
EGOV	SI	Count	11	11
		Expected Count	11.0	11.0
	NO	Count	2	2
		Expected Count	2.0	2.0
Total		Count	13	13
		Expected Count	13.0	13.0

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	13

a. No statistics are computed because WILLING is a constant.

Directional Measures

			Value
Nominal by Nominal	Lambda	Symmetric	.[a]

a. No statistics are computed because WILLING is a constant.

Symmetric Measures

		Value
Nominal by Nominal	Phi	.[a]
N of Valid Cases		13

a. No statistics are computed because WILLING is a constant.

Crosstabs-Gov-Gov

Warnings

No measures of association are computed for the crosstabulation of EGOV * INTERNET. At least one variable in each 2-way table upon which measures of association are computed is a constant.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * INTERNET	36	60.0%	24	40.0%	60	100.0%

EGOV * INTERNET Crosstabulation

Count

		INTERNET		
		SI	NO	Total
EGOV	SI	28	8	36
Total		28	8	36

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	36

a. No statistics are computed because EGOV is a constant.

Directional Measures

			Value
Nominal by Nominal	Lambda	Symmetric	.[a]

a. No statistics are computed because EGOV is a constant.

Symmetric Measures

		Value
Nominal by Nominal	Phi	.[a]
N of Valid Cases		36

a. No statistics are computed because EGOV is a constant.

Crosstabs

Warnings

No measures of association are computed for the crosstabulation of EGOV * SERVICE. At least one variable in each 2-way table upon which measures of association are computed is a constant.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * SERVICE	36	60.0%	24	40.0%	60	100.0%

EGOV * SERVICE Crosstabulation

Count

		SERVICE	
		SI	Total
EGOV	SI	36	36
Total		36	36

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	36

a. No statistics are computed because EGOV and SERVICE are constants.

Directional Measures

			Value
Nominal by Nominal	Lambda	Symmetric	.[a]

a. No statistics are computed because EGOV and SERVICE are constants.

Symmetric Measures

		Value
Nominal by Nominal	Phi	.[a]
N of Valid Cases		36

a. No statistics are computed because EGOV and SERVICE are constants.

Crosstabs

Warnings

No measures of association are computed for the crosstabulation of EGOV * WILLING. At least one variable in each 2-way table upon which measures of association are computed is a constant.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EGOV * WILLING	36	60.0%	24	40.0%	60	100.0%

EGOV * WILLING Crosstabulation

Count

		WILLING	
		SI	Total
EGOV	SI	36	36
Total		36	36

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	36

a. No statistics are computed because EGOV and WILLING are constants.

Directional Measures

			Value
Nominal by Nominal	Lambda	Symmetric	.[a]

a. No statistics are computed because EGOV and WILLING are constants.

Symmetric Measures

		Value
Nominal by Nominal	Phi	.[a]
N of Valid Cases		36

a. No statistics are computed because EGOV and WILLING are constants.

Puerto Rico's Law 151 – eGovernment Laws

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Electrónico, Ley de Gobierno

Ley Núm. 151 de 22 de junio de 2004

(P. del S. 2507)

Para establecer la política pública del Estado Libre Asociado de Puerto Rico para la incorporación de fas tecnologías de información al funcionamiento gubernamental y definir las facultades, deberes y responsabilidades necesarias para su implementación; enmendar la Ley Núm. 147 de 18 de junio de 1980, según enmendada, conocida como la Ley Orgánica de la Oficina de Gerencia y Presupuesto, para incorporar dichas facultades, deberes y responsabilidades, y derogar la Ley Núm. 110 de 27 de junio de 2000, según enmendada, conocida como la Ley del Estado Digital de Puerto Rico.

EXPOSICIÓN DE MOTIVOS

La evolución que las nuevas tecnologías de la información y las telecomunicaciones han experimentado en los últimos años ha impactado la forma en que tradicionalmente se desarrollaban las relaciones sociales, económicas y culturales. Así, los canales de comunicación y las posibilidades de acercamiento entre personas distantes se han ampliado, cualitativa y cuantitativamente, causando una transformación innegable en la sociedad que tiene el potencial de generar riqueza, intercambio de información y mejorar la calidad de vida de cientos de miles de personas. La aplicación por el gobierno de las tecnologías de la información le brinda la oportunidad de mejorar la prestación de servicios al ciudadano, el desempeño de las funciones gubernamentales y la divulgación de información gubernamental, contribuyendo así a facilitar la participación de los ciudadanos en el gobierno. La incorporación de la tecnología a los programas y servicios de gobierno es una valiosa herramienta para reducir tanto el tiempo de gestión como los costos de operación, y facilitar la supervisión e implantación de soluciones a las necesidades de los ciudadanos, permitiendo que el gobierno preste servicios de mejor calidad. Ante esta realidad, los gobiernos a través de todo el mundo se han enfrentado al reto que plantea incorporar los nuevos métodos de trabajo que las tecnologías de la información ofrecen, con el propósito de convertirse en precursores de una nueva cultura digital que propenda a relaciones multilaterales entre ciudadanos, empresas y gobierno a través de Internet. Puerto Rico no es la excepción.

Consciente de que el acceso a la información es un instrumento democrático de incalculable valor, que le brinda transparencia, agilidad y eficiencia, y facilita la atribución de responsabilidad en la gestión gubernamental, el Gobierno del Estado

Libre Asociado de Puerto Rico ha emprendido acciones concretas en esta dirección, las cuales forman parte del Gobierno Electrónico. Tales esfuerzos tienen el objetivo de acelerar los efectos positivos que los cambios en la sociedad de la información derivan, gestionando el desarrollo y mantenimiento de la Red Interagencial de Comunicaciones, portales de Internet del Gobierno y de las agencias. Al presente, una sólida infraestructura de sistemas de información y telecomunicaciones es un requisito esencial para desarrollar y mantener la competitividad necesaria en la economía globalizada a la cual nos

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enfrentamos, lo cual ha impulsado al Gobierno a invertir grandes esfuerzos en la actualización de sus redes de comunicaciones. Las iniciativas están dirigidas a beneficiar la relación del gobierno con ciudadanos y empresas, las relaciones intergubernamentales y a promover la toma de decisiones informadas a la hora de establecer política pública.

Las referidas gestiones no son susceptibles de ser desarrolladas individualmente, ya que requieren coordinación y cooperación interagencial. El Gobierno Electrónico, congo elemento crítico de la gerencia gubernamental, debe ser instrumentado a través de un entramado que atienda los aspectos financieros relativos a la obtención de recursos materiales y humanos, y a su vez plantee y resuelva los asuntos subyacentes relativos a la infraestructura y seguridad y demás retos que conlleva la prestación de servicios en el gobierno. Se persigue entablar una dinámica intergubernamental que potencie al máximo los beneficios correspondientes a los adelantos en las tecnologías de la información y que resulte en relaciones interagenciales más cordiales, convenientes, transparentes y menos costosas. Con esto, se busca mejorar el desempeño del Gobierno, tanto a nivel de cada Agencia como a nivel interagencial. Para aprovechar al máximo los beneficios de esta iniciativa, se necesita liderato enérgico, una organización sólida, mejor colaboración interagencial y corroboración efectiva del cumplimiento por parte de las agencias de las disposiciones relativas al manejo de los recursos de información.

La iniciativa de Gobierno Electrónico del Estado Libre Asociado de Puerto Rico constituye una herramienta útil para enfrentar los nuevos retos que plantea la gobernabilidad. Aspira a proveerle al individuo y a las corporaciones una oficina virtual abierta 24 horas al día, 7 días a la semana, 365 días al año, donde tengan a su disposición información sobre los servicios, formularios para solicitar servicios, entrega en línea de formularios, presentación en línea de solicitudes, pago de derechos y comprobantes, respuestas a sus solicitudes de servicio, la posibilidad de presentar querellas ante organismos reguladores y foros para opinar sobre la calidad de los servicios recibidos. Puerto Rico tiene el potencial de convertirse en país líder de Latinoamérica y el Caribe en el desarrollo de un Gobierno Electrónico, y de unirse a los poco más de 23 países del mundo que cuentan con programas de gobierno electrónico reconocidos por organismos internacionales como líderes en la incorporación de tecnología informática y de telecomunicaciones a la gestión pública. La Oficina de

Gerencia y Presupuesto, al amparo de las facultades otorgadas en su ley habilitadora relativas a los sistemas de información, métodos de procesamiento electrónico e interconexión del Gobierno, ha impulsado esta iniciativa a través del Portal de Internet del Gobierno, www.gobierno.pr.

Mediante esta Ley se pretende inyectar de voluntad y de liderato efectivo la gestión gubernamental de manera que se garantice el éxito de los esfuerzos emprendidos, estableciendo una estructura organizativa clara que instrumente los cambios necesarios e incorpore a las operaciones gubernamentales las mejores prácticas del sector tecnológico.

Tal encomienda se llevará a cabo con los siguientes objetivos como punto de referencia: promover el uso del Internet y de otras tecnologías de la información de manera que incremente la participación ciudadana en el gobierno; promover la colaboración interagencial, mediante la integración de funciones relacionadas y el uso de los procedimientos internos del Gobierno Electrónico, de manera que mejoren los

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servicios al ciudadano; reducir costos y cargas tanto para las entidades gubernamentales corno para las personas naturales y jurídicas que requieren servicios gubernamentales; promover la alfabetización digital del Pueblo y una cultura empresarial capaz de apoyar y desarrollar nuevas ideas; asegurar un proceso socialmente. inclusivo, capaz de generar la confianza de los usuarios y fortalecer la cohesión social; desarrollar al máximo el potencial de riqueza de la información social, cultural y comercial que contienen las bases de datos, y la adquisición eficiente de bienes por parte del gobierno.

Al implementar la política pública establecida mediante esta Ley, la Oficina de Gerencia y Presupuesto tendrá a su haber la encomienda de promover un acercamiento coordinado a las cuestiones que plantea la sociedad de la información y de facilitar que el acceso a la información y los servicios gubernamentales se ofrezca de manera armonizada con las disposiciones aplicables relativas a, entre otras, la protección de la privacidad, seguridad, políticas de disponibilidad de información y garantías de acceso a personas con impedimentos. Asimismo, tendrá a su cargo la evaluación y actualización de las Guías emitidas por el Comité de la Gobernadora sobre Sistemas de Información que rigen la adquisición e implantación de los sistemas, equipos y programas de información tecnológica para los organismos de la Rama Ejecutiva del Estado Libre Asociado de Puerto Rico.

DECRÉTASE POR LA ASAMBLEA LEGISLATIVA DE PUERTO RICO:

Artículo 1.- TITULO

Esta Ley se conocerá como la "Ley de Gobierno Electrónico".

Artículo 2.- DEFINICIONES

Los siguientes términos y frases contenidas en esta Ley tendrán el significado que a continuación se expresa:

(a) "Gobierno Electrónico" significa la incorporación al quehacer gubernamental de las tecnologías de la información con el propósito de transformar y agilizar las relaciones del Gobierno con los ciudadanos y empresas, además de las relaciones gubernamentales, de manera que el Gobierno resulte uno más accesible, efectivo y transparente al ciudadano.

(b) "Agencias" significa todos los organismos o instrumentalidades y entidades de la Rama Ejecutiva del Estado Libre Asociado de Puerto Rico, tales como departamentos, juntas, comisiones, administraciones, oficinas, subdivisiones y corporaciones públicas que estén bajo el control de dicha Rama.

Artículo 3.- POLÍTICA PÚBLICA

El Gobierno del Estado Libre Asociado de Puerto Rico adopta como política pública la incorporación de las tecnologías de información a los procedimientos gubernamentales, a la prestación de servicios y a la difusión de información, mediante

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una estrategia enfocada en el ciudadano, orientada a la obtención de logros y que fomente activamente la innovación.

Artículo 4.- IMPLEMENTACIÓN DE LA POLÍTICA PÚBLICA

La Oficina de Gerencia y Presupuesto será la responsable de, a tenor con la política pública establecida en la presente Ley, administrar los sistemas de información e implementar las normas y procedimientos relativas al uso de las tecnologías de la información a nivel gubernamental, a la vez que ofrecerá asesoramiento a las agencias actualizará y desarrollará las transacciones gubernamentales electrónicas, y se asegurará del funcionamiento correcto de las mismas.

Artículo 5.- FUNCIONES

La Oficina de Gerencia y Presupuesto, a tenor con la presente ley, tendrá las siguientes funciones:

A- Lograr, mediante la aplicación de los nuevos métodos de trabajo que ofrecen las tecnologías de la información, un gobierno más accesible, efectivo y transparente al ciudadano.

B- Promover un acercamiento coordinado a las cuestiones que plantean las nuevas tecnologías de la información y las comunicaciones.

C- Dirigir y administrar el Programa del Gobierno Electrónico y establecer el plan estratégico del mismo.

D- Desarrollar medidas de ejecución susceptibles de medir cómo el Gobierno Electrónico y los diferentes componentes de servicio adelantan los objetivos propuestos.

E- Considerar el impacto del desarrollo del uso de las tecnologías de la información a nivel gubernamental y del Gobierno Electrónico en diferentes legislaciones vigentes y procurar su armonización.

F- Estimular el desarrollo de soluciones innovadoras que conduzcan a la optimización de los servicios y procedimientos del Gobierno Electrónico y al uso de las tecnologías de la información a nivel gubernamental.

G- Desarrollar y mantener, directamente o mediante contrato, una infraestructura capaz de suplir las necesidades tecnológicas del Gobierno y que permita el ofrecimiento adecuado de servicios e información al ciudadano.

H- Incorporar a las operaciones gubernamentales las mejores prácticas del sector tecnológico, por medio de licenciamientos y adiestramientos globales u otros esquemas ventajosos a nivel gubernamental.

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I- Desarrollar un andamiaje que garantice controles efectivos con relación a la seguridad de los sistemas de información que sustentan las operaciones y activos gubernamentales.

J- Facilitar la comunicación entre la diversidad de tecnologías existentes en las instituciones del Gobierno, de manera que se logre la cooperación y coordinación necesaria para asegurar el éxito del Gobierno Electrónico.

K- Desarrollar, promover, colaborar, gestionar y dirigir proyectos de tecnología a nivel interagencial que propendan a un mejor funcionamiento gubernamental y a la ampliación de servicios al ciudadano y al empresario.

L- Proveer servicios de apoyo técnico, de almacenamiento de datos y de acceso a Internet a las agencias gubernamentales.

M- Proyectar la utilidad de las tecnologías de la información para prevenir accidentes y preparar planes de contingencia que permitan al gobierno

reaccionar adecuadamente en caso de crisis para el restablecimiento de sistemas y datos en caso de desastre en el menor tiempo posible.

N- Evaluar y asesorar, de acuerdo a los criterios previamente adoptados, los sistemas de procesamiento electrónico e interconexión del Gobierno de manera que los mismos propicien, faciliten y agilicen los procesos interagenciales.

Artículo 6.- FACULTADES

La Oficina de Gerencia y Presupuesto, a tenor con la presente Ley, tendrá las siguientes facultades:

A- Podrá requerir la información y los documentos que entienda necesarios para la incorporación de procesos y servicios gubernamentales al Gobierno Electrónico.

B- Podrá realizar las gestiones necesarias para anunciar y promover entre los ciudadanos los servicios disponibles a través del Gobierno Electrónico, las ventajas que conllevan y la manera de utilizarlos. Así también, podrá patrocinar actividades para implicar al público en el desarrollo e implementación de las tecnologías de la información.

C- Podrá contratar servicios, programas y equipos necesarios para cumplir con la política pública establecida mediante esta Ley y en la gestión del Gobierno Electrónico, incluyendo programas globales de licenciamiento y adiestramiento.

D- Podrá requerir la participación administrativa de las agencias del Gobierno en el desarrollo de proyectos de colaboración.

E- Podrá establecer políticas de seguridad a nivel gubernamental sobre el acceso, uso, clasificación y custodia de los sistemas de información.

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F- Podrá establecer políticas dirigidas a garantizar la privacidad y protección de la información personal con relación al uso del Internet.

G- Podrá realizar las gestiones necesarias relacionadas con el desarrollo y actualización del portal gubernamental central y de la infraestructura de comunicaciones e información.

H- Podrá servir de ente coordinador de las correspondientes áreas de Sistemas de Información de las diferentes agencias e instrumentalidades de manera que se puedan incorporar efectivamente las mejores prácticas del sector tecnológico.

I- Podrá agenciar proyectos de tecnología con impacto interagencial.

J- Podrá encaminar el desarrollo de carreras de empleados de Gobierno en el área de Informática.

K- Podrá administrar y contratar aquellos servicios necesarios para adelantar el Gobierno Electrónico, que incluyen pero no se limitan a, servicios de Internet, el centro de apoyo técnico y el banco de datos a nivel gubernamental.

L- Con relación a los sistemas de procesamiento electrónico e interconexión del Gobierno, podrá realizar las siguientes funciones:

i. Instrumentar la política pública a seguir y las guías que regirán la adquisición e implantación de los sistemas, equipos y programas de información tecnológica para los organismos gubernamentales con el objetivo primordial de lograr la interconexión de los organismos para facilitar y agilizar los servicios al pueblo.

ii, Encomendar la realización de los estudios necesarios que identifiquen los parámetros y dirección estratégica para adoptar la política pública en el desarrollo de los sistemas de información del Gobierno.

iii. Establecer y emitir por medio de políticas las guías o parámetros indicados en el apartado (i) de este Artículo.

Artículo 7.- DEBERES DE LAS AGENCIAS

Con relación a la consecución de los propósitos de esta Ley, los Jefes de agencias e instrumentalidades tendrán los siguientes deberes:

A- Desplegar una página electrónica que contenga la información necesaria para que los ciudadanos puedan conocer su misión, los servicios que ofrecen, la localización geográfica de las oficinas, sus horarios y números de teléfono, que deberá estar conectada al portal principal, www.gobierno.pr.

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B- Desarrollar las actividades y gestiones necesarias dirigidas a incorporar activamente el uso de tecnologías de información y telecomunicaciones en el funcionamiento gubernamental, con especial atención a las siguientes áreas: servicios a los ciudadanos, compras y subastas, orientación y divulgación sobre temas de interés social, cultural y económico para los ciudadanos a través del portal del Gobierno.

C- Apoyar, en lo que respecta al Gobierno Electrónico, los esfuerzos para desarrollar, mantener y promover la información y los servicios

gubernamentales, así corno enfocar sus esfuerzos y recursos para cumplir con los planes de trabajo para la conversión de transacciones a medios electrónicos.

D- Desarrollar medidas de ejecución capaces de medir cómo el Gobierno Electrónico adelanta los objetivos de la Agencia o instrumentalidad.

E- Considerar el impacto del desarrollo de estos servicios en personas que no tienen acceso a Internet y llevar a cabo los esfuerzos necesarios, mediante programas y alianzas con el sector privado y con organizaciones sin fines de lucro, para asegurar que todos los sectores de la sociedad logren acceso a los mismos.

F- Cumplir con lo dispuesto en la presente Ley, las políticas de manejo de información y los estándares tecnológicos relativos a la Informática emitidos por la Oficina de Gerencia y Presupuesto.

G- Impartir las instrucciones necesarias para asegurar el cumplimiento de esta Ley y las normas que se emitan de conformidad con la misma, asegurándose de que las políticas gerenciales de manejo de información y las guías que bajo esta Ley emita la Oficina de Gerencia y Presupuesto sean comunicadas de manera rápida y efectiva al personal correspondiente.

H- Estructurar las respectivas áreas de Sistemas de Información de cada agencia de manera que sean las encargadas de implementar las políticas de manejo de información y las Guías al respecto que emita la Oficina de Gerencia y Presupuesto.

I- Las páginas electrónicas gubernamentales beberán estar diseñada en lenguaje universal conforme con los parámetros establecidos en la Ley Núm. 229 de 2 de septiembre de 2003, según enmendada, conocida como la Ley para Garantizar el Acceso de Información a las Personas con Impedimentos, de forma tal que los equipo de asistencia tecnológica, de personas con impedimentos, las puedan reconocer y accesar.

Artículo 8.- DEBER DE INFORMAR AL PÚBLICO

La Oficina de Gerencia y Presupuesto estará obligada a desarrollar campañas de orientación a través de los distintos medios, mediante las cuales le informará a la

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ciudadanía sobre tos servicios disponibles a través del Gobierno Electrónico, las ventajas que conllevan y la manera en que pueden utilizarlos.

Artículo 9.- DEBER DE PUBLICAR INFORMACIÓN

La Oficina de Gerencia y Presupuesto deberá rendir un informe anual sobre las acciones concretas en la consecución de la política pública establecida mediante la presente Ley y el progreso de Gobierno Electrónico a la Asamblea Legislativa y al Gobierno del Estado Libre Asociado de Puerto Rico. Este informe deberá incluir, además, un análisis del impacto del Programa de Gobierno Electrónico en la administración de los recursos humanos. Dicho informe deberá estar disponible al público a través del Portal del Gobierno, www.gobierno.pr.

Artículo 10.- DERECHOS DEL CIUDADANO

Al amparo de la política pública establecida en el Artículo 3, los ciudadanos del Estado Libre Asociado de Puerto Rico tendrán derecho a tener disponible a través del Internet información gubernamental y a recibir servicios del Gobierno por medios electrónicos, incluyendo pero no limitado a:

1. Solicitudes de certificados de matrimonio y nacimiento;

2. Solicitudes de antecedentes penales y de buena conducta;

3. Radicación corporativas y de registros de marcas;

4. Solicitudes de préstamos ante sistemas de retiro;

5. Solicitudes de financiamiento ante el Banco de Desarrollo Económico;

6. Solicitudes de empleo en todas las agencias e instrumentalidades del Gobierno;

7. Reservaciones de espacio en la Autoridad de Transporte Marítimo;

8. Reservaciones en los centros vacacionales que opera el Gobierno;

9. Inclusión en los registros de licitadores elegibles para participar en subastas de cada agencia o instrumentalidad;

10. Acceso electrónico a los textos de todas las medidas radicadas ante las Secretarías del Senado y la Cámara de Representantes, al igual que los informes en torno a éstos, récords de votación, textos de aprobación final y textos enrolados;

11. pagos de sustento de menores;

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12. La radicación de solicitudes de asesoramiento laboral o de administración de los recursos humanos. La radicación de nominaciones para participar en los

adiestramientos. La solicitud para contratar servicios profesionales en la preparación de planes de clasificación y de retribución para empleados, administración de exámenes, normas de reclutamiento, sistemas de evaluación y reglamentos de personal;

13. Radicación cíe las planillas contributivas requeridas por ley, incluyendo pero no limitado a las de ingresos, retención y arbitrios;

14. Solicitudes de beneficios de desempleo, tarjeta de salud y ayudas asistenciales y beneficios de programas sociales que estén vigentes;

15. Permisos de uso y otras solicitudes ante la Administración de Reglamentos y Permisos;

16. Solicitudes no relacionadas a préstamos ante los diversos sistemas de retiro;

17. Acceso a la transmisión en video y audio de las sesiones de los Cuerpos Legislativos;

18. Pago de multas de tránsito;

19. Solicitudes de licencia de conducir y renovación de licencias, prestación de fianzas;

20. Solicitudes de licencias de caza, embarcaciones y demás solicitudes requeridas por el Departamento de Recursos Naturales y Ambientales;

21. La participación de audiencias públicas de comisiones legislativas mediante teleconferencia, previo arreglo con la Secretaría del Cuerpo Legislativo correspondiente; y

22. Sellos profesionales electrónicos.

Tales servicios se prestarán siempre que sean factibles, no sean irrazonables y no exista algún impedimento legal para hacerlo. Para determinar si se ha violentado este derecho, se tomarán en cuenta los esfuerzos y gestiones razonables que el Gobierno haya realizado a los fines de ofrecer tales servicios electrónicamente, reconociendo que se trata de un programa en constante progreso.

Además, los ciudadanos del Estado Libre Asociado de Puerto Rico tendrán derecho a que los servicios gubernamentales que se ofrezcan por medios electrónicos se brinden de manera armonizada con las disposiciones aplicables relativas a la protección de la privacidad, seguridad de la información, políticas de disponibilidad de información y garantías de acceso a las personas con impedimentos.

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Artículo 11.- DEROGACIONES

A. Se deroga el Artículo 7 de la Ley Núm. 147 de 18 de junio de 1980, según enmendada, conocida como "Ley Orgánica de la Oficina de Gerencia y Presupuesto". Las Guías emitidas por el Comité de la Gobernadora sobre Sistemas de Información mantendrán su vigencia hasta que sean sucesivamente evaluadas, actualizadas y emitidas por la Oficina de Gerencia y Presupuesto.

B. Se deroga la Ley Núm. 110 del 27 de junio de 2000, conocida como "Ley del Estado Digital de Puerto Rico", según enmendada.

Artículo 12.- VIGENCIA

Esta Ley comenzara a regir inmediatamente después de su aprobación.