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An E-Government Platform for Improving Communication among Municipalities and Citizens in the North of Chile

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ABSTRACT

Government and its further development has been increasingly associated with the use of IT and communication. This interconnection is also happening in developing countries such as Chile. This study is designed to assess the e-government infrastructure and the use of IT and communication among some municipalities in Chile in order to implement a platform that allows government to government (G2G), government to employees and government to citizens (G2C) communication. The proposed platform will allow these municipalities to share information about citizens and corporations in the region. This study is conducted in second region of Chile and considered eight municipal governments. The findings suggest that while all the municipalities are highly interested in e-government initiatives, their infrastructure are different and in a very early stage of development. Thus, the study suggested e-government platform highly flexible to incorporate the differences in infrastructure among the municipalities, as secure as possible to allows government interactions, and implemented using an Application Service Provider (ASP) solution. As a result a distributed system using a Java system (J2EE) was the technology chosen e implemented for the ARM2 e-government platform.

Keywords

E-Government, Web Platform, G2G

INTRODUCTION

E-Government is a concept that combines intensive employment of Information Technology (IT) and communication with different modalities of management. The government of Chile has recognized the importance and benefits of IT and the Internet in various areas in order to produce a new approach to government. Chile as a country has decided to integrate this concept as a governmental policy in a presidential statement in May 11 2001 (Gobierno de Chie, 2001). This policy attempts to incorporate the advancement of IT and communication to improve the efficiency and efficacy of government management, to decrease transaction costs and coordination through the interaction among public entities, to generate incentives and procedures that facilitate the administration, to incorporate more public value to the activities of the sector, and to improve the degrees of transparencies in all their activities. The digital agenda is another initiative introduced by the government to assure that government will provide some basic digital services to the citizen before 2010. At the local governmental level, the Chilean Government has created specific programs to improve the capacities of the municipalities. A specific program to strengthening the municipal administration (PROFIM) is dedicated to help municipalities to implant the e-government concept in every region of Chile.

Chile is administratively divided in twelve regions and a metropolitan region, the capital. The study was conducted in the Second Region of Chile, Antofagasta. This region is located in the desert of Atacama, known as the driest region in the world. Antofagasta is the location for important copper mines which represent the highest portion of the national income. This region has experimented important internal migrations. This region belongs to Chile since 1879 after the war among Chile, Peru, and Bolivia. The region covers an area of 50,000 sq. miles with highly sparse cities and towns (the main ones are the head of the municipalities). The altitudes of the cities and towns range from sea level to 12,000 feet in the highest Andes plateau. While there is a good road infrastructure and two major airports in the region, difficulties in communications have been always impulses for the use of technology. This study is aimed to improve coordination and communication among authorities of the region and to facilitate the achievement of G2G and G2C aspects of the e-Government model. The Second Region Regional Association of Municipalities (from now on ARM2), is the association for which this study was conducted.

The main goal of the study was to create a new channel for communication and management that allows real time interaction among the members of ARM2 and the citizens. The previously mentioned arid and vast characteristics of the territory drove the need to connect the nine municipalities in ARM2. The Information Technology infrastructure of the ARM2

municipalities was very diverse basically because these municipalities had different level of population, level of income, and economic activities.

The project for ARM2 seeks to establish a distributed technological platform that allows the interoperation of geographically disperses municipalities systems and applications. This interoperation will optimize each municipality's decision and improve the services that require interrelation among municipalities and citizens (figure 1). The project will bring some advantages in coordination and administration for ARM2.
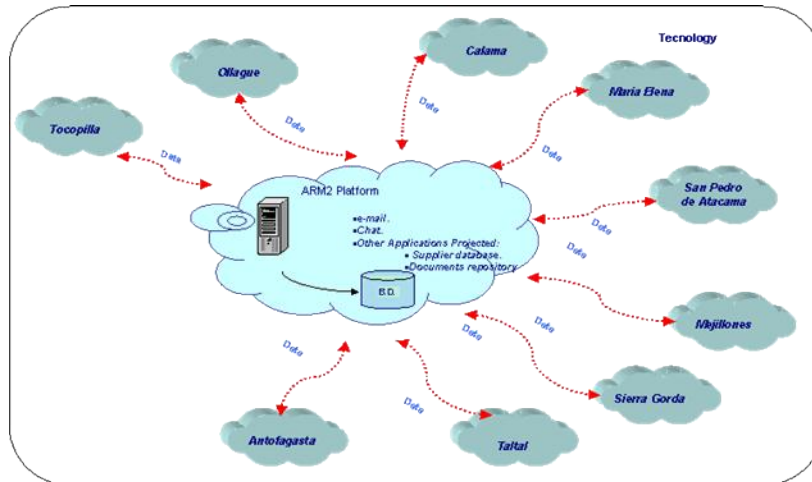

Figure 1. ARM2 Technological Platform

The advantages expected from the ARM2 project are: i) To improve in a significant way the administration, collaboration and communication among the municipalities of the region, ii) To bring the public entities to the people, iii) To provide an informative window to all the inhabitants of the region and the country, and iv) To enable technological capacities providing better information for the whole community. This platform will permit ARM2 to become a virtual office of coordination and administration. In Chile only the Araucanía region possesses a basic technology where the association deploys basic information about the region and its municipalities.

The research team conducted a digital city survey (Hilbert, 2002) to analyze the technological infrastructure of eight municipalities in the second region of Chile as well as to identify the main objectives for using e-government. The first part of this study defines the necessities and requirements for the platform of the Association of Municipalities using a survey that assesses the level of technological architecture in these municipalities. Additionally a questionnaire specifically developed for the research team to identify the particular requirements that each municipality demand was carried out. The second part of the study is dedicated to the design and implementation of prototypes of applications of the tools chosen for the ARM2 platform, so that these prototypes will become the base for the final development.

BACKGROUND

Electronic Government

Electronic government, or e-government, is a term created to describe these technology-mediated interaction opportunities in the public sector. This technology is used principally in the form of IT and communication (TV, Radio, telephones, computers and networks). This new form of government enables the access to information, communication and transaction as well as participation for citizens, businesses and organizations in a way that they have never seen before. Moon (2002) suggests that the e-government concept and practice has followed the private-sector adoption of e-business and e-commerce.

The e-government concept has evolved as Internet Technologies are becoming increasingly mature. Moon (2002) and West (2004) point out that e-government definitions now are including a variety of IT applications that go beyond simple online interactions and include computers, faxes, and wireless devices. E-government applications now include country portals, regional (state) portals and local municipality websites (Moon, 2002). Although academic researchers and government practitioners around the world agree on the definition of e-government and what it includes, there are some differences in scope, depending on government structure, budget allocations, resources, availability of skills and technology, and central

government vision. An e-government definition provided by the World Bank (www.worldbank.org) stated that "E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other branches of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions." The Gartner Group describes e-government as "the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet and new media (Baum, Di Maio, and Caldwell, 2000)." Most of the e-government goals can be achieved through Government to Government (G2G), Government to Business (G2B), Government to employees (G2E) and Government to citizens (G2C) operations. G2G is said to consist of activities between one government and other branch of the government. This type of e-government also considers the relationship with other governments of different countries. G2C comprise all the electronic interactions that the government has with its citizens. G2B refers to electronic commerce where the government sells to businesses or provides them with services, as well as businesses selling products and services to the government. This type of electronic government facilitates businesses to interact, transact and communicate with government in a speedy and convenient way. G2E involves the activities and services between government units and their employees, and its objective is to develop IT capabilities among government employees in order to generate efficient and cost-effective services.

E-Government in Chile

Chile has achieved important advances in electronic government in the last decade. Some statistics that demonstrate this advance are: i) toward the end of 2003, near a million homes had computers, half of them with access to the Internet , ii) near one hundred thousand companies are connected to the Internet iii) there are almost three hundred and twenty thousand broadband connections. This statistics shows penetration levels close to countries considered developed. Indeed, all central governmental services have portals in Internet and there is more that 170 on-line processes available for citizens. It is necessary to point out the successful take off of the electronic invoice which constituted the first concrete application of the Law of Document and Electronic Signature signed on March 25, 2002. This initiative was possible thanks to the continuous growth of the last fifteen years, the economic aperture that allowed the reduction of computers prices and, the duplication of the income per capita which favored the increment of the demand for TI and communication devices and services (Chateau, 2003).

In the last three years the community access to Internet has improved via schools and Infocenters. The use of Internet in schools and infocenters has compensated the inequality of access in homes and work. Indeed, figure 2, produced with the information gathered in a national survey CASEN, evidences that the Internet connections from homes are concentrated on the level with highest income, and the access to Internet from work places is better distributed. It is necessary to emphasize that the great fairness factor comes from schools connections (enlaces program) and Infocenters where people at lower income level are concentrated.

The situation has improved substantially from 2000 to 2003. The number of schools in the net "Enlaces" increased from 5.335 to 8.352, the number of Infocenters increased from some few dozens to 1,300, and cybercafés have also increased at a similar level.

A number of rankings and studies by international institutions emphasises the high access level to the Internet achieved by Chile. In the 2004 e-Readiness Rankings, the Economist Intelligence Unit (EIU, 2004) identified Chile as "Latin America's most e-ready market", highlighting the country's introduction of electronic invoicing. In 2004, Chile obtained the 29th position out of 64 countries. In another study, the 2003-2004 Networked Readiness Index, published by the World Economic Forum (WEF), Chile took the 32nd position out of 102 economies. Chile ranked above Brazil, China, and the Czech Republic. The WEF report highlighted the rapid growth of Internet users over the last three years. However, the report of the International Union of Telecommunications (UIT) locates Chile in the 43° place considering digital access. This rank represents a significant lower position compared with developed countries. This situation is faced in homes and companies, but Government and educational organization are in a better position. Also, there is an important digital gap that is determined by the unequal distribution of income, the difference of productivity among big and small companies, as well as the differences in telecommunications infrastructure between the Metropolitan Region and the rest of the country. A global e-government study conducted by the Center for Public Policy at Brown University (West, 2004) analyzed what is online globally and how electronic government has changed. The study ranked Chile in the 40° position. This study analysed 1,935 government websites in 198 different nations during summer, 2004.
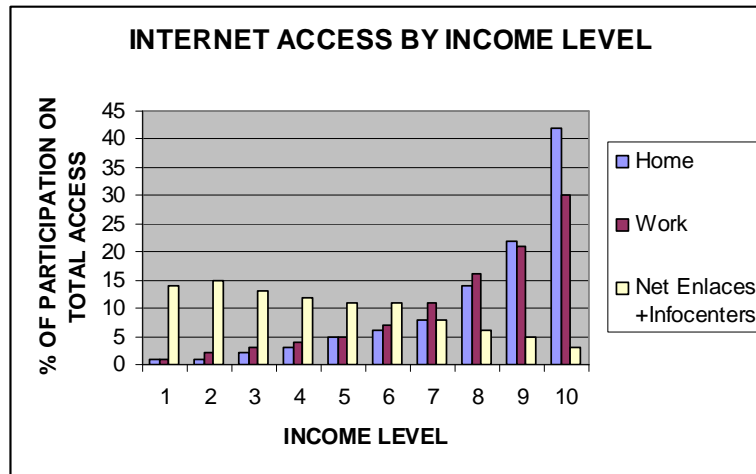
INTERNET ACCESS BY INCOME LEVEL

Figure 2. Internet Access in Chile according to income level (Gobierno de Chile, 2004)

The digital agenda, an explicitly digitally oriented public policy, attempted to reduce the digital gap between the people with internet access and the ones who have not access in Chile. This initiative created some specific regulations to facilitate the development of a modern telecommunications infrastructure. Chile was the first Latin America country that carried out an effort to create a strategy of digital development. A preliminary evaluation of this policy in 2004 showed that ten of the eleven high-priority actions in the initial digital agenda were satisfactorily fulfilled. In the period 1998-2003, the users of Internet have quintupled, the number of schools connected to the Internet has been duplicated, and the number of small companies with access to Internet has tripled. At the end of 2003 the government estimated that about 3,7 millions of Chileans have Internet access from their homes, work, educational institutions, or Infocenters. The government also expects that by the end of 2005 around five millions users will be connected. This growing number will be a result of the growth of homes and companies connected, but also it will be a result of the extended use of Infocenters and cybercafés.

In spite of the better position of the country in the digital rankings, the evolution of e-government at municipal level is still at an early stage of development.. A study conducted by the E-Governance Institute, the National Center for Public Productivity, and the Global e-Policy e-Government Institute in 2003 (UNDP 2003) positioned the capital of Chile, Santiago, in the 60th position among 80 countries. This study focused on the evaluation of current e-government practices from the perspective of government. The emphasis of the UNDP research was on the evaluation of each Web site in terms of digital governance, digital government (delivery of public service) and digital democracy (citizen participation in governance). The criteria used in this study were security, usability, and content of websites, the type of online services currently being offered, and citizen response and participation through websites established by city governments. The low score of the city of Santiago was mainly due to the privacy, services and participation criteria. The study also showed that most of the progress toward a digital development is concentrated in the capital of Chile, Santiago, with more than 50% of the e-commerce initiatives and Internet users located in this capital.

E- Government at Municipal level

Electronic government at municipal level has been studied from various perspectives. Moon (2002) analyzed the state of municipal e-government implementations using the 2000 e-government survey conducted by the City/County Management Association and Public Technology Inc. finding that although e-government has been adopted at municipal level, it is still in an early stage. Moon (2002) also suggested that there are some financial, technical, and legal barriers to the progress of municipal e-government in the United States. Sanchez, Koh, Kappelman, and Prybutok (2003) examined the connection between the barriers that affect the success of e-government initiatives and the use of IT for strategic communication at a municipal government in the State of Texas finding that effective communication among the relevant parts of the government was essential in overcoming barriers to successful e-government. Also, in Austria the cities of Vienna and Zagreb are developing systems to integrate tourism information and citizen relation management as an approach to resolve common problems.

However, most of the e-government initiatives at municipal level are conducted on developed countries. Some efforts implementing e-government projects that allow communication among municipalities in developing and less developed

countries have been undertaken in Greek, India, and Southern Africa. For example, Bouras , Destounis , Garofalakis ,Triantafillou , Tzimas , and Zarafidis developed a system with the support from the Greek General Secretariat of Research and Technology that is intended to improve the efficient distribution and management of information between and within different types of local authorities (Municipalities, Prefectures). Some initiatives to take advantage of the networking opportunities between city governments in Southern Africa are mentioned by Odendaal (2003). However, she highlighted that most of these interventions are still in their infancy.

Association of Regional Municipalities in the second region of Chile (ARM2)

ARM2 is a public entity that represents an institutional net of municipalities and coordinates the administration, collaboration and communication among them. This organization created to contribute to the development of the region, does not pursue profit goals and its members are all the municipalities in the Second Region of Chile. The members of ARM2 are the municipalities of Antofagasta, Calama, María Elena, Mejillones, Ollagüe, San Pedro de Atacama, Sierra Gorda, Taltal and Tocopilla. ARM2 headquarter is located in the city of Antofagasta. The main objective of the ARM2 is to support the work of their members at local, national and international level. ARM2 plays an important role as regulatory entity as well as coordinator and agent of projects that involve the development of the region. ARM2 decided to be involved actively in this new electronic government conception following the tendencies proposed by the government of Chile and due to the constant growth that this region has experienced (Gobierno de Chile, 2004).

METHODOLOGY

The study used an action research methodology where the research team participates in the study and evaluations that allow interventions. The first part of the study analysed e-government capabilities of the municipalities members of ARM2 using a survey developed by Martin Hilbert (Hilbert, 2002) from the Economic Commission for Latin America and the Caribbean (CEPAL) to assess the digital level of cities in Latin America. This survey's main objective was to obtain information on the use of IT and the services provided by the municipalities of the second region of Chile. The results of this survey were expected to help in the design of an electronic government platform for ARM2. The survey was applied to all technology chief officers (CIO) in every municipality and the results were analyzed using descriptive statistics and cross tabulation tables in SPSS. In this stage also the CIO and administrative manager in every the municipalities were consulted through the use of a questionnaire and interviews about the specific requirements for the platform. The main results of the requirement analysis process allowed the research team to recommend a solution that took into consideration the specific characteristic and requirements of all municipalities in the project.

The second part of the study attempted to design a prototype of the platform that allows the interaction among the municipalities in the region. Moon (2002) found that there is a positive relationship between population and e-government capacity at the local level so the author warns about the need to assimilate this differences when implementing a e-government initiative that include various municipalities. The final prototype was developed considering the size and the individual technological capacities of every municipality in ARM2. They main goal of this process was to allow the platform to be flexible secure and scalable.

Survey and Subjects

The surveys and questionnaires used in the study were applied to the CIO and administrative managers of the ARM2 municipalities. In the evaluation of the municipal technological capabilities, the study used the CEPAL "digital cities" survey (Hilbert, 2002) to assess the level of digital development in every municipality. The detection and evaluation of the requirements for the ARM2 technological platform used a questionnaire specifically developed by the research team and series of interviews.

The research team invited all the CIO and administrative managers of the ARM2 municipalities to a working meeting. Two surveys, the digital city survey and the survey to assess the municipality's individual requirements to the e-government platform were handed to these municipalities officials. The areas of assessment of the digital city Instrument are presented in Table 1

A questionnaire to identify and evaluate the requirements for the e-government platform was used. This questionnaire had 33 questions that evaluated the level of IT knowledge in every municipality as well as the basic requirements for the platform. The result of the questionnaire allowed the research team to produce specific interviews with the future users in every municipality. Finally a complete set of requirements were obtained and the design of the platform was possible.

E- government category	Number of questions
Infrastructure	7
Objectives	1
Strategies	5
Generic Services	6
Obstacles	6
General information	4

Table 1. Digital City Survey categories

DATA ANALYSIS

Digital City Survey

Some demographic data indicate that there were two major municipalities participating in this project, Antofagasta y Calama with 300.000 and 200.000 inhabitants respectively. The size of the rest of the municipalities can be considered small and those range from 300 to 23.900 inhabitants.

Some basic information about the characteristic of the municipalities shows that, as expected, the major municipalities has better capacities in terms of human resources as well as infrastructure (figure 3). The questions for figure 3 were coded on a five-point scale (0, 1, 2, 3,4,5) where 5 represents 100% y 0 is used for "no answer".
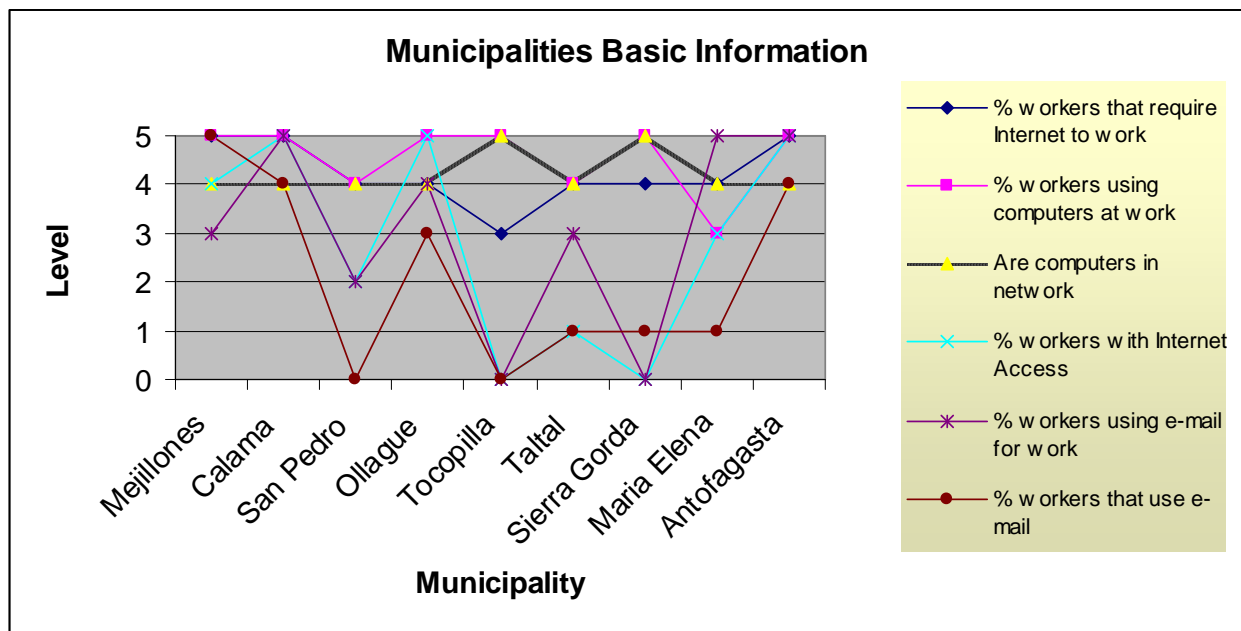
Figure 3. Basic Characteristic of ARM2 Municipalities

The question regarding the main e-government objectives for the ARM2 municipalities showed that most of the traditional objectives of e-government were considered important for all the municipalities. Only minor difference in importance of every objective is present. Table 2 shows that for all municipalities the objectives of Improving the accessibility, improving service speed, improving service quality, improving the transparency of municipal administration, improving the decision process, and the creation of competitive advantages were considered important or very important. However, the objectives of

improving the image, increasing the productivity of the companies and, improving the future political conditions were considered for some municipalities as less important.

Improving the image is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Important	1	11,1	11,1	11,1
	Important	3	33,3	33,3	44,4
	Very Important	5	55,6	55,6	100,0
	Total	9	100,0	100,0	

Improving the accesability is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	1	11,1	11,1	11,1
	Very Important	8	88,9	88,9	100,0
	Total	9	100,0	100,0	

Improving service speed is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	1	11,1	11,1	11,1
	Very Important	8	88,9	88,9	100,0
	Total	9	100,0	100,0	

Improving service quality is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	1	11,1	11,1	11,1
	Very Important	8	88,9	88,9	100,0
	Total	9	100,0	100,0	

Improving the transparency of municipal administration is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	1	11,1	11,1	11,1
	Very Important	8	88,9	88,9	100,0
	Total	9	100,0	100,0	

Improving the decision process is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	3	33,3	33,3	33,3
	Very Important	6	66,7	66,7	100,0
	Total	9	100,0	100,0	

Increasing the productivity of the companies is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Important	1	11,1	11,1	11,1
	Important	3	33,3	33,3	44,4
	Very Important	5	55,6	55,6	100,0
	Total	9	100,0	100,0	

The creation of competitive advantages is an e-gov objective for this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	1	11,1	11,1	11,1
	Very Important	8	88,9	88,9	100,0
	Total	9	100,0	100,0	

Improving the future political conditions is an e-gov objective in this Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Important	1	11,1	11,1	11,1
	Important	4	44,4	44,4	55,6
	Very Important	4	44,4	44,4	100,0
	Total	9	100,0	100,0	

Table 2: Objectives for implementing an e-government initiative

The use of Information technologies in the municipalities members of ARM2 showed that most of the small municipalities do not have an administrative software or web pages (Tables 3 and 4). This result was also expected since the size of the population in these municipalities and the economic situation were not favorable.

Municipality * This Municipality has a website * Population Range Crosstabulation

Count

Population Range			This Municipality has a website		Total
			No	Yes	
<1000 Hb	Municipality	Ollague	1		1
	Total		1		1
1001 a 10000	Municipality	Mejillones		1	1
		San Pedro de Atacama	1		1
		Sierra Gorda	1		1
		Maria Elena	1		1
	Total		3	1	4
10001 a 100000	Municipality	Tocopilla	1		1
		Taltal		1	1
	Total		1	1	2
100001 a 1000000	Municipality	Calama		1	1
		Antofagasta		1	1
	Total			2	2

Table 3.Web Sites in the ARM2 Municipalities

Municipality * The municipality use any administrative software * Population Range Crosstabulation

Count

Population Range			The municipality use any administrative software		Total
			NO	Yes	
<1000 Hb	Municipality	Ollague	1		1
	Total		1		1
1001 a 10000	Municipality	Mejillones		1	1
		San Pedro de Atacama		1	1
		Sierra Gorda		1	1
		Maria Elena		1	1
	Total			4	4
10001 a 100000	Municipality	Tocopilla	1		1
		Taltal	1		1
	Total		2		2
100001 a 1000000	Municipality	Calama		1	1
		Antofagasta		1	1
	Total			2	2

Table 4. Use of administrative software in the ARM2 Municipalities

Requirements Questionnaire and Interviews

The assessment of the main requirement for the e-government platform for ARM2 showed that most of the municipalities agreed that the Platform of Software should include, among other, a portal Web informative and interactive, and a Private Virtual Office (PVO) where the authorized users can access. Additionally, the municipalities participating in the platform suggested a need for an Information system that allows the diffusion of information about the quality of contractors for medium or big contract. This requirement was highly mentioned since many contractors in the region did not satisfactorily finish the contracts when they move from one city to another in the region. The users argued that the lack of interrelationship

and communication among the cities allowed this type of problems. Another import requirement was the need for a highly flexile secure and scalable platform since they will rely on it to provide critical information to their processes.

ARM2 Electronic Government Platform

Once defined and clarified the requirements and necessities of the project, the research teams defined the functionalities and general structure of the platform. The users profile and their interaction with the systems were also an important matter in this stage.

The basic structure of the platform is represented in the figure 4. In the figure, the two main components of the solution, a public portal and a Virtual office, are represented. A public portal is made to implement the G2C part of the platform. Initially, citizens are able to access community news, authorities' names and addresses (mayor and city council members) for each municipality in the association, job opportunities, public polls and a public forum. They can also mail questions to the city authorities. The next stage includes the design of a single service portal for most of the citizen's transactions related with the municipalities. A virtual office is designed to implement the G2G and G2E components of the platform. The virtual office gives access to a working environment that includes a scheduler, access to chat rooms, email services and a virtual library with official documents. Contract Managers will have access to the Contractors Administration System, which allows them to asses the contractors in every municipality of the association.
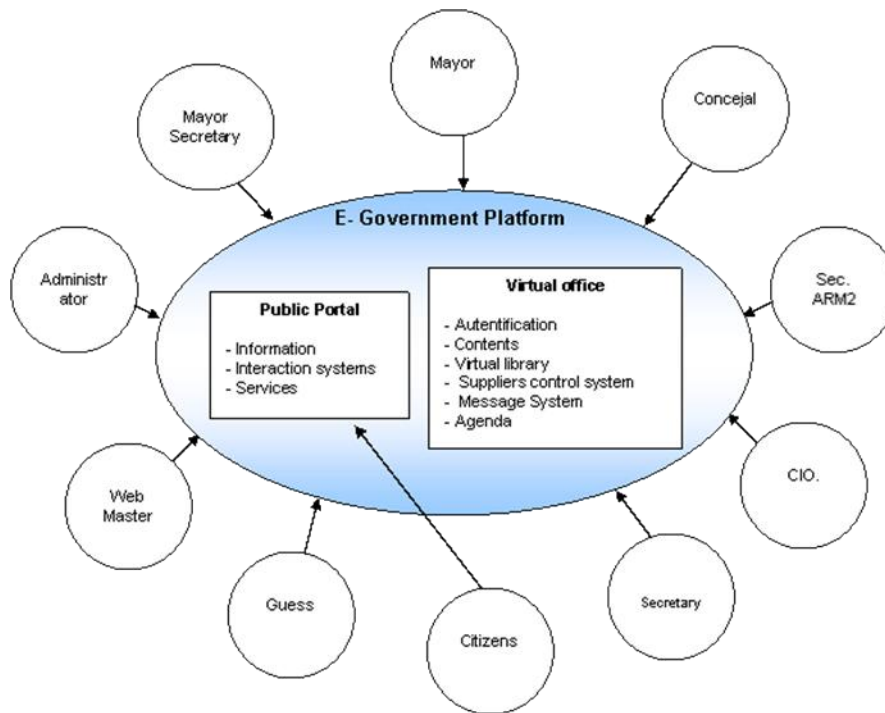

Figure 4. Basic E-government Platform for ARM2

As usual, a mayor issue in the design of the e-government platform was the election of a appropriate software and hardware platform for the system, given the budget restrictions in the project.

Many considerations were included to define the hardware and software platform that could respond to the need of the ARM2 municipalities. In Chile, the majority of the experience at public service level is through electronic platforms is in the form of traditional two-tier systems, like cgi based interactions. Those platforms have advantages related with flexibility and security, but they do not the scalability requirement. Multi tier systems achieve scalability through distribution of data and tasks. The main evaluation was then restricted to the two more representative technologies in the field, the J2EE from Sun Microsystems and the Microsoft's .NET platform. The selection of the platform followed two criteria, price and support. All the previous considerations allowed the design team to select J2EE as the system platform.

 J2EE provides a complete multi-tier computing model in web environment with high integration capabilities, using a standard web interface design for transaction processing meeting requirements like availability, scalability, performance, reusability and interoperability, together with enhanced predictability over other platforms in timely development and deployment (Lilienfeld and Byous, 2004). J2EE is a standard for developing multitier enterprise applications, based on standardized modular components. They give a complete set of services to those components, handling many details of application behavior automatically, without complex programming. The J2EE architecture is based on components as Java Servlets, JavaServer Pages (JSP) and Enterprise Java Beans (EJB). The standard services provided are Java database connectivity (JDBC) for data access and Java Messaging Service for communications, XML, JavaMail and Java Security. Figure 5 shows the J2EE architecture and components.

Certainly J2EE is an open source, free platform which means no software costs. Support is the most difficult part with open source, but the Universidad Catolica del Norte in Chile made a social concern about this matter committing support through the university's Computing Department.
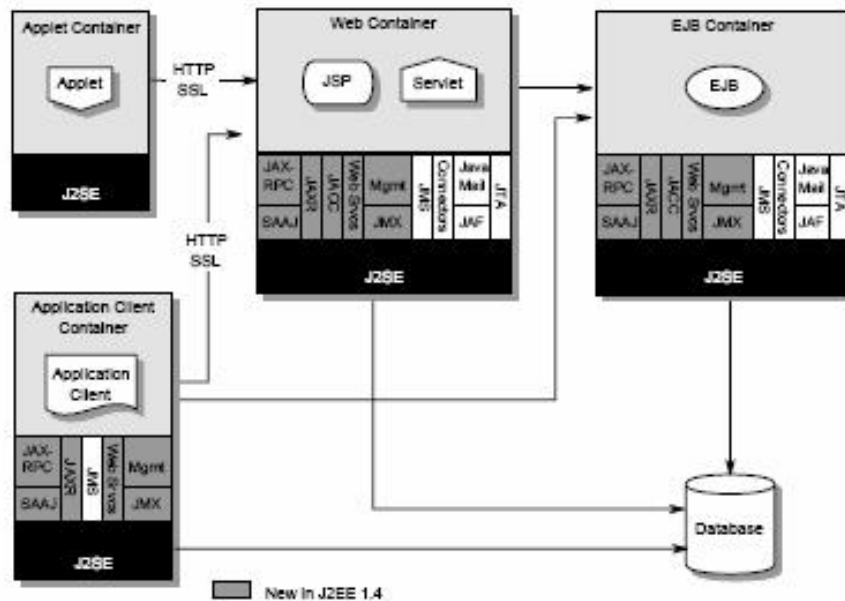

Figure 5: J2EE Architecture Diagram (www.java.sun.com)

The selection of the hardware considered the requirements in term of security and suitability to hold the software solution. A dual processor Pentium IV with 1 Gigabyte of main memory and a four disc RAID was chosen as the server. The server has dual power supply and UPS with generator backup. For security issue, the server is placed in a DMZ (demilitarized zone) of firewalls, preventing undesired accesses

CONCLUSION

The results obtained from the analysis of the municipalities technological infrastructure showed mayor differences among them. The major municipalities had better infrastructure while the smallest had poor or no IT infrastructure. These differences obligated the research team to propose an e-government platform that allowed the necessary flexibility as well security in their future operation. According to the requirements of the municipalities member of ARM2, the platform also needed to maintain two main components of the solution, a public portal and a Virtual office. The selected software platform was J2EE, an ideal solution to respond to the municipalities individual differences.

The development of this type of projects allows the opening of a new form of interaction between government and citizens. This is a pioneer project at municipal level in Chile, and it is expected that other regions will adopt it. An important contribution of this study is the empowerment that an e-government platform will provides to small municipalities. In fact, this platform will permit the access to better communication services as well as information to the small municipalities in the program. These municipalities will also achieve web capabilities and they will take advantage of the central server that interconnect and give services to all the municipalities in the region.

Finally, the project will permit the communication and collaboration of the municipalities in the north of Chile, so they can undertake the development of major initiatives as circulation permits, the management of traffic fines, etc.

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