Municipal m-Services using SMS

Antonio Azcué Bremer
Lucio A. López Prado

IT Cooperation Center Mexico-Korea
Av. San Fernando 37, Toriello Guerra, 14050, MEXICO
e-mail: aazcuebr@sct.gob.mx / llprado@sct.gob.mx
web page: http://www.ccti-mexcor.org/

Abstract: *Regardless the several practices all around the globe and particularly the growth of cellular users in Mexico, the mobile technology have not been exploded for government services. The following case represents the first municipal model of m-Government services in Mexico, establishing a best practice and a solution model that involve new operational schemes with service providers (technological standards), as well as with the cellular carriers.*

The paper contains the description of the Solution Model developed by the IT Cooperation Center Mexico-Korea for the Miguel Hidalgo District, Mexico City Government denominated: "Municipal m-Services using SMS". The objective was to take advantage of the development of cellular telephony, as well as its penetration, in order to establish an additional and personalized communication channel that improves the relationship between the District and the users of its services, as well as improving its internal processes.

The project is based on best practices from Korea that use short messages as a key tool for e-Democracy and citizen participation, allowing the establishment of technological exchange between the two countries and originating an innovation strategy that allows the easy replication of the model in a short term.

Keywords: SMS, Mexico, mobile, internal efficiency, e-Democracy, transparency

1. Introduction

Mexico City is considered one of the biggest cities in the world. It has a population of more about 20 million people (INEGI, 2006) and for its administration is divided in 16 districts (or delegations). Each district government is democratically elected each 6 years.

Miguel Hidalgo District in Mexico City has an estimated population of 350,000 people (INEGI, 2006). Nevertheless it has more than 3 million people who visit or work in the zone, which results in one of the more populated districts regarding business.

This amount of people represents one of the biggest demand centers for government attention and procedures. The offer for the citizens is based on a catalog of 350 services, including 270 that are freely provided to the community, mainly related to security, common areas development and maintenance and urban infrastructure. The offer also considers 80 procedures as passports, driving licenses, building licenses and those related to the business registration and opening, among others. These procedures have to be paid by the interested citizen or business.

Due to the previous reasons, the district had the following challenges:

- Satisfy the demand without affecting the service level
- Establish new communication channels with the citizens, facilitating the access to information and services.
- Establish a marketing strategy for the service implementation and for the mobile community development.
- Improve processes and services giving them a citizen-orientation.

Fig. 1: Ubiquitous service. Miguel Hidalgo District.

- Integrate new technologies for developing last generation services and re-stating the scheme and dynamics of the actual citizen relationship, using channels with a wider penetration.

In this context and, as a result of the growing penetration of cellular telephony in the district population (COFETEL, 2004), mobile government, specifically using the Short Message System (SMS), was considered a strategic tool for the solution development. In fact, m-Government is considered particularly suited for the developing world where Internet access rates are low but mobile phone penetration is growing rapidly (Lallana, 2004).

2. Objectives

- Extend the services and procedures processes provided by the Miguel Hidalgo District, integrating faster, more personal and more efficient communication systems.
- Develop a pilot solution model, based on a technological platform and digital telephony communications, using short messages for selected services.

3. Main SMS Services

SMS Service for the first stage
This project consider Informative and Interactive Services

DMH AVISO (Notice)
- Procedure or Service conclusion notice.
- Notice for procedure or service problem.

Improve the respond times, providing accurate information to citizens, regarding services and procedures status

DMH CITA (Appointment)
- Appointment confirmation & reminder.

Formality and more efficiency in work process, orienting services to citizens needs.

DMH INFORMA (Informs)
- District important notice.

DMH PROTEGE (Protects)
- Civil protection, alerts and emergencies notice.

More efficiency in the government responsibility to inform on time, using a personalized communication channel.

DMH PARTICIPA (Participates)
- Citizen participation (e-democracy & e-polls)

DMH ESCUCHA (Listen)
- Citizen attention

Active citizens engagement, enabling two way communications with citizens, for service requests and e-democracy programs

All the SMS services are the result of a specific request by the user (mobile originated) or by previous subscription, in all the cases are based upon a Keyword that gives access for the specific service, and facilitates the service request or subscription. The Keyword uses the DMH for the Miguel Hidalgo District allocation.

Services Description

DMH AVISO - (Notice) **Procedure or Service conclusion notice:** Conclusion notice is send to those users who previously started or requested a procedure or service. This short message is triggered by a CRM when the process concludes, additionally the user can request notice on-demand.

Notice for procedure or service problem: Procedure or service problems send to those users who previously started or requested a procedure or service. This short message is triggered by internal users or the CRM when the process presents a problem, requesting more information or the citizen intervention, additionally the user can request notice on-demand.

DMH CITA - (Appointment) **Appointment confirmation & reminder**: Reminder or confirmation of appointment is send 24 hours before. These appointments are previously requested at the 1 800 number, attended by the call center, for Passports, driving license, business center and job finding services.

DMH INFORMA - (Informs) **District important notice:** Messages with relevant information regarding districts programs such as Medical and notary services, programs starts or conclusions, send to those users who previously registered or requested it. Additionally the user can request news on-demand

DMH PROTEGE - (Protects) **Civil Protection, alerts and emergencies notice:** Alerts send, regarding meteorological and high rain risks, low temperature, earthquakes, floods, emergency shelters location, emergency phones, streets and avenue closed, volcano eruptions and supply centers location

DMH PARTICIPA - (Participates) **Citizen participation:** Allows the citizen to consul and participate in e-democracy & e-polls, some publish by printed media or at the web page, allowing the users to select the theme and the desired option.

DMH ESCUCHA - (Listen) **Citizen attention:** Allows the citizen to send comments, complains, different service request and direct comments or messages to the District Mayor.

4. SMS Service Model

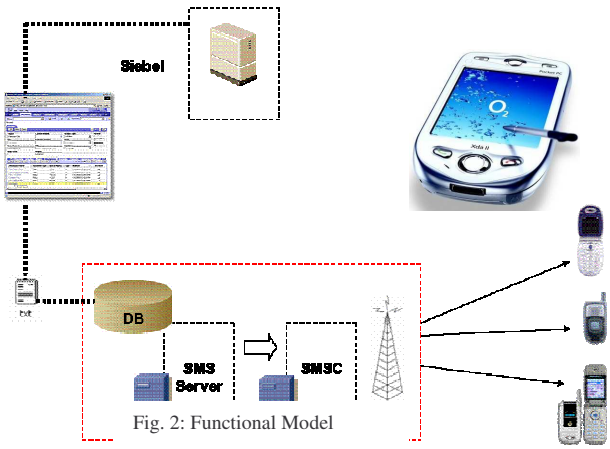

Fig. 2: Functional Model

The project considers on a first stage the previously stated services, covering the design, development and implementation, integrating to the actual Citizen Relationship Management (CRM) System and to the applications that support the services and procedures, the possibility to send short messages to the citizens using SMS, related to a specific process, under subscription or on demand. The system allows informing about elements as: File number, response date, stage of the procedure, finish of the procedure, appointment confirmation, traffic jams, street maintenance and emergency alerts.

Interactive services are actively promoting the e-

Democracy. The citizen is able to send comments and ask for services from its mobile, as well as answering polls and be involved in citizen participation programs. This capability of expressing easily the Citizens opinions directly to the government, is one of the most significant goals of the m-Democracy (Zálešák,2004).

Because of the technological advances on cellular telephony and SMS, actually there are several applications and systems designed for sending short messages. There are also several solution models worldwide (Zálešák, 2005) and specially in Korea (Kwon, 2004) for extending services using SMS. Nevertheless, and despite the actual penetration of more than 42 million mobile telephone users in Mexico (COFETEL, 2004), there was no model applied to Government Services.

Additionally, there were commercial agreements between the carriers for exchanging messages between their users. The agreements only allowed the carriers to send Mobile Originated (MO/SMS) services, limiting the possibilities to provide the required, system originated, services.

An API based on XML standard was implemented. To facilitate the Data integration with the Siebel CRM, a FASTFTP program was developed. This program defines messages priorities and imports plain text files to a local entity through a FTP protocol. Once the file has been extracted the program executes a process that allows data insertion in the SMS Database files. This program can be configured to execute process at a specific time of day to assure one-day data extraction.

According to internationally accepted e-Government methodologies (Holmes, 2001), the project was designed to be easily replicated. The technological requirements and Best Practice are documented in order to allow the short term replication in the 16 districts of Mexico City and in approximately 100 municipalities of the existing 2,400 which represents the 80 percent of the population.

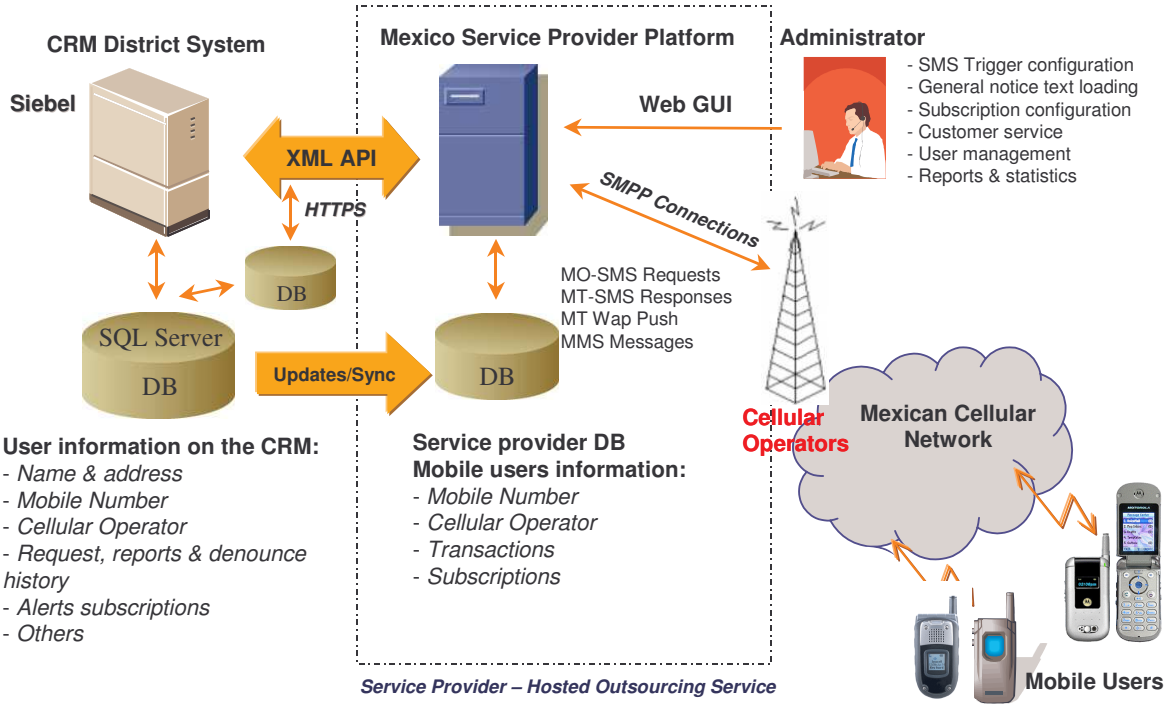

Fig. 3: Technological Architecture.

This project represents the first municipal model of m-Government services in all the country, establishing the needed operational schemes with service providers (technological standards), as well as with the carriers, allowing the easy replication of the model in a short term.

5. Results and Benefits

As a part of the project, a study about the SMS Impact was developed (Azcué & Puente, 2005). This study covered the improved efficiency on the District internal processes and the external impact on the users. The table in *figure no. 4* shows the number of procedures and services demands that were analyzed in the impact study. The number was based on the percentage of the total demand that is represented.

	Procedures		Services	
	Number	% of Demand	Number	% of Demand
Demands	18	66.2%	39	56.3%
Problems	0	0.0%	6	2.3%
Impact	6	9.5%	8	6.7%
TOTAL	**24**	**75.7%**	**53**	**65.3%**

Fig. 4: Criteria for Selection of procedures and services to be analyzed based on: a) demand b) problems c) impact..

Although the Problems do not impact directly on the total demand, due to the potential negative impact that they can have on the citizens, they were also analyzed. Finally, the district authorities selected some procecdures that, even when they are not the more demanded, because of their Social Impact they were considered relevant for the Study.

The data for the study was collected by applying surveys to the Citizens that visited the municipality office to make a procedure. The sample used represents a confidence of 0.95 and a maximum allowable difference of 0.4, considering a 350,000 population.
Based on the previous criteria, the impact study considered:

- 24 procedures, which represent 76% of the total procedures demand.
- 53 Services, which represent 65% of the total services demand.
- 68% of the solicitants go to the offices physically to ask for information.
- Only 19% of the attendants use Internet.
- 80% of the users think that the use of the cell phone will make the process easier
- 90% think that making appointments with their cell phone will reduce the time required.

By the successful implementation of the SMS Model in the Miguel Hidalgo District, several benefits may be attained. The tables on *figure no. 5* show the waiting time and visits that were needed before the system implementation. With the implemented solution, the waiting time and visits to the municipality offices are no longer needed.

Time before Starting a procedure	Procedures
5-20 min	6%
21-40 min	15%
40-60 min	15%
1-2 hrs	38%
2-4 hrs	9%
4 a 6 hrs	0%
More	18%

Visits before Starting a procedure	Services	Procedures
1 Visit	36%	9%
2 Visits	36%	62%
3 Visits	12%	21%
More	16%	9%

Fig. 5: Previous waiting time and visits

Additionally, we can summarize some benefits as follows:

- Provide access to relevant information, reducing transport and indirect costs.
- Improves transparency as well as the District political image.
- Improves the communication and, thus, the citizen relationship.
- Makes the processes more efficient, makes the services and procedures easier for the citizen.
- *Reduces 32.5% of the required time for procedures and 48% of the services process.*
- Promotes the e-Democracy and Citizen Participation.

6. Conclusions

There are a number of elements that are required for a 'Mobile Government' (m-Government). Some key success factors can be established, starting from the simple definition of who will provide and who will operate which come along with the requirement of experience & Know-how for mobile government service, knowing when & what kind of mobile services to be introduced continuously. (NECCC, 2001)

The second element is to define what is provided. This should consider a market proven solution for mobile government service, based on customized and localized, differentiated services assuring impact and benefits for the citizen.

It is important to define when and how to provide the service. A service plan based on an exhaustive market analysis should be documented and supported, including a marketing strategy and the capability to develop, operate and maintain a close relationship between the client and the service provider.

Due to the various types of applications and providers available, it is important to base the solution in a strong technology that considers the following specifications

Functional Specification	Description
Easy customizing	Easy to launch & customized service
Various messaging	Send over 100,000 SMS at the same time and support SMS/SMS MO, and Multimedia Message System (MMS) for future stages.
Robustness	All Hardware and Software can be duplicated and all data is stored to DataBase and backup.
Various interfaces	Support any regional operator's SMS interface at the same time.
Easy access	Support web page & client application, as well as Wireless Application Protocol (WAP) for supporting push services in future stages.

Fig. 6: Solution characteristics needed

The successful implementation of the service demonstrates that Mobile Government is feasible in Mexico and other developing countries. For having a wider impact nationwide, is important to replicate the model based on the best practice, with the effort of local authorities, generating scale economies and taking advantage of a successful experience.

By taking advantage of the cellular penetration and establishing a clear strategy for the implementation, several benefits were attained. The importance of the model is that the previous theoretical efforts are now tangible and, although this is only a first step, now m-Government is a reality in Mexico.

References

- Azcué & Puente, 2005, Estudio de impacto del servicio de SMS en la Delegación Miguel Hidalgo, Centro de Cooperación en Tecnologías de la Información México-Corea.
- COFETEL, 2004, Dirección General de Tarifas e Integración Estadística, Comisión Federal de Telecomunicaciones.
- Holmes, Douglas, 2001, e.Gov e-Business strategies for government, Nicholas Brealey Publishing.
- INEGI, 2005, II Conteo de Población y Vivienda 2005, Instituto Nacional de Estadística, Geografía e Informática.
- Kwon, Young-il, m-Government In Korea, Keynote Speech at the OECD e-Government Meeting, 2004
- NECCC, 2001, M-Government: The Convergence of Wireless Technologies and e-Government, National Electronic Commerce Coordinating Council
- Zálešák, Michal, 2005, m-Government Case Studies, Web Projects Ltd.
- Zálešák, Michal, 2004, m-Government: more than a mobilized government, Web Projects Ltd.

ING. ANTONIO AZCUE BREMER

Industrial Engineer by the Universidad Iberoamericana, he has a finance diploma by the ITESM and a Project Management diploma by the Project Management Institute. Mr. Azcué has several courses and certifications by the AIM University of IBM. He has coursed different programs and specialties in process consulting, technological alignment and, recently, e-Government Strategies in Seoul, Korea by the KADO Institute.

Member of the e-Government Agenda workgroup, jointly with the Institute of the Americas, World Bank, and Mexican IT organizations.

Consultant and specialist for World Bank in e-Business and e-Government, as well as in economical development and SMB promotion, working in several projects and solution model designs and Director of the pilot project for the design and development of a "Municipal System for business opening and registration" and development of the specific government program (to be implemented in 100 Districts in 3 years, with an approved fund of 58 million dollars).

Responsible of the Consultancy and Business area of Grupo PISSA (1999-2004) where he was Director for e-business and e-government projects, specifically for technological alignment to the business processes. Development of municipal diagnosis methodology, Director of the designing group of the IT Infrastructure for the e-Mexico National System Coordination, develop the Web.GOB program with the President's office as a part of the e-Government program.

Since March 2004, Project Incubation Director for the IT Cooperation Center Mexico-Korea, part of the e-Mexico National System and the National Computerization Agency of Korea. Responsible of the development of projects as a model for advanced government information search, SMB diagnose using Web, Digital Cities diagnose model and responsible of implementing the first mobile solution using SMS for the Miguel Hidalgo District.

ING. LUCIO ANTONIO LOPEZ PRADO

Computer Science Engineer by the Universidad Panamericana, he has a Production Management Direction Speciality by the same institution and has several certifications by the Digital Gateway Foundation, sponsored by the World Bank, in e-Governance, Next Generation Networks and Mobility.

Mr. López Prado is certified as e-Government Consultant by the Korean Agency for Digital Opportunity and Promotion. He has attended different overseas training courses, focused on e-Government strategies and policy formulation. He is also certified in Formulation of e-Government Strategies by the Organization of the American States (OAS).

Consultant for the e-Mexico National System General Coordination, coordinating several e-Health projects as the development of a unified e-Health portal and technology assessment for the visually impaired and handicapped people. He was an active promoter of the creation of the Health Level 7 (HL7) Chapter in Mexico for e-Health Standardization.

Since March 2004, Projects Coordinator for the IT Cooperation Center Mexico-Korea, part of the e-Mexico National System and the National Computerization Agency of Korea. Coordinating providers and public entities for the development of projects as a model for advanced government information search, SMB diagnose using Web, Digital Cities diagnose model and the first mobile solution using SMS for the Miguel Hidalgo District.