Survey on Implementation Level of Government Services in Mobile Devices

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Abstract. When comparing Argentina's population with the number of cellular telephony active lines, it can be assert that the active lines widely exceed the inhabitants. Because of this high concentration of cellular telephony, due to the lower cell phone's price against computer's price, it begins to be necessary for the government agencies to provide services that can be implemented in cellular phones. The government agencies, that opportunely, joined their efforts to provide on line services through the web, facilitating the procedures for the citizens and starting a field called eGovernment, must now consider the high insertion of the cellular phones within the population and, accordingly, facilitate the access to services from mobile devices (mServices). When mobile devices become the eGovernment communication channel, this new field of study is called mGovernment. The present paper presents the analysis of the obtained results after surveying mServices and the technology implemented by government agencies.

Keywords: mGoverment, mServices, WAP, SMS, Bluetooth, Mobile Devices, Information, Citizen's Participation

1 Introduction

The high number of users that use internet has made government agencies to publish contents and also allow transactions and procedures through the web, creating a new ICT's (Information and Communication Technologies) field called Electronic Government (eGovernment).

The Information Technology National Bureau (ONTI), which is the government agency that rules this activity in Argentina, defines eGovernment as: "A better service offered to the citizen, to improve the governance, to reduce costs, to promote transparency and participation, among others. That is to say, it includes having accessible official web sites, useful and participatory. But it goes beyond. It includes improving the services' access to citizens, giving them more power in the decisions"[6].

"At the end of 2008, the total quantity of people with mobile phone access rounded 2.700 millions and the 80% of the world population has GSM[1] net coverage. These statistics show how the mobile platform could be the best alternative to provide those services nowadays" [7].

This paper proposes that the different platforms must join in order to benefit the citizens offering different alternatives to fulfill a determined task. The possibility for a citizen to consult a file's state by navigating the web, must not be substituted by the possibility of fixed phone calling or going in person to the agency to inquire the file's state. No matter if the consultation is made by means of telephone, or by navigating a web site with a personal computer or a mobile device, the real important fact is that the citizen can have different ways to access a service. Otherwise a lot of citizens would be excluded because of their lack of resources or knowledge to be able to access a specific technology.

The use of mobile devices in eGovernment's service delivering has created a new research area called Mobile Government (mGovernment). From the citizen's scope the Mobile Government provides a new access interface to public services that have specially been made available to mobile devices, or have been adapted to existing eGovernment applications.

The Mobile Government Consortium International (MGCI) [5] is a nonprofit organization that, promotes the Mobile Government (mGovernment) as research and practice fields. It points to achieve that public and private academic researchers would work together to understand and to analyze the present development and to shape the future mGovernment's development.

"Text messages are one of mGovernment's bases mainly because of their simplicity and immediateness. There are messages that contain only and exclusively text, informative messages, or messages that contain wap[2] push links in order to access other services or contents download. Also they are cheaper than other ways of connection allowing the fundamental characteristic of bidirectionality"[3]. Regarding this premise of the Short Message Service (SMS) advantage over other technologies, there have been written some other papers only dedicated to this implementation mechanism (it is advisable to see [1]). However, the present paper shows the survey's results of the services used in Argentina, the applied technologies, and the incidence of SMS implemented services.

1.1 Mobile Devices' Insertion

The number of cell phone's active lines in Argentina, exceeds the country population. Their insertion is 122% (this value is calculated taking the population according to Statistics and Census National Institute (INDEC) [8], and the number of active lines according to National Communications Commission (CNC) [2].

Taking the number of mobile devices' active lines in each one of the Argentine's provinces and each province's population, it is possible to calculate the insertion's coefficient in the following way: Number of mobile devices' active lines each 100

[1] GSM: Global System for Mobile communications
[2] WAP: Wireless Application Protocol

inhabitants. This proportion will allow the insertion's level comparison among them (see Figure 1). Figure 1 has been built from INDEC [9] population data and CNC [2] data.

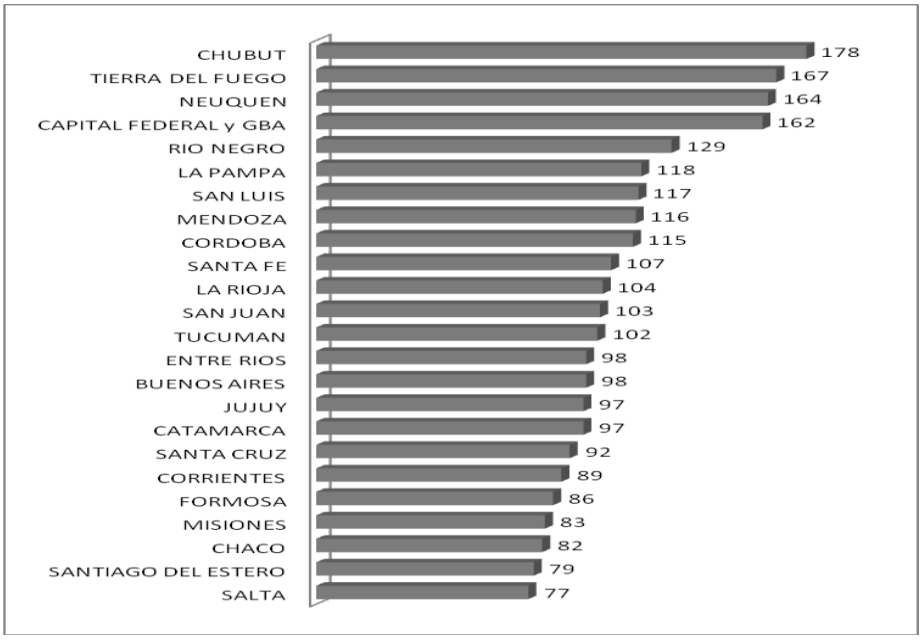

Fig. 1. Number of mobile devices' active lines each 100 inhabitants

Considering the government agencies (municipalities, tourism offices, ministries, departments, centralized agencies, etc.), the research team fulfilled a survey which produced that 58.33% of the provinces counts with, at least some information accessible from cell phones. eGovernment's aim must not be the replacing of transaction or procedures made on person, but it must look forward to provide the citizen with a new alternative of fulfilling the same procedures in an electronic way. This way may be to navigate internet from a computer or from a mobile device. When a mobile device is used, it is called mGovernment, but remembering that all the technologies must join to facilitate the citizen's procedures. Otherwise those citizens who don't have the necessary resources to access technology will be excluded.

The following reasons show why it is essential to implement services through mobile technologies:

- Because of their lower costs, it is easier for a citizen, to reach a mobile device rather than a computer. In Argentina, the number of mobile devices with active lines exceeds the total population.
- Nowadays, mobile devices integrate Internet, through a simple configuration. Otherwise, to have Internet in computer, it is necessary to contract a service.
- It is easier to learn how to use a cell phone rather than a computer, for a person who doesn´t have any technology knowledge.

- "A computer can be used by different users but mobile devices usually are used by only one user… This means that more personalized information can be delivered to the user through the device" (this reason has been transcribed from page 6 of [4]).

2. Mobile Services Classification

Mobile services have been classified following different implementation levels as can be watched in Figure 2, and explained below.

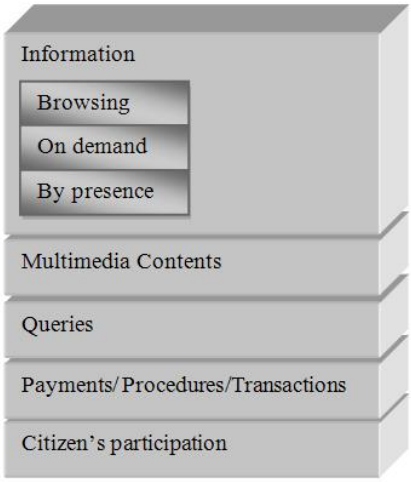

Fig. 2. Offered mobile services classification

- Information: Are those contents that can be accessed by a standard cell phone and are presented in text mode. For example: Basic information of the government agency, necessary documentation and data to fulfill a procedure or transaction, taxes expiration days' calendar, blocked streets, weather data and forecast…
  This information can be offered in three ways:
  - Browsing: The user can access a determined web site from his cell phone (that is, entering certain options in order to reach the required information). This site must be specifically developed for mobile devices, using WAP or other technologies.
  - On demand: The user can receive alerts regarding the information he is interested frequently (example: scheduled blocked streets, weekly activities, weather forecast).
  - By presence: Being the use inside a governmental building he can be able to use other technologies such as Bluetooth, Wireless Fidelity (WIFI)… this way, for example the visitors, can get, not only printed information, but also by means of their cell phones.

- Multimedia Contents: They include images, sounds, videos… (For example, tourism site where the visitors can get images from the main resorts, local sounds and music…).
- Queries: Means that, when the user knows certain data he can get related information, for example if he inputs:
    - His DNI's (National Identity Document) number he can know, in elections times, where he must vote and his table number. He also can ask his health insurance, social security and the benefits they grant.
    - Cadastral data of real estate property (lot, block…) the street or address where it is placed.
    - A file number in order to monitoring it.
    - A car plate number in order to obtain debt information.
- Payments/Procedures/Transactions: Mobile devices should allow a user to make a tax or service's payment; they also should allow the user to fulfill transactions and procedures that nowadays can be performed in remote way through the web. Regarding low cost's services it would be desirable paying them by a deduction from the own device's credit, in addition regarding high cost's services or taxes, the user should be able to associate the mobile device with a credit card and pay them by means of inputting a password. The same way, should be used to ask an appointment in public offices.
- Citizen's participation: This service implies that the citizen can have an active participation, expressing his ideas to collaborate in the government's decision making. For example:
    - Answering polls using the cell phone to express his point of view on municipality's management and services implementation.
    - Sending SMS or fill a form in order to make: Claims, Suggestions, and Complaints…

3. Accomplished Survey

3.1 Implementation Percentages Classified by Services Classes

The survey was made on the services, offered by several Argentine provinces' government agencies, analyzing, in all the cases, the mGoverment implementation classified as: Information (browsing, on demand, by presence), Multimedia Contents, Queries, Payments/ Transactions/ Procedures and Citizens participation, For each one of these classes, two different categories are distinguished:

a) Current: Services that have already been implemented and are properly working.
b) Announced: Services that are announced to be implemented in the future, or services that haven´t been totally implemented yet and services that are in maintenance.

Argentina's 24 provinces were surveyed, and counted those which have implemented and/or announced services in each category.

Figure 3 shows the obtained results by means of percentages.

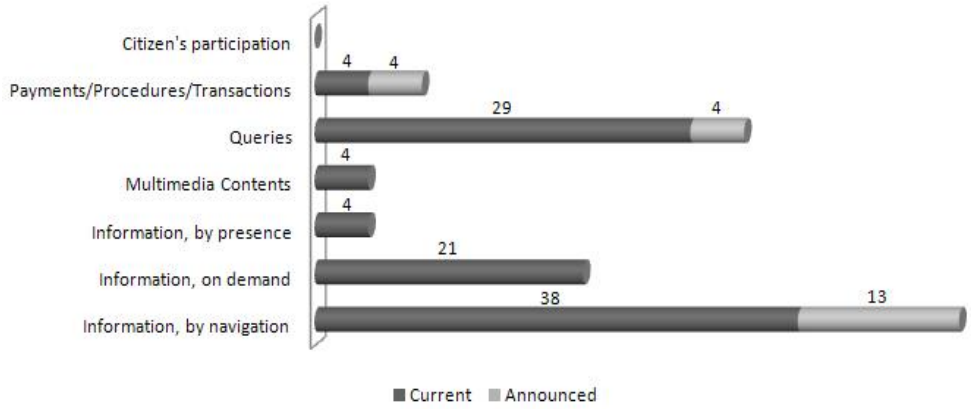

Fig. 3. Current and announced services' percentages.

Figure 3 shows that the mServices' highest implementation, at country level, is oriented to provide information, being mainly offered by navigation with a mobile device (38%), followed by mServices that allow to make consultations (29%). Otherwise the possibility of making Payments/ Transactions/ Procedures and Multimedia Contents got very low percentages (4% for each category). It can be observed that there are no citizen's participation oriented services.

3.2 Offered services

Not only, the government agencies must offered services to the citizens, but it is essential to broadcast them. The ignorance of the available services will make the implementation effort useless. Otherwise, it is very important to consider the implementation of a service, by means of more than one possible technology in order to allow the citizen to decide the way of accessing the service. However it is important prioritizing the mServices delivery by SMS due to its usability and, in addition, SMS is available in all the cell phone market, and afterwards migrating to other technologies. In comparison with that, in Argentina, the highest mServices implementation is by means of WAP technology navigating through mobile devices, as can be watched in the following tables. These tables show the different mServices classified by category and the technology with which they are implemented. It is important to notice that in some cases there are services offered by two different technologies, but this fact doesn´t mean that the same government site has the service implemented in both ways, but it means that different agencies allow to access the implemented service with different technology (this note is valid for all the tables).

Table 1 shows the services offered in Argentina in the category Information (browsing, on demand, by presence). It is important to highlight that the same services is offered by different provinces with different names, so, a representative name has been put in order to show the information available by a mobile device. It is important to watch that the offered mServices belonging to the Information Category is much higher than those showed as belonging to other categories.

Table 1. Offered mServices belonging to the Information Category

	Service Description	Browsing (WAP)	On Demand (SMS)	Presence (Bluetooth)
News	Most relevant headlines	X	X	
	Sports Activities		X	
	Cultural Activities	X	X	
	Human Rights Activities		X	
	Events and Shows Calendar	X		
	Municipal's Draws data	X		
Payments related	Expiration Calendar	X		
	Current Payment Plan	X		
	How do I pay taxes?	X	X	
Enabled discos & transportation	Enabled Discos	X		
	Enabled School Buses	X		
Advertisements	Courses and Workshops Registration		X	
	Commencement of work		X	
	Today's Scheduled Blocked Streets	X		
Health	Health Services		X	
	Drugstores	X		
	Hospitals	X		
Useful Data	Government Agencies' Location, telephone numbers and opening hours	X		
	Weather data/Weather forecast	X	X	
	Mechanical Assistance/ Official Workshops	X		
	Bus Lines	X		
	Taxis and Remises	X		
	Useful Telephone Numbers	X		
Tourism	Tourist Attractions	X		X
	Restaurants	X		X
	Lodging	X		X
	Visitors Activities	X		X
	Car Rental	X		X
	Travel Agencies	X		X
	Handicrafts	X		X
	Banks and Money Exchange	X		
Specific	Notice to lawyers about the courts' names with released files.		X	

Table 2 shows the offered services in the Multimedia Contents Category, and if they are provided in WAP or SMS Categories.

Table 2. Offered services from the Multimedia Category

Service's Description	WAP	SMS
Video camera images in different city locations	X	
City's typical Culture, Sounds and Voices	X	

Table 3 shows the queries that citizens can fulfill through mobile device, distinguishing if they are provided in WAP or SMS Categories. The first 10 rows belong to municipalities of several provinces, and the last 7 rows belong to other government agencies which names are written, in brackets, following the service description.

Table 3. Offered services from the Queries Category

Service Description	WAP	SMS
Voter's data	X	X
Obtaining from Cadastral Information the Lot's Address	X	
DNI's State of the Procedure	X	X
CGPC's Address Search	X	
Taxes' Expiration Calendar	X	
Car License Debt	X	
Real State Property Debt	X	
File tracking	X	
Gross Income Registration		X
Vehicle Radication	X	
From the vendor's CUIT, obtaining his level of compliance with taxes (ARBA – National Revenue Agency of the Buenos Aires Province	X	
For cereal trading companies, from their CUIT, obtaining if the company is registered in the Grain's Operators Registered Base and which is their situation (AFIP – Federal administration of public revenue).		X
To consult through a CUIT number if a person belongs to a current CVDI-Importers Validated Data Certificate (AFIP)		X
To consult through a CUIT number if a person belongs to a current CFC-Fiscal Contract Certificate (AFIP)		X
Sending a CUIL number belonging to an AFIP's employee, it will indicate if he is really a government employee and will show his current work.		X
Sending a CUIL or CUIT number shows the retire system (AFIP)		X

Table 4 shows the offered mServices belonging to the Payments/ Transactions/ Procedures Category, by means of mobile devices. In this table there are only 2 cases.

a) Parking's mobile phone payment (first table's row) implemented in Buenos Aires Province (La Plata City) and announced in Buenos Aires City.
b) To begin a house' transfer (AFIP)

Table 4. Offered services from the Payments/ Procedures/Transactions Category

Service Description	WAP	SMS
Mobile phone payment for parking		X
To begin a house' transfer (rate: COTI – Offer code for properties transferences - AFIP)	X	

As it was noted above, there are no mService oriented to citizen's participation, so the paper doesn´t include a table belonging to that category.

3.1 Used Technologies

When implementing mGovernment, it is very important to use all the possibilities that technology provides. If an inexperienced citizen must make a consultation, it will be easier for him to send a text message instead of navigating a mobile site and fulfill a form to receive the same information. Based on the surveyed services shown above, Figure 4 shows the percentages of use of each one of the technologies.

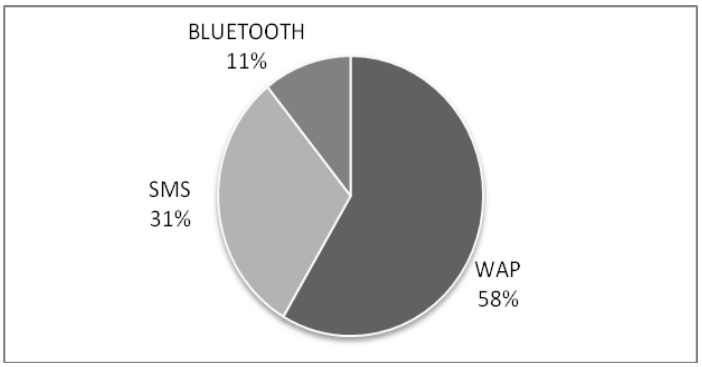

Fig. 4. Percentage of use of the technologies implemented to provide mServices

Although we share the premise expressed by several authors regarding that SMS must be the basis of mGovernment, beginning its implementation with SMS and migrating later to other technologies. Figure 4 displays that in Argentina, the survey shows that WAP is the most used technology. However there are a lot of services that can be deliver by SMS but they are implemented by WAP.

4. Conclusions

Because of the very high insertion of cell phones in Argentina, the necessity of implementing mServices is imminent. In America, Argentina is placed in second place (after Bahamas) regarding cell phones insertion (according to CNC[2] statistics). There's still a long way to run in the mServices' road.

It is possible to assert, according to the results obtained in the present paper, that although SMS should be the initial mechanism for implementing mSevices, because of their simplicity of use, in Argentina this fact is not reflected, being only the 31% the services offered by SMS. There are a lot of mServices offered from the own government web site (for example AFIP, ARBA, etc.) and other services that are not announced in the web site but can be read from other sites news. It is not enough to develop a good service but it must be known by the citizens. On the other hand, there were found advertisements in government web sites, which show the possibility of accessing services by mobile devices but these cases have been excluded because, they are the same computer's web sites and haven't been adapted to the mobile technologies. The consequences of an unadapted site are for mobile devices are: very long pages, the site requires more memory than the one available in the current mobile device available on market and, besides, the time-cost of accessing to these sites is very high.

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