A New Way to Community Services
Communication with Administration

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Abstract. In this paper we are going to describe the architecture of community services by mean mobile devices. We opt for a direct communication between the mobile users and server information and where users interact directly from their mobile devices and the cloud system, by leaving a record of the accused and requested data. As result of this improvement in the process, we have a platform that saves costs and time management to users of these services in the instantiation and regular payments to government claims.

Keywords: Mobile devices, Cloud, Community Services, Administration, Citizens.

1   Introduction

In this article we are going to perform some community services where the architecture is defined by the mobile devices. The increase in both mobile and tablet mobile devices between citizen has been exponential over the past years. The 63.2% of mobile users has one of these types of devices. Despite being the most expensive and the recession experienced by the country, this rate exceeds the rate of the United Kingdom (62.3%), France (51.4%), Italy (51.2%) and Germany (48.4%). [1]

All these mobile devices have 3G, 4G broadband Internet connection or WiFi, where the speed of data transmission is suitable for communication with the offices of the city government. The public administration have public information offices and records for the entry of the official documentation and communication of official bulletins, on the other hand, it has a system for regular payments, in which citizens make their payments by mean of bank transfer, obtaining the subsequent receipt or by mean a payment of the fee bill for that service.

In this case we opt for a direct communication between the mobile users and server information, instead of using a cloud large system, we will try to make a simple system where users interact directly from their mobile devices and the cloud system, by leaving a record of the accused and requested data by checking the activity log or the parameters required. With a system like this, we would have a platform that would save costs and time management to users of these services in the instantiation and regular payments to government claims.

2   State of Art

Currently the communication systems with public administration are provided by the citizen´s office, each public administration has a different system, the region's city hall, the county, the central government in its officiate, this is true for both traditional offices and Web sites that offer online services to citizens. [2]

In a system of these characteristics we should find:

- Agility sending and receiving documents.
- Agility in the processing and validation.
- Agility in doubts´ resolution.
- Permission to run multiple processes simultaneously.
- Direct and personalized attention with users
- Integration of different services offered by different public entities.
- Authentication and electronic registration of incidents.
- Generating warnings for electronic confirmation of income or output registration.

We have to keep in mind that administrative systems are normal instances and we can find many instances according to each of the different public administrations. The process that we have to undertake is explained below:
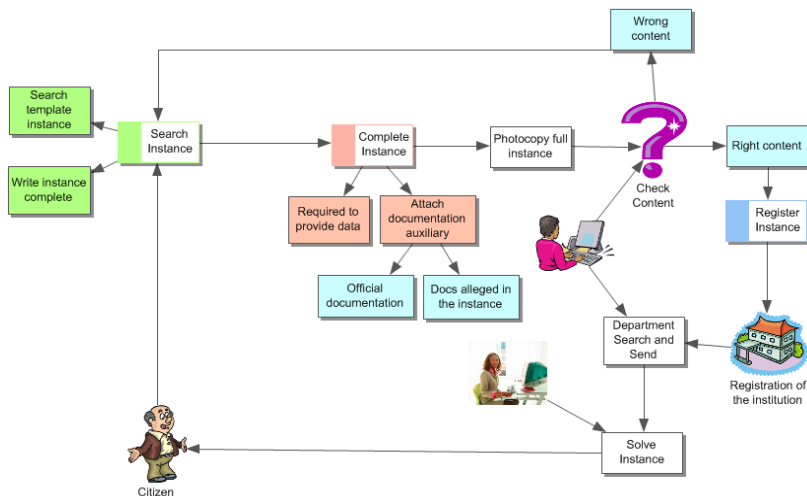

Fig. 1. Current Operation

As we can see, there are different parts in the creation of a request's receipt. First citizens must search the standard instance for creating an ordinary paper or fill out a pdf. For that we need to complete the instance with the required arguments and the necessary documentation. Once the instance is done, the officer proceeds to check in order to perform a verification of the information's correction. After that, they proceed to the instance registration at the registry office and to the request delivery to the officer, who must solve the instance, and send this resolution to the citizen.

There is no direct communication between the instance's solver and citizens so that an error in the documentation not controlled makes the process starts again. Once the instance is opened, this is closed with this resolution and must be restarted again to make every step. Bank transfer or deposit in banks, nowadays makes payments to public administration, fees and administrative penalties.

As we can see now the information system that manages these requests is limited to a web page and an email where the instance is processed. There are no payment gateways or personalized online citizen services. The realizations of these management processes are performed in complex ways and sometimes repeatedly, until citizens receive the reply to their bureaucratic paperwork with the state's administration of the local regions.

We must realize that the administrative process must comply with state law, law of the local region, municipalities and counties. All the regulations depend on each other and regulations and laws complement the higher laws [3]. A system like this would be included in the e-Government for the transparency and the improvement in the communication with the citizens. Thus, we allow them to carry several different operations out, especially those where multiple agencies are involved, without the need for contacting each of them [4]. A single access point reinforces citizen participation in democratic processes because the citizens can easily use administrative procedures and the most convenient way to express their needs to public servers. [5]

3   Objective

Our main goal in this research is approaching a way that enables a system like this to streamline its operations, both for making payments to the administration and for the creation of instances in the process. Since the instance or the administrative process is opened until it ends, considering that the arguments to this fact are included within the process.

Reception and agility of information is done by making the data process be validated by an expert or whoever has to solve the instance and calling for applications in real time or within a short period. It is not the same making a medical demand that making a request for information. This categorization of instances is performed by the administration itself. Therefore officials treat instances and applications in one way or another depending of specific criteria. This fact is well accepted always that it speeds up the process [8][9].

In the previous section we referred the legal rules of public administration and the administrative procedure, as we can see, there are many laws and amendments, which must be followed [5] joined to the law of administrative procedure [6].

4   Definition

Our definition does not controvert the current legislation, we intend to make a system in where different platforms can interact, users can make inquiries and the different administrations can use it in order to streamline their official paper works [10][11].

The cloud system must fulfil the existing law, or in other words, the cloud system as a whole must receive the approval of the official register, as all the regulations would be adjusted to the existing law and also the administrative act would be guaranteed by the different legislations. In the Cloud systems, layers can be added depending on the complexity level of the system itself. We will add to this architecture two very significant layers: the legislative layer, where the instances will be linked to meet the administrative act and the administrative procedure; and the layer monitoring and its resolution, where all the instances and procedures will be accommodated to their completion and archiving.

5   Architecture

In an architecture that solves these needs, we need a big storage for instances and attachments. Therefore we need a cataloguing system for them through the departments that will be associated to the platform and the space for placing on record along the time [12].
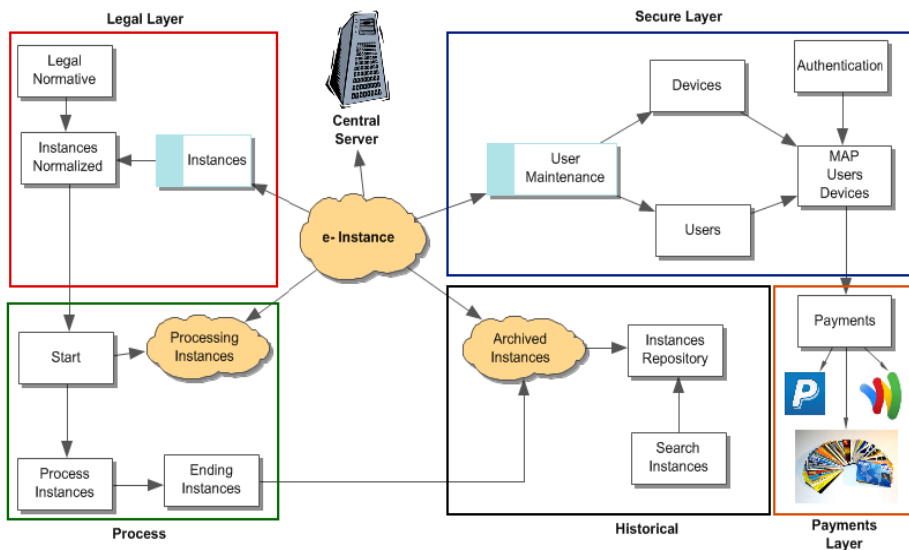

Fig. 2. Cloud Architecture

As we can see above in the diagram, we can also find the layers of an operating system of these features [13]. We can meet below a description of them:

- **Legal Layer:** In this layer, instances are constructed from legal formalities. In the construction of instances by departments we obtain a normalized instance, which is also listed for various agencies. This layer must have a cataloguing system that allows users to find the instance. This layer contains also legal regulations in order to allow the worker to build the instance according to current regulations.
- **Secure Layer:** In this layer the mapping between the user device and the end user is done. In this way we get a safe access, users will only have access from devices discharged by the system, thus we increase the security. There are two ways to do this: the citizen goes to the city centre for the first time and discharge his mobile application or by accessing the electronic ID card and thus authenticate the user on the device.
- **Process:** This layer is where the build process instance and its verification is done, this request is received by the employee of the department, who receives the instance, and once started the process, the communication procedure between the citizen and the worker is established in order to include documentation and data necessary to complete the instance. This is currently done by instances and resolutions. At this point we make the full resolution in an administrative procedure in order to expedite the process and reduce inconveniences to citizens.
- **Historical:** Once the instanced is resolved, this instance is stored in a repository so that the system's stakeholders can have access to it, in this section we have to remember that we must store all the contents and also the different laws which the formation of the instance and its resolution are based, because the legislative layer must remain updated and instances once are completed are not retroactive.
- **Payment Layer:** This layer is where the payment of taxes is made in the administrative procedures. The payment is stored in the historical order to allow the user's processes the request and receipt of payment in the proper department. It is usual that the payment rate be associated to an official document that starts an instance without further complexity.

The figure below shows the system logical structure by using FOBT [7]:
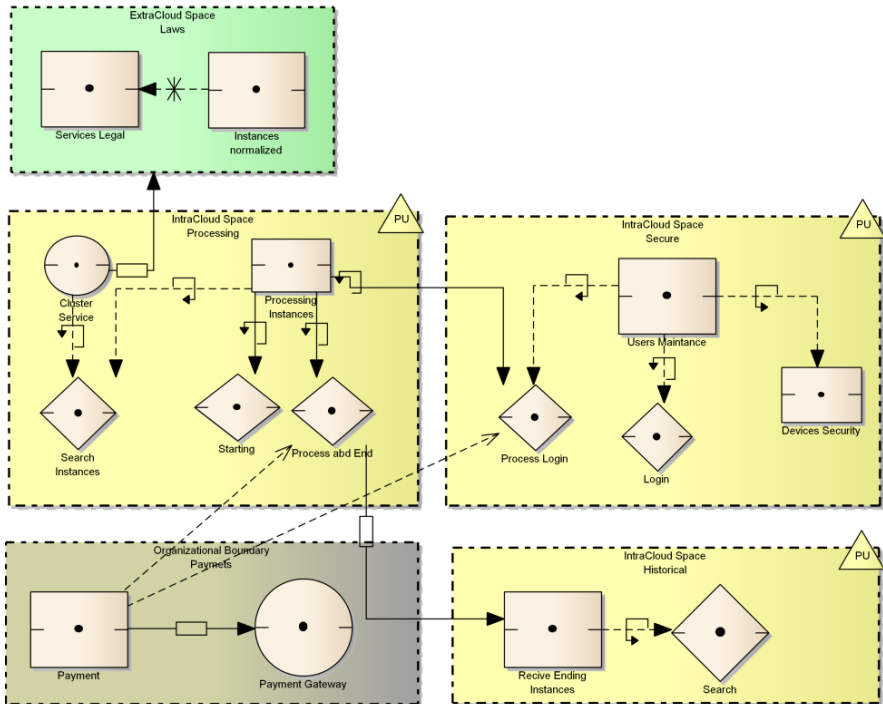
Fig. 3. Logical design

As we can see in this logical design, we establish the different parts of the system in the cloud and the performance. The logical process is developed in the cloud even during the interaction with users; in this way we can increase the safety and speed in the development of the instances.

These objects in the cloud are shared in memory spaces allocated to both users and can perform jumps between processes with no time for the user. We must remember that the transaction time is minimal, but bandwidth is limited to a server of these characteristics due to that the number of users connected simultaneously is elevated. By placing all the business logic in the cloud, the design differs from what we are used to, for example, for each transaction or process's change, the validation is performed by login in order to record all the user steps in the database. Further, we can use external systems to the cloud, where modifications are done by another department and employ a service bus for both to communicate the cloud with outside and to allow receiving data from other applications, through the buses where we control the bandwidth and security.

6   Study Case

This study case reports the receiving instances in the secretary of the education department as we can see at the following screenshot:
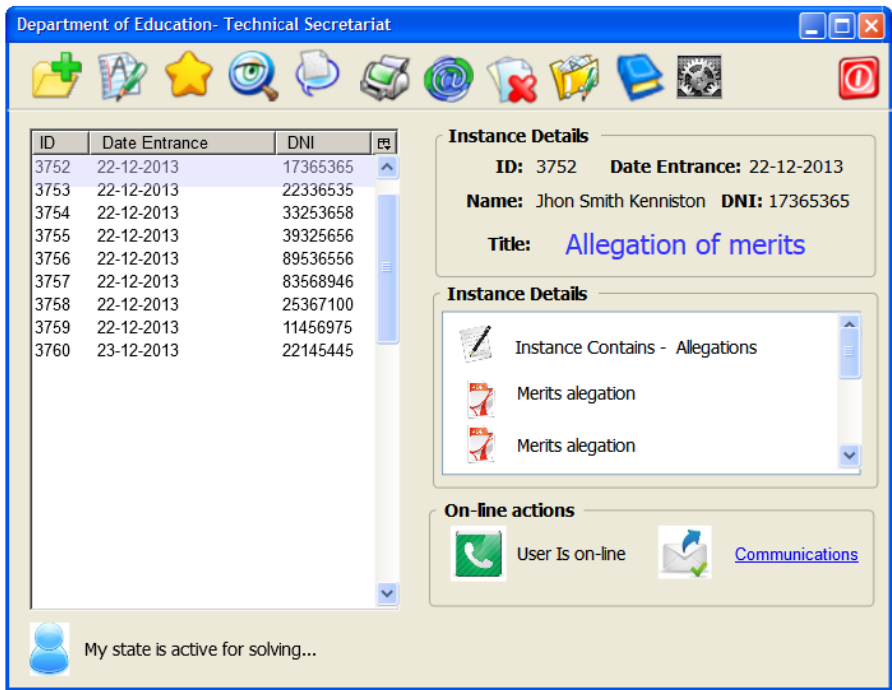
Fig. 4. Screen of Technical Secretariat

The worker has access to all instances assigned by the registry. He proceeds to review the request and processes the resolution. We see that the interface section "Online actions" allows the worker to contact with the active user through the application. From this screen the user can perform the following actions:

Table 1. Icons

	The worker performs an internal instance. Sometimes it is necessary to proceed with interdepartmental requests in order to clarify the legislation which solves citizens' instances.
	The worker performs the selected instance processing, allowing him to make the resolution of this instance.
	This option allows the worker to add the resolution to outstand, in order to see that it is an instance in process and should be handled as soon as possible.

Table 1. (*continued*)

	Search Button instances, both processed and unprocessed. In this case it allows to access to important instances, and it will only look for at the departments in which the worker is allowed.
	The employee has direct communication with the citizen. He can choose the communication channel through the application.
	Generates an instance report in order to send it by regular certificate mail. Thus, the resolutions can be sent in case they are necessary.
	This allows sending the resolution report to an email recipient. The service sends mail through institutional email with the resolution, questions or concerns.
	With this option the instance is removed. The worker must justify the reason for the cancellation and must record it into the database. Also he has to emit a notice to the applicant with the reason for the cancellation.
	It keeps opened the instance to be completed by the issuer. The data can be: complete the instance, documentation or a legal reason for the request can be closed.
	Allows searching the law regulations to perform the resolution of the instance or application.
	Settings panel of the application.
	The application detects the availability of the user through the application in order to the worker can contact to the citizen to inform him about the requested incidents.
	Communications are stored in the system. Citizens can perform queries that will be queued in the system and then the worker will contact him depending on the need.
	With this option, the employee may make a change of state to inform the citizen that he is working on the resolution of his/her instance.

The application is installed into the citizens' terminals to allow them to create instances and to send them directly to the registration [14]. As we see in the following illustration, it is a simple and usable application where the user fills his court and claims the documents necessary for the registration.
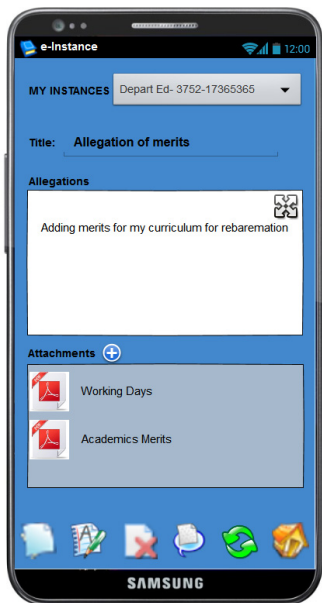

Fig. 5. Application into citizen's mobile terminal

Table 2. Mobile icons

	The citizen conduct a new instance in the system by selecting the data
	The citizen edits an instance stored in the system for the registration request.
	Cancelling an instance on record. Occasionally the citizen makes a wrong instance and s/he could delete it from the system. Once initiated the process, the instance cannot be removed.
	The citizen accesses to the communication with the worker performing the response to the request in order to resolve any questions or concerns about the instance of the department. This communication depends on the state of the worker's management.

The application has not the save option, this is due to optimization of resources in the cloud system [15]. The system itself detects the changes and saves the changes as well as we can also see that do not have the export option. This is because in this way

the unique existence of the instance is fully guaranteed for privacy and it won't have problems with the country´s legislation, because the data is stored in a secure system without the possibility of modifying the set of data instances or request sent. We have previously named the PayPal option. In this case we have determined that the worker performs the request for the payment of the application after their revision, thus we reduce the citizen's costs.

7   Conclusions

This is a paper that begins a new research line integrating the e-democracy. We understand that the administration must allow to the citizens the quick send of instances and to reduce the time necessary to their request even when these are wrong and must be solved. A system of these characteristics creates many questions and others that all of you are going to ask during the presentation. Therefore we need a system that answers this question: Is it possible to certify a Cloud system in which the system is included into the administrative procedure?

We have asked to judges and state lawyer and in both cases their answer has been easy, the content can be modified and falsified. Facing this fact we have made this thought: if I were able to treat, inside of the own Cloud system, the instances like non modifiable objects, in other words, to make a copy of them in a system non accessible from outside and that it were possible to make a copy from inside of the Cloud (Everyone knows about RAID systems in the hard disks). This makes us to think about another difficult question to solve, but it is possible that in the future it will be solved from the operating system. The theme is that the operating systems oriented to e-democracy systems give to citizens a safe space for storage with intern copy, allowing the access to one of the system's layers and the realization of a copy of that memory space to other system updated and encrypted with biometrical data.

The technologic evolution will come but before we need to make aware to the administration that an elevated investment would save costs and would improve the efficiency of the own administration. The set formed by the citizen, a virtual space with biometric encryption, a section of hard disk inviolable where the processes with the administration can be stored and sensible information can be saved, all of these form the e-AdministrativeHD, a meeting point to access to citizen's data.

References

1. Eurostat (Statistical Office of the European Communities),
   http://epp.eurostat.ec.europa.eu/statistics_explained/
   index.php/Telecommunication_statistics#Main_tables
2. Administración electrónica y gestión documental. Consideraciones a la luz de la Ley para el Acceso Electrónico de los Ciudadanos a los Servicios Públicos. Carlota Bustelo y Elisa García-Morales. El Profesional de la Informacion 17(1), 106–111 (January-February 2008) ISNN 1386-6710

3. Glassey, O.: Developing a one-stop government data model. en Government Information Quaterly 21(2), 156–169 (2004)
4. Yong, J.S. (ed.): E-Government in Asia, Time Editions, Singapur (2003)
5. Leyes del procedimiento administrativo, `http://legislacion.060.es/procedimiento_administrativo_regimen_juridico-ides-idweb.html`
6. Ley 11/2007, de 22 de junio, de acceso electrónico de los ciudadanos a los Servicios Públicos. «BOE» núm. 150, de 23 de junio de, páginas 27150 a 27166 (17 págs.) (2007)
7. Service-OrientedModeling Framework, `http://www.sparxsystems.com.au/somf`
8. Ammons, D.N.: Municipal Benchmarks: Assessing local performance and establishing community standards (2012) ISBN: 978-0-7656-2660-8
9. Lance Bennett, W., Wells, C., Freelon, D.: Communicating Civic Engagement: Contrasting Models of Citizenship in the Youth Web Sphere. Journal of Communication 61(5), 835–856 (2011), doi:10.1111/j.1460-2466.2011.01588.x
10. Nam, T.: Suggesting frameworks of citizen-sourcing via Government 2.0. Government Information Quarterly 29(1), 12–20 (2012)
11. Meijer, A.J.: Networked Coproduction of Public Services in Virtual Communities: From a Government-Centric to a Community Approach to Public Service Support. Public Administration Review 71(4), 598–607 (2011), doi:10.1111/j.1540-6210.2011.02391.x
12. Feller, J., Finnegan, P., Nilsson, O.: Open innovation and public administration: transformational typologies and business model impacts. European Journal of Information Systems 20, 358–374 (2011), doi:10.1057/ejis.2010.65
13. Fardoun, H.M., Ciprés, A.P., Alghazzawi, D.M.: CSchool-DUI for Educational System using Clouds. In: Proceedings of the 2nd Workshop on Distributed User Interfaces: Collaboration and Usability, Conjunction with CHI 2012 Conference Austin, Texas, USA, pp. 84–695 (2012) ISBN-10
14. Fardoun, H.M., Zafar, B., Altalhi, A.H., Paules, A.: Interactive Design System for Schools using Cloud Computing. Journal of Universal Computer Science 19(7), 950–964 (2013)
15. Fardoun, H.M., Cipres, A.P., Alghazzwi, D.M.: Distributed User Interfaces in a Cloud Educational System. In: Distributed User Interfaces: Usability and Collaboration, pp. 151–163. Springer, London (2013)