

# SCRIVANIA: A SOLUTION FOR TRANSPARENCY IN PUBLIC SERVICES

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*Abstract - Public Administration transparency is among the main issues to solve in order to improve e-government quality of services. In this area the paper presents an approach and an IT tool supporting Public Administration transparency named Scrivania. It allows Public Administration employee to model and publish their services be guided by Business Processes models. Using Scrivania citizens can search and execute the provided services tracing their execution and, in case of delay, observe the state it occurs. Citizen can also use Scrivania social environment where they can be involved in a community during the services execution and where they can give feedback.*

## 1. – Introduction

In the modern Public Administration (PA) transparency is one of the most important requirement to improve on the one hand administration efficiency and on the other hand citizens satisfaction [5]. With transparency we mean the ability of the PA to make citizens aware of the delivery process in terms of activities and people in charge to its execution and governance, improving the citizen perceived trust. A service supports transparency if for each task citizen knows exactly how to perform it, and in case of delay know where is the bottleneck. This means that transparency quality requirement predicates over the flow of the Business Process (BP). Indeed, public services related processes can be modelled and implemented using notations and tools based on the BP abstraction.

“A BP is a collection of related and structured activities undertaken by one or more organizations in order to pursue some particular goal. Within an organization a BP results in the provisioning of services or in the production of goods for internal or external stakeholders. Moreover BPs are often interrelated since the execution of a BP often results in the activation of related BPs within the same or other organizations” [1].

This is because the PA sector in modern society is characterized by the need to support extremely complex processes in order to provide services to citizens and business. Complexity is raised by the fact that the provisioning of services is in the most cases a collaborative activity shared among different, possibly many, PA offices. Provided PA services are in general quite interrelated, so that activities carried out to deliver a service can generally lead to the enactment of other activities.

In order to support such scenario we design and develop an approach and a tool to implement transparency into Public Administration and more in general to improve citizen's satisfaction for what concern the use of e-government services. From the technological point of view the approach is two-folds, on one site it recognizes the role of interoperability and takes into

account inter-organization process value, on the other side it reconsiders the value of social environment in order to contribute to close the gap among use and availability of e-government service. The approach enables to build up a community involving all stakeholders of Public Administration ecosystem.

The rest of the paper is organized as follows. Section 2 presents the scenario and the proposed approach, whereas Section 3 describes *Scrivania*, the approach and related use cases. Section 4 introduces the implementation tool. Section 5 presents a real Italian case study. Concluding remarks are discussed at the end of the paper.

## **2. – Scenario Analysis and the proposed approach**

The e-government in Italy is characterized by services availability and low service usage. This is most relevant in small towns that represent 70.3% of all National Cities. From the point of view of the citizen there is an emerging demand for update information and fully interactive public services. The citizens want to be aware of the to do list before using the service through the Internet. This is possible via friend's relationship and contacting the government itself. All this can be traced to understand the level of citizen satisfaction and consequently review the practices of the administration.

Moreover, e-government services cannot be based only on a single PA, but they are scenario characterized by complex inter-administration processes, where each PA contributes on the basis of their responsibilities. In such a way a Public Administration community emerge following the success story of social networks such as Facebook and LinkedIn.

The proposed approach aims to improve the experience of citizens in interacting with PA. *Scrivania* aims to ensure to the PA a tool for continuous improvement.

The proposed scenario makes raise multidisciplinary issues that can be solved at technological level thanks to the integration of Knowledge Management (KM) [4] and Business Process Management (BPM) [3]. Talk about KM and BPM in Public Administration means face knowledge-intensive and collaborative processes. In this context, KM and BPM techniques represent a management tool in a changing scenario.

*Scrivania* address KM and BPM in two main areas: respectively (i) the citizens profiling and (ii) the service modeling.

First, in order to return to the citizen information and services more attractive than their own interests *Scrivania* allow accurate profiling of the individual. It can be implemented either with explicit and implicit mechanisms. The explicit profiling is done via the interpretation of bookmarks or the analysis of the registration data. The implicit profiling is done to taking into account several indicators such as the time spent on a page and the browsing history.

Compared with the models of services in Public Administration studies underscore the ongoing transformation in the life cycle of the service and facilities at its base. The traditional hierarchies of the public sector, historically associated with processes driven by internal goals, rather than a mentality of service provision outside, have been pushed to evolve thanks to new technologies. The impact on the life cycle of the service is indicative: the citizen who inquires, orients itself, interacts with the PA and talks are all steps to govern appropriately with reference to the underlying processes.

The conventional model of PA who works as a separate and distinct entity, each managing its own knowledge in silos protected and disconnected from each other, is being transformed. The scenario in which the PA is likely to operate an information society is characterized by network relations in whom governments need to cooperate with other governments, with non-profit organizations, businesses and citizens to deal with the new challenges of globalization. New actors and stakeholders enter into a relationship with the government. In this regard it is essential to support administrative processes. Summing up the transformation of the service models of public administration can be contextualized with respect to the following points as key factors of success: collaboration, control, sharing, transparency, inclusiveness and simplification.

### 3 – The Scrivania project

#### 3.1. Overview of the project and architecture

The *Scrivania* architecture is based on a web application, suitable to support scalability and modularity. The main components are showed in Figure 1 and following proposed:

- *Authentication Module*, It allows citizens and administrators access to the functionalities provided by *Scrivania*. It guaranties different levels of security, as following presented.
  - Level 0 = self-registration where the users can register their-self and use such credential with a low level of security.
  - Level 1 = user name and password (identity is based on what the users knows). It is the most common and simple authentication system to administrate, it offers a lot of advantages, for example it does not need special hardware devices but it also presents many disadvantages, the association between the identity of people and authentication data is not guaranteed. Typically, this method is used to trace the activity of the user (profiling) and it grants a low protection level services access.
  - Level 2 = Smart cards (identity is based on what the consumer own). It is an authentication system based on physical support that guarantee the association between real identity and authentication data into smart cards. The security level can be further increase by a personal code that ensures the person from loss and robbery. In particular *Scrivania* supports the Electronic identity card [6] as the national standard for digital identity card.
- *Administrator Module*, It allows administrators to manage PA services. Two different sub-modules that are described following compose this module.
  - *Services Creation sub-module*. It provides functionalities for services creation – in particular it introduces a collaborative environment for BP modeling in which a BPMN 2.0 [2] model can be implemented. It enables communication during the modeling by a chat system. This module support verification functionalities.
  - *Manage Services sub-module*. It permits administrators to manage services and *Scrivania* functionalities. Using the module administrators can share services in order to allow citizens their executions. Administrators can also check statistics about services quality.

- *Citizen Module*, It allows citizens to execute services and to interact each other's. Three sub-modules compose this module.
  - *Social sub-Module*. To support citizens communication during services executions. Citizen can also search their friend and give a feedback about a service or single activity of service.
  - *Similarity sub-Module*. To promote services to citizen based on profile similarity. It means that probably two similar citizens need to execute same services. This module provides an algorithm that merges two types of properties, service execution frequency and citizen similarity as a way of validation.
  - *Execution sub-Module*. To search and to execute services. It provides also semantic searching functionalities.

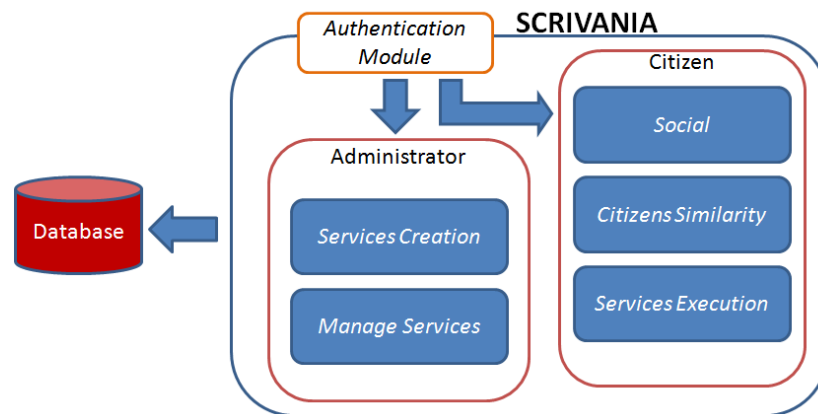


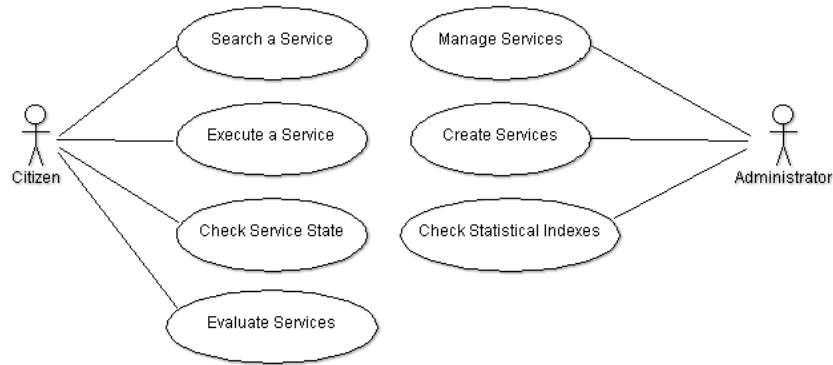
Figure 1 Scrivania Architecture

### 3.2. – Use Case

The most important use case related *Scrivania*'s functionalities are following proposed. They are modelled using UML 2.0 use cases diagrams. It provides a graphical representation of actor's interaction with the system and of use cases specification emphasizing dependencies. We group the use cases in two areas: (i) the *Scrivania* services, and (ii) the social environment use cases.

*Scrivania* services refer both to citizens and PA employs playing the role of administrator. According to use case in Figure 2 a citizen can do the following activities.

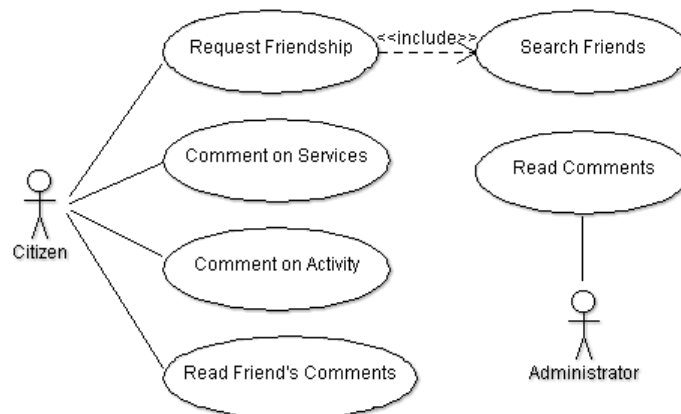
- Search a Service using key words.
- Execute a Service following step by step the service execution, this make possible to complete and validate the service instance quickly and without problems.
- Check the state of a service instances during execution in order to check if there are issue to solve.
- Evaluate the Services giving a rating for 1 to 10 where 1 is the minimum score and 10 is the maximum.



**Figure 2 Services Use Cases**

According to use case in Figure 3 an administrator can:

- Manage Services in case better versions of service are available.
- Create Services and make services available to citizens using the modeling phase of the collaborative environment.
- Check Statistical indexes about services and citizen’s opinions about a specific service.



**Figure 3 Social Environment Use Cases**

The use case of Scrivania Social Environment is showed in Figure 3. As we can see it is showed that citizens can do the following activities:

- *Search and send a friendship request to another citizen.* To communicate two or more citizen has to be friends. For this reason *Scrivania* provides functionalities to search and request a friendship.
- *Comment executed Services and Activity.* Citizens comments are used in order to improve the quality of services and in order to support others during executions.
- *Read Comments of friends.* Citizen can be driven during service execution reading other citizen opinion in a specific service.

Instead administrators can only read citizens comments in order to check citizen needs to improve services.

#### 4. – Tool chain implementation

*Scrivania* is implemented as a web based application running on Apache Tomcat. It is showed in Figure 4. It permits to use java code directly to dynamic web pages. The services modeler is based on jGraph, a free javascript library used to draw graph. We adapt jGraph to BPMN 2.0 specification in order to provide a standard language for services modeling. Thanks to jQuery we implement most of supported functionalities, for example the collaboration environment is created using jQuery post functions and java code.

The used Database Management System is MySQL. It contains all the needed information such citizens and administrators data, services models, services instances, etc.

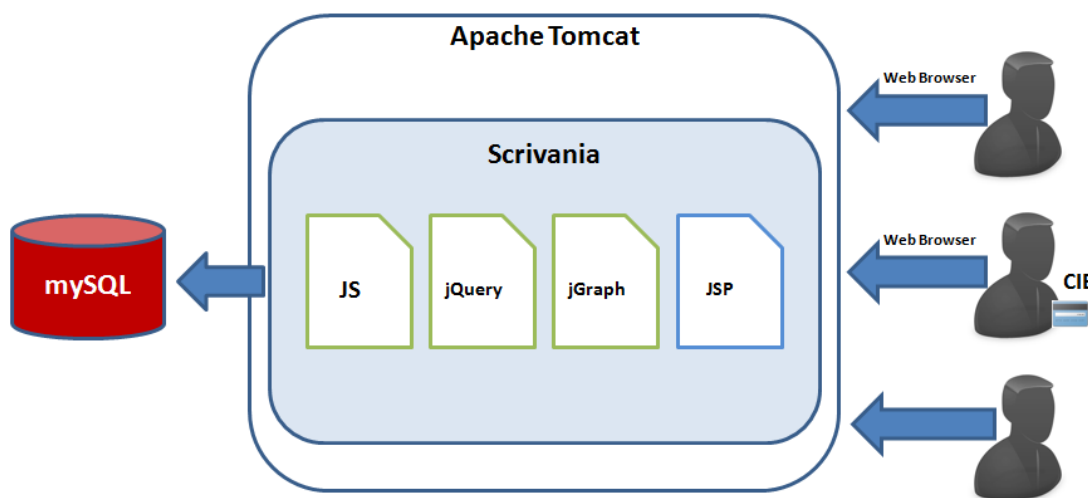


Figure 4 Scrivania used Technology

Administrators and citizens can use *Scrivania* via web browser (Internet Explorer, Firefox, Safari, etc). It means that *Scrivania* is a 3-tier application where the complexity of client is managed in the server.

#### 5. – Case study

In order to validate our approach we analyze a real Italian scenario in the PA domain. The BP concerns the request for tenders. In Italy a request for tenders require the involvement of three different participants: (i) the *Citizen*, which send an offer; (ii) the *Auctioneer PA*, which checks offers and decrees the winner; (iii) the Italian regional law court (TAR).

On the base of the Italian law we model the process using *Scrivania*. Figure 6 shows the modeled BP. Citizen sends an offer to Auctioneer PA that checks if the offer is the provisional highest. If the offer is the global highest, Auctioneer decrees the winner of tender that can accept or renounce the contract. Otherwise, if the offer is not the highest and citizen thinks that the judgment was not correct, he/she can present an appeal to the TAR. TAR analyzes the sent appeal and establishes if accept or reject appeal. In any cases TAR sends an appeal outcome to Citizen and to Auctioneer PA.

As soon as the process has been modeled, in order to execute the request for tender service citizens can search it using the *Scrivania*'s research form as Figure 5-A shows. Research result shows service name and provides a button to allow citizen executions. When a citizen clicks on execution button in his/her home page appear a new service instance as Figure 5-B shows. Each instance has a different instance name (that correspond to services name), and instance citizen, a date and a state that can be active, in waiting end ended. An instance is active when the citizen can execute some tasks, in waiting state when he/she has to wait for other participant actions and ended state means services is complete correctly.

**RICERCA PROCESSI**

gara

Nome Processo	Descrizione	
Gara Appalto Pubblico		<input type="button" value="esegui"/>

**ISTANZE ESEGUITE**

Nome Istanza	Nome Cittadino	Cognome Cittadino	Codice Fiscale Cittadino	Data	Stato		Vota
Gara Appalto Pubblico	Mario	Rossi		2013-06-25 12:48:53.0	Attiva	<input type="button" value="esegui"/>	

(A)
(B)

**Figure 5 Scrivania services research and citizen instance list**

If the state of the request of tender is active the citizen can execute the service. When citizen clicks on the execution button (button “*esegui*” in Figure 6-B) an new page shown in Figure 7-A contained the list of possible tasks appears. In this case the only task citizen can perform is Send Offer. When he/she performs it the instance state change in “Waiting” (Figure 7-C) because, as the BP in Figure 6 shows, citizen has to wait a message from Auctioneer PA to go ahead. In the other side an Auctioneer PA worker can see that a new instance of Request for Tender has to be performed (Figure 7-B) and that he/she can execute the task “Select Best Offer” (Figure 7-D), and after that he/she can send the message task “Best Offer” or “No Best Offer” to citizen. In any cases the state of instance change to “Active”.

In this way using *Scrivania* is possible to execute the entire BP.





(A) Citizen Tasks

Nome	Descrizione
Invia Offerta	<input type="button" value="esegui"/>

(B) Auctioneer PA Home

Nome Istanza	Nome Cittadino	Cognome Cittadino	Codice Fiscale Cittadino	Data	Stato	Vota
Gara Appalto Pubblico	Mario	Rossi		2013-06-25 12:48:53.0	Attiva	<input type="button" value="esegui"/> Solo i cittadini possono votare

(C) Citizen instance state

Stato
In Attesa <input type="button" value="es"/>

(D) Auctioneer PA Tasks

Nome	Descrizione
Selezione la migliore offerta provvisoria	La selezione avviene secondo i criteri stabiliti dal Codice degli appalti aggiornato al D.L. n °52/2012. Al termine della procedura dichiarata l'aggiudicazione provvisoria a favore del miglior offerente. <input type="button" value="esegui"/>

Figure 7 Request for tender tasks and instance state

## 6. – Conclusion

The paper presents an approach for Public Administration transparency. The approach is based on services modelling and execution. To validate our approach we provide a web-based application called *Scrivania*. Using *Scrivania* domain experts can model services in term of Business Processes and citizens can search and execute the services they need. *Scrivania* also provide a social environment to involve citizen in a community with the aim to support processes execution.

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