

# COMPLAINTS AND SUGGESTIONS WEB-BASED COLLABORATIVE PROCEDURE

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*Citizens in modern societies demand quality public services. People like to participate and collaborate in local governments by means of suggestions and complaints submission. Administrative procedures have arrived to the Web and citizens can save a lot of time because of this new situation. Not only citizens need to save time, but also civil servants do. The system we suggest in this paper supports feedback between government and citizens through the Internet. Intelligent agents, workflow processes and Web-based computing are some issues which could be mixed to facilitate worker-to-worker (w2w) and Government-to-Citizen (G2C) communication and coordination. The more complaints and suggestions a govern processes, the better it works. All the administrative procedure steps are well analyzed by workflow modelling and tasks coordination is shown in this paper. Full and easy access is guaranteed using a Web-based system.*

## 1 Introduction

Quality of service inside public administration is something more than a beautiful expression. This is especially true in local administration. Local governments in advanced democracies are interested in citizens' opinion about their management.

Politicians want people to participate in the government and researchers are looking for new ways to increase citizen participation [6], [7], [9], [14]. The complaints and suggestion administrative procedure is one of the most common systems that allows people be heard by their local government.

A complaints and suggestion procedure affects different people and can be considered as a kind of computer supported collaborative work system (CSCW). Town councils are scenarios where CSCW systems could help to coordinate civil servants work, because of the communication between each other is allowed. This is not only good for an internal use, but also for coordinating, communicating, and collaborating with citizens [4], [5], [7].

Citizens need to express what they think, and town councils need to know what their citizens think in order to improve. Lots of administrative procedures are processed every day in administrative units of the town councils, most of them initiated by citizens.

In this paper we analyze a Complaints and Suggestions Web-Based Collaborative Procedure (CS-WCP), an electronic administrative procedure which takes into account collaboration, communication, as well as worker-to-worker (w2w) and Government-to-Citizen (G2C) coordination. This system is one of the main tasks defined in a project that is being developed in our research group [3], [11], [13].

CS-WCP includes three intelligent agents supporting tasks that are processed in a semi-automatic manner. We say semi-automatic because these agents suggest what to do. Although they could do it by themselves, the last decision could depend on the final responsible of the system.

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The paper is organized in the next sections: section 2 describes the workflow model. Section 3 shows how an intelligent agent can help in the reception of comments stage. Section 4 presents a user assistant agent. Section 5 describes how the response time is controlled. Section 6 introduces some expected results and finally the conclusions and future work are presented in section 7.

## 2 System Description and Workflow Model

The objective of our CS-WCP system is to allow citizens to post their complaint or suggestion in an easy way (web based) and, at the same time, the system enforces public administration to solve the comment and to answer citizens in a finite time.

The complaint and suggestion procedure contributes to increase the participation of citizens in the city management and allows politicians get a real feedback from people.

The system takes a comment (it may be a complaint or a suggestion) which is sent to the Town Council through the Web. It is processed, some times automatically, some times manually, and then, the comment is processed.

Workflow modeling describes the system in a comprehensible way to all the people involved in the development of the final system: civil servant, analysts and developers. Figure 1 shows the complete chart of the main process organized in blocks.

In particular, these blocks are: (a) *complaint or suggestion arrival*, (b) *validation of comments*, (c) *invalid comment workflow*, (d) *valid comment workflow*, and (e) *complaints control time*. The blocks are described in the following sections.

Any CSCW system has to define groups and roles played by people involved in the complaints and suggestion procedure. In CS-WCP we have four roles: *Citizen*, *Reception Responsible*, *Unit Responsible* and *General Administrator*.

A user in the system accessing to the Web without authentication, that is to say, with the default user, is considered to be a *Citizen*. This is a public role. Neither a user nor a password is required to access the system as a *Citizen*. Complaints and suggestions could be sent through the system, but we have considered that a valid e-mail is essential for providing responses to the citizens. Any user with another role needs to be authenticated in the system.

A *Reception Responsible* user receives all the comments (complaints and suggestions) and he may personally answer the comments or assign them to *Unit Responsible* users, assisted by the two intelligent agents, the *Unit Assignment* agent and the *Comment Classification* agent that will be described in the next section.

The *Unit Responsible* user is usually a civil servant in an administrative unit. Such a user only receives assigned comments from the *Reception Responsible* and he must answer in time. There is a final role in the system, the *General Administrator*. This user is in charge of creating, modifying and deleting users.

And on the other hand, a series of comment marks have been created so that users and administrators can follow the process of any comment: (1) *Kind*, an initial classification of the comments -might be a complaint or a suggestion; (2) *Received*, the comment has been received and saved in the system and may be processed; (3) *Invalid*, a rude, insulting, offensive or non constructive comment, which will not be accepted in the system; (4) *Analyzed and Valid*, if the content analyzed is accepted; (5) *Threshold*, when a timely warning threshold has been overcome; (6) *Timeout*, when a final time-based threshold has been exceeded; (7) *Assigned*, if the

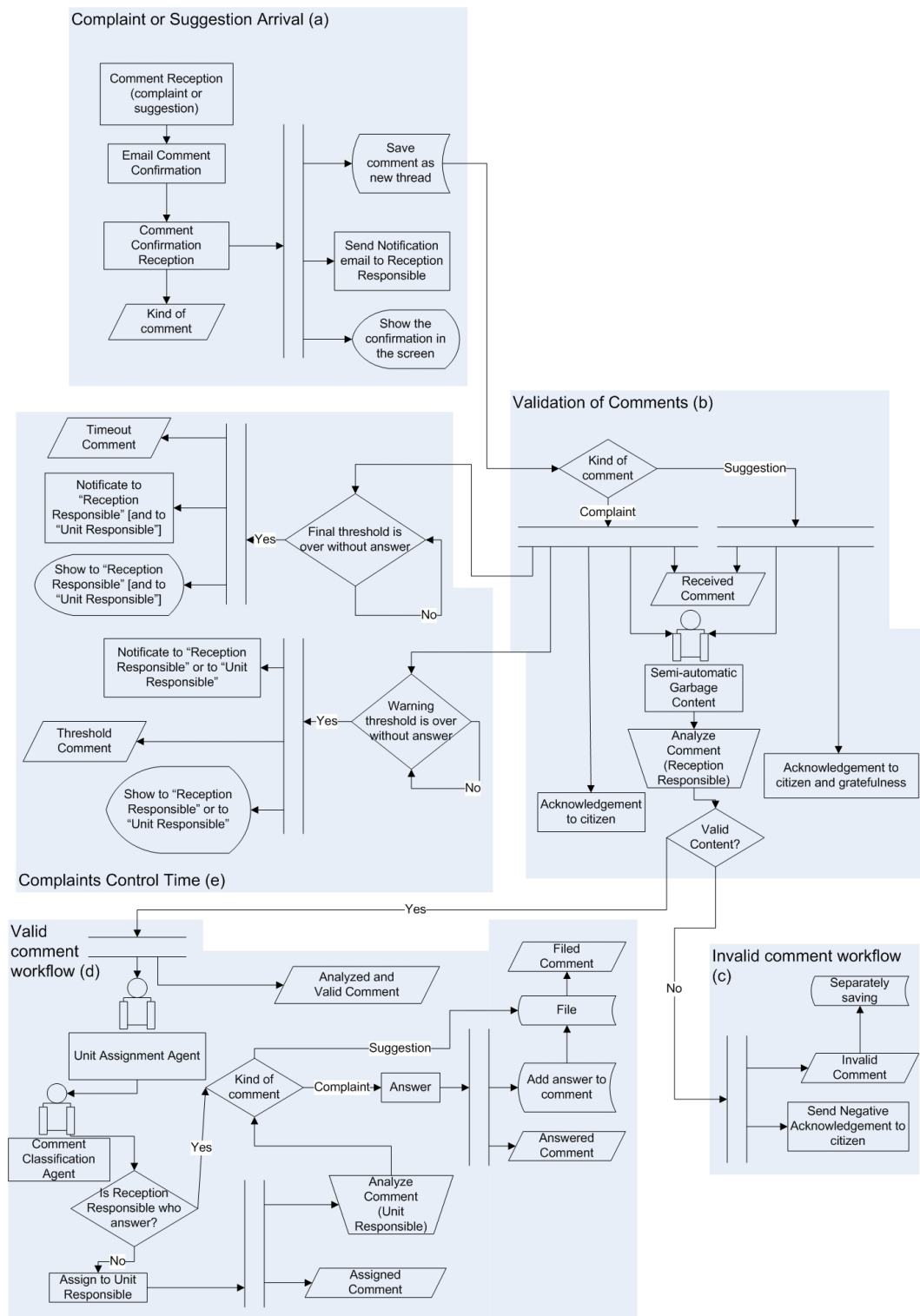


Figure 1: Workflow model of CS-WCP system

*Reception Responsible* has re-addressed the comment to a *Unit Responsible*; (8) *Answered*, for the case of a complaint that has been answered; and finally, (9) *Filed*, when the process is fully accomplished.

### 3 Intelligent Validation of Comments

When a citizen wants to file a complaint or a suggestion (a comment, in general) by way of our CS-WCP, he must fill in an electronic form. And, some additional information is saved in an automatic manner: arrival date and hour of the incoming comment.

Users of the system are warned about acceptance conditions for their comments (rude, insulting, offensive... non constructive comments are not allowed) and they are also informed of the next steps which are going to follow the actual one.

It is important to have a correct e-mail for feed back and for confirmation purpose. The process is started when a confirmation of a comment arrives to the system.

There are three tasks performed in parallel at this point: (1) a notification is sent to the *Reception Responsible*, who receives an e-mail with the new comment, but he has the whole information, even the notification, in his intranet client; (2) a new comment thread is saved, and (3) a gratefulness message including some information about the next steps is shown on the user's screen.

Depending on the kind of comment, complaint or suggestion, the workflow will take one different way, deriving to one or another task.

If it is a complaint, a set of tasks will be performed, and a different set will be performed if it is a suggestion, as you may appreciate on Figure 1-b.

Anyway, an acknowledgement is always mailed to the user. Acknowledgements include the final date when the response should be answered (only for complaints). Comments in this point in the workflow process will be marked as *Received Comment*. Afterwards, the *Reception Responsible* will analyze the comment in order to check if the content of the comment is appropriate, but the *Reception Responsible* is guided in his decision through the intelligent agent called the *Semi-automatic Garbage Content* agent. This agent behaves as a filtering agent [15] and classifies comments as valid or invalid; then, a particular user of the system decides what to do with the comment, or it even can be automatically eliminated. For this purpose, the agent is fed by a vocabulary containing a full set of semantic terms related to unsound words and patrons of inappropriate expressions. The agent automatically mines the comments to extract the number of words present in the unsound vocabulary database. The recommendation of the *Semi-automatic Garbage Content* agent is two-fold: valid comment, if the number of unacceptable terms in the comment is reasonably low or invalid comment, when the number of invalid terms overcomes a predefined score.

If the decision taken by the responsible person is finally that the comment is invalid, the comment is marked as an invalid comment, and it is separately saved (for future statistics purposes).

### 4 The User Assistant and Recommender Agent

When the *Reception Responsible* accepts the comment as a valid comment – after accepting the recommendation of the intelligent agent to mark the comment as valid, or after not accepting the recommendation of the *Semi-automatic Garbage Content* agent to mark the comment as invalid –, it is marked as an *Analyzed and Valid Comment*.

Here a new intelligent agent – a user assistant [12] and recommender agent [2] –, namely the *Unit Assignment* agent assists the *Reception Responsible* in the decision of who is the best-tailored person to handle with the complaint or suggestion. The assistant agent again mines the comment looking for semantic terms related to the administrative units of the council. This agent, as it may be appreciated, performs a semi-automatic ontology-based information extraction. After matching the semantic terms found in the comment with the terms related with each administrative unit, a recommendation algorithm offers as output zero, one or a set of ascending ordered possible unit candidates. A value of zero means that the *Unit Assignment* agent is not able to recommend one concrete administrative unit to be the more confident to the suggestion or complaint. Obviously, in this case, a reasonable action for the *Reception Responsible* is to personally handle the comment. A sorted set of administrative units means that more than one unit may be related to the incoming message. If lastly the *Reception Responsible* decides that one *Unit Responsible* is the person who should answer, he assigns this comment to the *Unit Responsible* from a predefined list. The *Unit Responsible* selected by the *Reception Responsible* may coincide with one unit responsible recommended by the *Unit Assignment* agent. But this is always up to the *Reception Responsible*.

The *Unit Responsible* selected will receive an e-mail notification with the assignment and he is invited to analyze the comment. A third and last intelligent agent helps in classifying the comment that arrives to a unit. The idea behind the use of this *Comment Classification* agent was originally to aid the *Unit Responsible* in keeping track of the great variety of comments through appropriate clustering techniques. This classification is also being used to throw interesting statistics of the contents of the comments that are sent by the citizens. The *Comment Classification* agent is fully inspired in the so called semantic agents [10], which operate on the semantic web. The semantic web is an extension of the current web in which information is given well-defined meaning. A semantic agent introduces a set of descriptors, including the vocabulary, the semantic interconnections and some simple rules of inference and logic.

Of course, this new event is also displayed in his intranet and the comment is marked as an *Assigned Comment*. Either the *Reception Responsible* or the *Unit Responsible* has to take into account the comment if it is a suggestion. Then, it will be filed and marked as *Filed Comment*. Now, if the comment is a complaint, it has to be answered in time. The response is added to the comment, and the comment is marked as an *Answered Comment*, so it can be filed. Ultimately it is marked as a *Filed Comment*.

## 5 Controlling the Public Administration Response Time

Spanish laws force public administrations to establish a limit time for any administrative procedure. That is, administrative procedures should be completed in a finite time. If a person of the public administration does not answer a question in time, obviously the system can not do much. Nevertheless the system helps the public workers by providing two control times.

A person who has to answer a complaint always can see how much time is left in the intranet of the CS-WCP system. He perfectly knows that the answers must be sent out before the final time. In order to provide an efficient aid, the system incorporates two thresholds: a *warning threshold* and a *final threshold* (see Figure 1-e). When the procedure is near to finish without being answered a new e-mail is sent to the person who must answer (*Reception Responsible* or *Unit Responsible*, warnings are only for people who should answer the complaint), alerting about the proximity of the final time. This complaint comment is stuck out in the intranet. Otherwise, if nobody answers a complaint after the *final threshold*, then this would be the worst situation and three parallel tasks would be performed: (1) to notify this fact to the *Reception*

*Responsible*, (2) to mark the comment as a timeout comment, and (3) to show this information in the intranet of the *Reception Responsible* who would send an apology mail to the citizen.

## 6 Expected Results

The CS-WCP system should be running in two months. The system is being developed in the context of a Research + Develop project in a real scenario. All the analysis and modeling stages have finished and now we are in the development and debug process. The research group has been working together with the local public administration managers to define the system.

The CS-WCP system should increase the number of suggestions that people send to the town-council. Currently the town-council receives two or three suggestions a day and it is not possible to citizens to distinguish between complaints and suggestions. Moreover, the suggestions are not processed with the desired time because there is not a system like CS-WCP running. CS-WCP will force the collaboration of different areas inside the town-council in order to build a suitable response to the demanding citizen. Another expected benefit is the increase of quality of service of the local public administration thanks to the rapid processing of complaints and suggestions. Citizens will feel that town-council hears what they have to say. The introduction of an intelligent agent should improve the response time of the public services. This system will be the first web-based collaborative system running in a town-council supporting the complaints and suggestions procedures. This is absolutely necessary in a town where the use of the Internet has grown up an 8.5% since 2002 [1].

## 7 Conclusions and Future Work

An intelligent Web-based collaborative system to support the suggestions and complaints administrative procedure called CS-WCP has been presented. This is a research in progress paper that can contribute public services become of augmented quality. A good quantity of suggestions reveals the society degree of maturity. Modern public administration need to hear the opinion of their citizens.

A town-council is a rich scenario for the deployment of CSCW systems because there are several groups and roles of people working together. Civil servants in a local administration are organized in functional groups that have to answer the suggestions and complaints from citizens.

Both complaint and suggestions should be managed by different groups inside the town-council in a collaborative way. CSCW system can play an important role to help public administration reach a higher level of quality.

Citizens are always informed through e-mail notifications, which are automatic, and other communications from the officials are facilitated by some links in the intranet and notifications e-mails. Thereby, an official could answer even suggestions.

The main collaborative aspects managed in this system are the coordination between different civil servant to attend the complaint or suggestion and the communication between public administration and citizens.

The procedure has been modeled using a workflow system and moved from manual to semiautomatic due to the introduction of intelligent agents.

Future works include the deployment of the system and its evaluation using satisfaction questionnaires and usability metrics oriented to CSCW systems.

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