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A Model for Customer Complaint Management System using SOA

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Abstract: - Customer Complaint is important information reflecting customers sound and is a primary measure of customer dissatisfaction. An Effective and Efficient response to these complaints is an essential index of organization's performance. The presented model for the Customer Complaint Management System will have the ability to minimize customers' dissatisfaction and on the other hand it can encourage customers to participate in controlling the quality of the service provided. In this paper the researcher tries to improve the relationship between Citizens and the Social Solidarity by presenting a new model of e-Complaint web-service based on SOA. The Proposed model aims to develop a Service-Oriented framework for e-Complaint Web-based that targets the charity lifecycle. The cycle starts with distribution of different services that are provided through charity. Those services are applied for different people based on their needs. Due to different obstacles those services may not be applied in appropriate way. Therefore, a need for a system that could detect Citizen's problems and provide them with suitable feedback is raised. Also, this paper describes the Complaint Management System oriented by Web-application which will be used by Citizens in order to make complaints about their dissatisfaction on provided services. This system will be able to handle complaints by recording and giving feedback for each raised complaint. Results of the study can be a good reference to find out users needs from e-complaint and the handling process of this complaint in the body of any organization.

Key-Words: - *e-CRM, e-Complaint, Complaint Management System, Complaint Handling, SOA*

1 Introduction

Today's development cycles for web-applications such as Portals and Marketplaces are short, and getting shorter with continuous improvements and enhancements as new requirements and features become apparent. Therefore, developing "Web Services" using the "Service-Oriented Architecture" paradigm is a widely accepted concept. On the other side, most of user's complaints are apparent when a system has inappropriate communication between the organizations, their employees and customers (Citizens). Poor communication can result in poor services or products being provided by the organization or Government. Whilst concentrating on the topic of complaint handling, organizations can achieve an efficient success factor by increasing their user satisfaction and their loyalty. Therefore each organization needs to develop its internal and external communication towards its staff and

customers to achieve success. Although appropriate communication can reduce user dissatisfaction; it cannot eliminate complaint.

For a Social Solidarity, there is a need for a Complaint Management System in order to deal with complaints concerning their food quality or delivery service ... etc. Every day Citizens complaint to staff of the service department because of feeling dissatisfied. No matter direct or indirect accusation to any staff, such as face to face complaint, telephone complaint, complaint letter, and message on the web, all the complaints should be accepted and properly cared for. The resolution of the complaint might be economic compensation, improving service and so on. Also it should weight this complaints i.e., weak complaint or strong complaint and take respective measures in order to prioritize handling of complaint. However, many investigations have been done on the topic of e-

complaint system, only one researcher focused on using SOA in e-Complaints System to improve relation between Citizens and Government. The Researcher believes using SOA in e-Complaint Systems can bring more flexibility for complaint departments to change their complaint services. In this paper the concept of e-CRM, e-complaint and SOA were explored first then a new model was presented afterwards the implementation of the new model was discussed.

2 Literature Review

2.1 Previous Work

Out of the previous related work done concerning customer complaint, the most recent research was: Razali *et al.* (2011) [6] develop a new complaint management system called (e-Aduan) as a platform for UiTM Pahang's customers to complaint and comment regarding the services and facilities provided by the university.

The researcher found out that the most appropriate to the research topic handling customer complaint using SOA was: Najar *et al.* (2010) [5] tried to improve relation between Citizens and Government by presenting a new model based on Service Oriented Architecture (SOA). With utilizing the presented model in Government body on one hand Governments will have the ability to minimize Citizens' dissatisfaction and on the other hand it can encourage Citizens to participate in controlling Government body such as Governments' staffs and organizations.

2.2 E-CRM

Electronic Customer Relationship Management (e-CRM) is gaining the attention of e-business managers who are interested in increasing repeat business and customer loyalty. [4] Refer to Cho Y. *et al.*, (2002) [1] CRM has four key components, as shown:

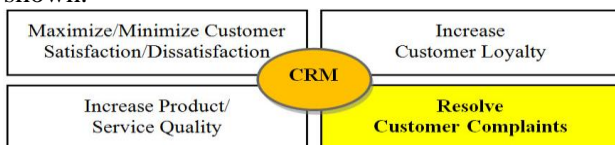


Fig.1. Key components of e-CRM [1]

Complaint information should be shared among departments within a company and even other companies through the supply chain. Best-Practice companies have realized that using CRM strategy solves expected problems in implementation as managing all complaint information and defining relations between different complaints.

2.3 E-Complaint

Each organization has its own definition for complaint. They define complaint related to the services they provide for users. Hence definitions are different because of the variety of services among the organizations [5]. Customer complaining behavior defined as the consequences of customer dissatisfaction [7], it has long been considered an important form of market feedback [2]. On other words, Customer Complaints Management is becoming a critical key success factor in today's business environment. Complaint Management System is a system that can survey customer feedback about any organization. Best-practice organizations consider complaints as opportunities for improvement. These companies understand the link between complaint resolution and customer loyalty and work hard to act immediately on problems that can be easily resolved. In addition, the researcher believes that either Government or any system needs user feedback to find out the challenges after running new system. User feedback can be considered as complaints and suggestions, which can be instrumented in the organization to improve its services and products.

2.4 Service-oriented architecture (SOA)

Service-oriented architecture (SOA) is a style of developing and integrating software [3]. It is designing system with services instead of procedures [5]. It involves breaking an application down into common, repeatable "services" that can be used by other applications, both internal and external, in an organization – independent of the applications and computing platforms on which the business and its partners rely [3]. Therefore it helps system to be more flexible to change. With using SOA the costs of change will be decreased enormously since administrator does not need to change the whole system and they just need to change or add the service which system needed. There are many definitions for the SOA but the researcher deeps all definitions are same in concept. In SOA base systems we have different systems with different services which have to collaborate with each other through a common bus and unique data type although each system has its own data type [5]. The researcher believes that e-complaint based on SOA talks about designing a system based on different services beyond a common interface.

3 Proposed Model Structure

3.1 System Analysis

The development of the proposed model is not only depending on how the system works. It also depends on the working flow process that being identified and need to be implemented and followed. The proposed complaint handling model is a method, platform or web-application to ensure that the complaint process is addressed and handled properly. The proposed Work Flow Process is shown in figure 2.

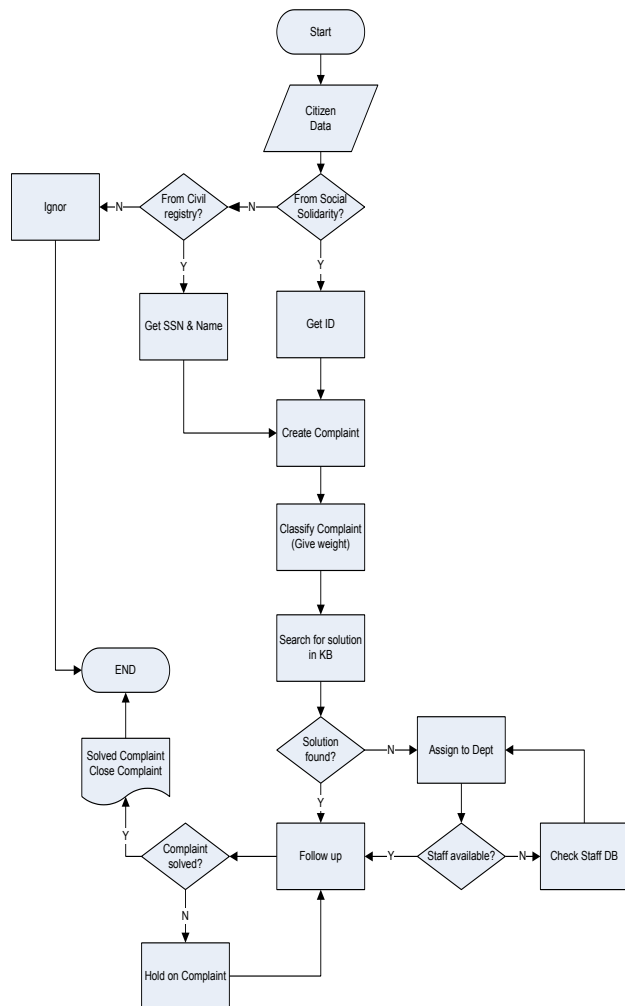


Fig.2. Proposed Working Flow Process

Figure 2 shows the main processes in the working flow process of the proposed model. First, verifying the Citizen validity, then creating the Citizen complaint followed by a detailed processes to manage each complaint according it's classification priority and searching in the knowledgebase for related reference or similar case in order to find a quick handling procedure for finding a solution with the contribution of the responsible staff who will be dedicated to identify the rules on how to solve and get appropriate solution.

In this paper the researcher tries to develop a model in terms of electronic complaints, which can support complaining from poor service quality and delivery. The advantage behind this model is the simple method for handling the Citizen's complaints about what dissatisfies them.

3.2 System Design

According to Najar *et al.*, (2010), there was a previous model which handles the e-Complaints based on SOA, as shown in figure 3.

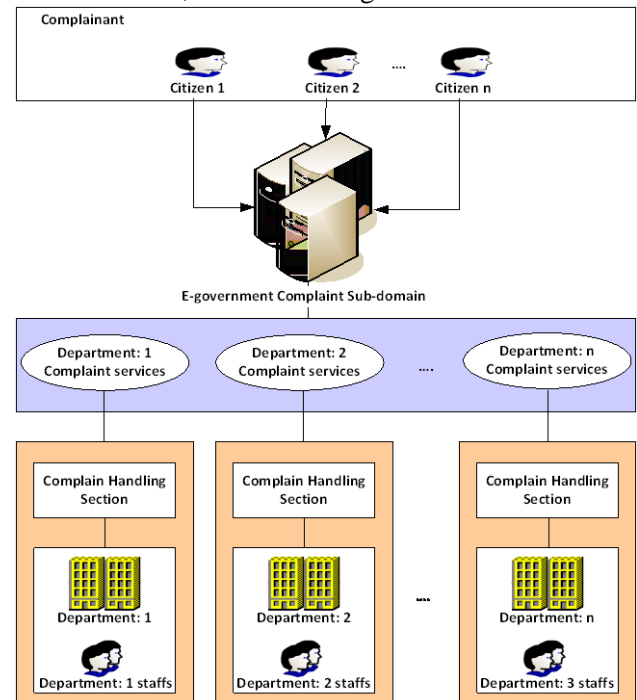


Fig.3. Previous model for e-complaint based on SOA [5]

This model was designed to remove the main complaint handling department. In consequence, it made a small complaint handling section in each department. These small complaint handling sections provide complaint services for irritated citizens. Due to each organization has its own complaint handling procedure therefore each complaint section provides specific complaints handling method according to its department. [5]

The researcher disagrees with the previous model concerning the idea of removing the centralization of handling the complaints as this is against the idea behind e-CRM which is the coordination and common view of all the processes related to customer and proposed the below architecture for e-Complaint System based on SOA. The researcher enhanced the previous model by redesigning and centralizing the Complaint Management System, as shown in figure 4.

The proposed model is divided into 3-tiers that consist of the following:

▪ **Database - tier**

It contains data about system users and their profiles, Citizens information, available resources, and social association profiles.

▪ **Business – tier**

It consists of the core of the system. i.e. complaint handling and feedback components.

▪ **Presentation - tier**

It consists of web-based user interface.

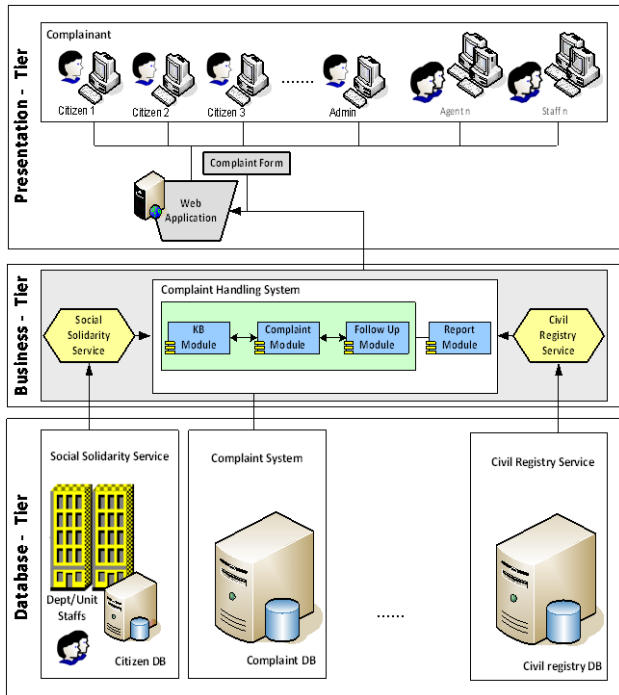


Fig.4. Proposed Model for e-complaint handling system using SOA

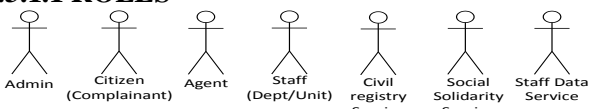
The proposed system could be generally applicable for any web-based e-complaining system.

3.3 Implementation Design

After explaining the working flow process and the proposed model, the next step is the implementation of the system as follows:

3.3.1 Use Case Diagram

3.3.1.1 ROLES



- **Admin-** Create system users and manage their privileges,
- **Citizen-** Make Complaints against the provided services,

- **Agent-** Record the Complaint in the web-based then assigns follow up to available staff,
- **Staff-** Manage the Complaints causes and actions in the system then provide solutions,
- **Civil registry-** Has all Citizens SSN, Name... etc,
- **Social Solidarity-** Has Citizens details that deserve services,
- **Staff Data-** Has all staff details who works on Social Solidarity and could be assigned to deal with Complaints.

3.3.1.2 Scenario Overview

A Citizen encounters a problem with the Social Solidarity; he enters the web and fills his new complaint in the complaint form, or he contacts the agent and explains his problem. Then the agent records the problem; opens the complaint system and creates the new complaint entry, also updates the complaints and enters information on each failure associated with the complaint. In a subsequent process the staff of the service department handles the complaints and delegates each complaint to the responsible one. Each department deal with the assigned complaints according to the management rules then analyzes actions and causes to get results. After that, propose a satisfying solution for the Citizen's problem. If this solution is satisfactory for the Citizen then the statement of the complaint is closed. If not, the responsible department edits the original complaint and the process starts again. The new Complaint Management System is needed to improve these workflows and enable each department to contribute to the process of solving the Citizen complaints.

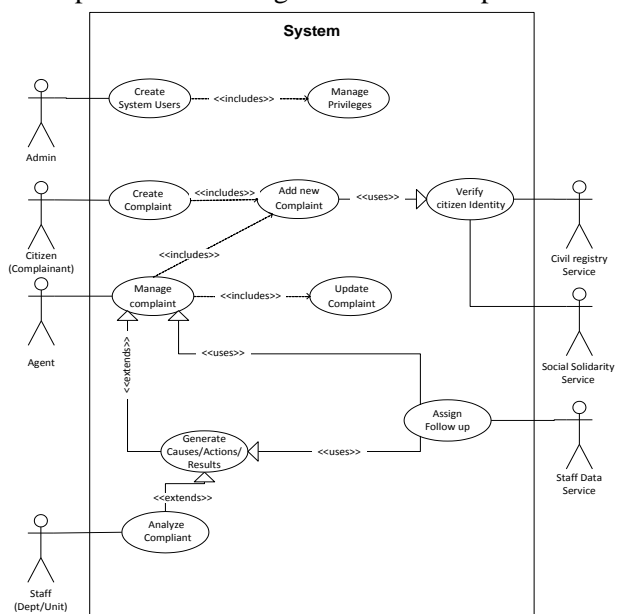


Fig.5. Proposed Use case Diagram

3.3.2 Sequence Diagram

For more understanding, the researcher summarizes the flow of the major functions of the system using the sequence diagram to show how processes operate one with another and in which order. The major functions of this system need to answer the following questions as: Which type of users deal with it? Who manage the system users and assign roles? Who make the complaint? Who deal with each complaint and according to which criteria? Who solve the complaint? Who follows up each complaint? Fig.6. shows the flow for the four main system users dealing with the system.

- **First user:** the administrator who adds new users or manages system privilege for whom exist on the system by assigning their roles.
- **Second user:** the Citizen (complainant) who makes complaint and check for existing complaint status.
- **Third user:** the agent who registers or manages Citizen Complaint each according to its weight classification and follows up through knowledge base in case of solution not found then forward the complaint case to the responsible staff of the service department to handle it.
- **Fourth user:** the responsible staff of the service department who deals with the waiting complaints by identifying and analyzing the causes and actions for each complaint then resolving it according to the management rules and propose a preventive action in order to ensure that this complaint will not be raised again. Then finally, back the complaint case to the agent in order to follow it up. After that, the agent updates the complaint status or closes the complaint case if it resolved.

Also there are two main services that integrate with the proposed system, as showed in fig.6.

- **First service:** the Social Solidarity service which contains the entire Citizens' information that deserves the services each according to his region and Governorate, also it contains the entire staffs' information, each according to his department and role to deal with cases on the system.
- **Second service:** the Civil Registry service which contains the entire Citizens' identity information, if they deserve services or not, also to validate the identity of the Citizen who make complaint in order to improve the provided service as general.

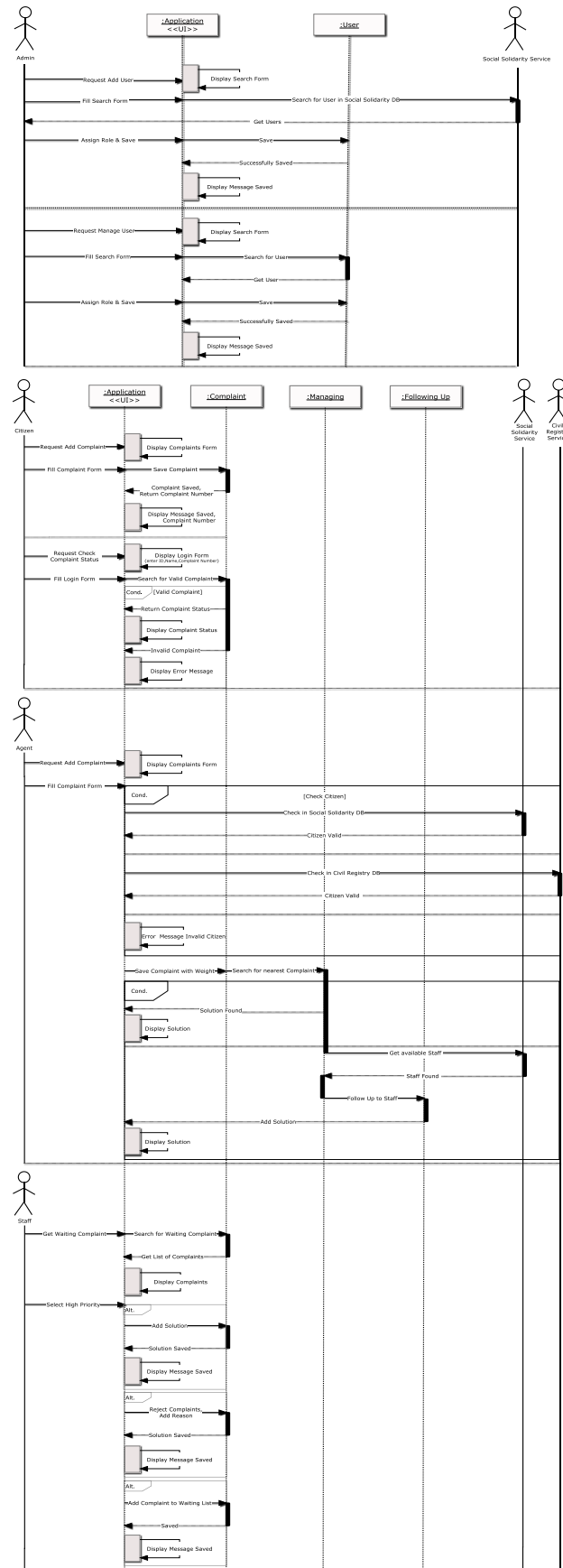


Fig.6. Sequence Diagram for the proposed e-Complaint System

4 Conclusion

The researcher has highlighted how the system works, who are the main users, services and how they can deal with the proposed system. This paper presents an overview of the development and implementation of the Complaint Management System as a web-service based on SOA. The results obtained from the implementation are encouraging and promising for the development of more complex systems in the future as the Complaints Management is a complex and critical problem. Complaints and compliments are a valuable source of information that organizations can use to improve program delivery and service. As regulatory and market pressures continue to mount upon companies, industry leaders will need to develop effective solutions or face the high costs inherent in failed technology implementations and weak customer relationships. The preferred alternative is a customer-focused complaints management solution that works. Finally the researcher believes that the presented model can be helpful in other fields of e-complaining in terms of Citizen Adaption and Citizen Loyalty.

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