Developing ADUN e-Community Portal for Community in Malaysia : Crime Prevention Tips Module, Message Board Module, Report Module and Analysis Module

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Abstract—**ADUN e-Community Portal is a medium that enable community to voice out their complaints, dissatisfaction or opinion towards relevant government agencies services in Malaysia. This portal can help to enhance the way of relevant government agencies managed the complaints created by community. This is because the portal provides the service that allows the community representative supervised the progress of particular government agencies that handling the community's complaint. This portal also indirectly will improve relationship between community representative and the local community. There are nine modules involved in development of this portal. They are my profile, complaints/issues, discussion, announcement, directory, message board, crime prevention tips, report and analysis. All of this module have different role and bring different benefit to the community. This paper will describe about development techniques used for four modules. They are crime prevention tips, message board, report and analysis.**

Keywords : e-Community; message board; crime prevention tips; report; analysis, technique.

I.   INTRODUCTION

Internet usage has increased and become a necessity for every community due to today borderless world. Various technologies and new applications were developed and invented for the use and enjoyment of community. One of new developed technology is web portal which is an application that has become a trend for an organization's usage to increase their quality service. State Assemblyman (ADUN) e-Community Portal is a government social networking service portal which is developed to be as a platform for the community to voice out their opinions, dissatisfactions or complaints regarding any community issues towards the relevant government agencies and departments in Malaysia. This portal consists of nine modules which are my profile, complaints/issues, discussion, announcement, directory, message board, crime prevention tips, report and analysis. It also consists of three type of user which is ADUN, user and admin. These modules bring different roles and benefits to the community. They provide services to assist the community in any particular area, city or town to get the information regarding complaints, announcement news, tips, and sharing of experiences, information or concern via message board. The development of this web portal is using the dynamic scripting language that is PHP scripting language and MySql as a database to store the required information.

The community is unsatisfied with the way the relevant government agencies react with the complaints. Their public service system delivery was worse because sometimes the complaints have no answer, delayed answer or even no action taken [1]. Besides that, the difficulty of having face to face conversation with the community representative also became another reason for dissatisfaction of the community. Therefore, this portal provides a solution to solve the problem. It provides a service that enables the State Assemblyman (ADUN) to monitor the progress of relevant government agencies in handling the complaints. This portal also uses the transparency concept which each community can view the other complaints which related to the same area or district with them and know the progress action. Besides that, they also can have conversation easily with the community representative via message board or discussion module without need to make any appointment and queue up to meet the representative to report any complaints. The services provided via this portal, in return, will give pressure to the relevant government agencies to solve the complaints better and faster than before thus it improves the efficiency. It also indirectly will improve the relationship between the community representatives and the local community.

A. Objective in Modules Development

The overall objective of ADUN e-Community Portal is to enhance the performance and efficiency of relevant government enforcement authorities in managing any complaints created by the community and to improve the communication and relationship between community representative and community. While the specific objective for crime prevention tips, message board, report and analysis modules are:

a) To provide the guideline, information or tips about criminal for community to increase caution and awareness in crime prevention tips module.

b) To enable and encourage user to discuss or share any information, experience and question about representatives or other users in the community using message board module service.

c) To provide performance report of government agencies and departments who handle the community's complaints in the report module.

d) To enable community representatives to examine a particular government agency or department performance in terms of volume and nature of complaints from time to time in report module.

e) To enable admin to analyze social network of the community who vote or submit particular complaints to examine the flow of information in the analysis module.

II. TECHNIQUES OVERVIEW

There are several potential techniques in developing the web portal. These techniques have been researched and prepared during the analysis phase. The potential type of techniques to be used are system flowchart, UML, entity relationship diagram (ERD), and storyboard which provide the ability to specify the relationship process, information flow, presentation, navigation, and temporal aspects of the modules. Such techniques are described in the following subsections.

A. Flowchart

Flowchart is a graphical representation that helps organize steps in developing a program or modules. It helps to generate understanding about the idea of the module and guides a programmer to write the module easily from start until the end of the operation [2]. Usually, flowchart is drawn by using different symbols or shapes to determine the process of flow in sequential steps. The symbols used are circles, rectangle, diamond, ellipse, hexagonal and line. These symbols are used to represent the activity occurred in a brief and clear statement for the module. For example, start and end of a program, input and output operation, decision making, processing steps and flow line [3]. By using flowchart as a technique before developing a program, it benefits a programmer to reduce the number of errors, and easily find an error and it is helpful during testing.

B. Unified Modeling language (UML)

UML stands for Unified Modeling Languages. It is an object-oriented modeling technique and it is used for determining, visualizing, constructing and documenting the behavior of software systems [4]. It is usually used in complex and large system. Software engineers and designers always use UML to analyze, design and develop applications. It becomes an important practice for them during analysis and design phase in developing modules. Besides that, UML provides many types of diagram or graphical notation to describe static or dynamic behavior of the system in a few different situations. These types of diagram are class diagram, use case diagram, activity diagram, sequence diagram and others [5].

UML is compatible to design all sizes of the system in various levels. It also not only used for object-oriented software system, but can be used to design database [6]. Besides that, it also enhances its maintainability and reusability.

C. Entity Relationship Diagram (ERD)

Entity relationship diagram or known as ERD is used to represent database relationship structure. It is used to identify the entities and relationships between entities [7]. ERD usually is used in designing a database. It consists of three important components which is entity, relationship and attribute. Each of component describes different meaning. An entity is an object, person, place or thing that represents a category of data. Relationships represent the interaction between entities and attribute used to identify a number of relationships [8].

D. Storyboard

The storyboard is a technique that uses drawings or sketches to represent the interface layout of modules or program. The storyboard technique describes an interaction between a user and a product or other user. The storyboard is designed to represent the things that are external to the system. The designer can plan and create a storyboard to determine the change of user interface layout once the system gets the interaction from the user. The storyboard enables the designer to feel the flow of user experience and it uses minimum details in order to get good illustration about the system [9]. Advantages of storyboard are giving more meaningful user experience rather than flow chart and other technical diagram. It also gives a quick way to sketch design idea. The disadvantage is that it is not practical to be used for complex system to cover all use cases.

III.   SELECTED TECHNIQUE

After understanding several potential techniques and knowing about their advantages and disadvantages, UML is selected as a technique to develop the respective modules. Since UML supports many types of diagram, it has the capability to determine whole operation of modules either external or internal. Besides that, UML is a good technique to develop an object oriented system and has been practiced by many software engineers. Two diagrams in UML which is use case diagram and state chart diagram have been selected. Both use case diagram and state chart diagram are used for analyzing the functionality of the modules and they define the actor who will interact with the modules.

IV.   SYSTEM COMPONENTS

A. CRIME PREVENTION TIPS MODULE

This module provides tips on crime prevention for the user to increase their awareness regarding the danger of crime. Figure 1 represents the use case of activity in crime prevention tips subsystem or modules. By using use case, it is easy to identify the function and actor involve in this subsystem. The use case shows the three types of users or called as actors are involved in this module. These actors have different capabilities to respond with the function provided. The users are ADUN, admin and User. The line connecting between actor and use case in figure 1 signifies the relationship between the users and the function provided. ADUN and admin have the same capabilities to access, manage, add, edit, delete crime and view crime prevention tips. While a user is only enabling to view the crime prevention tips.
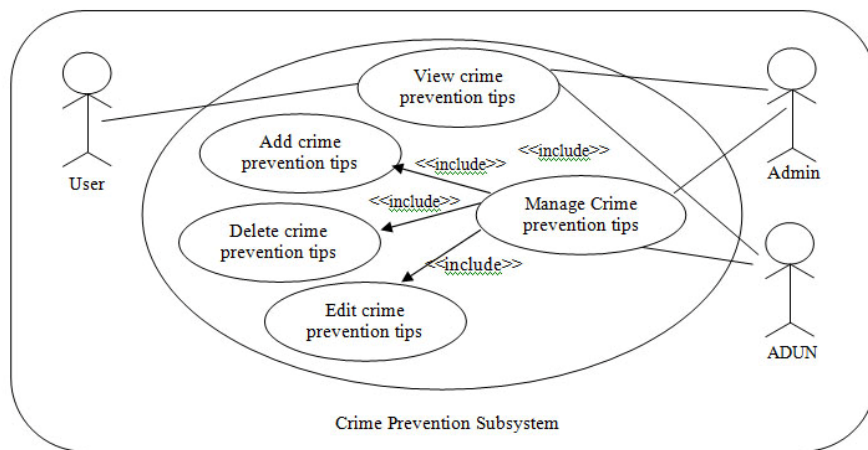

Fig. 1.   Use Case of Crime Prevention Tips Module

State chart diagram in figure 2 is an event-triggered state change. It represents the flow of control from one state to another state of the module. The black dot used in diagram represents as starting state. The oval rectangle defines as status of object and arrow as transition. This module shows the flow of action from crime prevention tip when it has been added until it has been updated. It explains the workflow of module in more details than use case. This diagram really helps software developer or designer to easily develop a program because it has already shown what need to be occurred.
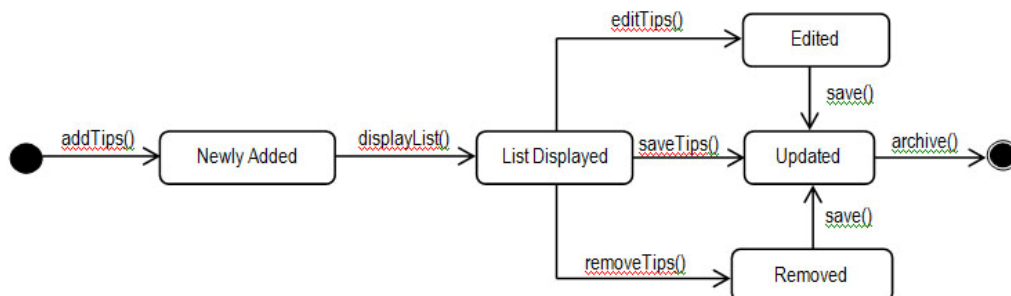

Fig. 2.   Statechart Diagram of Crime Prevention Tips Subsystem or Module

B. MESSAGE BOARD MODULE

The message board module works similar like forum based system. User can create a message about any issue and also can reply or comment on other user's message. Figure 3 shows use case of message board activity. This use case shows that all of user have the same capability to handle the message board. But, admin only has permission to delete the message board.
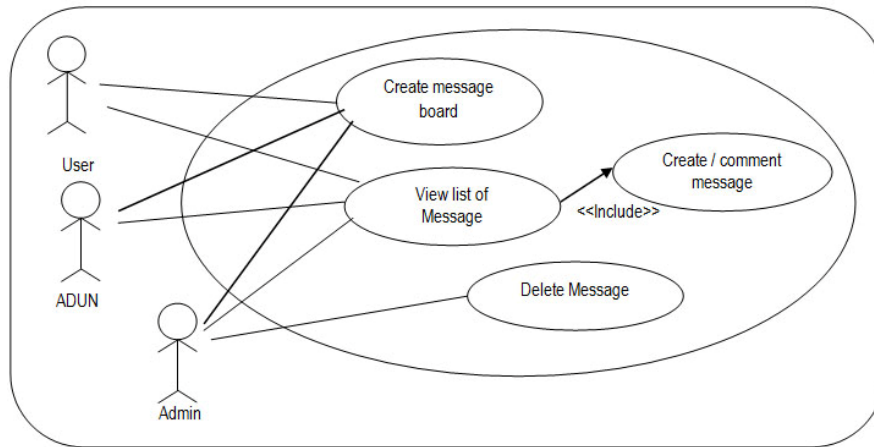

Fig. 3.   Use Case of Message Board Tips Module

The statechart diagram in figure 4 represents the workflow of the message board. It starts with creating a message board topic and end up with updating the comment created. The admin has an option to delete the message board and comment section.
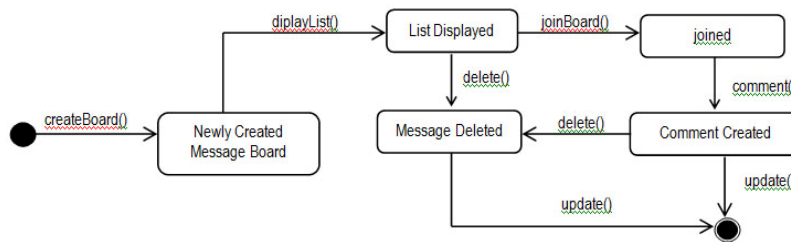

Fig. 4.   Statechart Diagram of Message Board Module

C. REPORT MODULE

Report Module enables the ADUN to view the performance of every agency in two options. First, by displaying the percentage type of status such as in process, pending, in progress and fixed. Second is by displaying report in term of problem category. Figure 5 represents a use case of report module. This use case shows only one type of user which is ADUN. This means that only ADUN can access the report module. ADUN is able to choose the report to be visible. ADUN is also able to email the report, display the details and take an action toward relevant agencies.
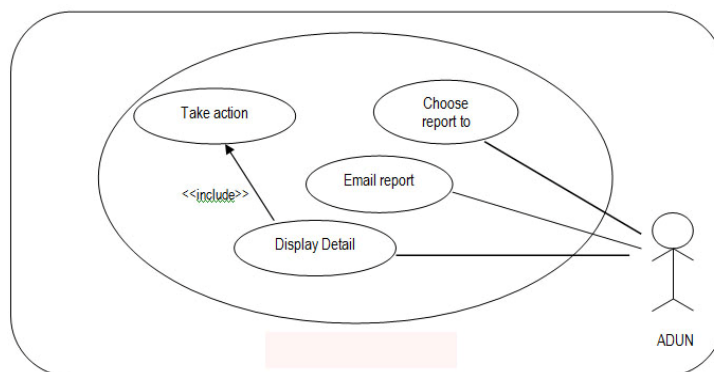

Fig. 5.   Use Case of Report Module

Figure 6 shows the flow of report module which consists of four status of the object. It begins by choosing the report either by category or agencies, then ADUN is able to view the details of information for the report and can take an action by sending the email to the relevant agencies. ADUN also can email the report for future use.
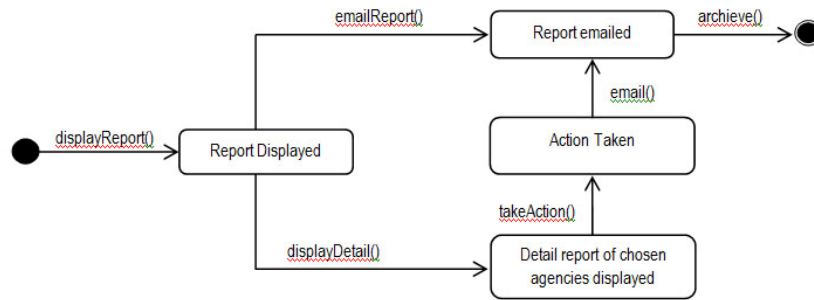

Fig. 6.   Statechart Diagram of Report Module

D. ANALYSIS MODULE

The last module which is described in this study is analysis module. This module is used to perform the analysis about social network who are involved with the complaints in this portal. This module will provide service to analyze the attributes of the user either female or male and also in term of the level of age. This module is also planning to show the result of the analysis using a bar graph. Figure 7 represents the use case of analysis. This use case shows that only admin is authorized to use this module. Admin can run data analysis about the users in this portal in term of their gender or age.
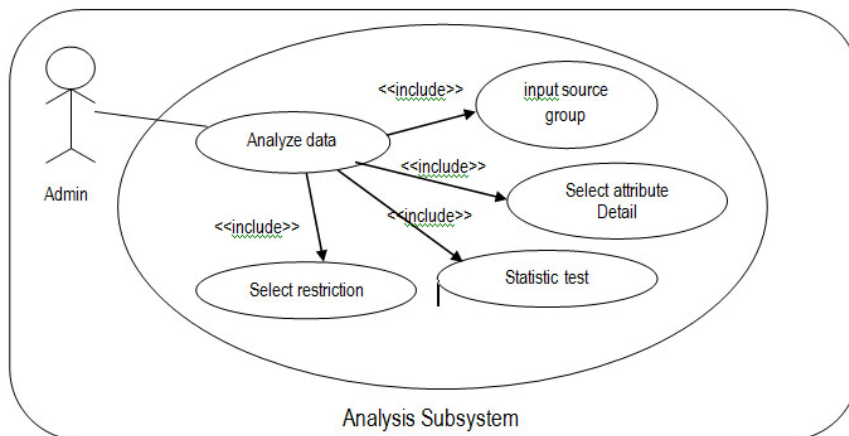

Fig. 7.   Use Case of Analysis Module

Figure 8 illustrates the flow of analysis module. The flow process starts by giving input source, then choose either to analyze by attribute or restriction. If the admin selects analyze by attribute, it is also required to choose the type of statistic that is mean, median or standard. Next the analysis graph will be displayed according to admin choice.
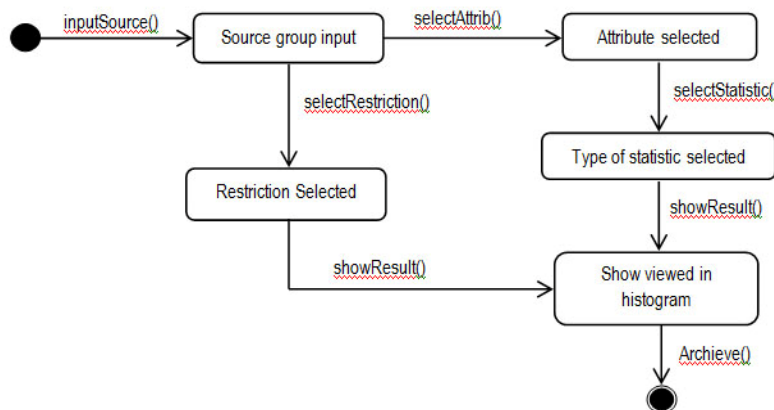

Fig. 8.   Statechart Diagram of Analysis of Module

V.   CONCLUSION

This paper discussed about four modules in ADUN e-Community Portal which are highlighting the techniques used in developing the modules. There are crime prevention tips, message board, report and analysis modules. This portal is proposed to solve the problems which are raised in community area. Therefore, this portal is developed to provide a service that enables a community to express their dissatisfaction or complaint toward the government agencies and department. This portal will put pressure to the relevant government agencies to improve their services. Thus, it can reduce the delayed actions for complaints and enhance the relationship between ADUN and community. There are several potential techniques can be used in developing modules. There are flowchart, Unified Modeling language (UML) diagram, Entity Relationship Diagram (ERD) and storyboard. After justification of these techniques, two types of Unified Modeling language (UML) technique were chosen which are Use Case and State Chart diagram. Use case generates an understanding and easiness to identify the function and actor involved in every module, while state chart diagram represents the flow of control from one state to another state of the module. Both of them illustrate the operation of the module and are also capable to determine whole operation of modules either internal or external.

ACKNOWLEDGMENT

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