MOODS

MOBILE ONLINE OFFICE DIARY AND SCHEDULER

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Submitted To The Faculty Of Computer Software Engineering,
National University Of Sciences And Technology, Islamabad In Partial Fulfillment For The Requirements Of a BE Degree In Computer Software Engineering, july 2011

CERTIFICATE OF CORRECTNESS AND APPROVAL

Certified that work contained in this thesis “Mobile Office Diary and schedule (MOODS)” was carried out by Maj Adnan, Capt Daud and Capt Khurram under the supervision of Col Naveed Sarfraz Khattak for partial fulfillment of Degree of Bachelor of Computer Software Engineering, is correct and approved.

Approved by

Col Naveed Sarfraz Khattak
(Supervisor Name)

Dated: July 2011

ABSTRACT

MOODS

"MOODS" is a web based online portal which is a personalized scheduler for routine commitments and has the capability of generating alerts for its subscribers. These alerts are delivered as short notifications to end user mobile phones as SMS messages. To supplement it, users have the option of sending email alerts too. Generating alerts has been simplified by placing users as individuals as well as listing them under a specified user group. The application can either send alerts from the addressee list to a complete user group or to any specified number of individual users.

The target group of the system is a common user in terms of web expertise yielding the need for a straight forward attractive and user friendly interface. The main objective of this project is to develop a web based scheduling system, prompting organizational alerts for various events/ activities. MOODS can create number of users to send and receive alerts using a normal web browser. This approach allows convenient sending of alerts anytime, anywhere. Being a web based system, minimal maintenance issues are posed for the administrator.

Administrator is primarily concerned with user subscription for the applicants. This simplified management of user control for the MOODS makes it extremely efficient and viable for use by experts as well as novices. Moods also provide search and analysis filters to apply various search criteria from databases that makes MOODS efficient for analysis purposes.

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DECLARATION

No portion of the work presented in this dissertation has been submitted in support of any other award or qualification either at National University of Sciences and Technology or any other institution.

DEDICATION

Dedicated to Maj Adnan Zafar Sindhu, our group member who very bravely fighting against cancer. May Allah bless him good health and quick recovery.

ACKNOWLEDGMENT

All praises are for the Almighty Allah, who is Magnificent and Merciful. He, who guided us and made us achieve everything that we accomplished. We thank everyone who has been involved in this project for their valuable time and effort and we also thank the entire Computer Science Department for all the support and facilities extended.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The world is a very busy place, where time is something no one can afford to waste. And yet there are so many things that require attention but it is very difficult to take time out for them. So it is obvious that not all information is acquired successfully. Everybody needs information on finger tips. There are solutions available which provide information but which are very general and not specific to the user`s needs. Like SMS alerting services provided by many organizations in our country like Banks (MCB, Allied bank, Standard Chartered…), Telecom networks (Telenor, Ufone, PTCL…), but all the services provided by these organizations are completely limited to their own networks like banks only provide alerts about their account`s transactions and telecom organizations only provide alerts about their own promotion packages, user`s account`s status, their new services, etc. Keeping all of the above in mind, we have come across a solution which is going to combine the internet as well as mobile technology to provide people information that is specific to them only.

1.2 Problem Statement

Commitments and Information dissemination to particular persons in large organization needs to be very efficient and reliable. There should be a swift and fast mechanism of remaining abreast with routine commitments and schedules.

1.3 Solution

MOODS system will provide facility to compose and schedule a calendar based commitments for all employees of an organization and transmit them with just a single

click of button on screens of their clients. Information will be made redundant by delivering same information through Short Messaging Service (SMS) over the mobile phones and electronic mail system of the employees.

1.4 Objectives

The main goals of the project include personalized scheduler that has the ability to maintain ones commitments online. User should also be able to disseminate all important information to a desired list of addressees using very cheap, effective and reliable mode of communication.

1.5 Goals

The main goals of the project include a user friendly GUI that provides a simple database management for a personalized scheduler/ calendar interface manageable for a person with very basic computer knowledge. System must be able to disseminate important information on mobile sets as well as email addresses of those who need to be alerted. A log of what all alerts have been sent to who all must be maintained and available for view.

1.6 Domain of Project

The project is a web based application that deals with databases. The application is meant for multiple online users.

1.7 Intended Audience

The document for MOODS (Mobile Online Office Diary and Scheduler) is an all encompassing document with all details the application is capable of. This document is primarily intended for following

Project Supervisor: To ensure the development of the project fulfills requirements provided in this document.

Project Team: To ensure project team is developing the right project that fulfills requirements of supervisor.

Project Panel: Analyzing and evaluating the progress of the project.

Users: To get familiar with the idea of the project and suggest other features that would make it even more functional.

System Administrators: In order to know exactly what they have to expect from the system, right inputs and outputs and response in error situations.

1.8 Organization of Report

Chapter 1: Introduction of the project and an overall functionality.

Chapter 2: Describes the literature review done for this project.

Chapter 3: Requirement specifications of this project.

Chapter 4: Design and architecture of this project

Chapter 5: Describes the system development with all the details of the system functions and explains the way they have been implemented.

Chapter 6: Presents the results and analyze it with other techniques and methodologies available in market.

Chapter 7: Includes the future work and the conclusion.

1.9 Conclusion

This was a brief description of MOODS. The chapter was intended to give an over view of need of the project, problem domain, scope, objectives followed by a brief description of chapters to come. Software is very easy to use and requires no maintenance. No special qualification is required to use or install it. It can be used in various institutions/ offices for fast information dissemination.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

It is important to know about the equipment and technology used. This chapter provides the details about the technology, its working principles and limitations. It introduces GSM Modems available and software available to use them. It also includes calendar scheduling and its integration with web page. RSS news feeds along with email facility for redundancy are also studied

2.2 Short Messaging

SMS (Short Message Service), commonly referred to as "text messaging," is a service for sending short messages of up to 160 characters (224 characters if using a 5 bit mode) to mobile devices, including cellular phones, smart phones and PDAs. SMS is similar to paging. However, SMS messages do not require the mobile phone to be active and within range and will be held for a number of days until the phone is active and within range. SMS messages are transmitted within the same cell or to anyone with roaming service capability. They can also be sent to digital phones in a number of other ways, including from one digital phone to another, from Web-based applications within a Web browser, from instant messaging clients like ICQ, from VoIP applications like Skype and from some unified communications applications.

2.2.1 Benefits of using SMS

2.2.1.1 Discretion

An SMS message is less of an intrusion in a union environment as well as demonstrating sensitivity towards privacy when communicating with your members.

2.2.1.2 Accuracy

Your message is there in black and white so there are fewer distractions compared to other channels, like background noise disrupting phone calls. This is particularly important when disseminating important information.

2.2.1.3 Succinct Messaging

Why use 10 words when five will do. Most messages can be articulated in one 160-character message.

2.2.1.4 Mass Communication

The same message can be broadcasted to thousands of handsets at a touch of a button. Mass messaging is cheaply available in present telecom companies. By just activating the simple package we can have complete month messaging free.

2.2.1.5 Cost Savings

The standard rate of a text message is very petty. Sending out thousand of messages cost less by use of various bulk packages offered by companies.

2.3 Bulk Short Messaging

In Bulk short messaging, SMS can be sent to numerous recipients by just a touch of button. This is done by using a list of recipient's numbers. The same message is sent to all of them by using a GSM Modem, a cell phone or a web service. Every message is dealt independently. Even if some numbers are switched off or incorrect, the messages to other numbers are delivered.

2.4 Methods of sending SMS

Various methods are available to send bulk messages. These methods rely on different techniques. A mobile handset or a GSM Modem can be used. And they need support of software program. However web based solutions do not use handset/modems neither any software, they directly communicate with SMS Gateways. The used methods are using mobile handsets, using a web based SMS solution and using software / instant messengers like ICQ, Skype etc.

2.4.1 SMS sent by mobile handset

SMS as used on modern handsets was originally defined as part of the GSM series of standards in 1985 as a means of sending messages of up to 160 characters, to and from GSM mobile handsets. Since then, support for the service has expanded to include alternative mobile standards such as ANSI CDMA networks and Digital AMPS, as well as satellite and landline networks. Most SMS messages are mobile-to-mobile text messages, though the standard supports other types of broadcast messaging as well. The benefits of SMS to subscribers center on convenience, flexibility, and seamless integration of messaging services and data access. From this perspective, the primary benefit is the ability to use the handset as an extension of the computer as illustrated in Figure 2.1. SMS also eliminates the need for separate devices for messaging because services can be integrated into a single wireless device the mobile terminal. These benefits normally depend on the applications that the service provider offers.

Figure 2.1 SMS sent by mobile network

2.4.2 SMS using a web based account

Web based SMS account can be used to send bulk SMS from anywhere using internet. SMS can be sent to any phone with a personalized id. SMS credit is purchased from the web site/ service provider to use the account. These sites let members reply via SMS from mobile phone and the replies drop straight back to desktop as illustrated in Figure 2.2. Moreover no hardware or software is to be purchased. This account can be used from anywhere in the world where internet facility is available.

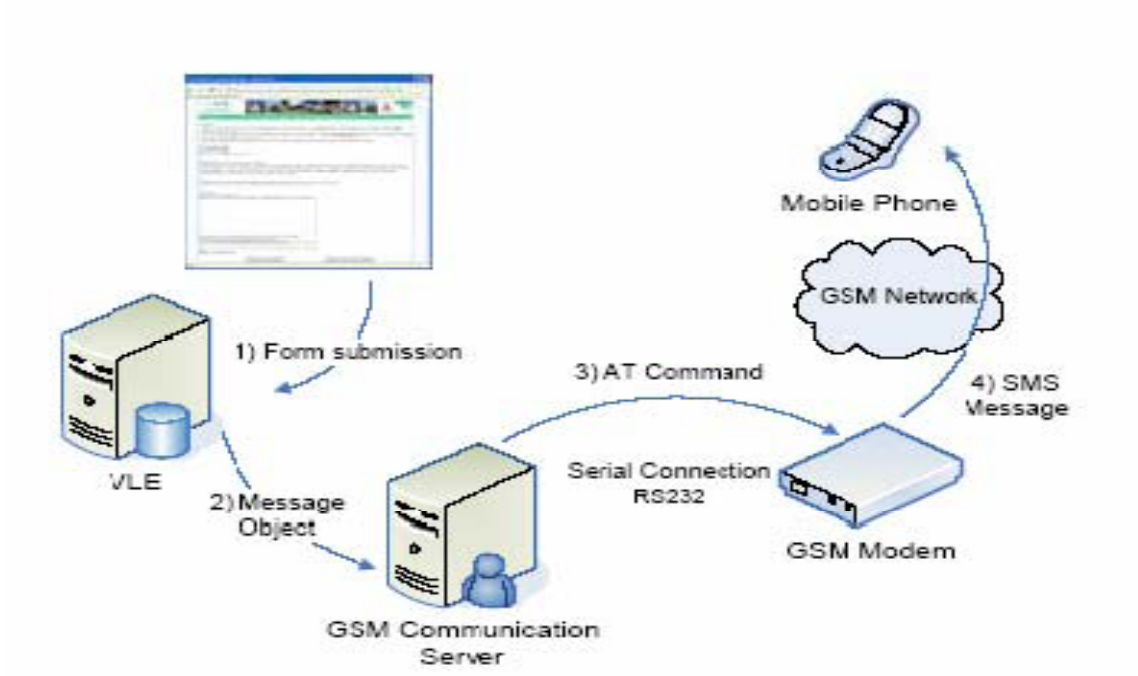

Figure 2.2 SMS sent through web network

2.4.3 SMS using a software and GSM Modem

SMS can be sent to multiple numbers using software and a GSM Modem. A SIM of any cellular network is used with GSM Modem, which is connected to the server. List of number is selected from database or entered manually, message is sent to al numbers from modem attached to server. Replies can also be received at the server through modem.

2.5 GSM Modem

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it may be a mobile phone that provides GSM modem capabilities. A GSM modem exposes an

interface that allows applications such as MOODS to send and receive messages over the modem interface. The mobile operator charges for this message sending and receiving as if it was performed directly on a mobile phone. To perform these tasks, a GSM modem must support an "extended AT command set" for sending/receiving SMS messages. GSM modems can be a quick and efficient way to get started with SMS, because a special subscription to an SMS service provider is not required. The mobile operator charges for this message sending and receiving as if it was performed directly on a mobile phone. In most parts of the world, GSM modems are a cost effective solution for receiving SMS messages, because the sender is paying for the message delivery.

Figure 2.3 GSM Modems

2.6 Commitment Feeds

RSS (most commonly expanded as Really Simple Syndication) is a family of web feed formats used to publish frequently updated works such as blog entries, news headlines, audio, and video in a standardized format. An RSS document (which is called a "feed", "web feed", or "channel") includes full or summarized text, plus metadata such as publishing dates and authorship. A Commitment feed was added to MOODS on

inspiration from RSS. This look alike in MOODS called Commitment feeds allowing users to avoid manually inspecting all of the websites for weekly upcoming events.

2.7 Email Facility

Electronic mail, commonly called email or email, is a method of exchanging digital messages from an author to one or more recipients. Modern email operates across the Internet or other computer networks. Some early email systems required that the author and the recipient both be online at the same time, in common with instant messaging. Today's email systems are based on a store-and-forward model. Email servers accept, forward, deliver and store messages. Neither the users nor their computers are required to be online simultaneously; they need connect only briefly, typically to an email server, for as long as it takes to send or receive messages. An email message consists of three components, the message envelope, the message header, and the message body. The message header contains control information, including, minimally, an originator's email address and one or more recipient addresses. Usually descriptive information is also added, such as a subject header field and a message submission date/time stamp. MOODS system also provides facility to generate email to subscribers besides publishing news feeds to the client.

2.8 Chapter Summary

The software available in the market does not provide required functionalities all in one. The features offered by them are limited so there is an immense need to develop software that fulfils all the requirements and provide required features.

CHAPTER 3

REQUIREMENT ANALYSIS

3.1 Introduction

This chapter deals with software requirement specifications. It explains the requirements given by the user. This chapter explains what our system needs to perform. Functional and non functional requirements are given in this chapter to determine whether system developed is in accordance with the specifications or not. The chapter also includes the functional requirements that were inferred from the scope and the objectives of the project. It also discusses the non-functional requirements that must be achieved for better performance of the system.

3.2 Functional Requirements

Detailed requirements were gathered by the stake holders. System is designed and developed keeping these requirements in focus. System needs to be redundant and have full availability to all users. It should be well capable of sending alerts efficiently and accurately.

3.2.1 Friendly GUI

The system should have a graphical user interface that should provide it with the options to update commitments and generate alerts. More friendly GUI makes user feel confident. Graphical user interface must makes the job easier and time saving. It will make the system user friendly. Criticality is that a good GUI is important for the system to be successful. Some technical issues may come up as interface is being made by graduate level student, no HCI expert has been consulted for aesthetics.

3.2.2 Connectivity

On successful connectivity of GSM Modem system should give “OK” status and a graphical screen should depict that the user on server side knows device is communicating with the system and MOODS is available to send messages. User on server side may not be familiar with the backend processing so he must be signaled that device is ready. This step is very critical as it will be difficult to troubleshoot by a user who does not have in depth knowledge of the system. Wrong port numbers or baud rate may not give acknowledgment of the successful connectivity of the device causing a technical issue.

3.2.3 Multi delivery

MOODS should work on all cellular networks to deliver messages. It should be accessible from all browsers and should be able to send email to all accounts. All available services must be compatible with the application. If limited to single network, browser or particular mailing service, the utility of the application will decrease.

3.2.4 Multiple Clients

Application should be accessible to multiple users simultaneously. More over user should have options for searching the list based on criteria of groups / individuals. If a search gives list of 20 students and users wants to send message to only 8 students, system should provide the option. This requirement is critical and system must offer this facility for efficient alert system. User cannot give direct queries to database, only available queries can be used. If this functionality is not available then user will have to send message to the complete list which may not be desirable.

3.2.5 Database/ Log Maintenance

This feature should offer user to see the record of sent alerts and their status. More over user as administrator as well as client should be able to see what all alerts have been generated so far. User should also be able to see all calendar events and commitment as well as the edited ones. The priority of this feature is high and it is a must to achieve it.

3.3 Non Functional Requirements

In requirement engineering, a non functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. This should be contrasted with functional requirements that define specific behavior or functions. The plan for implementing non-functional requirements is detailed in the system architecture.

3.3.1 Performance

The system should perform at reasonable speed, to handle traffic from multiple users. Clients must get a message on successful delivery of alerts. Performance increases and decreases with the service of service providers. By generating alerts in big figures can deplete the performance.

3.3.2 Usability

It is a web application so clients / end users must be able to use it with ease possessing basic knowledge of computer. Administrator should be able to use the system efficiently with simple understanding of the MOODS back end functionality.

3.3.3 Efficiency

Search capability must be efficient and provide clients to give multiple search criteria for user management. System must be able to deal multiple requests at the same time. This is a real time interactive application so it must be efficient.

3.3.4 Compatibility

The system should be compatible with different versions of windows (XP, VISTA) and should be able to work on multiple browsers. Besides being accessible from all browsers it should be able to send email to all accounts and send SMS to all cellular services. All available services must be compatible with the application. Compatibility factors can enhance the system value and vice versa.

3.3.5 Reliability

The system should have a low failure rate and a high level of service availability. Critical messages should be sent twice to ensure delivery. The more the reliability factor is the better it will be performing in all aspects.

3.3.6 Maintainability

The system should be easy to be maintained by administrator. However developers or users with adequate knowledge are able to edit, add or delete given functionality. The graphical user interface provides a very user friendly view that eases the problem of handling and maintaining the product.

3.4 Chapter Summary

Chapter described the requirements of MOODS. To conclude, system should be able to work efficiently in real time environment and provide reliable information dissemination. Multiple clients should be able to use it as if they are working on a dedicated information dissemination system. Functional and non functional requirements are organized according to the scope of the project.

CHAPTER 4

SYSTEM DESIGN AND ARCHITECTURE

4.1 Introduction

Chapter gives an account of the system design of MOODS. Here high level design is briefly explained to give an over of the system. Decomposition of system in modules is also given for better understanding. Working and relationship between modules helps in better conceptualizing of implemented system. Chapter is kept simple so that a reader with minimum background knowledge can fairly understand the working of MOODS. Figure 4.1 gives a pictorial view of the system.

Figure 4.1 View of the System

4.2 High Level Design

MOODS design is kept very simple. Client server architecture is used. For communication between client and server existing LAN resources are utilized. Major functionality is kept with server end. Client end is used as an interface to authenticate clients, enter search criteria, slect users and receive /compose commitment. Figure 4.2 shows that client end perform minimum essential funtions. Logic and processing rest with server end. This design encourages even users with basic computer knowledge to use the system efficiently.

Figure 4.2 High Level Design

4.3 Use Case Diagram

Use case diagrams are the most effective way of depicting and understanding functional requirements of a system. Figure 4.4 describes the use case diagram for MOODS system. It has login/out, view portal, generate alert add modify user and manage/ analyze as main use cases. The view portal use case further extends add commitments, delete commitment and reschedule use cases. User and administrator are the primary actors.

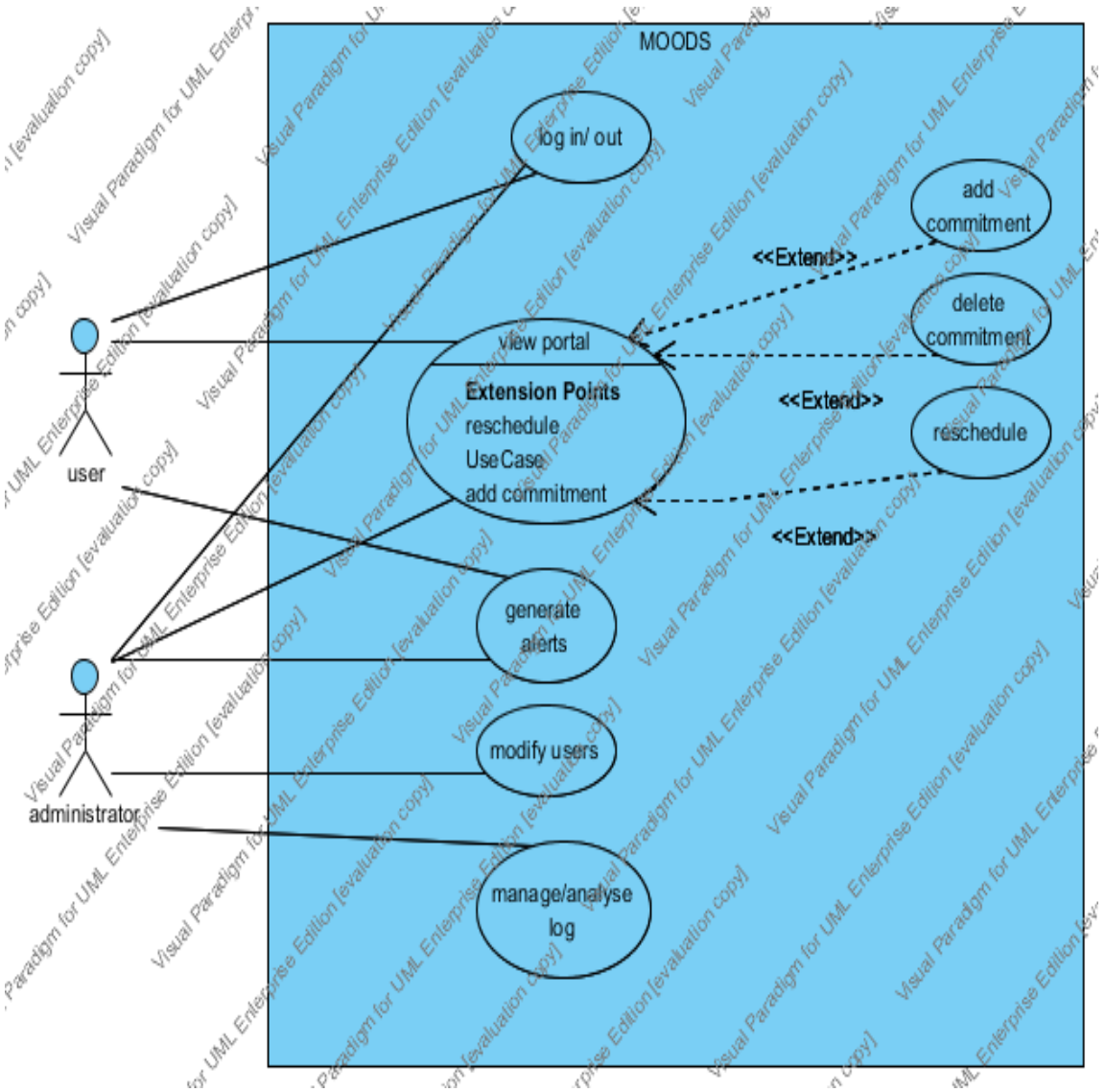

Figure 4.4 Use Case Diagram

User sends user name and password, logs on to the web and connects the modem device. On OK status of modem, the user then straight away goes over to an interface that displays his/ her commitment. On closing of this interface, user goes to the calendar interface of the system, where all the major functionalities depicted above should be available. Here user searches the intended receivers from the data base basing on any criterion. Either he may choose an entire group of people belonging to the same domain he should be able to randomly choose an individuals or multiple individuals. He then chooses an old commitment that had previously been created or creates a new commitment to inform people he wants to alert and sends the SMS/ Email alert message. User as administrator should be able to view complete details of alerts and commitments that have been updated. After using the system, user logs out. Database maintains the system records and logs. Administrator can add, delete or update database entries, manage users, assigns user name and passwords.

4. 4 Sequence Diagrams

A sequence diagram in UML is a kind of interaction diagram that shows how processes operate with one another and in what order. They are also known as event diagrams, event scenarios and timing diagrams. It is a construct of a message sequence chart. This section describes the details of sequence of activities involved in various functionalities that are to be implemented in MOODS system. The sequence of activities is very helpful in methodical development of the system. It is vital in further development and coding of the application.

4.4.1 Login

On accessing the web user enters his username and password. On verification of correctness from database commitments appear on the portal right away. On unsuccessful logins system allows multiple attempts for login trials until the correct details are feed into the system. Figure 4.5 shows the login procedure.

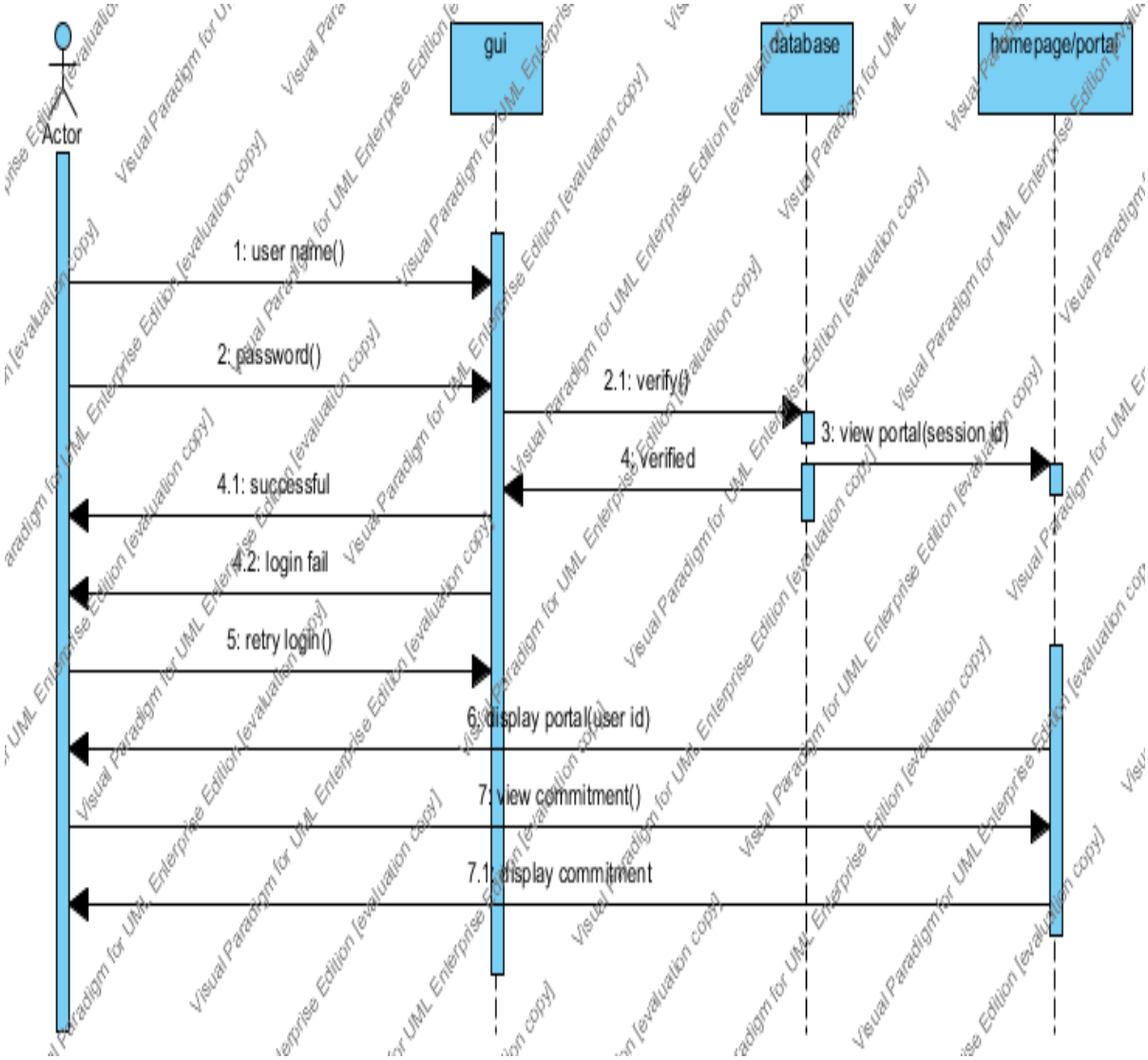

Figure 4.5 Login diagram

4.4.2 Add Commitments

User can add a commitment with its details on the calendar interface which includes a title, start end date and time and a brief description of the commitment. Commitment addition has to be made as simple as a layman should be able to understand it. Figure 4.6 shows the commitment addition procedure. User can add any number of commitments to the calendar that must be stored in database at the given point of time and date.

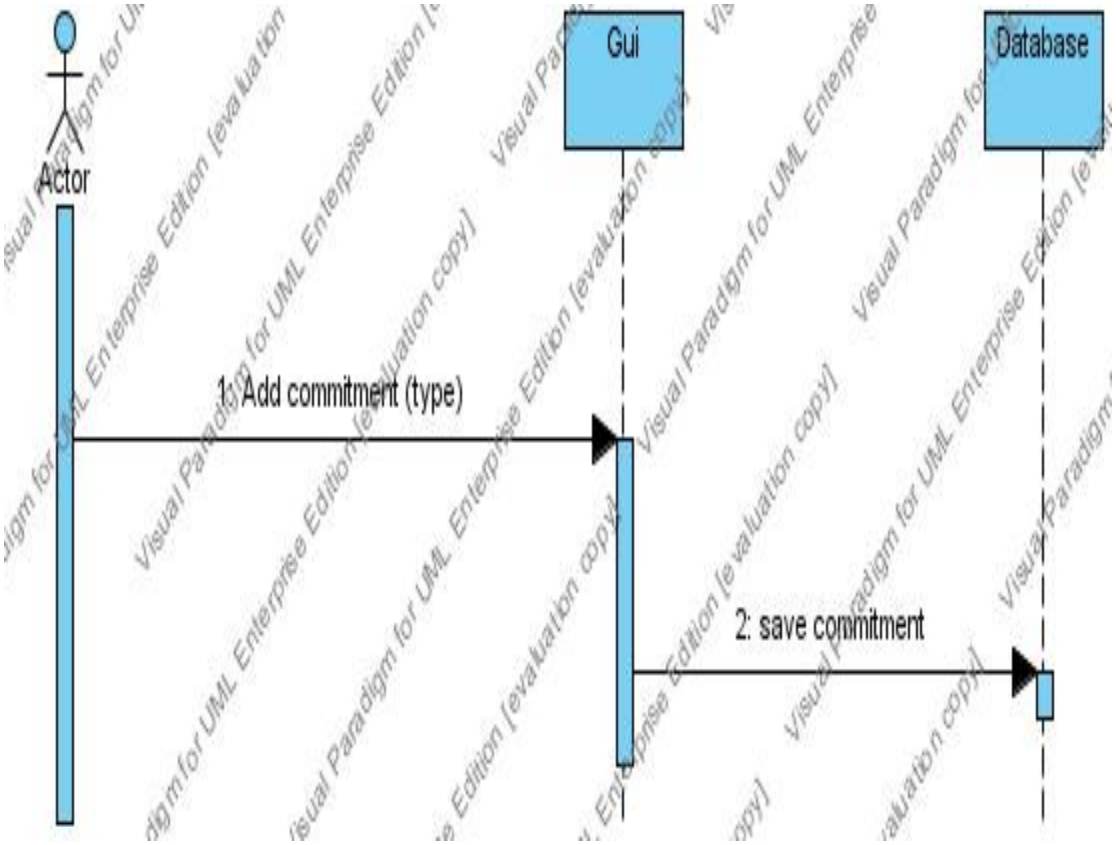

Figure 4.6 Add Commitments

4.4.3 Delete Commitment

Commitments may over populate the calendar due to lack of space, therefore to free up calendar space or to oust a lapsed event whose details are no longer needed user will have the facility of removing the desired commitment if needed be.

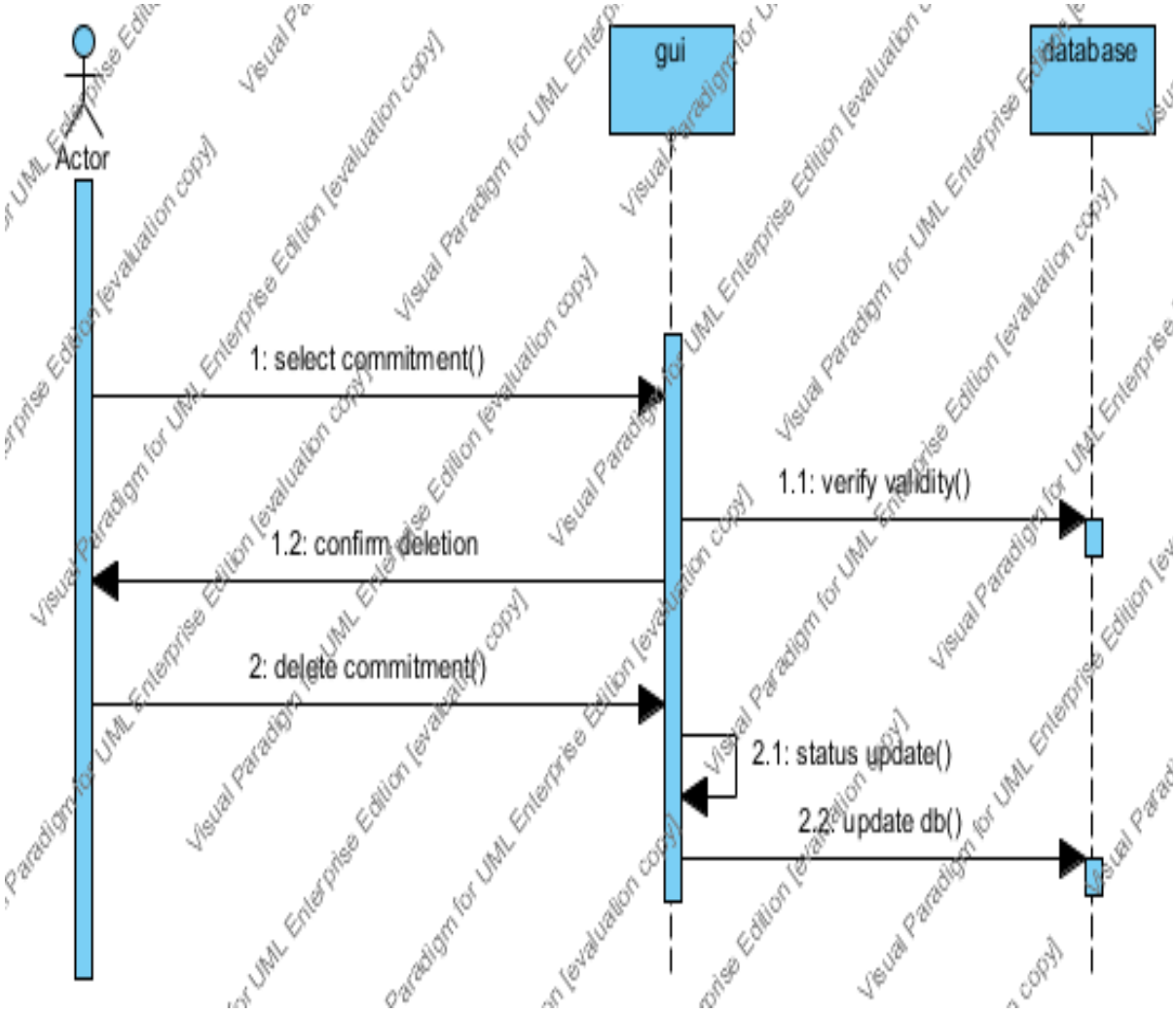

Figure 4.7 Delete Commitments

4.4.4 Generate Alerts

Besides viewing commitments feed set up for himself by a client, he can select multiple people from the subscribed user list and alert them regarding a commitment. System provides optional facilities for sending email as well as SMS messages to the desired users. All such record details are updated at the databases. A completion report is also displayed at the portal.

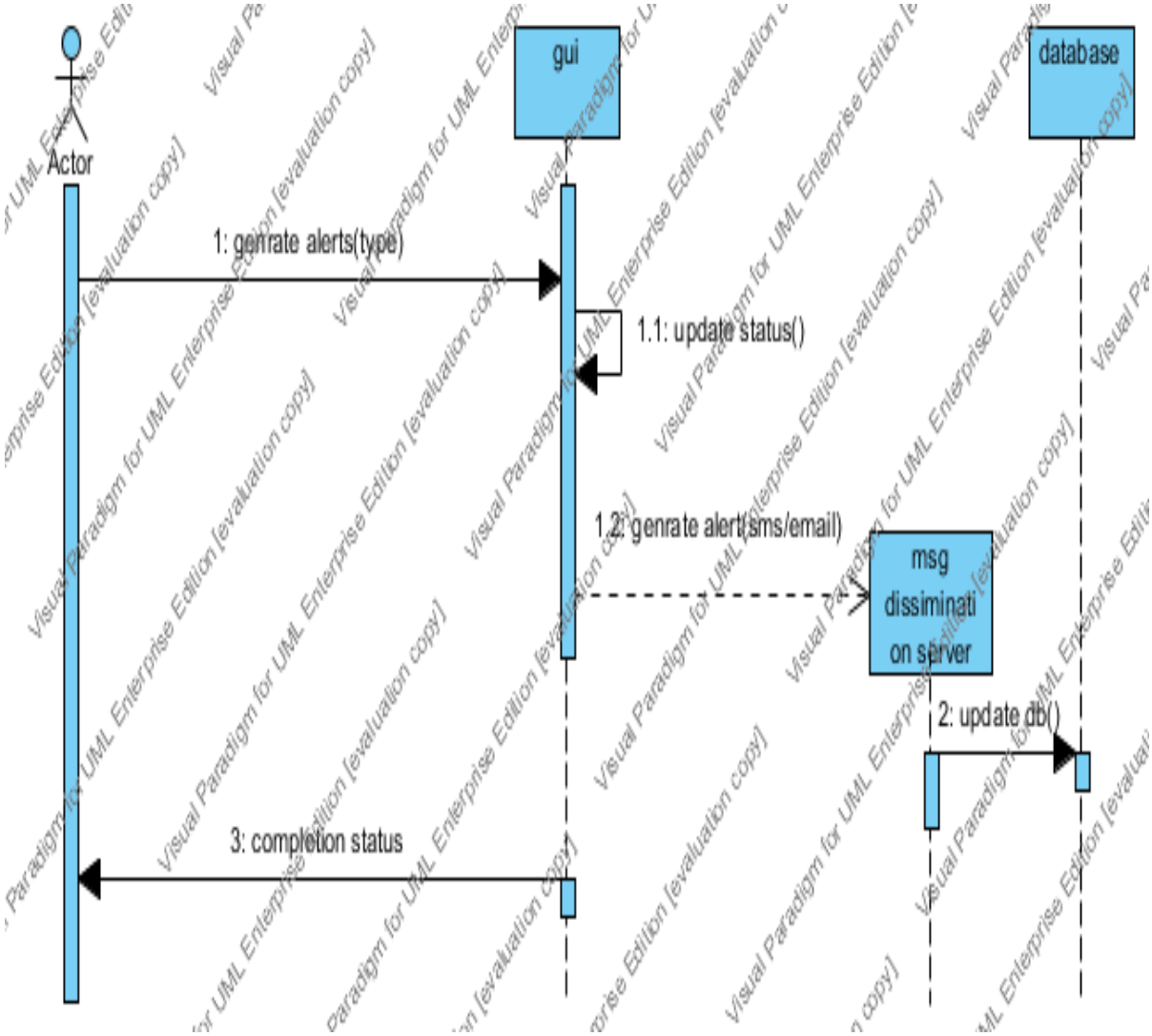

Figure 4.8 Generate Alert

4.4.5 Edit Commitment

A commitment may get delayed or advanced and hence requires that system should allow changes to the same commitment. Change may be in content of the commitment or its time and date. User may then telecast these changes to desired people. System facilitates such telecast of rescheduled events to all concerned.

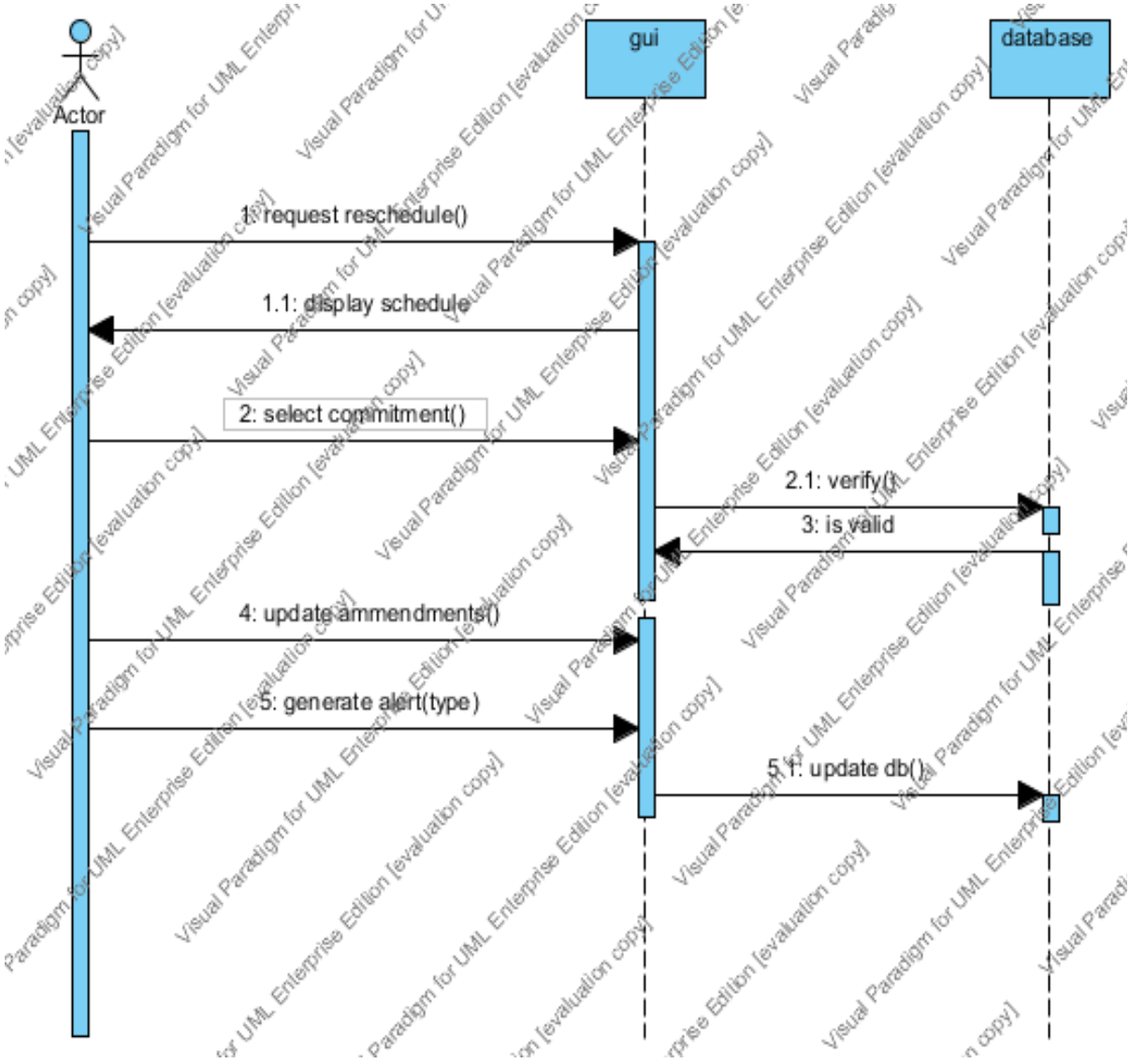

Figure 4.9 Reschedule Commitment

4.4.6 Modify User Group

User database requires changes as people may add up or leave a group. Also an entire group may be required to be removed that previously existed or a new group may be added. All such changes are administered and updated by administrator.

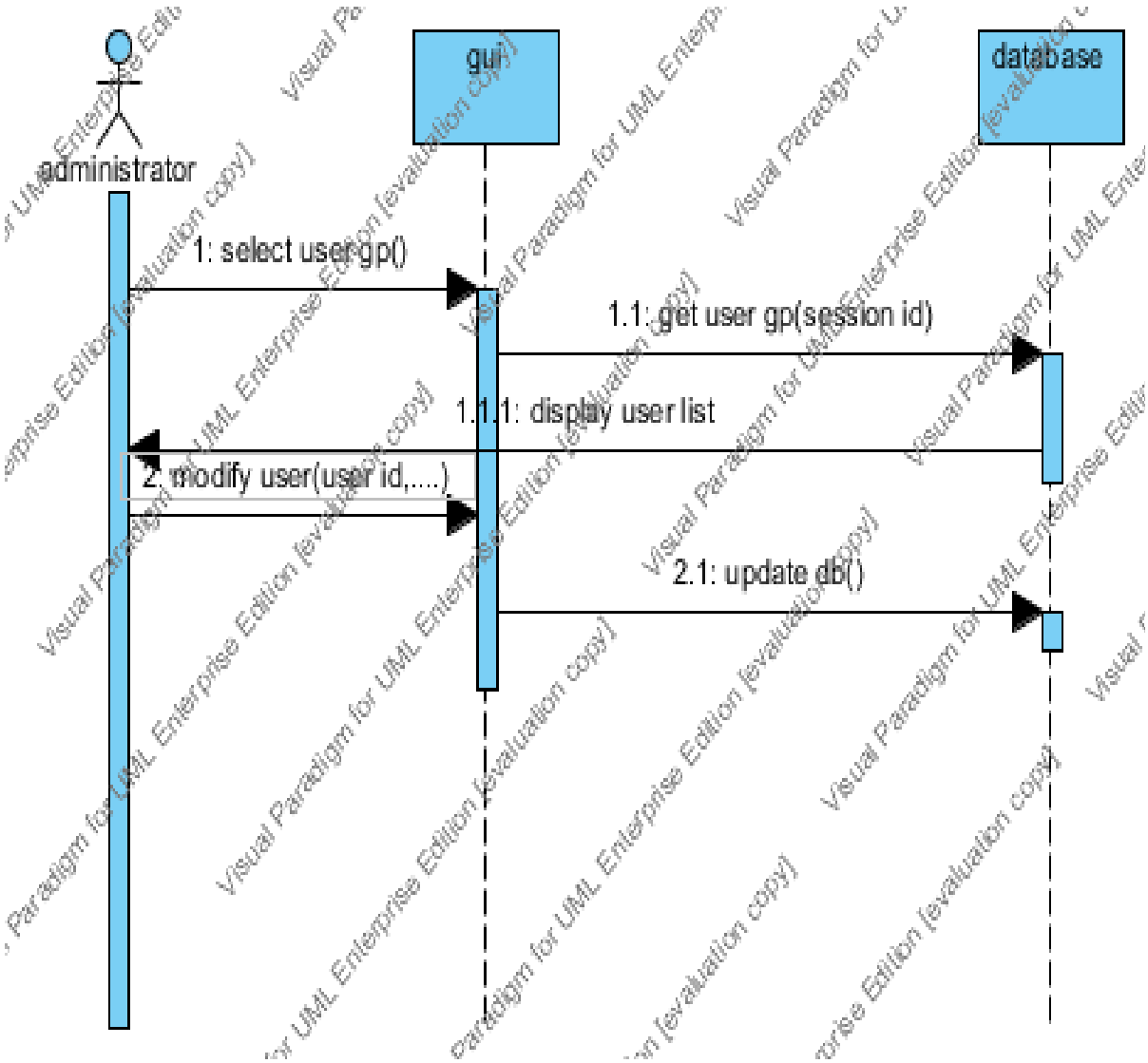

Figure 4.10 Modify User Group

4.4.7 Log Analysis

A filter based analyzer is implemented in system where all those commitments that have been sent as alerts to anyone are maintained. Log details can be viewed based on name criterion.

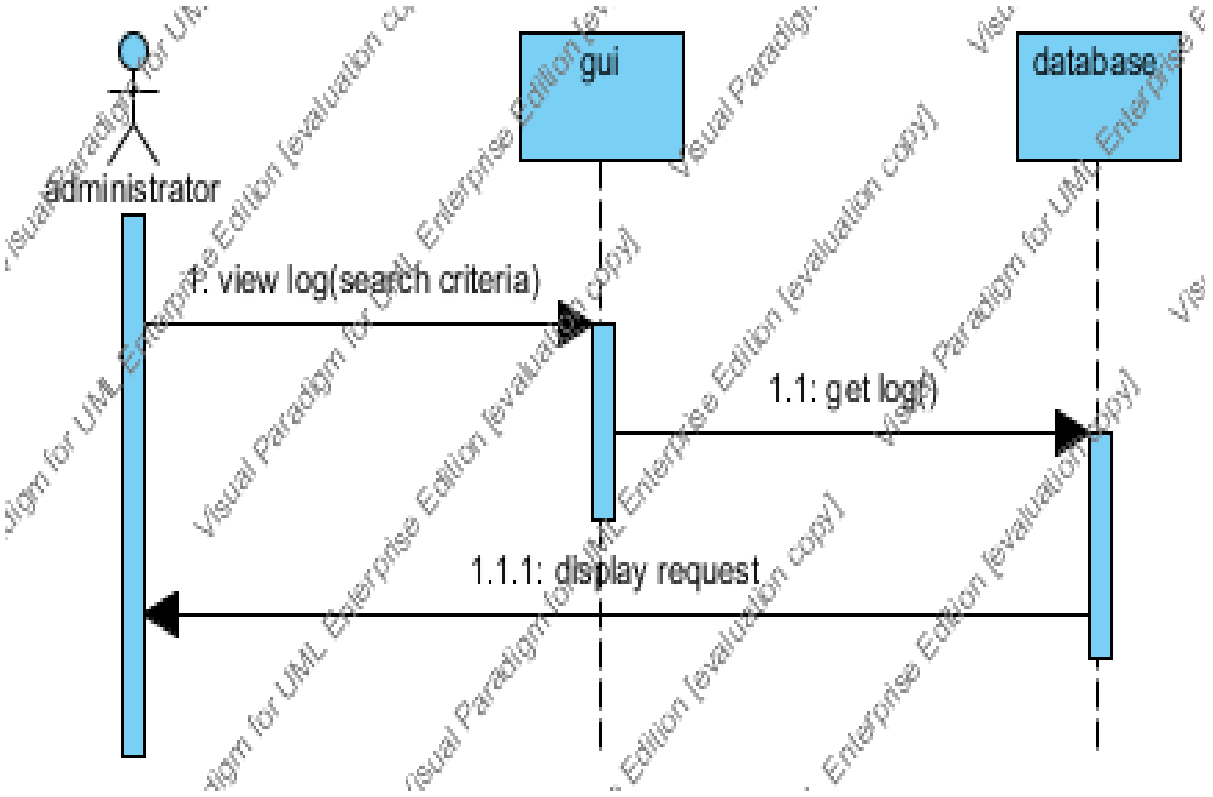

Figure 4.11 Modify log

4.5 Class Diagram

In UML class diagram is a static structure diagram that describes the structure of system showing various classes, their attributes, operations and the relationships among various

classes. It is the main building block in object oriented programming. Although numerous classes have been implemented, however basic functionalities have been simplified below in Figure 4.12

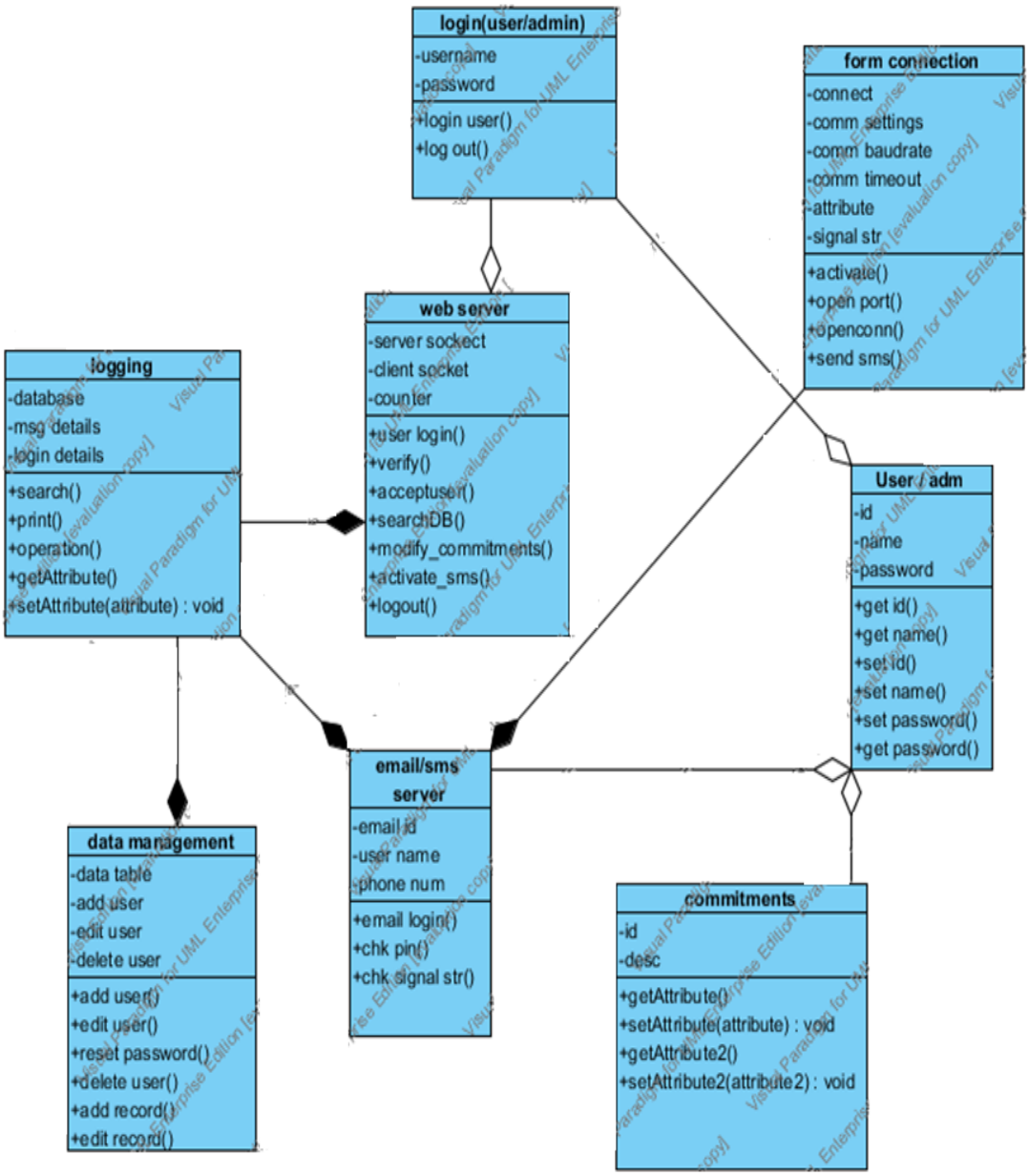

Figure 4.12 Class Diagram

4.6 Chapter Summary

Overall design and architecture of the MOODS is simple to understand and it can be expanded easily. This design supports data handling of large number of clients. More modules with different functionality can be added to interact with existing databases to make the system more adoptable to the needs of various people and organizations.

CHAPTER 5

DEVELOPMENT & IMPLEMENTATION

5.1 Introduction

In this chapter implementation detail is given. It has been explained that how each module was designed and implemented. All the techniques and tools used are explained. This chapter explains how functionality is achieved.

5.2 Work breakdown Structure

Figure 5.1 explains the work break down structure of MOODS.

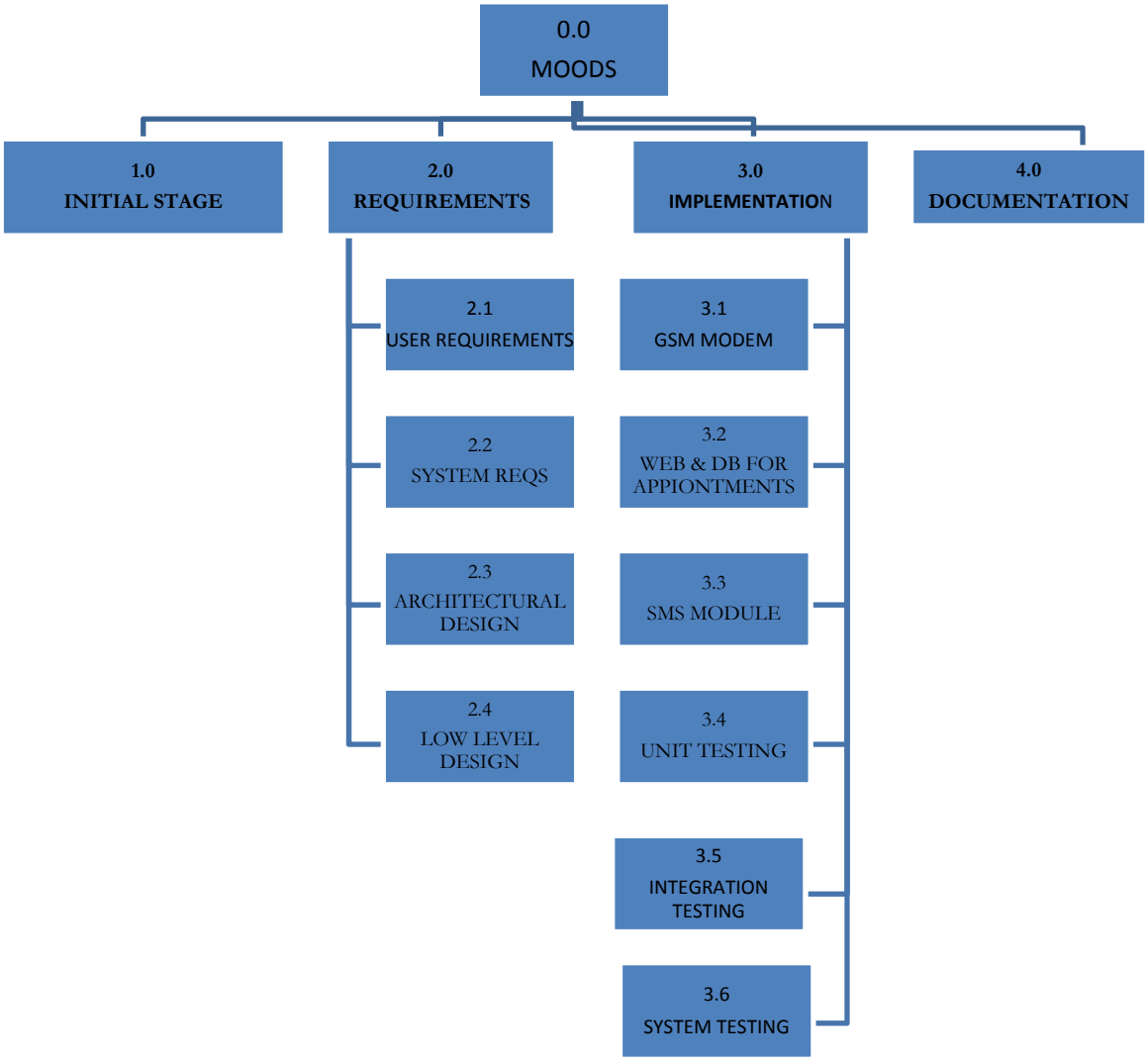

Figure 5.1 Work Breakdown Structure

5.3 Tools and Technology

The application has been developed using Visual Studio 2008. The basic framework is ASP.net. Backend programming language is C sharp. For databases and query, Microsoft SQL server has been used. Moreover, for the purpose of generating SMS GSM modem has been used in the application.

5.4 Implementation of System

Application has been developed as a simple web application based on server client model. Details of all logs are stored in relational data bases. SMTP mail services are incorporated into the system for the purpose of generating emails. GSM modem is required for administrator / client to generate SMS alerts.

5.5 Users Views

In this section system all the interfaces of the portal have been briefly described. The illustrations are snapshots of the developed application. They not only describe the system precisely but also help as a user guide that assists in usage of the application.

5.5.1 Client Login

Application runs on computers of all client users after login. It is kept simple and user friendly. First screen is for login. Users are able to use the system only after authentication. A user is given a user name and password is conveyed by the administrator. On wrong entry of username or password re-login is offered to the user until a successful login procedure.

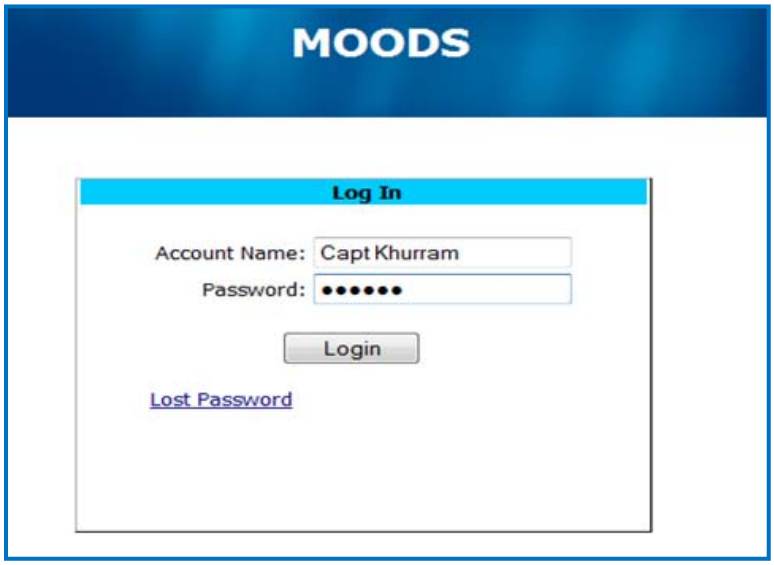

Figure 5.2 Login page

5.5.2 Commitment feeds

On successful login user views the Commitment feeds appear right away. This screen displays commitment from current day up to the next week. It describes the title of commitment with minor descriptions of time and date as shown in Figure 5.4

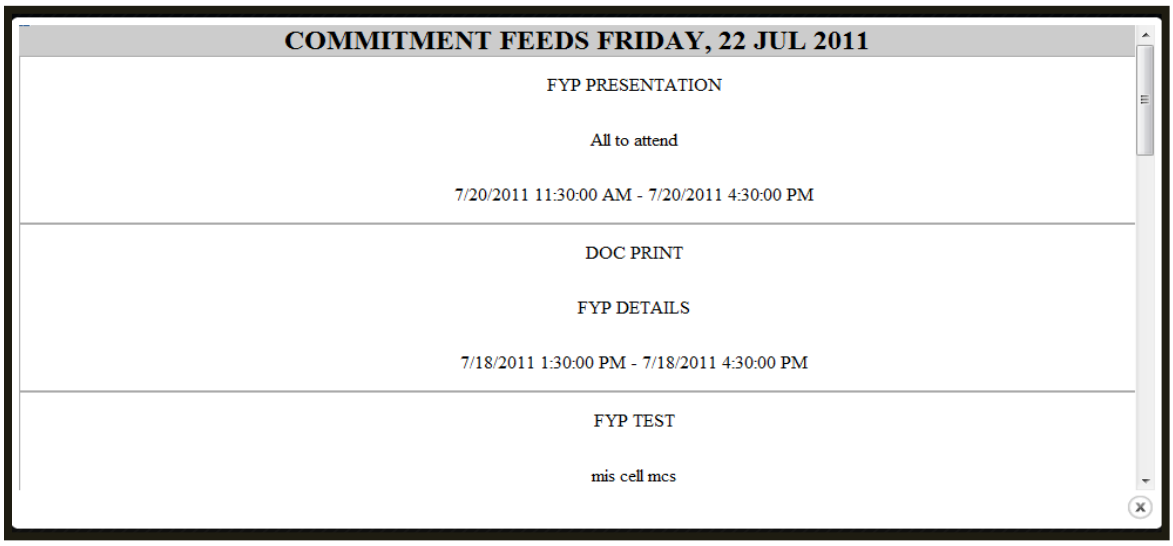

Figure 5.3 Commitment Feeds Ticker

5.5.3 Calendar Interface

On closing down the feeds user goes over to the scheduling calendar main page. This page is the main navigation page. It shows a monthly mini calendar to the left and a main 7 days event editor with timing details to add, delete and update users and events. User here can navigate back to ‘commitment feeds’, go to ‘generate alerts’ or view the log of his ‘edited events’.

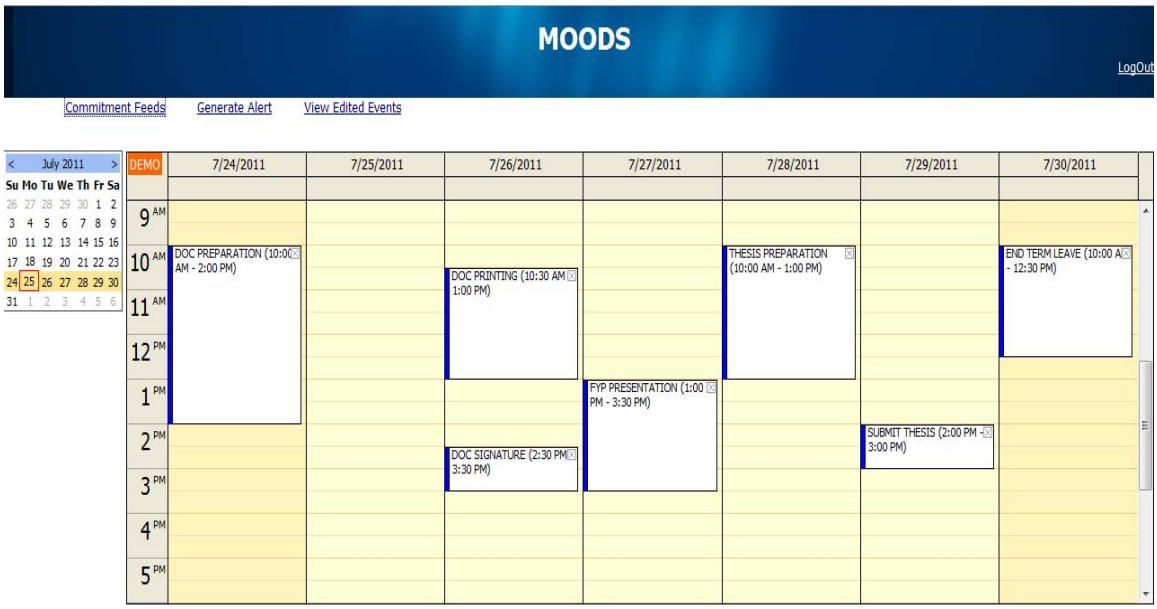

Figure 5.4 Calendar View

5.5.4 Setting Commitments

When users want to add or modify a commitment we go for commitments delete and edit option by simply clicking on the calendar at specific time duration field. This pops up a mini window where user can add Name, start, end time and brief description of the event.

To increment and decrement time of day, a particular event may be dragged down by the event bar.

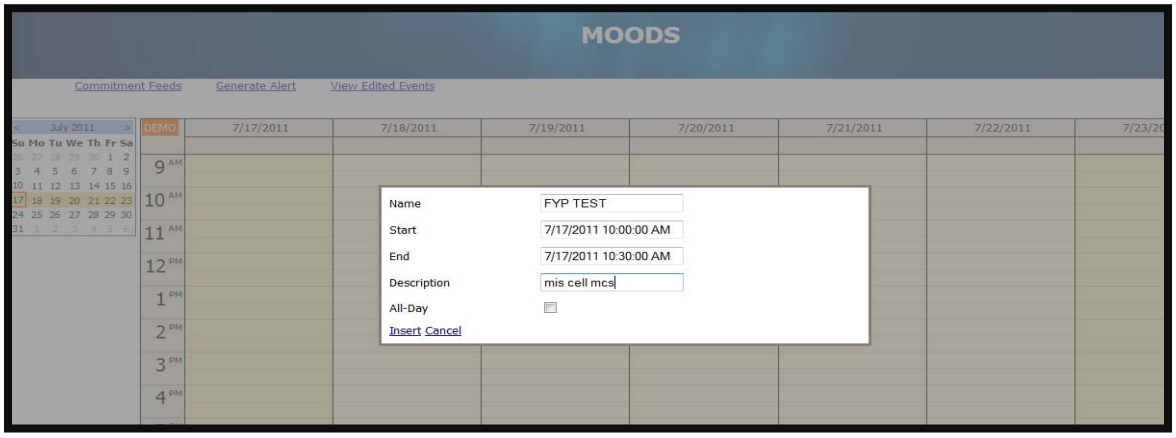

Figure 5.5 Commitments Set/Edit

5.5.5 Generate Alerts

To generate alerts client chooses a selected list of addressees, selects commitment from the dropdown list, checks SMS or email and sends alert.

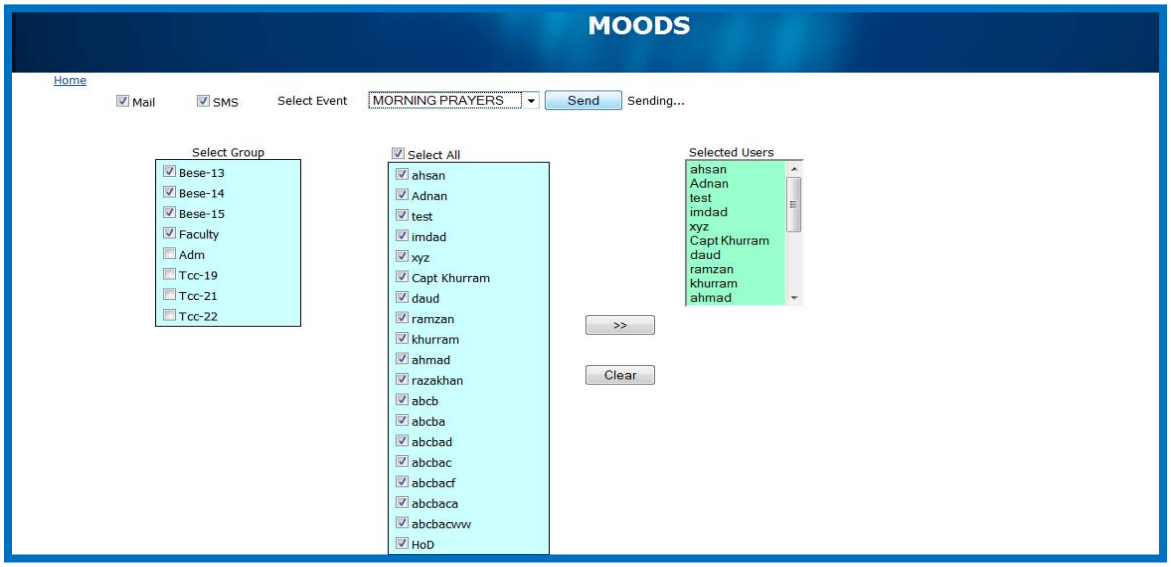

Figure 5.6 Alerts Generation

5.5.6 View Edited Events

Edited Events page shows all those commitments that had been edited, rescheduled by user to a different time and date for whatever reasons.

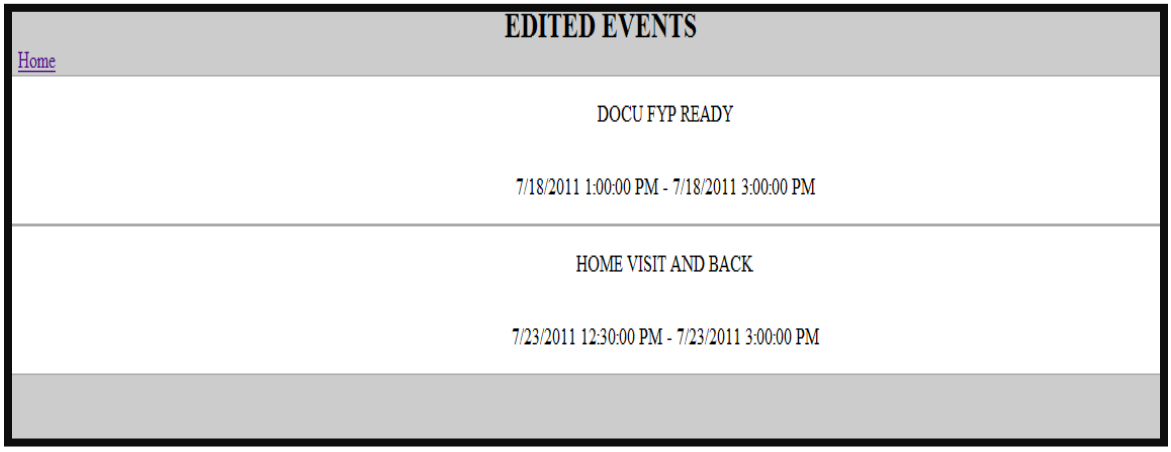

Figure 5.7 View Edited Events

5.5.7 Administrator login

Administrator logins the system with own account details as shown in Figure 5.8.

On unsuccessful login retrials are available until successful login actions

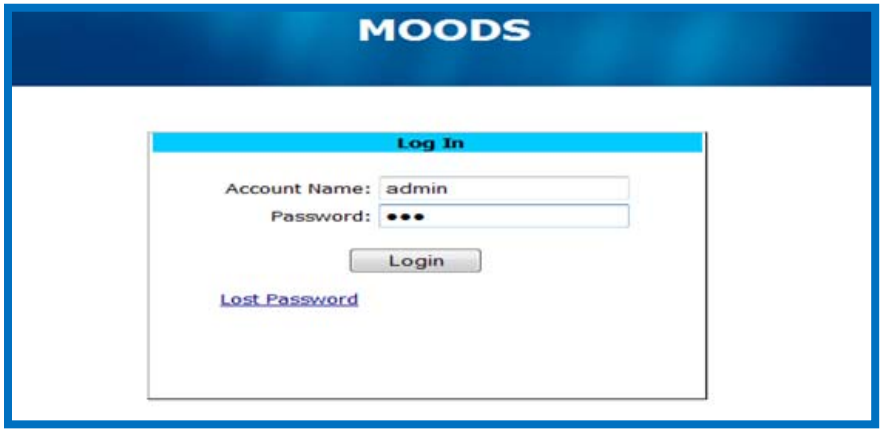

Figure 5.8 Admin Login

5.5.8 Administrator Home page

Administrator after successful login moves to the main administrator page. Administrator is responsible for creation of new user groups, adding users to these groups, deleting any of them and assigning each one of them with usernames and passwords as shown in Figure 5.9. Admin can navigate to different page like event log, edited event log and to the sent alert log for analysis and user management. A list of all the added users that have subscribed to the system is visible to the administrator.

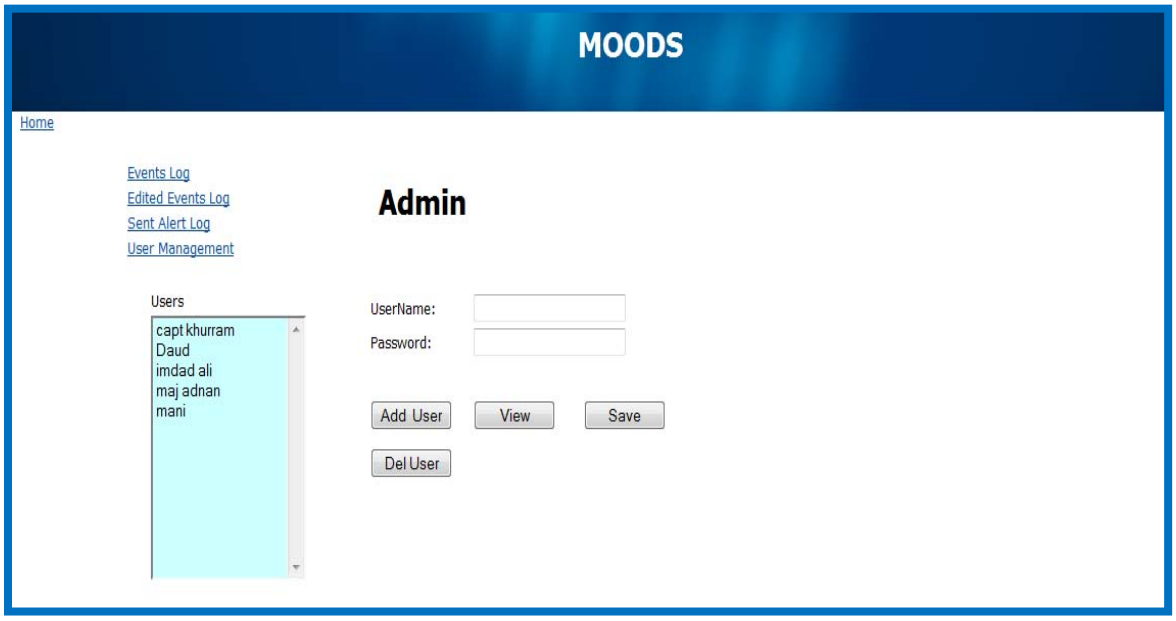

Figure 5.9 Admin Enabling User Access

5.5.9 Event / Edited Events log

Administrator possesses the views of all events generated on the calendars of each subscribing client. To avoid confusion and make the interface more meaningful, this search query is filtered by name of the user. On the drop down screen administrator select a particular

user to view his generated event. Figure 5.10 illustrates the details of this view. Moreover administrator can also view what all events have been rescheduled / edited by a particular user as illustrated in Figure 5.11.

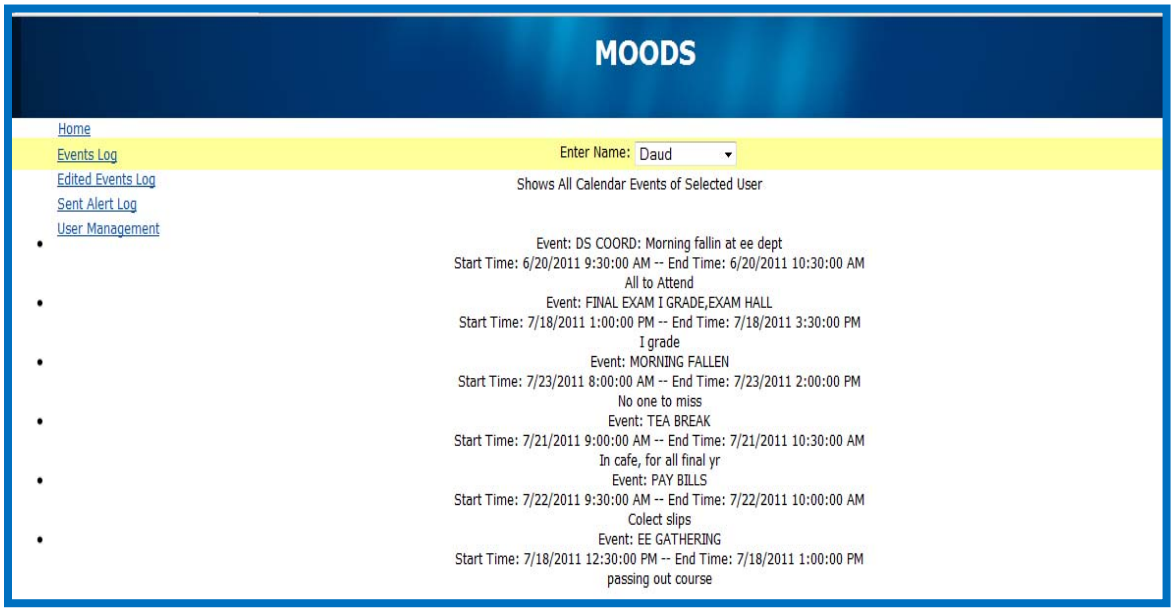

Figure 5.10 Events Log View

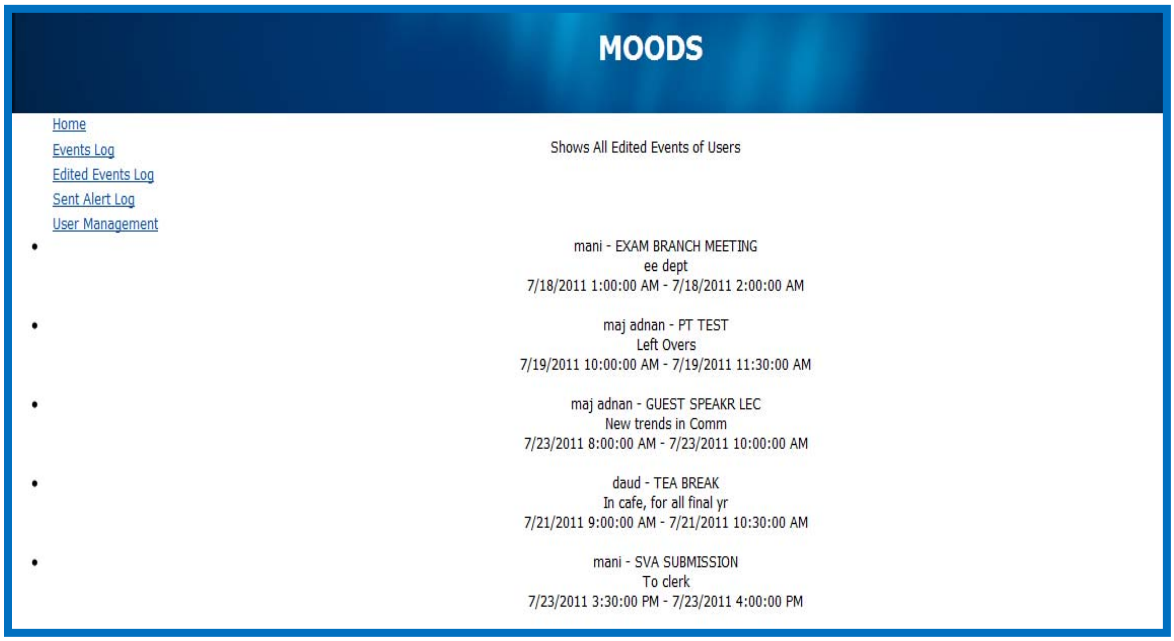

Figure 5.11 Edited Events Log View

5.5.10 Sent Alerts log

Administrator can see all the alerts generated by selecting a specific user by his name.

This section of log is different from events added to the calendar as it includes only those that have been sent as SMS or Email alert. This eases the effort for searching the alerts and helps analyze number of alerts generated by a particular user. The view has been illustrated in Figure 5.12.

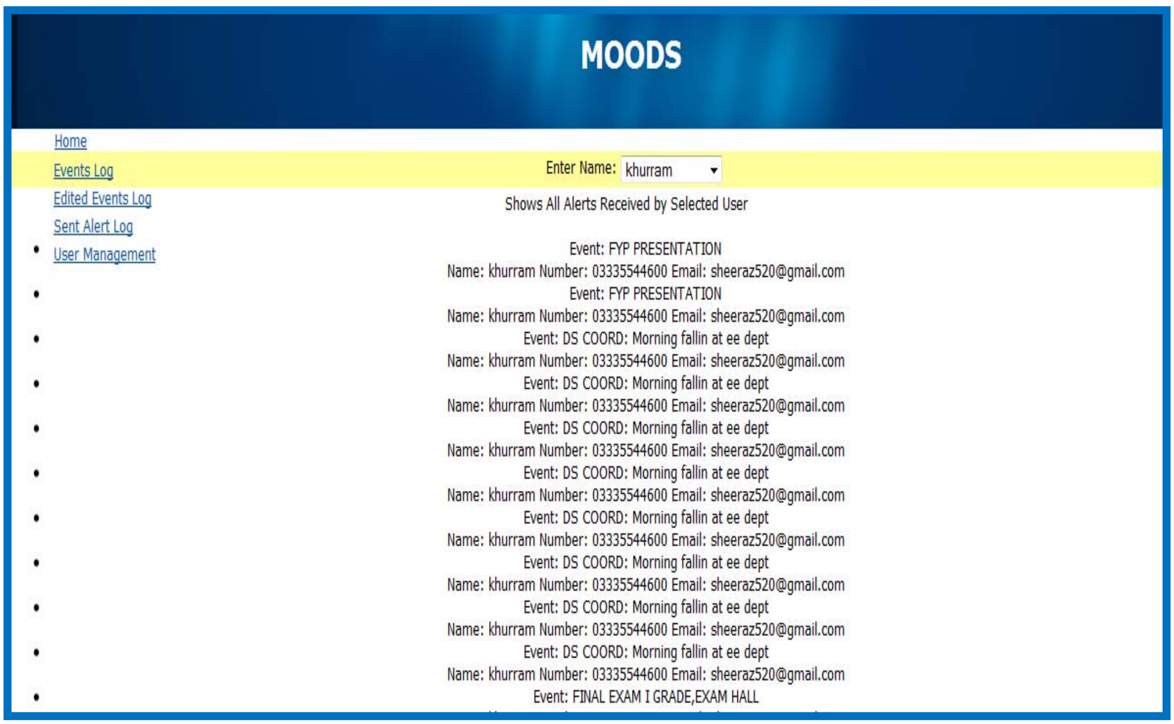

Figure 5.12 View of all Alerts by Selected User

5.5.11 User Management

Administrator can add and delete the name, phone number and email address of user to be entered in a specific group and allowing access of system.

For group addition/deletion separate textbox is available as shown in Figure 5.13.

Figure 5.13 User Management

5.6 Chapter Summary

This chapter explained how the system is designed and implemented. The logic used and modules working is explained in this chapter with the help of views that come up on interacting with the application. MOODS is developed keeping the design very simply and implementation in small modules so it is very easy to expand it.

CHAPTER 6

TESTING AND RESULT ANALYSIS

6.1 Introduction

This chapter presents the testing and results of the system for evaluating its performance. Real time testing of the system has not been performed yet. Sample data was used for the testing, analysis and evaluation of the system. Comparison of the software developed is done with the existing software. This chapter explains why developing MOODS was important. Logic implemented to develop MOODS has been successful and it meets all the functional requirements. Tests have been carried out and results are achieved. This system will make the information dissemination very fast and easy when it is deployed.

6.2 Testing

To get a knowhow of the systems best performance as well as its limitations, different test strategies have been designed. These testing strategies will ensure that system is finally deployed should not go faulty. Extreme conditions and tough testing schedules ensure accuracy and efficiency. A test case in software engineering is set of conditions and variables under which a tester will determine whether the software is working correctly or not.

6.2.1 Unit Testing

In computer programming unit testing is the procedure by which individual units of source code are tested in order to determine whether they fit into system or not. Firstly the web end of system software, mail sending module and SMS sending modules were individually tested for their correct services independently. They worked properly and further selected for use.

6.2.2 Integration Testing

After achieving satisfactory results of individual components of system they were integrated with web services. Components were then tested together as a whole along with integrated database. Regression testing was performed until expected, the desired results.

6.2.3 System Testing

For evaluating System Performance, load testing was performed with multiple users logged in to system simultaneously. Security features of the system were tested by providing incorrect login details at the web end for users and at server end for the admin and also making sure that the updates were not sent to any other subscriber except for the subscriber the update is concerned with.

6.2.4 User Acceptance Test

Valid users were logged in successfully in to their online accounts, also valid administrator successfully logged in to their accounts at the server-end. And alerts for specific user were delivered only to them successfully.

6.2.5 Functions to be tested

Various functions are tested to include Add Subscriber, Verify Subscriber, Subscriber login/logout (only for website), User commitment feeds display, Administrator account creation, Admin login, User Account creation, User login, Password change, Send SMS, send Email, Create Report.

6.3 Test cases

A test case in software engineering is set of conditions and variables under which a tester will determine whether the software is working correctly or not. Following test cases have been conducted in order to fulfill the testing precisely. Test cases like login and logout, add/verify subscriber, admin account creation/deletion and password change and alert generation are included in following tables.

6.3.1 Login and Logout

The first test case in the sequence of application is login. This section covers the login testing scenarios that are concerned with user names and their respective logins/logouts. All foreseeable problems that may arise during login/logout procedures have been tested and described in Table 1. Testing was conducted during the implementation phase.

Table 1 Login and Logout

Test Case #	Test Case Description	Expected Result	Actual Result	Pass/Fail
1	Enter correct Username and password and click on Login	Make sure user is logged in	Dashboard is displayed/ User details displayed on dashboard(for website)	Pass
2	Click On logout Button/Link	Make sure successful logout	Confirmation box appears on clicking Yes application exits/ login page is displayed	Pass
3	Enter invalid Username in the username field and click on login	Should prompt for username	Error message displays “Invalid Username/Password	Pass

Table 1 Continued Login and Logout

Test Case #	Test Case Description	Expected Result	Actual Result	Pass/Fail
4	Without providing a username, and click on login	Error message for Username should be provided	Error message displays as: 'Enter Username'	Pass
5	Enter invalid Username and password combination and click on login	Error message for invalid details should be provided	Error message displays "Invalid Username/Password"	Pass
6	Enter invalid password and click on login	Error message for Password should be provided	Error message displays "Invalid Username/Password"	Pass
7	Without providing a password, try to login	Should prompt for password	Error message displays: 'Enter Password'	Pass
8	When logged in to website navigate to login page again	Should not go to login page	Goes to login page with message displayed. You must Log Out to sign in	Pass

6.3.2 Add/Verify Subscriber

Administrator has the rights to add/ verify various clients that subscribe to the application. Thus there was a dire need to check all cases that may come up during adding / editing details of each newly added user that includes his name, mobile number, email address

and login details to include his login ID and password. Various test cases described briefly in Table 2 were created to check the above mentioned instances.

Table 2 Add/Verify Subscriber

Test Case #	Test Case Description	Expected Result	Actual Result	Pass/Fail
1	Fill in all specified fields and click the Submit button	Make sure the details get submitted successfully.	Information is submitted successfully, with a confirmation message.	Pass
2	Leave “Name” field empty and click the Submit button	Information should not be submitted. With appropriate error message	Error message displays “Enter Name”	Pass
3	Leave “Mobile #” field empty and click the Submit button	Information should not be submitted. With appropriate error message	Error message displays “Enter Mobile #”	Pass
4	Leave “E-mail” field empty and click the Submit button	Information should not get submitted	Error message displays “Enter E-mail”	Pass
5	Leave “Login ID” field empty and click “Submit” button	Information should not be submitted. With appropriate error message	Error message displays “Enter Login ID”	Pass
6	Leave “Password” field empty and click “Submit” button	Information should not be submitted. With appropriate error message	Error message displays “Enter Password”	Pass

6.3.3 Administrator Account Creation/Password Change

All foreseeable problems that may arise during login/logout procedures have been tested and described in Table 3. Administrator account has been created differently from clients account and therefore needed separate testing. This testing was also was conducted during the implementation phase.

Table 3 Administrator Account Creation/Password Change

Test Case #	Test Case Description	Expected Result	Actual Result	Pass/Fail
1	Enter correct Master Admin password, and New username and password	Account should be created	Message displayed ”Account has been successfully created”	Pass
2	Enter Incorrect Master Admin password, and New username and password	Error message should be displayed	Error message displayed “Please enter correct password” Field is highlighted	Pass
3	Enter Username which already exists	Should not create Account	Error message displays “User account already exists” Field is highlighted	Pass
4	Enter currently logged in user Password and new Password	Password should be changed	Message displays “Password has been changed”	Pass
5	Enter incorrect password of logged in user	Password should not be changed	Message displays “Incorrect Password”	Pass

6.3.4 Send SMS Alert

SMS sending module was developed independently and later integrated with the application. Therefore test cases mentioned in Table 4 were created.

Table 4 Send SMS Alert

Test Case #	Test Case Description	Expected Result	Actual Result	Pass/Fail
1	Select the commitment from drop down list and press SEND	SMS should not be sent to subscriber	Sending fails	Pass
2	Select a group of multiple users after choosing commitment	Bulk SMS should be sent to all users	SMS sent with appropriate Alert Text	Pass

6.3.5 Send Email Alert

Email sending module was also later integrated with the application. Test cases mentioned in Table 5 were created to test various situations.

Table 5 Send Email Alert

Test Case #	Test Case Description	Expected Result	Actual Result	Pass/Fail
1	Select the commitment from list and press SEND	Email should not be sent to subscriber	Email sending fails	Pass
2	Select multiple users after choosing commitment	Bulk Email should be sent to all users	Email sent with appropriate Alert Text	Pass

6.4 Comparison with other Software Products

MOODS is better than other software available in the market due to the fact that it provides multiple functionalities as all in one software. It is more efficient and user friendly. It provides special logging analysis and filtering functionalities which are not available in contemporary software. Some of the features that distinguish this application are discussed ahead.

6.4.1 Log Maintenance

Log maintenance available in the existing software products is very random and does not provide adequate filtering criteria to make queries intelligent and meaningful. Moods provides logging details such as saved events, edited events and all sent alerts details by name. Rights to access this log are reserved with administrator.

6.4.2 Generic Product

Existing system was only supported by one cellular operator (Ufone) thus limiting the system to be used in limited areas where the service is available. But MOODS can work on any available network.

6.4.3 Multiple Clients

New system supports multiple clients at a time. More than one user can access the services from web by subscribing at administrator. Administrator has ultimate access and rights to subscribe any number of users for this application. The greater the number of clients the more system will be tested for maintainability and performance.

6.4.4 SMS and Mail Alerts

MOODS will generate alerts for registered users. These alerts are delivered over to the users via their email accounts and mobile sets. Alerts will show the sender's email and message subject line. It not only ensures timely delivery of alerts but also make them redundant in case some problem occurs due to network congestions or some other technical failures. This enhances the capability of system to work more efficiently.

6.4.5 User Management

Most of the alerting software products in market are developed typically from advertising point of view that allow sequential mobile numbers in a from-to series range, MOODS however is tailored typically to handle particular user groups that help enhance organizational efficiency

6.4.6 GUI

One of the prime feature is user friendly GUI. Software is very easy to use. A user with basic computer knowledge can use it efficiently. Database can be managed using GUI. GUI enables this product to be more time savvy and allows user to understand its functionalities without the requirement of user manual or guide.

6.5 Chapter Summary

MOODS is a complete software providing all the important functionality through a very user friendly GUI. It can be used by person possessing very general knowledge of computer. No special training is required to use and manage it. System provides better

features than all the software available in the open market as discussed in one of the sections above. Testing procedures adopted as mentioned in the chapter make it very reliable and efficient. Its usage scope is not limited. It can be deployed in many organizations besides being a good scheduling help for independent users too.

CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 Future Works

MOODS is versatile software and can be tailored to organizational requirements with existing / additional functionalities. Future work includes deployment of the software at Military College of signals. To use existing login and privileges of Learning Management system already deployed at Military College of signals MOODS may be integrated with the same.

MOODS functionalities can be enhanced by generating the capabilities such as requests for data. For example Students can send their college registration identity number on MOODS and it will send them a message with their result in reply. Students can send queries like date sheet, schedule etc.

User functionalities can be improved can providing user the facility of composing and save messages that are to be delivered later at some point of time and system automatically delivers them.

Elaborate logging details have been made part of the application already. Printing log can be helpful in many ways for saving the data as hardcopy for any reference or planning parameter. Therefore feature allowing printing of logs may be integrated later into the system.

MOODS can be extended to allow on request alerts. Users may email or post web request to server for delivery of a particular alert to desired addressees. Moreover priority lists can be configured at server to entertain such requests from user. Database configuration with custom settings including more detailed user account setting may be built as currently it stores only necessary personal information vital for alerts generation.

7.2 Conclusion

Mobile online office diary and scheduler is a good advancement towards process of staying abreast with your vital commitments in a busy routine visa vise ensuring fast communication of alerts. It is useful software developed targeting users with normal level of computer knowledge. It is not only restricted to university or college use. It is a very useful system that can be installed in organization to keep their employees up to date and informed. It can be deployed for marketing/ advertising purposes. MOODS provide all the required functionality but more features can be added to it or it can be integrated with other system to yield better results. Deployment of this system will bring a very effective change. Information dissemination and message passing will be very rapid and time saving.

APPENDIX A

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APPENDIX B

USER MANUAL

1. System Requirements

a. Computer must have working USB Port

b. Internet Connectivity

c. GSM modem

2. Installation

a. Server must support .NET 3.5 or above

b. Must have a SQL server with IIS setup

c. Put the 'Global folder' containing the software application files in the Root Directory of C Drive of the server.

d. Put the .dll files provided with the Software in the bin of Global folder's bin file.

e. Install the GSM Modem Driver to the System.

3. How to use the software?

a. **Connecting GSM Modem With Computer**

i. Connect the GSM Modem device with the Computer.

ii. Allow the Auto run (Every Time) to connect the Modem properly to the computer.

iii. Check the status of GS M Modem in its software. Wait till it show "connected".

iv. Finish the GSM modem setup

b. **Connect to Internet**

i. Enter URL localhost/issp/login.aspx to get to the web

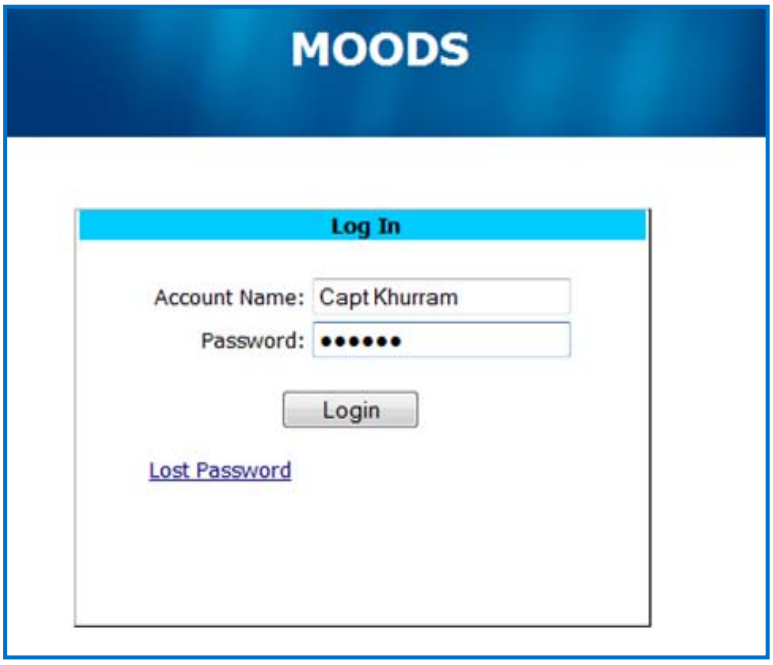
ii. Use your customized MOODS application

4. User orientation with the application

a. **Log in View**

i. Enter a valid user name

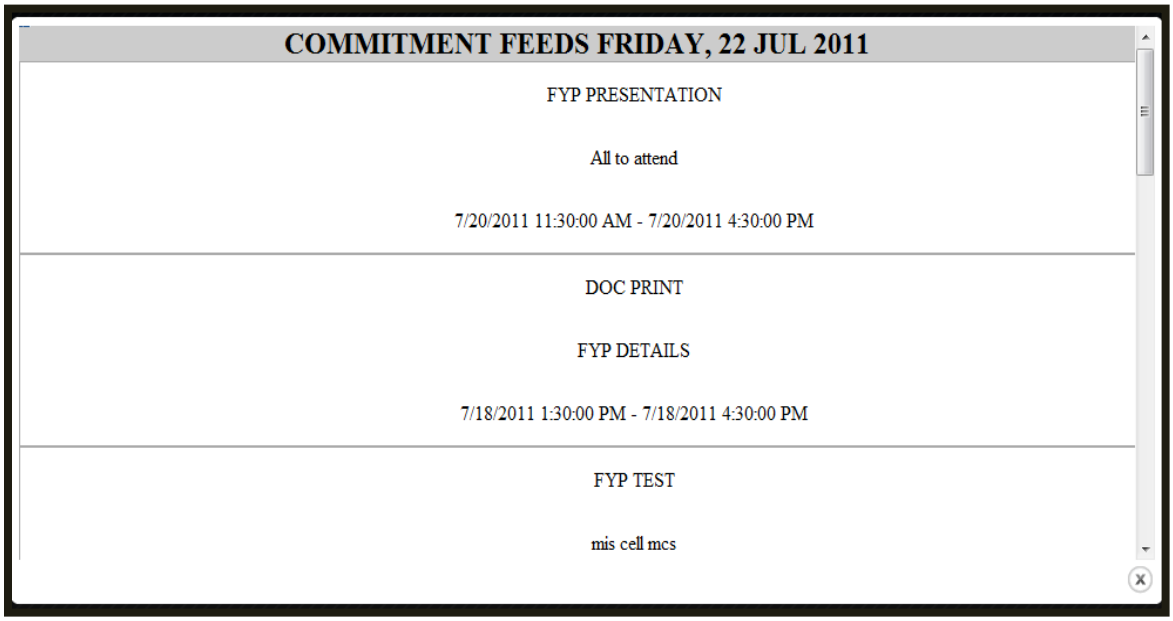
ii. Enter password



b. **Commitment Feed homepage**

i. When the user/administrator has logged in the first page containing the commitment feeds will open directly.

ii. Read the feeds and check if any commitment is there in the subsequent week.



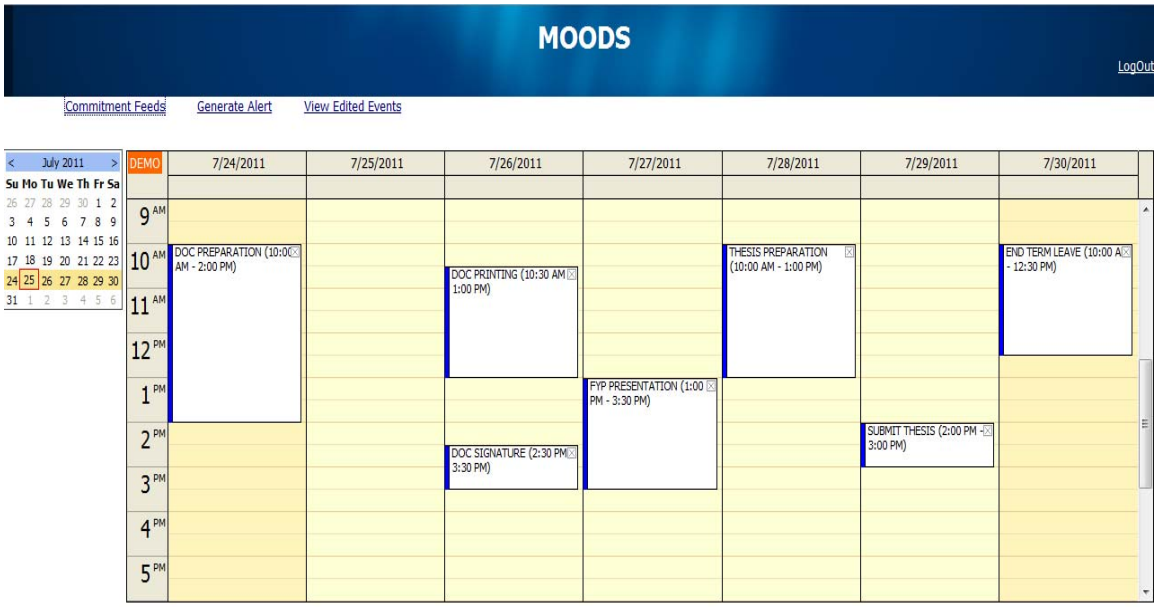
c. **Add, Delete and Edited Commitments**

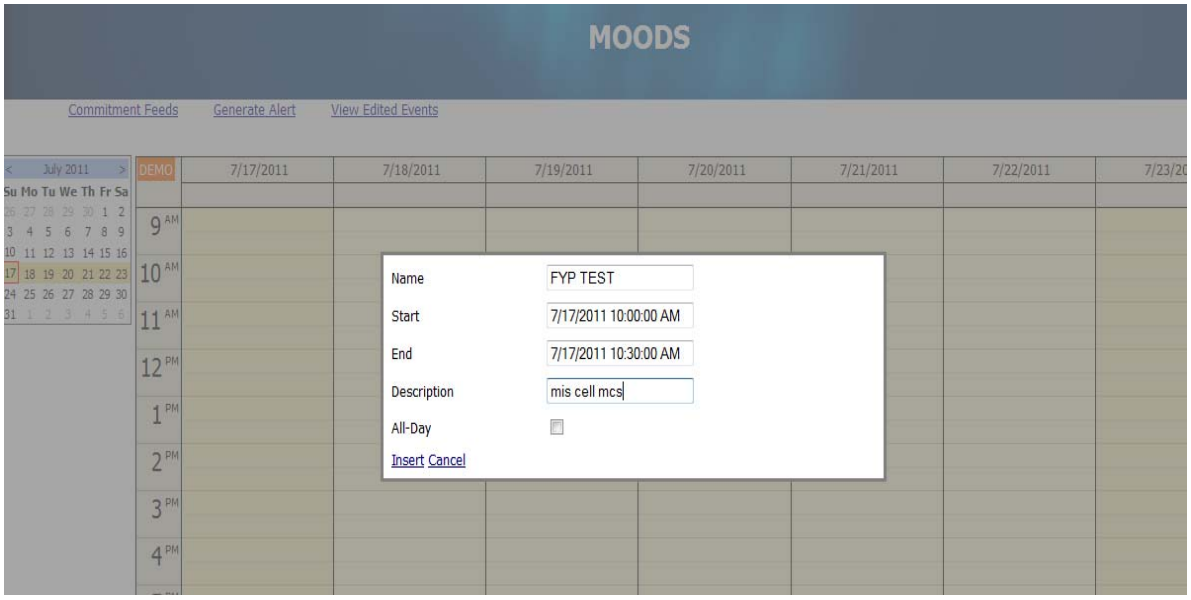
i. If user/administrator wants to add, delete and edit the commitment the main calendar page will serve the purpose.

ii. Just click on the desired time and date column in the calendar page and a box will appear for making add, delete and edit procedure.

iii. When editing is done the click the insert button and wait for commitments to be upgraded.

iv. When up gradation is complete it will appear in the commitment feeds page as well as in the main calendar.





d. **Send SMS and Email**

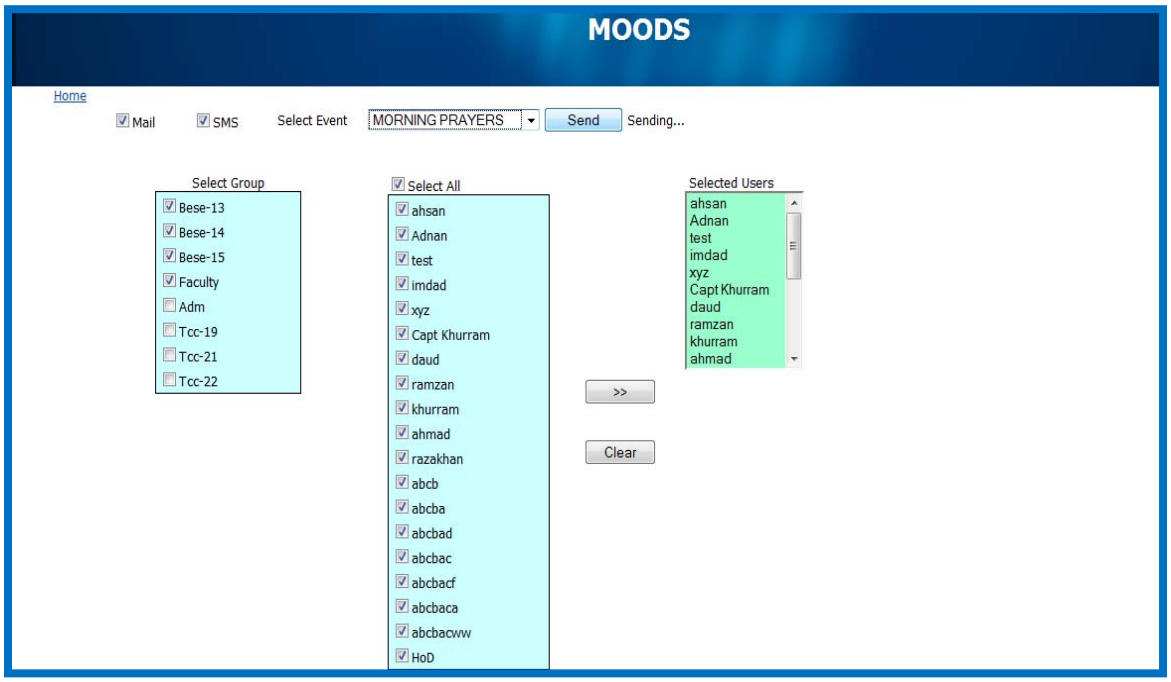
i. Click “Generate Alert” Button at home screen.

ii. A new screen will appear.

iii. Number and Email id of users has already stored in the database, just simply click the check box given for complete user group or single user.

iv. After completing above step system is ready to send SMS and Email. Check the SMS and Mail check box.

v. Click the send button and SMS and email will be sent to the user/multiple users.

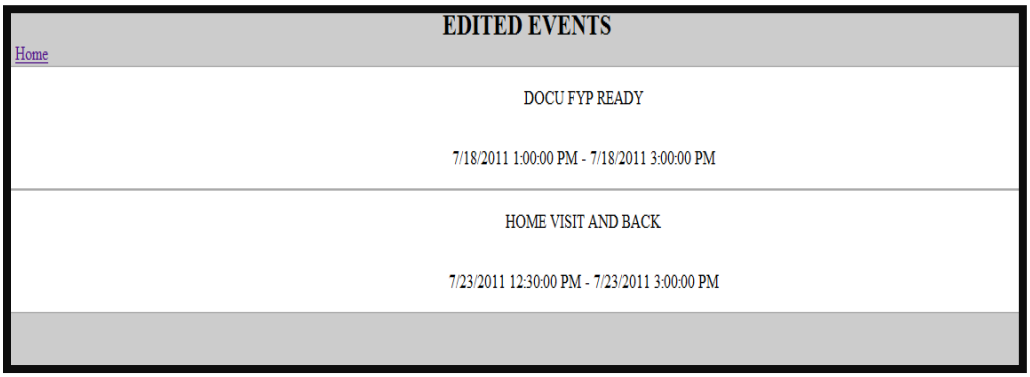


e. **View Edited Commitments**

i. Press view edited commitments button on main page.

ii. Enter the desired Search criteria. (Specific legitimate user name)

iii. The detailed commitments will appear in the feeds ticker.



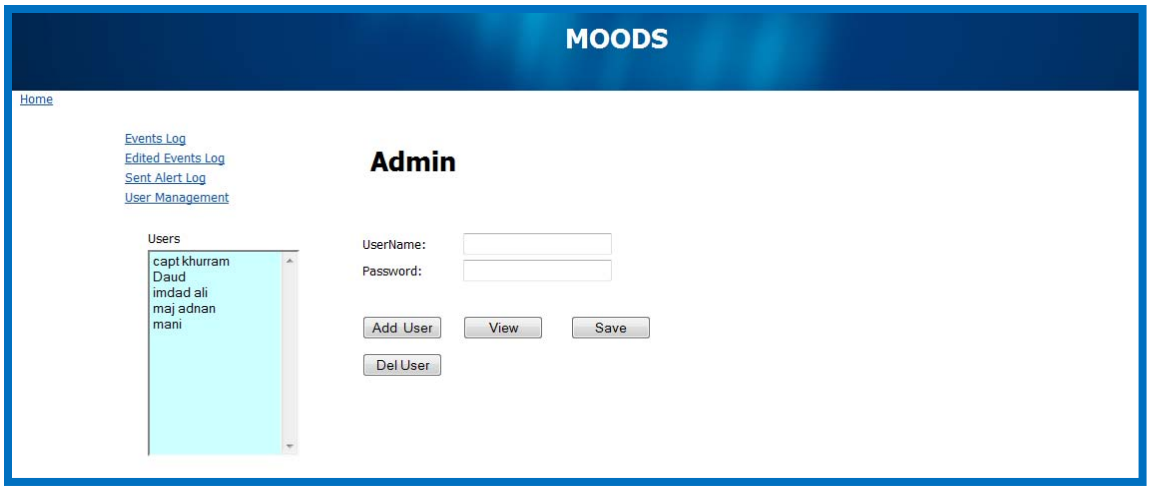
f. **User Management (Administrator)**

i. User management lies with administrator. After login Admin page appears.

ii. **Add User:** For adding new system user, click the user management button. Enter the desired username, password and press “add user”.

iii. **Delete User:** For deleting the existing user. Just enter the desired username and Press “Delete User”

iv. **Reset Password:** You can also reset the user password by using add button after viewing the user statics.



g. **Administrator adding the users**

i. Enter the user name, phone number and email address in user management page.

ii. Press the Button Add/delete users and required action of addition/deletion will occur.

iii. For entry in specific group select the group in list box and click add.

iv. For entry of user group write the group name in text box given on webpage and press “Add Group” button