

Mobicom® CRM

Introduction to Software Engineering (MBIS202) Coursework

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Acknowledgement

We are pleased to acknowledge Mrs. Kalpana Weerasinghe, our Introduction to software Engineering lecturer for her invaluable guidance during the course of this project work, without her guidance, this project would have been an uphill task.

We are also grateful to other members of the Mobicom® team who co-operated with us regarding some issues.

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Introduction

Overview

This project focuses on the development and prototyping of a Customer relationship management software fits for a small to medium scale business. This Mobicom® CRM will be designed to address our client's requirements functional and non-functional. Mobicom® CRM is web based and uses PHP for the development and use MySQL for database handling. Mobicom® is also mobile responsive. Users can manage their profiles create quotations and create tickets. The point is, since this is mobile responsive users of the system can perform task anywhere. Mobicom® CRM will also include with an admin panel to manage users, quotes and tickets. Also admin panel is designed to provide insights of the system to the admin at a glance.

Background of the project

Mobicom® is an IT firm which does businesses or projects like website development, search engine optimisation etc. Mobicom® wanted to have a system where the internal environment of the company needs to communicate with its external environment like clients. They also wanted to make it easy for their customers to use their system. We designed them a lightweight system that use less resources that works in real time. Mobicom® have ticket system where advanced users like employees can ask for guidance from the admin.

Objective of the project

- Create a lightweight system
- Use new technology
- Address every functional, non-functional and domain requirement
- Make system secured.
- Handle quotes effectively
- Parallelly implement KMS capabilities
- Make it possible to upgrade careers
- Integrate reports/insights facilities
- Make system built around the customer
- Reduce costs
- Create new target market
- Address human computer interaction concepts

Methodology

To achieve above objectives, we will choose agile methodology and scrum sprint, we will develop the software using top down approach and singleton design pattern. Each day we will have scrum meetings and decide the plan for the next day and add them to our scrum backlog. Each task will be allocated to a different user. Business analysts will gather requirements with questionnaire sessions with our client and provide the details to the developers. Quality analysts will use black box methodology to test the software.

Requirement specification

Functional Requirements User Side

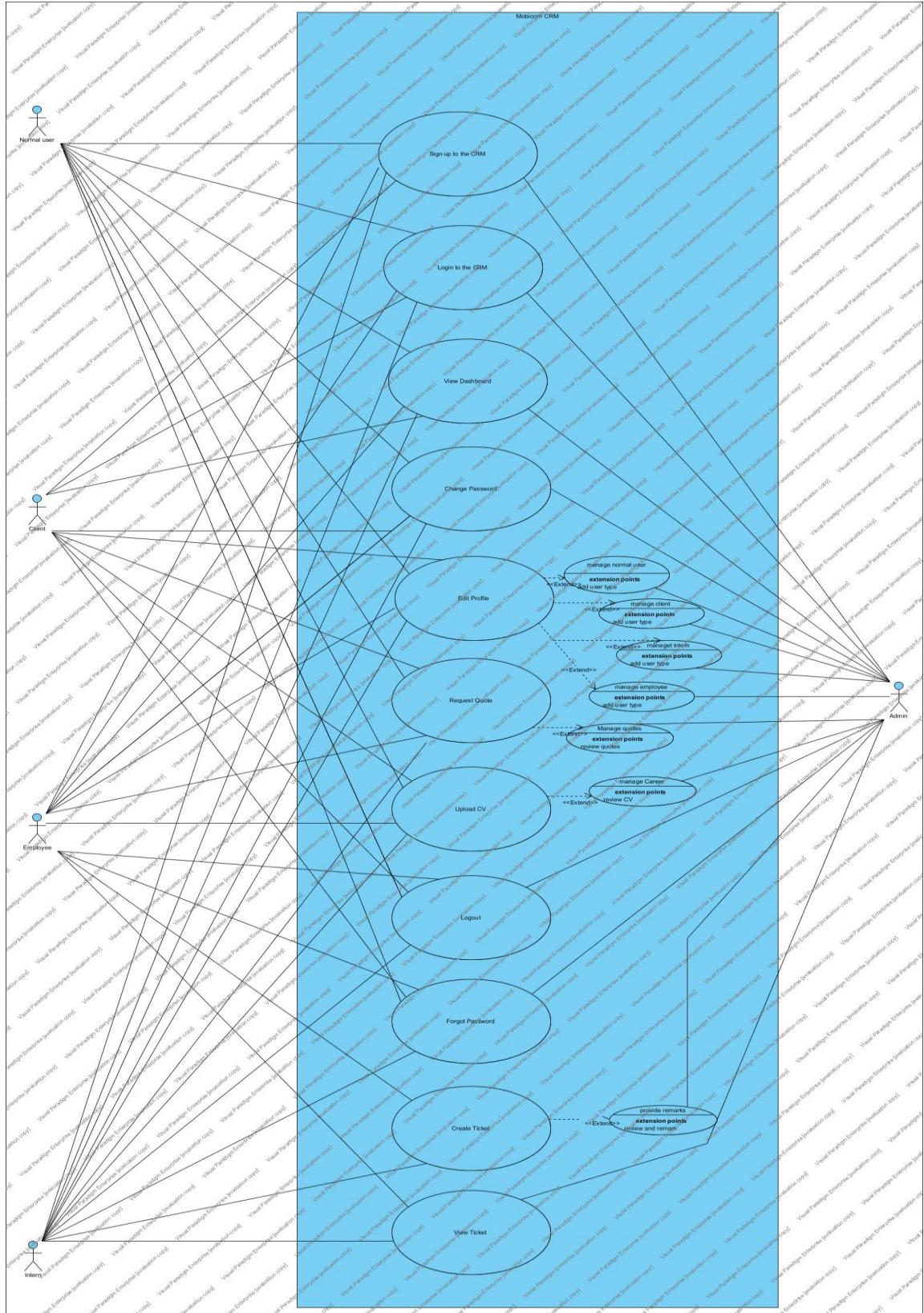


Figure 1 Use case diagram

Simplified diagrams

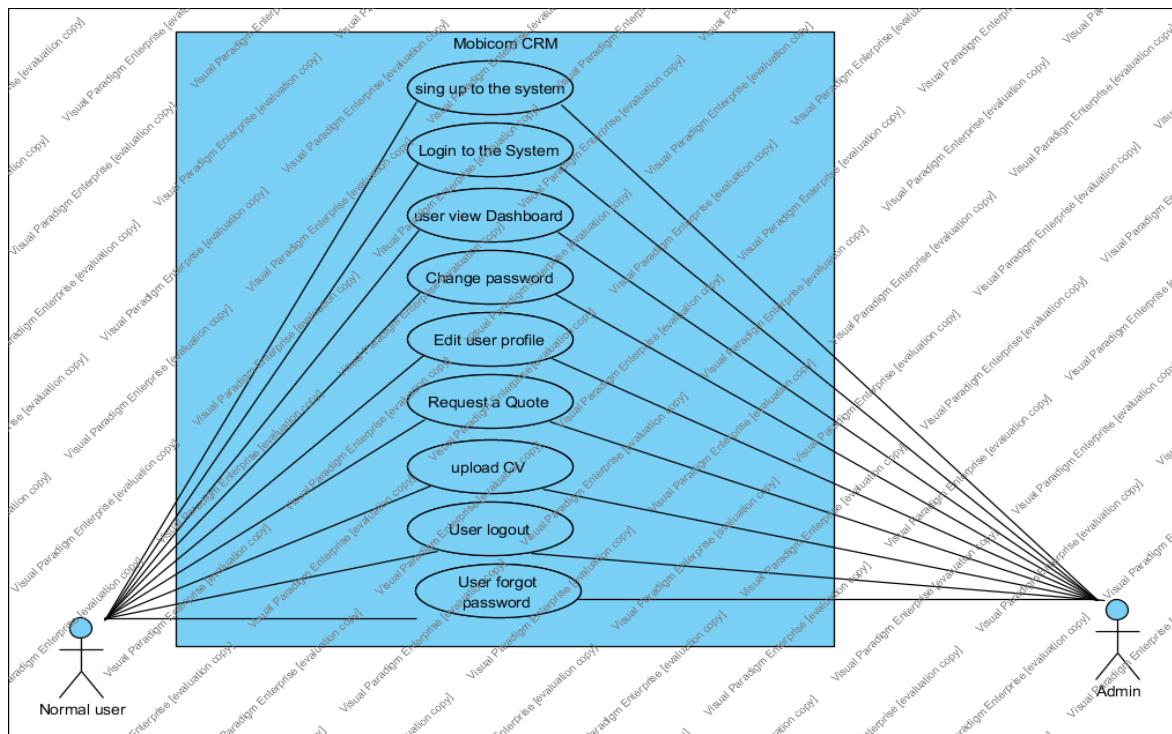


Figure 2 normal user case Diagram

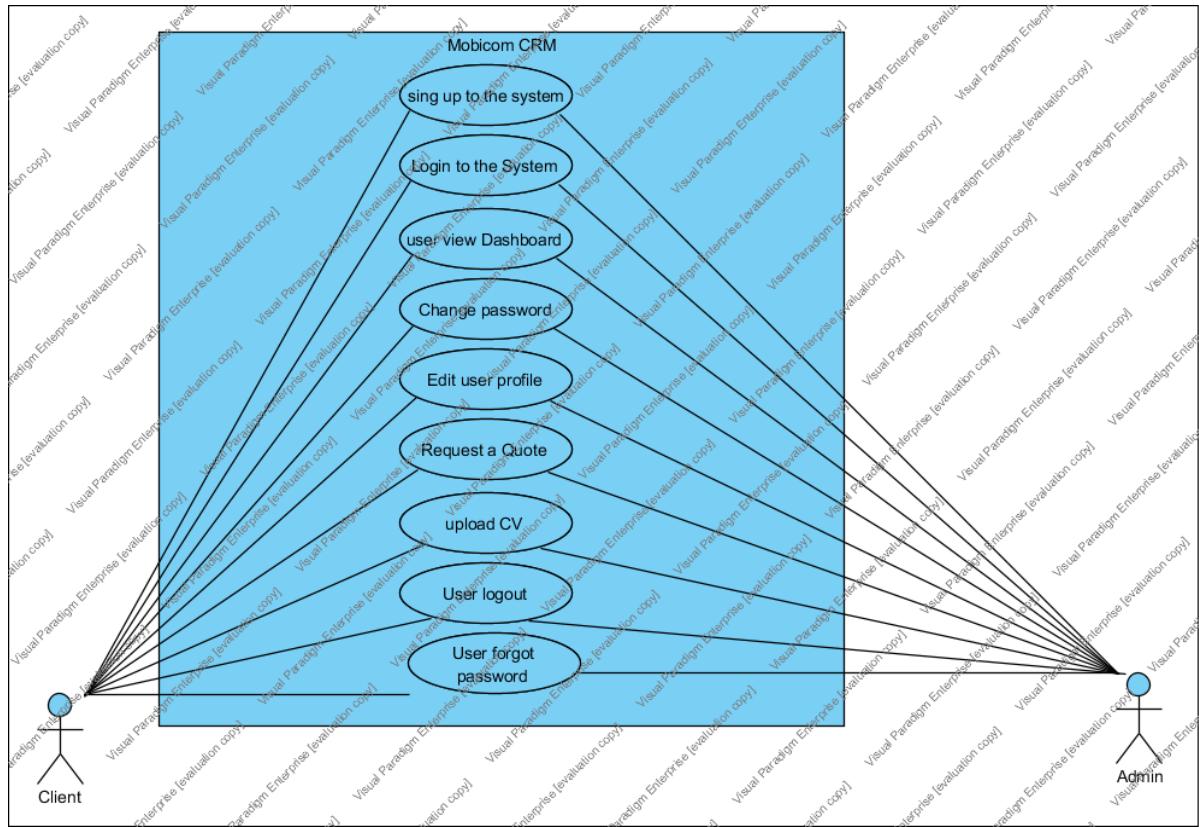


Figure 3 Client use case Diagram

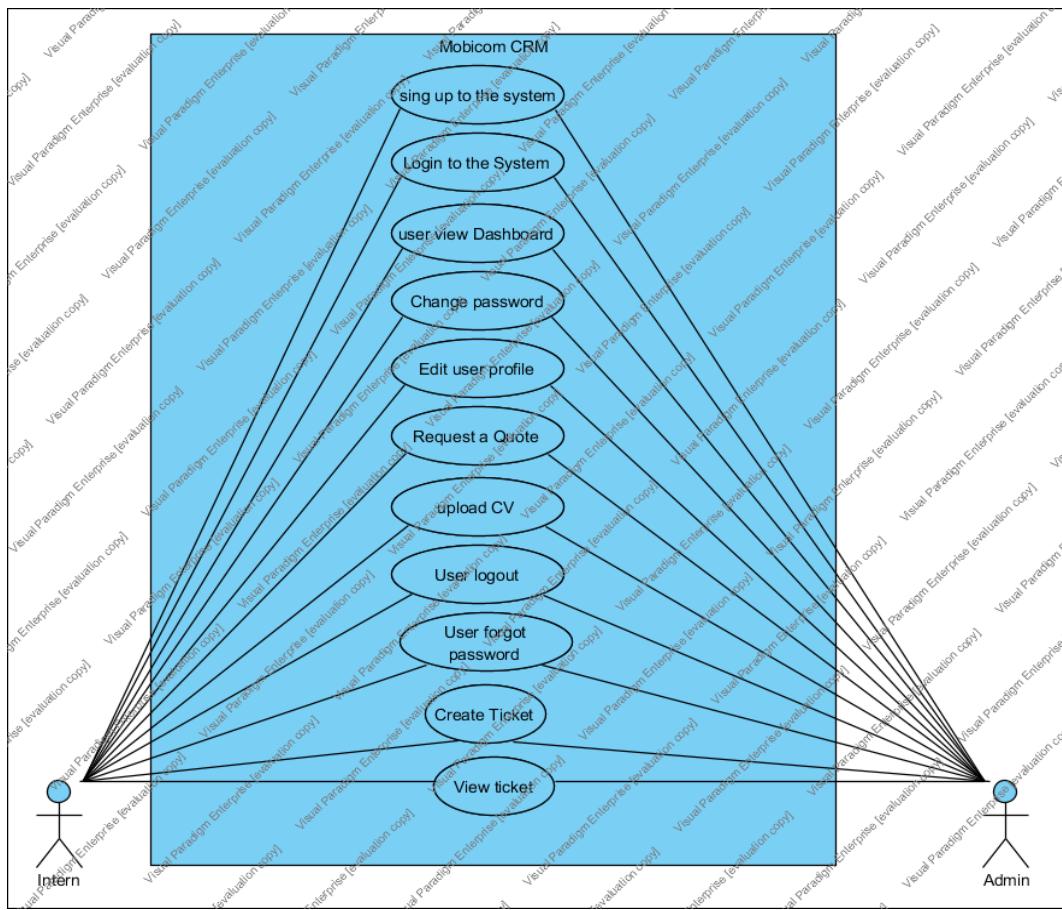


Figure 4 Intern use case Diagram

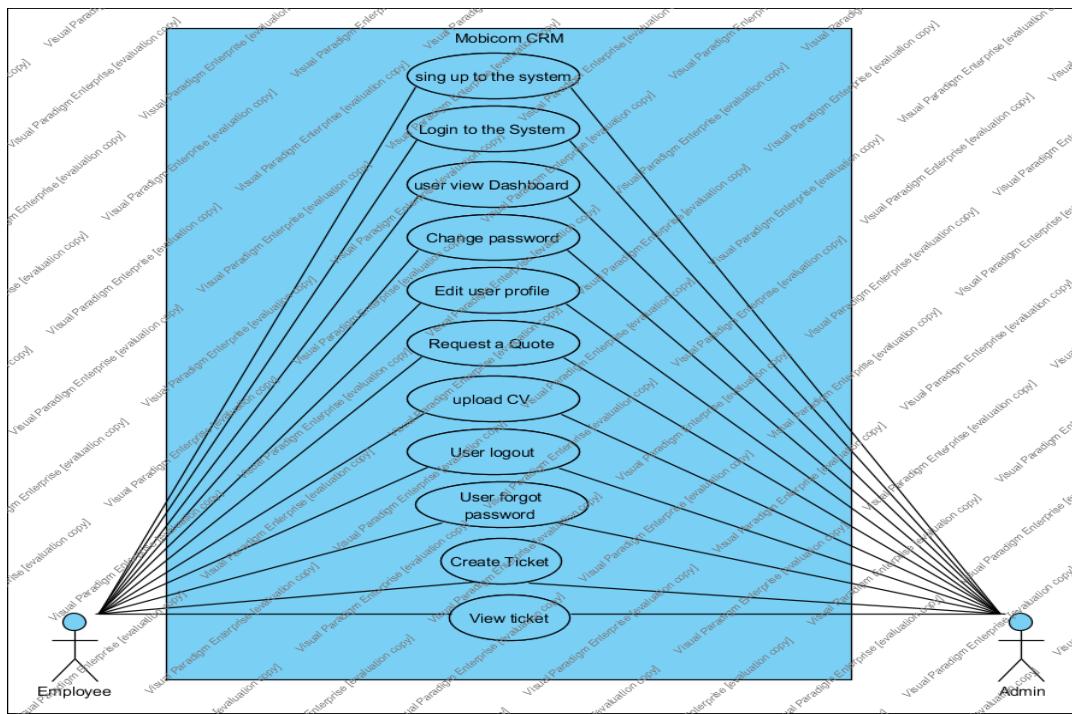


Figure 5 Employee use case diagram

Signup to the system

Use Case Name	signup to the System
Trigger	The user tries signup to the Mobicom® website
Precondition	The website displays required textbox and password and radio buttons field for corresponding user inputs of name , email , password , password re-enter (for confirmation) , contact number and gender
Basic Path	<ol style="list-style-type: none"> 1. User enter username 2. User enter the email 3. User enter a password 4. User re-enter the password in the relevant password field 5. User enter the contact number 6. User choose gender (automatically selected for male)
Post condition	User's email is checked for validations, user's password and re-entered password are checked to identify if they match. If all conditions are ok user is registered to the system and a record will be added to the database

Table 1 signup to the system

Login to the system

Use Case Name	Login to the System
Trigger	The user tries to assess the Mobicom® website
Precondition	The website displays required textbox and password field for corresponding username and password inputs
Basic Path	<ol style="list-style-type: none"> 1. User enter username 2. Press tab key or click on password field 3. User enter password 4. User press enter key or press login button
Post condition	User's username and password combination is checked with database records and if matched user will be logged in to the system and database is update with a record about the user and his computer's physical address

Table 2 login to the system

View Dashboard

Use Case Name	User view dashboard
Trigger	The user login to the system
Precondition	User needs to be logged in to the system in order view dashboard
Post condition	none
Other	User is presented with tickets , profile , quotes as tiles

Table 3 user view dashboard

Change passwords

Use Case Name	Change password
Trigger	The user tries to change his password after login
Precondition	User needs to be logged in to the system in order to change the password. If logged in website displays password fields for the user inputs of current password ,new password and confirm password
Basic Path	<ol style="list-style-type: none"> 1. User clicks Change Password from sidebar 2. User enter the current password 3. User enter a new password 4. User re-enter the new password 5. User click change
Exception path	User can click clear form and choose not to change password
Post condition	User's username and password is derived from the database and checked against the current password he entered to find if they match. If they match then new passwords and re-entered new password is checked to verify if they have more than six characters and they match with each other. If all conditions are ok database will be updated and current password will be replaced by the new password for that user

Table 4 change password

Edit user profile

Use Case Name	Edit user profile
Trigger	The user tries to edit user details after login
Precondition	User needs to be logged in to the system in order to edit his details. If logged in website will display textboxes for the user inputs of name, primary email, alternative email, contact number, gender and address.
Basic Path	<ol style="list-style-type: none"> 1. User clicks Profile from sidebar 2. User click pencil icon and edit his username 3. User click pencil icon and input his primary email 4. User click pencil icon and edit his alternative email 5. User click pencil icon and edit his contact number 6. User click pencil icon select a gender from dropdown list 7. User inputs an address 8. User clicks submit
Exception path	User can click clear form and choose not to edit any detail, user also can choose not to provide alternative email and an address if he needs to.
Post condition	If user edits his primary email it'll be checked to verify if it is a valid email. If user enters an alternative email it will also be checked to verify. If all conditions are ok database will be updated for that corresponding user
Other	User's username is displays as the page title. user's registered day is displayed below his username

Table 5 edit user profile

Requests a quote

Use Case Name	Requests a quote
Trigger	The user tries to request a quote after login
Precondition	User needs to be logged in to the system in order to request a quote. If logged in website will display textboxes and checkboxes for the user inputs of name, email, contact number, company and wide array of services offered by Mobicom® as checkboxes. Plus a query box for any additional comments
Basic Path	<ol style="list-style-type: none"> 1. User clicks Request a Quote from sidebar 2. User click pencil icon and enter a name 3. User click pencil icon and enter an email 4. User click pencil icon and enter a contact number 5. User click pencil icon and enter a company 6. User select one or more services 7. User enters any additional query 8. User clicks on submit button
Exception path	User can click clear form and choose not to submit any quote, user also can choose not to provide query if he needs to.
Post condition	Database will be updated with new a record

Table 6 Request quote

Create a ticket

Use Case Name	Create a ticket
Trigger	The user tries to create a ticket after login
Precondition	User needs to be logged in to the system in order to create a ticket. If logged in website will display textbox to enter a subject for the creation of the ticket, a dropdown list for selecting task type from (billing, requesting to custom options), and another dropdown list for select a priority level and a text area for descriptions.
Basic Path	<ol style="list-style-type: none"> 1. User clicks Create ticket from sidebar 2. User click pencil icon and enter a subject 3. User clicks task type dropdown list and select one option 4. User clicks priority dropdown list and select a priority 5. User fills the description 6. User clicks on send

Exception path	User can click clear form and choose not to send any ticket.
Post condition	Record enters to the database

Table 7 create a ticket

View ticket

Use Case Name	View a ticket
Trigger	The user tries to view a ticket after login
Precondition	User needs to be logged in to the system in order to view a ticket. If logged in website will display a list of tickets with expand capabilities to view additional information
Basic Path	<ol style="list-style-type: none"> 1. User clicks View ticket from sidebar 2. User clicks open to view additional information
Alternative path	User can click magnifying glass icon to view additional details

Table 8 view ticket

Career

Use Case Name	View and upload a CV
Trigger	The user tries to view career and upload a CV login
Precondition	User needs to be logged in to the system in order to view career. If logged in website will display a table with a button to upload a CV
Basic Path	<ol style="list-style-type: none"> 1. User clicks Career from sidebar 2. User views the table 3. User click pencil icon 4. User upload the CV via the website in the popup windows
Post condition	Record will be added to the database

Table 9 career

Logout

Use Case Name	User logout
Trigger	The user tries to logout
Precondition	User needs to be logged in to the system in order to logout. Website header will display a cog icon for drop down list.
Basic Path	1. User clicks cog icon from header 2. User clicks logout
Post condition	Session destroys

Table 10 user logout

User forgot password

Use Case Name	User forgot password
Trigger	The user tries to recover password
Precondition	User will be asked to supply his email address. And password will be sent
Basic Path	1. User clicks forgot password 2. User enter email 3. User click submit
Post condition	Password will be sent

Table 11 user forgot password

Functional Requirements Admin Side

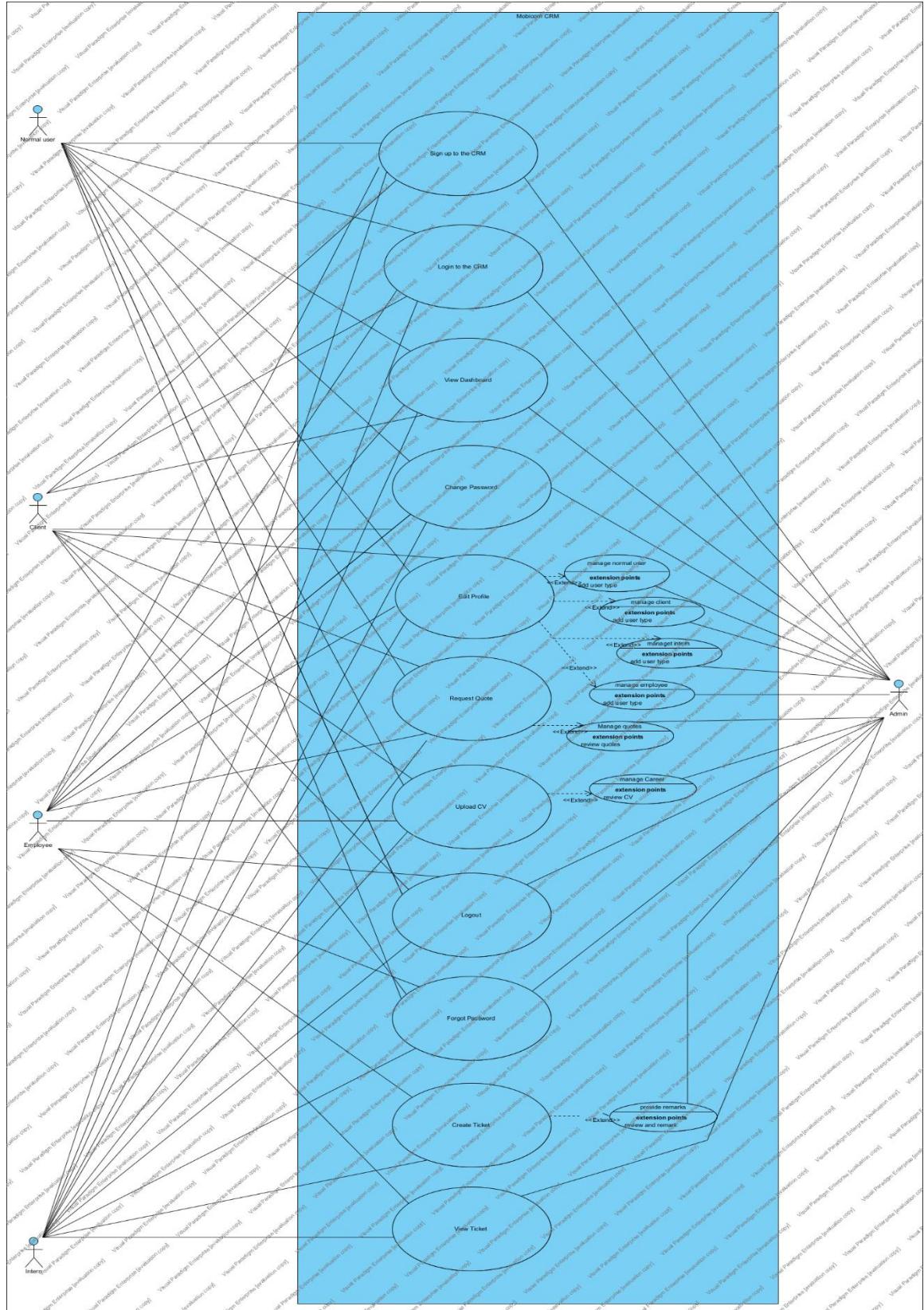


Figure 6 Admin Use case diagram

Simplified version

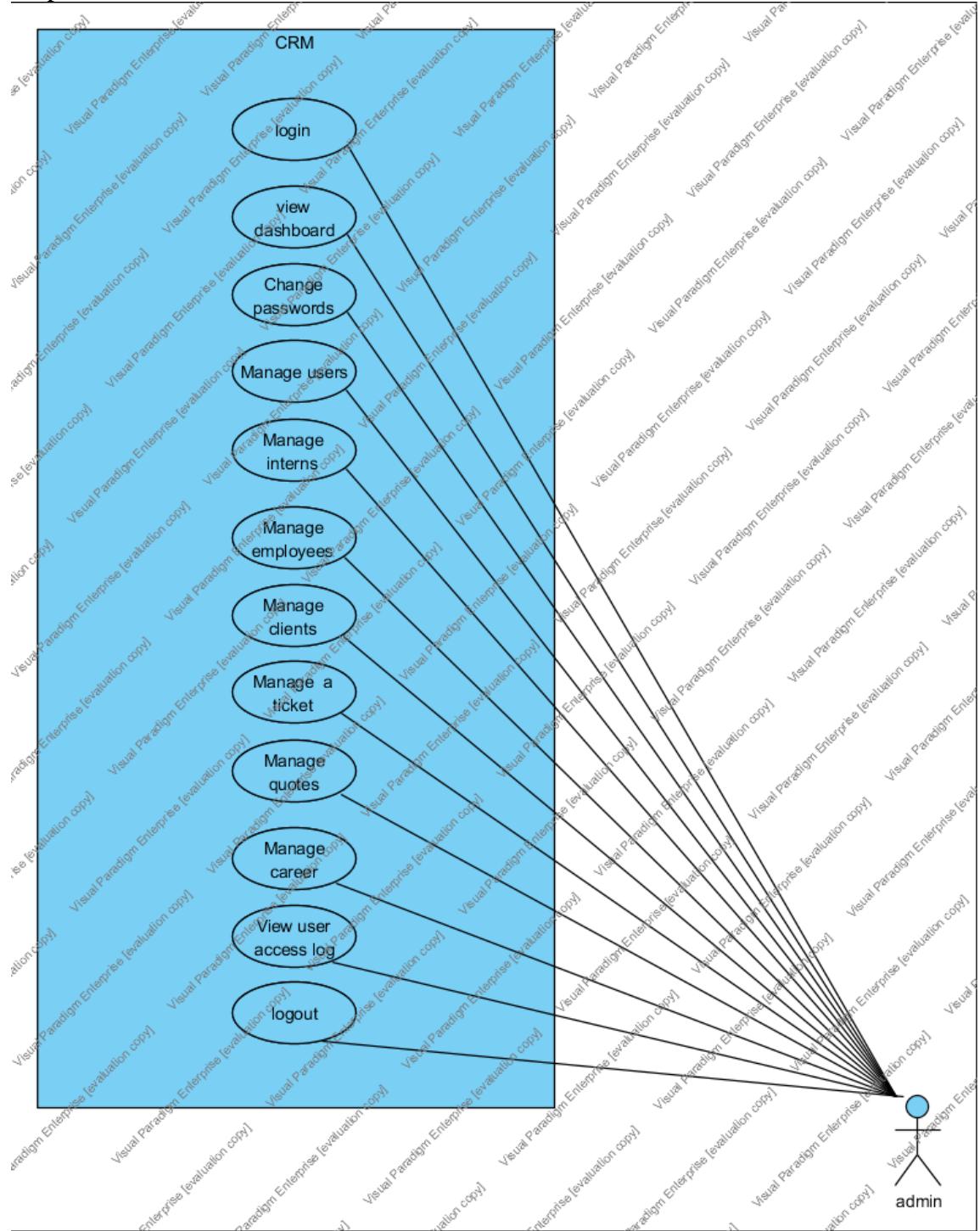


Figure 7 Admin use case close-up

Login

Use Case Name	Login to the System
Trigger	The admin tries to assess the Mobicom® website
Precondition	The website displays required textbox and password field for corresponding username and password inputs
Basic Path	<ol style="list-style-type: none"> 1. Admin enter username 2. Press tab key or click on password field 3. Admin enter password 4. Admin press enter key or press login button
Post condition	Admin's username and password combination is checked with database records and if matched admin will be logged in to the system and database is update with a record about the admin and his computer's physical address

Table 12 admin login to the system

View dashboard

Use Case Name	Admin view dashboard
Trigger	The user login to the system
Precondition	User needs to be logged in to the system in order view dashboard
Post condition	none
Other	User is presented with tiles about overall visitors , registered users , quotes requests , overall tickets , messages and overall tasks A graph is also there to graphically view user arrivals in a month (y axis – number of visitors , x axis – date of the month), graph can also be exported as an .jpg , .png or .svg image

Table 13 admin view dashboard

Change password

Use Case Name	Change password
Trigger	The admin tries to change his password after login
Precondition	Admin needs to be logged in to the system in order to change the password. If logged in website displays password fields for the user inputs of current password ,new password and confirm password
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Change Password from sidebar 2. Admin enter the current password 3. Admin enter a new password 4. Admin re-enter the new password 5. Admin click change
Exception path	Admin can click clear form and choose not to change password
Post condition	Admin's username and password is derived from the database and checked against the current password he entered to find if they match. If they match then new passwords and re-entered new password is checked to verify if they have more than six characters and they match with each other. If all conditions are ok database will be updated and current password will be replaced by the new password for admin

Table 14 admin change password

Manage users

Use Case Name	Manage users
Trigger	The admin tries to manage users
Precondition	Admin needs to be logged in to the system in order to manage users. If logged in website displays table with all the normal users registered in the system , with table columns of full name , email id , contact number registration date and action
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Normal Users from sidebar 2. Admin views the normal users 3. Admin either click "view in edit" or delete
Exceptional path	Admin can choose not to edit or delete

Post condition	none
Other	User table have refresh functionalities. View in edit option will open a new page where admin is present with textboxes for edit a user's name, primary email, alt email, contact number. Drop down lists for select gender and user types (normal, intern, and employee, clients). And a textarea to edit address. Editing these and click changes will update that user's details. Users username is presented as page title

Table 15 admin manage users

Manage interns

Use Case Name	Manage interns
Trigger	The admin tries to manage interns
Precondition	Admin needs to be logged in to the system in order to manage interns. If logged in website displays table with all the interns registered in the system , with table columns of full name , email id , contact number registration date and action
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Interns from sidebar 2. Admin views the interns 3. Admin either click “view in edit” or delete
Exceptional path	Admin can choose not to edit or delete
Post condition	None
Other	Interns table have refresh functionalities. View in edit option will open a new page where admin is present with textboxes for edit an intern's name, primary email, alt email, contact number. Drop down lists for select gender and user types (normal, intern, and employee, client). And a textarea to edit address. Editing these and click changes will update that intern's details. Intern's username is presented as page title

Table 16 admin managing interns

Manage Employees

Use Case Name	Manage employees
Trigger	The admin tries to manage employees
Precondition	Admin needs to be logged in to the system in order to manage employees. If logged in website displays table with all the employees registered in the system , with table columns of full name , email id , contact number registration date and action
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Employees from sidebar 2. Admin views the employees 3. Admin either click “view in edit” or delete
Exceptional path	Admin can choose not to edit or delete
Post condition	None
Other	Employees table have refresh functionalities. View in edit option will open a new page where admin is present with textboxes for edit an employee’s name, primary email, alt email, and contact number. Drop down lists for select gender and user types (normal, intern, and employee. client). And a textarea to edit address. Editing these and click changes will update that employee’s details. Employee’s username is presented as page title

Table 17 admin manage employees

Manage Clients

Use Case Name	Manage clients
Trigger	The admin tries to manage clients
Precondition	Admin needs to be logged in to the system in order to manage clients. If logged in website displays table with all the clients registered in the system , with table columns of full name , email id , contact number registration date and action
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Clients from sidebar 2. Admin views the clients 3. Admin either click “view in edit” or delete
Exceptional path	Admin can choose not to edit or delete

Post condition	None
Other	Clients table have refresh functionalities. View in edit option will open a new page where admin is present with textboxes for edit an client's name, primary email, alt email, and contact number. Drop down lists for select gender and user types (normal, intern, and employee. client). And a textarea to edit address. Editing these and click changes will update that client's details. Client's username is presented as page title.

Table 18 admin manage client

Manage tickets

Use Case Name	Manage a ticket
Trigger	The admin tries to manage a ticket after login
Precondition	Admin needs to be logged in to the system in order to view a ticket. If logged in website will display a list of tickets with expand capabilities to view additional information
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks View ticket from sidebar 2. Admin clicks open to view additional information 3. Admin fill out the text area 4. Admin click update
Alternative path	Admin can click magnifying glass icon to view additional details. Admin can also choose not to fill out the text area
Post condition	If text area is accessed and update button is clicked database will be updated with admin's query

Table 19 admin manage tickets

Manage Quotes

Use Case Name	Manage quotes
Trigger	The admin tries to manage quotes after login
Precondition	Admin needs to be logged in to the system in order to manage quotes. If logged in website will display a list of quotes with details like their senders name, email, contact number, services required and action with view function to view individual quotation in detail
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Manage Quotes from sidebar 2. Admin view quotes 3. Admin click view to view in detail 4. Admin fill out remark 5. Admin click submit
Exception path	Admin can just view the quote and choose not to fill out the remark too
Post condition	If remark area is filled and submit is clicked database record will updated with admin's remark for that particular quote
Other	View button will open a different window with additional quote detail like name, email, and contact number, company of the sender plus required services and additional description. Admin can choose how many quotes to display from the drop down list (default is 10)

Table 20 admin manage quotes

Manage career

Use Case Name	Manage career
Trigger	The admin tries to manage careers after login
Precondition	Admin needs to be logged in to the system in order to manage quotes. If logged in website will display a list of users in the system (normal users, employees, interns , clients) with their name, email, contact, resume, status, admin remark and action
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks Manage Career from sidebar 2. Admin view career 3. Admin select status from dropdown list (not selected , under review and shortlist for interview) 4. Admin fill out remark 5. Admin click update

Exception path	Admin can choose not edit anything Admin can search for the user too from the search box provided
Post condition	If remark area is filled plus status is selected and submit is clicked database record will be updated with admin's remark for that particular quote
Other	Admin can choose how many users to display from the drop down list (default is 10)

Table 21 admin manage career

View user access log

Use Case Name	View user access log
Trigger	The admin tries to View user access log after login
Precondition	Admin needs to be logged in to the system in order to manage quotes. If logged in website will display a list of users who accessed the system with details like their user id, name, the date and time they logged, IP address, mac address, city and country
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks User access log from sidebar 2. Admin view user access log
Exception path	Admin can search for the user too from the search box provided
Post condition	none
Other	Admin can choose how many users to display from the drop down list (default is 10)

Table 22 admin view user access log

Logout

Use Case Name	Admin logout
Trigger	The Admin tries to logout
Precondition	Admin needs to be logged in to the system in order to logout. Website header will display a cog icon for drop down list.
Basic Path	<ol style="list-style-type: none"> 1. Admin clicks cog icon from header 2. Admin clicks logout
Post condition	Session destroys

Table 23 admin log out

Non Functional Requirements

Database

Database is created using MySQL and is a very simple one. It contains nine relations, they are represented below.

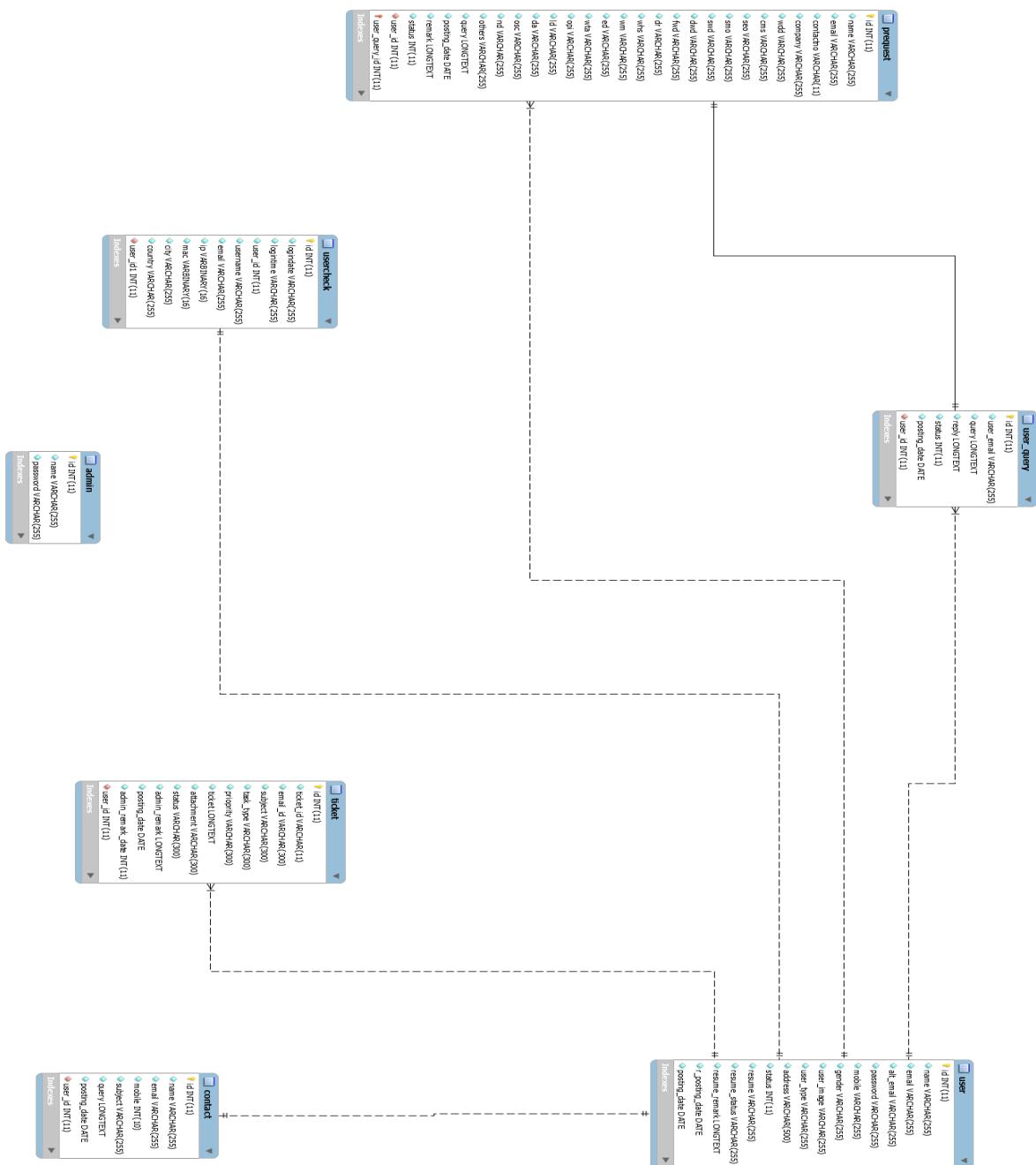


Figure 8 ER Diagram

Security of software

Primary mode of security in Mobicom® is password. User passwords and admin passwords are encrypted with MD5 algorithm and made very difficult to crack. Every user needs to have a strong passwords (expected password length is at least 8 characters).

Validations

Email validations are done at the filling state and, Mobicom® is intelligent to detect if an entered email is wrong. Alerts are programmed to popup if there is a validation failure.

Feedback

Mobicom® is programmed to give feedback as much as possible, buttons change colours to inform user that the mouse curser is over that button, same is happening when a button is clicked. Textboxes change their border colour when they are focused on. Mobicom® left bar, where the possible options is, will also change colours when the mouse curser is over the options. If a section is selected from the left bar the selected section will be highlights until user click different option from left bar.

Memorability

Mobicom® is very simple to understand and remember, every possible option is categorized under sections for easy navigation and to enhance memorability.

Visibility

Mobicom® is developed only using 6 colours to increase visibility and to enhance minimalism. Every page's title is displayed in large fonts and. font style used in here will work on any web browser.

Mapping

Mobicom®'s mapping is done according to the modern HCI principles in mind and done to eliminate human mistakes as much as possible.

Domain Requirements

Feature requirement

Following is a list of required system features. The features are integrated according to the format requests for proposal (RFP). Functional and non-functional requirements are also influenced by the following features

- Contact management
- Account management
- Reports
- Dashboards
- Quote management
- Knowledge base / ticket management
- Chat (in future releases)

These features are just the fundamental layer of the Mobicom® business environment.

Business Requirement

CRM is a platform where internal environment of a firm, gets together with the external environment. As per in the RFP Mobicom® is designed to address this requirement. Mobicom® is an IT company which offers many services as web site development and SEO etc. in a normal scenario a normal user will login to the system and request a quote from Mobicom®. Then if the request get approvals, the normal user will become a client and offered many functionalities of the system. This is business scenario that is modelled in Mobicom®.

Software Design

Software Design Specification

Components

User component

This is one of the key components in Mobicom® CRM. There are four types of users. Normal user, intern, employee and client. The idea is employees and other user types use the same interfaces to do what they require

Access control component

Like described above four user types use the same interfaces to do the work, but they will not have the access to every interface in the system. For example employee may have the highest access and the ability to view every interface while normal user may have the least privileges.

Authentication component

Authentication component influence every user type in Mobicom®. This component is responsible for the registration of new users. Authentication of existing users. Removing users from the system. This component and access control component works parallel.

Quote component

System is developed around this component. Each user type can create a quote and submit it to the database. It will later be examined by the admin component. This is the business environment of this software.

Ticket component

Ticket component is like a feedback type components, sometimes it also can act as a knowledge management tool within the system. Any user type can submit tickets which are to be assessed by the admin component later.

Career component

Career component is responsible for uploading CV to the system. If any user type except employee and intern can upload their CV and join the firm if selected.

Admin component

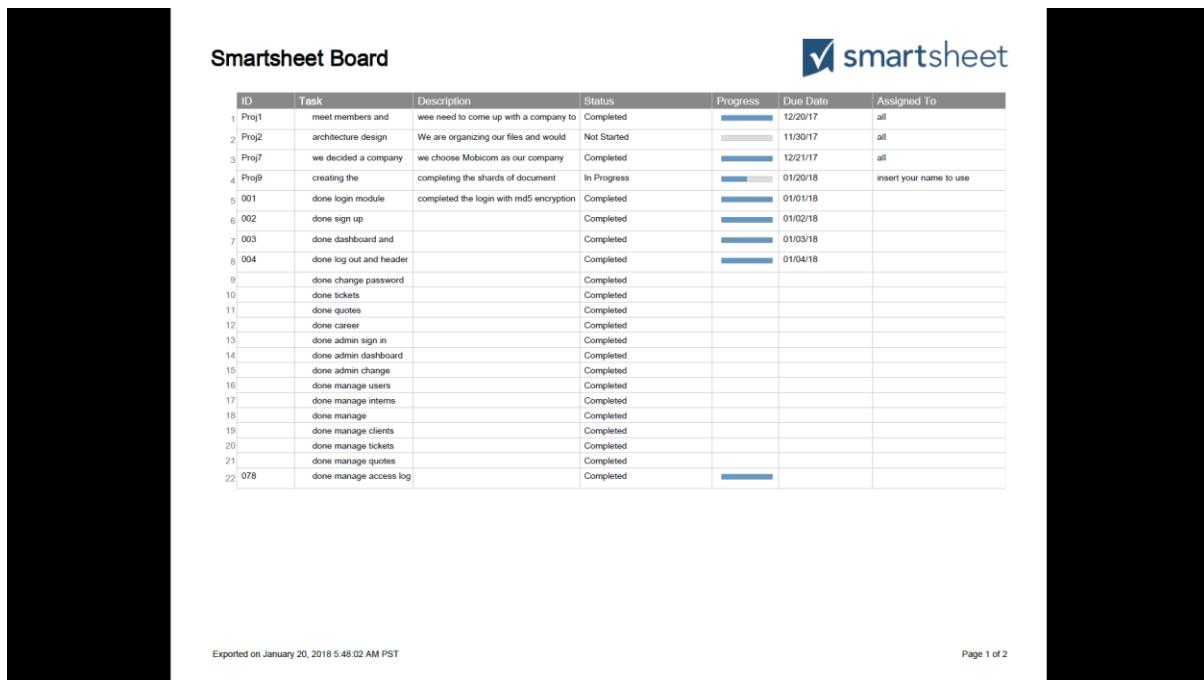
This is the management component of Mobicom®, this component has the full privilege to manage every user type, manage tickets and quotes and CVs.

Design pattern

Mobicom® is developed using single design pattern, because it is easy to use and with the extent of the audience it was the best decision. All the functions in Mobicom® require only one instance of the same class. After a function is done it refreshes itself rather than creating a new object. Mobicom® is optimized to use only one database class instance for all its transaction. It is necessary to increase the speed of the software.

Design methodology

We use Scrum sprint methodology for design and develop our software. Below is a diagram of our scrum backlog



The image shows a Smartsheet board titled "Smartsheet Board". The board displays a table of tasks with columns for ID, Task, Description, Status, Progress, Due Date, and Assigned To. The tasks are listed from 1 to 22. Most tasks are completed, indicated by blue progress bars and the word "Completed" in the status column. Some tasks are in progress or not started. The "Assigned To" column shows "all" for most tasks, except for task 4 which has "insert your name to use". The Smartsheet logo is visible in the top right corner.

ID	Task	Description	Status	Progress	Due Date	Assigned To
1	Proj1	wee need to come up with a company to	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>	12/20/17	all
2	Proj2	architecture design	Not Started	<div style="width: 0%;"><div style="width: 0%;"> </div></div>	11/30/17	all
3	Proj7	we decided a company	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>	12/21/17	all
4	Proj8	creating the	In Progress	<div style="width: 50%;"><div style="width: 50%;"> </div></div>	01/20/18	insert your name to use
5	001	done login module	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>	01/01/18	
6	002	done sign up	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>	01/02/18	
7	003	done dashboard and	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>	01/03/18	
8	004	done log out and header	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>	01/04/18	
9		done change password	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
10		done tickets	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
11		done quotes	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
12		done career	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
13		done admin sign in	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
14		done admin dashboard	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
15		done admin change	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
16		done manage users	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
17		done manage interns	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
18		done manage	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
19		done manage clients	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
20		done manage tickets	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
21		done manage quotes	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		
22	078	done manage access log	Completed	<div style="width: 100%;"><div style="width: 100%;"> </div></div>		

Figure 9 Scrum Backlog

Class diagram user side

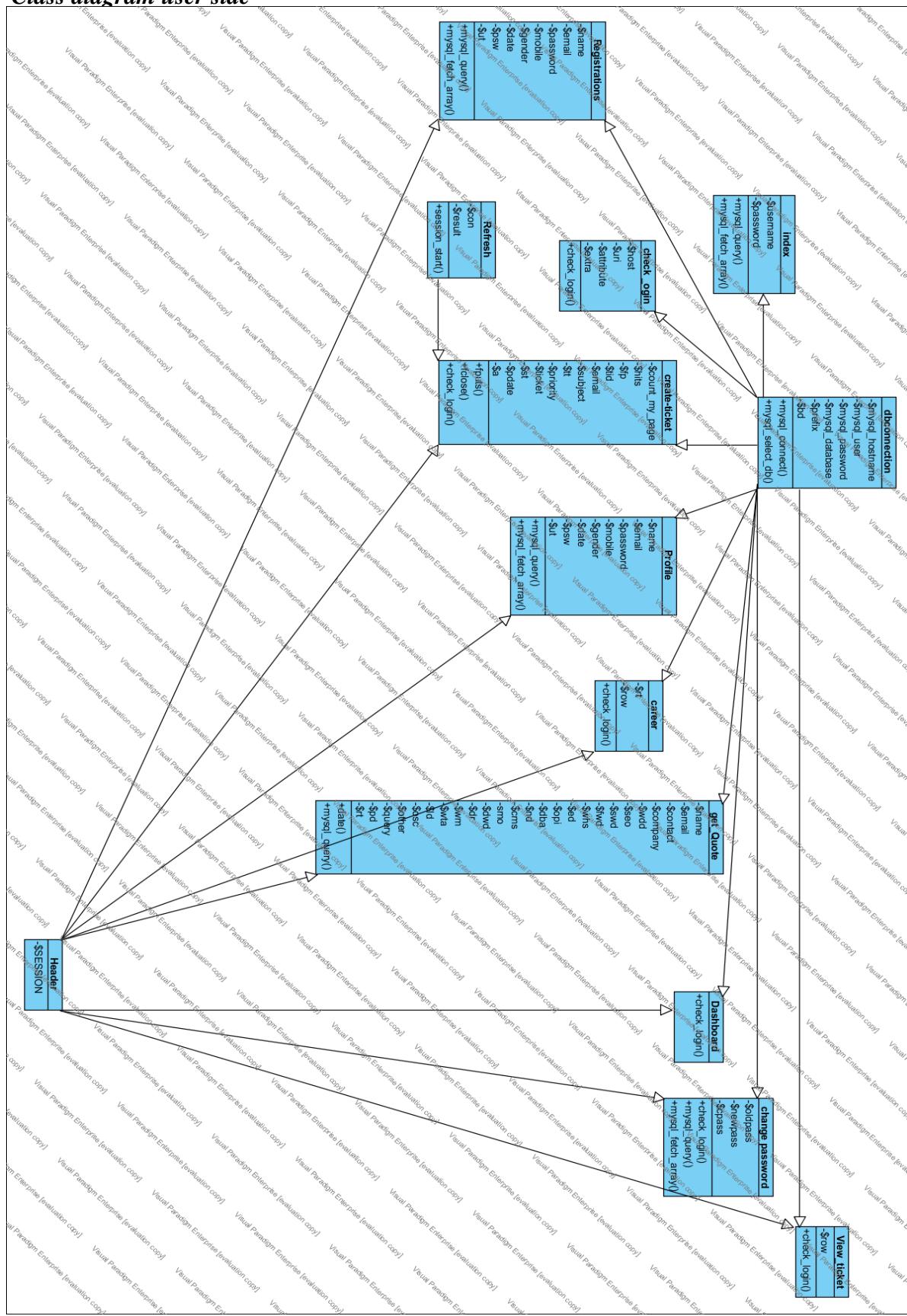


Figure 10 user side class diagram

Class diagram admin side

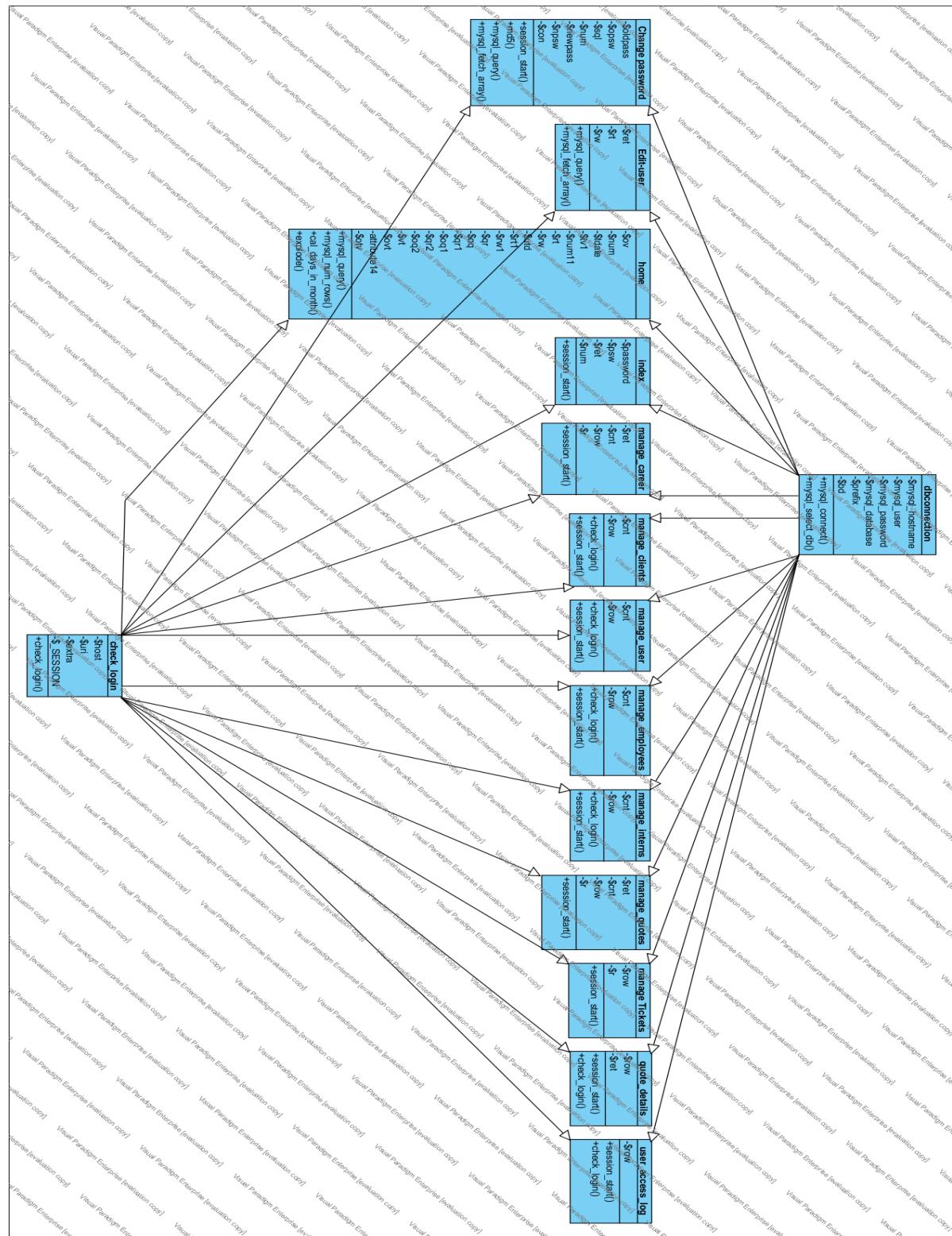


Figure 11 Admin side class diagram

Important sequence diagrams user side

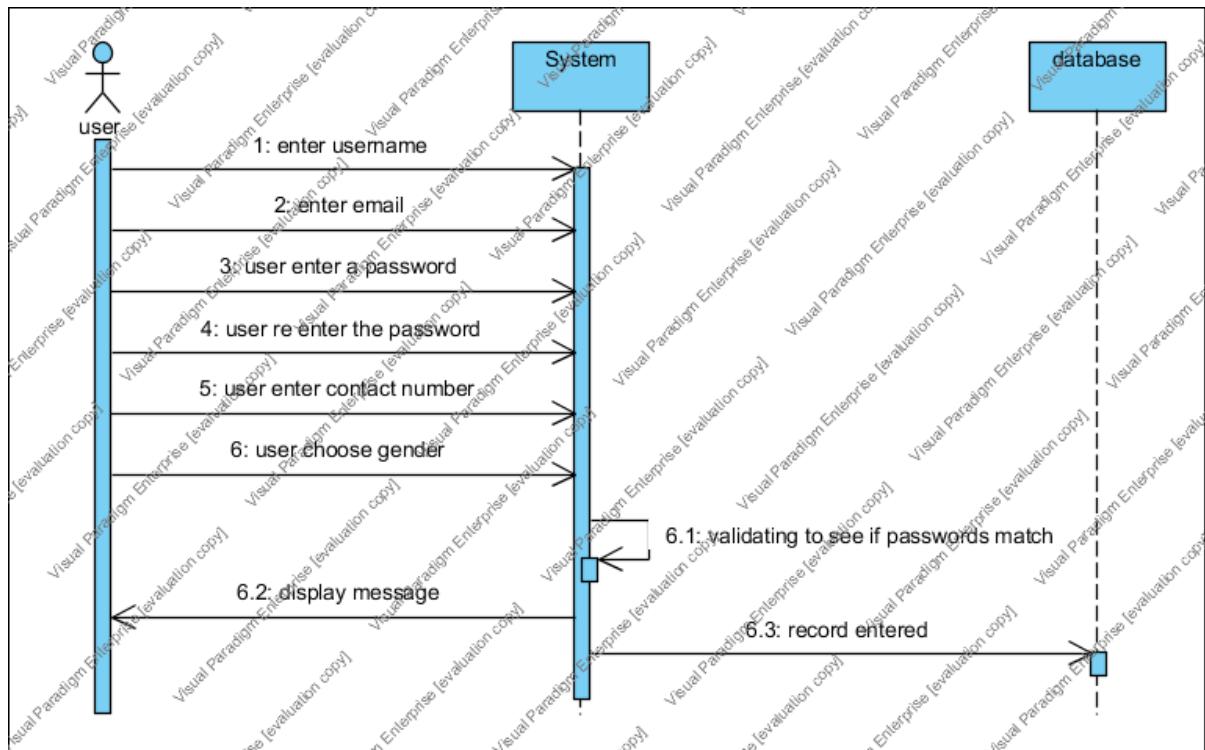


Figure 12 user sign in

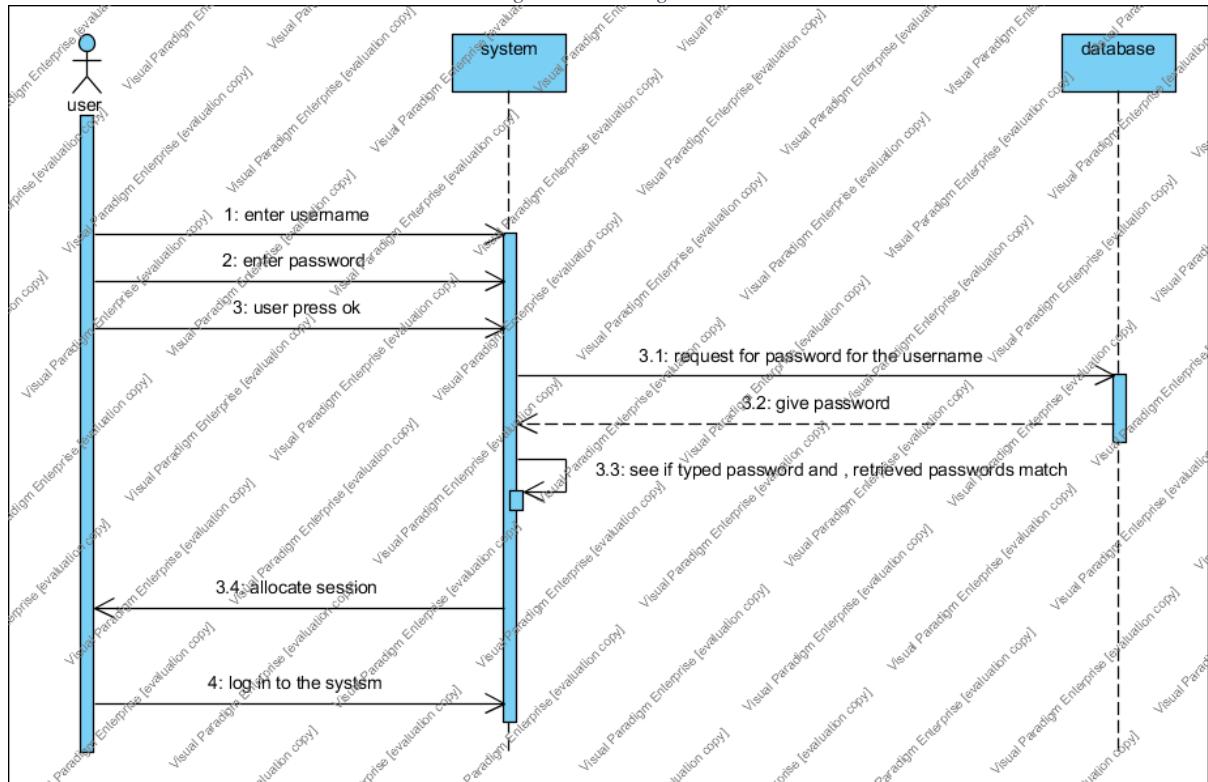


Figure 13 user log in

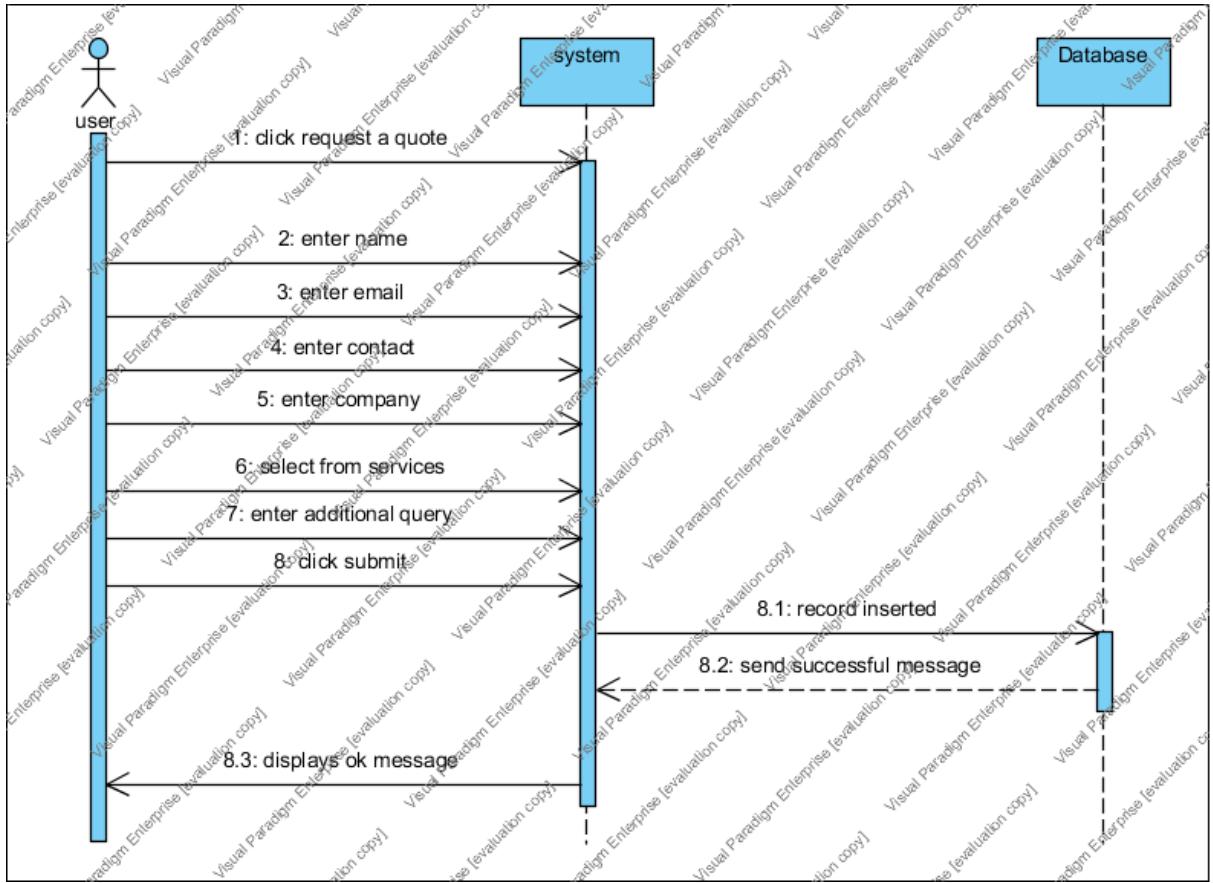


Figure 14 user request quote

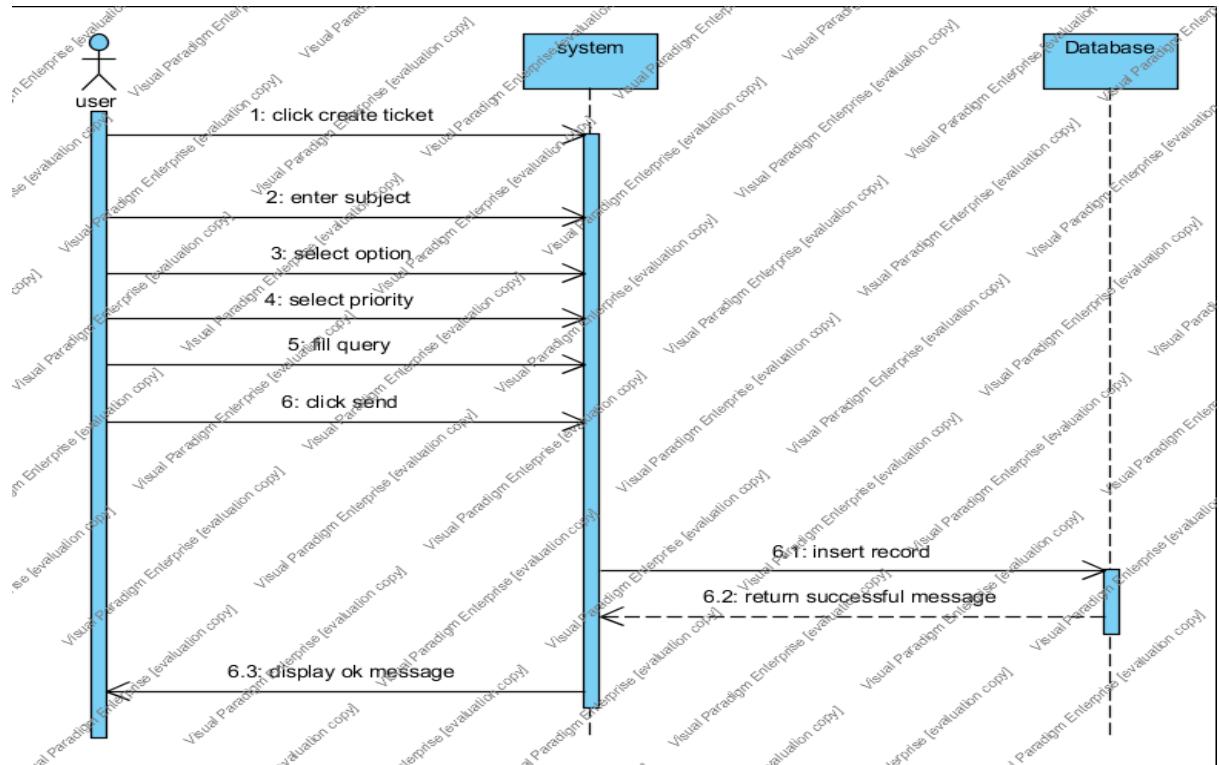


Figure 15 user request ticket

Important sequence diagrams Admin side

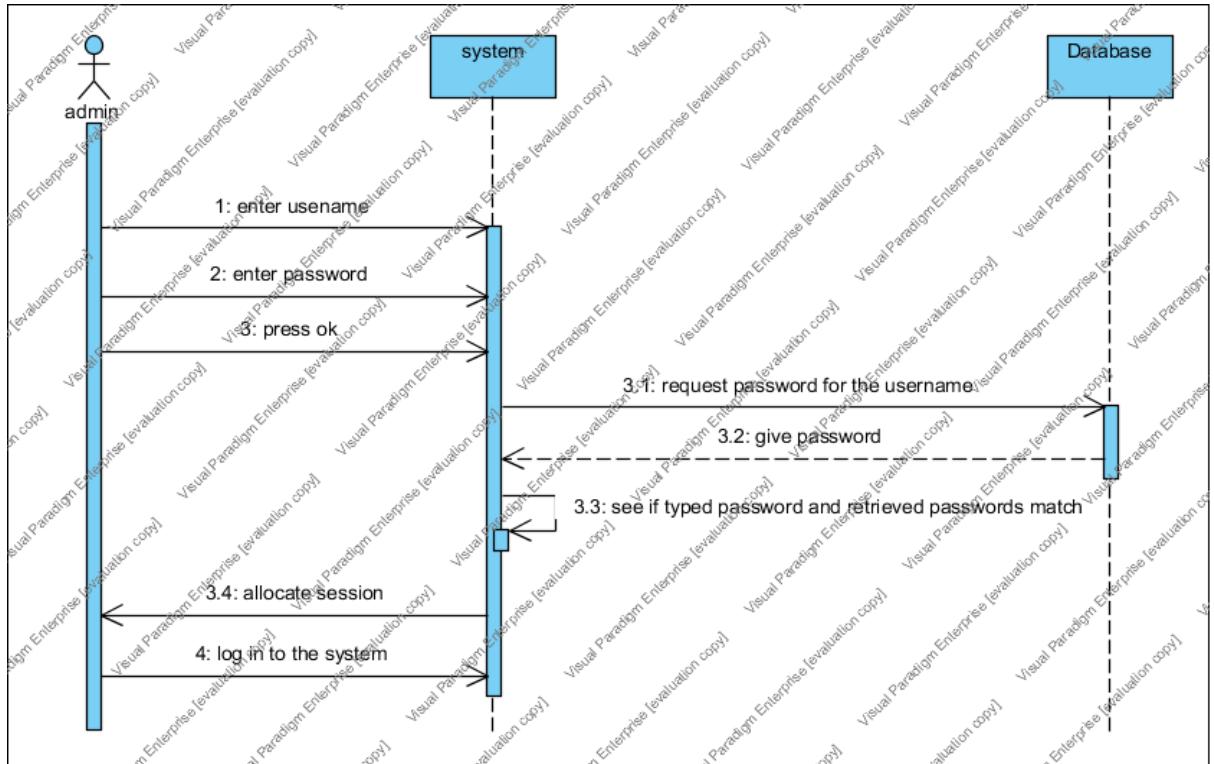


Figure 16 Admin login

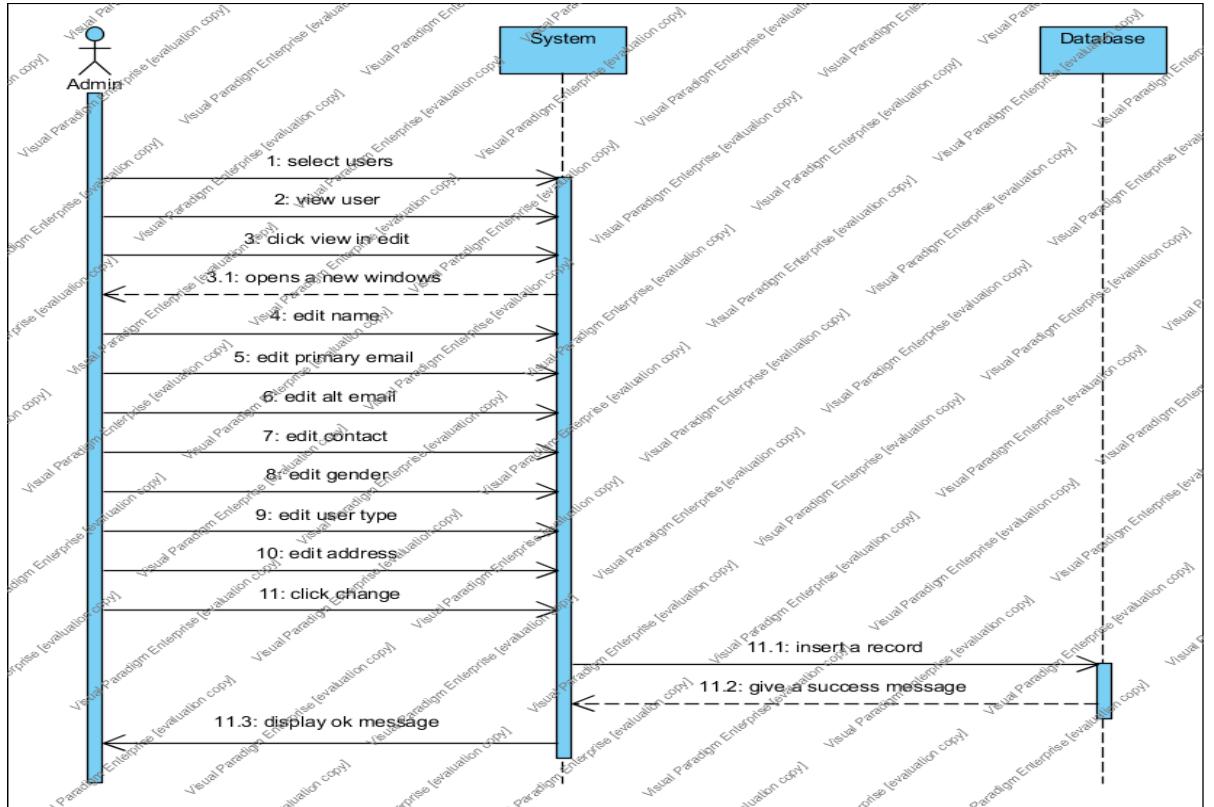


Figure 17 Admin edit user

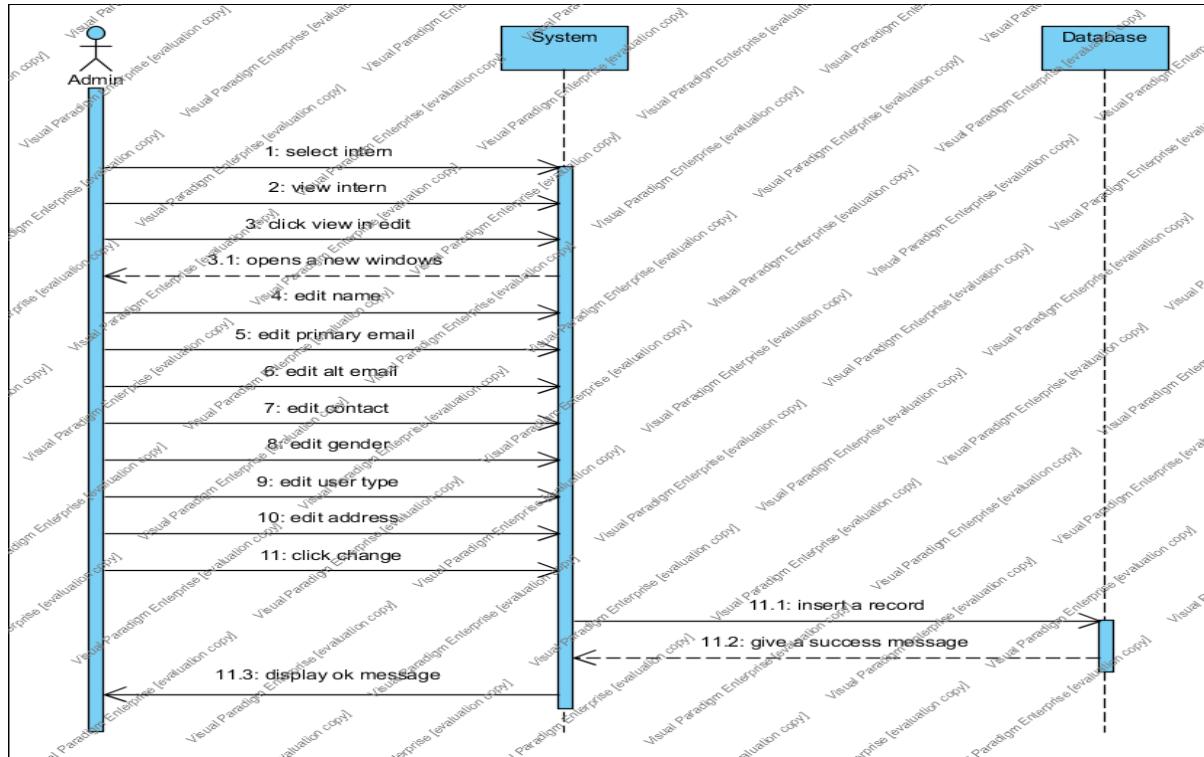


Figure 18 Admin edit intern

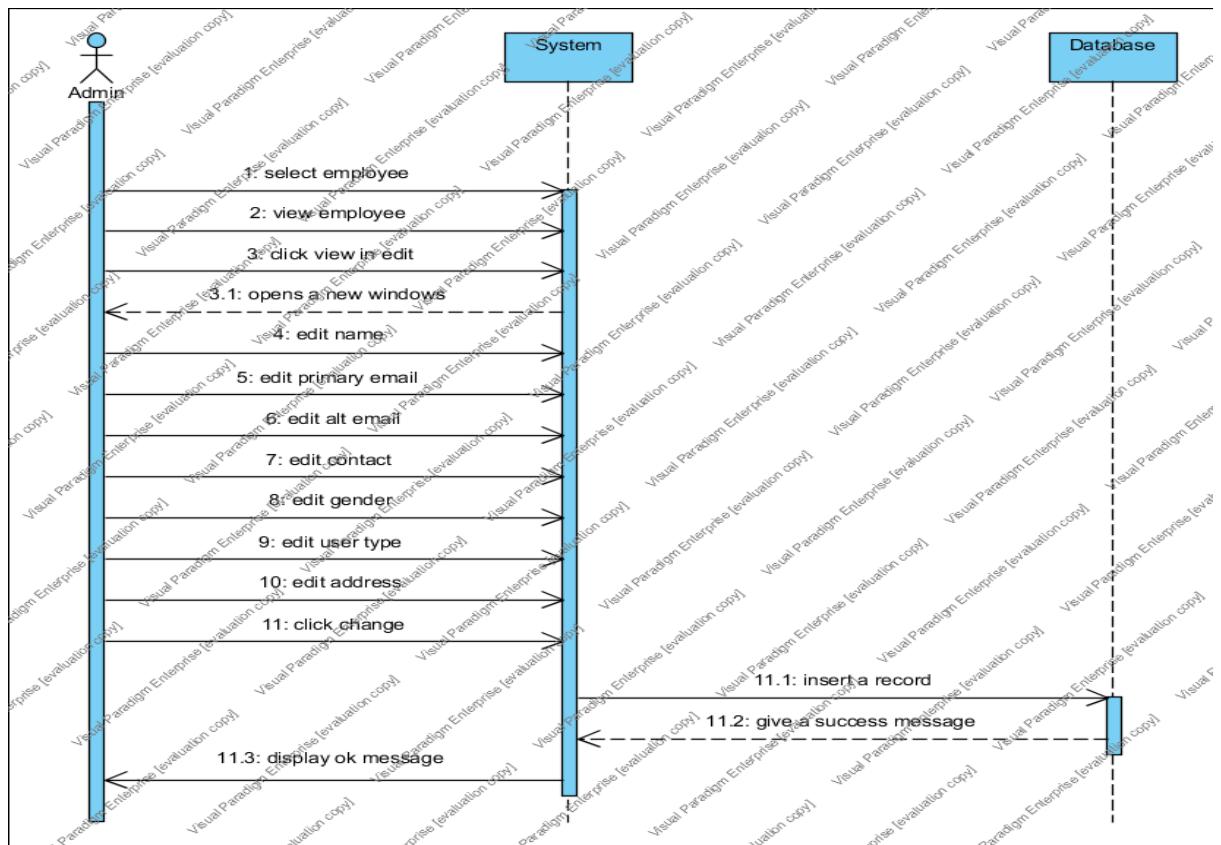


Figure 19 Admin edit employee

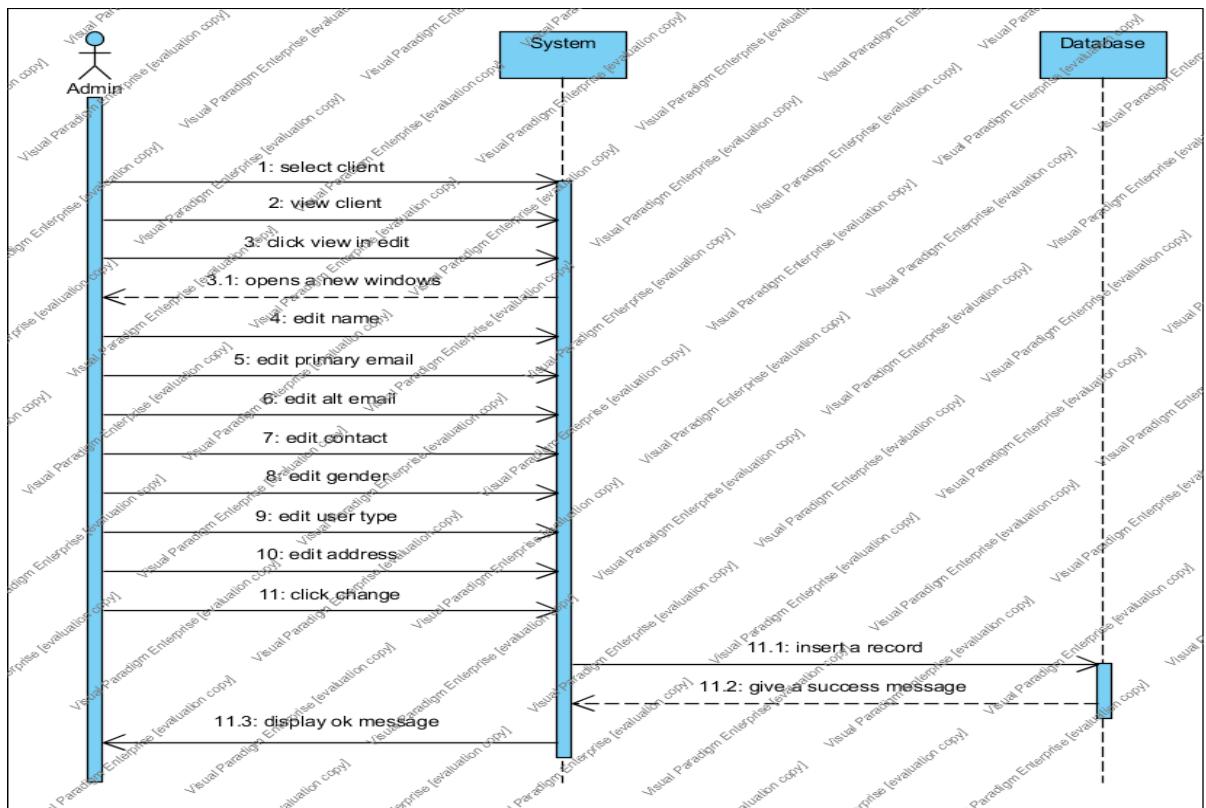


Figure 20 Admin edit client

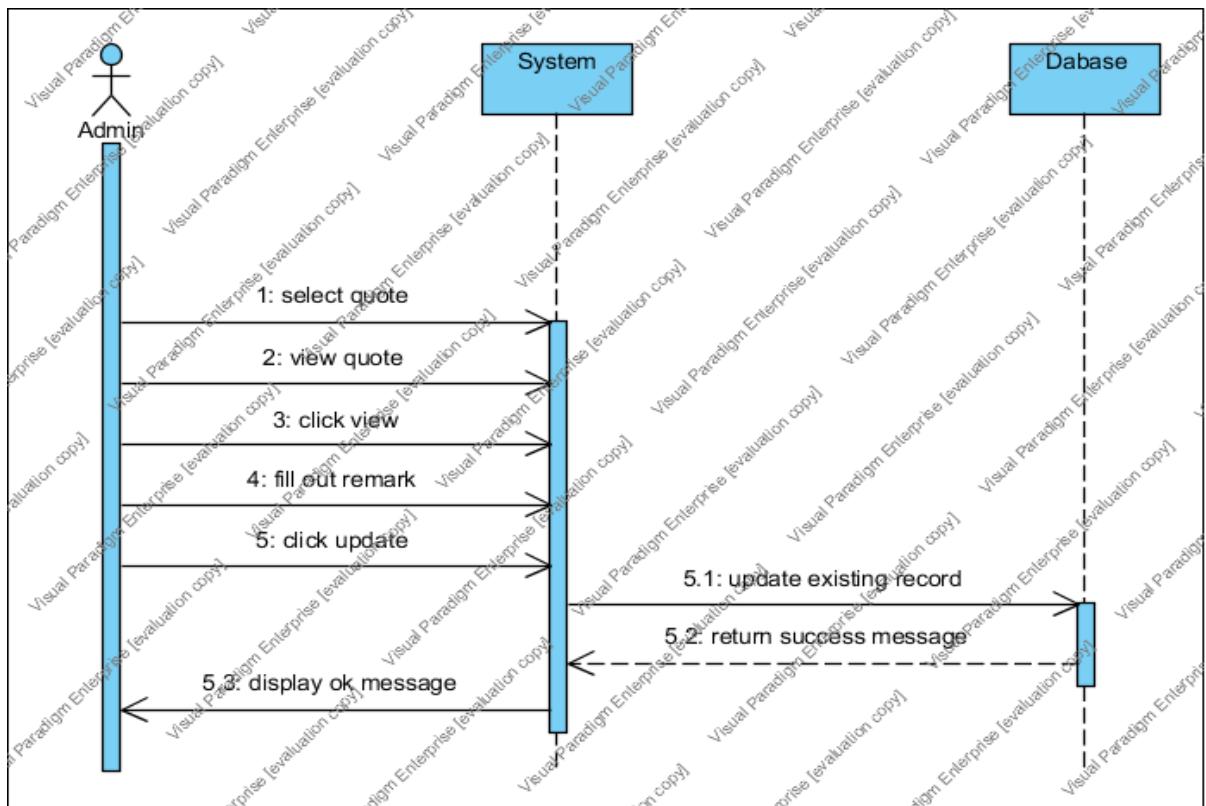


Figure 21 admin edit Quote

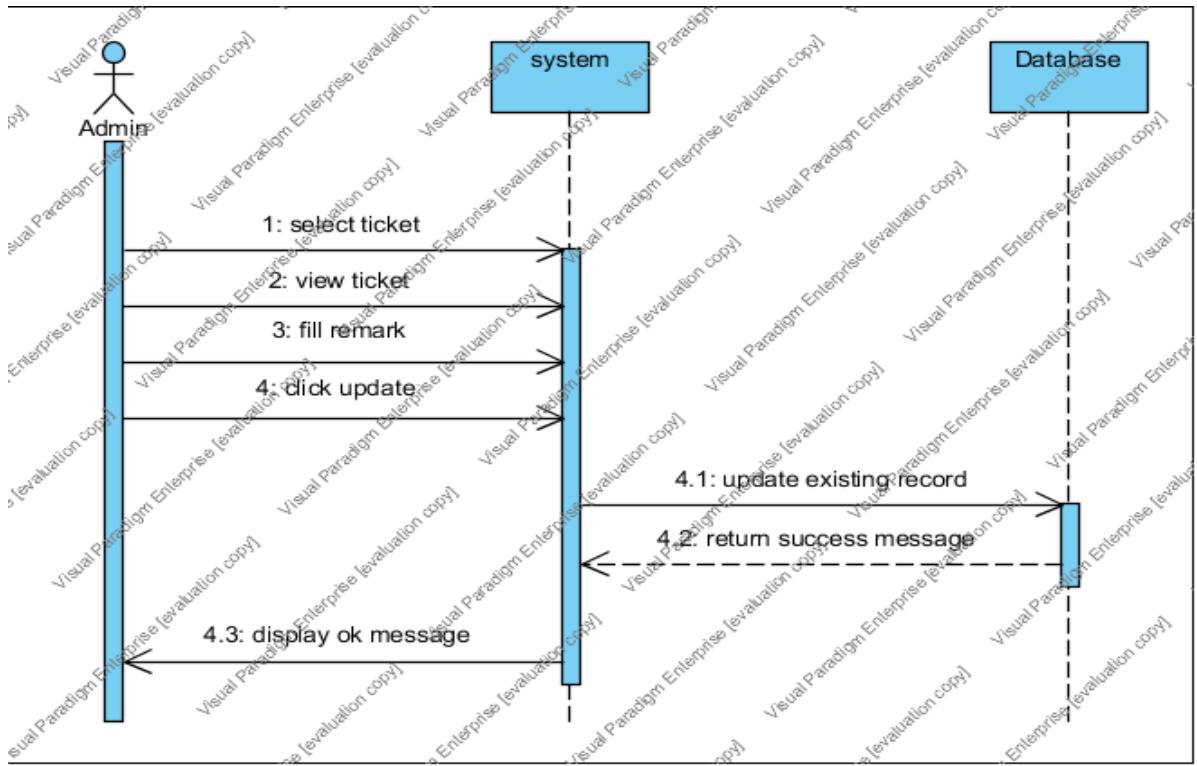


Figure 22 Admin edit ticket

Wireframes

Sign in to CRM

Sign in Now! for an account It's free and always will be..

Name

Email id

Password

Re-Password

Contact no.

Gender

Male Female

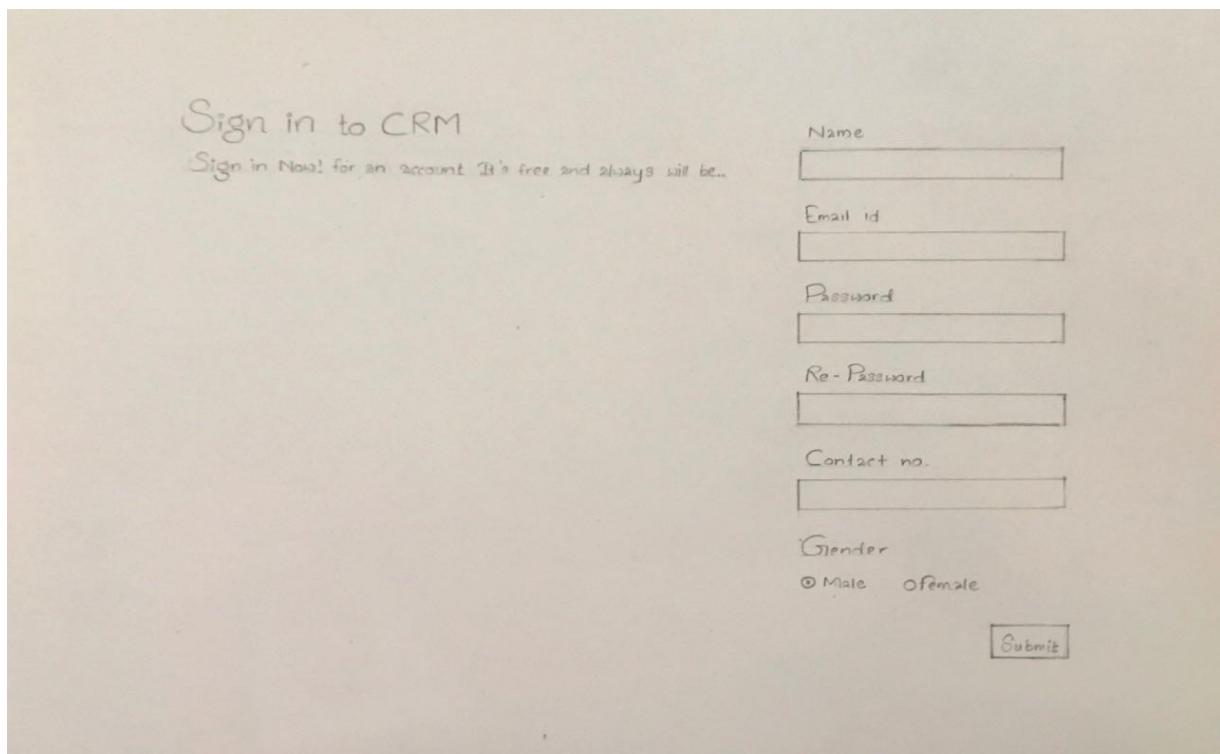


Figure 23 sign up wireframe

Sign in to Mobicom® CRM

Sign up Now! for an account It's free and always will be..

Email

Password

[Forgot Password](#)

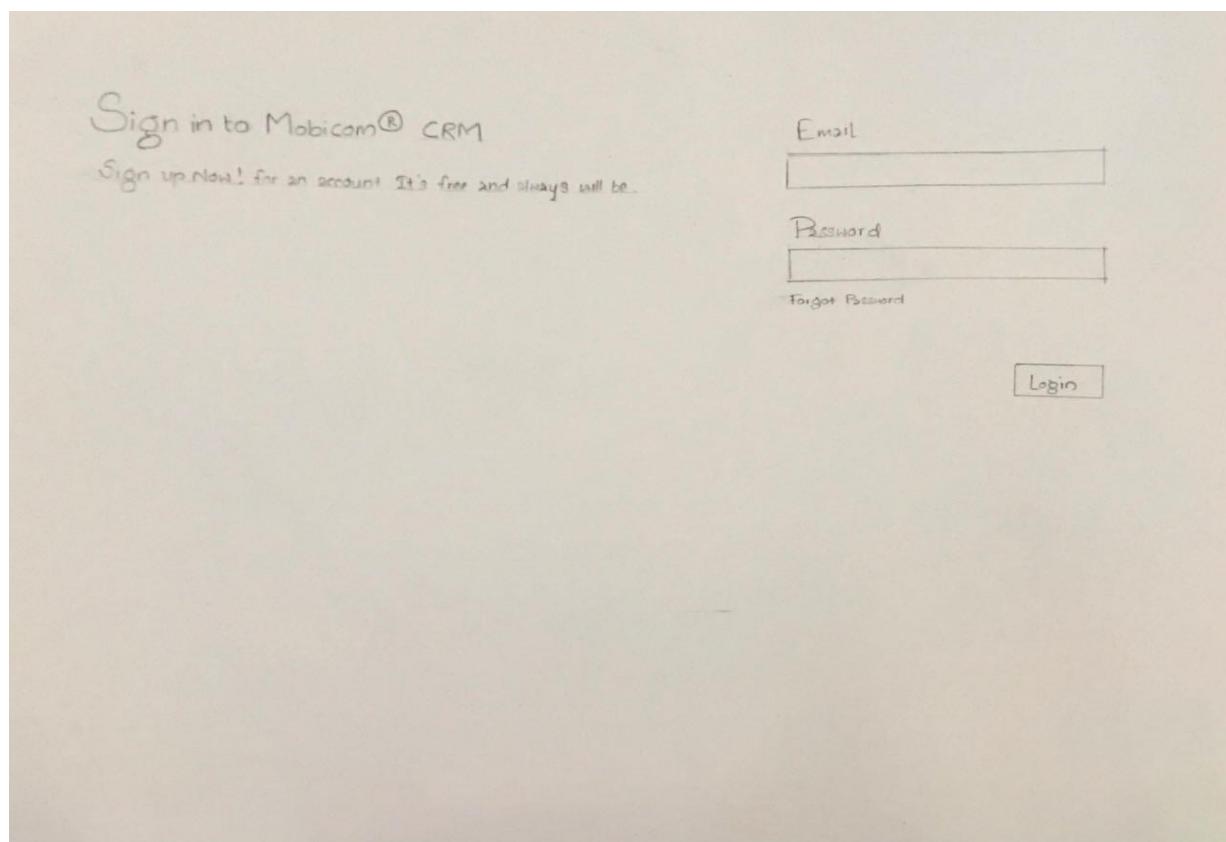


Figure 24 sign in wireframe

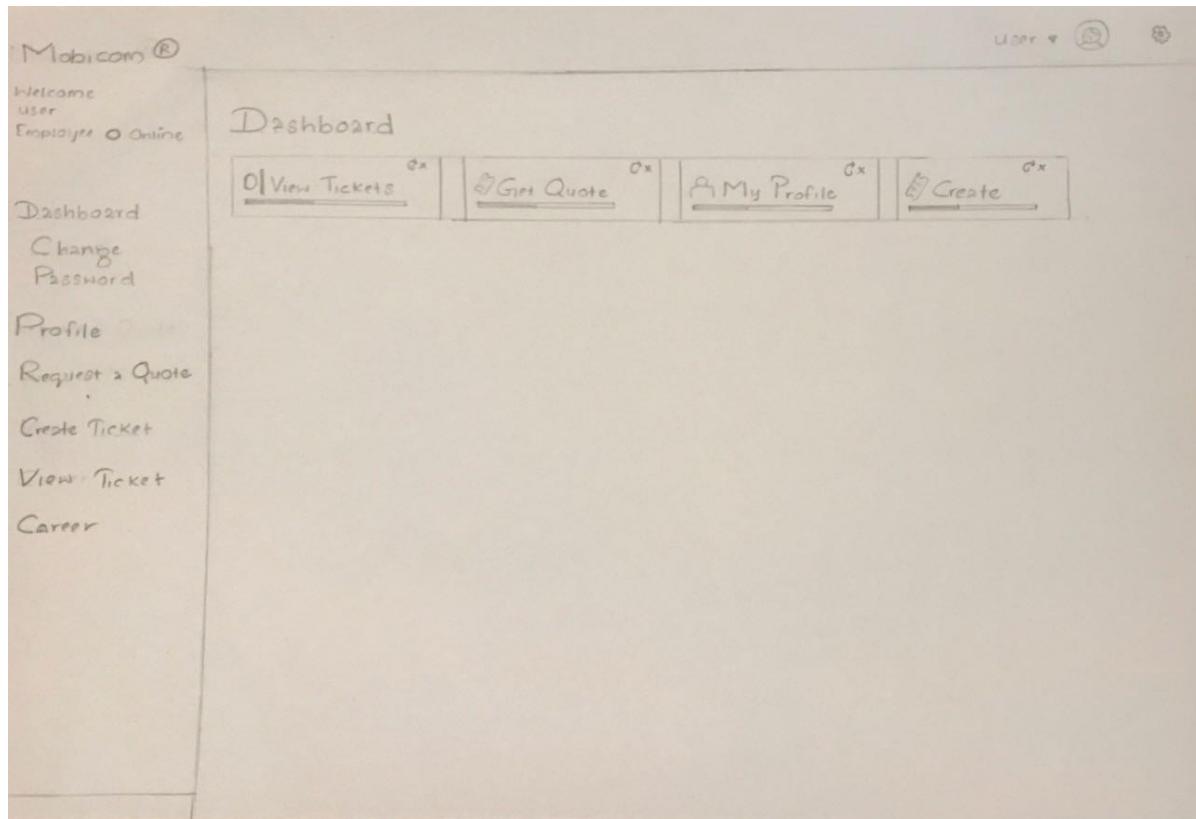


Figure 25 dashboard wireframe

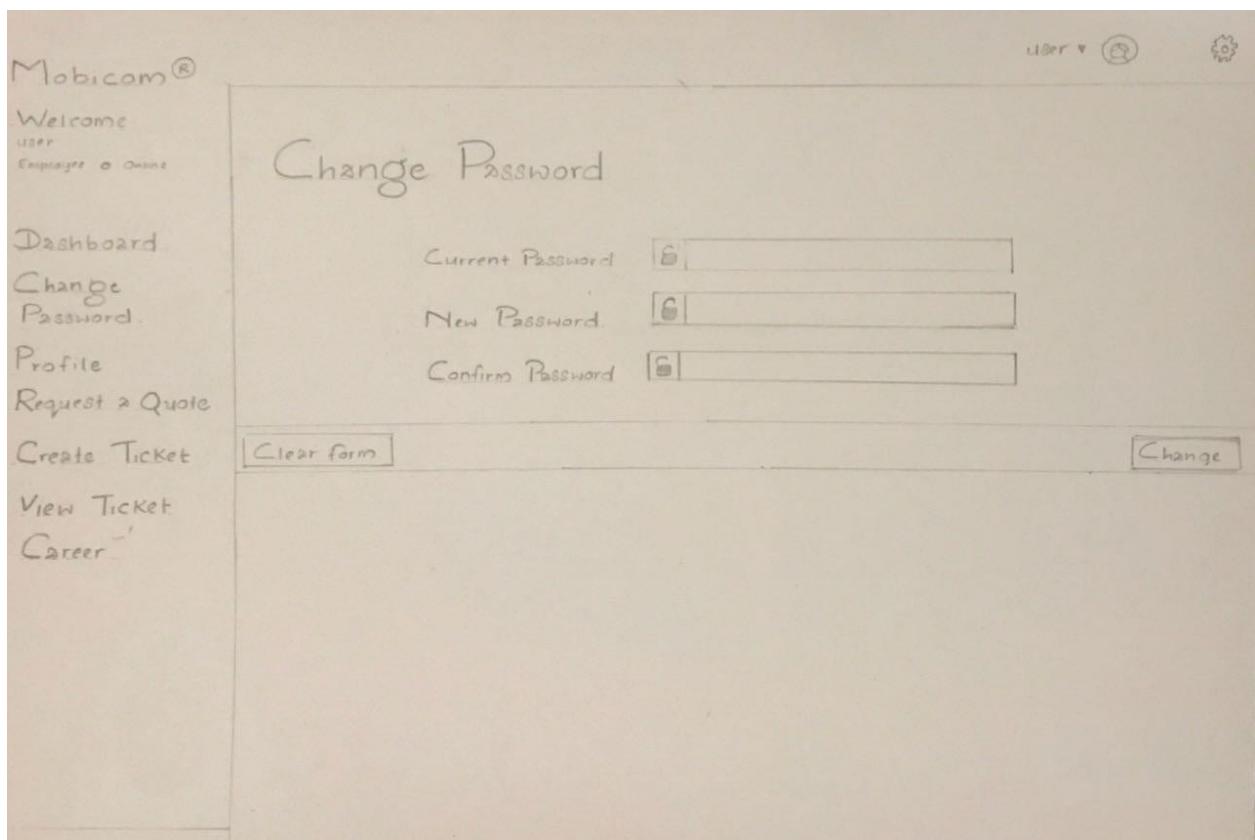


Figure 26 change password wireframe

User's profile

name []

primary email []

alternative email []

contact no []

gender address []
address []

[sub]

Figure 27 user profile wireframe

Request a guest

name [] Email []

contact no [] company []

service
[]

work []

[sub]

Figure 28 sign in wireframe

create ticket

subject []

task type []

priority []

description []

[Send]

This is a hand-drawn wireframe for a 'create ticket' interface. The title 'create ticket' is at the top left. Below it are four input fields: 'subject' (empty), 'task type' (with a checked checkbox), 'priority' (with a checked checkbox), and 'description' (empty). At the bottom right is a button labeled 'Send'.

Figure 29 create ticket wireframe

view ticket

tickets [] open []

This is a hand-drawn wireframe for a 'view ticket' interface. The title 'view ticket' is at the top left. Below it is a single input field containing the text 'tickets []' followed by a checked checkbox labeled 'open'. A large bracket on the right side groups this entire section.

Figure 30 view ticket wireframe

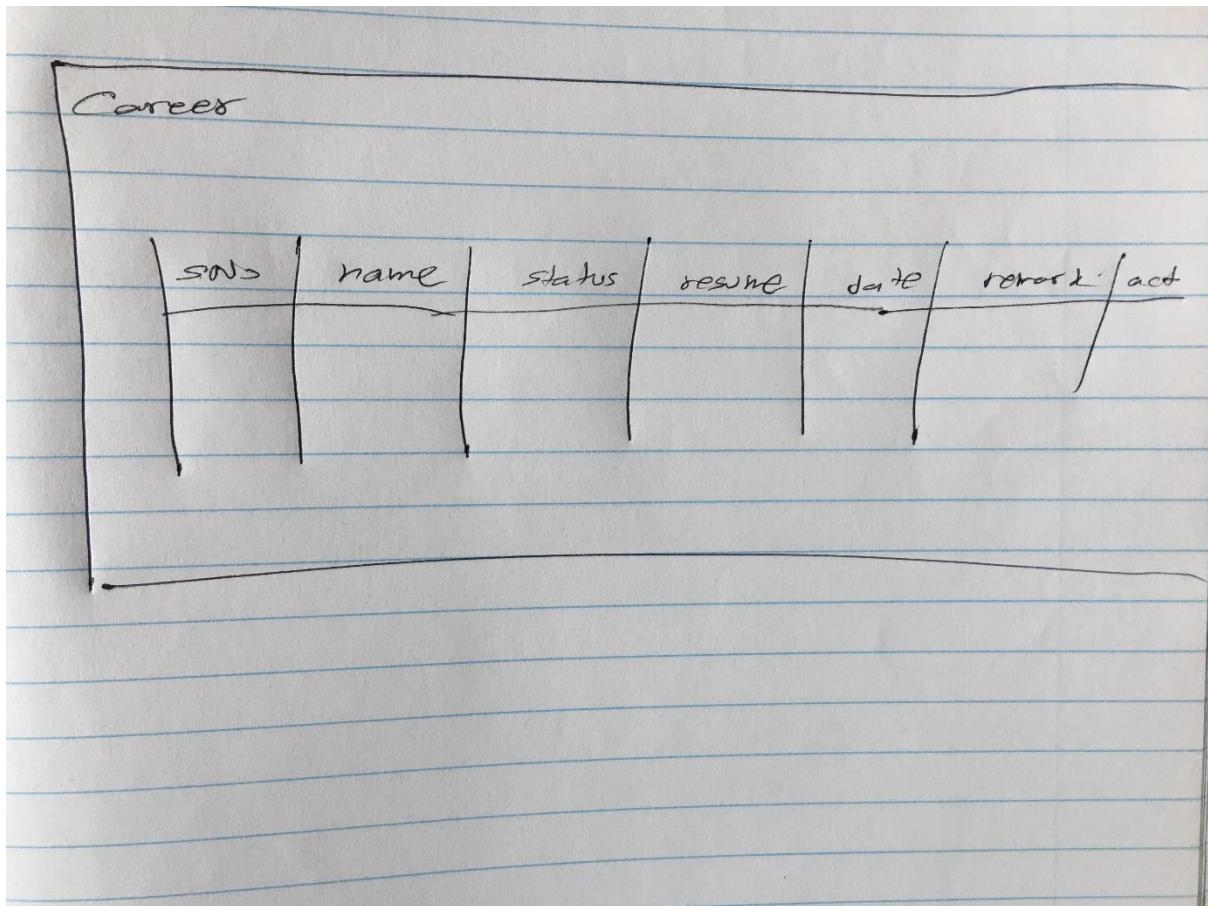


Figure 31 career wireframe

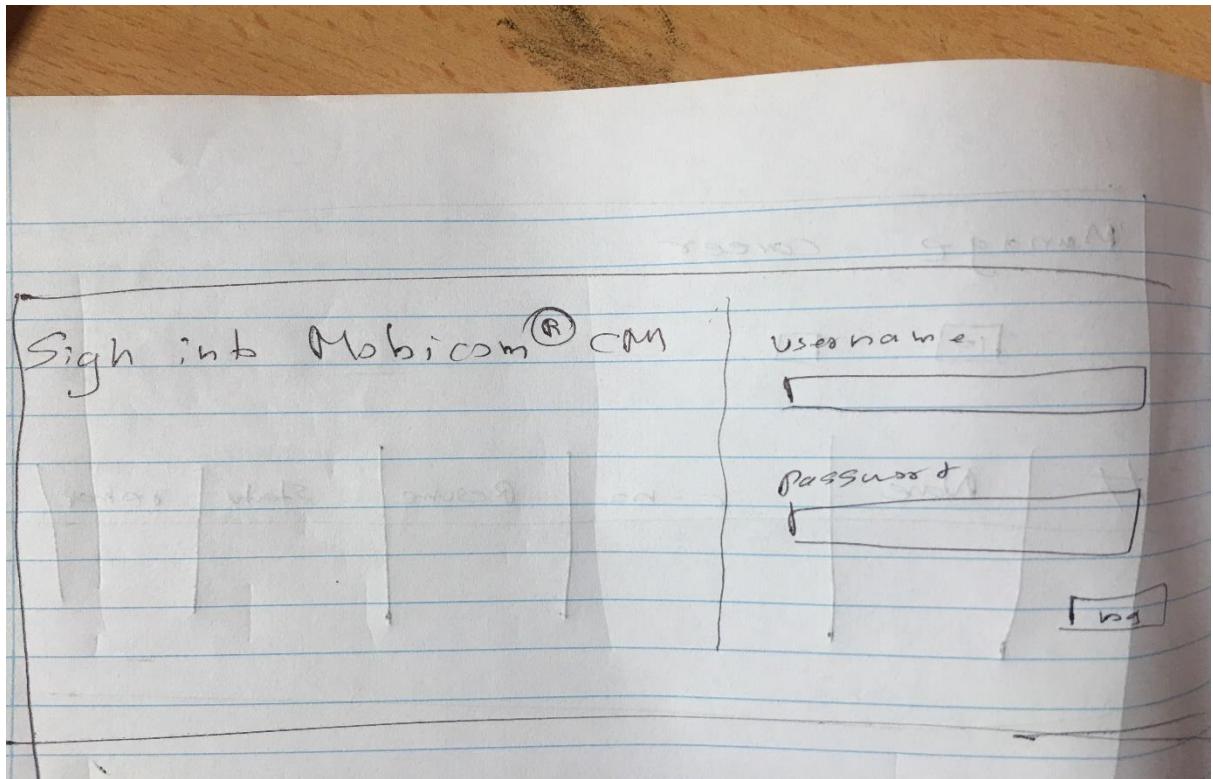


Figure 32 admin sign in wireframe

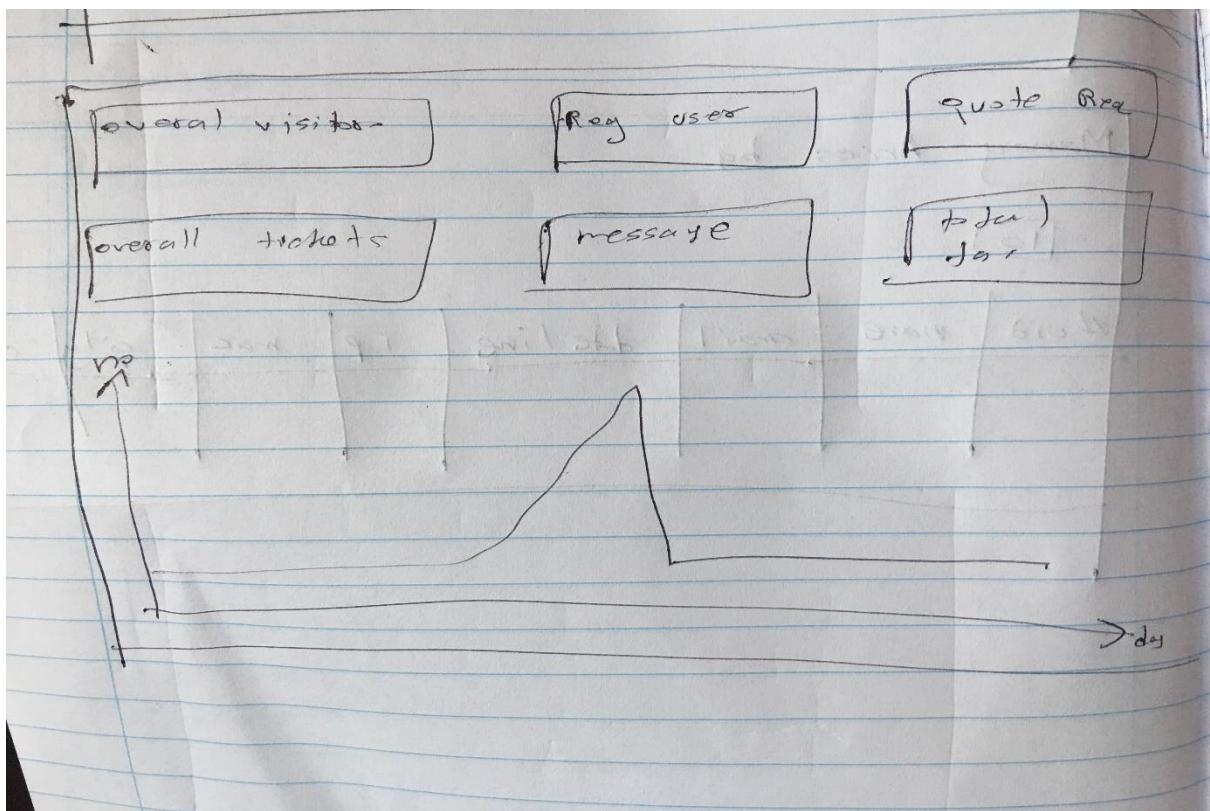


Figure 33 admin dashboard wireframe

change password

current password	<input type="text"/>
new password	<input type="text"/>
confirm password	<input type="text"/>

(change -)

Manage users

Figure 34 admin change password wireframe

Manage users

#	Name	email	c-no	regd	actr
-	-	-	-	-	Livet

Figure 35 admin manage user wireframe

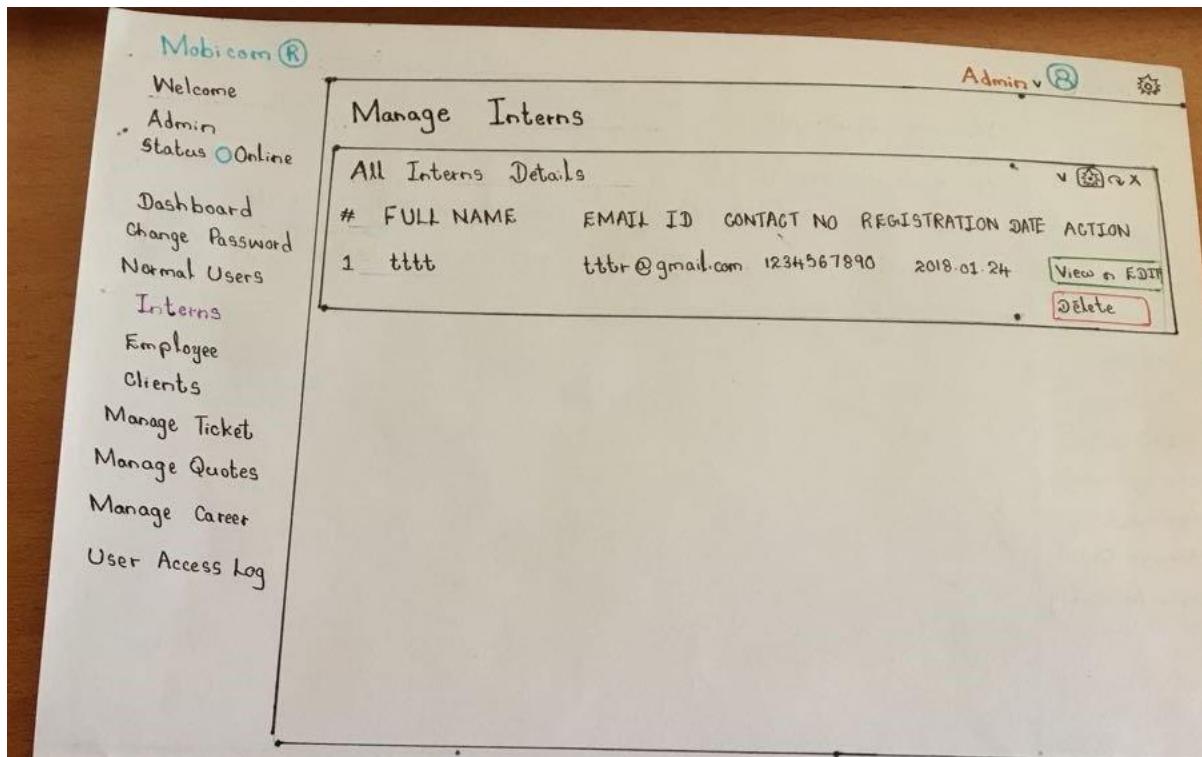


Figure 36 admin manage intern wireframe

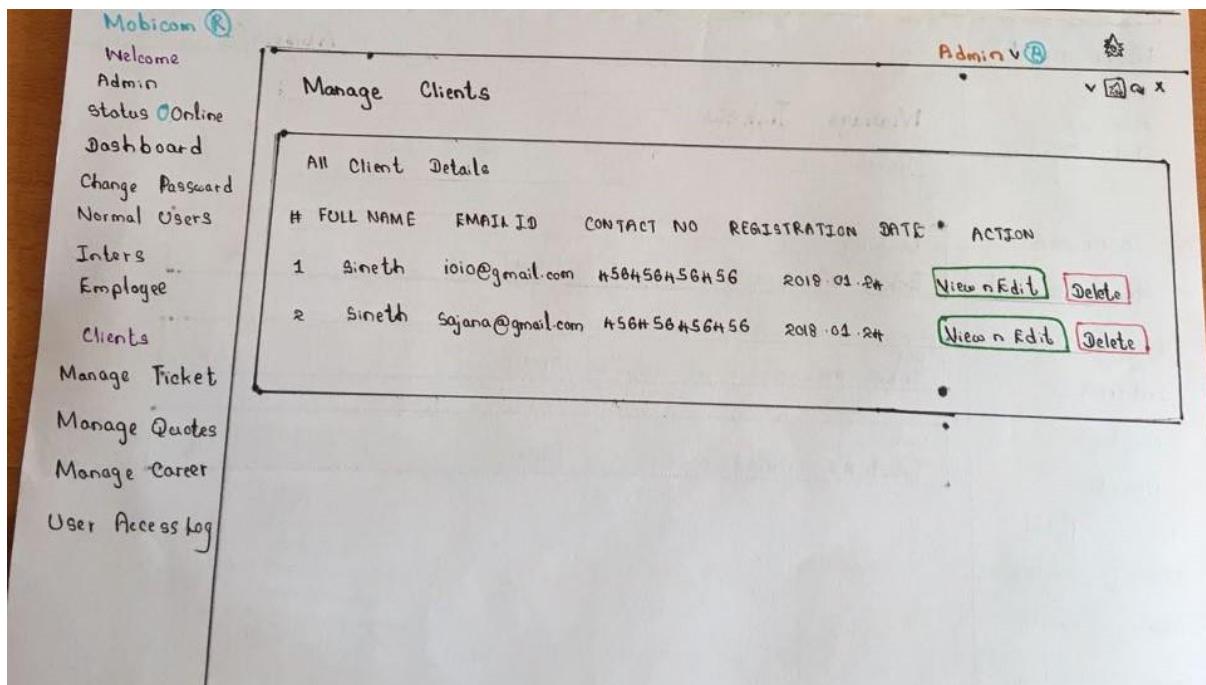


Figure 37 admin clients wireframe

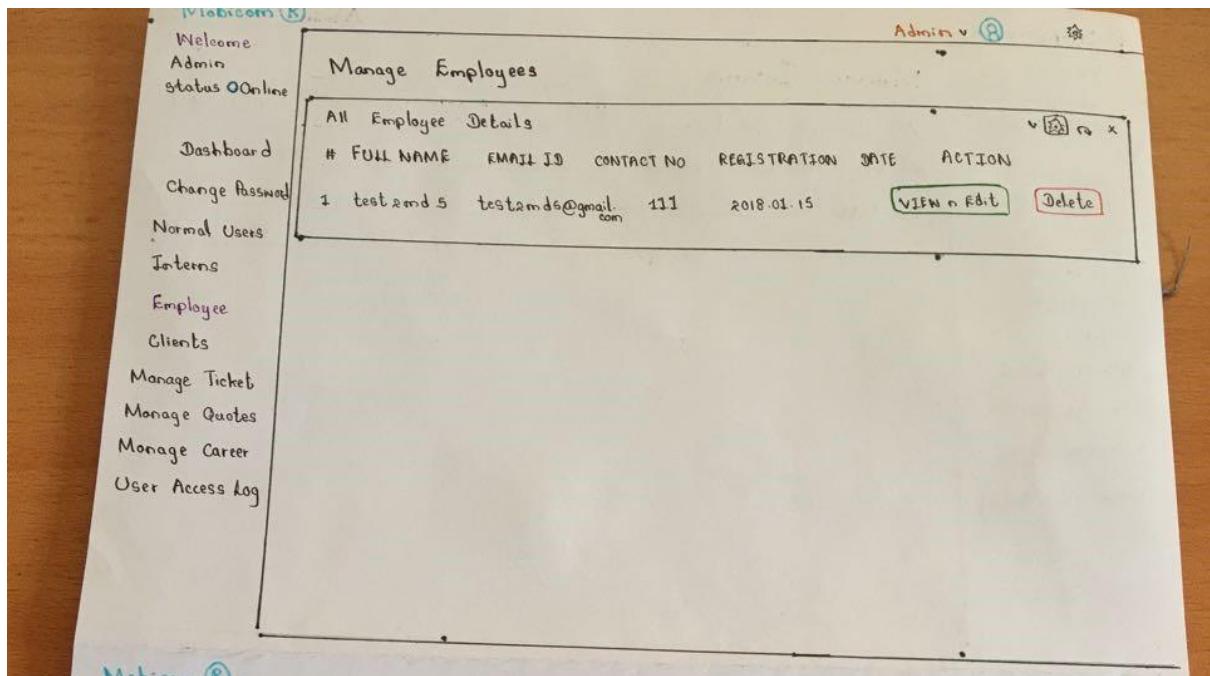


Figure 38 admin manage employees wireframe

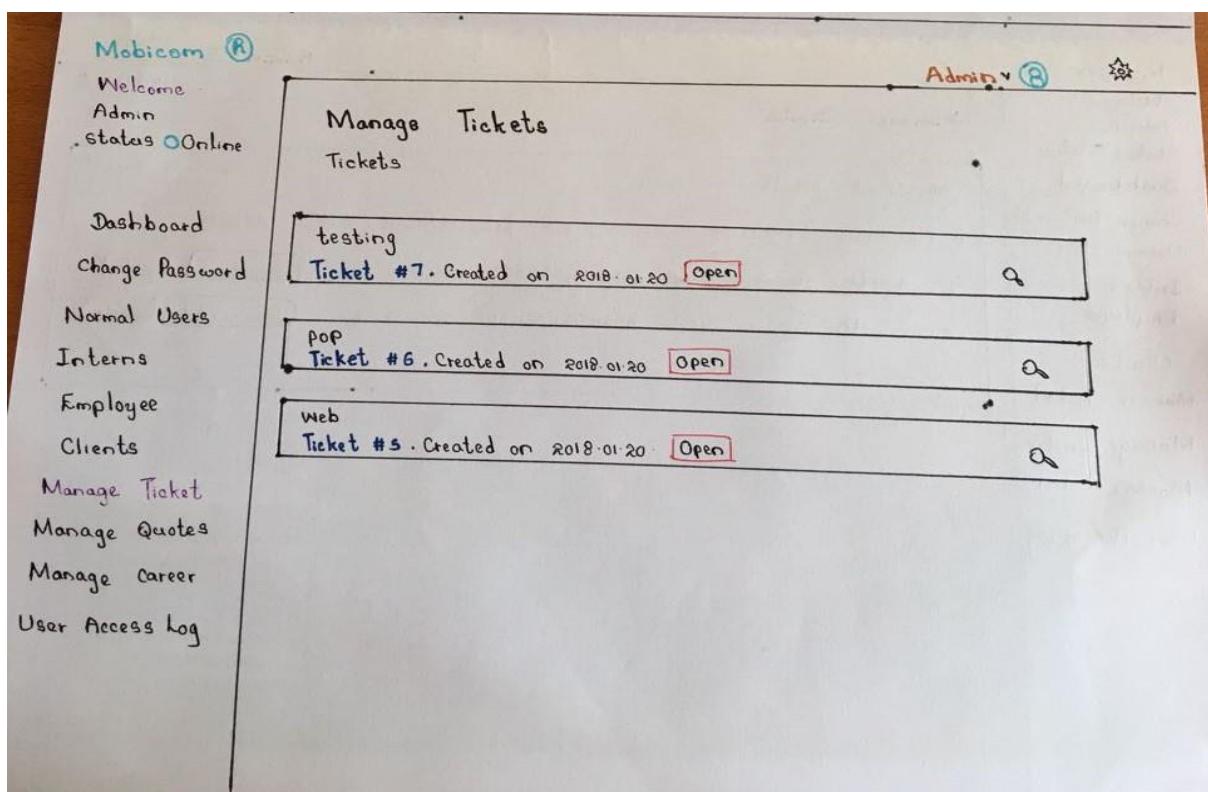


Figure 39 admin manage tickets wireframe

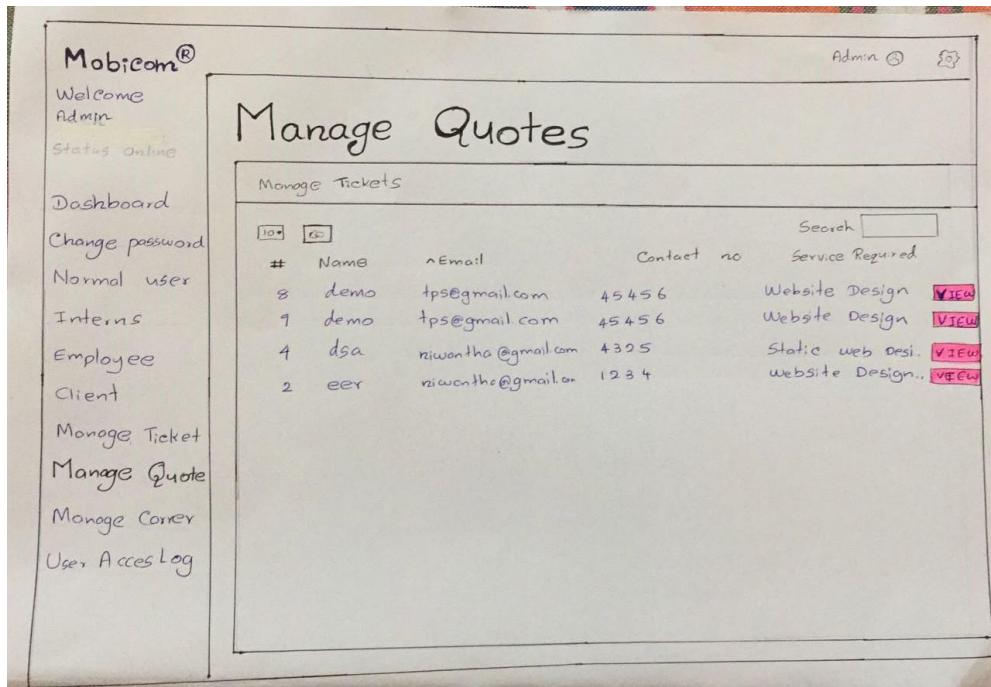


Figure 40 admin manage quotes wireframe

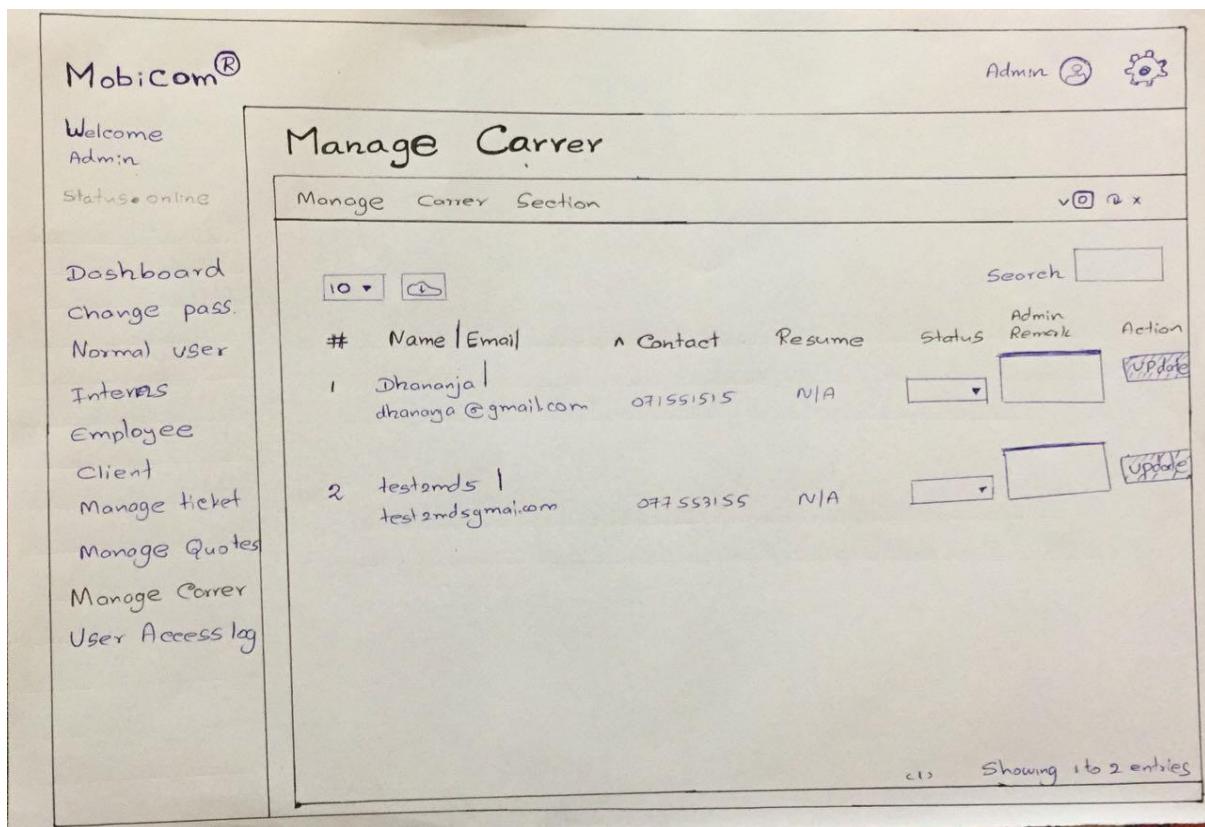


Figure 41 admin manage career wireframe

Mobicom®		Manage Access Log					
Welcome Admin Status: Online		Table Style					
		10	10	Search <input type="text"/>			
#	UID	U Name	Email	Login Date/Time	IP	MAC ID	CITY
3	Dhonaja	Dhonaja@gmail.com	2018/01/20	11.21.am	1	00AC53	
3	Dhonaja	Dhonaja@gmail.com	2018/01/23	10.53am	1	00AC53	
2	Dhonaja	Dhonaja@gmail.com	2018/01/24	11.24 am	1	00AC53	
2	Sineth	Sineth@gmail.com	2018/01/24	11.36 am	1	00IB13	
2	testdb2	testdb@gmail.com	2018/01/24	11.59 am	1	00ACS	
2	Sineth	Sineth@gmail.com	2018/01/24	12.07 pm	2	00A95B	
2	Soraj	Soraj2@gmail.com	2018/01/24	12.10 pm	1	00IB2C	

Figure 42 admin access log wireframe

User interfaces

User side interfaces

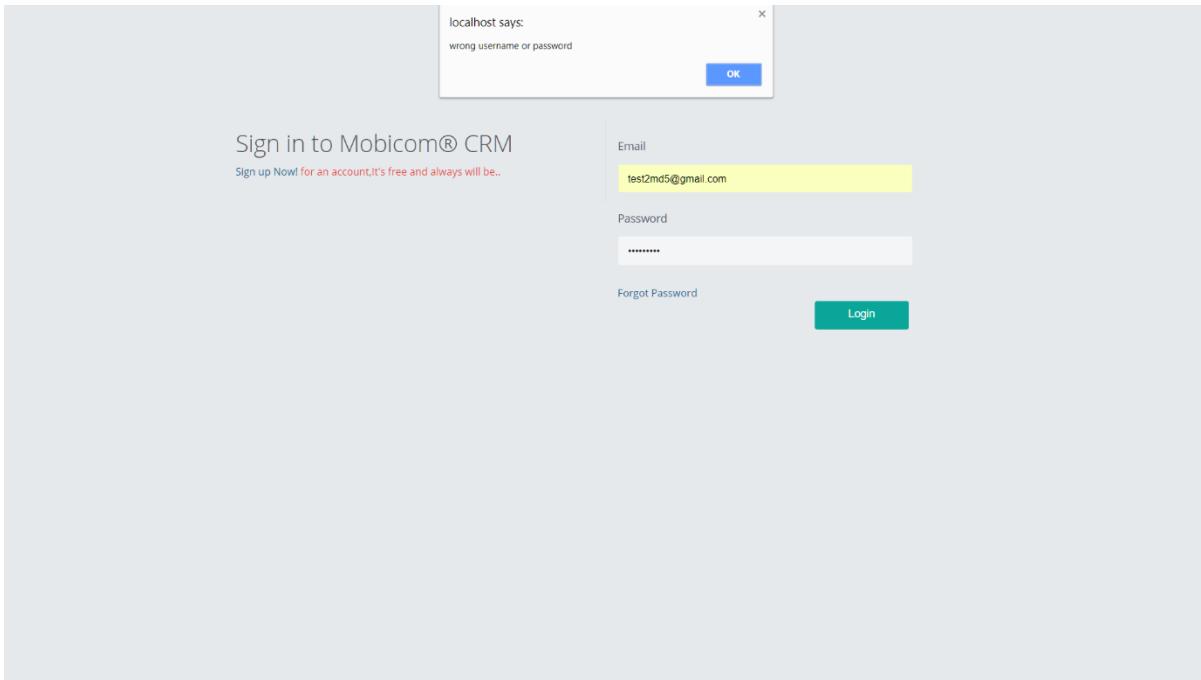


Figure 43 user login screen

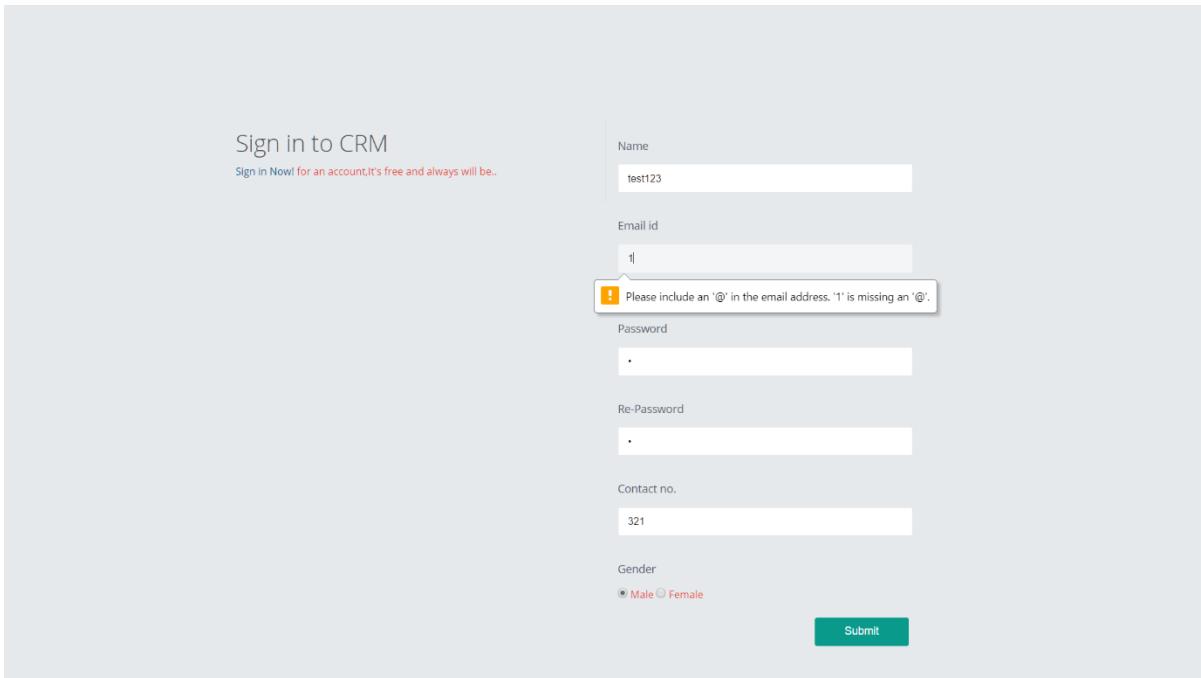


Figure 44 user signup screen

Sign in to CRM

Sign in Now! for an account. It's free and always will be..

Name

Email id

Password Please lengthen this text to 8 characters or more (you are currently using 1 character).

Contact no.

Gender Male Female

Submit



Figure 45 user login screen when password is short

Mobicom®

Welcome test2md5 Normal User Online

Dashboard

Change Password

Profile

Request a Quote

Create Ticket

View Ticket

Career

Dashboard

0 | View Tickets

Get Quote

My Profile

Create

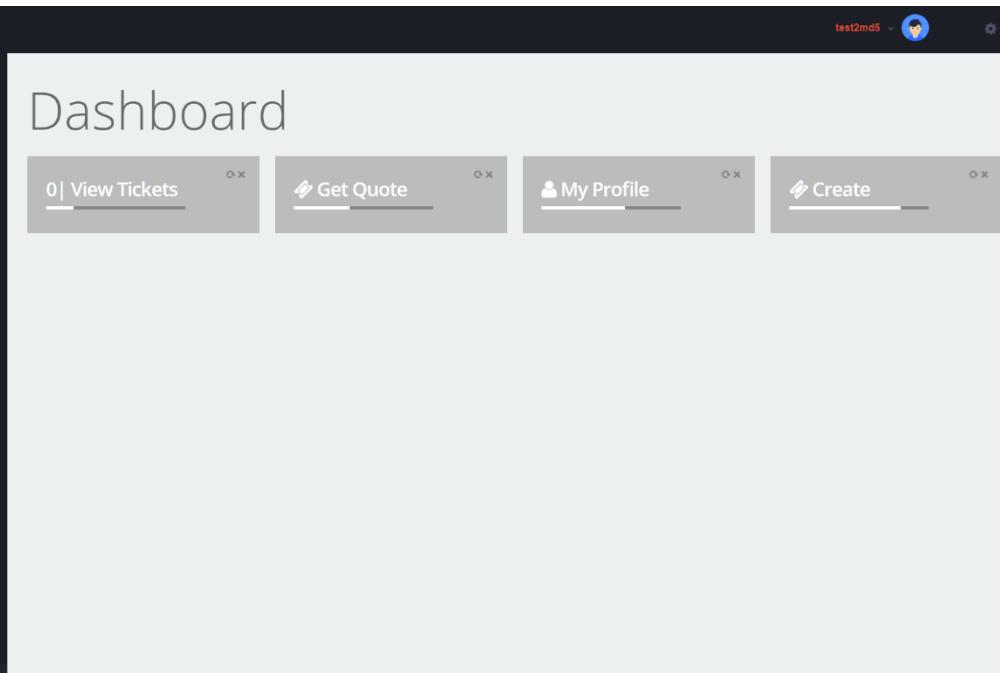


Figure 46 user dashboard screen

The screenshot shows the 'Change Password' page of the Mobicom® application. On the left sidebar, under the 'Welcome' section, the user 'test2md5' is listed as 'Normal User' and 'Online'. The main content area has a title 'Change Password'. It contains three input fields: 'Current Password', 'New Password', and 'Confirm Password'. The 'Confirm Password' field has a validation message: 'Please lengthen this text to 8 characters or more (you are currently using 2 characters)'. Below the form are two buttons: 'Clear Form' and 'Change'.

Figure 47 user password change screen when password is too short

The screenshot shows the 'Profile' screen for the user 'test2md5'. The sidebar shows the same user information as Figure 47. The main content area displays the user's profile details: Name (test2md5), Primary Email (test2md5@gmail.com), alternate Email (o3p@gmail.com), Contact no (111), Gender (Male), and Address (empty). A success message 'localhost says: ok' is displayed in a modal window. Below the form are 'Clear Form' and 'Submit' buttons.

Figure 48 user profile screen

Mobicom®

Welcome
test2md5
Normal User Online

Request a Quote

Name: pop Email: pop3@gmail.com

Contact no: 1231231231 Company: acme

Service Required:

- Website Design & Development
- SEO (Search Engine Optimization)
- Static Website Design
- Web Hosting Services
- CMS (Content Management System)
- SMO (Social Media Optimization)
- Dynamic Website Design
- Others

Query: qq

localhost says:
ok

OK

Clear Form Submit

Figure 49 request a Quote screen

Mobicom®

Welcome
test2md5
Normal User Online

Create ticket

Subject: testing

Task Type: Option 1

Priority: Important

Description: important

localhost says:
Ticket Generated

OK

Clear Form Send

Figure 50 create ticket screen

Welcome
test2md5
Normal User Online

Dashboard
Change Password
Profile
Request a Quote
Create Ticket
View Ticket
Career

View Ticket

Tickets

	Created on	Status	Action
web	2018-01-20	Open	Q
test			
Posted on 0			
pop	2018-01-20	Open	Q
testing	2018-01-20	Open	Q

Figure 51 view ticket screen

Welcome
test2md5
Normal User Online

Dashboard
Change Password
Profile
Request a Quote
Create Ticket
View Ticket
Career

Career

Your Career Section

SNO.	NAME	STATUS	RESUME	POSTING DATE	REAMRK	ACTION
1	test2md5	File no available		0000-00-00		

Figure 52 user career screen

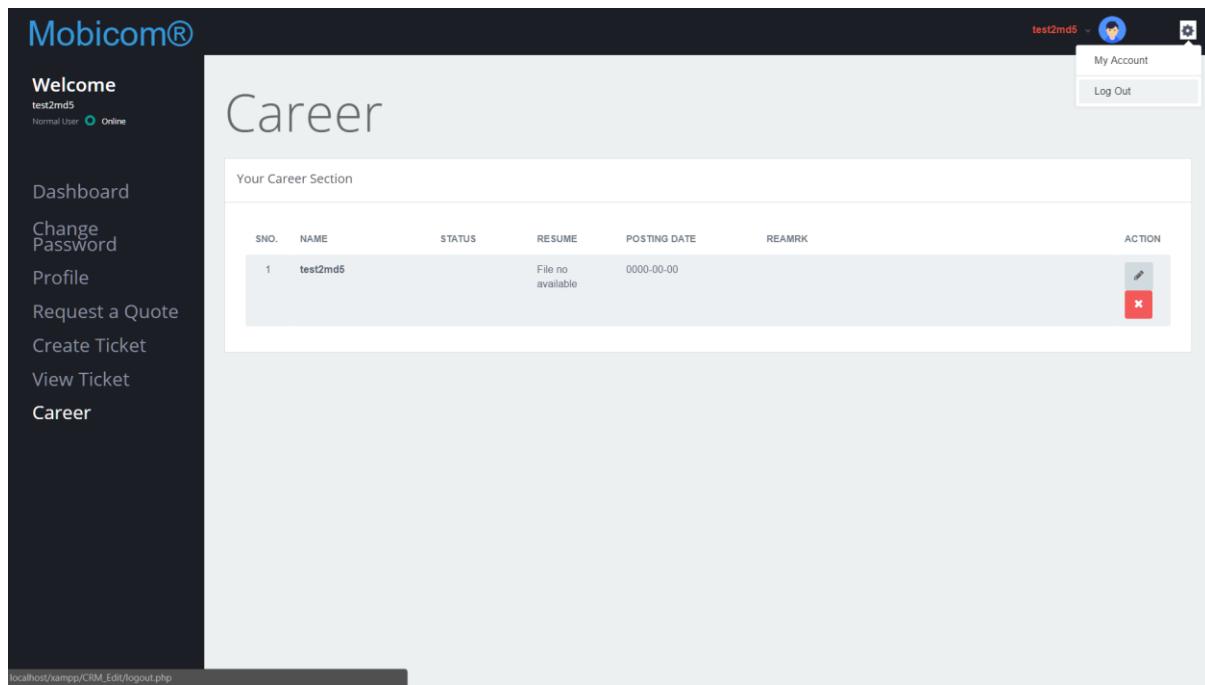


Figure 53 user logout screen

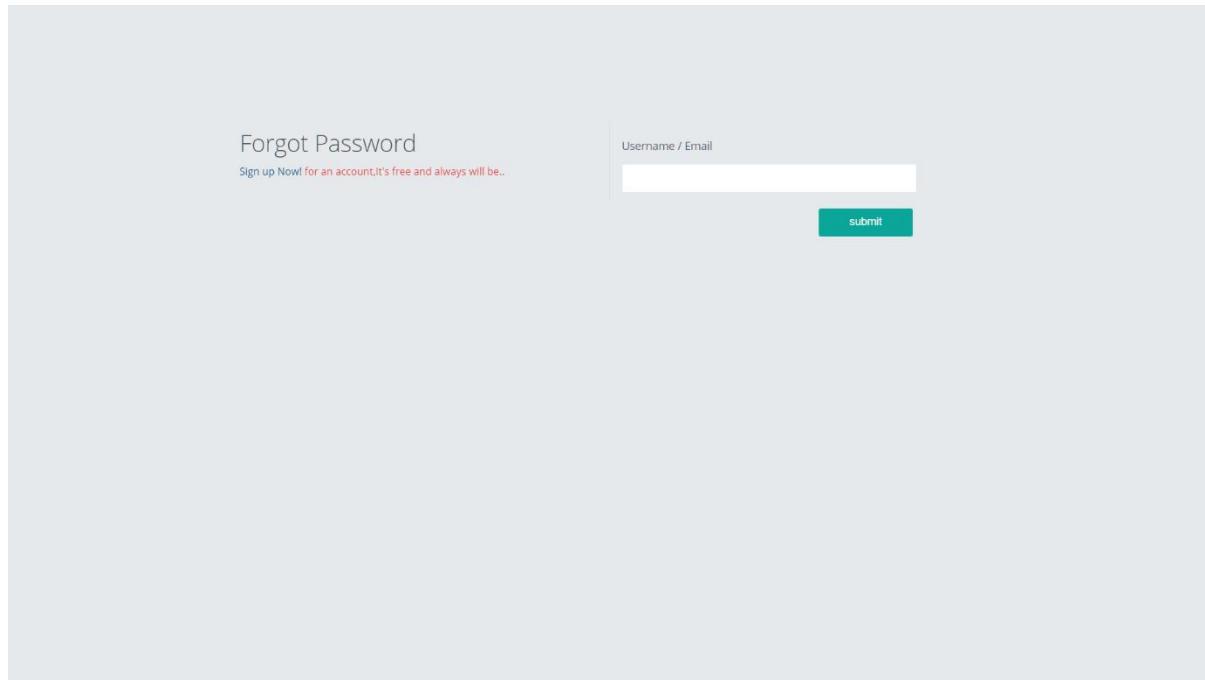


Figure 54 user password recovery screen

Admin side interfaces

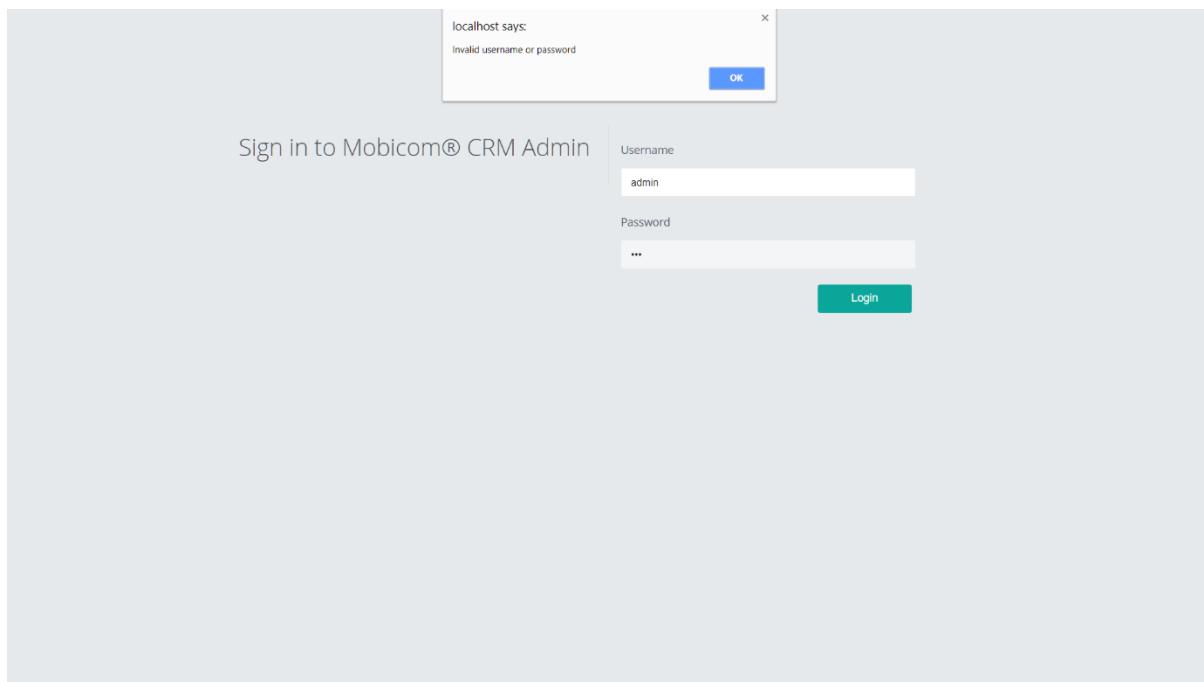


Figure 55 admin login screen

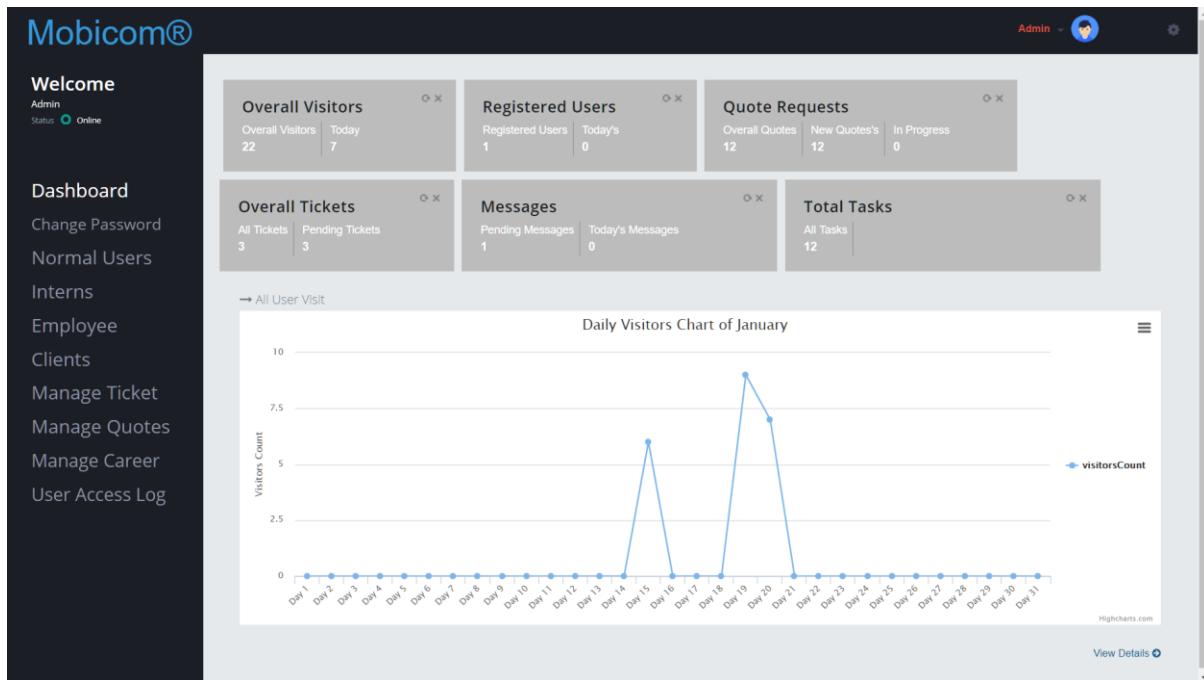


Figure 56 admin Dashboard screen

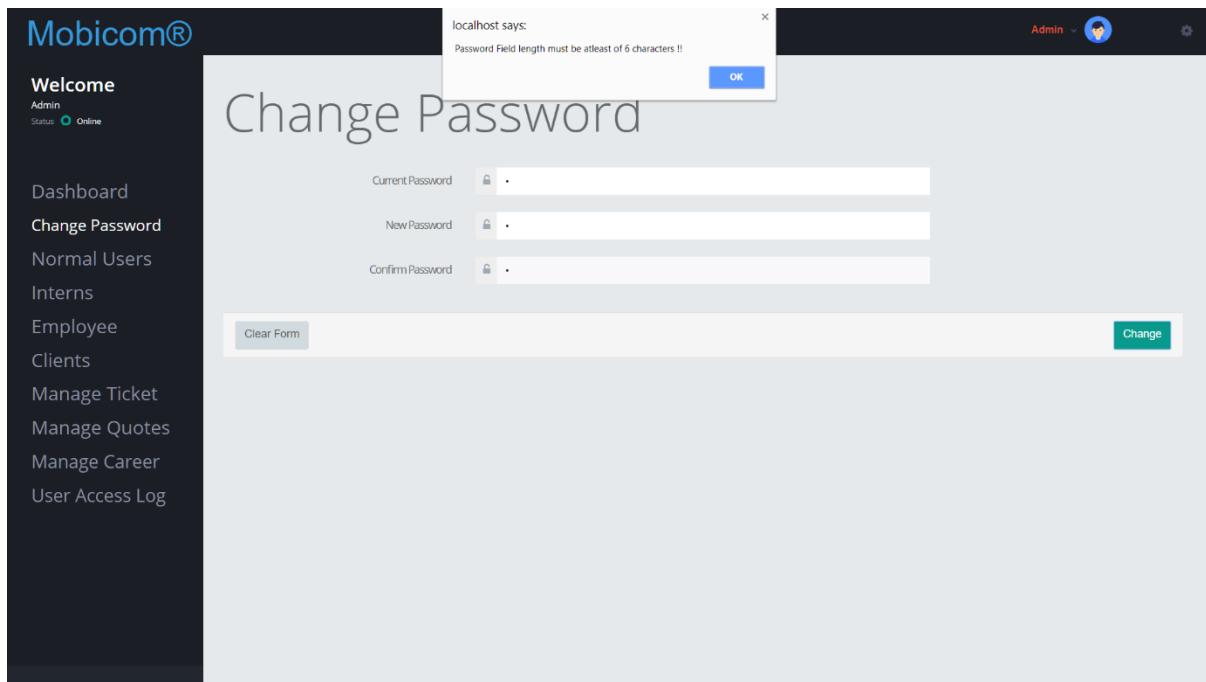


Figure 57 admin change password screen

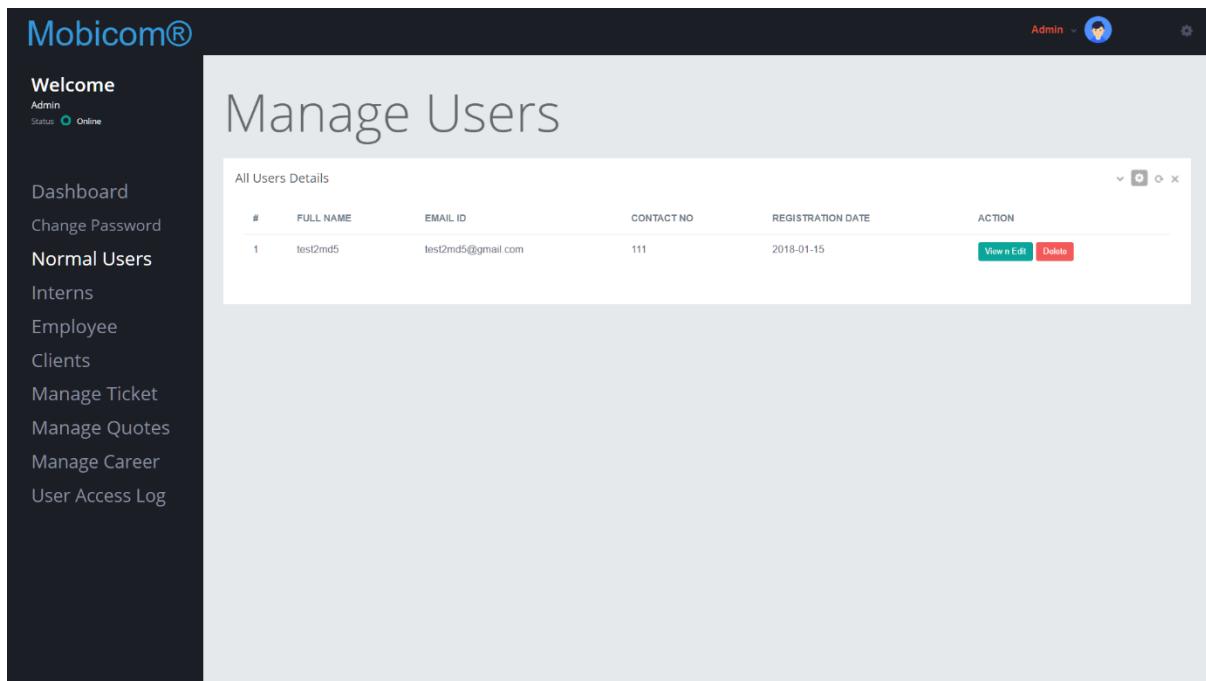


Figure 58 manage users screen

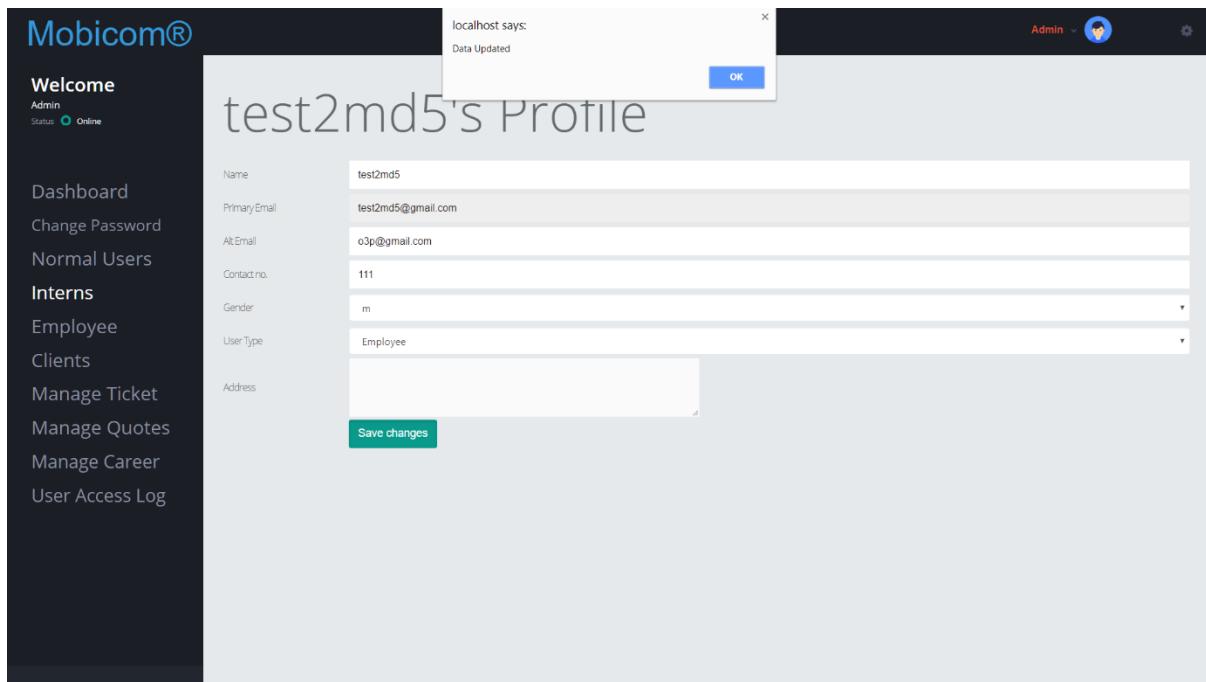


Figure 59 admin intern edit screen

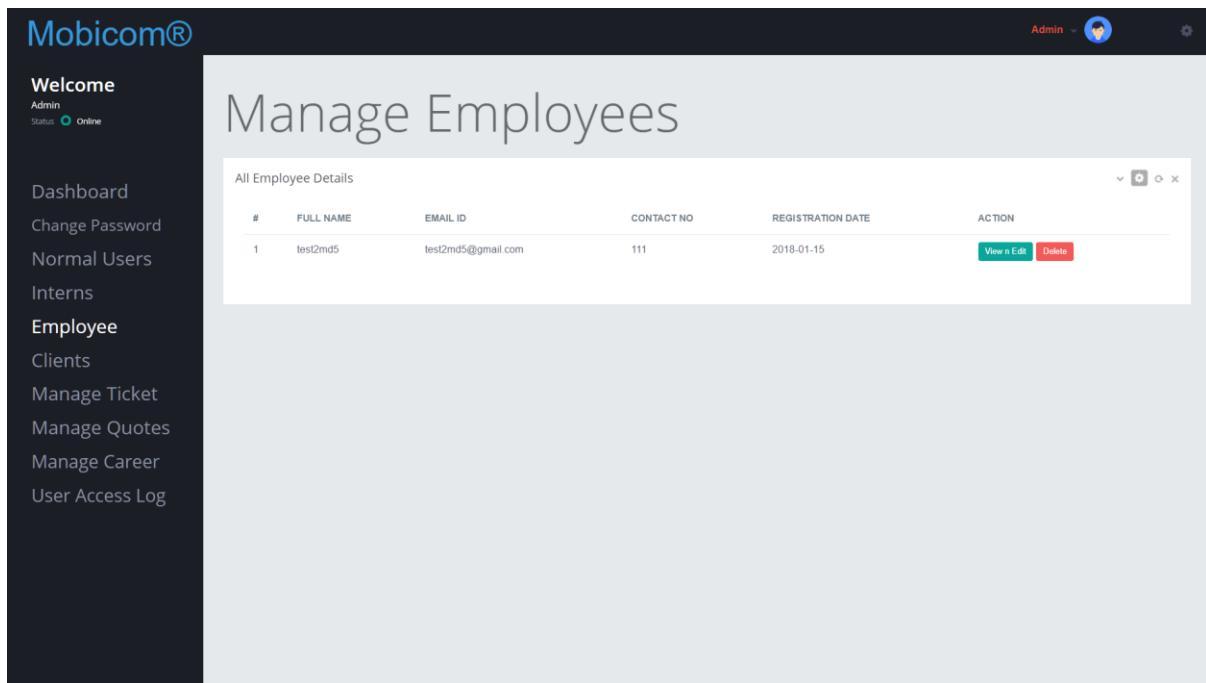


Figure 60 manage employees screen

The screenshot shows the 'Manage Clients' screen of the Mobicom® application. The left sidebar, titled 'Welcome' and showing 'Admin Status Online', contains links for Dashboard, Change Password, Normal Users, Interns, Employee, Clients, Manage Ticket, Manage Quotes, Manage Career, and User Access Log. The main content area has a title 'Manage Clients' and a sub-section 'All Client Details'. A table header row includes columns for '#', FULL NAME, EMAIL ID, CONTACT NO, REGISTRATION DATE, and ACTION. There are no data rows visible in the table.

Figure 61 manage clients screen

The screenshot shows the 'Manage Tickets' screen of the Mobicom® application. The left sidebar is identical to Figure 61. The main content area has a title 'Manage Tickets' and a sub-section 'Tickets'. It displays three ticket entries: 'testing' (Ticket #7 - Created on 2018-01-20, status Open), 'important' (Ticket #8 - Created on 2018-01-20, status Open), and 'pop' (Ticket #9 - Created on 2018-01-20, status Open). Each ticket entry includes a red 'Open' button and a search icon. Below each entry is a text input field labeled 'ok' and a blue 'update' button. The 'pop' ticket also has a 'web' label below it.

Figure 62 manage ticket screen

#	NAME	EMAIL	CONTACT NO	SERVICES REQUIRED	ACTION
8	demo	tps@gmail.com	45456	Website Design & Development Web Hosting Services	View
9	demo	tps@gmail.com	45456	Website Design & Development Web Hosting Services	View
4	dsa	niwanthiperera455@gmail.com	123	Website Design & Development SEO (Search Engine Optimization) Static Website Design	View
2	eer	niwanthiperera455@gmail.com	123	Website Design & Development Static Website Design	View
3	eer	niwanthiperera455@gmail.com	123	Website Design & Development SMO (Social Media Optimization)	View
5	iii	niwanthiperera455@gmail.com	123	Website Design & Development	View
1	pop	pop3@gmail.com	1231231231	Website Design & Development SEO (Search Engine Optimization)	View
10	test	test2md5@gmail.com	123123	Website Design & Development SEO (Search Engine Optimization)	View
11	test	test2md5@gmail.com	123123	Website Design & Development SEO (Search Engine Optimization)	View
12	test	test2md5@gmail.com	123123	Website Design & Development SEO (Search Engine Optimization)	View

Figure 63 manage quotes screen

localhost says:
Remark Updated

Figure 64 quote view screen

Figure 65 manage career screen

#UID	USER NAME	EMAIL	LOGIN DATE LOGIN TIME	IP	MAC ID	CITY	COUNTRY
2	test2md5	test2md5@gmail.com	2018/01/15 10:14:06pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/15 10:14:51pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/15 10:15:34pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 07:53:54pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 08:39:37pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 08:41:46pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 08:54:28pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 10:19:53pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 10:21:55pm	1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 10:22:30pm	1	4C-CC-6A-7F-17-B		

Figure 66 manage access log screen

The screenshot shows the Mobicom® administrative interface. At the top, there's a header with the Mobicom® logo, a user profile for 'Admin' (Status: Online), and a 'Log Out' button. On the left, a sidebar menu lists various administrative functions: Dashboard, Change Password, Normal Users, Interns, Employee, Clients, Manage Ticket, Manage Quotes, Manage Career, and User Access Log. The main content area is titled 'Manage Access Log'. It features a table with the following columns: #UID, USER NAME, EMAIL, LOGIN DATE | LOGIN TIME, IP, MAC ID, CITY, and COUNTRY. The table displays 10 entries of user login logs. At the bottom of the table, it says 'Showing 1 to 10 of 22 entries' with a navigation bar for pages 1, 2, 3, and 4.

#UID	USER NAME	EMAIL	LOGIN DATE LOGIN TIME	IP	MAC ID	CITY	COUNTRY
2	test2md5	test2md5@gmail.com	2018/01/15 10:14:06pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/15 10:14:51pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/15 10:15:34pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 07:53:54pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 08:39:37pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 08:41:46pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 08:54:28pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 10:19:53pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 10:21:55pm	-1	4C-CC-6A-7F-17-B		
2	test2md5	test2md5@gmail.com	2018/01/19 10:22:30pm	-1	4C-CC-6A-7F-17-B		

Figure 67 admin logout screen

Testing

Test plan and specification

Objective

The test will execute and verify the test functions identify, fix and retest all high and medium severity defects per the entrance criteria.

The final product of the test is... A production-ready software.

Test tool

Black box testing.

Strategy of testing

Below is a list of services that testing may provide. Next to each service is the degree of testing that we will perform. Below are the valid level desired:

- High – High risk area, test this area very hard
- Medium – Standard testing
- Low – Low risk area, test if time allows
- None – No testing desired

Level Desired	Service
Low	<p>Performance Testing:</p> <p>Performance testing is testing to ensure that the application responds in the time limit set by the user. Client did not specified the benchmark. but since this is a lightweight software there won't be performance slips</p>
High	<p>Windows / Internet GUI Standards:</p> <p>This testing is used to ensure that the application has a standardized look and feel. It is for ensuring that GUI is up to HCI standards</p>
High	<p>Platform Testing:</p> <p>Platform testing needs to done on Google Chrome and Microsoft Edge browsers to see if any component looks faulty</p>

Low	<p>Stress Testing:</p> <p>Stress testing is testing to ensure that the application will respond appropriately with many users and activities happening simultaneously.</p>
High	<p>Parallel Testing:</p> <p>Parallel testing is used to test the functionality of the updated system with the functionality of the existing system.</p>
Medium	<p>Usability:</p> <p>Usability is testing to ensure that the application is easy to work with, limits keystrokes, and is easy to understand. The best way to perform this testing is to bring in experienced, medium and novice users and solicit their input on the usability of the application.</p>
Medium	<p>Security Testing:</p> <p>Security testing is performed to guarantee that only users with the appropriate authority are able to use the applicable features of the system.</p>
None	<p>Out of Memory Tests:</p> <p>Testing designed to ensure that the application would run in the amount of memory specified in the technical documentation. This testing will also detect memory leaks associated with starting and stopping the application many times.</p>

Table 24 Strategy of Testing

Features to be tested

Business Requirement	Reference number	Requirement	range
Login	r01	<p>Username should not be duplicated</p> <p>Passwords must be at least 8 characters long</p> <p>Passwords must be encrypted</p> <p>Capital letters or simple letters needs to be treated the same</p>	High
Profile manage	r02	<p>Any user must be able to change their name, email, contact, address, passwords at any time.</p> <p>Admin shouldn't be able to change the username.</p> <p>Admin must be able to change every detail about an user except for the passwords</p>	Medium
Quote handling	r03	<p>Any user should be able to create quote by providing name, email, contact, business name and the service required.</p> <p>Admin user should be able to view them and provide remarks</p>	High
Ticket handling	r04	<p>Only employees and interns should be able to create tickets.</p> <p>Tickets need to have priority, and type and subject included.</p> <p>Admin user must be able to view the tickets and add a remark</p>	high

Career	r05	All users should be able to upload their CVs to the Systems via a provided link. Admin user must be able to view them and decide what has to done to them from the given options of reject, pending and shortlisted for interviews.	high
Access log	r06	Admin user must be able to see the users who access the systems and their user ids , names and even their computer mac addresses with time zones and countries	medium

Table 25 Features to be tested

Test cases

Test case id	Reference id	Test case description	Expected outcomes
t01	r01	<p>Try register two users with same email.</p> <p>Try login with an all capital letter username and the same username with all simple letter.</p> <p>See the database if the password is encrypted.</p>	<p>Should be in with the username with all capital letters and all simple letter.</p> <p>Usernames should be unique in database level</p>
t02	r02	<p>Try to change users' name, email, contact, address, passwords at any time.</p> <p>Try to change user password from admin panel.</p>	User should be able to do and message should be displayed after they finished
t03	r03	<p>Try to create quote from different user levels</p> <p>try to view them and provide remarks from admin panel</p>	User should be able to do and message should be displayed after they finished
t04	r04	<p>Try to view tickets from client and normal user level account</p> <p>Try to view the tickets and add a remark from admin panel</p>	User should be able to do and message should be displayed after they finished
t05	r05	<p>Try to upload a cv</p> <p>Try to view cv from admin panel</p>	<p>Should be able to upload a cv from popup window</p> <p>CVs should be listed on the career tab in the admin panel</p>
t06	r06	Try to view access log	Should be displayed with all the details in the relevant tab

Table 26 test cases

Test Case Pass/Fail Criteria

The feature will pass or fail depending upon the results of testing actions. If the actual output from an action is equal to the expected output specified by a test case, then the action passes.

Pass criteria:

- All processes will execute with no unexpected errors
- All processes will finish update/execution in an acceptable amount of time based on benchmarks provided by the business analysts and documented by the development team

Severity Codes

Severity code	Severity name	Severity description
1	high	Testing cannot proceed further within existing test cases
2	medium	The test case can be completed, but application incorrect output when valid information is input
3	low	The test case can be completed and application correct output when valid information is input, but application incorrect output when invalid information is input.

Table 27 test pass fail criteria

Test outcomes

Test case id	Reference id	Actual outcome
t01	r01	3
t02	r02	3
t03	r03	3
t04	r04	2
t05	r05	2
t06	r06	2

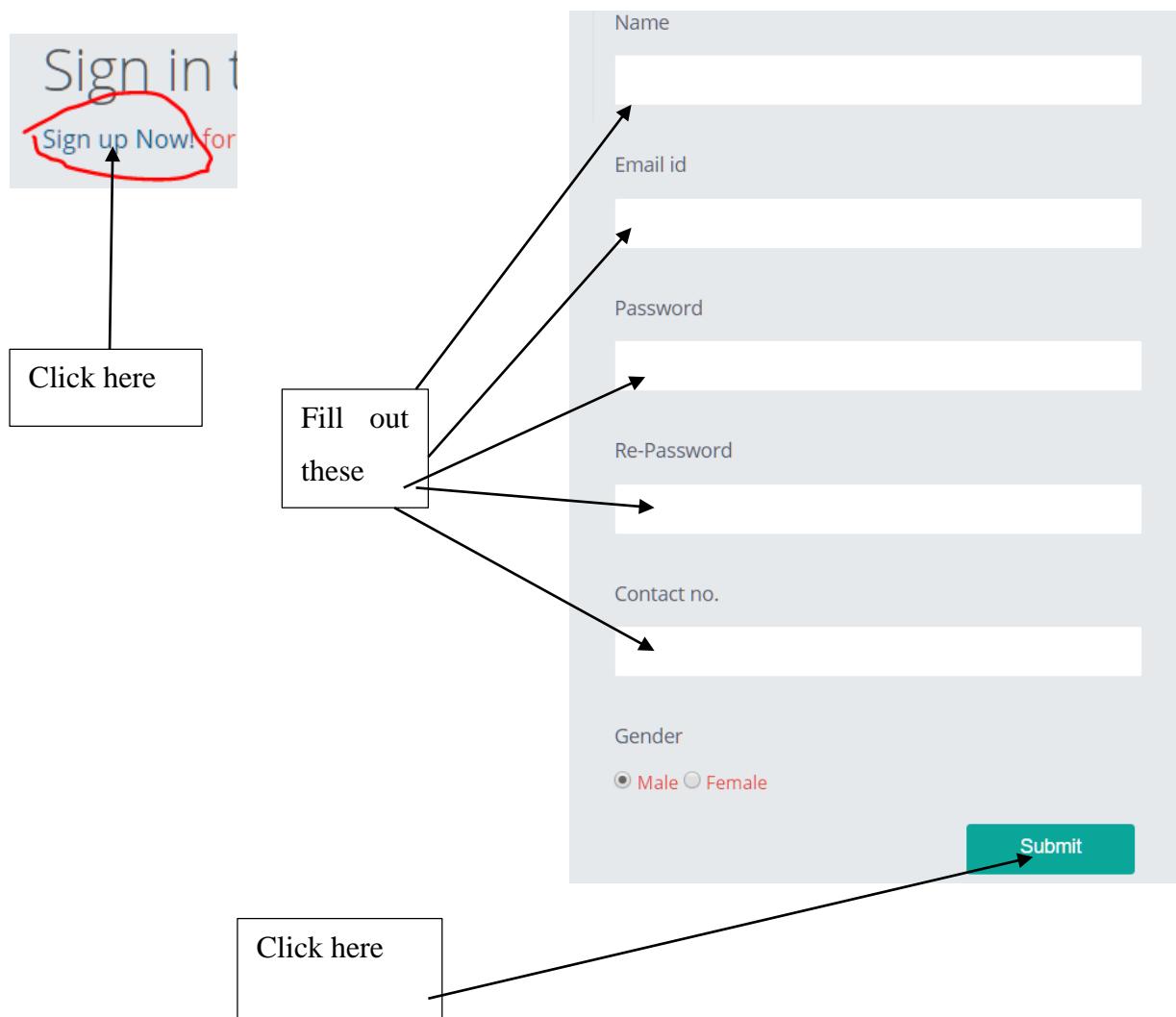
Table 28 test outcomes

Sample User guide

How to sign up

- Click sign up now
- Fill up name
- Fill up email id. Make sure to add a legitimate one or sign up would not work
- Enter a password. Make sure it has more than 8 characters
- Re-enter the same password
- Fill out the contact number
- Choose gender

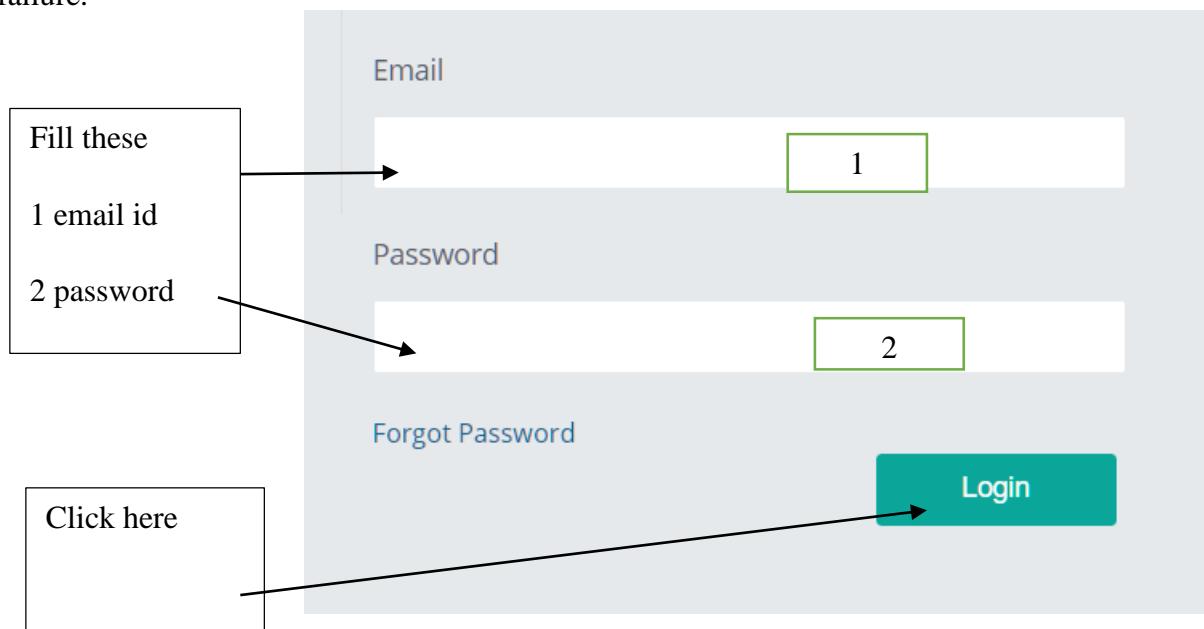
If successfully signed up you'll be able to log in



How to log in

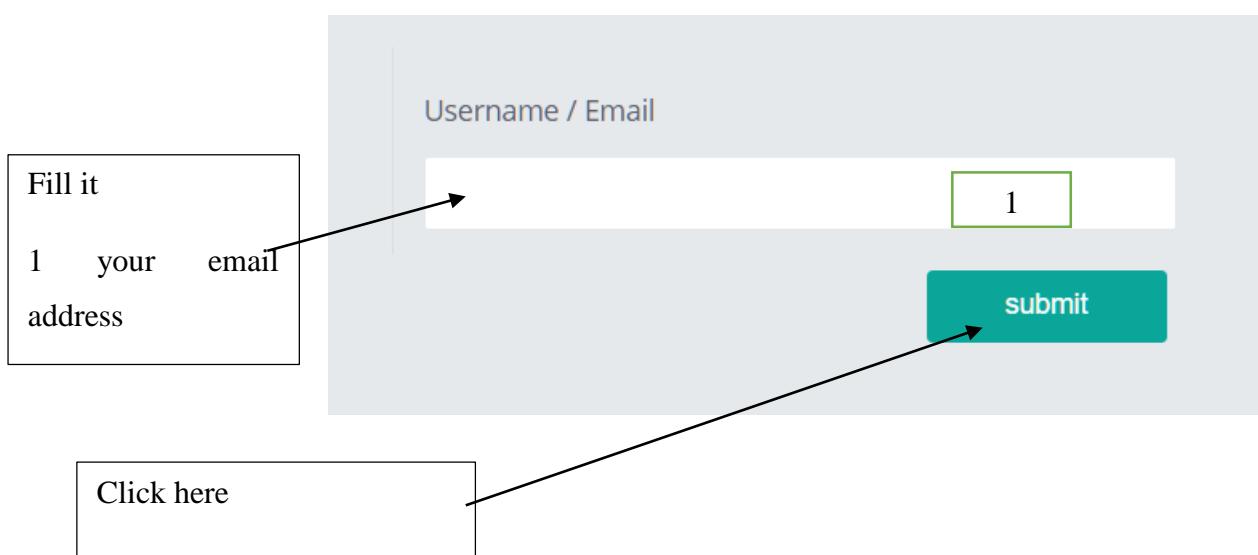
- Type your email. Lowercase or uppercase it doesn't matter
- Type your password
- Press enter or click login

If successful user dashboard will display. If not successful you'll see a message indicating the failure.



Forgot password

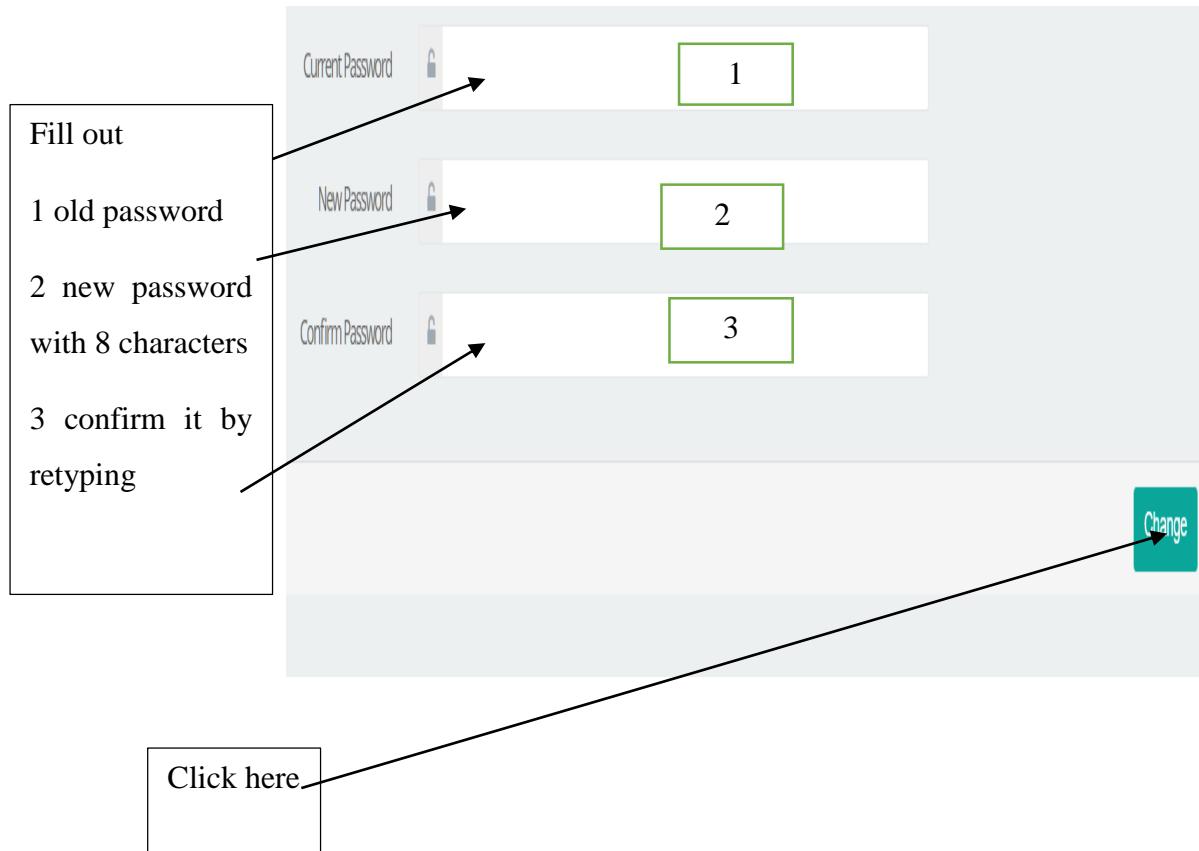
- Click forgot password
- Type your email address



Change password

- Click change password from left bar
- Type current password
- Type new password. Make sure to add more than 8 characters
- Re-type the new password
- Press change

If successful you'll be notified with an alert



Edit profile

- Click profile from left bar
- Edit anything except for the primary email
- Press submit

If successful you'll be notified with an alert

The screenshot shows a profile editing form with the following fields and values:

- Name: test2md5 (highlighted by a green box labeled 1)
- Primary Email: test2md5@gmail.com
- Alternate Email: o2p@gmail.com (highlighted by a green box labeled 2)
- Contact no: 111 (highlighted by a green box labeled 3)
- Gender: Male (highlighted by a green box labeled 4)
- Address: (highlighted by a green box labeled 5)

A legend on the left side provides instructions:

- 1 username
- 2 alt email
- 3 contact no
- 4 address

A callout box labeled "Choose one" points to the gender dropdown. A "Submit" button is located at the bottom right.

Below the form, a legend indicates which fields to edit:

- Edit out these

Callouts with arrows point to specific fields:

- 1 username (points to the Name field)
- 2 alt email (points to the Alternate Email field)
- 3 contact no (points to the Contact no field)
- 4 address (points to the Address field)
- Click here (points to the "Choose one" callout)

Request a quote

- Click request a quote from left bar
- Fill name
- Fill email
- Fill contact
- Fill company
- Select anything from the options. Put a tick mark on the checkboxes
- Fill the query
- Press submit

If successful you'll be notified with an alert

Fill out these

- 1 name
- 2 email
- 3 contact
- 4 company
- 5 Query (additional info)

Select any amount by clicking on the box

Click here to submit

Create a ticket

- Select create ticket from left bar (only for employee and intern users)
- Fill out the subject
- Choose an option from the dropdown list
- Choose a priority
- Provide a description
- Click send

If successful you'll be notified with an alert

The screenshot shows a user interface for creating a ticket. At the top, there is a 'Subject' input field with a placeholder 'Type your Subject here'. Below it is a 'Task Type' dropdown menu with the placeholder 'Select your Task Type'. To the right of the dropdown is a 'Priority' dropdown menu with the placeholder 'Choose your Priority'. At the bottom of the form is a 'Description' area containing a rich text editor with a toolbar. A green box labeled '1' is placed over the 'Subject' field. A green box labeled '2' is placed over the rich text editor area. A large teal button labeled 'Send' is located at the bottom right of the form. Three callout boxes provide instructions: one pointing to the 'Subject' field says 'Fill out these 1 subject 2 description'; another pointing to the dropdown menus says 'Choose one from the dropdown list'; and a third pointing to the 'Send' button says 'Click here'.

1

2

Send

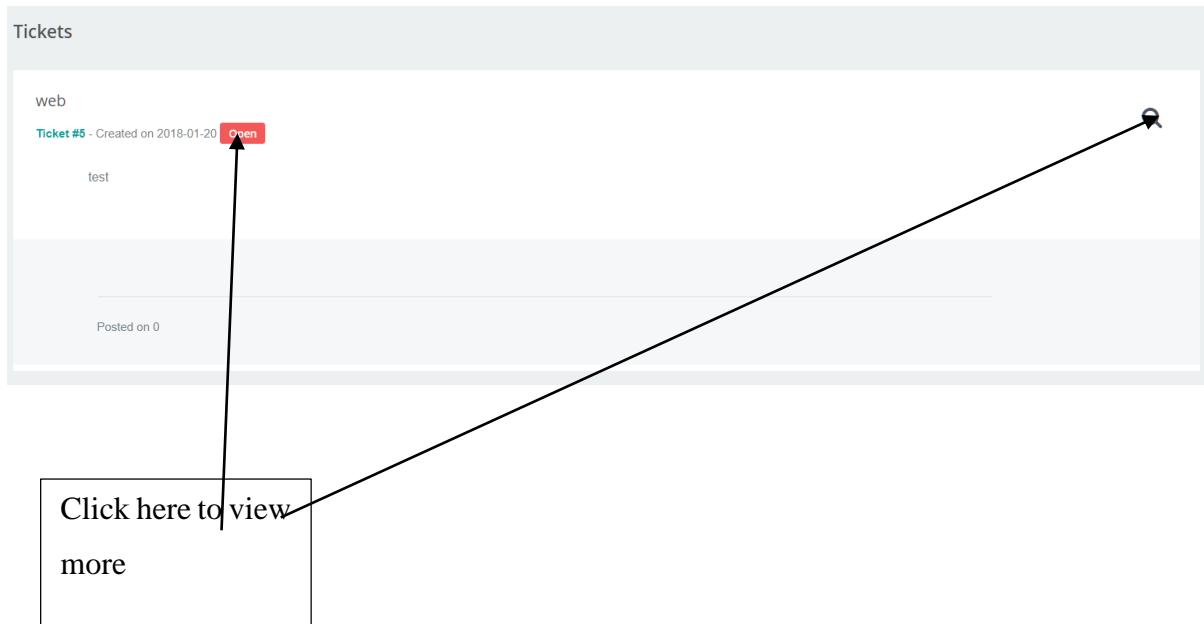
Fill out these
1 subject
2 description

Choose one from
the dropdown list

Click here

View a ticket

- Select view ticket from left bar (only for employee and intern users)
- You'll be presented with all the tickets you have submitted
- Click open or magnifying glass icon to expand and view details



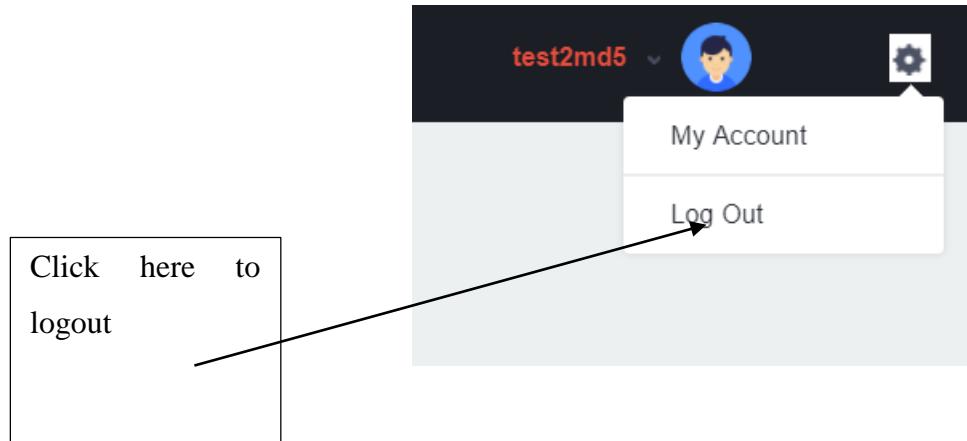
Career

- Select career from left bar
- You'll be presented with a table with your username
- Click on pencil icon to upload a CV
- A popup window will open

SNO.	NAME	STATUS	RESUME	POSTING DATE	REAMRK	ACTION
1	test2md5		File no available	0000-00-00		A callout box with the text 'Click here to upload a CV' points to the 'ACTION' column.

Logout

- Click cog icon in the header
- Click logout from the dropdown list



Conclusion

Mobicom® CRM is web based CRM done to enhance customer relations in Mobicom®. This software can perform quote handling and profile management of customers. Can enhance the bond between customers by accepting CVs and doing projects parallel. Mobicom® is a customer centric software with heavy admin based functionalities implemented. Review and provide remark to clients, managing various types of users, provide feedbacks to employee and intern tickets are just few of the functionalities. Mobicom® also provides insights of the current status of the business to the admin. Not only the functional requirement but also the non-functional and domain requirements are also addressed in this software. Usage of flat UI concepts and minimalism are just few examples for that. From security perspective Mobicom®'s user data is encrypted and database is backed up with end of a session to secure valuable data. Mobicom® is also implemented with modern HCI user design principles. New technologies like bootstrap 3 and JQuery has been used in this software. Below is the list of archived objectives

- Create a lightweight system
- Use new technology
- Address every functional, non-functional and domain requirement
- Make system secured.
- Handle quotes effectively
- Parallel implement KMS capabilities

Appendix

List of Questions We asked from our Client

Q: - What is your company size, and how many users will I have?

A: - A small to medium scale business with 15 employees and 5 interns

Q: - How much money can you spend on a CRM?

A: - 100,000 LKR to 150,000 LKR

Q: - Who are your users and customers?

A: - we have four types of users employee, intern, client and normal user. We would consider some administrator too

Q: - Does the solution have mobile device support?

A: - Of course it needs to be, we want our customers to access the system from anywhere

Q: - Is the CRM Web-based, or does it require a desktop app?

A: - Web based would be preferable

Q: - Will your users require training to use the system?

A: - Provide a user manual.

Q: - Do you want to have hosted software, or a fully managed service (SaaS)?

A: - we would consider a hosted software

Q: - Do you want it open-source or proprietary solutions?

A: - Open source would be great, because we don't have that many customers

Q: - Does the solution needs to be easily scale to handle your needs?

A: - as first implementation we would like to have a prototype rather