

Islamic University Of Technology (IUT)



Department : Computer Science and Engineering (CSE)

Project- Company on the move – A smartphone based online employee tracking and sales management system.

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Certification of completion of the project

This is to certify that the work presented in this report is the result of the implementation of a “Smart Phone Based Employee Tracking and Sales Management System” approach, a project undertaken by candidates under the supervision of **Kashif Nizam Khan**, lecturer in the Department of Computer Science and Engineering at Islamic University of Technology (IUT), Board Bazar, Gazipur 1704, Bangladesh.

Neither of this report nor any part of the project has been submitted anywhere else for the award of any degree or for any publication.

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Abstract

In the recent times smart mobile phones has become very popular because of their features. People are getting interested about this smart phones day by day. These advanced technology can be used in several purposes. According to study, in Bangladesh pharmaceutical companies like Beximco, Square, Incepta are big industries which has got a large number of employees, who are working at the field level. Their job is to sale product to the clients. However, according to the current system, none of these pharmaceutical companies have got any system which will allow them to communicate with the employees, those are working at the field level. As a solution "A smart phone based employee tracking and sales management system" is proposed, where the company will be able to communicate with the employees, and also the employees will be able to update the company about the sales and order information using the smart phone . For the purpose of showing the result to the administrator of the company, a website is used where all the results are shown . This will definitely increase the efficiency of the company and will also save a lot of valuable time.

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Chapter 1 : Introduction

1.1 Background

In Bangladesh , there are several big pharmaceutical companies, which has got a lot of employees who are working at the field level. The job of this employees is to sale the product of the company to the clients. But these whole process of sale and order takes a whole day to be done. An employee goes to the field and gives the update of the whole information to the administrator at the end of the day. This is a wastage of time for the company, as it lags behind for those information. The administrator also needs to know where the employee currently is. The employee should also be able to send update information to the administrator, which is still not available.

1.2 Problem Definition

For a company which has got a large number of employees, who's duty is to travel through different places and sell the products of the company, it is really difficult to maintain the accuracy of the employees and also to maintain the efficiency of the company. The employees travel in different places and sell the products. In this case, it takes a whole day to analyze the progress of the day for the company. Employees report to their supervisors at the end of the day, the new orders are also enlisted at the end of the day. This causes a lot of waste of time. The supervisors cannot also determine the performance of the employees as there is no such option to get constant report on their duty. The supervisor cannot assign any task to the employees after they leave for duty. This reduces the efficiency of the company.

1.3 Objectives

A solution to this problem is to develop a user friendly system called “Employee tracking system”. In this system the primary objective are :

- Employee Tracking : The employees mobile phone will give update about the current location to the server. The administrator will be able to see the location of the employee through website.
- Task Assignment : The administrator will be able to send instant messages to the employee, so that they will be updated about their new job.
- Sales notification : The employee will be able to send sales update to the administrator, according to the sale that just occurred.
- Order placemenet : Whenever a client places a order , the employee will be able to send that update , so that the administrator will be notified about the new orders.
- Product Search : Employee can also search for product information where, he will be able to see the detail information about that particular product , so that he can help the client with the information.

Chapter 2 : Literature survey

In order to develop the system, several technologies have to be followed. Among them, some are mentioned below :

2.1 Eclipse

Eclipse is a software development platform which supports different languages. Java is the most common language used in eclipse. But it also supports other programming languages as Ada, C, C++. Perl, PHP, Python, Ruby, Scala, Clojure. Eclipse has got an integrated development environment (IDE) and also an plug-in system. Java development tools are used to develop with java.

The plug-in system in eclipse is used in order to provide functionality for a run-time system, other than some different applications which does not provide plug-in options. The eclipse platforms runtime system is based on Equinox.

The plug-in mechanism of eclipse allows it to work with versatility. As eclipse can work with different programming languages, it can also work with applications like LaTeX and networking applications such as telnet and database management system.

Because of these advantages of eclipse, it is used for the development of this software , because it provides plugins for android , thus it is easy to develop android application using eclipse IDE.

2.2 Android

Android is an operating system which is used in mobile devices such as smart phones and tablet computers. Android was developed by Android Inc, but later it was purchased by Google.

Android has a large community of the developers, and as it is also open source, the number of applications available for android are also huge in number.

Using android, several applications can be developed, which are very user-friendly. Android has got different sdk, which are used for developing different applications. The integrity of the application, depends on the sdk that is being used. Android has got different levels like 2.3, 4.0, 4.0.3. The applications which are developed for higher level cannot be used in lower ones.

2.3 JavaScript

JavaScript is a scripting language that is dynamic.

The following features can be found in JavaScript.

Imperative and structured :

JavaScript supports maximum syntaxes from the language C.

Dynamic :

- Dynamic typing :

For maximum scripting languages, variables are not used for the criterion types. Values are used for types.

- Object based :

JavaScript prefers objects for scripting. Objects can be changed. Their values and properties can be added, deleted.

2.4 HTML

The full formation of HTML is Hyper Text Markup Language. All the web browsers basically reads this HTML documents and gives output into visible or audio webpages. HTML elements are the main structure for building a webpage.

2.5 Web service

The process through which two electronic devices can communicate with each other over internet is known as Web Service.

- **Web API**

Web API is an implementation in Web services, which improvises for representational state transfer (REST) rather than Simple object protocol (SOAP).

Criteria of Web service :

Web service can be used in different manners. The criteria's of web service are :

- Remote procedure calls (RPC) :

RPC was the first method used for the Web Service. Because of this RPC is quite popular. A distributed function called interface is promoted by RPC. RPC always referred to a language based function, which is the reason, RPC was questioned for its performance.

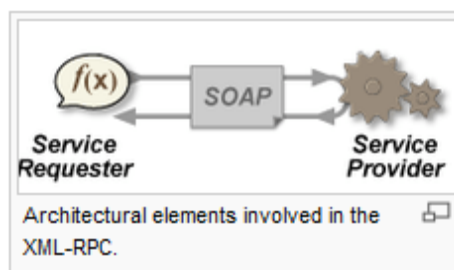


Figure 2.1 : Remote procedure calls

- Service oriented architecture (SOA) :

Another methodology in case of Web-services is service-oriented architecture. SOA Web services are mostly popular, because of its flexibility and ease of use. In SOA the source of communication is message, which makes it easier than RPC method.

- Representational state transfer (REST) :

REST is an architecture for web services. This method differs from RPC and SOA, as the main idea behind this architecture is clients and servers. The client and the server works in the way like, client sends a request to the server and the server then processes the requests and sends it back to the client.

2.6 Web Server

Web server is responsible for performing the requests that comes to it. It delivers the webpages according to the request. A web server can be considered as a software or even as a hardware. Although the primary objective is to deliver the requested webpages, a web server can also receive contents from clients.

2.7 PHP

PHP is a scripting language which is used basically for the Web Development. PHP can also be embedded into an HTML document. Most of the web-servers are capable of using PHP. PHP interpreters are available on both 32 bit and 64 bit operating systems

2.8 Google API

For the development purpose, Google API's are used in this project . Google has provided several API's for the development purpose. API- Application Programming Interface may include some specifications , which are then used to develop the different applications.

2.9 JSON

JSON stands for JavaScript Object Notation which is a data interchange format. JSON defines a small set of formatting rules for the portable representation of the structured data.

2.10 Background Study

In order to develop such a system where a particular company can access information of one of the employee of the company, several projects came out of the study which were developed by different companies. Some of them are discussed below :

- **Track4Win**

Track4Win was developed by the Sepama Software Ltd. This particular software is able to track the activities of the employee, so that it can be visible what a particular employee is accessing . This particular software is able to calculate how much time is spent through a specific software. It can also evaluate the performance of the employee so that it will be easier for the managers to judge the performance of the employees.

- **Time and attendance software**

Time and attendance software was developed by the GHG corporation. The main feature of this software is that it is able to store in and out information of the employee , so that the manager can keep track of the log of individual employees. This software is also able to show the total time a particular employee has worked. All this signing processes are done electronically and also the software can show the leave balances for each particular employees.

Requirement Analysis :

In order to develop the system, first there is some analysis that has to be done. Requirement analysis is the process through which developer can track down the ultimate goals of the software development. There are several methods for requirement analysis.

3.1 Use Case for the system

3.1.1 Use Case Name : Login

Actors :

Administrator

Web page

Web server

Triggers :

The administrator indicates that, he wants to login to the webpage.

Pre-conditions :

The administrator has to browse the web page through the browser, in order to login to the webpage.

Post-conditions :

The administrator will be logged in to the webpage.

The administrator will be able to access the webpage.

Normal flow :

The administrator will indicate that he wants to login to the webpage.

The system will present the login page where user name and password will be asked. The user will give the username and password.

The system will confirm the login process.

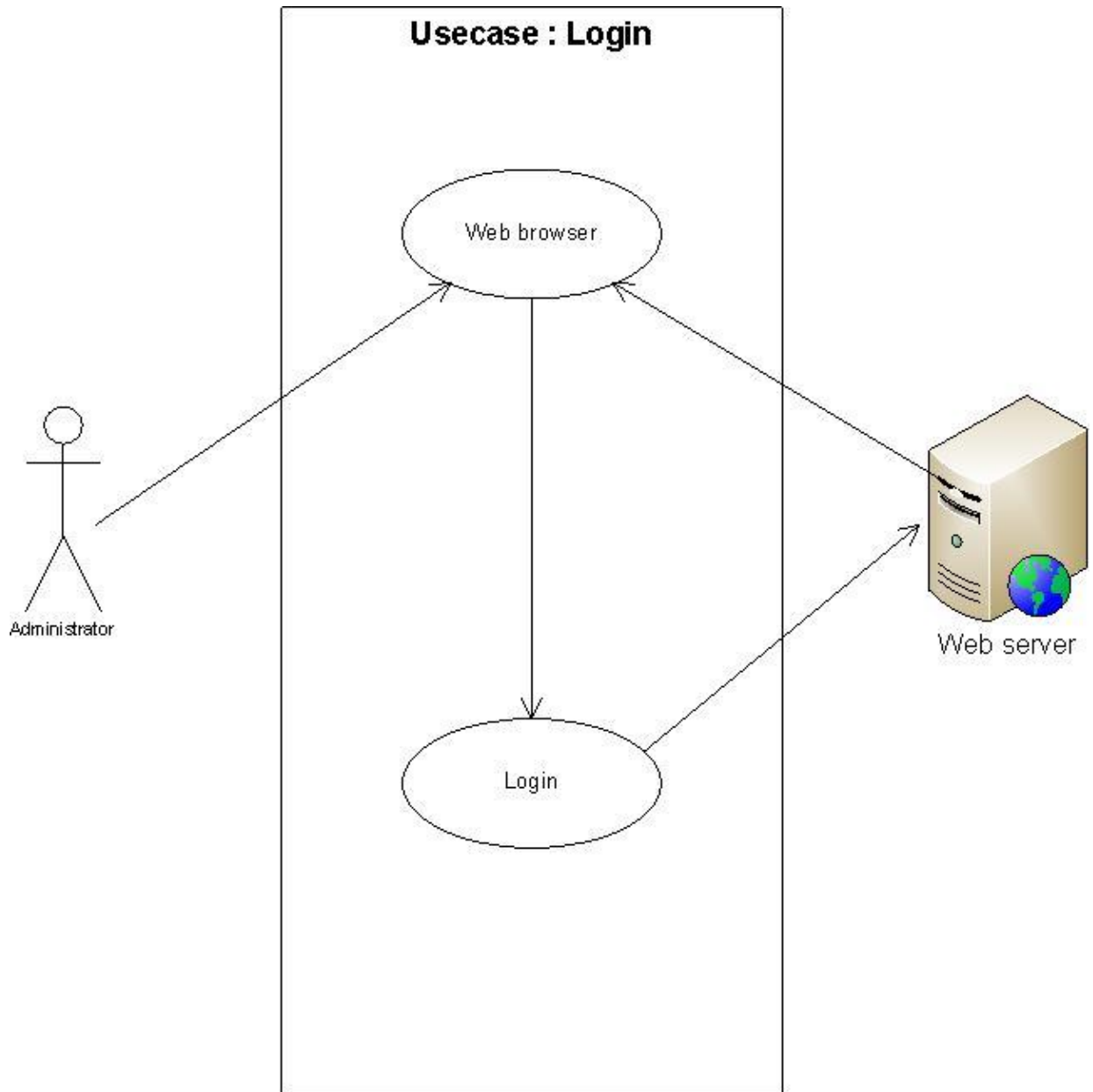


Figure 3.1 : Use Case for login

3.1.2 Use Case Name : Track employee

Actors :

Administrator

Employee

Mobile phone

Web server

Triggers :

The administrator will ask for the current location of the employee.

Pre-conditions :

The administrator will mention the employee he wants to track.

Post-conditions :

The employee will notify the system about his current location through mobile phone.

The user will get the current location of the specified employee.

He can also access the previous locations that the employee visited.

Normal flow :

The administrator will ask for the location of the employee.

The mobile phone of the employee will notify the server about its current location.

The system will identify the location of the employee by using the altitude and latitude provided by the employee phone.

It can also show the previous locations of the employee, which are saved.

Alternative flow :

The administrator may give some employee information which doesn't exist. Then the system will notify the user about the wrong information and will ask for the correct one.

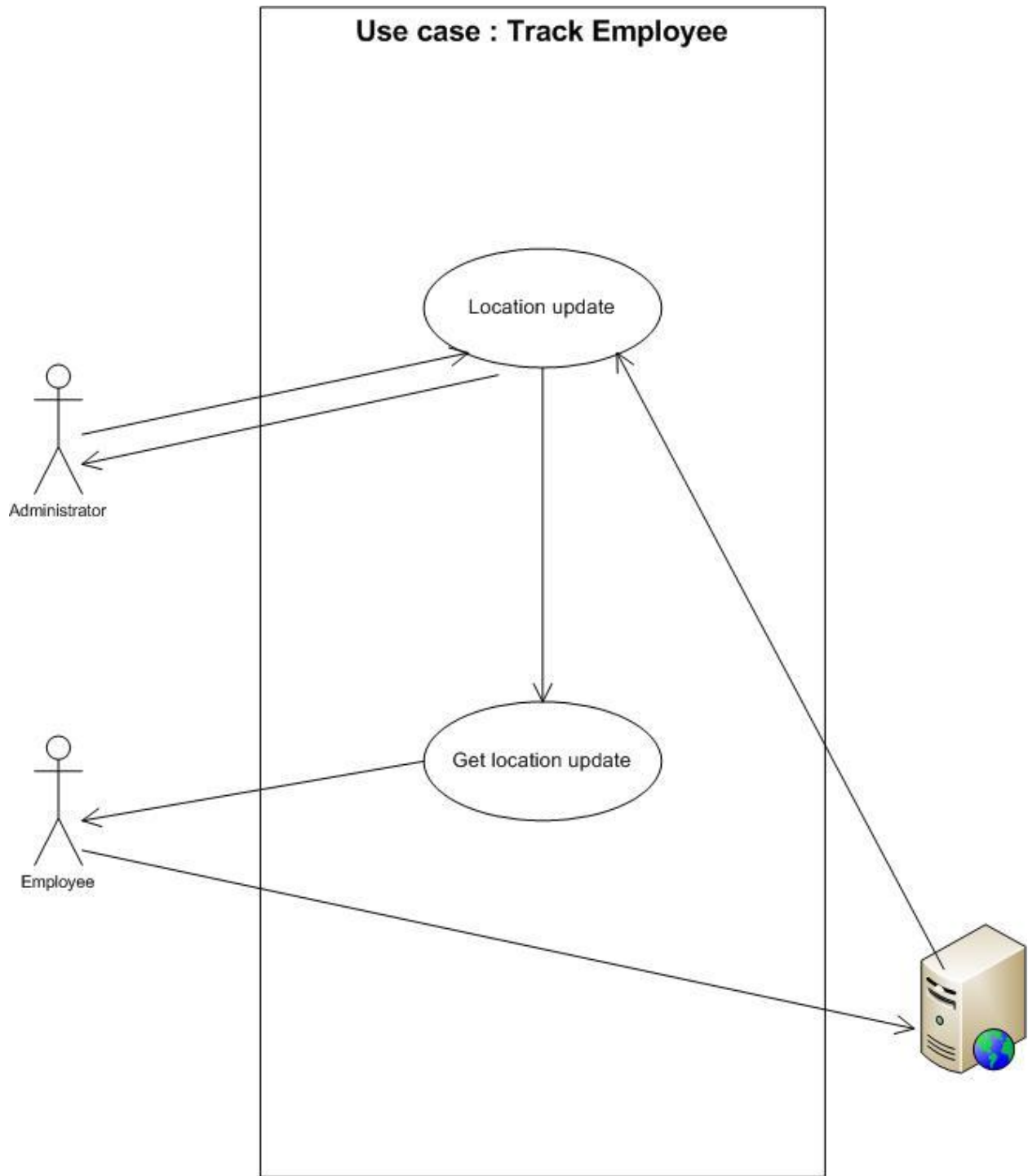


Figure 3.2 : Use Case for employee tracking

3.1.3 Use Case Name : Task assignment

Actors :

Administrator

Employee

Web server

Mobile phone

Triggers:

The administrator will assign some task to the employee so that they will be notified.

Pre-conditions :

The administrator has to place the task into the message which will be sent to the employee.

Post – conditions :

The employee will be notified about the task through his phone.

Normal flow :

The administrator will define the task that is to assigned.

Then the task will be sent to the employee through his mobile phone.

The employee will be notified about the assigned task.

Alternative flow :

The administrator may assign a task of one employee to another employee. In that case the employee will notify the admin about the wrong information.

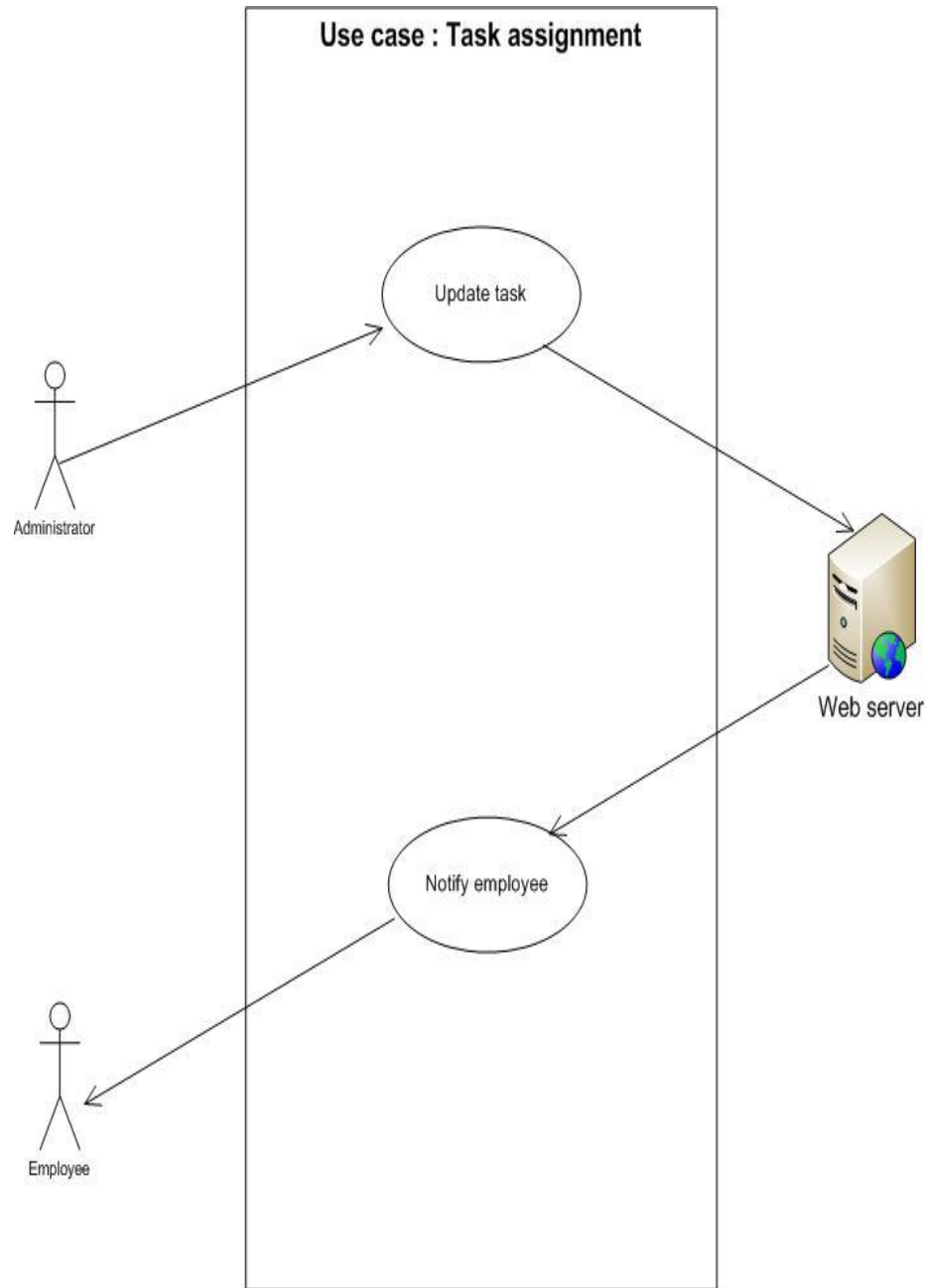


Figure 3.3 : Use Case for Task assignment

3.1.4 Use Case Name : Sales update

Actors :

- Employee
- Web server
- Mobile phone

Triggers:

The employee will notify the administrator about the recent sales information by updating the database.

Pre-conditions :

The employee has to sent the update message to the web server.

Post – conditions :

The administrator will be notified about the latest sales update.

Normal flow :

The employee will make the invoice of the sell.

Then employee will sent that invoice to the web server

The administrator will be notified about the update.

Alternative flow :

The employee may give input of a different client. In that case employee has to correct it, by changing the data in the server.

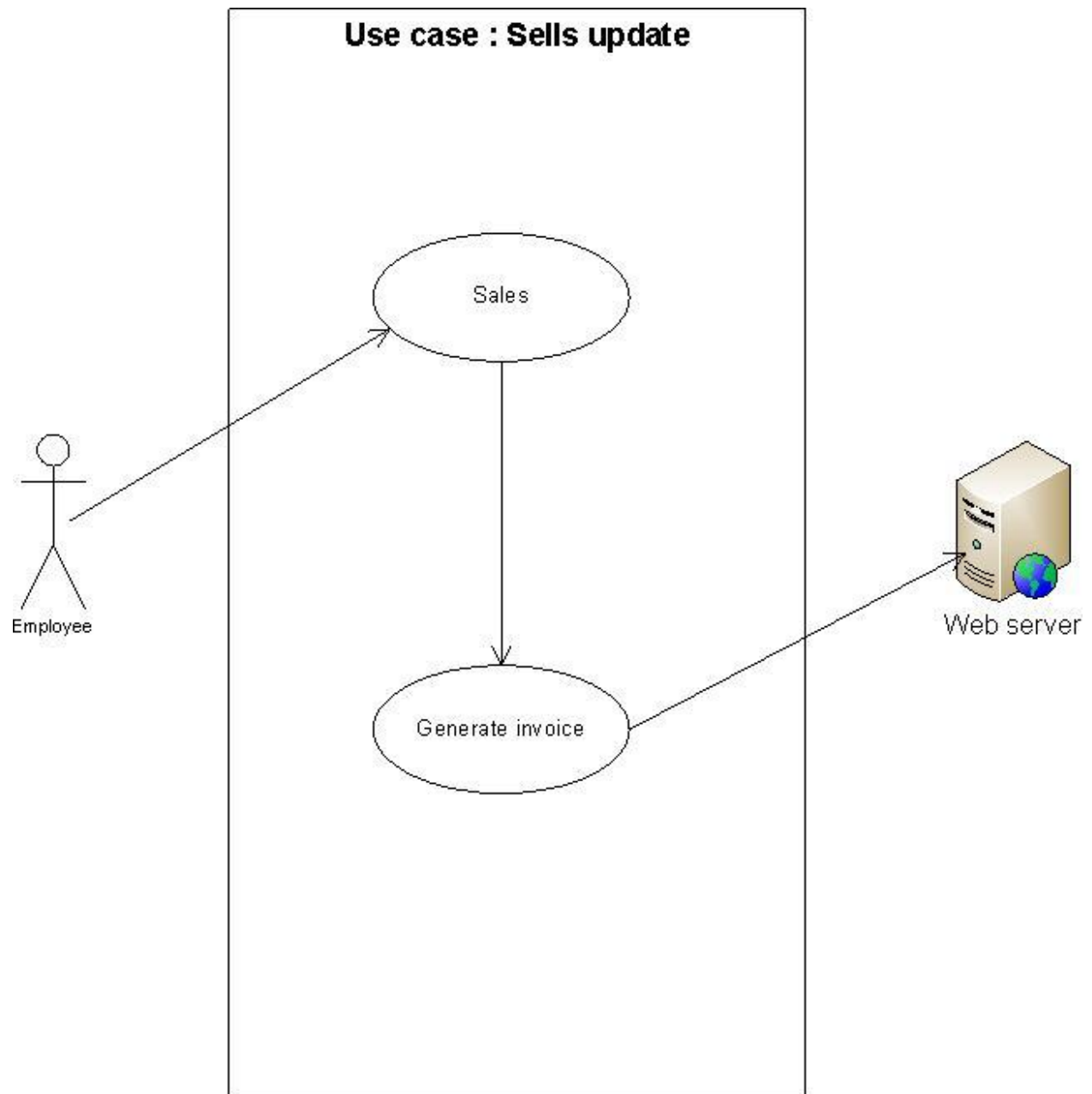


Figure 3.4 : Use Case for Sales update

3.1.5 Use Case Name : Order placement

Actors :

- Employee
- Client
- Web server
- Mobile phone

Triggers:

The client will make the order that he wants to.

Pre-conditions :

The employee will get that order from the client.

Post – conditions :

The employee will update the database about the new order.

Normal flow :

The client will place the order.

Then the employee will update that order to the database.

The administrator will be notified about the new order.

Alternative flow :

The employee may give a wrong input to the database .Which means that the order quantity may be wrong or the client id is wrong.In that case he has to update the database again.

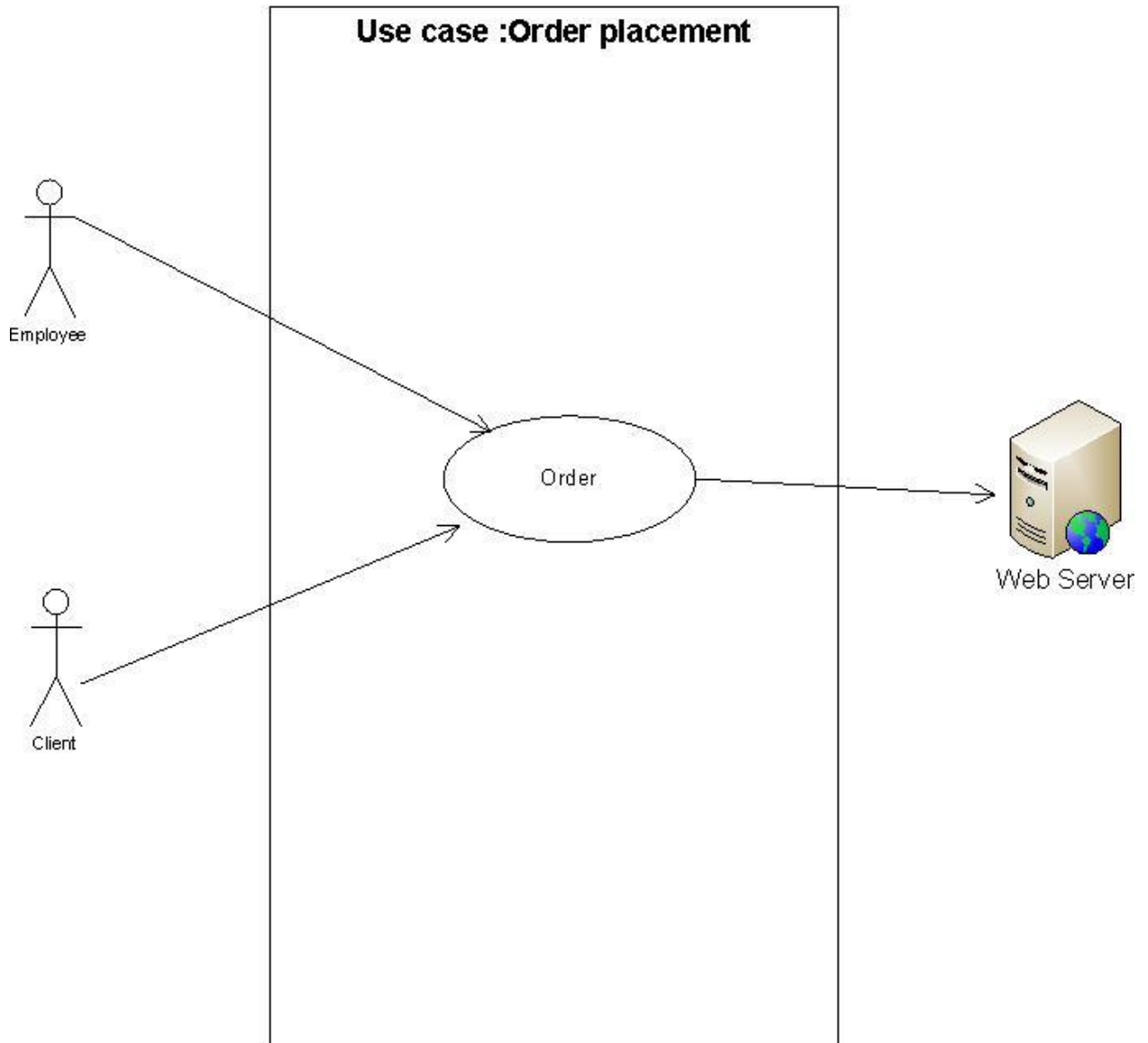


Figure 3.5 : Use Case for Order Placement

3.2 Class diagrams :

Conceptual entities, such as tangible things, roles, incidents, interactions, and specifications, specific to the domain being modeled are abstracted into classes. Classes can have attributes and operations.

The relationships between these classes will be indicated with associations and generalizations. Some associations may require further abstraction as an Association Class.

3.2.1 Class diagram for person class :

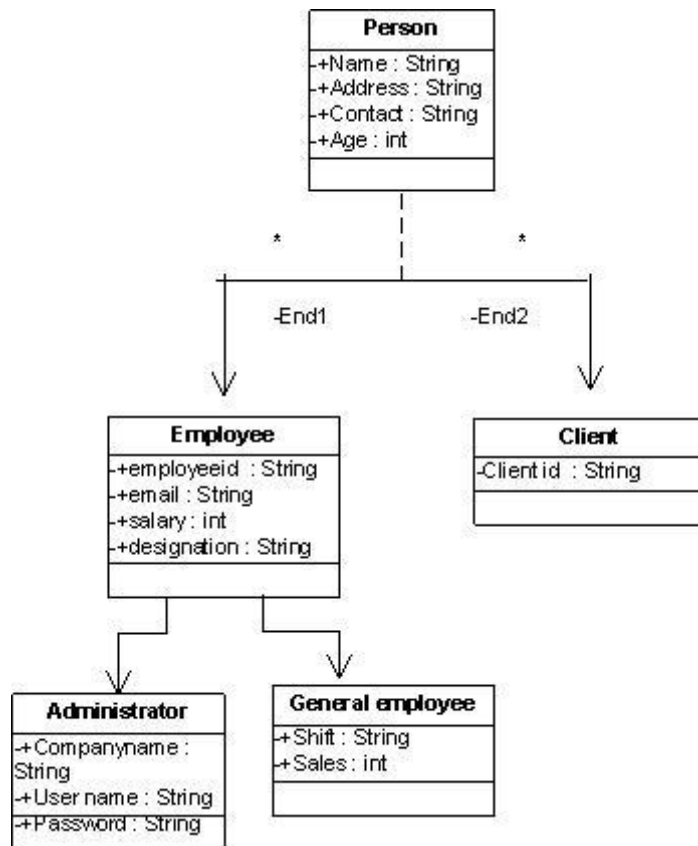


Figure 3.6: Class diagram for Person class

3.2.2 Class diagram for the class Order, Location, Sells, Task assignment :

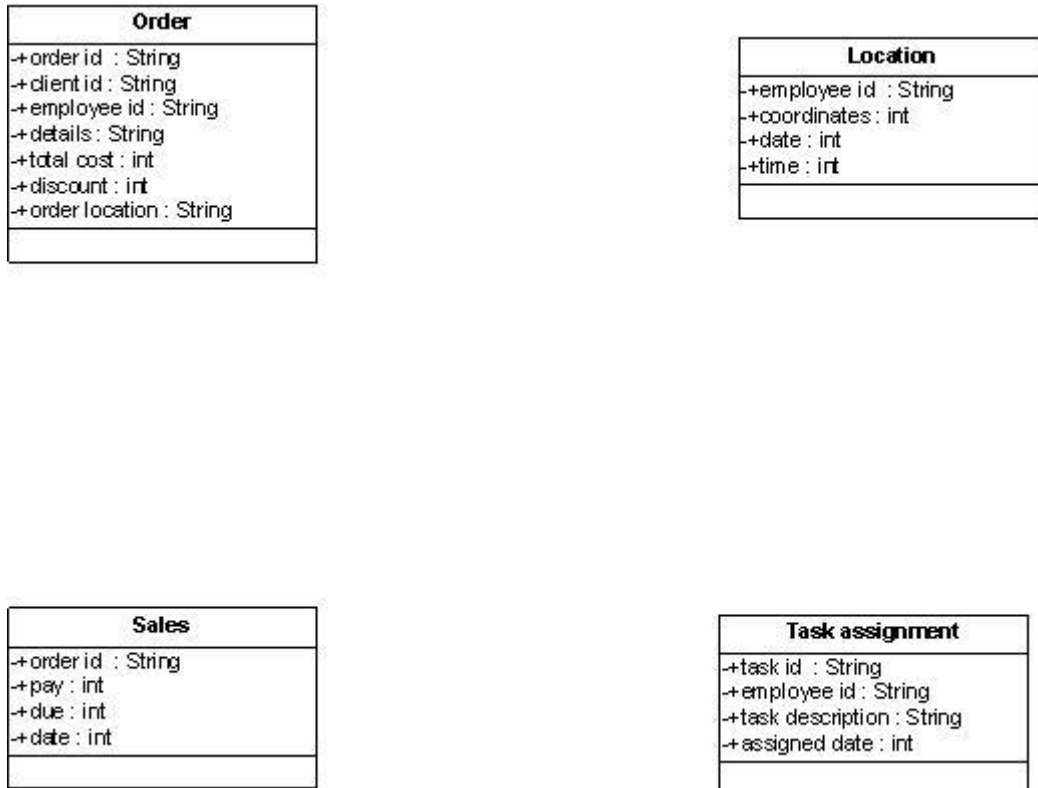


Figure 3.7 : Class diagrams for Order,Location,Sales,Task assignment

Chapter 4: Implementation

In order to develop the whole system , there were several different parts to be implemented. These can be divided into three parts:

- Employee mobile phone application (Android)
- Database
- Administrator's Website

4.1 Employee mobile phone application

In the mobile application, there are different features that are developed for the purpose of the software . These different features of the software are :

- Login
- Employee Location
- Sales Update
- Order Placement
- Message
- Product Search

4.1.1 Login

In order to access the different features of the application, the employee has to login to the company's database. Each of the employee of the company has been provided with a specific Employee ID and Password. The Employees has to login using these information. Then if the provided ID and password of the employee is correct , then he/she will be able to access the features of the application .

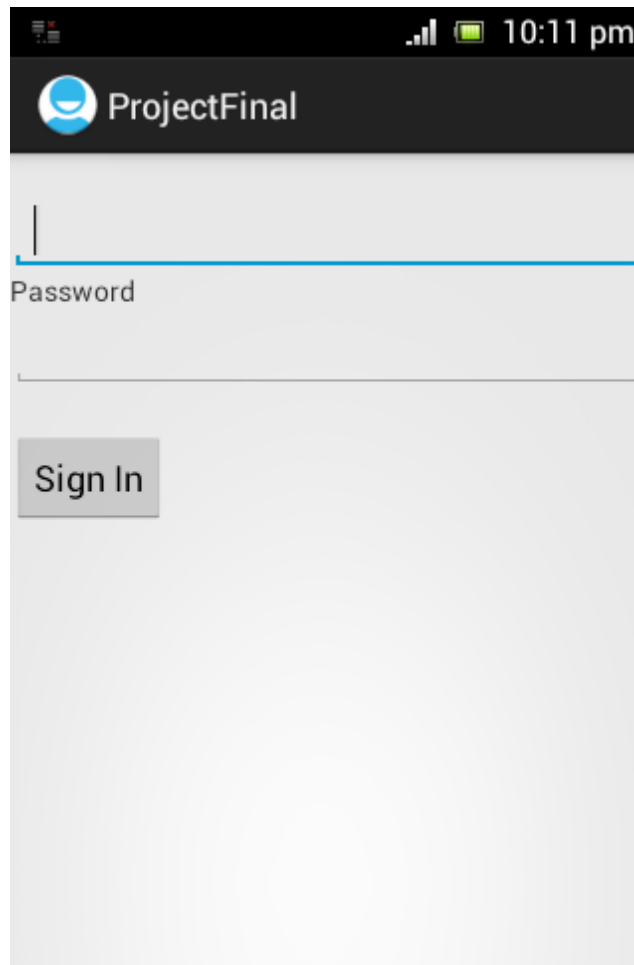


Figure 4.1 : Login form in Mobile application

4.1.2 Main Menu

After login into the application, a list of features will appear in the main menu , where the employee will have to choose the feature that he wants to access. There are different features in the main menu. The employee has to choose the one which is required.

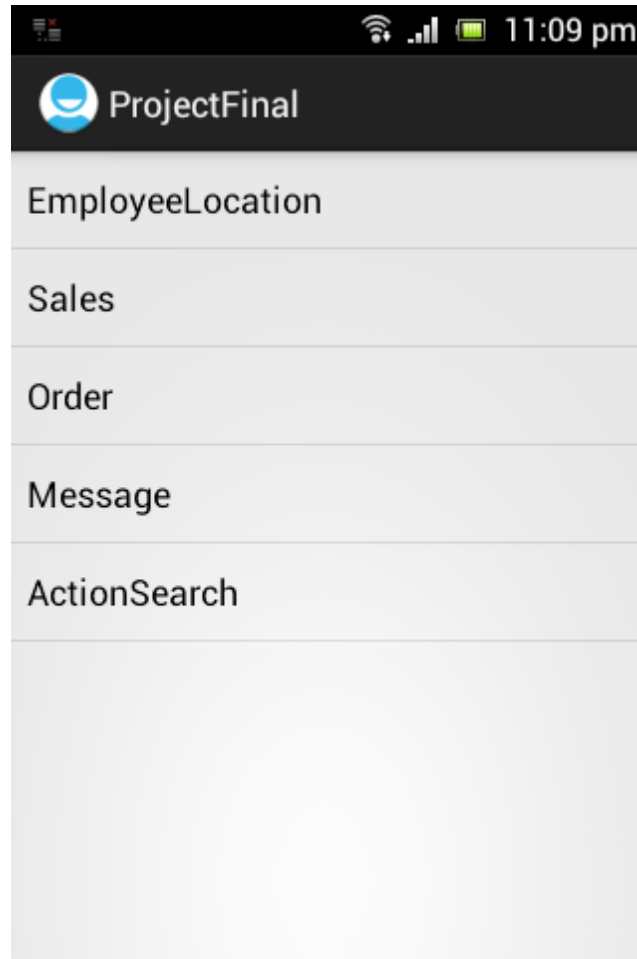


Figure 4.2 : Main Menu of Mobile application

4.1.3 Employee Location

The first feature that appears in the application is the Employee Location. The purpose of this feature is to get the current latitude and longitude of the location and also to show the name of the current location .

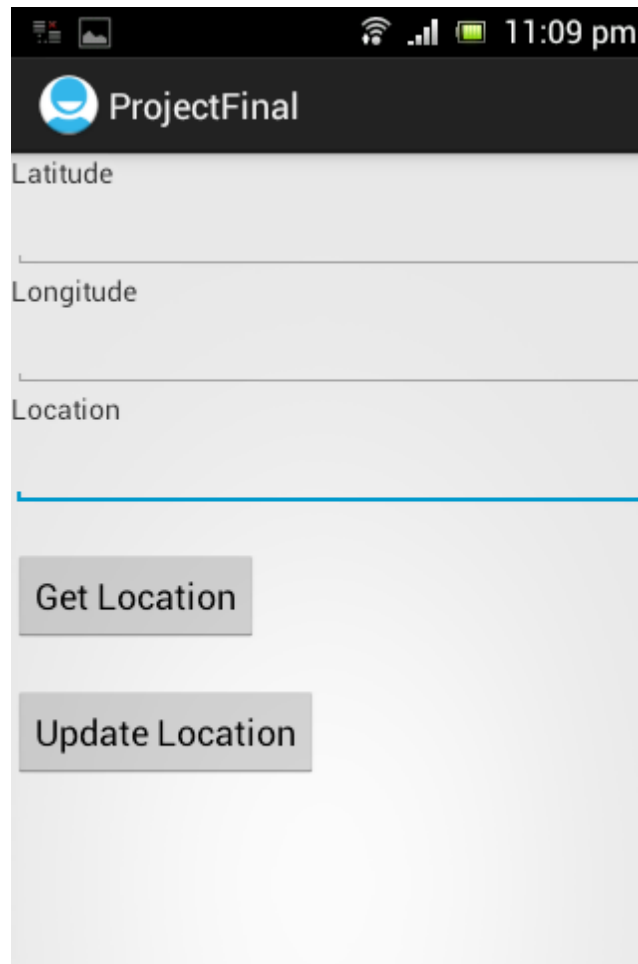


Figure 4.3 : Employee Location

By pressing the “Get Location” button , the employee would be able to get the latitude, longitude and the current location. After that the employee would be able to update the database with these information by pressing the “Update Location” button .

4.1.4 Sales Update

Another feature of the application is to update the database about the sales. In order to do so, the employee can access the Sales feature. There are two fields to give update about. One is the product name and the other one is the quantity of the product that is being sold. The employee can give input to this fields and after that, by pressing the “Update” button he can update the database about the current sale.

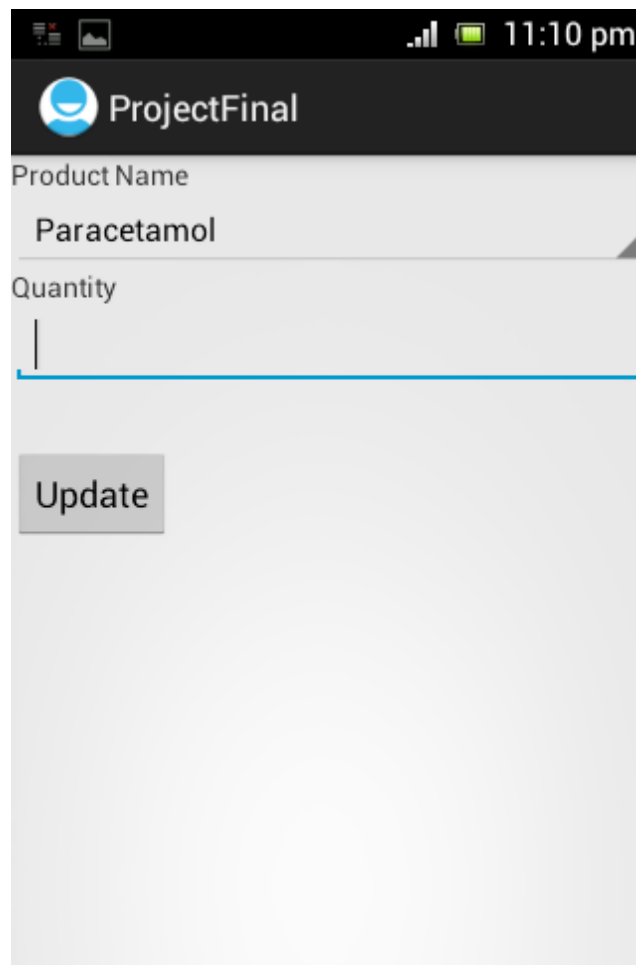
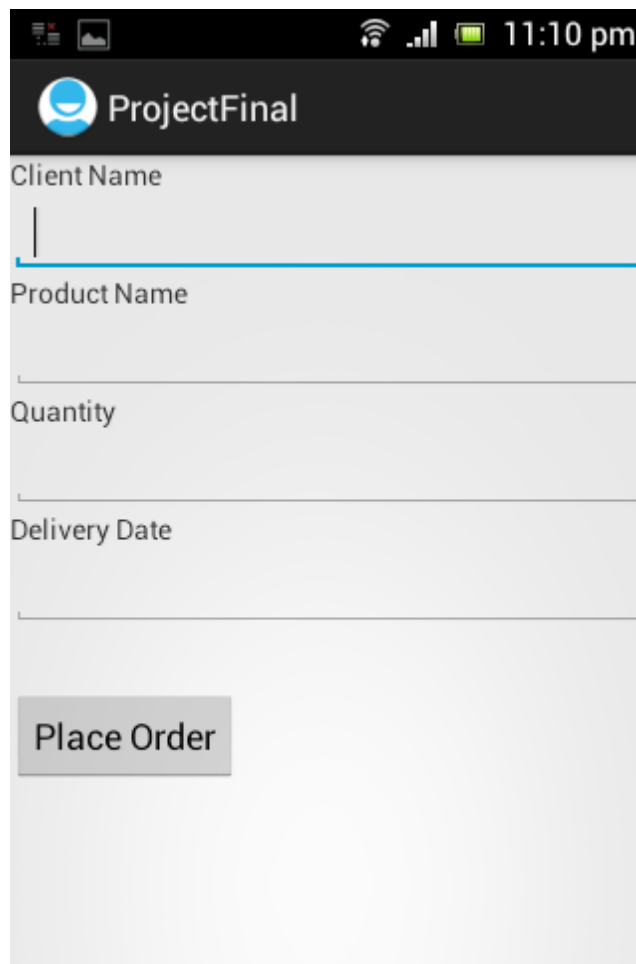


Figure 4.4 : Sales update feature of the application

4.1.5 Order Placement

For the order purpose, there is also a feature called Order , which is used to place order that is being provided by the customer instantly . Here, the employee has to provide detail information about the order. The information, that the employee has to provide are the name of the Client, name of the product, quantity of the product and the delivery date that has to be maintained.



The screenshot displays the 'ProjectFinal' application interface on a mobile device. At the top, the status bar shows the time as 11:10 pm along with icons for Wi-Fi, cellular signal, and battery. Below the status bar is a dark header with the 'ProjectFinal' logo and title. The main content area contains four text input fields labeled 'Client Name', 'Product Name', 'Quantity', and 'Delivery Date'. The 'Client Name' field is currently active, indicated by a blue underline. At the bottom of the form is a grey button labeled 'Place Order'.

Figure 4.5 : Order placement of the application

4.1.6 Message from the administrator

For the business purpose, the admin may require to send some instant message to the employee, so that the employee would be aware of the current job specification that is provided by the administrator.

4.1.7 Product Search

In order to make the job of the employee easier, another feature is provided in the application, which is known as Product Search . Here the basic information about the Product is provided. Suppose the employee has searched for a specific product, then the relevant information about the product will be shown, which are the name of the manufacturer, a small description about the product, and the unit price of the product.

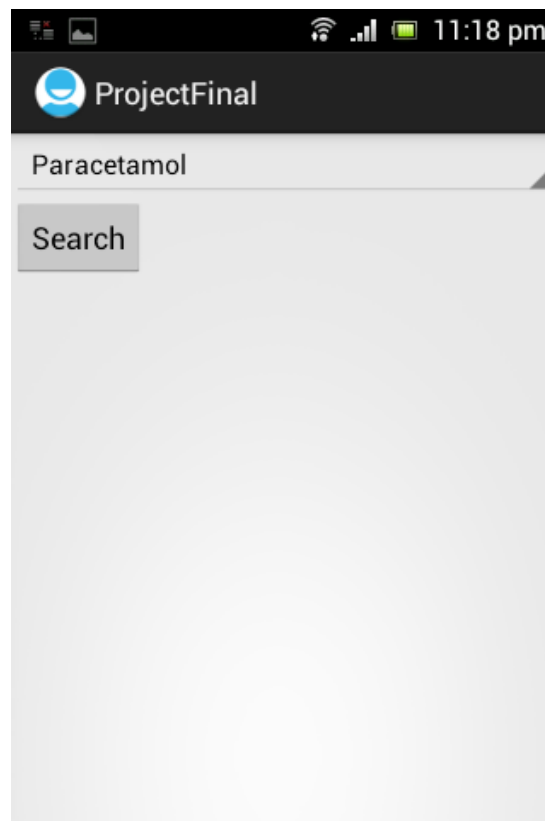


Figure 4.6 : Product Information Search

4.2 Database of the Employee Tracking and Sales Management System

The screenshot displays the phpMyAdmin interface for a database named 'employee tracking'. The main area shows a table structure with the following data:

Table	Action	Records ¹	Type	Collation	Size	Overhead
employee_info	[Icons]	3	MyISAM	latin1_swedish_ci	2.1 KIB	-
employee_order	[Icons]	3	MyISAM	latin1_swedish_ci	2.1 KIB	-
employee_sales	[Icons]	3	MyISAM	latin1_swedish_ci	2.1 KIB	-
employee_task	[Icons]	2	MyISAM	latin1_swedish_ci	3.1 KIB	52 B
employee_tracking	[Icons]	2	MyISAM	latin1_swedish_ci	2.1 KIB	-
event	[Icons]	2	MyISAM	latin1_swedish_ci	1.3 KIB	-
product_info	[Icons]	3	MyISAM	latin1_swedish_ci	2.1 KIB	-
user_login	[Icons]	3	MyISAM	latin1_swedish_ci	2.1 KIB	-
8 table(s)	Sum	21	InnoDB	latin1_swedish_ci	16.9 KIB	52 B

Below the table structure, there is a 'Create new table on database employee tracking' form with fields for 'Name:' and 'Number of fields:'. A warning message at the bottom states: 'May be approximate. See FAQ 3.11'.

Figure 4.7 : Database of the Employee Tracking and Sales Management System

Here all the data, both from the mobile application and the Website are stored. After that these data are shown in the mobile application and the Website according to the request that is send from the employee or the administrator.

4.3 Administrator's Website

The another part of the whole system is the administrator's Website, where all the information from the employee's mobile phone can be shown. This website also contains different parts where administrator can store information in the database and also retrieve information from the database.

4.3.1 Login Page



Figure 4.8 : Login Page

The administrator has to provide the Username and Password in order to login to the Website. All the administrator's are assigned different Username and Password.

4.3.2 Main Menu



Figure 4.9 : Main menu of the Website

After login, a main menu will appear to the administrator, where he will be able to navigate through different options, which are provided only for the administrator's. Each page contains Logout, so whenever the administrator wants to logout, he can logout of the Website .

4.3.3 Searching by Employee ID



Figure 4.10 : Searching by Employee ID

If the administrator, wants to see the sales update or order placement for a particular employee, then he can search for that particular employee and all the information , relevant to that employee will be shown . Again, if the administrator wants to see the whole update of the day, that could also be generated by showing the full result of the day .

4.3.4 Entering Employee Information

As being the administrator, the job of entering employee information has to be done by the administrator. Whenever a new employee joins the company, the administrator will be able to add a new profile for that particular employee.

The screenshot displays a web application interface for 'Employee Management'. The main heading is 'Employee Management', and the sub-heading is 'Employee Information Entry'. On the left, there is a sidebar with the text 'Employee Profile Allocation'. The central area contains a form with the following fields: 'Employee ID*', 'Username*', 'Password*', 'Name*', 'Address', 'Date of Birth' (with a 'Month/Day/Year' dropdown), 'Joining Date' (with a 'Month/Day/Year' dropdown), 'Contact Number*', and 'Designation*'. Below the form are two buttons: 'Submit' and 'Main Menu'. In the bottom-left corner, there is a 'Logout' link.

Figure 4.11 : Entering Employee Information

4.3.5 Entering Product Information

In order to provide information about the product to the employee, the administrator has to update the product information. For that purpose, there is a form, which is given for the purpose of product information, so that the administrator can update the employee about the product information.

The screenshot displays a web application interface titled "Employee Management". Below the title is a section for "Product Information Entry". The form contains several input fields: "Product ID*", "Name*", "Description" (a larger text area), "Manufacturer*", "Type*", and "Unit Price*". Each of these fields has an asterisk indicating it is required. Below the form are three buttons: "Submit", "Main Menu", and "Logout". The background of the interface features a dark, ornate floral pattern.

Figure 4.12 : Entering Product Information

Here, the administrator can provide necessary information about the product so that the information can be shown to the employee. The required field's which the admin must provide are Product ID, Name of Product, Manufacturer of the product, Type of the product and the unit price of the product.

4.3.6 Sending Message to the employee

In order to keep the employee updated about the job specification, the admin can send message to the employee, so that he will be notify about the current job that is being provided by the admin.



The screenshot displays a web interface for 'Employee Management'. At the top, the title 'Employee Management' is centered. Below it, the section 'Send Message' is also centered. The form consists of three main input areas: a text box for 'Employee ID*', a text box for 'Message Subject', and a large, empty text area for the message body. At the bottom of the form, there are two buttons: 'Send' and 'Main Menu'. The background of the interface is a dark, ornate floral pattern.

Figure 4.13 : Sending Message to the employee

Here , the admin has to provide the specific Employee ID, that he wants to send message to. This field is required , Because without these information, the message cannot be send to any employee. After that a Subject is required, in order to give the employee a hint about the job that is being assigned, and after that the description of that job is provided so that the employee will get to know what is actually required to be done .

4.3.7 Employee Tracking

For the betterment of the company, the admin can also see where the employee is actually right now . Whenever the employee gets the location and updates the database the admin can see the information provided from the employee's device.



Figure 4.14 : Employee Tracking

4.3.8 Sales Update



Figure 4.15 : Sales Update

Chapter 5 : Conclusion

Our main objective was to develop a system which will be useful enough for a particular company so that the company will be updated about the condition of the companies business. Through the implementation process, we have developed a system, where information can be send from the administrator's point of view and also employee's point of view. Both of them can share information that is required for the companies information update.

5.1 Future Work

The project “A smartphome based Employee Tracking and Sales Management System” has been developed to a major part of the design that was planned. But there are few more features, that are also considered to be developed.

- Make the system more user friendly .
- Develop for different Operating System .
- Develop a navigation system for the employee.
- To host the database using Cloud database service.
- To develop a traffic alert system for the employee, so that he can choose his route more conveniently

5.2 Conclusion

The title of the project itself defines a lot about the actual project. This project is built for the purpose of the betterment of different companies, so that they can easily communicate with their employees who are working at the field level. In the modern age, time is the most valuable thing that matters. So this project was developed keeping in mind that a lot of companies requires instant access to their data for the assessment of the performance of both the company and also the individual employees that are working under the company . In this modern world, the competition is so tough that no company wants to lag behind others. Because of this reason, this system was developed so that companies will be able to improve their efficiency and also to evaluate the performance of the employee who is working under the respective company. This entire system will be developed more to make it even more flexible and also user friendly to the companies, so that they can prosper in their business situations and also to ease the communication between the administrator and the employee's those are working under him .

Chapter 6: References

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