Web based Management System for JDC Printing Technologies (Pvt) Ltd

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DECLARATION

I certify that that dissertation does incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any university and to the best of my knowledge and belief, It does not contain any material previously published or written by another person or myself except where due reference is made in the text. I also hereby consent for my dissertation, if accepted, to be available for photocopying and for inter-library loans, and for the title and summary to be made available to outside organizations.

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ABSTRACT

JDC group of companies persist since 1979 and it is compromises three companies named JDC Printing Technologies (Pvt) Ltd, JDC Graphic Systems (Pvt) Ltd and Unifold. JDC Printing Technology (Pvt) Ltd is a leading supplier of machinery and materials to the printing and packaging industry in Sri Lanka from pre-press to finishing. JDC Graphic Systems (Pvt) Ltd is the market leader in the flexography industry in Sri Lanka. Unifold is the pioneer in the exclusive designing and production of photography albums, diary covers and note books.

The presented system is having the capability of managing all three companies' activities. The system covers the major areas of employee activities such as their leaves, attendance and performance. Furthermore it is facilitates with the HR (Human Resource) activities such as recruitments and staff relations. Other than those it is facilitates with issuing vehicle gate passes and calculating fuel consumption of company vehicles.

Requirements' gathering is carried out by interviewing certain staff members and surveying current documents. Then analysis is done by drawing use case diagrams for current process and writing a requirement specification. Finally get the approval for the requirement specification from the client.

RUP (Rational Unified Process) is used as the design methodology and the UML (Unified Modelling Language) Diagram is used to create the blueprint of the system. The system is developing by using open source technologies such as PHP (Hypertext Pre Processor) as the server side scripting language and MYSQL as the backend of the system. Codeigniter Framework is used to speed up the development. Furthermore JQuery and Ajax technologies are used to improve user friendliness of the system. Dreamweaver CS 5 is used as the IDE (Integrated Development Environment) for implementing the system.

Multiple Testing strategies were used at the testing phase of the system to ensure a high quality system. Unit testing, blackbox testing, integration testing, system testing and user acceptance was carried out and test cases are shown in the dissertation. In conclusion the future improvements of the system are stated in the dissertation which is considered to be implemented in the JDC Management System.

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LIST OF ACRONYMS

AJAX - Asynchronous JavaScript and XML

CD ROM - Compact Disc Read Only Memory

CSS - Cascading Style Sheet

CSV- Comma Separated Values

DBMS - Database Management Systems

ER - Entity Relationship

GUI - Graphical User Interface

HTML - Hypertext Mark-up Language

J2EE – Java Enterprise Edition

OO - Object Orientation

PDF - Portable Document Format

PHP - Hypertext Pre-processor

RAD - Rapid Application Development

RAM - Random Access Memory

RUP - Rational Unified Process

SQL - Structured Query Language

UML - Unified Modeling Language

URI - Uniform Resource Indicator

URL - Uniform Resource Location

CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

With the development of Information Technology more printing needs and graphical designs are grow faster. JDC is recognizes the current need of the society and expand their business by being the leader of the area. They import the machinery and spread them all over the country providing better service to their customers

This chapter further depict the nature of the system while explaining the motivation for the project and objectives and scope of the project.

1.2 MOTIVATION FOR PROJECT

JDC has to maintain lot of files and there is lot of paper works because of the current manual process. Therefore it is very hard to measure out the performance of the employees and consider their appraisals. JDC has more than 100 employees and without having a system all the HR processes going late. They are leading suppliers providing machineries; therefore they always have to visit their customers to give their service. Then the issuing vehicle gate passes should be automated also.

Furthermore without having a system they cannot get the relevant reports accurately. By considering their current difficulties they asked to create a JDC management system.

1.3 OBJECTIVES OF THE PROJECT

The main objective of the project is to provide a system to JDC. This should be reliable, effective and mostly rich with user friendliness. The system should be very simple as some options are available to all employees.

Here is a list of objectives in the system.

- Provide facility to assign tasks from the system and give the opportunity to see all employees. This will help employees to plan their works more efficiently.
- Track the all employees performance and finally motivate them to work happy and effectively.
- Reduce the paper works and maintain central repository of data.
- Generate timely reports through the system.
- Track the fuel consumption more effectively.
- Issue the vehicle gate passes more efficiently.
- Keep employees and employers relationship better than present.

1.4 SCOPE OF THE PROJECT

The scope of the system is identified by studying the client requirements and time allocated to do the BIT (Bachelor of Information Technology) final year project.

Company Details Management

The system will manage the details of each employee and departments.

Time Attendance

The system will keep track of employee attendance and show the late comings and late outs.

Leave Management

The system gives the facility to request leaves and view present status of leaves and furthermore helps employees to manage their leaves successfully.

Performance and duty monitoring

Employees can view their assigned tasks and duties through the system and for each and every task they completed can get marks. Finally this will help to get their working progress.

Recruitment and talent management

The system facilitates managing resignations and recruitments. It will show the qualification of current employees and their talents and gives opportunity to plan up training programs for necessary internal employees. Furthermore this will give the facility to employees plan their future activities and get the approval from certain managerial levels.

Managing Staff relation and Labor relation

The system facilitates handling inquiries from internal staff, organizing special HR events and maintains history of important employee remarks/events.

Vehicle gate passes and fuel management

Manage the fuel consumption timely and provide gate passes through the system while keeping track of the customer visiting details.

1.5 STRUCTURE OF THE DISSERTATION

The dissertation includes of mainly six chapters to depict how the system is initialized and implement and till the deployment.

Chapter 2 – Analysis

The Analysis is the initial stage of System Development Life Cycle. It gives the basement to the system and depending on the success of this stage the whole system will success. The complexity of this stage could be able to reduce by taking the process into a diagram.

Chapter 3 – Design

System design is the second phase of System Development Life Cycle. In this phase the analysis of the requirements converts into design model. This is include with UML diagrams, User Interface Design and the ways the system can designs.

Chapter 4 - Implementation

This is the description of how the system is implementing and what are the technologies used for design the system. Furthermore main code segments are describing here.

Chapter 5 – Evaluation

In this phase the system is testing while creating the test cases to ensure that the system is perfectly running and the client's requirements are covered. Depending on the success of this status the system will be a perfect one.

Chapter 6 – Conclusion

This is the final chapter of the dissertation. This is giving the summarized description of overall system and includes the future improvements planning to do.

CHAPTER 2 ANALYSIS

2.1 INTRODUCTION

Requirement gathering and Analysis phase is the most crucial situation in the software development life cycle. If it is not successful final output will be different from what the client expected. Therefore more time should be allocated and thoroughly go through the client needs. Fact finding techniques are used for the requirement gathering and furthermore have to do presentations to verify the facts are true and client need. Prototype of the proposed system helps to explain the client what they will see after build the system.

This chapter mainly include the fact finding techniques used, functional non-functional requirements of the system and similar system that are used to gain knowledge of proposed system.

2.2 FACT FINDING TECHNIQUES

Multiple fact finding techniques are carried out to get the requirements for design the system. The used techniques are Interviews, Document Review, Observation and Analysis similar systems.

Interviews are carried out with the managerial level users and the other staff members also. This can help to identify what are the difficulties they face current process and collect their new ideas for build the system. Pre make questionnaires used to get the more information.

By reviewing and analysing their current data repository could identify what kind of data they should want to maintain within the system. Furthermore what would be the final output of forms they want.

Observation is carried out to clarify the collected information’s validity and get involve with current process to familiar the company process.

The final output of the analysis of the current process further depict in Figure 2.1 use case diagram that any person can easily understand the process.

2.3 ANALYSIS OF CURRENT SCENARIO

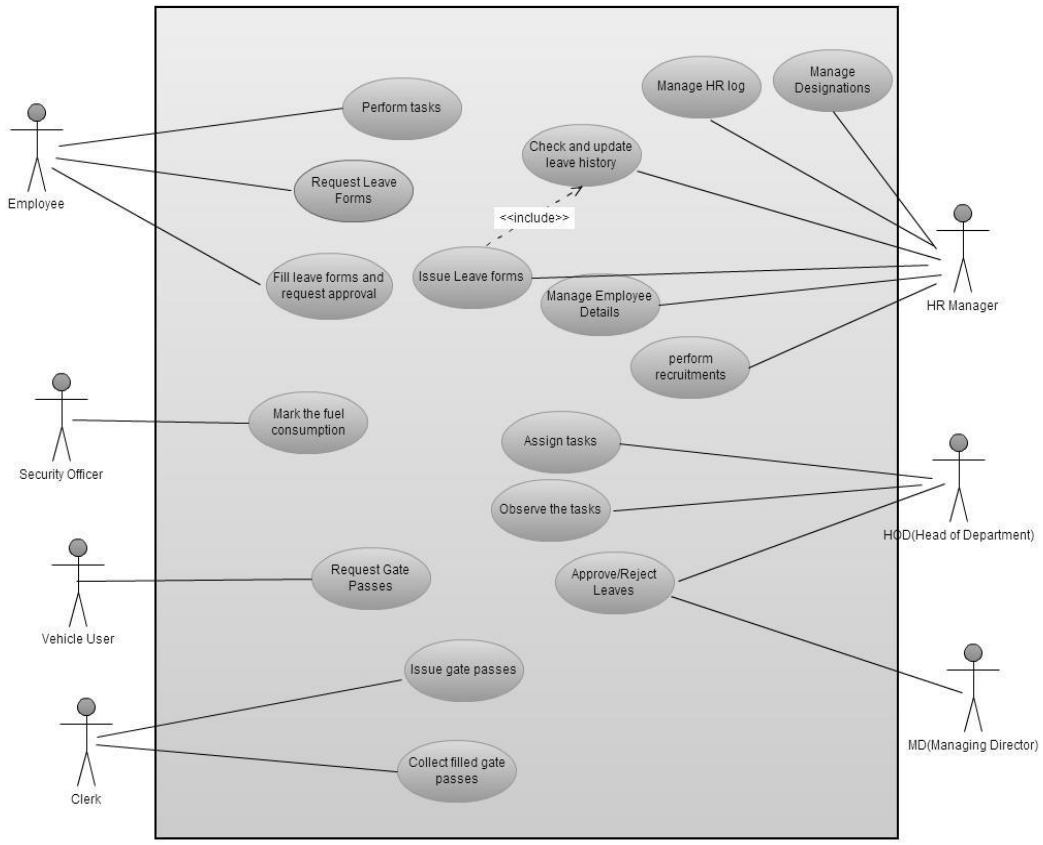

Figure 2-1 Top Level Use case Diagram - Current Manual Process

The current scenario is when the supervisors or managers demand daily tasks to the employees they complete them and mention whatever they done by face to face when they want to get leaves they have to fill the leave forms and get the approval by higher management by meeting them. Therefore HR manager has to maintain all those activities manually and neatly. When the

gate pass is process two persons have to get the details of the correct fuel consumptions and time spend for travelling.

2.4 FUNCTIONAL REQUIREMENTS

Functional Requirements are the facts that included in the system that should be need by client. After analysis the scenario the functional requirements are identified. To build a system that client wanted it is necessary to complete the functional requirements of the system successfully.

Company Details management Module

- Manage the details of three companies
- Manage the details of departments
- Manage the details of Employees

Time Attendance Module

- View the attendance of each employee with the date and time.
- Provide the attendance reports of the each employee in timely manner.

Leave Management Module

- System should provide the facility to add, edit, delete, view leave types
- System should provide the facility to add, edit, delete, view and search the allocation of leaves for particular employee
- System should give the facility to employees to request leaves when they want.
- System should provide the facility to higher management for approving leaves.

Performance and Duty Monitoring

- The system should give facility to the higher management (Head of Department) to assign tasks for the each employee and give the facility to edit, delete, view and search.
- System should facilitate view the assign tasks for particular employee only and give him/her the facility to mark when they complete the task.
- System should give the facility to HOD (Head of Department) to monitor the tasks completion of each employee and approve them.

Recruitment and Talent Management

- System should have the facility to manage job roles and the relevant details such as salary details for each job roles, functionalities etc.
- The system should have the facility to inform employee of their resignation through the system and by considering each employees' age the system indicate the list of employees who are near to resign.
- System should provide the facility to deploy the vacancy internally, for current employees to apply.
- System should give the facility to employees for propose their new ideas and future planning through the system.

Managing Staff relation and Labor relation

- System should have the facility to handle employee's inquiries.
- System should be facilitating planning HR events and send mails for certain parties to inform and get the approvals.
- System should be providing the facility with maintaining special HR log that is having history of special situations.

Vehicle Gate Passes and Fuel Management

- The system should maintain vehicle details such as vehicle number, patrol usage of the vehicle (how much kilometer can go by using one liter), number of years for the vehicle etc.
- The system should maintain details of the employees who use company vehicles for their personal use and customer visiting.
- System should have the facility to issue gate passes and calculate the fuel consumptions.

Administration Module

- System should give the facility to system administrator for manage users and set the privileges for users

Report Module

- System should have the functionality of generating timely reports.
- System should have the facility to print reports and documents.

2.5 NON FUNCTIONAL REQUIREMENTS

Non functional requirements define the how the system is useful to the day to day usage and familiarity to the user.

- The user interface should be simple as possible.
- The system should be reliable and should process accurately
- The response time of the processes should be fast in the system.
- The security of the system should be high without accessing irrelevant data to the irrelevant users.
- The validations of the system should be perfect to reduce erroneous situations
- As a web application the system should be compatible with all browsers.

- The data should be properly organized and navigations, search options should be properly plan out.

2.6 LITERATURE REVIEW AND SIMILAR SYSTEMS

The similar system of the scenario is reviewed to get further details and understanding. This is helped to determine the functionalities of the system and how those functionalities build to close for the users.

Web Human Resource (WebHR)

WebHumanResource (WebHR) is an online Human Resource Management System for small and medium organizations. WebHR makes it easy for the HR Department to start managing their HR effectively and efficiently in less than 20 minutes. WebHR is an indispensable tool not just for HR Manager but for the entire organization.

WebHR assists in managing the organization's most important asset - its Human Resource.

WebHumanResource (WebHR) facilitates all functions of the Human Resource Department that deals with recruitment, employees management, payroll, performance, training etc. In fact, WebHR can be used to simplify the daily task involved in the HR Department.

WebHR acts as a bridge between human resource management and information technology. It allows enterprises to automate many aspects of human resource management, with the dual benefits of reducing the workload of the HR department as well as increasing the efficiency of the department by standardizing HR processes.

WebHR converts human resources information into a digital format, allowing that information to

be added to the knowledge management systems of the organization. The result of this is that HR data can be turned into useful information that can cater the needs of any other department within the organization. In analyzing organization wide resource usage this data can prove valuable. Data related to the time usage of the workforce can enhance the decision making abilities of management, allowing the HR department to form an integral aspect of strategy formation for the organization as a whole. *[WWW1]*

OrangeHRM

OrangeHRM is the world's most popular and used open source human resource management software. The open source OrangeHRM product suite includes an array of modules that provide personal information management (PIM), employee self-service (ESS), leave management, time and attendance tracking (PTO), performance evaluation and recruitment, all at no cost. Today OrangeHRM is being used by over a million users around the world, while larger multinationals have used the open source version and customized the system to meet their human resource management standards & requirements.

OrangeHRM was started during fall 2005 and the first beta release was made in January 2006. Ever since OrangeHRM has been embraced by its community and is continuously improved by the help of a receptive and knowledgeable worldwide open source community. *[WWW2]*

CHAPTER 3 DESIGN

3.1 INTRODUCTION

A software design is a description of the structure of the software to be implemented, the data which is part of the system, the interfaces between system components and, sometimes, the algorithms used. Designers do not arrive at a finished design immediately but develop the design iteratively through a number of versions. The design process involves adding formality and detail as the design is developed with constant backtracking to correct earlier designs. *[Ian Sommerville, 2007]*

3.2 ALTERNATE SOLUTION

There are several alternative solutions for the proposed system. Following are the recognized solutions and their pros and cons when looking in client's perspective.

- Purchase online or standalone system – The client may have to pay large amount for purchasing a system and sometime there may have to do some major modifications to make it suitable for the client's requirement.
- Creating a standalone system – Once this system is build for usage of each and every employee the system has to install all of their computers and it is not cost effective and cannot maintain centralize database. Finally it is very hard to get necessary reports without having all data.
- Implement a web based solution using Asp.net – these types of solutions come with IIS server and SQL server. They are not open source technologies. Therefore have to buy licenses then it is not cost effective to build a system using these type of technologies.
- Implement a web based solution using J2EE – It is open source technology that can run any platform once java is platform independent language.
- Implement a web based solution using PHP and MYSQL – This is also an open source technology can run on any platform.

3.3 SELECTED SOLUTION JUSTIFICATION

Considering the client's problem domain and affordable budget it is suitable to going for an open source web based solution. Bellow is the justification for used web based system build in PHP and MYSQL.

- Once the PHP is an open source technology it is really easy to get the online support to solve errors while programming.
- Cross platform compatibility
- Centralized repository of data is available. Therefore it is easy to manage and maintain data.
- Highly deployable where simply the web address is necessary to login and use the system.
- Security of the data is high as the data resides on the server when using client server architecture.
- Only the web browser is enough for run in client computer. Therefore operational and maintenance cost is low.
- Have less possibility to crash the whole programme.

3.4 PROCESS MODELS

A software process model is a simplified description of a software process that presents one view of that process. Process models may include activities that are part of the software process, software products and the roles of people involved in software engineering. *[Ian Sommerville, 2007]*

Some of the process models briefly describe bellow.

3.4.1 Waterfall model

The waterfall model derives its name due to the cascading effect from one phase to the other. In this model each phase well defined starting and ending point, with identifiable deliveries to the next phase. At the end of the each phase, a review takes place to determine if the project is on the right path and whether or not to continue or discards the project. *[Ian Sommerville, 2007]*

3.4.2 Prototyping Model

A prototype is a working model that is functionally equivalent to a component of the product. This model reflects an attempt to increase the flexibility of the development process by allowing the client to interact and experiment with a working representation of the product. The developmental process only continues once the client is satisfied with the functioning of the prototype. At that stage the developer determines the specifications of the client's real needs. *[Ian Sommerville, 2007]*

3.4.3 Rapid Application Model (RAD)

"This is an incremental software development process model that emphasizes a very short development cycle [typically 60-90 days]." The RAD model is a high-speed adaptation of the waterfall model, where the result of each cycles a fully functional system. *[Ian Sommerville, 2007]*

3.3 PROPOSED SYSTEM METHODOLOGY

Short for Rational Unified Process, a software development methodology from Rational. Based on UML, RUP organizes the development of software into four phases, each consisting of one or more executable iterations of the software at that stage of development.

Inception -- In this stage, the project business case is stated and the team decides if the project is worth doing or if it is even possible. It is important to the process to first formulate the scope of the project and also determine what resources will be needed.

Elaboration -- In this stage, the developers take a closer look at the project to determine its architecture foundation and to evaluate the architecture in relation to the project. This stage is

important to the RUP because it is here that developers analyze the risks associated with changing the scope of the project or adding new technologies along the way.

Construction -- In this stage, the development of the project is completed. The application design is finished and the source code is written. It is in this stage that the software is tested to determine if the project has met its goal laid out in the inception phase.

Transition -- In this stage, any fine-tuning is performed. Any final adjustments can be based on user feedback, usability or installation issues. *[WWW3]*

The following diagram shows the RUP life cycle.

3.4 DESIGN TECHNIQUES

Unified Modeling Language (UML) is a standardized, general-purpose modeling language in the field of software engineering. The Unified Modeling Language includes a set of graphic notation techniques to create visual models of object-intensive systems.-Unified Modeling Language (UML) combines techniques from data modeling (entity relationship diagrams), business modeling (work flows), object, and component modeling. It can be used with all processes, throughout the software development, and across different implementation technologies.

The Unified Modeling Language (UML) offers a standard way to visualize a system's architectural blueprints, including elements such as:

- Activities
- Actors
- Business
- Database schemas
- (Logical) components
- Programming language statements
- Reusable software components. *[WWW4]*

3.5 SYSTEM DESIGN

The use case diagram has drawn for determine the users of the system and the for the each module separate use case diagrams created for getting clear picture about the system.

The system is consisting of nine modules. They are

- Company Details Management Module
- Time Attendance Module
- Leave Management Module
- Performance and Duty Monitoring Module
- Recruitment and Talent Management Module
- Managing Staff Relation and Labour Relation Module
- Vehicle Gate Passes and Fuel Management Module
- Administration Module
- Report Module

3.5.1 Company Details Management Module

This module is implemented to store the major information of the company and employee. Once a new employee is joined to the company his / her details must enter to the system to process other events.

DEO – Data Entry Operator

HOD – Head of Department

HR – Human Resource Staff

Figure 3.1 depicts the use case diagram for the Company Details Management Module

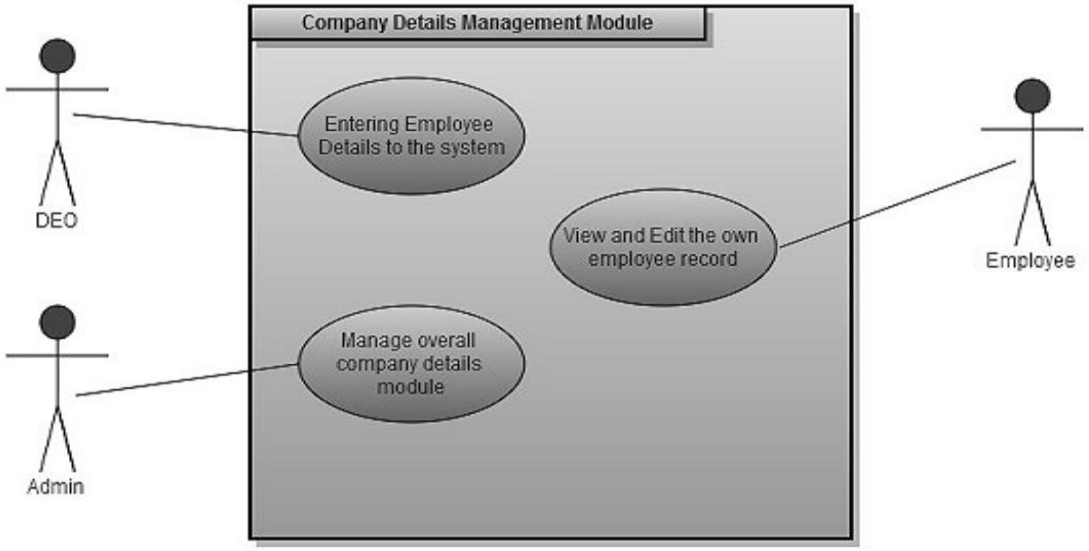

Figure 3-1 Use case diagram for Company Details Management Module

Table 3.1 depicts the use case description for the manage employee in Company Details Management Module

Use case narration for join new employee

Use case	Manage Employee
Actors	DEO, Employee
Overview	
Every employees in the company should register with the system	
Precondition	
Should not be already has employee record in the system	
Flow of events	
1. Insert new employee record 2. The own details can modify by each employee when they login 3. Employee can mention resignations	
Post Condition	

1.When employee is resign or leave the company that record should deactivate

Table 3-1 Use case narration for join new employee

3.5.2 Time Attendance Module

Figure 3-2 depicts the use case diagram for Time Attendance Module

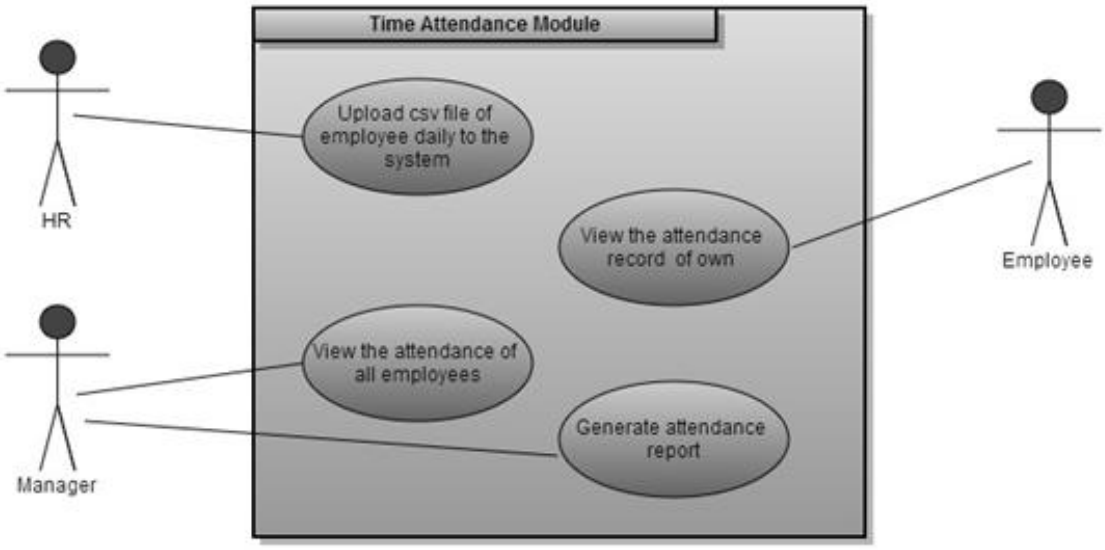

Figure 3-2 Use case diagram for Time Attendance Module

3.5.3 Leave Management Module

Figure 3-3 depicts the Use Case diagram for leave Management module

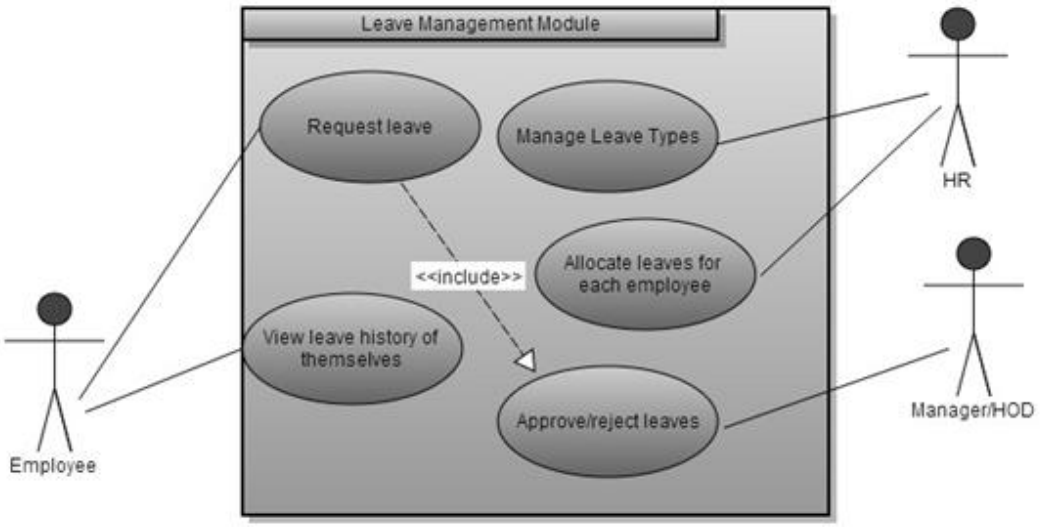

Figure 3-3 Use Case diagram for Leave Management Module

Table 3-2 depicts the use case narration for requesting leaves

Use case narration for request leave

Use case	Request leave
Actors	Employee, HR, HOD
Overview	
Employees who are active can apply for the leave	
Precondition	
Should have allocate leaves to apply for leave	
Flow of events	
1.Add leave types by HR 2. Allocate leaves for each employee 3. Apply leave by selecting necessary leave type 4. System shows the leave balance and details when applying.	

5. once the application is process it goes for the approval process
Post Condition
1.Leave application will approve/ reject by HOD/Manager

Table 3-2 Use case narration for Request Leave

3.5.4 Performance and Duty Monitoring Module

Figure 3-4 depicts the Use Case diagram for Performance and Duty Monitoring Module

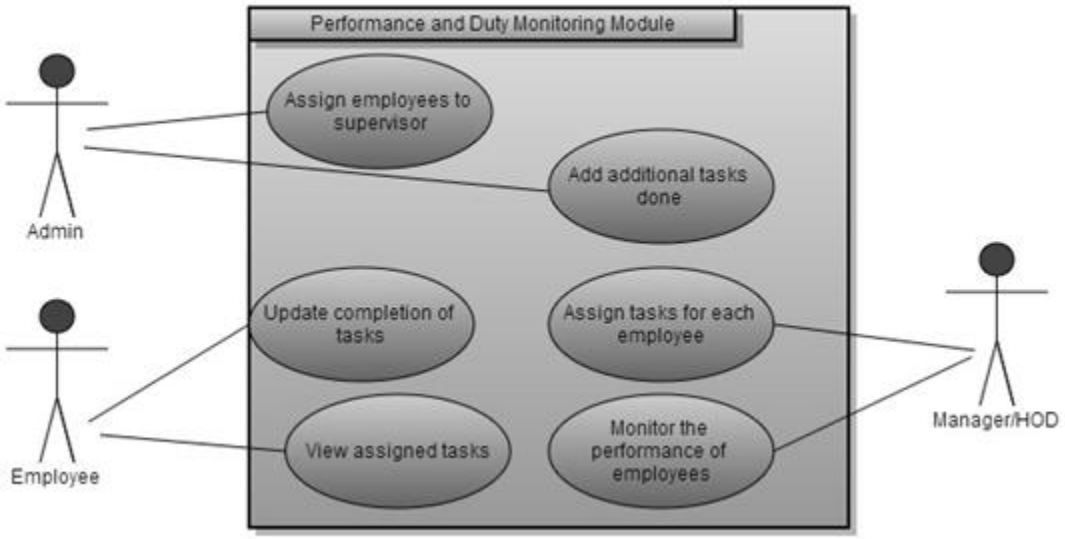

Figure 3-4 Use case diagram for Performance and Duty Monitoring Module

Table 3-3 depicts the Use Case narration for perform tasks

Use case narration for perform tasks

Use case	Perform Tasks
Actors	Employee, HOD
Overview	
Employees who have assign to supervisors can have tasks	
Precondition	
Supervisors(HOD/Manager) can only assign tasks for his/her employees	

Flow of events
1.Assign employees to the supervisor by Admin 2. Assign tasks for employees by each supervisor 3. Mark completion status of tasks by each employee 4.Monitor the working progress by each supervisor
Post Condition
1.Task will approve/ reject by HOD/Manager

Table 3-3 Use case narration for perform tasks

3.5.5 Recruitment and Talent Management Module

Figure 3-5 depicts the Use case diagram for Recruitment and Talent Management Module

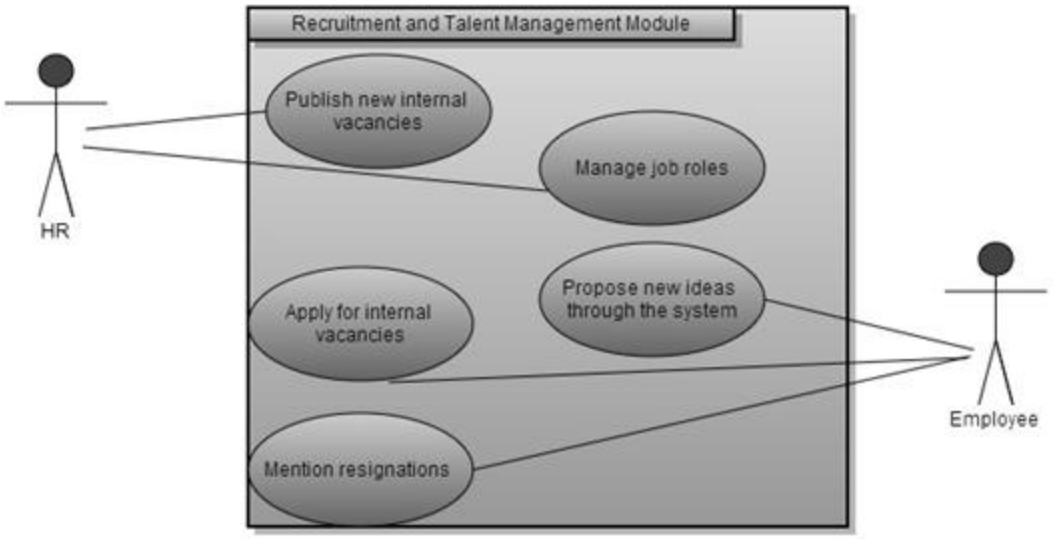

Figure 3-5 Use case diagram for Recruitment and Talent Management Module

Table 3-4 depicts the Use case narration for publishing vacancies

Use case	Publish vacancies
Actors	Employee, HR
Overview	
When a vacancy is open first give the chance to internal employees	
Precondition	

When an employee is mention the resignation or necessity of company this situation is arise
Flow of events
1.Employee mention the resignation 2.Nortification goes to HR 3.Publish vacancy 4. Qualified Employees can apply for the job
Post Condition
1.Employee can apply to the vacancy

Table 3-4 Use case narration for publish vacancies

3.5.6 Managing Staff Relation and Labour Relation

Figure 3-6 depicts the Use case diagram for Managing Staff Relation and Labour Relation

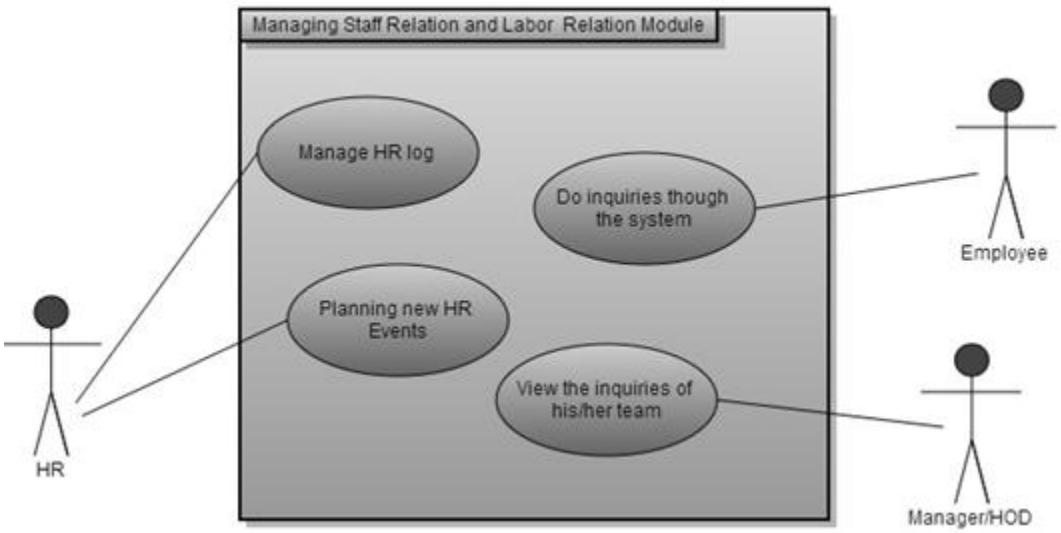

Figure 3-6 Use case diagram for Managing Staff Relation and Labour Relation

3.5.7 Vehicle Gate passes and Fuel Management Module

Figure 3-7 depicts Use case diagram for Vehicle Gate passes and Fuel Management Module

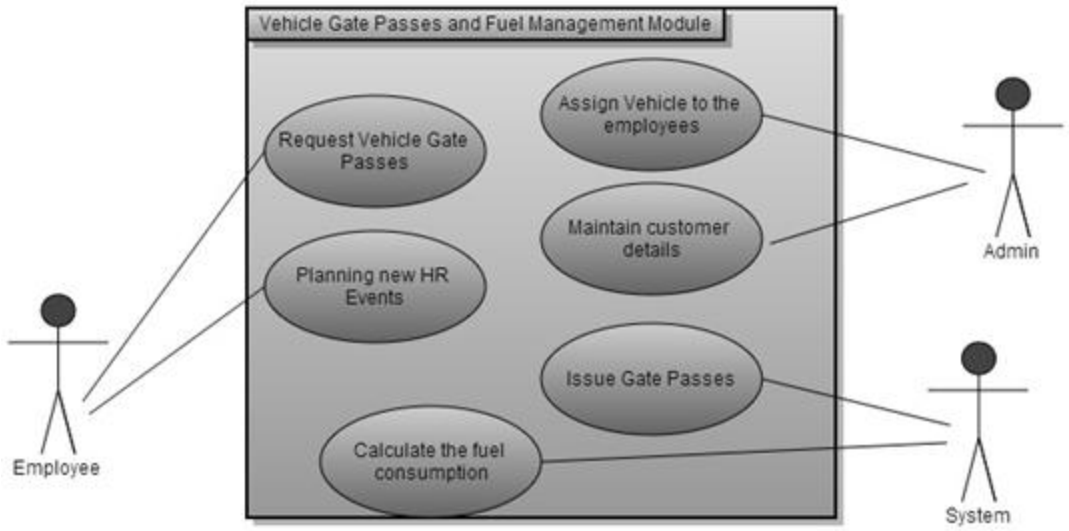

Figure 3-7 Use case diagram for Vehicle Gate passes and Fuel Management Module

Table 3-5 depicts the Use case narration for Vehicle gate passes module

Use case	Request Vehicle Gate Pass
Actors	Employee, Admin, System
Overview	
Employees who has assign to vehicles and not assigned also process this step	
Precondition	

Flow of events	
1. Request gate pass by selecting certain fields 2. Print the gate pass 3. Insert details after finish the customer visit 4. Auto calculate the fuel consumption	
Post Condition	

Table 3-5 Use Case Narration for Vehicle Gate Pass Module

3.5.8 Administration Module

Figure 3-8 depicts the Use case diagram for Administration module

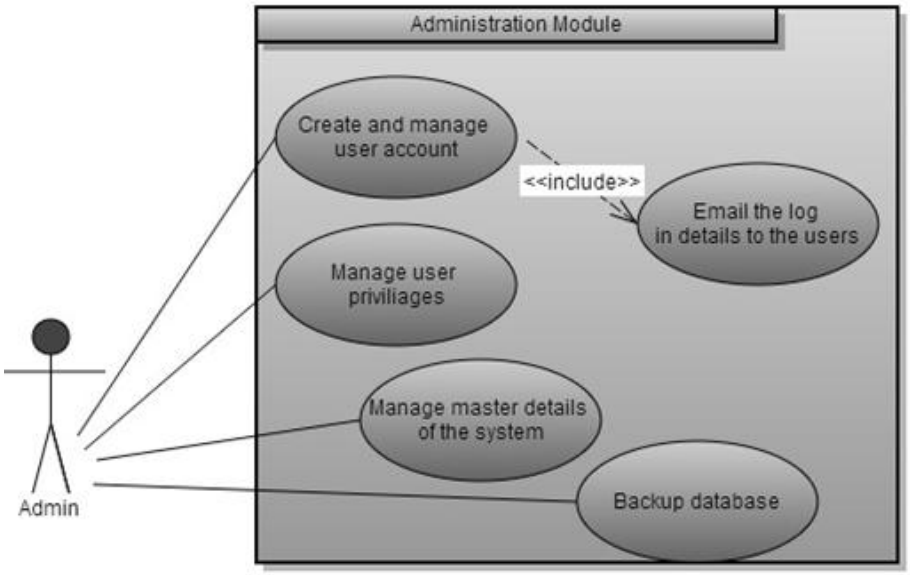

Figure 3-8 Use case Diagram for Administration Module

Table 3-6 depicts the Use case narration for the Create Account

Use case	Create user account
Actors	Admin
Overview	
Every employees who are working in the company have user account	
Precondition	
Employee profile should be in the system	
Flow of events	
1.Selecting the user role for particular employee 2.Give the username and passwords 3.Send a mail to the user mentioning username and password	
Post Condition	
Login to the system with created username and password	

Table 3-6 Use case narration for Create Account

3.5.9 Report Module

Figure 3-9 depicts the Use case diagram for Report module

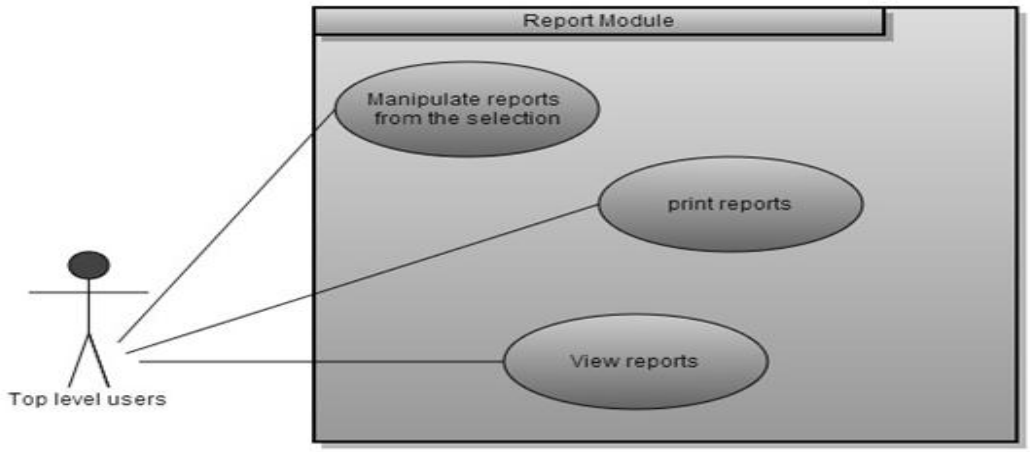

Figure 3-9 Use case diagram for Report Module

3.6 CLASS DIAGRAM OF THE SYSTEM

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. The class diagram is the main building block of object oriented modeling. It is used both for general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling. *[WWW5]* Figure 3-10 describes the class diagram of the system.

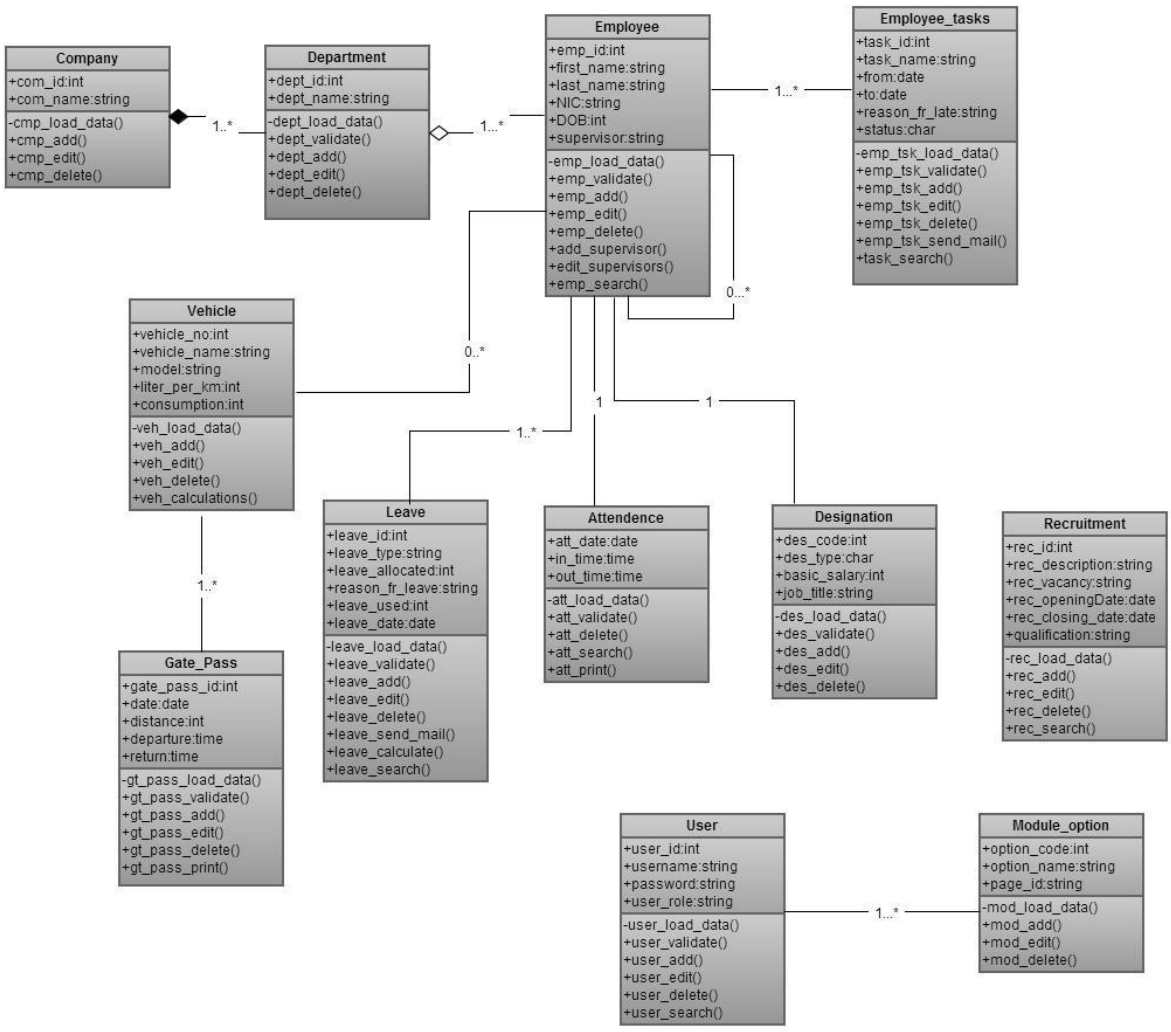

Figure 3-10 Class Diagram

3.7 DATABASE DESIGN

The database design depicts the overall database structure of the system. ER (Entity Relationship) Diagram can be create to define the database structure and normalized the tables while avoiding data redundancy. Figure 3-11 depicts the ER Diagram of the system.

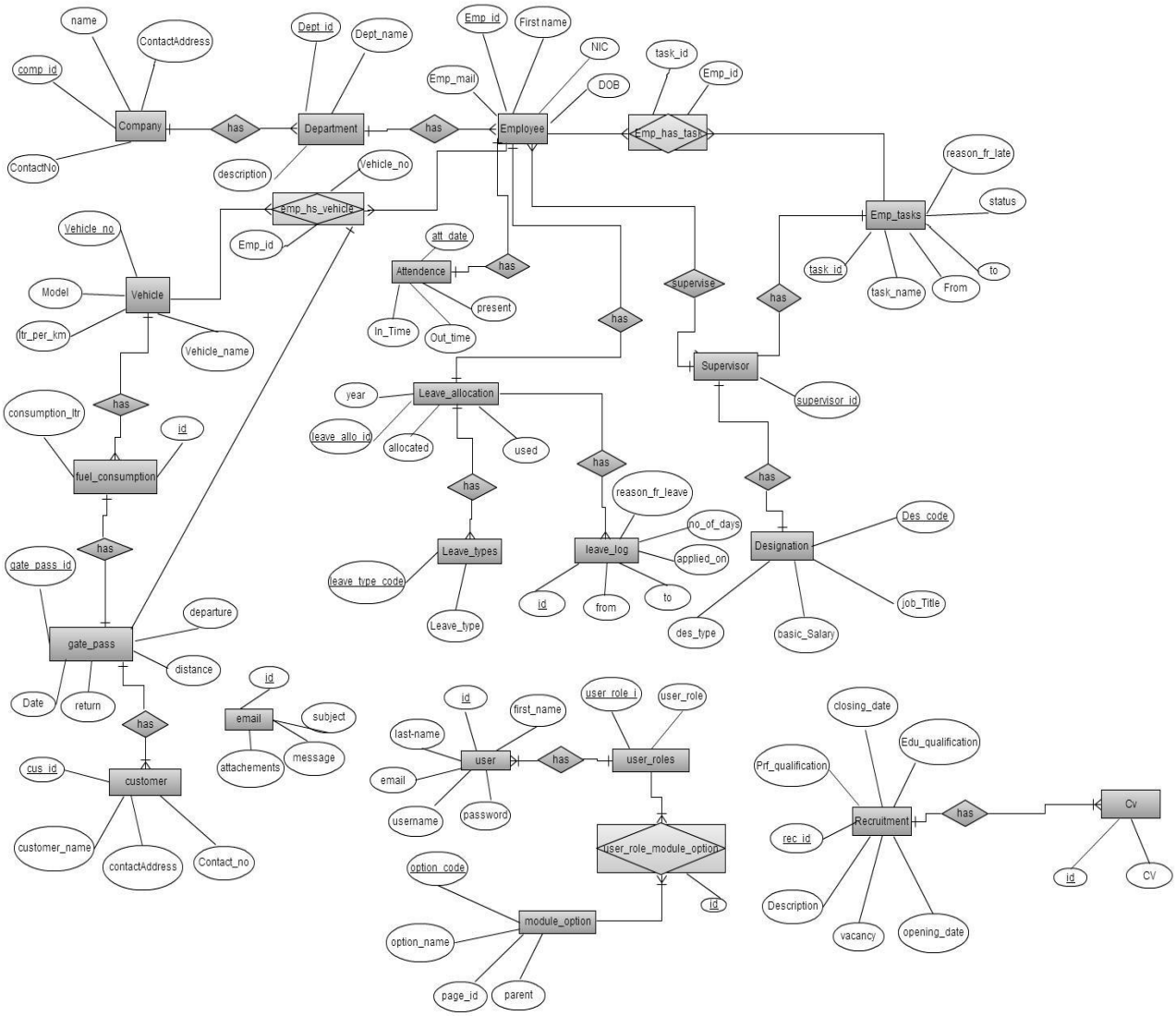

Figure 3-11 ER Diagram

3.8 DEVELOPMENT ARCHITECTURE

The system is developed using MVC architecture. Model, View and Controller is the most using development architecture today. This is help to increase the neatness of codes as the PHP is very untidy while using in structure manner.

Each component is in charge of different tasks. The **Controller** manages the user requests its main function is to get the necessary resources usually by calling the appropriate model and the selects the proper view. The **Model** is the data and the rules applying for the data. The **View** provides different ways to preview the data received by the model. *[WWW6]*

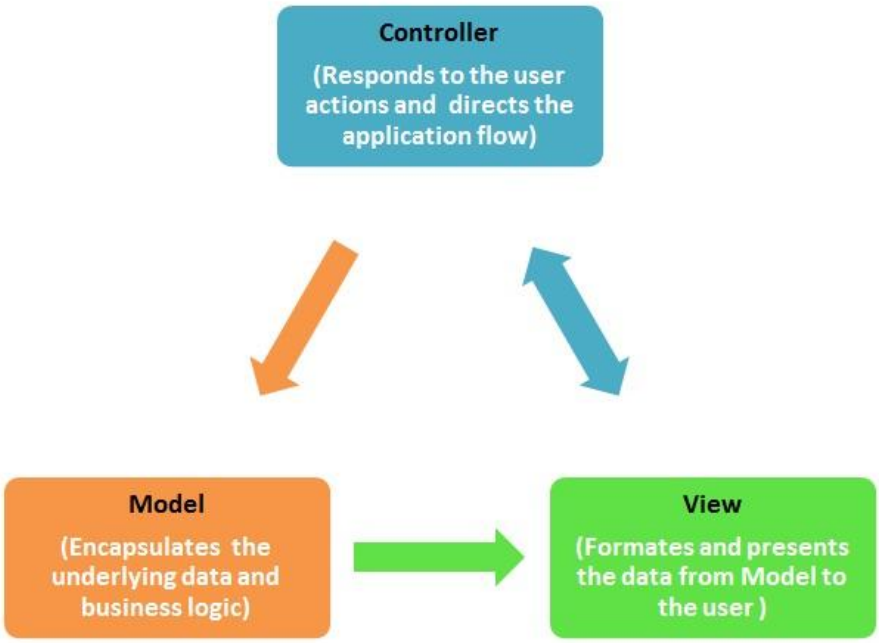

Figure 3-12 MVC architecture

Figure 3-12 shows what is that MVC architecture is clearly.

There are many already developed PHP frameworks available in the web. Out of which this web application was developed using the Codeigniter Framework. Codeigniter is a powerful PHP framework providing a rich set of libraries for commonly used tasks. Reasons for using codeigniter are *[WWW7]*

- A framework with a small footprint.

- Exceptional performance
- Learning curve is easier
- Does not require use of command line
- Does not require to adhere coding rules.

3.9 USER INTERFACE DESIGN

User interface design is the major thing that depicts the success of the system because the users interact with the system through the interfaces. Therefore the user interfaces should be simple and rich with user friendliness.

When the user interfaces are simple to understand then the users are easy to train and cope with new system. Finally they will like to work with the system regularly.
Following are major interfaces in the system.

Figure 3-13 shows the login page. This is including with company logo and name of the system to recognize separately with the other running system in the JDC.

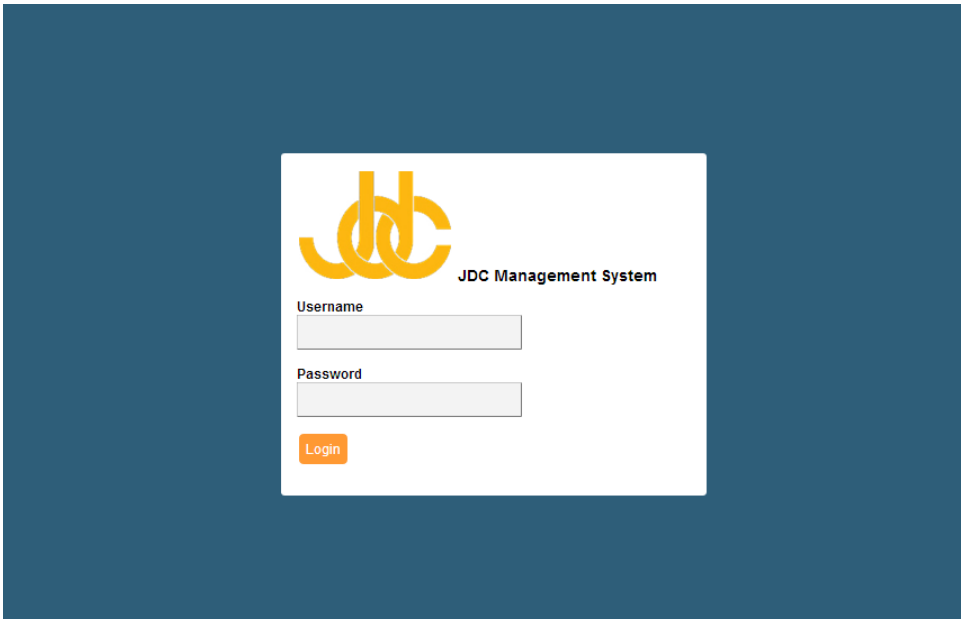

Figure 3-13 Login Page

Figure 3-14 shows the admin dashboard. This is the extra thing to menu in the system. This is supply easy of using the system

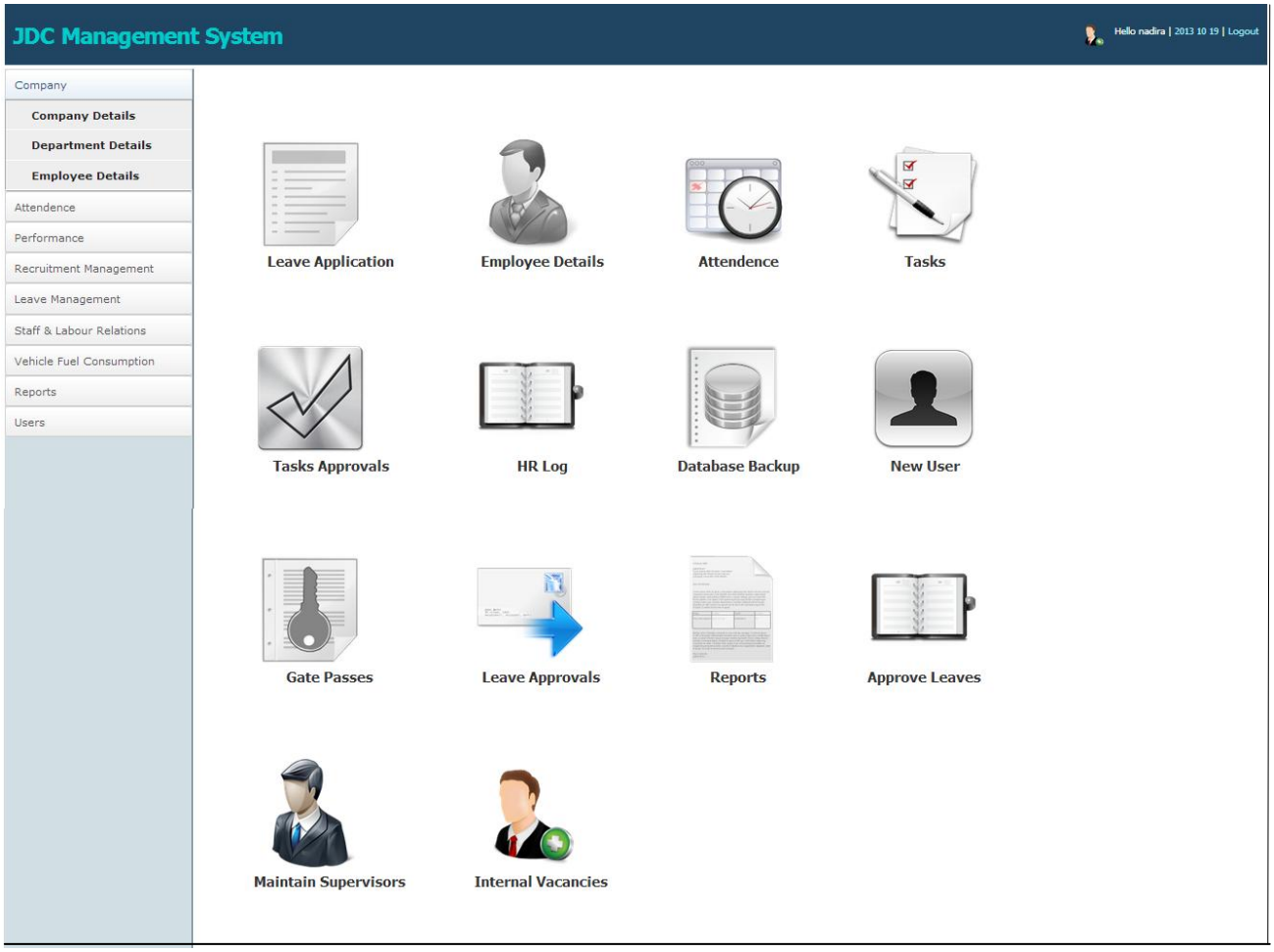

Figure 3-14 Dashboard

Figure 3-15 shows the Company details adding form and when the user click on Add button without filling required fields how the validation error shows. This is the way every form is handle in the system.

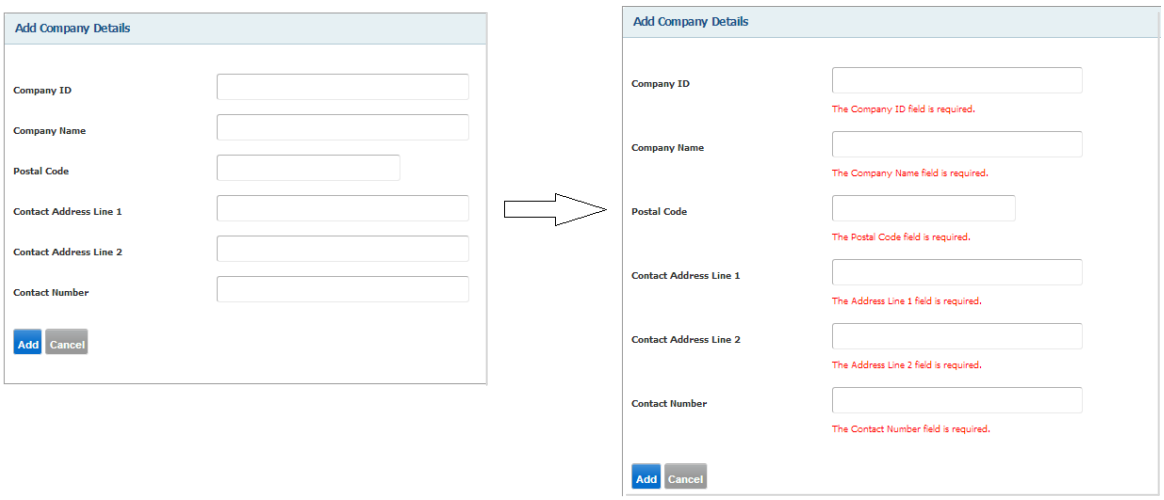

Figure 3-15 Add Form and showing validation errors

Figure 3-16 depicts the Grid view of the employee details when login as Admin user.

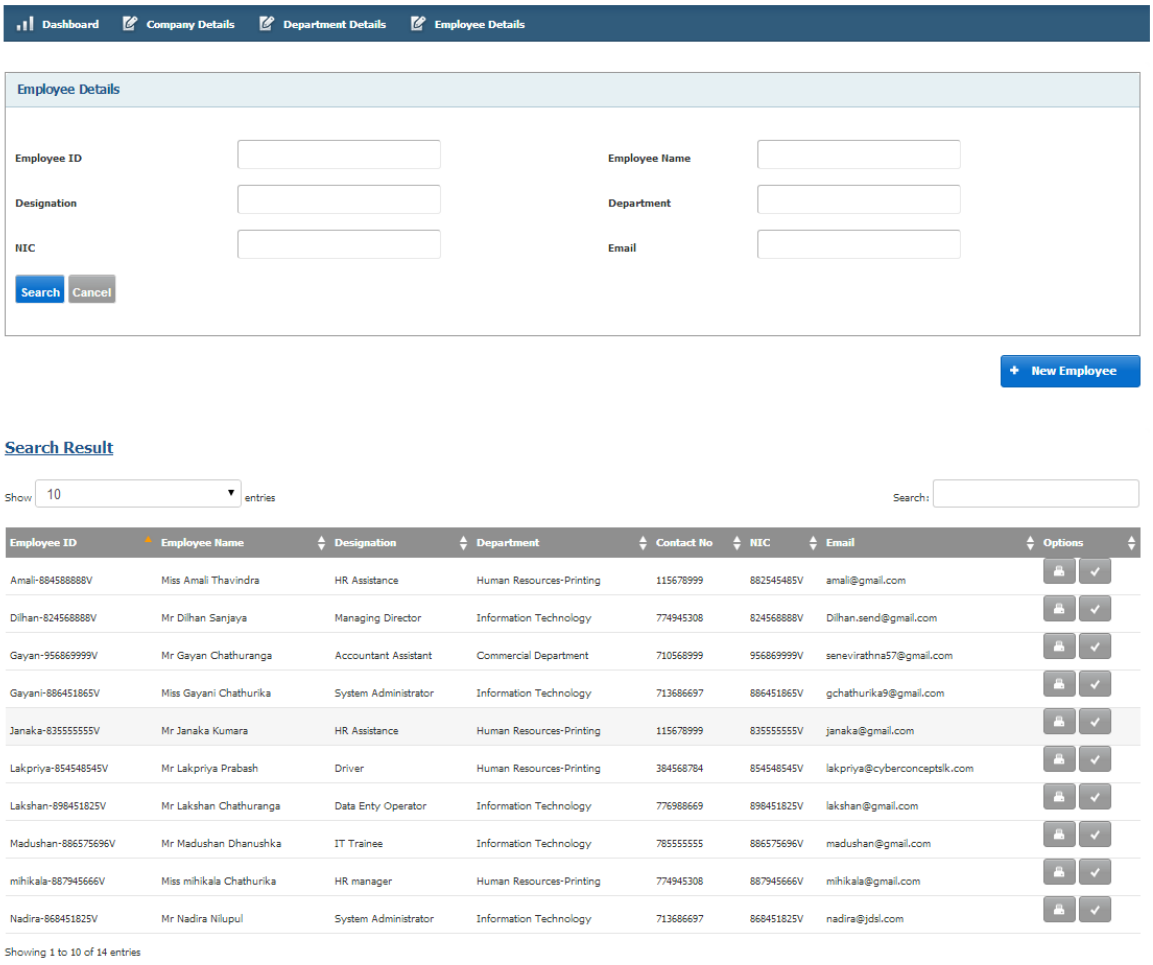

Figure 3-16 Data View

Figure 3-17 depicts the data view when an employee login to the system. He or she can see his/her information only.

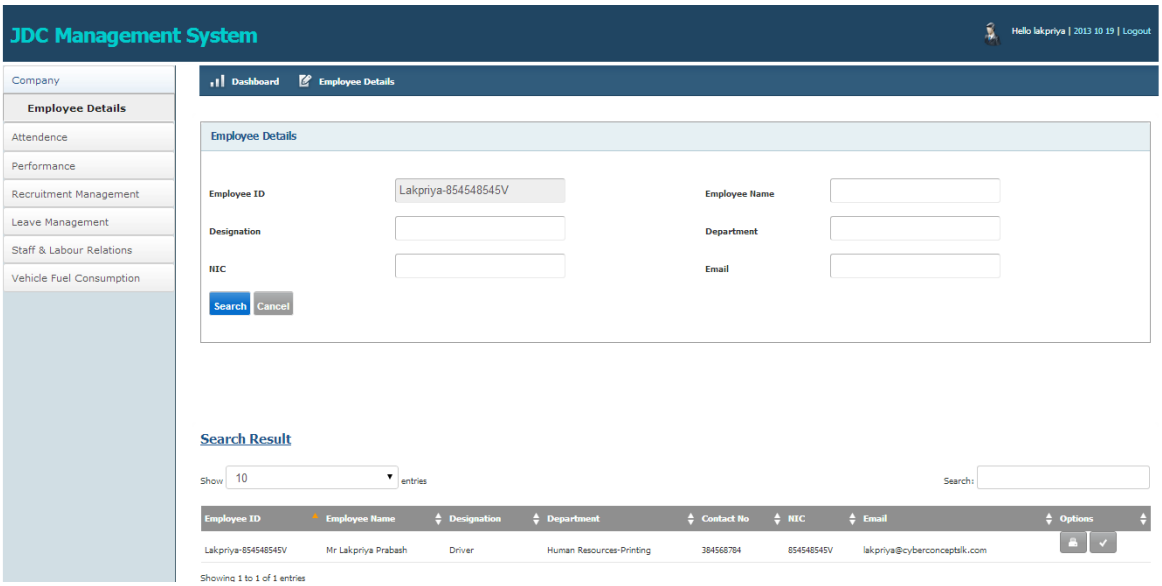

Figure 3-17 Data View for Employee

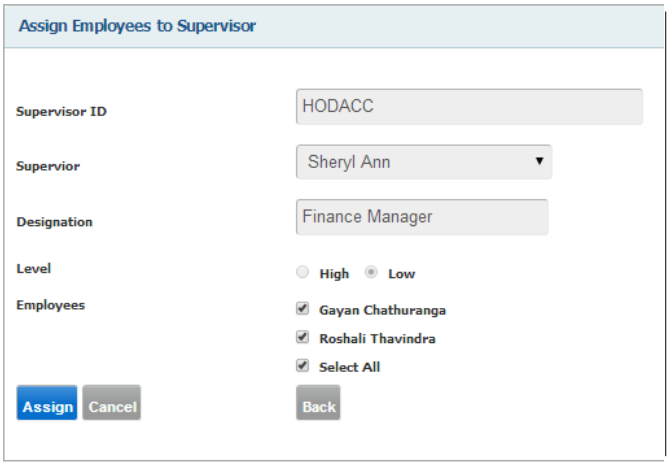

Figure 3-18 Assign employees to supervisor

Figure 3-18 depicts the assigning of employees to supervisor. Because of the JDC is a group of companies it has wide hierarchy of user levels. For the purpose of maintaining those levels the concept of supervisor was aroused. When an employee add to the system it is must to assign a supervisor to process next processes

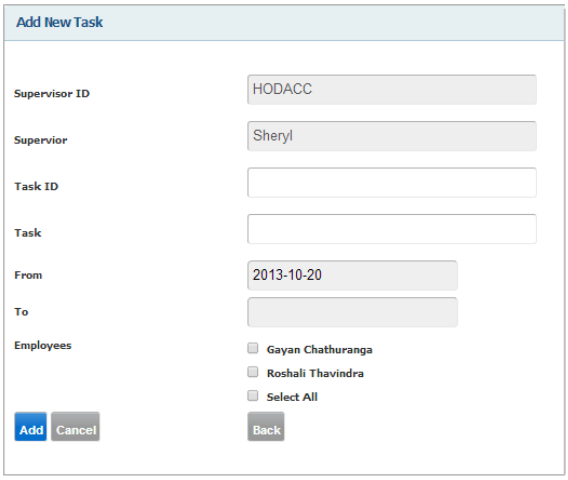

Figure 3-19 Form for adding new task

Figure 3-19 shows the interface for adding new tasks and assigning employees to those tasks.

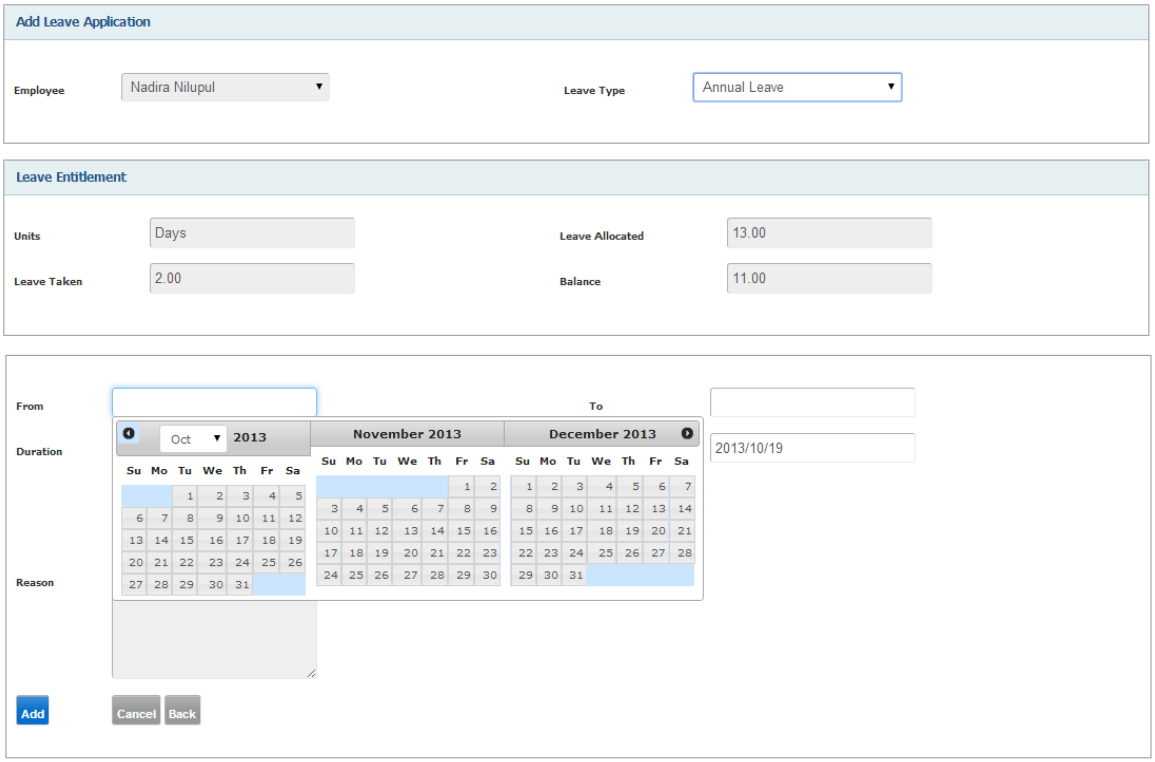

Figure 3-20 Leave Application

Figure 3-20 shows the leave application in the system. Once the employees are assigning to leave entitlements they can apply leaves. When a user selects leave type from the dropdown menu his/her leave history comes auto.

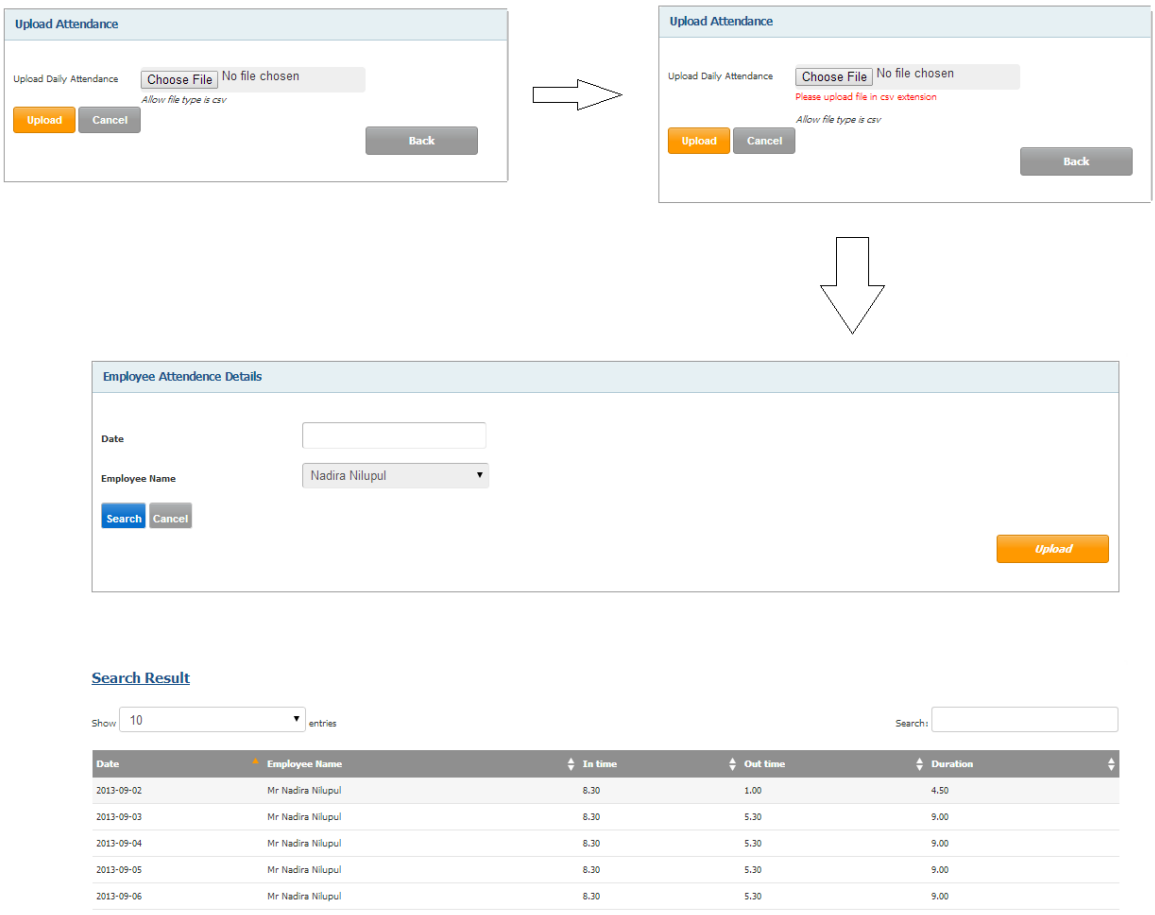

Figure 3-21 Uploading Attendance

Figure 3-21 shows the process of uploading attendance file to the system. When a user selected file is not a csv it gives error message. Once the upload is success user can see the attendance for the particular date that has uploaded. Beside that he or she can only see his or her attendance only.

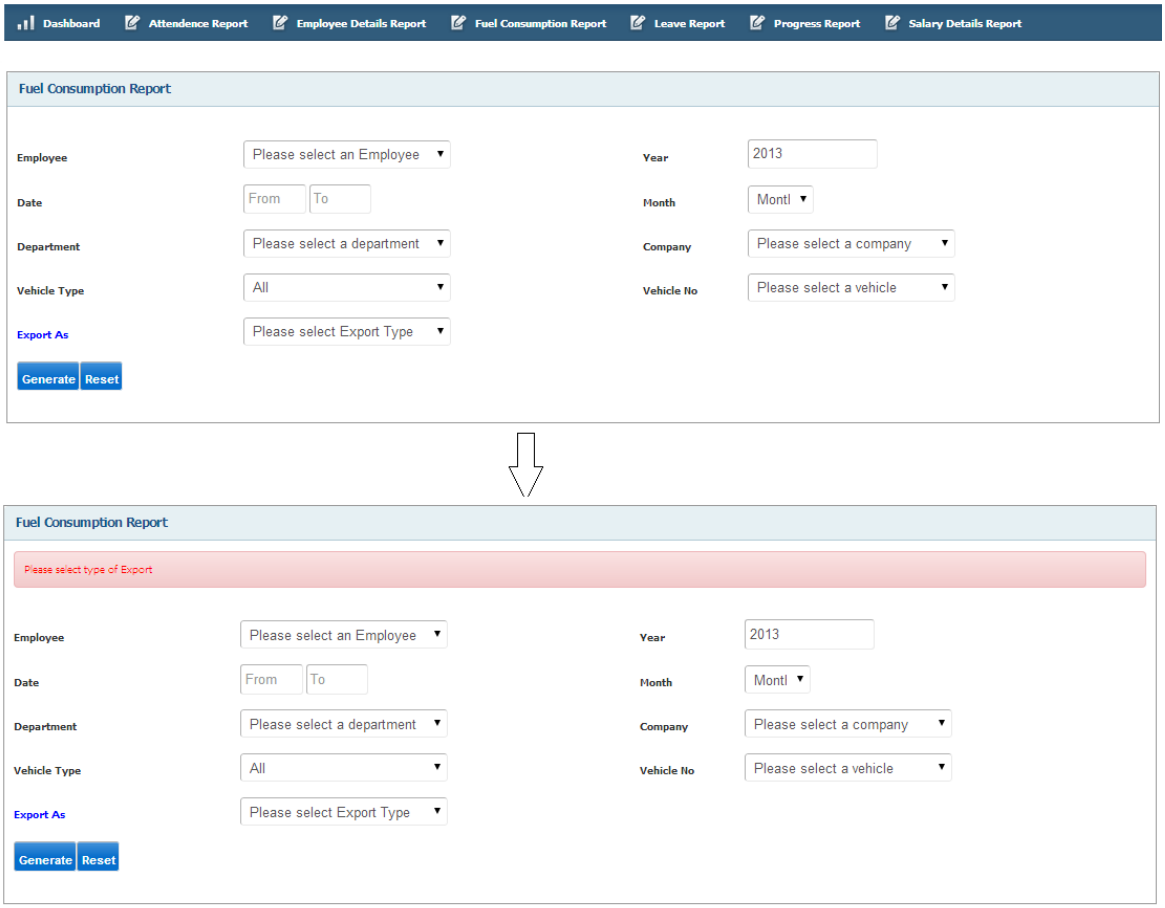

Figure 3-22 Report Generation

Figure 3-22 depicts the process of generating report from the system. When a user does not select the Export file type it shows errors as above.

Fuel Consumption Report

Employee Name	Vehicle No	Date	Fuel Consumption	Vehicle Type	Department	Company
Amali Thavindra	sw122	2013-09-07	672.00 ltr	Company	Human Resources-Printing	JDC Printing
Gayan Chathuranga	awq123	2013-09-07	144.00 ltr	Personal	Commercial Department	JDC Group
Lakpriya Prabash	sw122	2013-09-06	24.00 ltr	Company	Human Resources-Printing	JDC Printing
Lakshan Chathuranga	SW789	2013-09-07	2.00 ltr	Company	Information Technology	JDC Group
mihikala Chathurika	sw122	2013-09-07	384.00 ltr	Company	Human Resources-Printing	JDC Printing
Nadira Nilupul	SW789	2013-09-07	22.50 ltr	Company	Information Technology	JDC Group
Roshali Thavindra	aw123	2013-09-06	41.60 ltr	Personal	Commercial Department	JDC Group
Roshali Thavindra	aw123	2013-09-07	41.60 ltr	Personal	Commercial Department	JDC Group
Vidyani Nisansala	SW789	2013-09-07	16.00 ltr	Company	Information Technology	JDC Group

	A	B	C	D	E	F	G	H
1	First_name	Middle_name	Vehicle_no	Date	consumtion_ltr	Dept_name	com_name	usage_type
2	Amali	Thavindra	sw122	9/7/2013	672	Human Resources-Printing	JDC Printing	C
3	Gayan	Chathuranga	awq123	9/7/2013	144	Commercial Department	JDC Group	P
4	Lakpriya	Prabash	sw122	9/6/2013	24	Human Resources-Printing	JDC Printing	C
5	Lakshan	Chathuranga	SW789	9/7/2013	2	Information Technology	JDC Group	C
6	mihikala	Chathurika	sw122	9/7/2013	384	Human Resources-Printing	JDC Printing	C
7	Nadira	Nilupul	SW789	9/7/2013	22.5	Information Technology	JDC Group	C
8	Roshali	Thavindra	aw123	9/6/2013	41.6	Commercial Department	JDC Group	P
9	Roshali	Thavindra	aw123	9/7/2013	41.6	Commercial Department	JDC Group	P
10	Vidyani	Nisansala	SW789	9/7/2013	16	Information Technology	JDC Group	C
11								

Figure 3-23 PDF and CSV reports

Figure 3-23 depicts the PDF and CSV type reports generate by the system.

CHAPTER 4 IMPLEMENTATION

4.1 INTRODUCTION

The implementation stage is the next step after designing the user interfaces to the system. This is the stage that the conversion of design of a system to the executable format. Prior to the implementation of a system it is a must to determine the development environment. Once this is implementing using open source technologies it is consume very less cost for deploy the system and being a web based system there are both sides named client side and server side. All the system installation is going on server side computer because of that it is recommended to use machine of high performance for server. Only a web browser is the minimum requirement for run the system in client side.

4.2 IMPLEMENTATION ENVIRONMENT

Table 4-1 depicts the hardware and software using in the development.

Hardware	Software
Intel(R) Core(TM) i3 2.13 GHz	Microsoft Windows 7
4GB RAM	Wamp server 2.2 o Apache Server 2.2.21 o PHP 5.3.8 o MySQL 5.5.16 o phpMyAdmin 3.4.5
320GB Hard Disk	Codeigniter 2.1.4

Table 4-1 Implementation Environment

Development Tools

Adobe Dreamweaver CS 5 for coding

Technologies used

- PHP (HyperText Pre Processor) was used as the development language
- MySQL was used to handle the database.
- Codeigniter was used as a php framework to speed up the development
- Bootstrap for designing user interfaces
- AJAX – Asynchronous Javascript was used to get data from the server without refreshing the browser.
- JQuery which is based on javascript was used in the development

Reused Modules and Libraries

- **jQuery UI Date Picker –** It is a highly configurable plugin that adds datepicker functionality. The datepicker calendar opens in a small overlay onFocus and closes automatically onBlur or when a date is selected *[WWW8]*

- **BlueWhale Admin -** BlueWhale is a Free Premium HTML Admin/Backend Template for Web Applications based on 960 Grid CSS it has an elegant fluid **layout** which adjusts automatically as you change the screen size. *[WWW9]*

- **Bootsrap 3 -** Sleek, intuitive, and powerful mobile-first front-end framework for faster and easier web development. *[WWW10]*

- **html2pdf -** HTML2PDF is a converter from HTML to PDF written in PHP4 (uses FPDF) and PHP5 (using TCPDF). It allows converting HTML 4.01 valid PDF, and is licensed under the LGPL . This library was made to facilitate the creation of PDF files , not to directly convert an HTML page *[WWW11]*.

4.3 CODE STRUCTURE

CodeIgniter is a powerful PHP framework with a very small footprint, built for PHP coders who need a simple and elegant toolkit to create full-featured web applications. If you're a developer who lives in the real world of shared hosting accounts and clients with deadlines, and if you're tired of ponderously large and thoroughly undocumented frameworks, then CodeIgniter might be a good fit. *[WWW12]*.

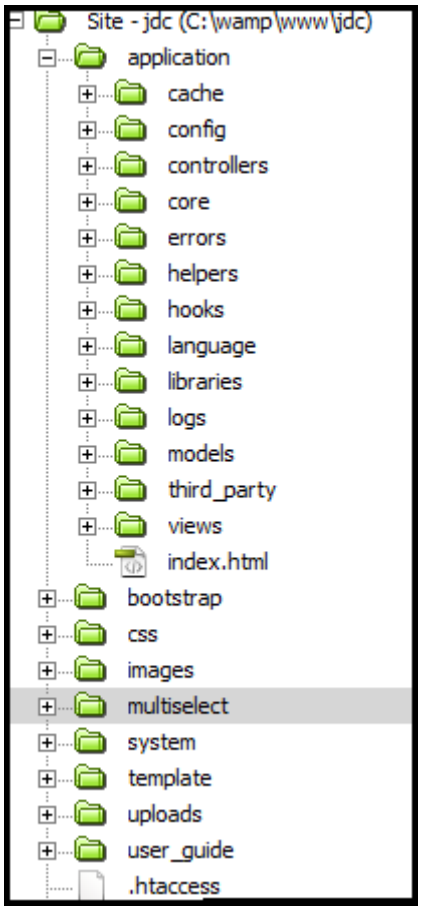

Figure 4-1 Directory Structure

Figure 4-1 depicts the directory structure of JDC management system. All the files related to the system reside in the application folder. The system folder resides separately therefore the changes in the codes not affected to the main core of the codeigniter. Under the application folder there is a major folder named **config** that contains the configuration settings of the system and **Database** file has the connection for database.

Controllers folder has the controller file of the system that integrate both the model and views. **Model** folder has the files that contain queries for getting data from the database. **Views** folder has the files that depict the front end of the system.

4.3.1 Controller

The controller is a simply a class file that is showing the URL of the address bar in the browser such as http://localhost/jdc/home_page. This index file is run auto when a controller is called. Once the controller is used to join the view and model there are specific ways to call view and model from the controller.
The controller class is extends CI_Contoller

When a model is called in the controller it's like

```
$this->load->model('company_model');
```

Once the company model is loaded can called the functions inside that model like bellow.

```
$this->company_model->insert($this->input->post());
```

The views are called to this template.php page through a data array.

```
$data['main_content'] = 'company/company';
$this->load->view('includes/template.php',$data);
```

4.3.2 View

The template file is created to depict front end of the system. Usually the header, footer sections and navigation are not change in a page. Therefore there is a file called template that contains the header and footer and define a variable call $main_content to load the all pages from controller to include in the template file.

```
<?php include_once('header.php'); ?>
<?php include_once('nav.php'); ?>
<?php $this->load->view($main_content); ?>
<?php include_once('footer.php'); ?>
```

Furthermore the views are having the code segments regarded to the GUI in the system. These are defining in a specific way relevant to the codeigniter style by loading form helper. Therefore write a code for depict the text boxes is different from the normal way.

Normal

```
<label>Company ID</label>
<input type="text" name="comp_id" value=""/>
```

Codeigniter Style

```
<?php echo form_label('Company ID','comp_id'); ?>
<?php echo form_input('comp_id',$this->input->get('comp_id'),'class="mini" id="comp_id"');?>
```

4.3.3 Model

This is the file that has all the functions related to the database. The queries can write as in the normal way and codeigniter style. The codeigniter style is known as Active Records. When a query is write in that style it becomes very secure than the normal way. It contains fewer errors also.

```php
function insert($data)
{
    $dataset = array(
        'comp_id'                   =>$data['comp_id'],
        'com_name'                  =>$data['com_name'],
        'com_postal_code'           =>$data['com_postal_code'],
        'com_contact_Address_line1' =>$data['com_contact_Address_line1'],
        'com_contact_Address_line2' =>$data['com_contact_Address_line2'],
        'com_contact_no'            =>$data['com_contact_no']
    );
    if($this->db->insert(COMPANY,$dataset)){return $data['comp_id'];}else{return FALSE;}

}
```

4.3.4 Major Code Segments

The bellow code segments depict the overall model, view, controller in the leave type section.

Controller

```php
<?php

class leave_ctr extends CI_Controller{

        function __construct()
        {
                parent::__construct();
                $this->is_logged_in();
        }

        function is_logged_in()
        {
                $is_logged_in = $this->session->userdata('is_logged_in');
                if(!isset($is_logged_in) || $is_logged_in != true )
                {
                  redirect('login');

                }
        }
```

```
function types()
{
	$this->add();
}

function add($msg = "")
{
	$data = $this->_load_data();
	$data['action'] = 'Add';
	$data['msg'] = $msg;
	$data['main_content'] = 'leave/leave.php';
	$this->load->view('includes/template.php',$data);
}

function edit($id = "", $msg ="")
{
	$data = $this->_load_data($id);
	$data['action'] = 'Edit';
	$data['msg'] = $msg;
	$data['main_content'] = 'leave/leave.php';
	$this->load->view('includes/template.php',$data);
}
function delete($id = '',$msg = '')
{
	$data = $this->_load_data($id);
	$data['action'] = 'Delete';
	$data['msg'] = $msg;
	$data['main_content'] = 'leave/leave.php';
	$this->load->view('includes/template.php',$data);
}
function view($id = '')
{
	$data = $this->_load_data($id);
	$data['action'] = 'View';
	$data['main_content'] = 'leave/leave.php';
	$this->load->view('includes/template.php',$data);

}

function _load_data($id = '')
{
	$data['leave_type'] = array('leave_type_code' => '','Leave_type' => '');
	$this->load->model('leave_model');
	if($id != ''){
	$data['leave_type'] = $this->leave_model->get_leave_type_by_id($id);
```

```
		}
	return $data;
	}

	function validation_type()
	{
		if($this->input->post('action') == 'Add'){
		$this->form_validation->set_rules('leave_type_code','Leave Type
Code','trim|required|alpha_dash|is_unique['.LEAVE_TYPE.'.leave_type_code]');
		}

		$this->form_validation->set_rules('Leave_type','Leave
Type','trim|required|is_unique['.LEAVE_TYPE.'.Leave_type]');

		if($this->input->post('action') == 'Delete'){
			$this->remove();
		}
		if($this->input->post('action') == 'View'){
			$this->types();
		}

		if($this->form_validation->run() == FALSE){
			switch($this->input->post('action')){
				case 'Add':
					$this->add();
				break;

				case 'Edit':
					$this->edit($this->input->post('leave_type_code'));
				break;
			}
		}else{
			switch($this->input->post('action')){
				case 'Add':
					$this->create();
				break;
				case 'Edit':
					$this->update();
				break;
			}
		}
	}//validation_type

	function create()
	{
		if(!empty($_POST)){
```

```
                $this->load->model('leave_model');
                $id = $this->leave_model->insert_leave_type($this->input->post());
                if($id != ''){
                        $this->session->set_flashdata('msg',RECORD_ADD);
                        redirect('leave_ctr/edit/'.$id);
                }else{
                        $this->session->set_flashdata('msg',ERROR);
                        redirect('leave_ctr/add');
                }
        }
}//create

function update()
{
        if(!empty($_POST)){
                $this->load->model('leave_model');
                $id = $this->leave_model->edit_leave_type($this->input->post());
                if($id != ''){
                        $this->session->set_flashdata('msg',RECORD_UPDATE);
                        redirect('leave_ctr/edit/'.$id);
                }else{
                        $this->session->set_flashdata('msg',ERROR);
                        redirect('leave_ctr/edit/',$id);
                }
        }
}//update

function remove()
{
        if(!empty($_POST))  {
        $this->load->model('leave_model');
        $id = $this->leave_model->delete_leave_type($this->input->post());
                if($id != ''){
                        $this->session->set_flashdata('msg',RECORD_DELETE);
                        redirect('leave_ctr/add/');
                }else{
                        $this->session->set_flashdata('msg',ERROR);
                        redirect('leave_ctr/delete/',$id);
                }
        }
}
```

Model

```
<?php
```

```
class leave_model extends CI_Model{

	function get_all_lvtype_combo()
	{
		$this->db->select('*');
		$this->db->from(LEAVE_TYPE);
		$this->db->order_by('Leave_type');
		return $this->db->get()->result();
		//echo $this->db->last_query();
	}

	function load_ajax_search($data)
	{
		$this->db->select('*');
		$this->db->from(LEAVE_TYPE);
		$this->db->like('leave_type_code',$data['leave_type_code'],'after');
		$this->db->like('Leave_type',$data['Leave_type'],'after');
		return $this->db->get()->result();
	}

	function get_leave_type_by_id($id)
	{
		return $this->db->get_where(LEAVE_TYPE,array('leave_type_code'=>$id))-
>result_array();
	}

	function insert_leave_type($data)
	{
		$dataset = array('leave_type_code'=>$data['leave_type_code'],'Leave_type' =>
$data['Leave_type']);
		$query = $this->db->insert(LEAVE_TYPE,$dataset);
		if($query){
			return $data['leave_type_code']	;
		}
	}

	function edit_leave_type($data)
	{
		$dataset = array('Leave_type' => $data['Leave_type']);
		$query = $this->db->update(LEAVE_TYPE,$dataset);
		$this->db->where('leave_type_code',$data['leave_type_code']);
		if($query){
			return $data['leave_type_code'];
		}
	}
```

```
function delete_leave_type($data)
{
        $this->db->where('leave_type_code',$data['leave_type_code']);
        $query = $this->db->delete(LEAVE_TYPE);
        if($query){
                return $data['leave_type_code']         ;
        }
}
```

View

```
<?php echo form_open('leave_ctr/validation_type'); ?>
            <?php if($action != 'Add'){
                                                    echo
form_hidden('leave_type_code',set_value('leave_type_code',$result['leave_type_code']));
                                                }?>
            <table class="form">
            <tr>
              <td class="col1">
              <?php echo form_label('Leave Type Code','leave_type_code'); ?>
              </td>
              <td class="col2">
              <?php echo
form_input('leave_type_code',set_value('leave_type_code',$result['leave_type_code']),'class =
"mini" '.$dis.' '.$view); ?>
              <div class="validate error">
                      <?php echo form_error('leave_type_code'); ?>
              </div>
              </td>
            </tr>
            <tr>
              <td>
              <?php echo form_label('Leave Type','Leave_type'); ?>
              </td>
              <td>
              <?php echo
form_input('Leave_type',set_value('Leave_type',$result['Leave_type']),'class = "mini" '.$view.' ');
?>
              <div class="validate error">
                      <?php echo form_error('Leave_type'); ?>
              </div>
              </td>
            </tr>
            <tr>
              <td>
              <?php echo form_hidden('action',set_value('action',$action));?>
```

```
                <?php if($action != 'View'){?>
                <?php echo form_submit('submit',$action,'class="btn btn-blue"');?>
                <?php echo form_reset('cancel','Cancel','class="btn btn-grey" id = "cancel"');?>
                <?php } ?>
                <?php if($action == 'View'){
                                                        echo form_submit('submit','OK','class="btn
btn-blue"');
                                                }?>
                </td>
                <?php if($action != 'Add'){?>
                <td>
                <?php
                                                echo form_reset('back','New Leave
Type','class="btn btn-blue" id="back"');
                                                ?>
                </td>
                <?php } ?>
              </tr>
              </table>
              <?php echo form_close(); ?>
```

Please refer Appendix-F for more code segments in the system

CHAPTER 5 EVALUATION

Software testing is one of the critical elements in the software development life cycle. It is a software quality assurance mechanism to discover defects by testing individual program components. The software testing process has two distinct goals. *[Ian Sommerville 2007]* They are

1. To demonstrate the developer and the customer that the software meets its requirements

2. To discover faults or defects in the software where the behavior of the software is incorrect, undesirable or does not conform to its specification

5.2 TEST STRATEGIES

Unit Testing

It is a method by which individual units of source code, sets of one or more computer program modules together with associated control data, usage procedures, and operating procedures, are tested to determine if they are fit for us Intuitively, one can view a unit as the smallest testable part of an application. *[WWW13]* Testing is done either using whitebox testing or blackbox testing.

Blackbox Testing

This method of software testing tests the functionality of an application as opposed to its internal structures or workings. This method is applicable for all levels of testing. The higher the level of testing and hence the more bigger and more complex the box. *[WWW14]*. In black box testing it just focuses on the inputs and outputs of the software system.

Whitebox Testing

It is the testing of a software solution's internal coding and infrastructure. It focuses primarily on strengthening security, the flow of inputs and outputs through the application, design and usability. White box testing is also known as **clear, open, structural, and glass box testing**.*[WWW15]*

Integration Testing

In Integration Testing, individual software modules are integrated logically and tested as a group. A typical software project consists of multiple software modules, coded by different programmers. Integration testing focuses on checking data communication amongst these modules.*[WWW16]*

System Testing

It is the testing of a complete and fully integrated software product. System testing involves testing the software code for following. *[WWW17]*

- **On fully integrated applications** in order to test how components interact with one another and with the system as a whole. This is also called End to End scenario testing.

- Very thorough **testing of every input** in the application to check for required outputs.
- Testing of the **user's experience** with the application from start to finish.

5.3 TEST PLAN AND TEST CASES

When implementing is going on unit testing is carried out to test the each module. Validation errors are identified while developing the system. After completing each module prepare the test cases for the each module and tested it separately. When the integrating of the system has done, system testing is carried out to find out whether the system is gained all functional and non functional requirements. After the system is deployed in the client place the user acceptance testing is carried out to verify whether the system is functionally work well with the end users.

Tested Items

Table 5-1 depicts the tested items

Module	**Events**
Company Details Management Module	Add/edit/delete/view company details
	Add/edit/delete/view Departments
	Add/Edit/Delete/View Employee
Attendance Module	Uploading Attendance Sheet
	Viewing attendance
	Search Attendance
Leave Management Module	Add/Edit/Delete/View Leave Types
	Add/Edit/Delete/View Allocated Leaves
	Requesting Leaves
	Viewing Leaves by each employee
	Approve/Reject Leaves
Performance and Duty Monitoring Module	Maintain Supervisors
	Assigning Tasks
	Viewing Tasks by each employee
	Add/edit each task by each employee
	Approve/ Reject tasks
Recruitment and Talent Management Module	Add/Edit/Delete/View Designations
	Recruitments
	Add/Edit/Delete/View Suggestions
	Approve Suggestions
Staff Relation and Talent Management Module	Add/Edit/Delete/View HR log
	Add/Edit/Delete/View/ Approve/Reject Inquiries
	Add/Edit/Delete/View HR Events
Vehicle Gate Passes and Fuel Management Module	Add/Edit/Delete/View Vehicle Details
	Add/Edit/Delete/View Customer Details
	Generating Gate passes
Report Generation Module	Generating Reports
	Print Reports
Administration Module	Get database backup
	Add/Edit/Delete/View user accounts

Table 5-1Tested Items

Following are the test cases identified each module.

5.3.1 Company Details Management Module

Table 5-2 depicts the test cases of the company details management module

Module Name		Company Details Management
Tested Components		Company, Departments, Employee Personal Details, Employee Education, Employee Work Details, Employee Profile
No	**Test Description**	**Expected Result**
1	User Access of each sections	Admin can only have the authorization to manage the company details; HR person can manage the department details and Admin also. Manager can view the company and department details. DEO can only add new employee to the system. When the employee login to the system they can see only their records through the system
2	Access without login to the system	Access should denied
3	Adding new records	All fields should validated
4	Editing a record	The relevant data should display for the selected Id
5	Deleting a record	Only the records which not having any dependencies can be deleted
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well
8	Add/edit/Delete records	Certain relevant messages and warnings should display
9	Search criteria for searching records	The result should be accurate for searching criteria
10	Displaying search result	The Result should be ordered in user friendly way
11	Select Data from combo box	The records should be ordered in alphabetical order

12	Adding NIC no	Only 10 characters can be entered
13	Selecting Appointment Date and Resign Date	Appointment Date should be older than the Resign Date
14	Editing records	Relevant fields should disable
15	Deleting and Viewing Form	The all fields should disable
16	Displaying Employee ID	The Employee Id should display and cannot modify
17	Adding Resign date	Without adding resign date the process can do further
18	Horizontal menu	The menu should show the authorized sections
19	Uploading photo	The allow file types should display
20	Uploading wrong file	Should show error message without losing data in the form
21	Deactivate an Employee	If employee resign date is less than the current date the HR Person can deactivate the employee and his/her user login

Table 5-2 Test cases for company details management module

5.3.2 Attendance Module

Table 5-3 depicts the test cases for the attendance module.

Module Name		Time Attendance Module
Tested Components		Uploading CSV file Displaying employee attendance
No	**Test Description**	**Expected Result**
1	User Access of each sections	Top level such as Admin, Managers can see the attendance of every employee. The other users can see only their attendance when login to the system
2	Access without login to the system	Access should denied

3	Search criteria for searching records	The result should be accurate for searching criteria
4	Displaying search result	The Result should be ordered in user friendly way
5	Select Data from combo box	The records should be ordered in alphabetical order
6	Uploading Attendance Sheet	The allow file types should display
7	Uploading wrong file	Should show error message
8	After uploading attendance sheet	New records should show without error
9	Date of search criteria	Only the current date should display and show the result for the current date

Table 5-3 Test cases for Time Attendance module

5.3.3 Leave Management Module

Table 5-4 depicts the test cases for the leave management module.

Module Name		Leave Management
Tested Components		Leave Types, Leave Allocation, Leave Requests, Leave Approvals
No	**Test Description**	**Expected Result**
1	User Access of each sections	When a top level user login to the system he can see the leave request and leave for approvals that belong to the employees under them. Manage leave types and leave allocation only can proceed by HR person. Once the employee login to the system he can see only his leave requests
2	Access without login to the system	Access should denied
3	Adding new records	All fields should validated
4	Editing a record	The relevant data should display for the selected

		Id
5	Deleting a record	Only the records which not having any dependencies can be deleted
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well
8	Add/edit/Delete records	Certain relevant messages and warnings should display
9	Search criteria for searching records	The result should be accurate for searching criteria
10	Displaying search result	The Result should be ordered in user friendly way
11	Select Data from combo box	The records should be ordered in alphabetical order
12	Editing records	Relevant fields should disable
13	Deleting and Viewing Form	The all fields should disable
14	Horizontal menu	The menu should show the authorized sections
15	Displaying all leave allocation	When comes to the page default year should be current year and that can be change by user.
16	Modifying records of leave allocation	Only the records relevant to current year can be modified
17	Showing employees for leave allocation	All the employees in the system should show whether they have been allocated leaves or not. The links for allocate leave should show to each employee
18	Time of leave allocation	Leave allocation can limit to the leave types of the system and that should be handle accurately
19	Applying for leave	Once the leave type is selected the records of allocated leaves and leave balance should show without reloading the page
20	Date validation in leave form	Once the To date is less than From date must

		give the error messages
21	When an employee apply leave	After request leave the system should change the leave balance correctly
22	Showing records for leave approvals	Only the leave that should forward to approval must display

Table 5-4Test cases for Leave Management Module

5.3.4 Performance and Duty Monitoring Module

Table 5-5 depicts the test cases for the performance and duty monitoring module

Module Name		Performance and Duty Monitoring
Tested Components		Assign Task, Employee Task, Approving Task, Maintain supervisors
No	**Test Description**	**Expected Result**
1	User Access of each sections	Admin can only have the facility to manage supervisors and assigning employees to the supervisors. Top level users can assign tasks for their employees and the other users can view the tasks assign to them.
2	Access without login to the system	Access should denied
3	Adding new records	All fields that are not disabled should validated
4	Editing a record	The relevant data should display for the selected Id
5	Deleting a record	Only the records which not having any dependencies can be deleted
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well
8	Add/edit/Delete records	Certain relevant messages and warnings should display
9	Search criteria for searching records	The result should be accurate for searching

		criteria
10	Displaying search result	The Result should be ordered in user friendly way
11	Select Data from combo box	The records should be ordered in alphabetical order
12	Editing records	Relevant fields should disable
13	Deleting and Viewing Form	The all fields should disable
14	Horizontal menu	The menu should show the authorized sections
15	Select supervisors to add	Once the employee is add his designation must load accurately without loading the page
16	Edit a supervisor	Supervisor id should disabled
17	Viewing employees to assign tasks	When a top level supervisor is log in to the system he can only view the employees assign to him and assign tasks only for his employees
18	Mark progress of the tasks	When an employee mention the progress of the task if the task is approved previous it should show as disable field
19	Rejected Tasks	The rejected tasks cannot process further
20	Approving tasks	When the task has expired and the completion status is not completed yet then there should be option to assign that tasks for other employee
21	Viewing approve tasks	Till the tasks end date is coming that tasks can go for the approval

Table 5-5 Test cases for Performance and Duty Monitoring Module

5.3.5 Recruitment and Talent Management Module

Table 5-6 depicts the test cases for the recruitment and talent management module.

Module Name		Recruitment and Talent Management
Tested Components		Maintain Designation, Recruitment, Suggestions
No	**Test Description**	**Expected Result**
1	User Access of each sections	Only the HR and admin can maintain the

		designations. Only the HR can publish vacancies and all the employees can apply for jobs. All the employees can give their suggestions and ideas.
2	Access without login to the system	Access should denied
3	Adding new records	All fields that are not disabled should validated
4	Editing a record	The relevant data should display for the selected Id
5	Deleting a record	Only the records which not having any dependencies can be deleted
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well
8	Add/edit/Delete records	Certain relevant messages and warnings should display
9	Search criteria for searching records	The result should be accurate for searching criteria
10	Displaying search result	The Result should be ordered in user friendly way
11	Select Data from combo box	The records should be ordered in alphabetical order
12	Editing records	Relevant fields should disable
13	Deleting and Viewing Form	The all fields should disable
14	Horizontal menu	The menu should show the authorized sections
15	Applying for vacancies	When a user click on Apply button they can send a mail to company mail

Table 5-6 Test cases for Recruitment and Talent Management Module

5.3.6 Staff Relation and Labour Relation Module

Table 5-7 depicts the test cases for the staff relation and labour relation module

Module Name		Staff Relation and Labour Relation
Tested Components		HR log, Handling Inquiries, Planning HR events
No	**Test Description**	**Expected Result**
1	User Access of each sections	Only the HR person can maintain HR log and planning HR events. Every employees can process inquiries
2	Access without login to the system	Access should denied
3	Adding new records	All fields that are not disabled should validated
4	Editing a record	The relevant data should display for the selected Id
5	Deleting a record	Only the records which not having any dependencies can be deleted
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well
8	Add/edit/Delete records	Certain relevant messages and warnings should display
9	Search criteria for searching records	The result should be accurate for searching criteria
10	Displaying search result	The Result should be ordered in user friendly way
11	Select Data from combo box	The records should be ordered in alphabetical order
12	Editing records	Relevant fields should disable
13	Deleting and Viewing Form	The all fields should disable
14	Horizontal menu	The menu should show the authorized sections

15	Approve/Reject Suggestions	Only the authorized people can approve/reject

Table 5-7 Test cases for Staff Relation and Labour Relation Module

5.3.7 Vehicle Gate Passes and Fuel Management Module

Table 5-8 depicts the test cases for the vehicle gate passes and fuel management module.

Module Name		Vehicle Gate Passes and Fuel Management
Tested Components		Vehicle Details, Maintain Customers, Gate passes
No	**Test Description**	**Expected Result**
1	User Access of each sections	Only the admin can access to the vehicle details and Gate passes
2	Access without login to the system	Access should denied
3	Adding new records	All fields that are not disabled should validated
4	Editing a record	The relevant data should display for the selected Id
5	Deleting a record	Only the records which not having any dependencies can be deleted
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well
8	Add/edit/Delete records	Certain relevant messages and warnings should display
9	Search criteria for searching records	The result should be accurate for searching criteria
10	Displaying search result	The Result should be ordered in user friendly way
11	Select Data from combo box	The records should be ordered in alphabetical order
12	Editing records	Relevant fields should disable
13	Deleting and Viewing Form	The all fields should disable

14	Horizontal menu	The menu should show the authorized sections
15	Printing Gate Pass	After selecting employee, vehicle and customer the gate pass can be printed

Table 5-8 Test cases for Vehicle Gate Pass and Fuel Management

5.3.8 Report Generation Module

Table 5-9 depicts the test cases for the report generation module.

Module Name		Report Generation
Tested Components		Report Generation Forms
No	**Test Description**	**Expected Result**
1	Generate Reports	User can generate report to selected criteria
2	Print reports	User can print the generated reports

Table 5-9 Test cases for Report Generation Module

5.3.9 Administration Module

Table 5-10 depicts the test cases for the administration module.

Module Name		Administration
Tested Components		User Account, Administration
No	**Test Description**	**Expected Result**
1	Create new users	Admin can create user accounts
2	Manage User Accounts	Admin can be able to edit/delete user account
3	Get backup	Admin can be able to get database backup

Table 5-10 Test cases for Administration Module

Table 5-11 depicts the test cases for login page.

Module Name		Login
Tested Components		Login Page
No	**Test Description**	**Expected Result**
1	Invalid username and password	System should show relevant error messages
2	Validate username password	Once the user enter correct username and

		password redirect to the home page

Table 5-11 Test cases for Login Page

5.4 TEST DATA AND TEST RESULTS

The system is tested by selecting dummy data and check whether it is showing user friendly errors. Then the user who has not much IT knowledge also can understand what is going wrong with his/her operation

When the system is completely implemented it was tested by using actual data that gather from JDC.

Finally testing the system and finding the weaknesses of the system and fix them to build the final output.

Please refer Appendix-E for test results

5.5 ACCEPTANCE TESTING

Acceptance Test was carried out after the implementation of the JDC Management system. Relevant staff members those who suppose to obtain privileges to use the system were asked to carry out certain tasks as they would do in a real situation with real data. As the result of the Acceptance Test it was identified that the system is user friendly, easy to use, effective and has a pleasant working environment to work. Many of the users' and the client's feedbacks were positive and they were pleased since the project was able to meet its all the objectives. Suggestions for future improvements of the system were also made by the client alone

Above mentioned user feedbacks are shown in Appendix E and the Client Certificate is attached in Appendix G.

5.6 User Evaluation

After system testing is done system is given to the JDC to enter the actual data and test the system in actual environment. The user evaluation is done by within that period.

User Evaluation Form

Figure 5-1 depicts the user evaluation form

No	Questions	Very Good	Good	Moderate	Poor
1	User Friendliness of the system	ok			
2	Cross Browser Compatibility		ok		
3	Consistency of navigations and forms	ok			
4	Speed of transaction per minute		ok		
5	Ease of understanding the system	ok			
6	Generating report	ok			
7	Importance of reports		ok		
8	Sequence of screens			ok	
9	Error messages		ok		
10	Validations of the input fields	ok			
11	Potential benefits getting through the system		ok		

Figure 5-1 User Evaluation Form

CHAPTER 6 CONCLUSION

6.1 INTRODUCTION

After get the project from the client understands the client requirements and made the project proposal to the client and got the client approval for doing the project.
Use case diagrams and Entity Relationship diagrams had created to further understand the client problem and identify the scope of the project. Once identified the scope on client perspective it was reduced to tally with BIT time schedule and inform that to client also.

After clarifying the client requirement create the UML diagrams to do the system design and after create the user interface design. Once the user interface design is done did a small presentation to the client to get client approval.

After studying the codeigniter framework started to do the implementation phase. The Codeigniter framework has used to speed up the time of doing the project.

Prior to the testing test cases have identified and after implemented whole system it was tested according to the identified test cases.
After system testing is done, the system is given to the selected JDC employees to do the user acceptance testing. They gave positive feedback to the system.

6.2 CRITICAL ASSESSMENT OF THE PROJECT

This means what are the major and critical sections identified in the system.

Leave module and the Vehicle fuel consumption modules are the most critical modules in the system.

When an employee is added to the system the HR person has to allocate leaves for that employee. Once that employee applies a leave application his/her leave entitlements should show with the leave balance accurately. When the leave has applied used leaves should update correctly with the php script.

When an employee comes after customer visit he/she must fill the gate pass details through the system. Once the user entered those details by considering the distance they travelled must calculate the fuel consumption using php script

6.3 Future Improvements

Though the functional and non-functional requirements are satisfied there are future improvements that can be implemented to the client anxious.

- Adding a payroll module to calculate employee's salary.
  This can be achieved with the current system because it has maintaining employee's attendance, leaves and salary details.
- Creating a mobile compatible application to apply leave online.
- Improve the management reports by adding diagramming tool

6.4 Lessons Learnt

This project gives me the knowledge of all the phases in software development life cycle (SDLC). Doing an individual project can get the overall knowledge of reporting, developing both.
This is a great chance to apply the knowledge we gain through our three year of Degree and what we research daily.

For creating this system I had learnt codeigniter framework on my own and practice the MVC architecture.

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- [WWW3] - Rational Unified Process - http://www.webopedia.com/TERM/R/RUP.html
- [WWW4] - Unified Modeling Language http://en.wikipedia.org/wiki/Unified_Modeling_Language
- [WWW5] - Class Diagram - http://en.wikipedia.org/wiki/Class_diagram
- [WWW6] - MVC for web applications - http://net.tutsplus.com/tutorials/other/mvc-for-noobs/
- [WWW7] - Code Igniter user guide- http://codeigniter
- [WWW8] - jQuery UI Date Picker - http://jqueryui.com/demos/datepicker/
- [WWW9] - Blue Whale Admin - http://www.templatescreme.com/free-website-bluewhale-professional-admin
- [WWW10] - Bootstrap - http://getbootstrap.com/
- [WWW11] - html2pdf - http://www.html2pdf.fr/en
- [WWW12] - codeigniter - http://ellislab.com/codeigniter
- [WWW13] - Unit testing - http://en.wikipedia.org/wiki/Unit_testing
- [WWW14] - Black box testing - http://www.onestoptesting.com/blackbox-testing/
- [WWW15] - Whitebox testing - http://www.guru99.com/white-box-testing.html
- [WWW16] - Integration Testing - http://www.guru99.com/integration-testing

- [WWW17] - System Testing - http://www.guru99.com/system-testing
- [WWW18] - Test Plan - http://softwaretestingfundamentals.com/test-plan/

APPENDIX A

SYSTEM DOCUMENTATION

This is providing the guidance to install the system in company environment.

To set up the system following hardware and software requirements should be fulfilled.

Hardware Requirements

Table A-1 depicts the hardware requirements.

Hardware	Minimum Requirements
Processor	1 GHz Intel core 2 Duo or newer processor
Memory	512 RAM or more
Hard Disk space	Minimum 1GB hard disk space or higher
Display	1024x768 or resolutions above. high color 16-bit display
Printer	Dot – matrix printer or ink jet printer or Laser printer
Internet	Minimum 512kbps ADSL connection

Table A-1 Hardware Requirements

Software Requirements

Table A-2 depicts the Software requirements.

Software	Minimum Requirements
Operating System	Microsoft Windows XP/ Vista/Windows 7
Bundle Package	WAMPP 2.2 or above XAMPP 1.7 or above
Web Browser	Internet Explorer 8.0 or above/ Firefox 6.0/ Google Chrome/Opera

Table A-2 Software Requirements

System setup

1. Copy the jdc folder given in the CD and paste it inside the root folder in the following paths.

   Windows Environment with XAMPP installed

   The path would be C:\xampp\htdocs

   Linux Environment with LAMPP installed

   The path would be C:\lampp\htdocs

Windows environment with WAMP installed

The path would be C:\wamp\www

2. Setup the mail server.

Database setup

1. Open phpMyAdmin by typing the following URL in the address bar of the browser Http://localhost/phpmyadmin/
2. Login by giving username and password
3. Create a blank database named jdc_db
4. Click the import tab and browse the CD's database folder (The path would be ../Database/jdc_db.sql) and select jdc_db.sql file
5. Click the go button to import the folder into the newly created database.

Figure A-1 depicts the way how the database import.

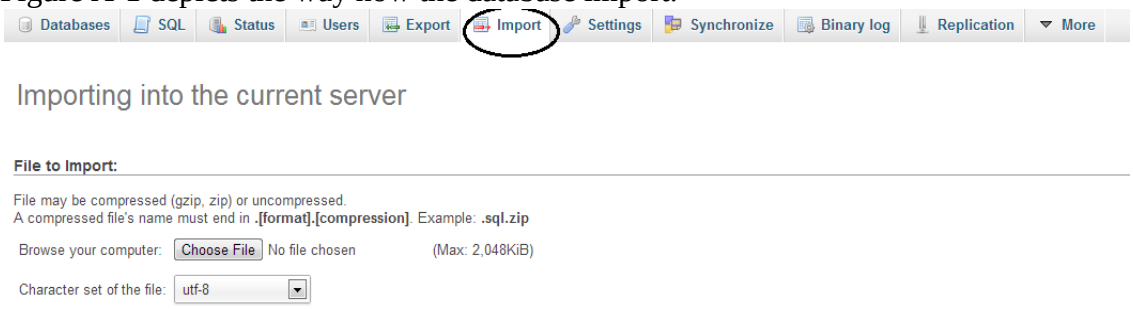


Figure A-1 Import Database

Usage of the system

Once the jdc folder is located in root folder and the database is imported and the configurations are done;

You can open preferred browser and type the following URL in the address bar

http://localhost/jdc or http://127.0.0.1/jdc

And login to gain access, by providing correct username and password.

Please refer Chapter 4 – Implementation to understand directory structure

APPENDIX B

DESIGN DOCUMENTATION

Sequence Diagram for vehicle gate passes

Figure B-1 depicts the sequence diagram for the generating vehicle gate pass.

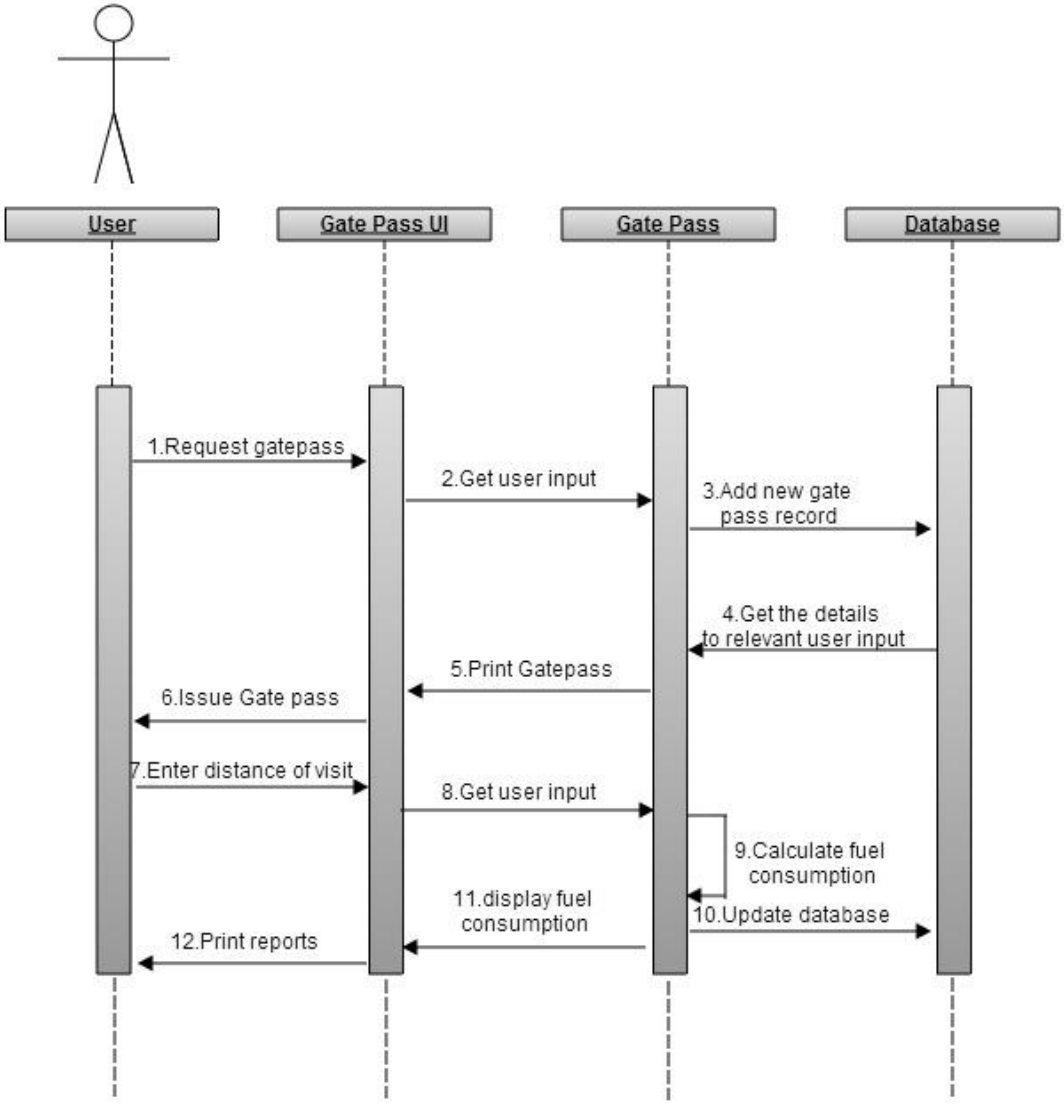


Figure B-1 Sequence Diagram for Vehicle Gate Passes

Sequence Diagram for Report Generation

Figure B-2 depicts the sequence diagram for report generation

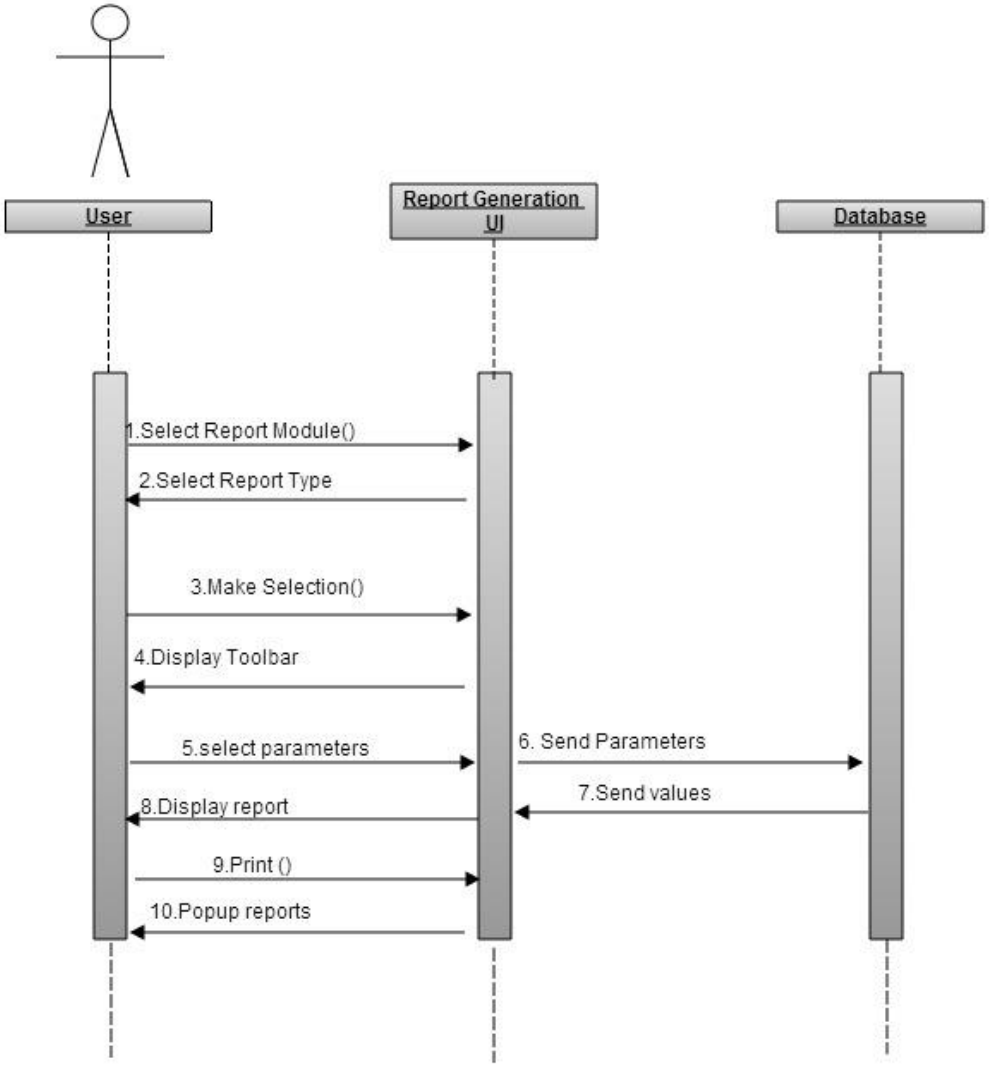


Figure B-2 Sequence diagram for Report Generation

APPENDIX C

USER DOCUMENTATION

The user documentation provide the complete details description to the user how to use system with images of GUIs and mentioning the path of accessing each pages.

The system is created to seven types of users and those users have different access to the modules according to their user privileges. For the explanation purpose these are showing admin and HR user's side because these employees has the access to all modules in the system,

Login

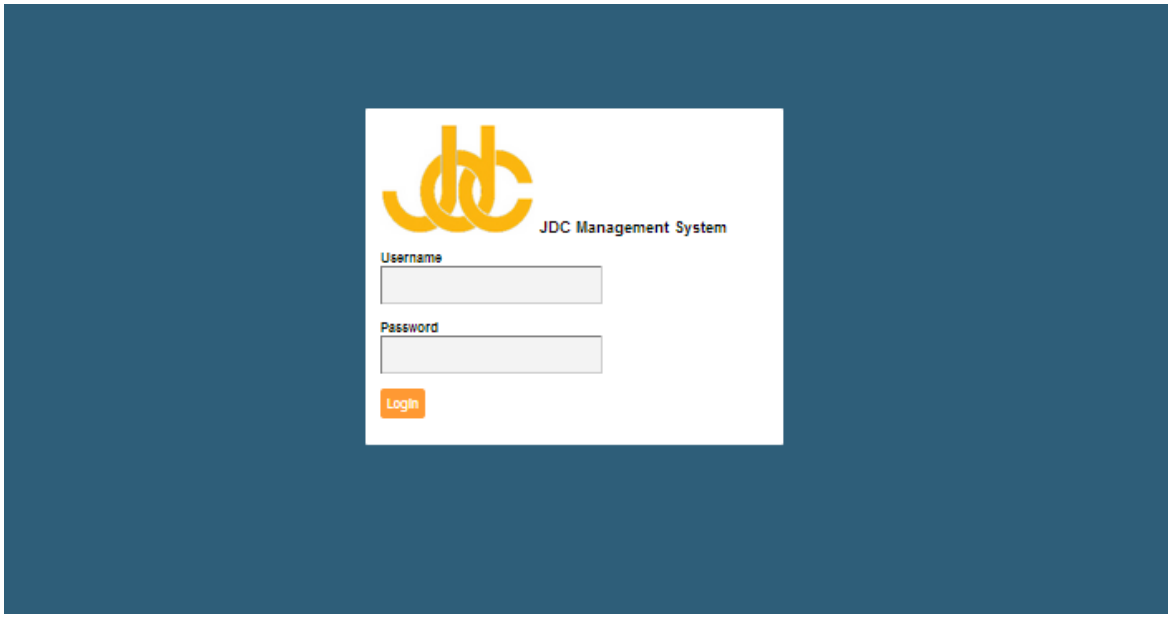


Figure C-1 Login

Typing the URL http://localhost/jdc this login screen showing in Figure C-1 and for login to the system user should enter valid username and password.

Dashboard

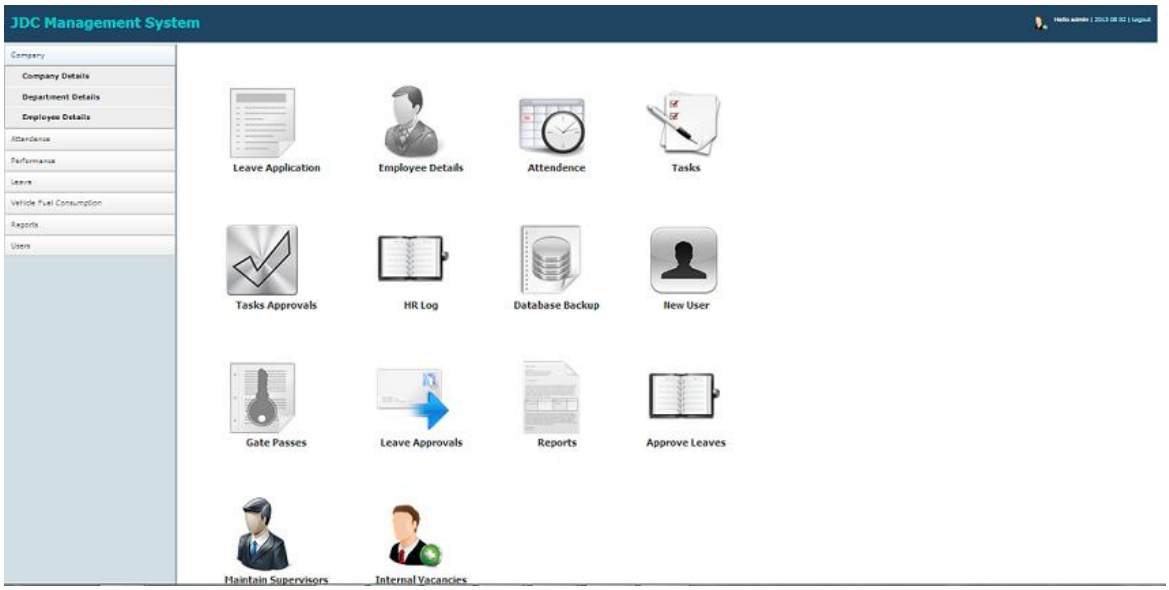


Figure C-2 Dashboard

Once the user login as admin correctly the dashboard will be shown as in figure C-2. This is the page that showing the vertical menu bar and for easiness of the user important modules has access through the dashboard.

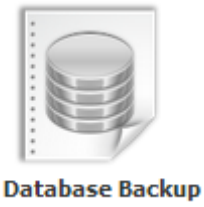


Figure C-3 Database backup

When a user clicks on Database backup icon (Figure C-3), He/she can get the database backup for login date as a zip file. This option is only for the admin.

Employee Management

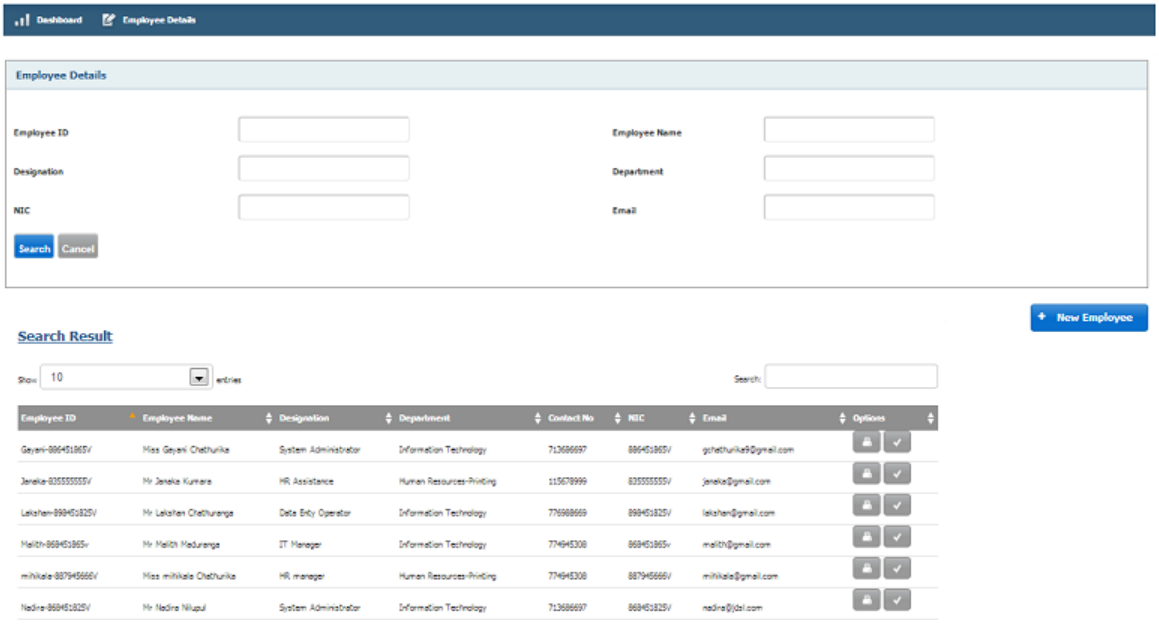


Figure C-4 Employee Management

When a user wants to see their profile he/ she can goes to this page (Figure C-4) from the dashboard clicking on employee icon or vertical menu bar

Common instruction to use the system

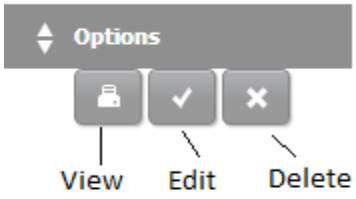


Figure C-5 Buttons

Figure C-5 shows the common buttons in the system that see in every data grid. When user keeps the cursor on an icon the title can see mentioning what to do with that icon

Figure C-6 Search buttons

When a user wants to search something he can do this by click on search button and reset the selected criteria by clicking on cancel button shown as in Figure C-6

Figure C-7 upload button

When a user wants to upload the attendance file this can achieved by click on the above button (Figure C-7)

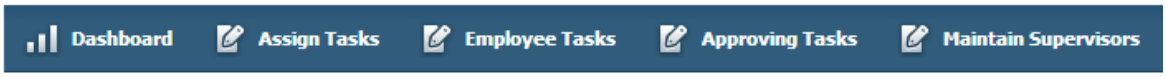


Figure C-8 Horizontal menu

These kind of horizontal menus are there for each module to increase the user friendliness of the system.

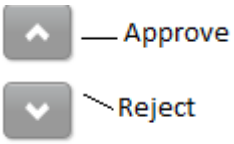


Figure C-9 buttons

Figure C-10 Assigning button

Figure C-10 shows the common button for assigning things.

Leave Application

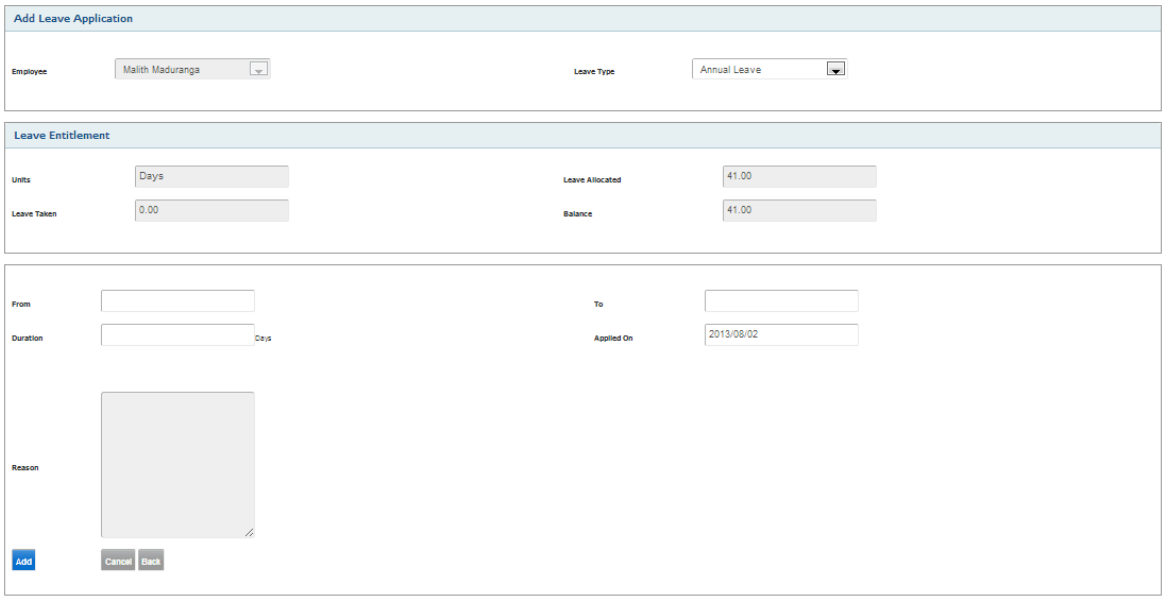


Figure C-11 Leave Application

This can view directly from the dashboard or by click on the vertical navigation. Leave application show with the login user's name like Figure C-11

Leave Allocation

Employee	Leave Type	Year	Allocated Leaves	Used Leaves	Leave balance	Options
Miss Gayani Chathurika	Annual Leave	2013	41.00	0.00	41	
Miss mihikala Chathurika	Annual Leave	2013	41.00	0.00	41	
Mr Janaka Kumara	Casual Leave	2013	12.00	3.00	9	
Mr Janaka Kumara	Casual Leave	2013	12.00	3.00	9	
Mr Lakshan Chathuranga	Annual Leave	2013	30.00	0.00	30	
Mr Malith Maduranga	Annual Leave	2013	41.00	0.00	41	
Mr Nadira Nilupul	Annual Leave	2013	40.00	0.00	40	

Figure C-12 Leave Allocation

As shown in the Figure C-12 the system shows the employees for leave allocation.

Leave Allocation

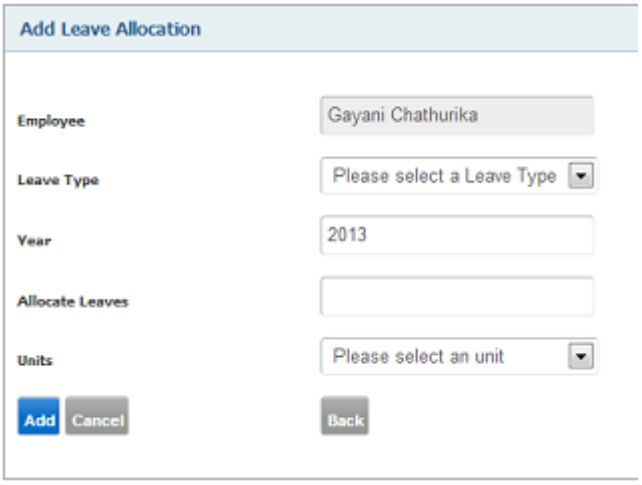


Figure C-13 Leave Allocation form

This form can see only to the HR staff to allocate leave for every employee. (Figure C-13)

Assigning Tasks

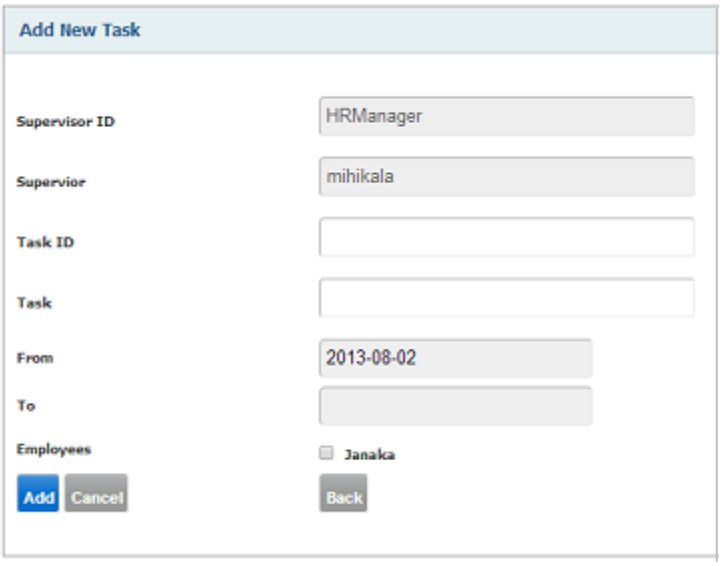
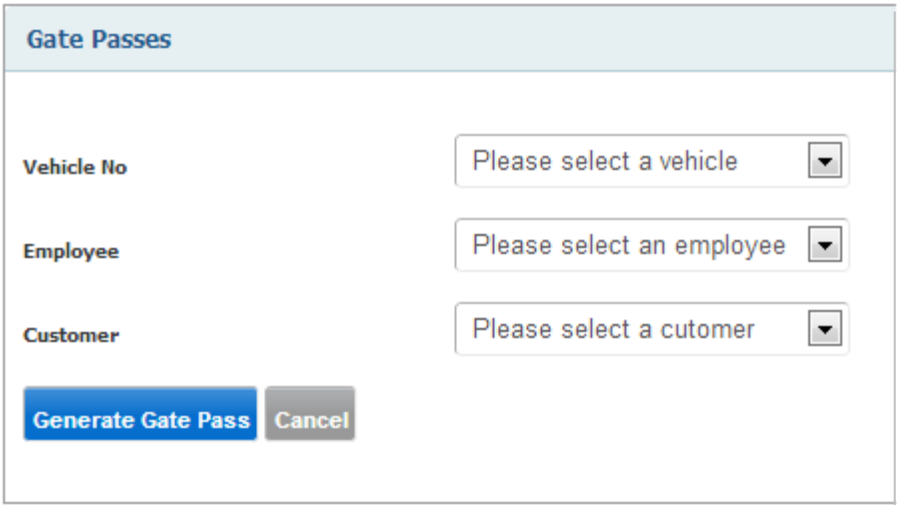


Figure C-14 Assign Task

Figure C-14 show the form for assigning task for employees by their supervisors

Generating Vehicle Gate Pass



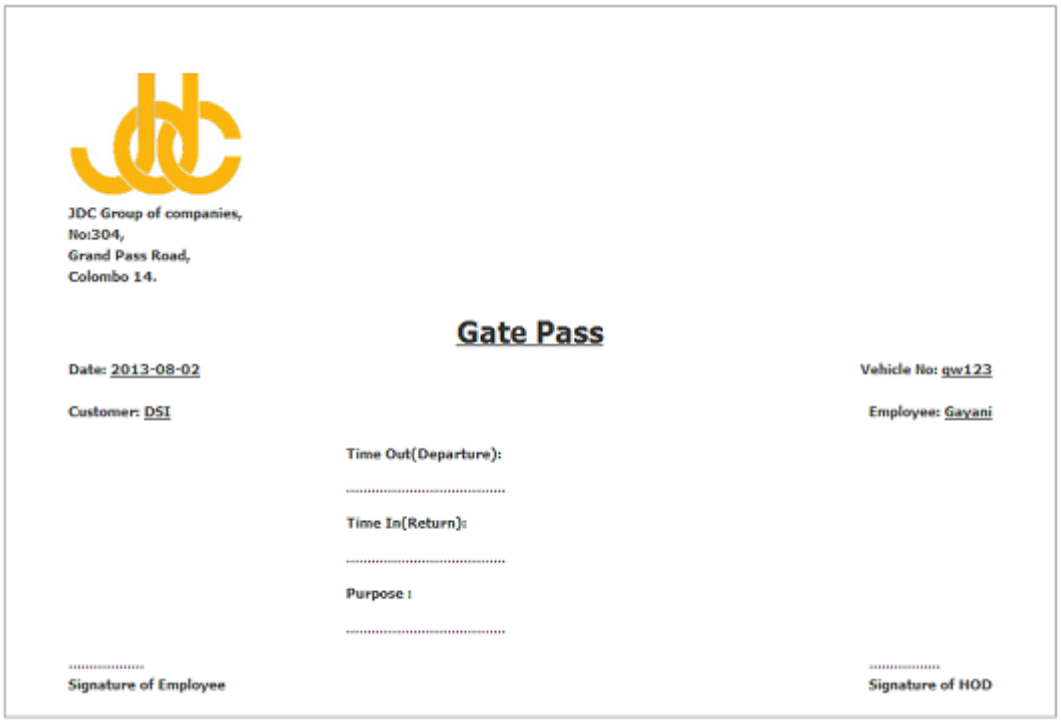


Figure C-15 Generating Vehicle Gate Pass

Figure C-15 depicts the process of generating vehicle gate pass. Once the user select the values from the dropdown and click on Generate button they can get a PDF type vehicle gate pass and can print it also.

APPENDIX D

MANAGEMENT REPORTS

Once the system is implemented the managerial reports are created. When designing the system consider the type of reports that can get from the system and do the implementation according to that.

The reports can be export to the excel and pdf both.

Progress Report

This is a report that shows the progress of each employee and these reports can get timely for particular employee.

	A	B	C	D	E	F	G
1	**Employee Name**	**Task**	**From**	**To**	**Status**	**Marks**	**Feedback Date**
2	Gayani Chathurika	HR system	1/9/2013	8/1/2013	Completed	100	8/2/2013
3	Nadira Perera	HR system	1/10/2013	8/2/2013	Half Completed	50	8/3/2013
4	Mihikala Madushani	New Recruitment	3/5/2013	4/1/2013	Completed	100	3/29/2013
5	Malith Maduranga	Client Meeting	6/10/2013	6/10/2013	Completed	100	6/10/2013
6	Dinesh Maduranga	Accounting system	6/10/2013	8/1/2013	Half Completed	50	6/11/2013
7	Madawa Perera	Income analysis	1/14/2013	2/5/2013	Completed	100	5/3/2013
8							

Figure D-1 Progress Report

Leave Report

	A	B	C	D	E	F
1	**Employee**	**Leave Type**	**Year**	**Allocated Leaves**	**Used Leaves**	**Leave Balance**
2	Gayani Chathurika	Annual Leave	2013	41	0	41
3	Mihikala Madushani	Annual Leave	2013	41	0	41
4	Janaka Kumara	Casual Leave	2013	12	5	7
5	Lakshan Chathuranga	Annual Leave	2013	40	3	37
6	Gayan Chathuranga	Casual Leave	2013	10	4	6
7	Nadira Perera	Casual Leave	2013	15	5	10
8						

Figure D-2 Leave Report

Attendance Report

	Employee	Attendance Date	In time	Out time	Duration
2	Gayani Chathurika	5/10/2013	9	5	8
3	Mihikala Madushani	5/11/2013	9	5	8
4	Janaka Kumara	5/12/2013	9	5	8
5	Lakshan Chathuranga	5/13/2013	9	5	8
6	Gayan Chathuranga	5/14/2013	9	5	8
7	Nadira Perera	5/15/2013	9	5	8
8					

Figure D-3 Attendance Report

Fuel Consumption Report

	Employee	Vehicle No	Date	Distance(km)	Consumption(l/km)
2	Gayani Chathurika	S124564	7/16/2013	20	2
3	Nadira Perera	S124566	7/17/2013	12	1
4	Mihikala Madushani	S124564	7/18/2013	10	0.5
5	Malith Maduranga	SW1235	7/19/2013	14	1.5
6	Dinesh Maduranga	S123356	7/20/2013	30	3.5
7	Madawa Perera	SW1235	7/16/2013	10	2
8					

Figure D-4 Fuel Consumption Report

Vehicle Gate Pass

Figure D-5 Vehicle Gate Pass

APPENDIX E TEST RESULTS

Company Details Management Module

Table E-1 depicts the test result of company details management module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	Admin can only have the authorization to manage the company details; HR person can manage the department details and Admin also. Manager can view the company and department details. DEO can only add new employee to the system. When the employee login to the system they can see only their records through the system	Pass

2	Access without login to the system	Access should denied	Pass
3	Adding new records	All fields should validated	Pass
4	Editing a record	The relevant data should display for the selected Id	Pass
5	Deleting a record	Only the records which not having any dependencies can be deleted	Pass
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies	Pass
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well	Pass
8	Add/edit/Delete records	Certain relevant messages and warnings should display	Pass
9	Search criteria for searching records	The result should be accurate for searching criteria	Pass
10	Displaying search result	The Result should be ordered in user friendly way	Pass
11	Select Data from combo box	The records should be ordered in alphabetical order	Pass
12	Adding NIC no	Only 10 characters can be entered	Pass
13	Selecting Appointment Date and Resign Date	Appointment Date should be older than the Resign Date	Pass
14	Editing records	Relevant fields should disable	Pass
15	Deleting and Viewing Form	The all fields should disable	Pass
16	Displaying Employee ID	The Employee Id should display and cannot modify	Pass
17	Adding Resign date	Without adding resign date the process can do further	Pass
18	Horizontal menu	The menu should show the authorized sections	Pass
19	Uploading photo	The allow file types should display	Pass
20	Uploading wrong file	Should show error message without losing	Pass

		data in the form	
21	Deactivate an Employee	If employee resign date is less than the current date the HR Person can deactivate the employee and his/her user login	Pass

Table E-1 Test result of company details management module

Performance and Duty Monitoring Module

Table E-2 depicts the test result of the performance and duty monitoring module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	Admin can only have the facility to manage supervisors and assigning employees to the supervisors. Top level users can assigning tasks for their employees and the other users can view the tasks assign to them.	Pass
2	Access without login to the system	Access should denied	Pass
3	Adding new records	All fields that are not disabled should validated	Pass
4	Editing a record	The relevant data should display for the selected Id	Pass
5	Deleting a record	Only the records which not having any dependencies can be deleted	Pass
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies	Pass
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well	Pass
8	Add/edit/Delete records	Certain relevant messages and warnings should display	Pass
9	Search criteria for searching	The result should be accurate for	Pass

	records	searching criteria	
10	Displaying search result	The Result should be ordered in user friendly way	Pass
11	Select Data from combo box	The records should be ordered in alphabetical order	Pass
12	Editing records	Relevant fields should disable	Pass
13	Deleting and Viewing Form	The all fields should disable	Pass
14	Horizontal menu	The menu should show the authorized sections	Pass
15	Select supervisors to add	Once the employee is add his designation must load accurately without loading the page	Pass
16	Edit a supervisor	Supervisor id should disabled	Pass
17	Viewing employees to assign tasks	When a top level supervisor is log in to the system he can only view the employees assign to him and assign tasks only for his employees	Pass
18	Mark progress of the tasks	When an employee mention the progress of the task if the task is approved previous it should show as disable field	Pass
19	Rejected Tasks	The rejected tasks cannot process further	Pass
20	Approving tasks	When the task has expired and the completion status is not completed yet then there should be option to assign that tasks for other employee	Pass
21	Viewing approve tasks	Till the tasks end date is coming that tasks can go for the approval	Pass

Table E-2 Test Result of Performance and duty Monitoring Module

Attendance Module

Table E-3 depicts the test result of the attendance module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	Top level such as Admin, Managers can see the attendance of every employee. The other users can see only their attendance when login to the system	Pass
2	Access without login to the system	Access should denied	Pass
3	Search criteria for searching records	The result should be accurate for searching criteria	Pass
4	Displaying search result	The Result should be ordered in user friendly way	Pass
5	Select Data from combo box	The records should be ordered in alphabetical order	Pass
6	Uploading Attendance Sheet	The allow file types should display	Pass
7	Uploading wrong file	Should show error message	Pass
8	After uploading attendance sheet	New records should show without error	Pass
9	Date of search criteria	Only the current date should display and show the result for the current date	Pass

Table E-3 Test Result of Attendance Module

Leave Management Module

Table E-4 depicts the test result of leave management module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	When a top level user login to the system he can see the leave request and leave for	Pass

		approvals that belong to the employees under them. Manage leave types and leave allocation only can proceed by HR person. Once the employee login to the system he can see only his leave requests	
2	Access without login to the system	Access should denied	Pass
3	Adding new records	All fields should validated	Pass
4	Editing a record	The relevant data should display for the selected Id	Pass
5	Deleting a record	Only the records which not having any dependencies can be deleted	Pass
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies	Pass
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well	Pass
8	Add/edit/Delete records	Certain relevant messages and warnings should display	Pass
9	Search criteria for searching records	The result should be accurate for searching criteria	Pass
10	Displaying search result	The Result should be ordered in user friendly way	Pass
11	Select Data from combo box	The records should be ordered in alphabetical order	Pass
12	Editing records	Relevant fields should disable	Pass
13	Deleting and Viewing Form	The all fields should disable	Pass
14	Horizontal menu	The menu should show the authorized sections	Pass
15	Displaying all leave allocation	When comes to the page default year should be current year and that can be	Pass

		change by user.	
16	Modifying records of leave allocation	Only the records relevant to current year can be modified	Pass
17	Showing employees for leave allocation	All the employees in the system should show whether they have been allocated leaves or not. The links for allocate leave should show to each employee	Pass
18	Time of leave allocation	Leave allocation can limit to the leave types of the system and that should be handle accurately	Pass
19	Applying for leave	Once the leave type is selected the records of allocated leaves and leave balance should show without reloading the page	Pass
20	Date validation in leave form	Once the To date is less than From date must give the error messages	Pass
21	When an employee apply leave	After request leave the system should change the leave balance correctly	Pass
22	Showing records for leave approvals	Only the leave that should forward to approval must display	Pass

Table E-4 Test Result of Leave Management Module

Recruitment and Talent Management Module

Table E-5 depicts the test result of the recruitment and talent management module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	Only the HR and admin can maintain the designations. Only the HR can publish vacancies and all the employees can apply for jobs. All the employees can give their suggestions and ideas.	Pass
2	Access without login to the system	Access should denied	Pass
3	Adding new records	All fields that are not disabled should validated	Pass

4	Editing a record	The relevant data should display for the selected Id	Pass
5	Deleting a record	Only the records which not having any dependencies can be deleted	Pass
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies	Pass
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well	Pass
8	Add/edit/Delete records	Certain relevant messages and warnings should display	Pass

Table E-5 Test Result of Recruitment and Talent Management Module

Staff Relation and Labour Relation Module

Table E-6 depicts the test result of the staff relation and labour relation module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	Only the HR person can maintain HR log and planning HR events. Every employees can process inquiries	Pass
2	Access without login to the system	Access should denied	Pass
3	Adding new records	All fields that are not disabled should validated	Pass
4	Editing a record	The relevant data should display for the selected Id	Pass
5	Deleting a record	Only the records which not having any dependencies can be deleted	Pass
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies	Pass
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well	Pass
8	Add/edit/Delete records	Certain relevant messages and warnings should display	Pass

9	Search criteria for searching records	The result should be accurate for searching criteria	Pass
10	Displaying search result	The Result should be ordered in user friendly way	Pass
11	Select Data from combo box	The records should be ordered in alphabetical order	Pass
12	Editing records	Relevant fields should disable	Pass
13	Deleting and Viewing Form	The all fields should disable	Pass
14	Horizontal menu	The menu should show the authorized sections	Pass
15	Approve/Reject Suggestions	Only the authorized people can approve/reject suggestions	Pass

Table E-6 Test Result of Staff Relation and Labour Relation Module

Vehicle Gate Passes and Fuel Management Module

Table E-7 depicts the test result of the vehicle gate passes and fuel management module.

No	Test Description	Expected Result	Actual Result
1	User Access of each sections	Only the admin can access to the vehicle details and Gate passes	Pass
2	Access without login to the system	Access should denied	Pass
3	Adding new records	All fields that are not disabled should validated	Pass
4	Editing a record	The relevant data should display for the selected Id	Pass
5	Deleting a record	Only the records which not having any dependencies can be deleted	Pass
6	Accessing through URL for deleting a record	Should give error message mentioning that record have dependencies	Pass
7	Click on Back button	Should go where the previous place it came. If records is selected through search criteria that should remain as well	Pass
8	Add/edit/Delete records	Certain relevant messages and warnings	Pass

		should display	
9	Search criteria for searching records	The result should be accurate for searching criteria	Pass
10	Displaying search result	The Result should be ordered in user friendly way	Pass
11	Select Data from combo box	The records should be ordered in alphabetical order	Pass
12	Editing records	Relevant fields should disable	Pass
13	Deleting and Viewing Form	The all fields should disable	Pass
14	Horizontal menu	The menu should show the authorized sections	Pass
15	Printing Gate Pass	After selecting employee, vehicle and customer the gate pass can be printed	Pass

Table E-7 Test Result of Vehicle Gate Passes and Fuel Consumption Module

Report Generation Module

Table E-8 depicts the test result of the report generation module.

No	Test Description	Expected Result	Actual Result
1	Generate Reports	User can generate report to selected criteria	Pass
2	Print reports	User can print the generated reports	Pass

Table E-8 Test Result of Report Generation Module

Administration Module

Table E-9 depicts the test result of administration module.

No	Test Description	Expected Result	Actual Result
1	Create new users	Admin can create user accounts	Pass
2	Manage User Accounts	Admin can be able to edit/delete user account	Pass
3	Get backup	Admin can be able to get database backup	Pass
1	Invalid username and password	System should show relevant error messages	Pass

2	Validate username password	Once the user enter correct username and password redirect to the home page	Pass

Table E-9 Test Results of Administration Module

APPENDIX F – CODE LISTING

This section shows the selected code segments the rest of the codes are come with the CD.

LOGIN

Controller

```
<?php
	class login extends CI_Controller{

	function index()
	{
		$this->load->view('user/login');
	}

	function validate()
	{
	$this->form_validation->set_rules('username','Username','trim|required');
	$this->form_validation->set_rules('password','Password','trim|required');

	if($this->form_validation->run() == FALSE){
	//validation fail
	$this->index();
	}else{
	//validation true
	$this->load->model('login_model');
	$query = $this->login_model->validate($this->input->post());
	if($query){
		$data = array(
		'username'		=> $query->username,
		'user_role_id'	=> $query->user_role_id,
		'user_role'		=> $query->user_role,
		'Emp_id'		=> $query->Emp_id,
		'is_logged_in'	=> true
		);
	$this->session->set_userdata($data);
		redirect('home_page');
	}else{
```

```
		$this->session->set_flashdata('msg',LOGIN_ERROR);
			redirect('login');
		}
		}
		}//validate




		}
?>
```

Model

```
<?php
class login extends CI_Controller{

function index()
{
		$this->load->view('user/login');
}

function validate()
{
$this->form_validation->set_rules('username','Username','trim|required');
$this->form_validation->set_rules('password','Password','trim|required');

if($this->form_validation->run() == FALSE){
//validation fail
$this->index();
}else{
//validation true
$this->load->model('login_model');
$query = $this->login_model->validate($this->input->post());
		if($query){
			$data = array(
				'username'		=> $query->username,
				'user_role_id'	=> $query->user_role_id,
				'user_role'		=> $query->user_role,
				//'firstname'		=> $query->First_name,
				//'Middle_name'		=> $query->Middle_name,
				'Emp_id'		=> $query->Emp_id,
				'is_logged_in'	=> true
				);
		$this->session->set_userdata($data);
		redirect('home_page');
```

```
        }else{
        $this->session->set_flashdata('msg',LOGIN_ERROR);
        redirect('login');
        }
}
}//validate




        }
?>
```

View

```
<html>
        <head>
        <title>Login</title>

     <link rel="stylesheet" type="text/css" href="<?php echo site_url(); ?>css/style.css" />
  </head>

  <body>
<div id="login_form">

<div id="main"><img src="<?php echo site_url(); ?>images/jdclogo.png"/>
  JDC Management System</div>
  <p id="errormsg">
  <?php if($this->session->flashdata('msg') != ''){
        echo '<font color="#FF0000">'.$this->session->flashdata('msg').'</font>';
   } ?>
   </p>
  <p id="sub">
  <?php echo form_open('login/validate'); ?>
  <?php session_start(); ?>
  <?php echo form_label('Username','username'); ?>
  <?php echo form_input('username',set_value('username')); ?>
  <div class="error"><?php echo form_error('username'); ?></div>


  <?php echo form_label('Password','password');?>
        <?php echo form_password('password',set_value('password')); ?>
  <div class="error"> <?php echo form_error('password'); ?></div>

  <?php echo form_submit('submit','Login'); ?>
  <?php echo form_close(); ?>
```

```
   </p>
</div>

        </body>
</html>
```

Calculating Used Leave

When an employee submits a leave application the used leaves must change. That is handling in Leave model

```
<?php
function get_cur_lv($lv)
   {
      $this->db->select('used,leave_allo_id');
      $this->db->from(LV_ALLO_TBL);
      $this->db->where('leave_type_code',$lv);
      $this->db->where('Emp_id',$this->session->userdata('Emp_id'));
      $this->db->where('year',date('Y'));
      return $this->db->get()->result();
   }

function inser_lv_app($data)
   {
      $test1 = $data['From'];
      $From = date('Y-m-d',strtotime($test1));
      $test2 = $data['to'];
      $to = date('Y-m-d',strtotime($test2));
      $test3 = $data['applied_on'];
      $applied_on = date('Y-m-d',strtotime($test3));

      $used_lv = $this->get_cur_lv($data['leave_type_code']);
      //$super = $this->get_supervisor($this->session->userdata('Emp_id'));

      //$apprv_by =  json_encode($super);


      $dataset =
array('From'=>$From,'to'=>$to,'applied_on'=>$applied_on,'no_of_days'=>$data['no_of_days'],'r
eason_for_leave'=>$data['reason_for_leave'],'Emp_id'=>$this->session-
>userdata('Emp_id'),'leave_type_code'=>$data['leave_type_code'],'app_status'=>'P');
      $all_used = $used_lv[0]->used+$data['no_of_days'];
```

```
        $this->db->trans_start();
        $this->db->insert(LEAVE_TBL,$dataset);
        $this->db->where('leave_allo_id',$used_lv[0]->leave_allo_id);
        $this->db->update(LV_ALLO_TBL,array('used'=>$all_used));
        $result = $this->db->trans_complete();
        if($result != ''){
           return TRUE;
        }
    }
```

Jquery Ajax call for getting Leave Entitlements

```
<script type="text/javascript">
jQuery(document).ready(function(){

    <?php if($action != 'Add'){
        ?>
        jQuery('#leave_type').attr('readonly',true);
        <?php
    } ?>

        get_allo();

        jQuery('#leave_type').change(function(){
          get_allo();
        });

        function get_allo(){
           jQuery.ajax({
                    url:'<?php echo site_url('search/get_lv_ent'); ?>',
                    type:'post',
                    data:jQuery('#leave_type').serializeArray(),
                    success:function(data){
                      //alert(data);
                      result=data.split(',');
                      //alert(result[0]);
                      jQuery('#allo_uom').val(result[0]);
                      jQuery('#uom').html(result[0]);
                      jQuery('#allocated').val(result[1]);
                      jQuery('#used').val(result[2]);
                      jQuery('#bal').val(result[3]);
                      //jQuery('#bal').val(data.bal);
              }

           });
        }
});  </script>
```

APPENDIX G – CLIENT CERTIFICATE

JDC Printing Technologies (Pvt) Ltd.

304, Grandpass Road,
Colombo - 14,
Sri Lanka.
Tel : (94 11) 2389160-5
Fax : (94 11) 2389166 & 2389167
E-mail : jdc@ jdcsl.com
Web: www.jdcsl.com

26th July 2013

The Coordinator,
BIT Degree Program,
University of Colombo School of Computing,
Colombo 07.

JDC Management System/HR and Gate Pass.

Dear Sir/Madam,

This is to certify that Miss K.M.Gayani Chathurika (Index No 0925952), final year student of Bachelor of Information Technology conducted by University of Colombo School of Computing, has developed a management system with required features and functionalities to perform the HR and vehicle gate pass at JDC Printing Technologies (Pvt) Ltd.

I believe that the system will help to manage internal operations of JDC effectively and successfully.

Thank you,
Yours faithfully,
JDC Printing Technologies (Pvt) Ltd

Authorized signature.

Suppliers to the Printing & Packaging Industries for Over 30 Years

GLOSSARY

AJAX (Asynchronous JavaScript and XML) – it is a method used on the client-side to create interactive web applications. It is the art of exchanging data with a server, and update parts of a web page without reloading the page.

Apache - is an open source web server.

Black Box Testing - is a method to test the functionality of an application as opposed to its internal structures or workings.

CSS (Cascading Style Sheet**)** - is a style sheet language used to describe the presentation of the display of a document written in a mark-up language.

CSV (Comma Separated Value) - A simple text format for a database table, each value being separated by a comma.

Database - is an organized collection of data for one or more purposes

Graphical User Interface - is a type of user interface that allows users to interact with electronic devices with images rather than text commands

Iterative and Incremental Development - is a cyclic approach to software development in which activities are repeated in a structured manner and the software is developed in increments.

JavaScript - is a prototype-based, object-oriented client-side scripting language that is dynamic. It is also considered as a functional programming language.

JQuery - is a cross-browser JavaScript library designed to simplify the client-side scripting of HTML.

Object Oriented Development - is a standard approach to software development based on objects and its instances.

PHP Hyper-text Pre-processor (PHP**)** - is a server-side programming language.

Unified Modeling Language (UML) - is a standardized general-purpose modeling language in the field of object-oriented engineering. This includes a set of graphic notation techniques to create visual models of object-oriented software-intensive systems.

White Box Testing - is a testing method which focuses specifically on testing internal knowledge and the structure of the software.

WWW (World Wide Web**)** - is a system of interlinked hypertext documents accessed via the Internet.

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