

---

**Final Project Report**

**for**

**Equipment Maintenance System**

**Version 2.0 approved**

**Prepared by Rinkal Singh**

**Niit University**

**30-August 2018**

# Table of Contents

## 1. Software Specification

- 1.1 Introduction
- 1.2 Overall Description
- 1.3 External Interface Requirements References
- 1.4 System Features
- 1.5 Other Nonfunctional Requirements
- 1.6 Other Requirements

## 2. Software Design

- 1.7 Introduction
- 1.8 Architectural Diagram
- 1.9 Logical Architecture (Class Diagram, Sequence Diagram, State Diagram)
- 1.10 Execution Architecture
- 1.11 Design decisions and trade-offs
- 1.12 Pseudo code for components

## 3. Software Coding Metrics

- 3.0 Logical Architecture Description
- 3.1 Class name:

## 4. Test Document

## 5. Minutes of Meetings with Customer

## 6. Nature of the Customer

## 7. Testimonials from Customer/Users (Comprehensive/Regular/Quality Feedback)

## 8. Tools and technologies used

## 9. Novelty of the Project Idea

## 10. Sophistication Value of the Project

## 11. Applicability of the Project

## **1. Software specification**

### **1.1 Introduction**

#### **1.1.1 Purpose**

This document provides guidelines about how to do a requirements analysis of PPM module and how to validate, analyse and document them. It gives hints about what you could do and warns you about things that you should not do.

PPM module is Pre - preventive Maintenance module which is a week - wide module for 52 weeks. It will generate an order for maintenance after a fixed interval and generate a different serial number. There will also be a check module which will be verified by the four Users.

It is basically 52 week module (Week wide maintenance). It will generate an order (type of check sheet) after fixed interval with different serial number generated. There will be a check module Verified by 4 Users. After final process list will not be editable (it will become a history record).

#### **1.1.2 Document Conventions**

This document follows MLA Format. Bold-faced text has been used to emphasize section

and sub-section headings. Highlighting is to point out words in the glossary and italicized text is

used to label and recognize diagrams.

#### **1.1.3 Intended Audience and Reading Suggestions**

This document is to be read by the development team, Data Entry Operator, O/M Incharge,

E/M Incharge and TCO Staff. The SRS has been organized approximately in order of increasing specificity. The developers and project members need to become intimately familiar with the SRS.

## **1.1 Product Scope**

This Product has features that it will help the Users by automatically creating the checklist that can easily validated by the users. For further information refer to this document.

## **1.2 References**

[1]srs\_template-ieee-1.doc

[2] <https://stackoverflow.com/questions/4015729/php-session-start>

[3] <https://www.w3schools.com/php/default.asp>

[4]

<https://teamtreehouse.com/community/how-to-display-alert-box-in-login-screen-in-php-if-a-user-enters-a-wrong-password-i-have-tried-that-in-ajax-is-there>.

[5]<https://softwareengineering.stackexchange.com/questions/302099/shopping-cart-in-php-sessions-or-database>

[6] <https://www.tutorialrepublic.com/php-tutorial/php-mysql-update-query.php>

[7] <https://www.formget.com/update-data-in-database-using-php/> [8]

<https://www.quora.com/How-do-I-create-a-scheduled-newsletter-in-PHP-MySQL> [9]

<http://www.psychocodes.in/schedule-posting-system-using-php-and-mysql.html>

[10]<https://www.sitepoint.com/how-to-create-mysql-events/>

[11]<https://www.c-sharpcorner.com/UploadFile/051e29/insert-value-from-checkbox-in-database-mysql-in-php/>

[12] <https://www.formget.com/php-checkbox/>

[13]

<https://corpocrat.com/2009/05/24/how-to-store-and-retrieve-checkbox-value-in-mysql-with-php/>

[14]<https://www.daniweb.com/programming/web-development/threads/428652/display-data-from-mysql-database-in-popup-window>

## **1.2 Overall Description**

### **1.2.1 Product Perspective**

The software product being developed is for Equipment Maintenance which functions as a chronic scheduler for generating checklist and deciding the status of equipment whether it is completed or pending or in progress. It has also the features of attaching the images/documents of the equipments. Please refer to this document for further information.

### **1.2.2 Product Functions**

*It contains following key functions:-*

#### **1.2.2.1-Functions**

- *Acts as chronic scheduler for maintaining the equipments.*
- *Shows the current Status of the equipments.*
- *Generates the checklist.*
- *Provide user verification Interface.*
- *Have features of uploading image/doc.*

### **1.2.2.2- User Case Diagram**



### **1.2.3 User Classes and Characteristics**

In this module there are basically four Users:

**1.2.3.1-Data Operator** - a technician will be the first user who will verify the equipments and if it is ok then Sr. Engineer will verify the checklist and the E/M incharge.

**1.2.3.2-Property Manager** - Engineers will be the second users which will again verify the equipments already verified by the technicians or first users.

**1.2.3.3-E/M Incharge** - They will be the third users who will again verify the equipments which is verified by both a technician or Engineers.

**1.2.3.4-O/M Incharge/ Admin** - He can give the Permission and rights to the different users according to the roles assign to them.

### **1.2.4 Operating Environment**

The software operate on windows xp,vista,7,8,8.1,10 ,android os,mac os,ios or linux and ubuntu with browsers like chrome, firefox, edge, safare with internet connectivity.

### **1.2.5 Design and Implementation Constraints**

1.2.5.1- Previous Record and History: uses Admin login for accessing record, log History

1.2.5.2- Equipment Maintenance: Admin will have permission of maintaining the equipment like adding, importing, exporting the Equipment record.

1.2.5.3- Language requirements: Only English is supported.

### **1.2.6 User Documentation**

For user documentation and information, please consult section 3: External Interface Requirements and attached user manual.

## **1.2.7 Assumptions and Dependencies**

It is assumed that the software designed will work correctly with every operating system with any pc and mobile phone with internet connections.

## **1.3 External Interface Requirements**

### **1.3.1 User Interfaces**

PPM module is Pre - preventive Maintenance module which is a week - wide module for 52 weeks. It will generate an order for maintenance after a fixed interval and generate a different serial number. There will also be a check module which will be verified by the four Users.

There will be four users so there will be four different user home screen after login. But the key features will be:-

1.3.1.1-A login Screen

1.3.1.2-Home Page Screen(diff. For different users)

1.3.1.3-Reports Import Export Screen

1.3.1.4-Checklist verification as well as import -Export Screen

1.3.1.5-Equipment Add, Delete, Update Screen(Only Admin).

1.3.1.6-Defectlist Screen

1.3.1.7- Event Log Screen(Only Admin).

The screenshot shows the admin home screen of a software application. On the left is a vertical sidebar with icons for Reports, Checklist, Defect List, and Logs. The main dashboard has four colored boxes: Reports (blue), Checklist (orange), Defect List (red), and Logs (dark blue). Below these is an 'Analysis' section titled 'Overview of This week 07 Aug 2018 Tuesday'. It contains a table with columns for week-31, Orders, week-32 (Current Week) (07 Aug 2018 Tuesday), week-33, week-34, and week-35. The table data is as follows:

week-31	Orders	week-32 (Current Week) (07 Aug 2018 Tuesday)	week-33	week-34	week-35
0	Total orders	2	0	1	1
0	Pending	2	0	1	1
0	Completed	0	0	0	0
0	Progress	0	0	0	0

On the right side, there are four summary cards:

- Total Users: 10
- Progress Order: 0
- Total Orders: 2
- Pending Orders: 2

The URL in the browser bar is 127.0.0.1:8080/admin/vieworders.php.

*Admin home screen*

### 1.3.2 Hardware Interfaces

This software requires an pc with internet connections with any os. It runs smoothly on any phone and on any browser.

### 1.3.3 Software Interfaces

This software runs on any operating system whether be windows, mac or linux on any browser. It is also supported on smartphones.

### 1.3.4 Communications Interfaces

User's can connect their pc or system with software via internet. Once connected to the internet, user's can easily login and can update, validate and maintain the equipments.

## **1.4 System Features**

Ems based on PPM module has feature to maintain all the equipments inside the niit university. It will generate an order for maintenance after a fixed interval and generate a different serial number. There will also be a check module which will be verified by the four Users.

### **1.4.1 Chronic scheduler**

*It basically schedule the equipment according to their frequency and classify them into pending, progress or completed.*

#### **1.4.1.1 Description and Priority**

It basically schedule the equipment according to their frequency and classify them into pending, progress or completed.

#### **1.4.1.2 Stimulus/Response Sequences**

It also generate checklist according to their status and type for the verification and validation by all the four users.

#### **1.4.1.3 Functional Requirements**

This features requires Equipment in the database as well as internet connectivity to set its timer for chronic schedule.

### **1.4.2 Checklist Validation**

The generated checklist was validated and verified in a different sequences.

#### **1.4.2.1 Description and Priority**

First data operator goes on site and verify the equipment through ok or not ok checklist then it is validated by other three user – Property Manager then E-M Incharge and at last O-M Incharge.

#### **1.4.2.2 Stimulus/Response Sequences**

According to the higher priority validation of checklist is carried out and at last when O-M Incharge validate it then that order becomes completed.

#### **1.4.2.3 Functional Requirements**

This feature requires Orders should be present so that checklist generation and checklist validation takes place.

### **1.4.3 Manage Users**

#### **1.4.3.1 Description and priority**

Users can be added, details can be updated like password, email or their roles which can be done by O-M Incharge or Admin.

#### **1.4.3.2 Stimulus/Response Sequences**

As a result of management users can be updated.

#### **1.4.3.3 Functional Requirements**

Users can be managed only when the person is logged in as Admin or O-M Incharge.

### **1.4.4 Manage Orders**

#### **1.4.4.1 Description and Priority**

Orders can be updated, removed or can be added by admin or O-M Incharge not by other.

#### **1.4.4.2 Stimulus/Response Sequences**

As a result orders are updated.

#### **1.4.4.3 Functional Requirements**

Orders can be managed only when user is logged in as admin or O-M Incharge.

### **1.4.5 Manage Equipment**

#### **1.4.5.1 Description and Priority**

Equipment can be added, updated or removed by the admin or O-M incharge not by others.

#### **1.4.5.2 Stimulus/Response Sequences**

As a result Equipment are updated.

#### **1.4.5.3 Functional Requirements**

Equipment can be managed only when user is logged in as admin or O-M Incharge.

### **1.4.6 User Reports**

#### **1.4.6.1 Description and Priority**

Reports of user like how many users are added from this date to till which date. These types Of details can be viewed by the admin and O-M Incharge.

#### **1.4.6.2 Stimulus/Response Sequences**

Reports can be printed or viewed.

#### **1.4.6.3 Functional Requirements**

To view user report or print it user should be logged in as Admin or O-M Incharge.

### **1.4.7 Order Reports**

#### **1.4.7.1 Description and Priority**

Reports of orders like how many orders are added from this date to till which date. These types Of details can be viewed by the admin and O-M Incharge.

#### **1.4.7.2 Stimulus/Response Sequences**

Reports can be printed or viewed.

#### **1.4.7.3 Functional Requirements**

To view order report or print it user should be logged in as Admin or O-M Incharge.

### **1.4.8 Equipment Reports**

#### **1.4.8.1 Description and Priority**

Reports like how many equipment are added from this date to till which date. These types Of details can be viewed by the admin and O-M Incharge.

#### **1.4.8.2 Stimulus/Response Sequences**

Reports can be printed or viewed.

#### **1.4.8.3 Functional Requirements**

To view equipment report or print it user should be logged in as Admin or O-M Incharge.

#### **1.4.9 Defectlist Reports**

##### **1.4.9.1 Description and Priority**

Reports like how many defects items are stored from this date to till which date. These types Of details can be viewed by the admin and O-M Incharge.

##### **1.4.9.2 Stimulus/Response Sequences**

Reports can be printed or viewed.

##### **1.4.9.3 Functional Requirements**

To view defectlist report or print it user should be logged in as Admin or O-M Incharge.

#### **1.4.10 Event Logs**

##### **1.4.10.1 Description and Priority**

Reports like users login , logout time, ip , os, browser can be viewed. These types Of details can be viewed by the admin and O-M Incharge.

##### **1.4.10.2 Stimulus/Response Sequences**

Reports can be printed or viewed.

##### **1.4.10.3 Functional Requirements**

To view logs report or print it user should be logged in as Admin or O-M Incharge.

## **1.4.11 Defectlist**

### **1.4.11.1 Description and Priority**

When some orders are not verified then they are stored in Defectlist with the reason why they are defected.

### **1.4.11.2 Stimulus/Response Sequences**

These types of list can be viewed or managed.

### **1.4.11.3 Functional Requirements**

To view defectlist or print it user should be logged in as Admin or O-M Incharge.

## **1.4.12 Import Users**

### **1.4.12.1 Description and Priority**

Users can be added in bulk by importing through CSV.

### **1.4.12.2 Stimulus/Response Sequences**

Large number of users can be add simultaneously.

### **1.4.12.3 Functional Requirements**

To import user should be logged in as Admin or O-M Incharge.

## **1.4.13 Import Equipment**

### **1.4.13.1 Description and Priority**

Equipment can be added in bulk by importing through CSV.

### **1.4.13.2 Stimulus/Response Sequences**

Large number of equipment can be add simultaneously.

### **1.4.13.3 Functional Requirements**

To import user should be logged in as Admin or O-M Incharge.

#### **1.4.14 Import Checklist question**

##### **1.4.14.1 Description and Priority**

Checklist question can be added in bulk by importing through CSV.

##### **1.4.14.2 Stimulus/Response Sequences**

Large number of questions can be add simultaneously.

##### **1.4.14.3 Functional Requirements**

To import user should be logged in as Admin or O-M Incharge.

#### **1.4.15 Export Sample**

##### **1.4.15.1 Description and Priority**

For importing users, equipment or questions, export sample will provide the sample csv file.

##### **1.4.15.2 Stimulus/Response Sequences**

Sample is filled with description of details of column for importing in bulk

##### **1.4.15.3 Functional Requirements**

To download for use user should be logged in as Admin or O-M Incharge.

## **1.5 Other Nonfunctional Requirements**

### **1.5.1 Performance Requirements**

The system supports concurrent users. This statement provides a general sense of reliability when the system is under load. It is important that a substantial number of users be able to access the system at the same time, since this is an employee portal. The times when the system will be under the most stress are likely during simultaneous checklist validation. Therefore, it must be able to handle the concurrent users.

### **1.5.2 Safety Requirements**

All data will be saved in the database: user accounts and profiles, password, orders etc. (except files which are stored on the disk.) The database allows concurrent access and will be kept consistent at all times, requiring a good database design.

### **1.5.3 Security Requirements**

1.5.3.1 Passwords will be saved encrypted in the database in order to ensure the user's privacy.

1.5.3.2 The user's IP will be logged.

1.5.3.3 The system will be protected against vulnerabilities such as SQL injection attacks.

### **1.5.4 Software Quality Attributes**

#### **1.5.4.1 Reliability –**

The reliability of the overall program depends on the reliability of the separate components.

#### **1.5.4.2 Availability –**

The system should be available at all times, meaning the user can access it using a web browser, only restricted by the down time of the server on which the system runs. In case of a hardware failure or database corruption, a replacement page will be shown. Also in case of a hardware failure or database corruption, backups of the database should be retrieved with the MySQL server and saved by the administrator.

#### **1.5.4.3 Maintainability –**

MySQL is used for maintaining the database and the Apache server takes care of the site. In case of a failure, a re-initialization of the program is recommended.

#### **1.5.4.4 Portability –**

The application is Linux-based and should be compatible with other systems. Apache, PHP and MySQL programs are practically independent of the OS-system

which they communicate with. The end-user part is fully portable and any system using any web browser should be able to use the features of the application.

### **1.5.5 Business Rules**

#### **1.5.4.1 Rank of post in ascending order is-**

**Data entry operator < Property Manager <E-M Incharge <O-M Incharge**

**1.5.4.2 After Data entry operator will verify the checklist it will go for validation of Property manager if he validate then checklist will go next user – E-M Incharge otherwise it will go on defectlist, after validation of checklist by the E-M Incharge it will go to O-M incharge if he unvalidate it will go in defectlist.**

**1.5.4.3 Superior Post user will be able to view the checklist verification of their juniors like Property Manager will be able to view the checklist verification of Data entry operator.**

## **1.6 Other Requirements**

### **1.6.1 Logical database requirements**

All data will be saved in the database: user accounts and profiles, discussion data, messages etc. (except files which are stored on the disk.) The database allows concurrent access and will be kept consistent at all times, requiring a good database design.

### **1.6.2 Design Constraints**

**1.6.2.1 The communication between the portal software and the database will be in SQL.**

**1.6.2.2 The portal layout will be produced with HTML/CSS.**

**1.6.2.3 The product will be written in PHP.**

**1.6.2.4 The output must be compatible with W3C XHTML 1.0**

**1.6.2.5 The source code must follow the coding conventions of PHP.**

**1.6.2.6 System administrators must have access to comprehensive documentation.**

## Appendix A: Analysis Models

S.N O	Features	Admin /O&M Inchar ge	Prop e-rty Man a-ge r	Data entr y Opr	E&M Inchar ge
1	Manage roles	Y			
2	Manage users	Y			
3	System usage report	Y			
4	Upload Image/Doc	Y	Y	Y	Y
5	Equipment type maintenance	Y			
6	Equipment list management	Y			
7	View equipment list	Y	Y	Y	Y
8	Checklist question master	Y			
9	Add orders (using batch job)	Y			
10	View orders	y	y	Y	Y
11	Enter data for order checklist			Y	
12	Verify checklist data (View and add defects)	Y	Y		Y
13	View Reports	Y			
14	View/Manage Defectlist	Y			

## **2. Software Design**

### **2.1. Introduction**

This is a Software Design Document which is used for describing the software product made by providing the details for how the product should be built. Within this document, there are descriptions and graphical representations of the software design for the project including use case models, sequence diagrams, collaboration models, object behaviour models, and other auxiliary requirement information.

#### **2.1.1 Purpose of this document**

This document will give detailed information about the entities (classes), events, attributes, states and their sequence in the PPM module and how to validate, analyse and file them. The information about what you could do and warns you about things that you should not do are also given.

#### **2.1.2 Scope of the development project**

This software product has features that it will help the Users by automatically creating the checklist that can easily be validated by the users.

#### **2.1.3 Definitions, acronyms, and abbreviations**

IEEE: Institute of Electrical and Electronics Engineers SDS: Software Design Specification

#### **2.1.4 References**

##### **2.1.4.1**

[https://sovannarith.files.wordpress.com/2012/07/sdd\\_template.pdf](https://sovannarith.files.wordpress.com/2012/07/sdd_template.pdf)

##### **1.4.2 IEEE SDS template**

#### 2.1.4.3

<https://www.c-sharpcorner.com/UploadFile/051e29/insert-value-from-checkbox-in-database-mysql-in-php/>

## **2.1.5 Overview of document**

This SDS is divided into seven sections with various sub-sections. The sections of the Software Design Document are:

2.1.5.1 Introduction: It describes about the document, purpose, scope of development with project definitions and abbreviations used in the document.

2.1.5.2 Conceptual Architecture/Architecture Diagram: describes the overview of components, modules, structure and relationships and user interface issues.

2.1.5.3 Logical Architecture: In this, we have described Logical Architecture Description and Components used to build up the product.

2.1.5.4 Execution Architecture: It defines the runtime environment, processes, deployment view.

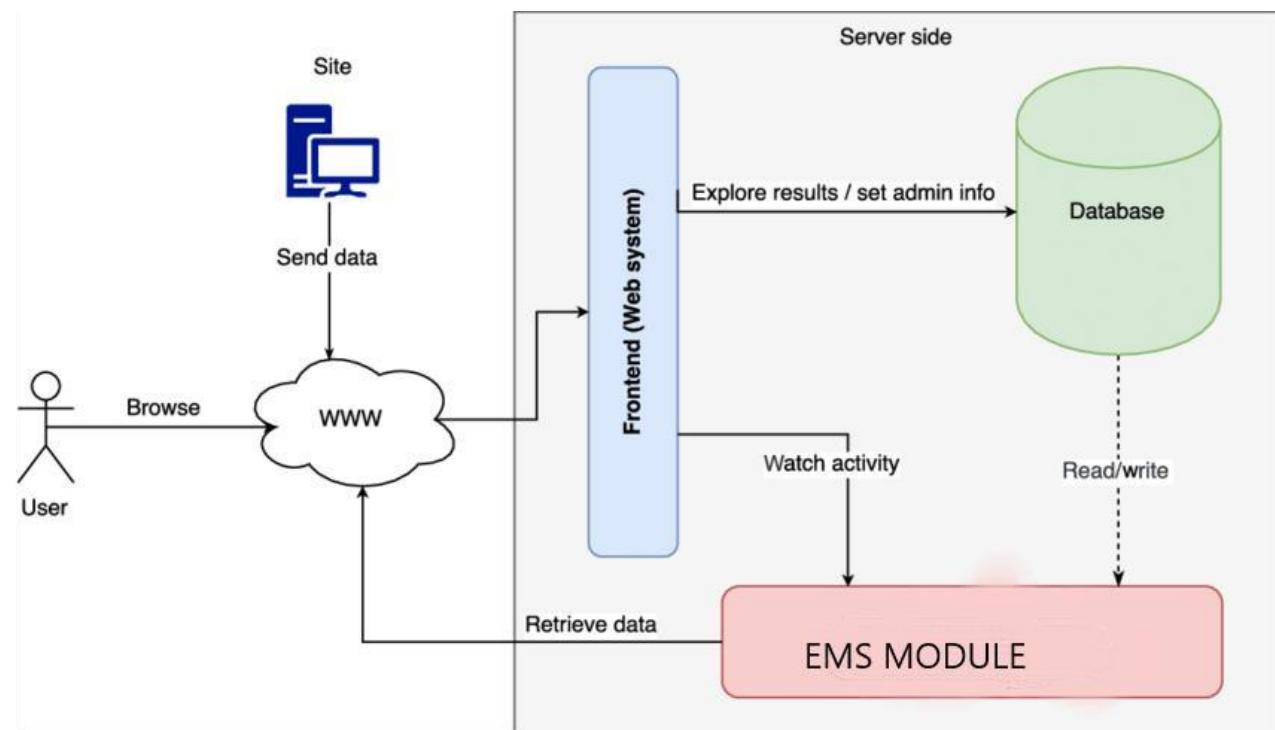
2.1.5.5 Design Decisions and Trade-offs: It describes the decisions taken along with the reason as to why they were chosen over other alternatives, thereby giving a brief comparison for which this product gets a greater margin to beat with.

2.1.5.6. Pseudocode for components: It describes the algorithm or the pseudocode for the entities used.

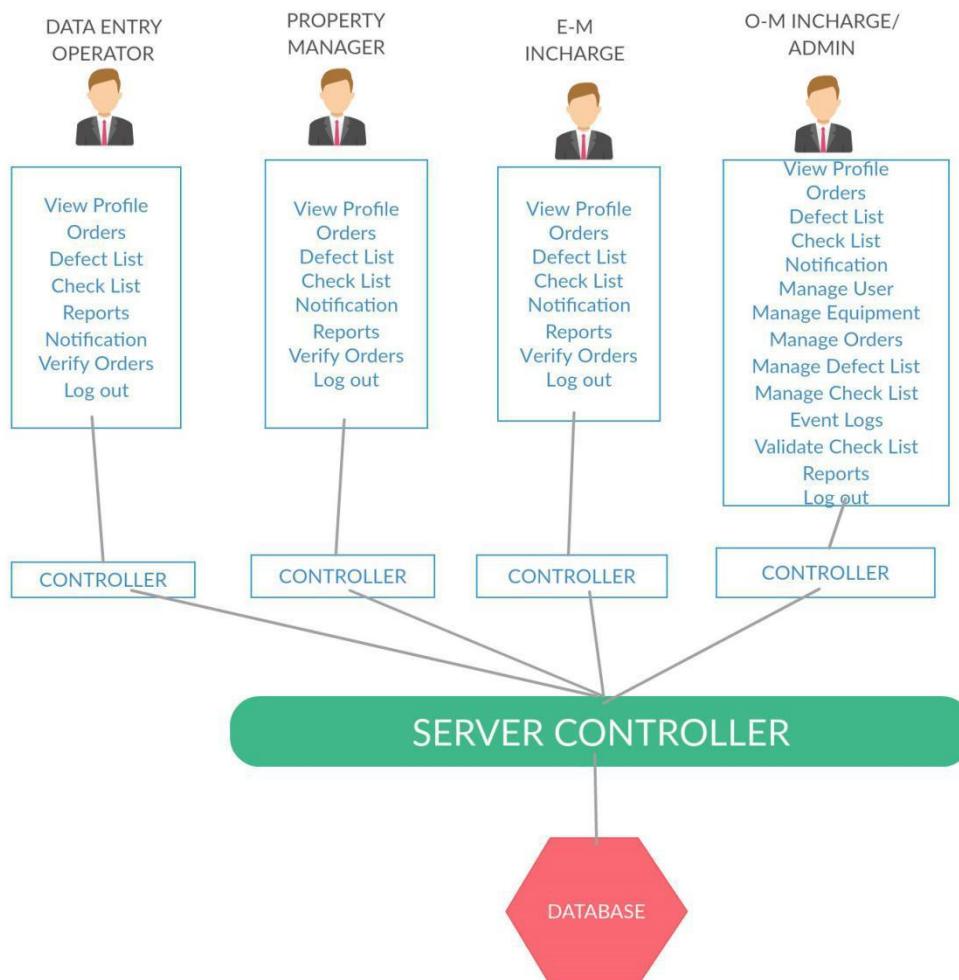
2.1.5.7. Appendices: describes subsidiary matter if any.

## 2.2. Conceptual Architecture/Architecture Diagram

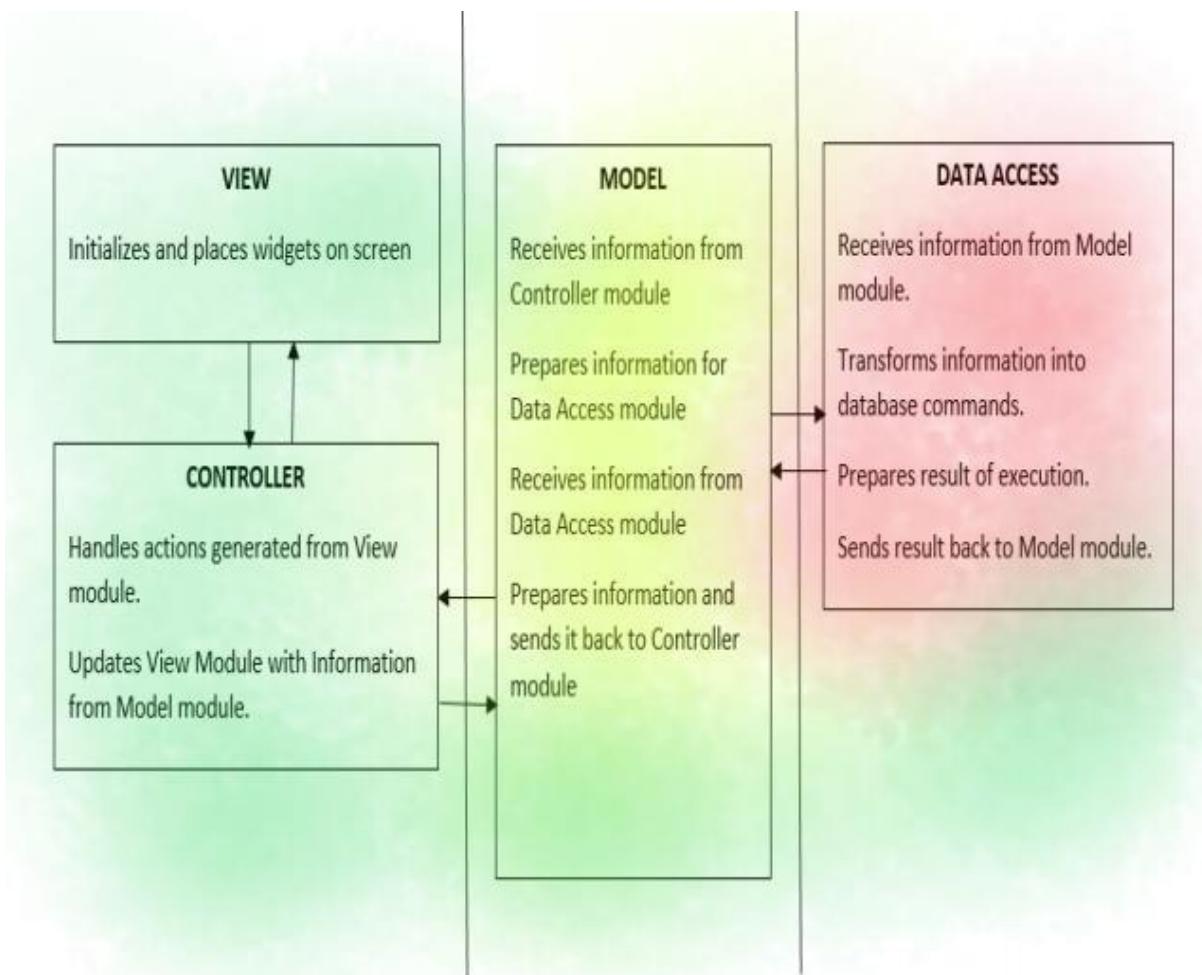
Architecture Diagram 1:



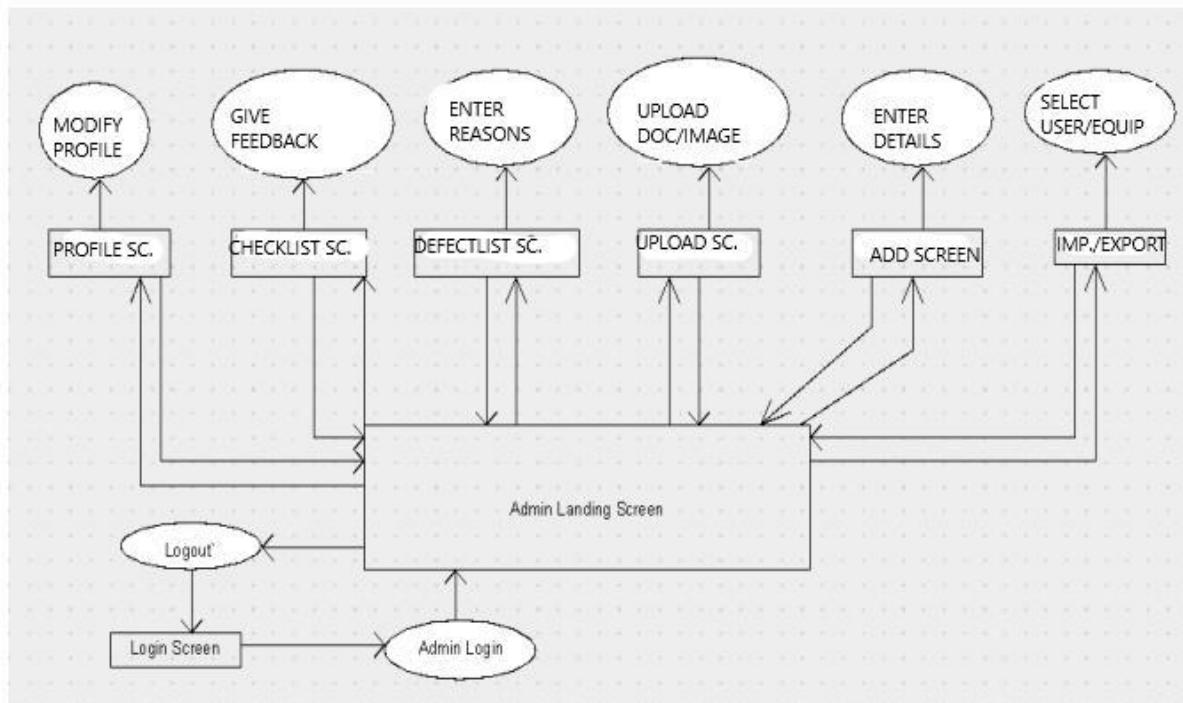
Architecture Diagram 2:



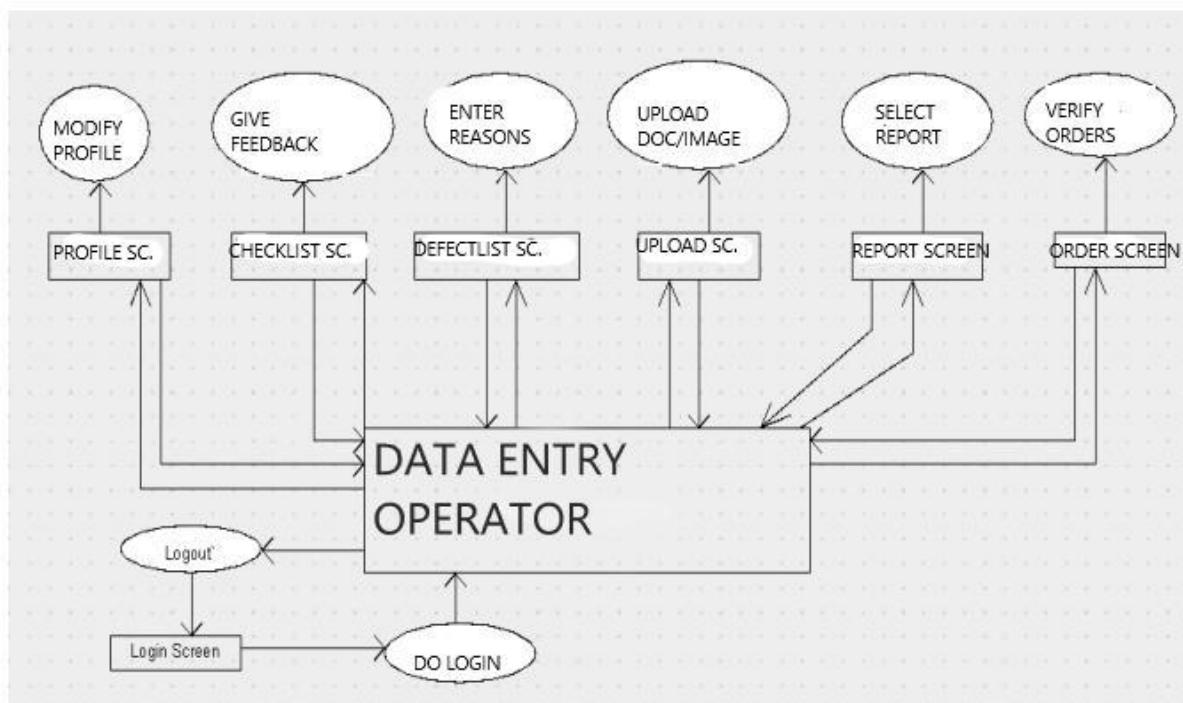
### **2.2.1 Overview of modules / components:**



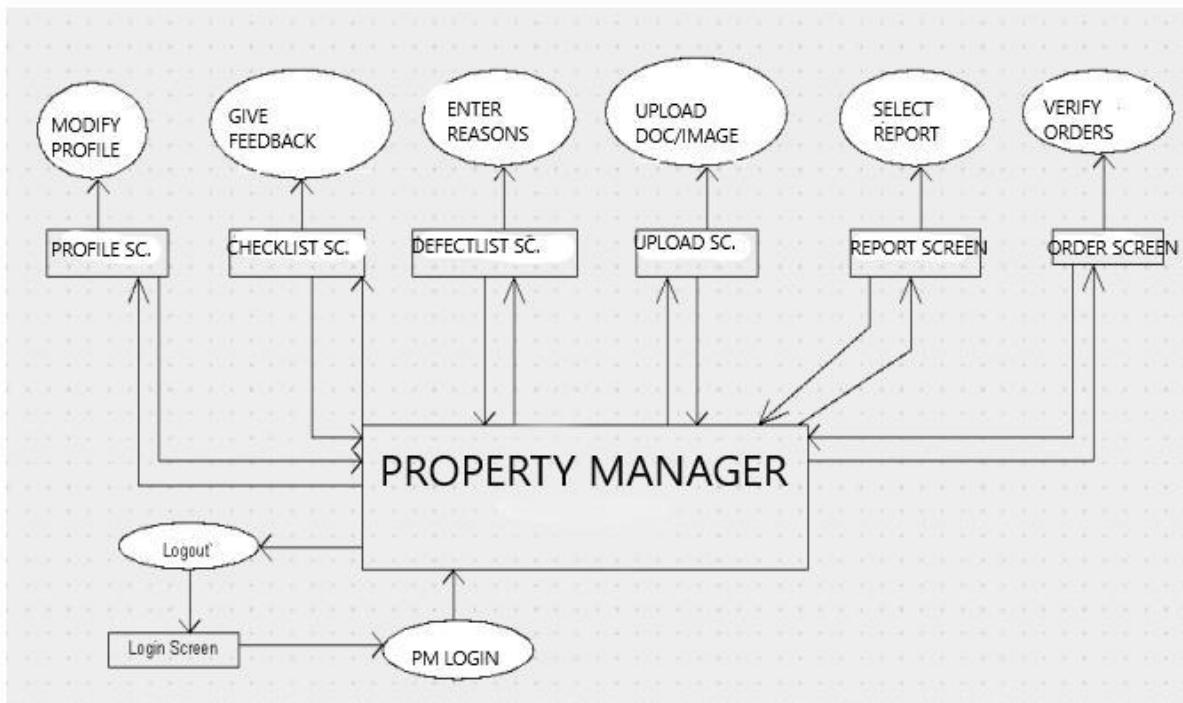
### 2.2.2.1 O/M Manager's (Admin) Side:



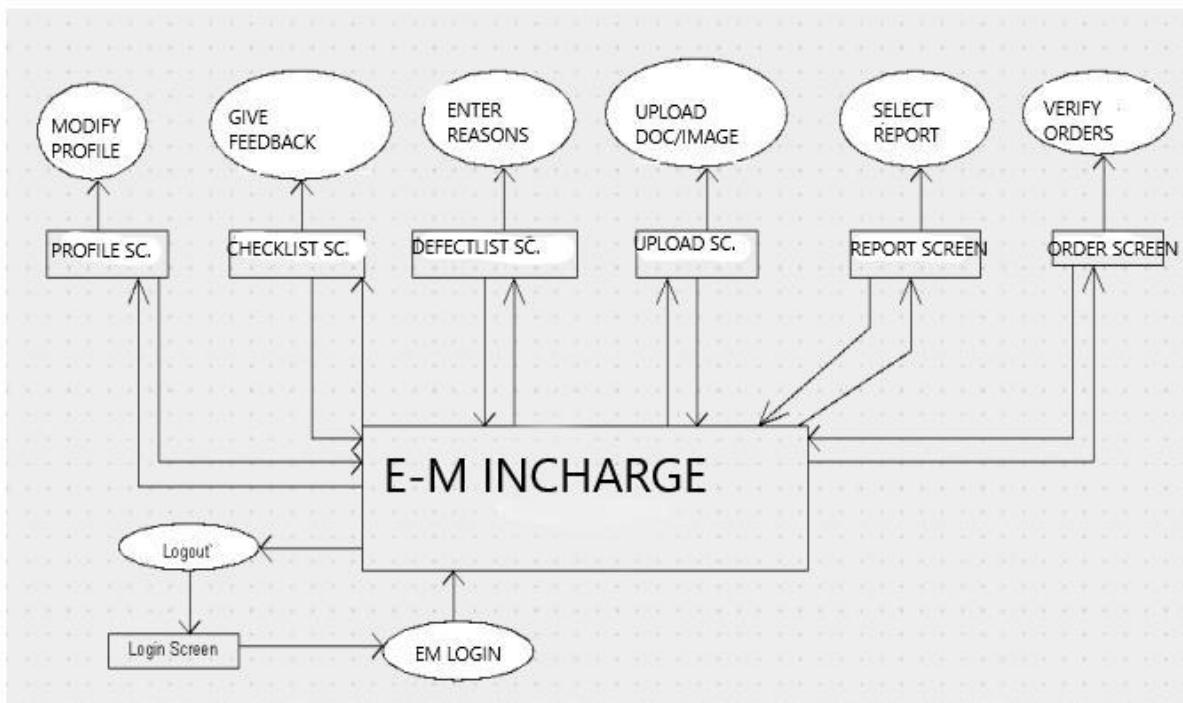
### 2.2.2.2 Data Operator's Side:



### 2.2.2.3 Property Manager's Side:



### 2.2.2.4 E/M Manager's Side:



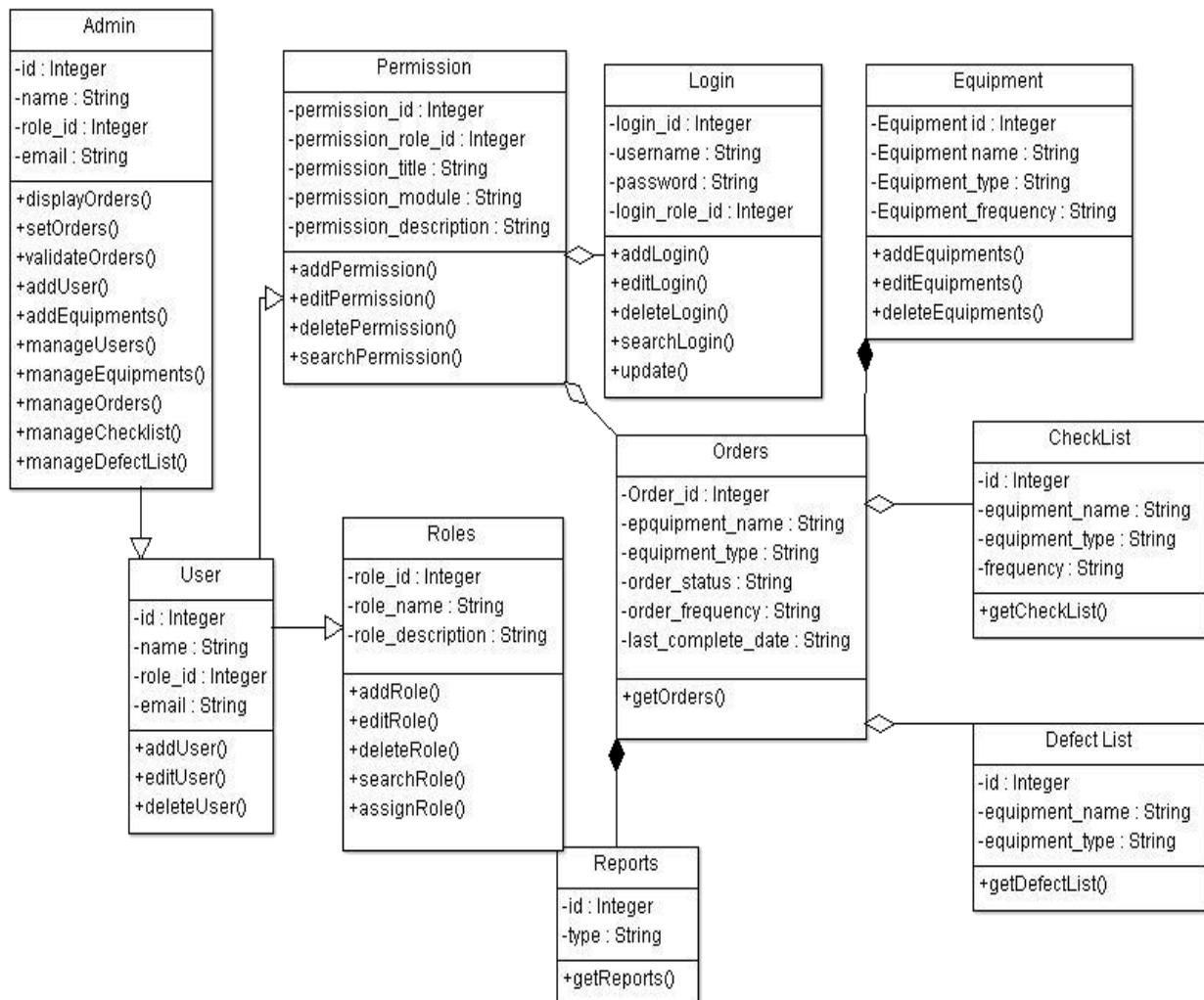
### **2.2.3 User interface issues**

This section will address User Interface issues as they apply to the following hypothetical users of NIIT University, who used manual means to maintain a register of the data related to the maintenance order of their computer and other related equipment.

- User who has the permission rights will login from the login screen on the server.
- After being logged in, different users get to see different home page according to their positions and tasks to perform.
- There is a reports screen where the users can import and export reports.
- Each user can generate a checklist according to the equipment verification he/she has done.
- Only the admin (O/M manager) has being given the right to insert, update or delete any equipment and the users.
- Sequentially, as per the position of the users, a defect-list can be generated after the equipment is verified by the users.
- A week - wide module for 52 weeks is created, which will generate an order for maintenance after a fixed interval and generate a different serial number.
- Admin is also given the privilege to create an event log.
- After the final process, a non-editable list will be generated (it will become a history record).

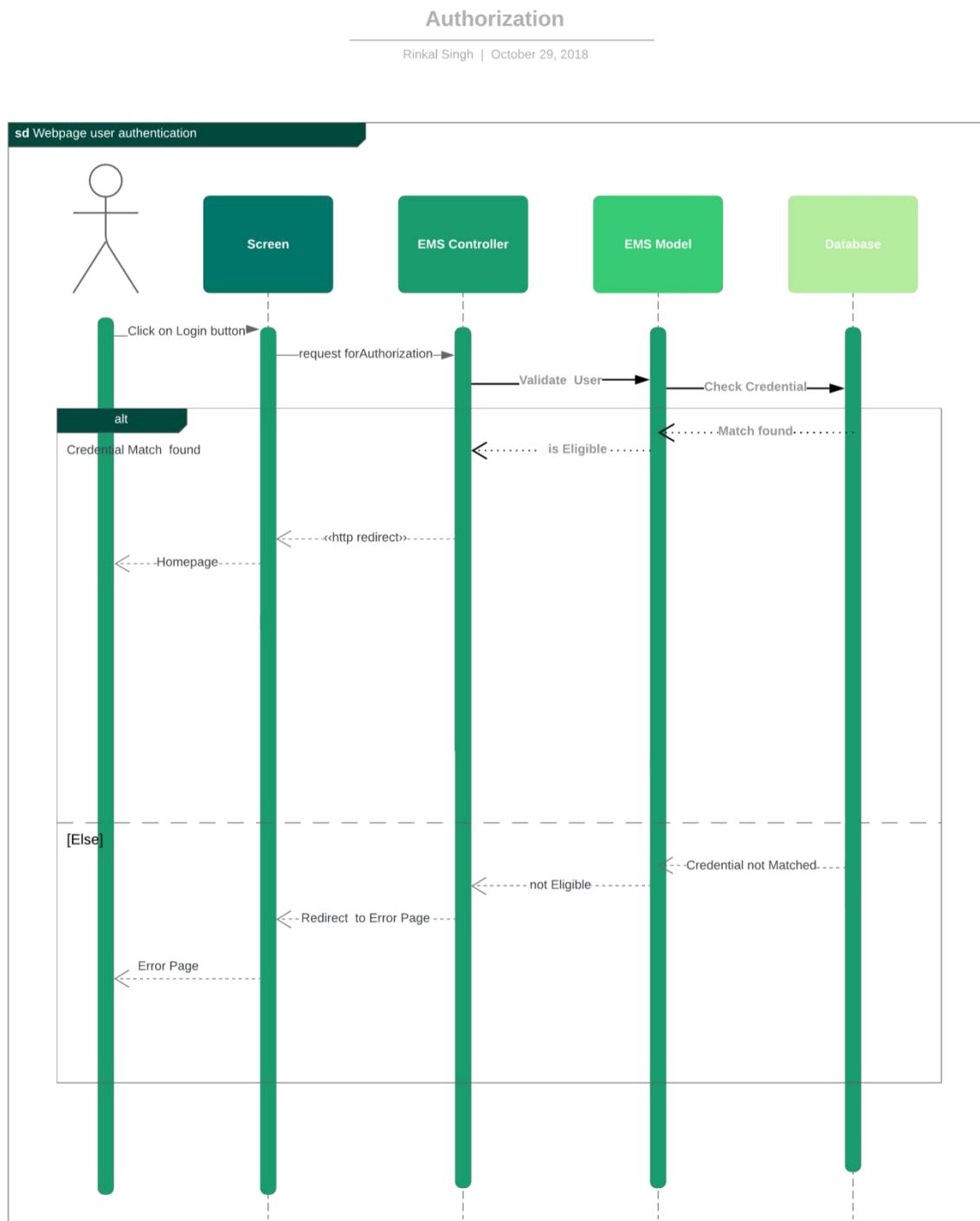
## 2.3. Logical Architecture (Class Diagram, Sequence Diagram, State Diagram)

Class Diagram:

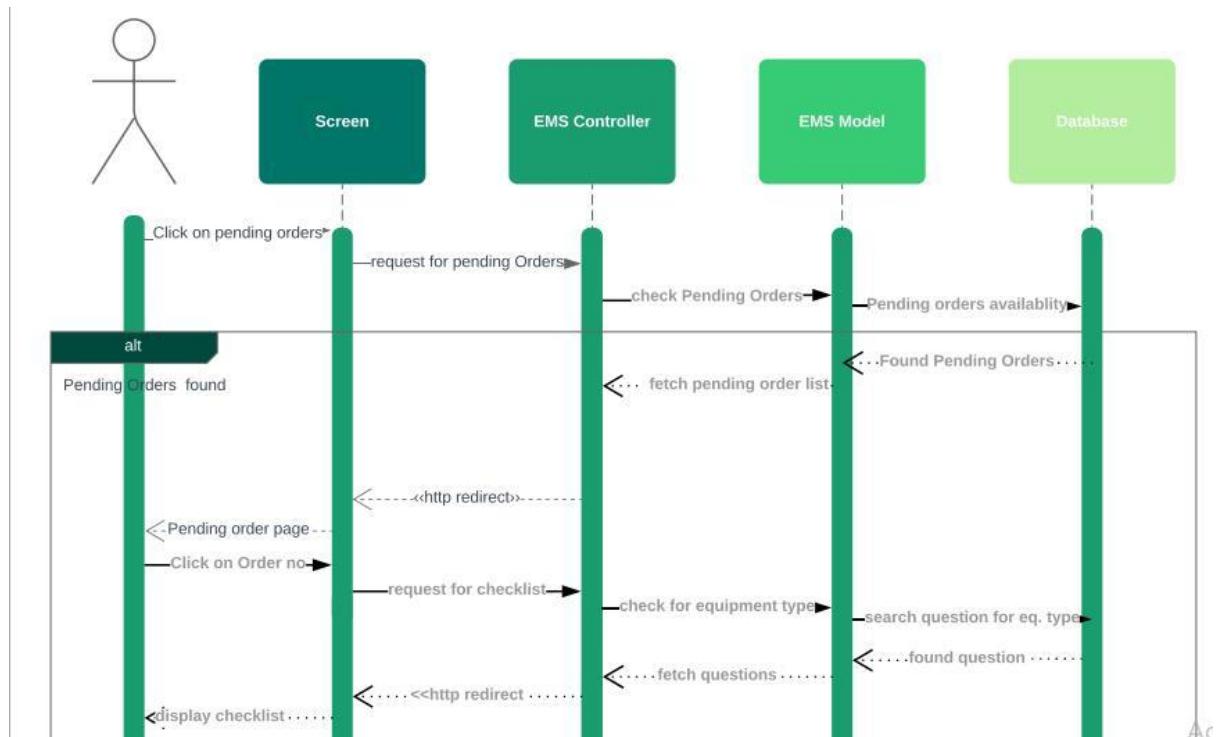


## Sequence Diagram:

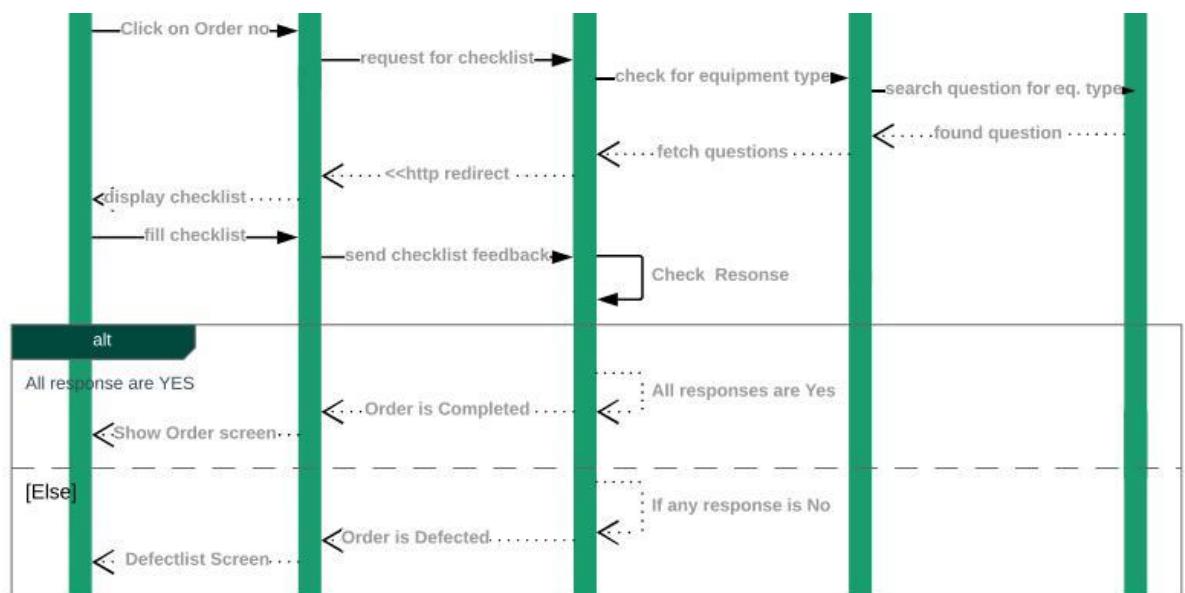
For Login/Authentication:



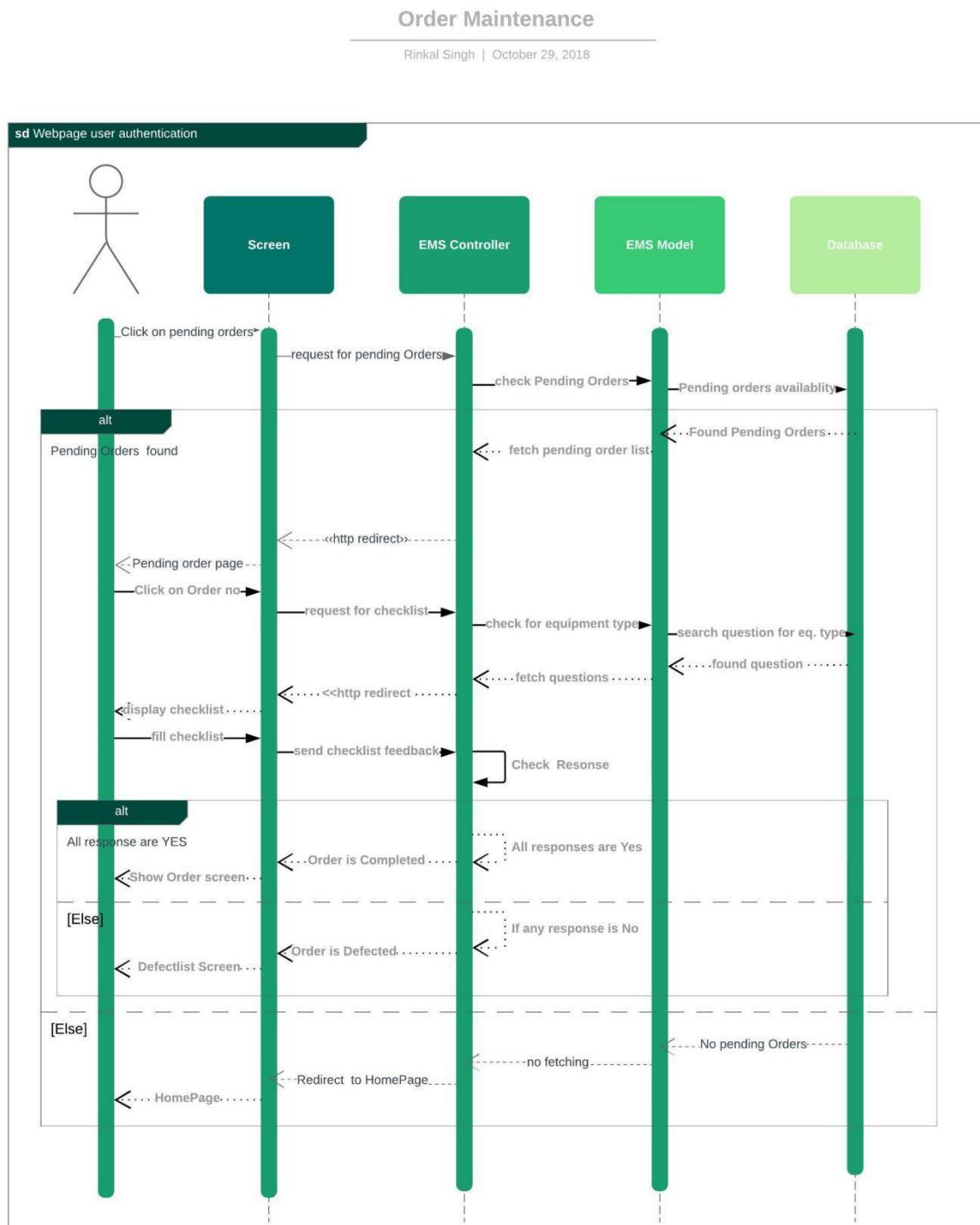
## Checklist page:



## Defect-list page:

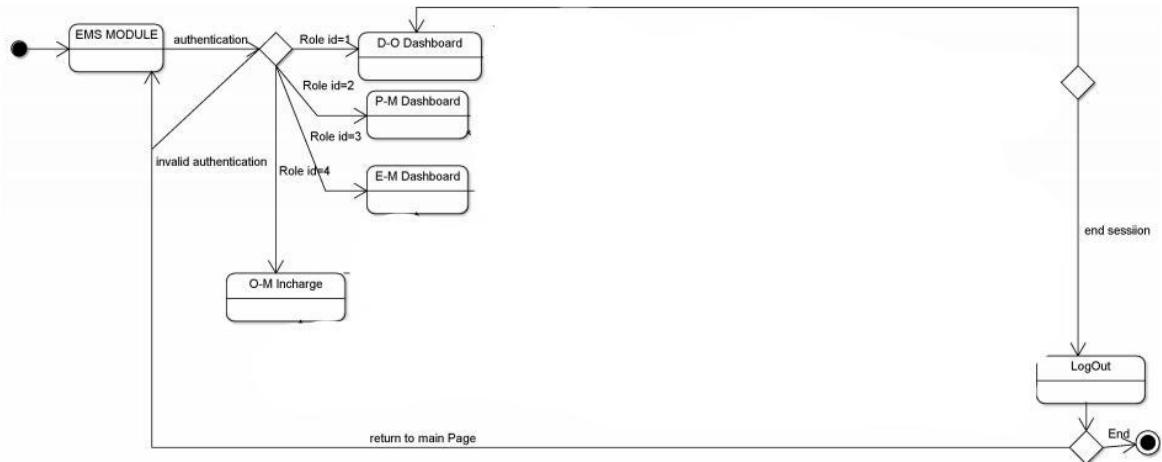


## Order Management:

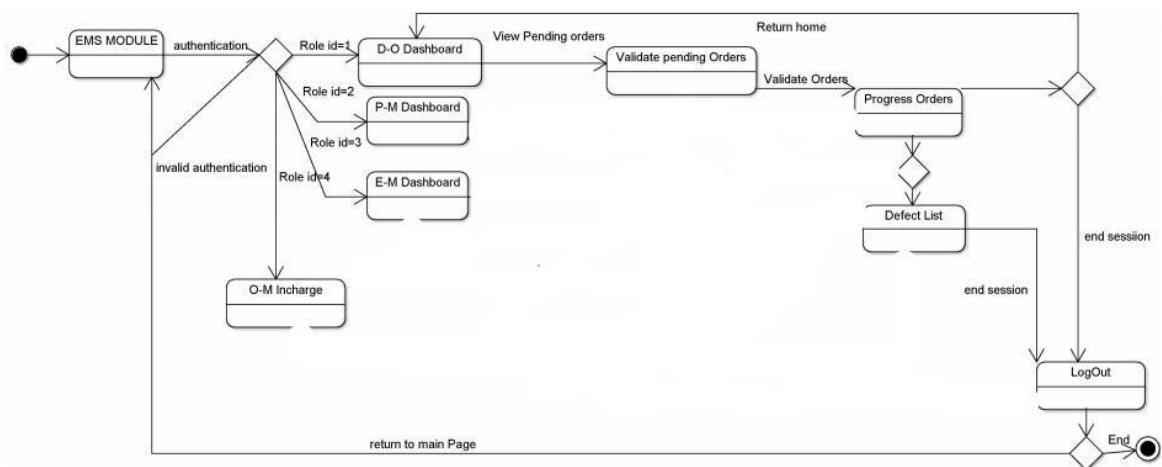


## State Diagrams:

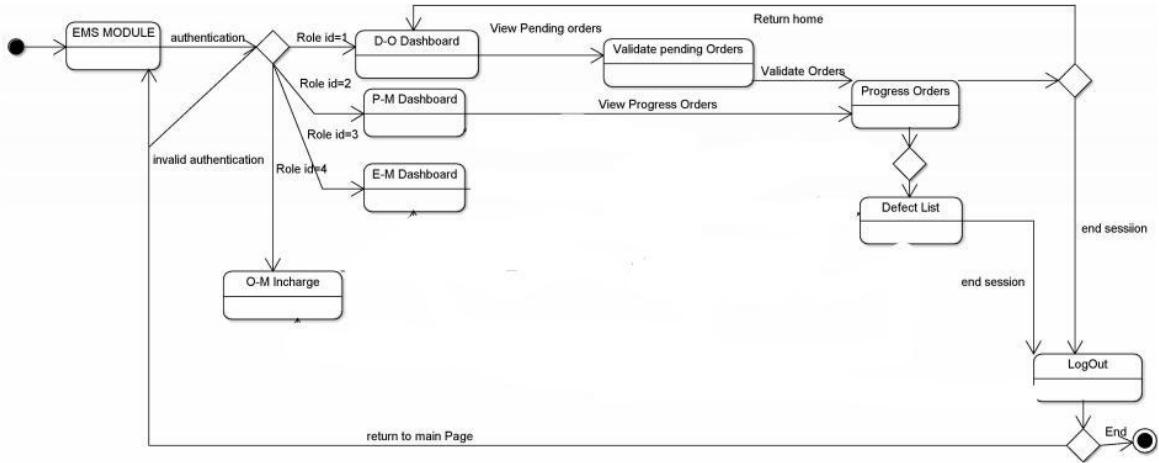
Login page to Homescreen:



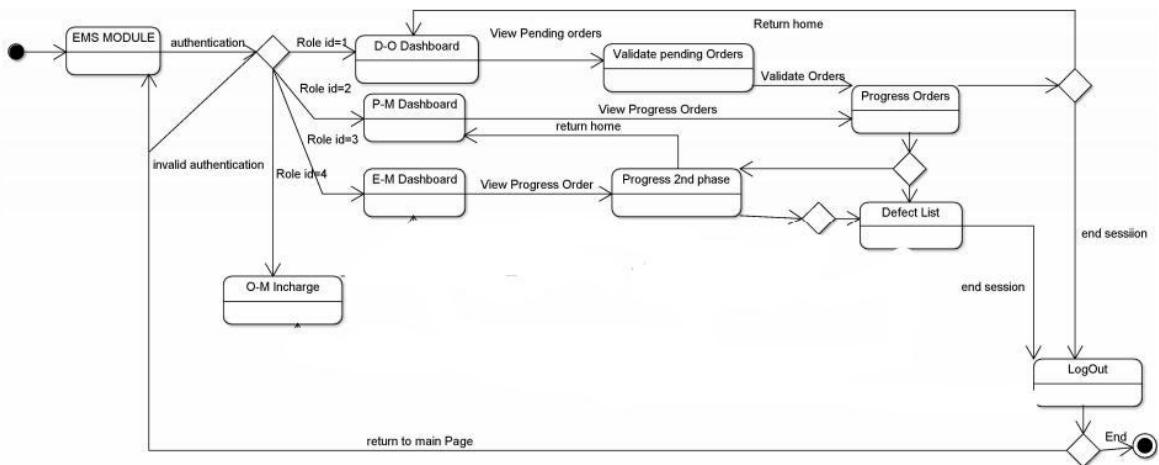
3.3.2 Data entry operator dashboard to other task screen:



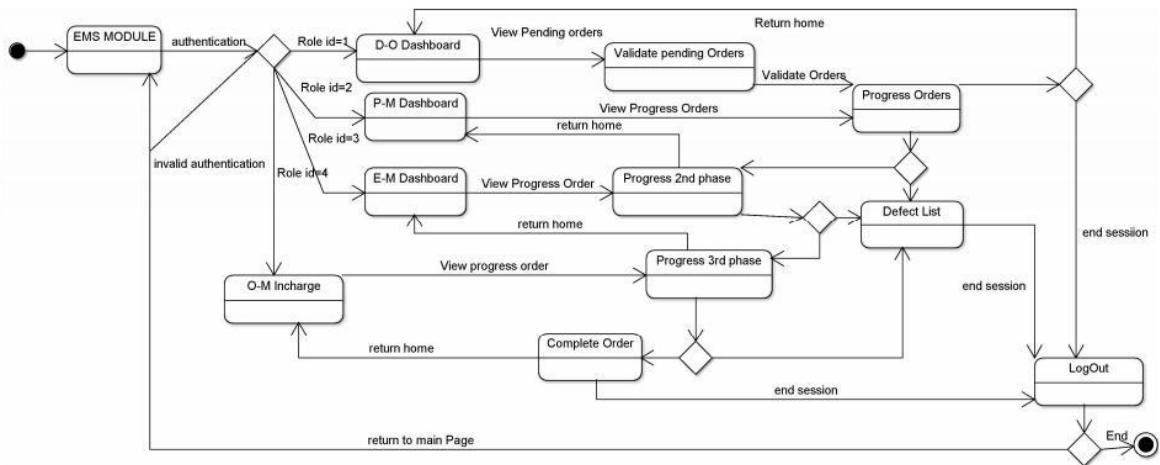
Property Manager dashboard to other task screen:



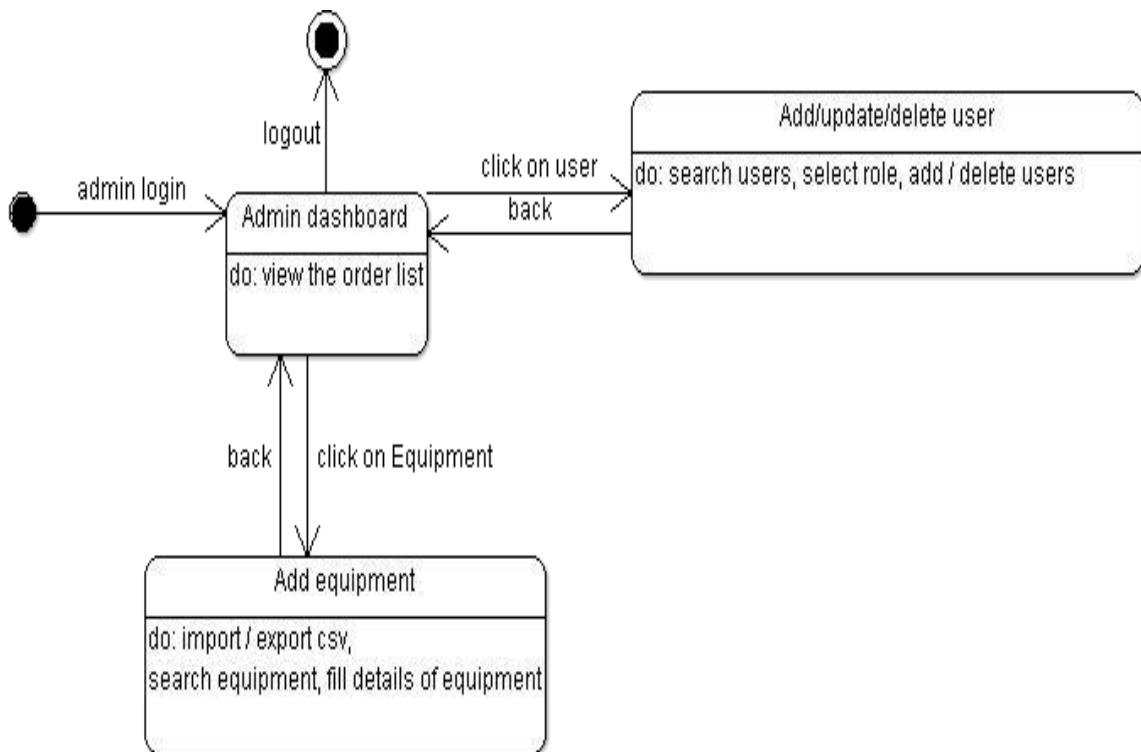
E-M Incharge dashboard to other task screen:



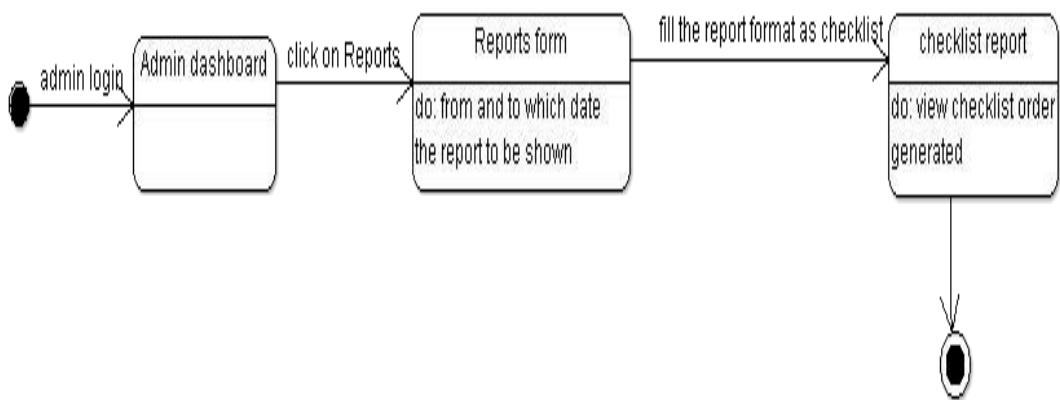
## O-M Incharge/Admin dashboard to other task screen:



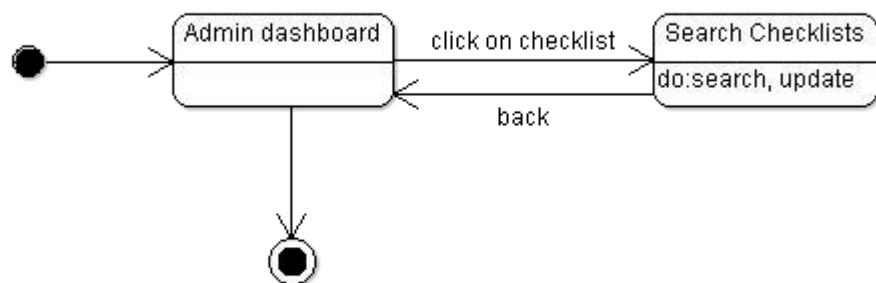
## Admin login to Other task -



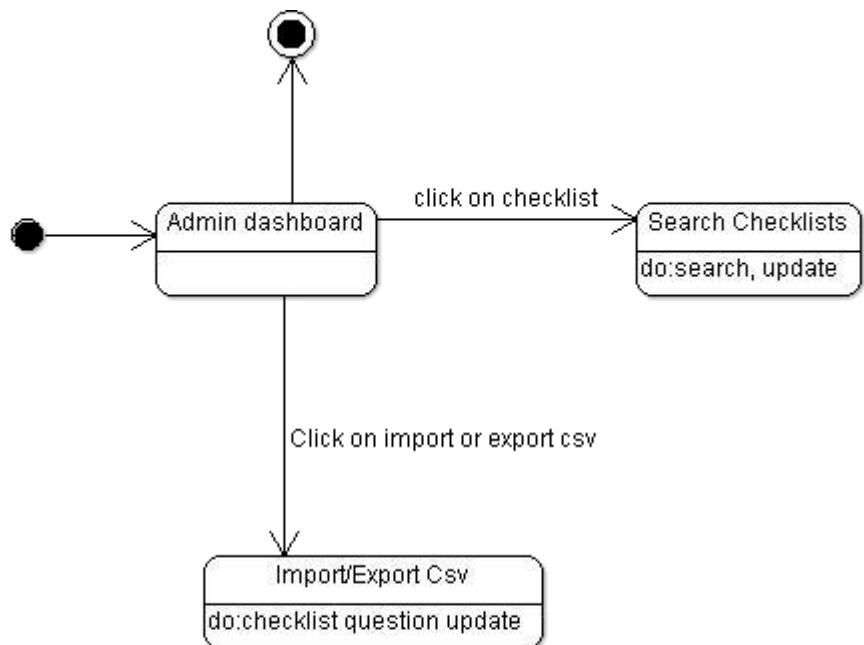
### Generating checklist Reports:



### Checklist verifying and remarking:

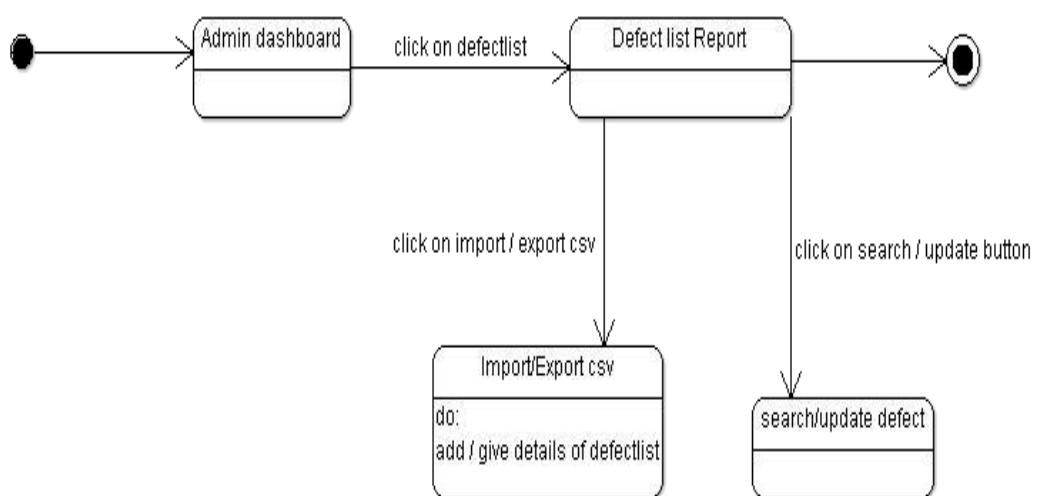


### Managing checklist questions:

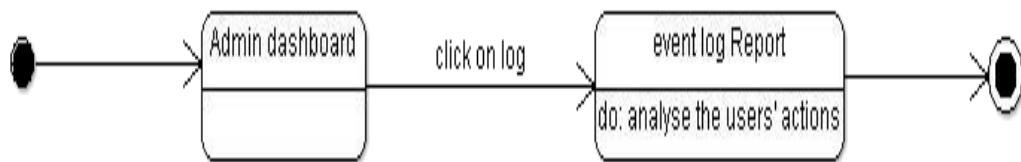


### 3.3.

### Defect-list generation:



Event log checking:



### **2.3.1 Logical Architecture Description**

#### **2.3.1.1 Class Diagram Description:**

The class which extends the parent class is represented by inheritance linkage which is shown by the arrow. The class which extends other classes are-

Admin class extends Users

User class extends permission

User class extends Roles

There are also some composition linkage, shown by lines with black-coloured diamond, which signifies that if the parent class is removed, the child class also loses its existence. Some of them are-

Report class depends on Orders

Order class depends on Equipment

The lines without arrow shows association linkage. It signifies that one class just makes instance of other class, but not dependent on each other in any way. Some of them are-

Login class and Permission class

Permission and Order class

Checklist and Order class

Defectlist and Order class

#### 2.3.1.2 Sequence Diagram Description:

Arrow line signifies there is a send message taken place. Response is being shown by dotted arrows.

2.3.1.2.1 Login/Authentication: It allows users to login with their niitUniversity mail domain as well as login with the username and password that are being registered in the database already. It loops being on same page until the correct information is not given.

2.3.1.2.2 Checklist: Checklist are a list of questions of an order according to the equipment type which has to selected between OK or Not Ok to maintain an order.

2.3.1.2.3 Defect List: These are list of equipment which are differentiated by users as defected. The equipment goes to defect list when a user fill not ok in its checklist verification.

2.3.1.2.4 Order Management: In Order management first user verifies the checklist of pending orders if he/she agrees on all ok then that order becomes progress and automatically goes to next user and if he reject then that order become a defect. Same happen with second and third user and when it goes to O-M Incharge if he agree then the order become completed.

### **2.3.1.3 State Diagram Description:**

Initial state is being shown by starting with a black dot. Final State is being shown by the black dot surrounded by an empty circle.

#### **2.3.1.3.1 Login page to Homescreen:**

When user goes to Ems module/website and fill the credential then if credential is right, then redirected to the dashboard of user according to its role. If Role id=1 then Data operator dashboard, if Role id=2 then property manager dashboard if Role id =3 then E-M incharge dashboard and if it is Role id=4 then it goes to O-M incharge or Admin Dashboard.

#### **2.3.1.3.2 Data entry operator dashboard to order management:**

After authentication first user can verify the order by verify the checklist of the corresponding equipment type. If he agrees on All ok then that order became Progress and automatically goes to next user.

#### **2.3.1.3.3 Property manager dashboard to order management:**

After authentication second user can validate the order by verify the checklist of the corresponding equipment type. If he agrees on All ok then that order automatically goes to next user.

#### **2.3.1.3.4 E-M Incharge dashboard to order management:**

After authentication third user can validate the order by verify the checklist of the corresponding equipment type. If he agrees on All ok then that order automatically goes to next user.

### **2.3.1.3.5 O-M Incharge dashboard to order management:**

After authentication fourth user can validate the order by verify the checklist of the corresponding equipment type. If he agrees on All ok then that order become completed automatically goes to next user.

### **2.3.1.3.6 Admin login to Other task:**

After login admin can manage(edit,delete,update,import,export) users, orders, equipment.

### **2.3.1.3.7 Generating checklist Report:**

Checklist report can be generated by simply selecting checklist in report and from date to till date.

### **2.3.1.3.8 Checklist verifying and remarking:**

Checklist verification can be done by the user by simply selecting the ok or not ok for a question of an order to maintain an order. If the order is not ok then user can give his remarks as the reason.

### **2.3.1.3.9 Managing checklist questions:**

Checklist questions can be managed(edit, add, insert, update, delete, import, export) by the O-M Incharge or admin.

#### **2.3.1.3.10: Event Log checking**

This is event log checking mechanism which stores user name, id , role , pages on which user browses, ip address, browser, os and fetch data from database to display.

### **2.3.2 Class Name**

#### **2.3.2.1 Login:**

This class allows the user to enter the system by authenticating the entered credentials.

##### **3.2.1.1 Method 1: getCredential()**

**Input:** Email,username, Password

**Output:** handle authentication state changes

**Method Description:** When activity start getting visible to user then getCredential() is called. Inside this method \$\_POST method is used.

##### **2.3.2.1.2 Method 2: hashpassword()**

**Input:** Password

**Output:** handle authentication state changes

**Method Description:** It start to hash the password before verifying the user credential to database.

#### **2.3.2.1.3 Method 3: verifyCredential()**

**Input:** username/email, hashed password

**Output:** handle authentication state changes

**Method Description:** It verifies the username/email and hashed password with database.

#### **2.3.2.1.4 Method 3: changePassword()**

**Input:** username, password, user role

**Output:** user password will be changed

**Method Description:** Only admin and O-M Incharge can change or update user password.

### **2.3.2.2 Class Name: Roles:**

#### **2.3.2.2.1 Method 1: loginRedirectPage()**

**Input:** user\_id

**Output:** User Role

**Method Description:** During login when credential is matched then this method fetch user Role from Database.

### **2.3.2.2.2 Method 2: updateRole()**

**Input:** username, password, email

**Output:** User Roles is changed

**Method Description:** Only admin and O-M Incharge can update users roles.

### **2.3.2.3 Class Name: Permission**

#### **2.3.2.3.1 Method 1: loginRedirectPage()**

**Input:** Role

**Output:** handle authentication state changes

**Method Description:** During login when credential is matched then this method redirect users to Homepage according to their Role

### **2.3.2.3.2 Method 2: updatePermissions()**

**Input:** username, password, email

**Output:** User Permission is modified

**Method Description:** Only admin and O-M Incharge can update users permissions.

### **2.3.2.4 Class Name: Equipment**

#### **3.2.4.1 Method 1: displayEquipment()**

**Input:** object of Intent

**Output:** Display the Equipments Details

**Method Description:** When button is pressed it intents to controller to fetch the equipment from the database and display them.

#### **3.2.4.2 Method 2: manageEquipment()**

**Input:** object of Intent, Equipment name, Equipment type

**Output:** manage the equipment

**Method Description:** It manages the equipment like add/insert equipment, export/import equipment, delete equipment, update equipment.

### 2.3.2.5 Class Name: Orders

#### 3.2.5.1 Method 1: displayOrders()

Input: object of Intent,equipment name,order id

Output:Display the Order Details

Method Description: When button is pressed it intents to controller to fetch all the Orders from the database and display them.

#### 3.2.5.2 Method 2: manageOrders()

Input: object of Intent,Equipment name,Equipment type,Order status,equipment frequency,users verifications

Output:manage the Order

Method Description: It manages the Orders like insert orders,export/import orders, delete orders, update update orders, update users verification, update order status .

### 2.3.2.6 Class Name: Users

#### 3.2.6.1 Method 1: displayUsers()

Input: object of Intent

Output:Display the Users Details

Method Description: When button is pressed it intents to controller to fetch the User from the database and display them.

#### **2.3.2.6.2 Method 2: manageUser()**

**Input:** object of Intent,User name,User Roles

**Output:**manage the User

**Method Description:** It manages the User like add/insert User,export/import User, delete User, update User.

#### **2.3.2.7 Class Name: Checklist**

##### **2.3.2.7.1 Method 1: displayChecklist()**

**Input:** object of Intent

**Output:**Display the Checklist Details

**Method Description:** When button is pressed it intents to controller to fetch the Checklist from the database and display them.

##### **2.3.2.7.2 Method 2: manageChecklist()**

**Input:** object of Intent,Equipment name,Equipment type

**Output:**manage the Checklist

**Method Description:** It manages the Checklist like add/insert Checklist,export/import Checklist, delete Checklist, update Checklist.

### 2.3.2.8 Class Name: Defectlist

#### 2.3.2.8.1 Method 1: displayDefectlist()

Input: object of Intent

Output:Display the Defectlist Details

Method Description: When button is pressed it intents to controller to fetch the Defectlist from the database and display them.

#### 2.3.2.8.2 Method 2: manageDefectlist()

Input: object of Intent,Equipment name,Equipment type

Output:manage the Defectlist

Method Description: It manages the Defectlist like add/insert Defectlist,export/import Defectlist, delete Defectlist, update Defectlist.

### 2.3.2.9 Class Name: Reports

#### 2.3.2.9.1 Method 1: displayReports()

Input: object of Intent, users,equipment

Output:Display the Equipment Reports/User Reports/Order Reports/Checklist Report/Defect List Reports

Method Description: When any of the option is selected like user, equipment, orders, checklist or defect list is selected then from date to till date is selected and button is pressed it intents to controller to fetch the item from the database and display them.

## **2.4.0 Execution Architecture**

The system supports concurrent users. This statement provides a general sense of reliability when the system is under load. It is important that a substantial number of users be able to access the system at the same time, since this is an employee portal. The times when the system will be under the most stress are likely during simultaneous checklist validation. Therefore, it must be able to handle the concurrent users.

This software runs on any operating system be it windows, mac or Ubuntu and on any browser. It is also supported on smartphones.

Users can connect their pc or system with software via internet. Once connected to the internet, users can easily login and can update, validate and maintain the equipment.

## **2.5.0 Design decisions and tradeoffs**

The design of the software is made in such a way that four user are decided as the roles in equipment maintenance. The previous records and history log are accessed by the admin who is also called the O/M manager.

The software product being developed is for Equipment Maintenance which functions as a chronic scheduler for generating checklist and deciding the status of equipment whether it is completed or pending or in progress. It has also the features of attaching the images/documents of the equipment.

The software is basically 52 week-wide pre-preventive maintenance module. It will generate an order (type of check sheet) after fixed interval with different serial number generated. There will be a check module verified by the four users.

## **2.6.0 Pseudocode for components:**

### **2.6.0.1 Class Name=:Login**

#### **2.6.0.1.1 Method 1: getCredential()**

Pseudo code:

```
Step 1: if(isset($_POST['login']))  
return username, password  
  
Step 2: else  
return step1
```

#### **2.6.0.1.2 Method 2: hashpassword()**

Pseudo code:

```
Step 1: $hashPassword=md5($password);  
Step 2: return $hashPassword;
```

#### **2.6.0.1.3 Method 3: verifyCredential()**

Pseudo code:

```
Step 1:$sql="select * from users_master where  
User_name='$username' and Password=$password";  
  
Step 2: $result= run query;  
  
Step 3: $numRows=$result->num_rows;  
  
Step 4: if($numRows>0)  
        $_SESSION['login']=$username;  
        $_SESSION['id']=$numRows['id'];  
        $uiP=$_SERVER['REMOTE_ADDR'];  
  
Step 5: else  
        Print "Invalid Credential";  
        Return to Step1;
```

#### **2.6.0.1.4 Method 4: changePassword()**

Pseudo code:

```
Step 1:$sql=update users_master set password=x  
Where user_id=y;  
Step2; Run sql query  
Step3: if(query==true)  
Print "user password has been updated"  
Step4: else  
Return to Step 1;
```

## 2.6.02 Class Name=:Role

### 6.0.2.1 Method 1: loginRedirectPage()

Pseudo Code:

```
Step 1:$sql="select * from users_master where  
User_name='$username' and Password=$password";
```

```
Step 2: $result= run query;
```

```
Step 3: $numRows=$result->num_rows;
```

```
Step 4: if($numRows>0)
```

```
    $_SESSION['login']=$username;
```

```
    $_SESSION['id']=$numRows['id'];
```

```
    $uiip=$_SERVER['REMOTE_ADDR'];
```

```
Step 5: else
```

```
    Print "Invalid Credential";
```

```
    Return to Step1;
```

### 2.6.0.2.2 Method 2: : updateRole()

Pseudo Code:

```
Step 1:$sql=update users_master set Role=x
```

```
Where user_id=y;  
Step2; Run sql query  
Step3: if(query==true)  
        Print "user role has been updated"  
Step4: else  
        Return to Step 1;
```

### 2.6.0.3 Class Name=:Permission

#### 6.0.3.1 Method 1: loginRedirectPage()

Pseudo Code:

```
if($Role==1){  
    Make SESSION['do']=1;  
    header('location:../dataoperator/vieworders.php');  
}  
else if($Role==2){  
    Make SESSION['pm']=1;  
    header('location:../propertymanager/vieworders.php');  
}  
else if($Role==3){  
    Make SESSION['em']=1;  
    header('location:../emincharge/vieworders.php');  
}  
else if( $Role==4){  
    Make SESSION['om']=1;  
    header('location:../admin/vieworders.php');  
}  
else  
    header('location:..errors/index.php');
```

#### 2.6.0.3.2 Method 2: : updatePermission()

Pseudo Code:

```
Step 1:$sql=update users_master set Role=x  
Where user_id=y;
```

Step2; Run sql query  
Step3: if(query==true)  
Print “user permissions has been updated”  
Step4: else  
Return to Step 1;

#### 2.6.0.4 Class Name=:Equipment

##### 6.0.4.1 Method 1: displayEquipment()

Pseudo Code:  
Pseudo code:  
Step1: \$sql=select \* from Equipments;  
Step2: run query;  
Step3: if(query==true)  
While(fetch->assoc)  
Fetch from the database  
Step4: else  
Print “no equipment is found”  
Return Step1;

##### 2.6.0.4.2 Method 2: : manageEquipment()

Pseudo Code:

Step1-\$sql = "SELECT  
equipment\_master.`Frequency`,  
order\_master.`Equipment\_id`,  
order\_master.`Last\_complete\_date`,  
order\_master.`Order\_id`  
from order\_master INNER JOIN equipment\_master on  
order\_master.`Equipment\_id`=  
equipment\_master.`Equipment\_id`";  
Step2- run query

Step 3- if(\$numRows>0)  
while (\$row= \$result->fetch\_assoc())

```

$id= $row['Order_id'];
$weekno = $week;
$last_complete_date= $row["Last_complete_date"];
Step4- return to Step1

```

## 6.0.5 Class Name=:Orders

### 6.0.5.1 Method 1: displayOrders()

Pseudo Code:

```

Step1: $sql=select * from Orders;
Step2: run query;
Step3: if(query==true)
While(fetch->assoc)
Fetch from the database
Step4: else
Print "no Order is found"
Return Step1;

```

### 6.0.5.2 Method 2: : manageOrders()

Pseudo Code:

```

Step1-$sql = "SELECT
    equipment_master.`Frequency`,
    order_master.`Equipment_id`,
    order_master.`Last_complete_date`,
    order_master.`Order_id`
    from order_master INNER JOIN equipment_master on
order_master.`Equipment_id`=
equipment_master. Equipment_id`;
Step2- run query
Step 3-   if($numRows>0)
while ($row= $result->fetch_assoc())

```

```

$id= $row['Order_id'];
$weekno = $week;
$last_complete_date= $row["Last_complete_date"];
Step4- if(frequency==monthly)
    Next Order=last date+1month
Step5-if(frequency==2 monthly)
    Next Order=last date+2month
Step6- if(frequency==3 monthly)
    Next Order=last date+3month
Step7-if(frequency==4 monthly)

```

```
    Next Order=last date+4month  
Step8- if(frequency==6 monthly)  
    Next Order=last date+6month  
Step9-if(frequency==yearly)  
    Next Order=last date+1 year  
Step10- else  
Return to Step1;
```

## 6.0.6 Class Name=:Users

### 6.0.6.1 Method 1: displayUsers()

Pseudo Code:

```
Step1: $sql=select * from Users;  
  
Step2: run query;  
  
Step3: if(query==true)  
While(fetch->assoc)  
Fetch from the database  
  
Step4: else  
Print “no Users is found”  
  
Return Step1;
```

### 6.0.6.2 Method 2: : manageUsers()

Pseudo Code:

```
Step1: $sql	insert/delete/update the user table where  
user_id=x;  
  
Step2: run query;  
  
Step3: if(query==true)  
While(fetch->assoc)  
Fetch from the database  
  
Step4: else  
Return Step1;
```

## 6.0.7 Class Name=:Checklist

#### 6.0.7.1 Method 1: displayChecklist()

Pseudo Code:

```
Step1: $sql=select * from Checklist;  
Step2: run query;  
Step3: if(query==true)  
While(fetch->assoc)  
Update the database  
Step4: else  
Print "no Checklist is found"  
Return Step1;
```

#### 6.0.7.2 Method 2: : manageChecklist()

Pseudo Code:

```
Step1: $sql=insert/delete/update the checklist table where  
id=x;  
Step2: run query;  
Step3: if(query==true)  
While(fetch->assoc)  
Update the database  
Step4: else  
Return Step1;
```

### 6.0.8 Class Name=:Defectlist

#### 6.0.8.1 Method 1: displayDefectlist()

Pseudo Code:

```
Step1: $sql=select * from defectlist;  
Step2: run query;  
Step3: if(query==true)  
While(fetch->assoc)
```

Fetch from the database

Step4: else

Print “no defectlist is found”

Return Step1;

#### 6.0.8.2 Method 2: : manageDefectlist()

Pseudo Code:

Step1: \$sql=insert/delete/update the defectlist table where  
id=x;

Step2: run query;

Step3: if(query==true)

While(fetch->assoc)

Update the database

Step4: else

Return Step1;

### 6.0.9 Class Name=:Reports

#### 6.0.9.1 Method 1: displayReports()

Pseudo Code:

Step1: \$sql=select \* from reports;

Step2: run query;

Step3: if(query==true)

While(fetch->assoc)

Fetch from the database

Step4: else

Print “no reports is found”

Return Step1;

### **3. CODING METRICS OF EMS**

#### **PHP Metrics Tools Used -**

##### **In Vim / Neovim**

You can easily configure in Vim every tools you want and let them parse your open files.

##### **PHP-CS-Fixer (PHP Coding Standards Fixer)**

PHP-CS-fixer is a simple tools which allows you to format your code automatically. By default PSR-1 and PSR-2 rules are used but you can define your own formatting rules.

With the following command you can format an entire codebase:

```
$ php-cs-fixer fix src/
```

You have as well the possibility to preview the modifications without applying them (--diff option) or you can precise the rules (--rules option) you want to use.

##### **PHPCS (PHP CodeSniffer)**

PHP CodeSniffer is a very good tool to output the coding standards violations you have in your codebase. Two command line scripts can be used: phpcs to output the actual coding standards flaws and phpcbf which can fix some errors for you.

##### **PHPMD (PHP Mess Detector)**

PHPMD will display the possible bugs and misuses of the language in your application.

PHPMD will scan the directory and sub-directories of your project and output in plain text the errors found. You can as well create an html or xml output by replacing the text option in the command line above.

## **PHPStan (PHP Static Analysis Tool)**

PHPStan is another tool to have in your toolbox. It aims? Output errors like a compiled language would display during compilation. It's a good complement to PHPMD.

## **PHPUnit and the CRAP metric**

PHPUnit can as well display a very interesting information: the CRAP metric.

CRAP uses the cyclomatic complexity with the code coverage of your code to display what might be the code difficult to change in your application.

More the CRAP index is high, more you code will be considered as “crappy”.

## **PhpLoc**

PhpLoc is a very good tool to get an idea of the size of a project.

- Comment lines of code are never good. Get rid of it without a second thought.
- Too high Average Class length is usually not good either. Split the god classes.
- Too high Average Method length is again not good. For the sake of your colleagues, split them.
- Cyclomatic complexity can indicate a bit everything and anything. Trusting something like CRAP might be wiser.
- Avoid unnecessary Dependencies.

## **dePHPend**

As you can see, dePHPend will output the number of Afferent Coupling, the number of Efferent Coupling and display an instability indicator based on them.

In clear:

- No class depends on the class App\Kernel
- The class App\Kernel depends on five other classes

The instability score is high here: this class couples other classes together but is never used!

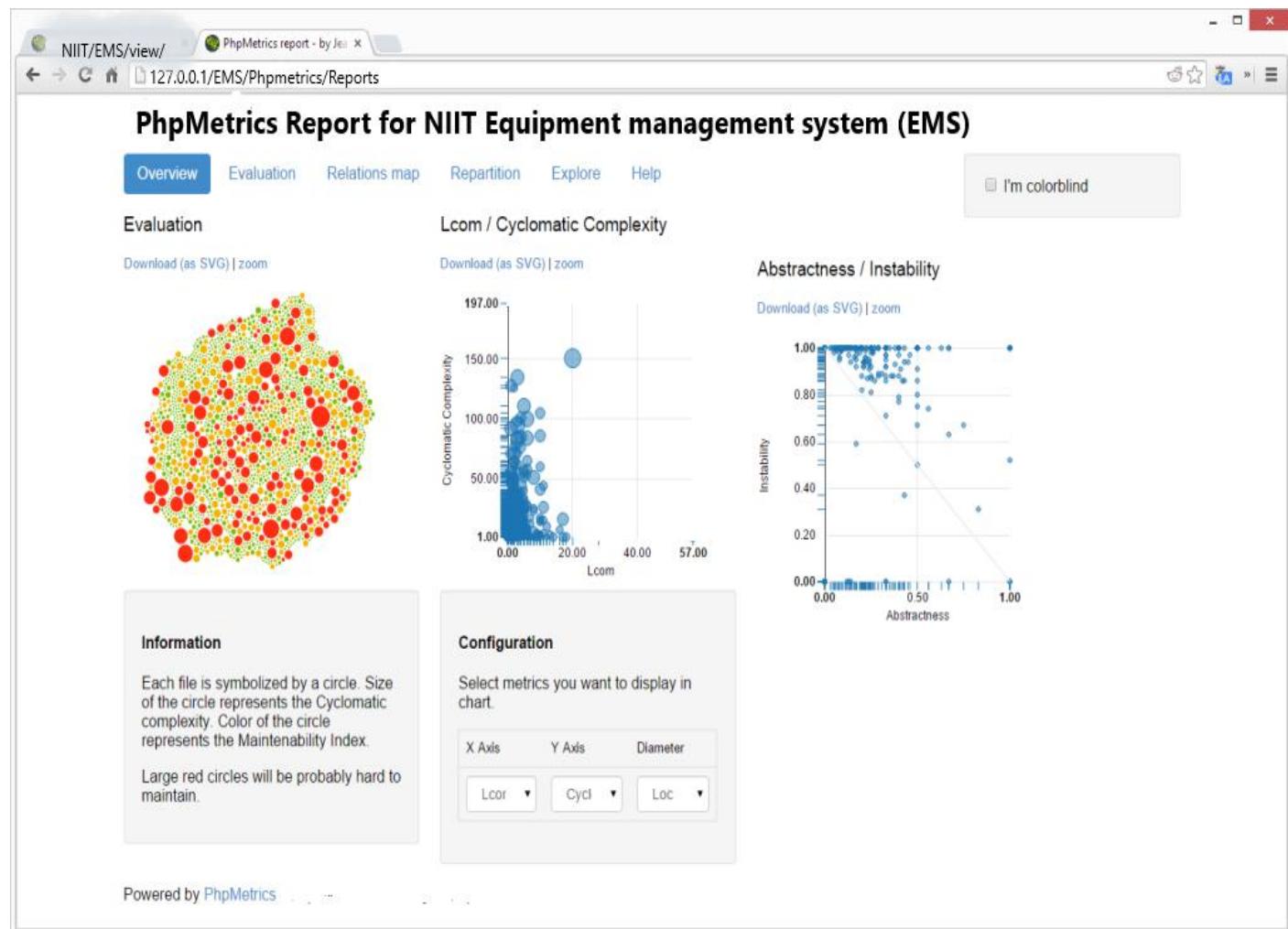
## churn-php

churn-php will display the classes you should refactor based on the cyclomatic complexity and the number of commit the class has.

This is a pretty interesting approach. A very complex class which is often modified has indeed a high chance to introduce bugs.

## PhpMetrics

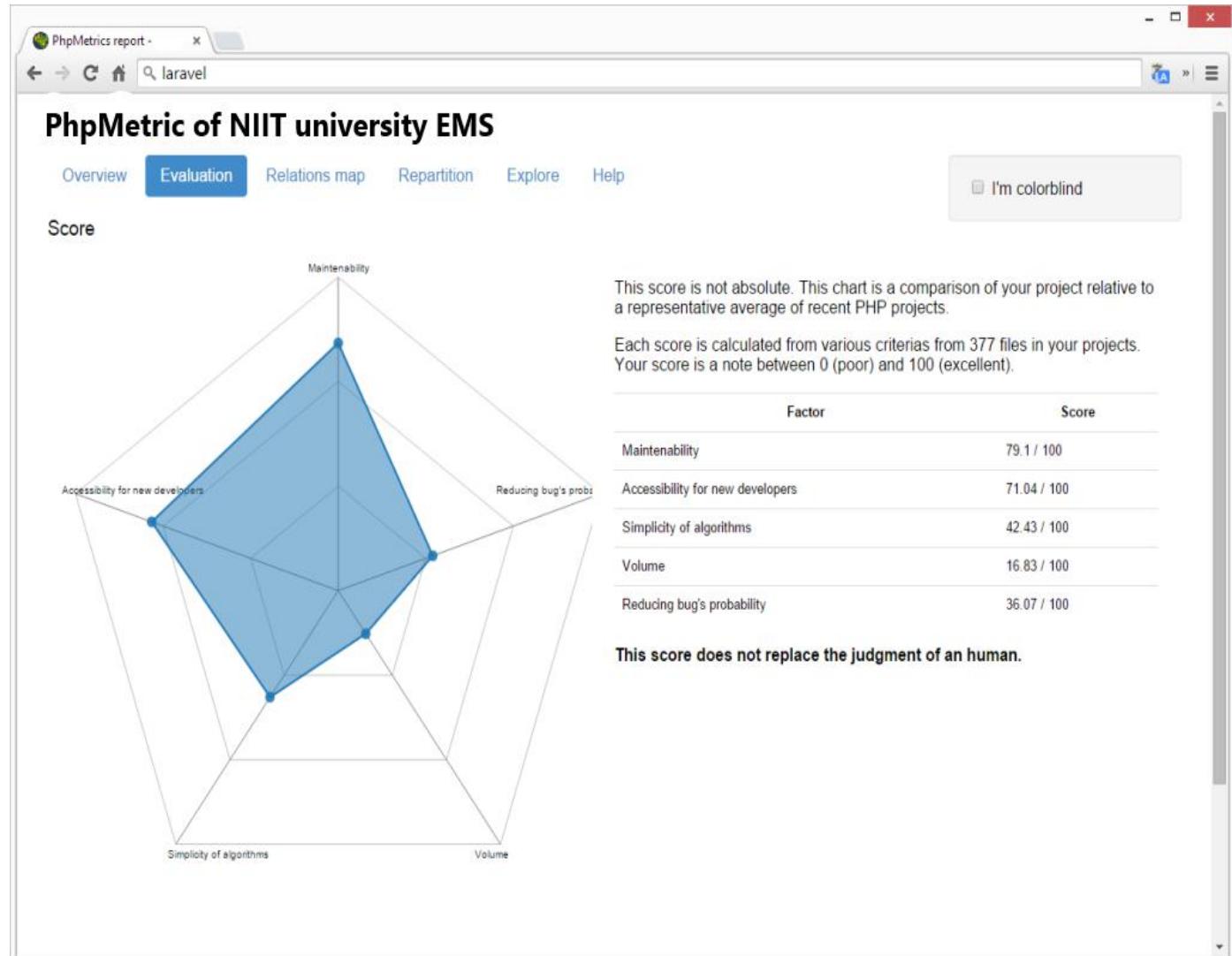
Last but not least, if you are a metric lover, PhpMetrics will be your daily fix. It will output *a lot* of metrics about your project. The HTML output will be full of diagrams and numbers.



Since in our project, there is no money related transaction is going on rather it is purely software and individual work time investment. So the planned value is higher.

Planned value = (the hours scheduled on the project) X (hourly rate of an employee who works on the project)

= (around 75 days x 24 hours invested) X(3 project members where one has given 80% of input time while other two have learnt and given some input with their 90% efforts)



## **4. Test Document**

Requirement ID	Class/Component Name	Method Name	Input parameters or scenarios	Expected Output	Real Output	Status(Pass/Fail)
1	Login	getCredential()	username, Password	TRUE	TRUE	PASS
2	Login	hashpassword()	Password	TRUE	FALSE	FAIL
3	Login	changePassword()	username, hashed password	TRUE	TRUE	PASS
4	Roles	loginRedirectPage()	username, password, user role	TRUE	TRUE	PASS
5	Roles	updateRole()	username, password, user role	TRUE	TRUE	PASS
6	Permission	loginRedirectPage()	Role	TRUE	TRUE	PASS
7	Permission	updatePermissions()	username, password, email	TRUE	FALSE	FAIL
8	Equipment	displayEquipment()	object of Intent	TRUE	TRUE	PASS
9	Equipment	manageEquipment()	object of Intent,Equipment name	TRUE	TRUE	PASS
10	Orders	displayOrders()	object of Intent,equipment name,order id	TRUE	TRUE	PASS
11	Orders	manageOrders()	object of Intent,Equipment name,Equipment type	TRUE	TRUE	PASS
12	Users	displayUsers()	object of Intent	TRUE	TRUE	PASS
13	Users	manageUser()	object of Intent,User name,User Roles	TRUE	TRUE	PASS
14	Checklist	displayChecklist()	object of Intent	TRUE	TRUE	PASS
15	Checklist	manageChecklist()	object of Intent,Equipment name	TRUE	TRUE	PASS
16	Defectlist	displayDefectlist()	object of Intent	TRUE	TRUE	PASS
17	Defectlist	manageDefectlist()	object of Intent,Equipment name,Equipment type	TRUE	FALSE	FAIL
18	Reports	displayReports()	object of Intent, users,equipment	TRUE	TRUE	PASS

## **5. MEETING AGENDA/MOM with Customer**

TCO Meeting:

### **A. Meeting Objective**

- Meeting 1: General design discussion, generated requirement analysis.
- Meeting 2: Database management system
- Meeting 3: Connection of database and interlinking of pages
- Meeting 4: More tables inclusion and their relational schema
- Meeting 5: Discussion of number of pages or modules visible or accessible as per user
- Meeting 6: Admin Homepage and other pages finalised objects to be made.
- Meeting 7: Changes in the EMS
- Meeting 8: Discussion on the debugging of the project
- Meeting 9: User interface work distribution

### **B. Pre-work/Preparation (documents/handouts to bring, reading material, etc.)**

<b>Description</b>	<b>Prepared by</b>
Design , flowchart, flow of test or fail, uploading file, change password, moodle as a faculty(ERP/Gatepass),	Rinkal and TCO Engineers
Relation tables, ER Diagrams, Recursive Tree Location	Rinkal and TCO Engineers
User and roles tables formation and relation	Rinkal and TCO Engineers
User, roles, equipments and location relation	Rinkal and TCO Engineers
Admin Homepage and management of users, location, roles, equipments	Rinkal, Nandini and Tejas
Finalized Admin side pages visible	Rinkal, Nandini and Tejas and Tco engineers
UI changes in the ERP format of the EMS project	Akhilesh Sir and Rinkal
Debugging and formatting of EMS	Rinkal and TCO engineers, Gurwinder Sir
Theme and editing for the front end of EMS	Nandini, Tejas, Rinkal and Bailendu Sir

### **Some snapshots-**

<https://mail.google.com/mail/u/0/#search/Balendu.Bhatnagar%40st.niituniversity.in/LXphbRLrghxkrJmVGKJhnBXqXSvzPnVSDFmNCHgCxV>

Gmail

Compose

Inbox 1,678

Starred

Snoozed

Sent

Drafts 43

Rinkal Singh

Rinkal

No recent chats Start a new one

Regarding Changes and Issues in EMS

Rinkal Singh <rinkal.singh@st.niituniversity.in> to Akhlesh, Balendu

Sir, I have noted some changes and issues in EMS during meeting with Akhlesh sir.  
Here are the issues:-  
1-Hovering Effect in Order Details Table.  
2-Bigger Order Details Table.  
3-Remove 4 tabs on the home page.  
4- Remove Analysis From Screen.  
5-Details on the generated checklist screen.  
6-Week Report from Gurwinder sir during testing.  
7-Separate Import and export.  
8-Drop down color.  
9-Make table- Status, Frequency.  
10-Send E\_R Diagram.  
11- Change Defectlist master to Defects.  
Thank You!

Aug 10, 2018, 8:58 AM

<https://mail.google.com/mail/u/0/#search/Balendu.Bhatnagar%40st.niituniversity.in/LXphbRLrghxkrJmVGKJhnBXqXSvzPnVSDFmNCHgCxV>

Type here to search

Gmail

Compose

Inbox 1,678

Starred

Snoozed

Sent

Drafts 43

Rinkal Singh

Rinkal

No recent chats Start a new one

Disclaimar

Rinkal Singh <rinkal.singh@st.niituniversity.in> to Akhlesh

Sir,  
The points raised by Gurwinder sir are:-  
1- Bigger Order Details Table.  
2-Photo/doc attachment with every Order.  
3-Remove 4 tabs on the home page.  
4- Remove Analysis From Screen.  
5-Details on the generated checklist screen.  
6-Accept/Reject Option for checklist of Progress Orders.

Aug 10, 2018, 1:10 PM

Rinkal Singh  
7235834291  
NIIT UNIVERSITY  
U101116FCS283

On Fri, Aug 10, 2018 at 9:59 AM, Akhlesh Agarwal <[Akhlesh.Agarwal@niituniversity.in](mailto:Akhlesh.Agarwal@niituniversity.in)> wrote:  
Pls send points raised by gurwinder also.

Get [Outlook for Android](#)

Activate Windows  
Go to Settings to activate Windows.

Type here to search

<https://mail.google.com/mail/u/0/#search/Balendu.Bhatnagar%40st.niituniversity.in/LxphbRlghxkrJmVGKJhnBxqXSvzPnVSDFmNCHgCcxV>

**Gmail**

**Compose**

**Inbox** 1,678  
Starred  
Snoozed  
Sent  
**Drafts** 43  
Rinkal Singh

Rinkal Singh <rinkal.singh@st.niituniversity.in>  
to Akhlesh ▾  
Sir,  
The points raised by Gurwinder sir are:  
1- Bigger Order Details Table.  
2-Photo/doc attachment with every Order.  
3-Remove 4 tabs on the home page.  
4- Remove Analysis From Screen.  
5-Details on the generated checklist screen.  
6-Accept/Reject Option for checklist of Progress Orders.

Rinkal Singh  
7235834291  
NIIT UNIVERSITY  
U101116FCS283

No recent chats  
Start a new one

On Fri, Aug 10, 2018 at 9:59 AM, Akhlesh Agarwal <Akhlesh.Agarwal@niituniversity.in> wrote:  
Pls send points raised by gurwinder also.

Get [Outlook for Android](#)

Activate Windows  
Go to Settings to activate Windows.

<https://mail.google.com/mail/u/0/#search/Balendu.Bhatnagar%40st.niituniversity.in/RdDgqcJHpWvcvDjPGtKfTdTgNqzwDdSRcWtngDPlqVHQ>

**Gmail**

**Compose**

**Inbox** 1,678  
Starred  
Snoozed  
Sent  
**Drafts** 43  
Rinkal Singh

Balendu.Bhatnagar@st.niituniversity.in

**Report of 2/9/2018**

Rinkal Singh <rinkal.singh@st.niituniversity.in>  
to Akhlesh, Balendu, Ashoo, Vivek ▾  
Sir,  
Today we worked on all four users roles. Tomorrow we will work on defect list management part.  
Thank You!

Rinkal Singh  
7235834291  
NIIT UNIVERSITY  
U101116FCS283

No recent chats  
Start a new one

Activate Windows  
Go to Settings to activate Windows.

Gmail

Compose

Inbox 1,678

Starred

Snoozed

Sent

Drafts 43

Rinkal Singh

Rinkal

No recent chats Start a new one

Rinkal Singh <rinkal.singh@st.niituniversity.in> to GurwinderS.Mann

Tue, Oct 16, 3:37 PM

Sir,  
Respectfully project is almost completed and its issues and debugging is currently going on.  
Debugging and testing will be completed by Saturday.  
Thank you!

IT UNIVERSITY OF THE FUTURE  
Innovative | Technology-based | Research-driven

Rinkal Singh <rinkal.singh@st.niituniversity.in> to Balendu

Wed, Oct 17, 4:32 PM

Activate Windows  
Go to Settings to activate Windows.

Type here to search

Compose

Inbox 1,678

Starred

Snoozed

Sent

Drafts 43

Rinkal Singh

Rinkal

No recent chats Start a new one

Rinkal Singh <rinkal.singh@st.niituniversity.in> to GurwinderS.Mann<GurwinderS.Mann@niituniversity.in>

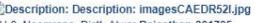
Tue, Oct 16, 2018 at 12:51 PM Gurwinder Singh Mann <[GurwinderS.Mann@niituniversity.in](mailto:GurwinderS.Mann@niituniversity.in)> wrote:

Dear Rinkal,

Hope the testing phase of Project is completed and Program must be ready for deployment.

Please confirm the same so that same can be implemented with user training and user manual for real time testing and fine tuning.

Warm Regards,

Gurwinder Singh Mann  
PMT Head  
  
NH-8, Neemrana, Distt. Alwar, Rajasthan-301705  
Phone: (+91)1494 660 771, [www.niituniversity.in](http://www.niituniversity.in)

From: Gurwinder Singh Mann  
Sent: 11 June 2018 12:22  
To: Ashoo Dubey <[Ashoo.Dubey@niituniversity.in](mailto:Ashoo.Dubey@niituniversity.in)>; Balendu Bhatnagar <[Balendu.Bhatnagar@niituniversity.in](mailto:Balendu.Bhatnagar@niituniversity.in)>; Vivek Singh <[vivek.singh@st.niituniversity.in](mailto:vivek.singh@st.niituniversity.in)>  
Cc: Rinkal Singh <[rinkal.singh@st.niituniversity.in](mailto:rinkal.singh@st.niituniversity.in)>  
Subject: Re: Requirement Analysis For PPM Module

Hello,

As per the user list, it need to be amended as following:

1. First user - Data entry operator
2. Second user - Property Manager
3. Third user - E&M incharge
4. Fourth user - O&M incharge
5. Fifth user - Super user

Scenario seems to be fine, user should be able to log in only if authentication verified successfully.

Activate Windows  
Go to Settings to activate Windows.

8:28 PM

10.6K/s ⚡ 25%



TCO

last seen today at 8:25 pm



You should message me. Tomorrow we will meet around 3.00 pm

7:30 pm

We came first at 11.00

8:01 pm ✓✓

But sir you are not there

8:01 pm ✓✓

Today I am working in it lab

8:02 pm ✓✓

I was there at 11.30

8:02 pm

OK we have class till 3.30

8:02 pm ✓✓

We will come at 3.30

8:03 pm ✓✓

OK

8:03 pm

13 OCTOBER 2018

Due to urgent need, I have to go to behror. We will have this meeting on Monday. Please suggest time. Thanks

3:14 pm

Ok

3:56 pm ✓✓

Sir

3:56 pm ✓✓

8:28 PM

600K/s ⚡ 25%



TCO

last seen today at 8:25 pm



Sir aaj meri extra classes hai and I am not free until 7.0

2:10 pm ✓✓

So can i meet you tomorrow with completed project

2:11 pm ✓✓

As it has some issues

2:11 pm ✓✓

Have you seen gurwinder mail. You need to complete in this week. Please respond the mail.

2:27 pm

OK in evening I will respond now I am in class

2:28 pm ✓✓

18 OCTOBER 2018

Sir I came in Tco but

4:05 pm ✓✓

You were not there

4:06 pm ✓✓

Can I come tomorrow

4:06 pm ✓✓

I just left for home

4:06 pm

OK sir

4:06 pm

8:28 PM

8.58K/s 25%



TCO

last seen today at 8:25 pm



OK Sir 4:06 pm ✓

Have you updated all we discussed  
yesterday

4:07 pm

Yes sir 4:08 pm ✓

Update on vinay system

4:08 pm

And talk to gurwinder and shown on  
this system

4:09 pm

Sir I am not free as extra classes are  
there

4:09 pm ✓

Can I mail 4:10 pm ✓

For tomorrow meeting with gurwinder  
sir

4:10 pm ✓

No, after class you have to update

4:10 pm

OK sir I will try 4:11 pm ✓

As tomorrow will be holiday, I am not  
sure about gurwinder as he will be in  
office or not

4:12 pm

8:28 PM

7.46K/s 25%



TCO

last seen today at 8:25 pm



OK sir I will try 4:11 pm ✓

As tomorrow will be holiday, I am not sure about gurwinder as he will be in office or not 4:12 pm

You do your part 4:12 pm

Upgraded your project on vinay system 4:12 pm

OK then I am going to meet sir after class 4:13 pm ✓

And what about theme part 4:14 pm

Two guys working on it 4:14 pm

They are telling me still incomplete 4:14 pm ✓

That's not acceptable 4:14 pm

Ya sir 4:15 pm ✓

I will give them deadline for tomorrow 4:15 pm ↴

8:29 PM

10.2K/s ⚡ 25%



TCO

last seen today at 8:25 pm



4:17 pm ✓✓

Sir I talked to gurwinder sir about to  
see the software

4:37 pm ✓✓

He said that he will verify after  
Monday

4:38 pm ✓✓

Ok 4:53 pm

But updated by today with the help of  
vinay

4:54 pm

Sir I updated it 4:57 pm ✓✓

Good, will check tomorrow 5:01 pm

25 OCTOBER 2018

Sir 12.00 pe Aa rha hu 11:47 am ✓✓

Group ko bhi Lana hai kya 11:47 am ✓✓

?? 11:47 am ✓✓

29 OCTOBER 2018

Sir can we meet after 2.30 today

8:29 PM

8.64K/s 25%



TCO

last seen today at 8:25 pm



29 OCTOBER 2018

Sir can we meet after 3.30 today

1:06 pm ✓✓

?? 1:14 pm ✓✓

Sir I came in to at 3.30 3:34 pm ✓✓

But u were not there 3:34 pm ✓✓

I was on leave 5:53 pm

OK sir 7:33 pm ✓✓

Sir tomorrow 7:34 pm ✓✓

Will tell you on what's up 8:29 pm

OK sir 10:23 pm ✓✓

All last discussed has been implemented

10:24 pm ✓✓

1 NOVEMBER 2018

You can meet me today when ever

8:29 PM

9.75K/s ⚡ 25%



TCO

last seen today at 8:25 pm



Sir tomorrow 7:34 pm ✓✓

Will tell you on what's up 8:29 pm

OK sir 10:23 pm ✓✓

All last discussed has been implemented 10:24 pm ✓✓

1 NOVEMBER 2018

You can meet me today when ever you free. 11:05 am

Meet me in second half 11:24 am

Yes sir at 4.30 2:24 pm ✓✓

Ok 2:33 pm

2 NOVEMBER 2018

Sir meri Abhi extra class hai Java ki

11:28 am ✓✓

12.30 tco aata hu 11:28 am ✓✓

## **6. Nature of the Customer**

This PPM module is for the TCO of NIIT University under the guidance of Mr. Akhlesh Agarwal. In this module, we have created an application which will be used for maintenance of equipment properties available in the University.

Our customers are using the product according to their assigned roles. First is the Data entry operator; second is Property manager; third user is E&M in-charge; and fourth one is O&M in-charge.

They have been given access to different tasks and according to their task performance and duties; we have made certain efforts in the project so that the users can work effortlessly. Even the evaluation of junior users by the senior users is taken into consideration.

In this module there are basically four Users:

- A. Data Operator - a technician will be the first user who will verify the equipment and if it is ok then Sr. Engineer will verify the checklist and the E/M in-charge.
- B. Property Manager - Engineers will be the second users which will again verify the equipment already verified by the technicians or first users.
- C. E/M In-charge - They will be the third users who will again verify the equipment which is verified by both a technician and an engineer.
- D. O/M In-charge/ Admin - He can give the Permission and rights to the different users according to the roles assigned to them.

The customers have shown keen enthusiasm and rigorous efforts to make this project successful. They have patiently given their inputs and opinions for amendments, if necessary. The product is also the fruit of their cooperation and understanding of the situations faced by the programmers and product developers.

## 7. Testimonial from Customer/Users

- How easy was it to install our software?  
 Extremely easy  Very easy  Moderately easy  Slightly easy  Not at all easy
  - How quick was the installation process for our software?  
 Extremely quick  Very quick  Moderately quick  Slightly quick  Not at all quick
  - How user-friendly is our software's interface?  
 Extremely user-friendly  Very user-friendly  Moderately user-friendly  Slightly user-friendly  Not at all user-friendly
  - How successful is our software in performing its intended task?  
 Extremely successful  Very successful  Moderately successful  
 Slightly successful  Not at all successful *We went to test at customer level.*
  - Overall, are you satisfied with the performance of our software and our team, neither satisfied nor dissatisfied with it, or dissatisfied with it?  
 Extremely satisfied  Moderately satisfied  Slightly satisfied  
 Neither satisfied nor dissatisfied  Slightly dissatisfied  Moderately dissatisfied  Extremely dissatisfied
  - How likely are you to recommend our software and the team to others?  
 Extremely likely  Very likely  Moderately likely  Slightly likely  
 Not at all likely
- How approachable our team was  
 Extremely approachable  Very approachable  Moderately approachable  very difficult to meet  don't respond on time

*How do you rate the technical competence of the team*

*Extremely Talented  Moderately Talented  Not talented at all*

*Would you like to continue with our team in future*

*Would love to work  Will at least give a thought  Will not consider at all*

*Rishabh Shukla*

The project was done as a course project of CS 301. Would you like to participate in selecting the team from pool of students next time for another product?

Would love to work  Will at least give a thought  Will not consider at all

How much business time is saved by the tool/product developed by our team compared to your traditional way of doing the business(e.g. without this product/tool/software)

0-10%  10-30%  30-60%  60-80%  more than 80%  
Product is in testing phase.

Do you think the product is helpful to increase the business turnover

Quite sure  It is likely to do so  Don't know/can't say  It was waste of time. No improvement at all.

How much percentage of your expectations /requirements are satisfied.  
 100%  70-90%  40-60%  below 40%

If you were the course supervisor how would you evaluate the project?

A+  A  B  B+  C+  C  D+  D  Below D

How would you rate the sincerity of the team

Any other suggestion/feedback/comment

extremely sincere  Good level of sincerity is there  Moderate level of sincerity  Not sincere at all

Balwinder Bhambhani

## **8. Tools and technologies Used**

### **8.1 Tools Used:**

8.1.1 Sublime Text Editor

8.1.2 Xampp

8.1.3 Github

8.1.4 Lucid Chart

8.1.5 Argo UML

8.1.6 PhpMetrics

### **8.2 Technologies Used:**

8.2.1 Php - Server side scripting/ Back-end

8.2.2 Mysql- Database

8.2.3 HTML - Front-end

8.2.4 CSS - Front-end

8.2.5 Java Script - Client Side Scripting

## **9. Novelty of the Project Idea**

As earlier mentioned the project Equipment management system is an unique of it own kind. As before this software is developed the users- basically the data operators go to the equipment site and then manually fill the hard copy checklist and then verify it time to time, then it goes to the next user property Manager then he physically go to the em incharge then O-M Incharge. It has many disadvantages as-

- A- More time consuming.
- B- Records are vulnerable
- C- Less Reliable
- D- No future Scope

Which is why the idea of equipment management system came to mind as it is unique, new as well as digitally reliable, records are more secure, No space requirement, less time consuming as well as great future scope.

## **10. Sophistication value of project**

Why this is not easy to do?

Although the project looks easy but actually it was quite unusual as-

- A- It has four users with different permissions
- B- SMTP Protocols require high level of coding
- C- It is based on PPM module means it is 52 week module and order management is based on equipment type, frequency as well as status
- D- Checklist generation for every equipment.
- E- Automatic generation of the defectlist
- F- Resolving the defectlist
- G- Event logging the user with ip, os as well as browser
- H- Autofill the user form then update, delete, add.

- I- Csv Import and export of users,equipment, orders,checklist, defect list
- J- Gmail notifications when order status changes, user password changes/updates

## **11. Applicability of the Project-**

- A- Less time consuming as compared to physical hard copy checklist management
- B- Automatically records are saved on cloud for backup.
- C- More reliable as compared to hard copy checklist management.
- D- Any number of orders, users can be managed.
- E- User can validate the checklist from anywhere.
- F- User can be tracked with users details as well as IP, Operating system and Browsers.