Online Order Processing System
For
Industrilas Asia Pvt Ltd.

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Declaration

I certify that this dissertation does not 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 here by give consent for my dissertation, if accepted, to be made available for photocopying and for interlibrary loans, and for the title an abstract to be made available to outside organizations.

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....   Date:....2017/11/05....

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Abstract

Industrilas group is specialized in the production and sales of commercial products (wholesale) and system solutions for latches, hinges and sealing technology for industrial applications. Industrilas Asia is a full service hub located in Sri Lanka with both R&D center, production, assembly, warehouse and logistics, they service the local markets, as well as India and the Middle East.

Presently, their staff uses Quick book software for accounts and inventory management. Since it is ready made software there are lot of limitations and less effective. Further, they use Spreadsheet applications and manual(paper) systems for Orders Management, Forecast Planning, Production planning, etc.

To reduce above manual systems, the best solution is web based online order processing system and proposed system was followed rapid application development methodology. It included online order placement and order management, Production planning, Finished Goods stock management and Shipping Module. Finally, Customers can view their order status online from their web portal.

The proposed Web based system was developed by using Object oriented PHP for server side scripting, HTML and bootstrap for interface development, Java script for client side scripting and MYSQL as the Database.

At the end of the development process, the system was tested by many users of the company to ensure the user requirements are satisfied. Finally, the system was handed over to the client and it was accepted with minor modifications.

Acknowledgement

I would like to express the deepest appreciation to the BIT Coordinators and academic staff of University of Colombo School of Computing (UCSC) for giving us valuable degree program and providing us a good guidance continuously.

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I would like to thank my client Mr. Aruna Fernando (IT Manager - Industrilas Asia Pvt Ltd), for given me this great opportunity to developed web based system and the support given through-out the project.

Finally, I would like to thank my family members for their encouragement.

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List of Acronyms

GRN – Goods Received Note

OOAD – Object Orient Analysis and Design

PO – Purchase Order

RUP – Rational Unified Process

SC – Sales Confirmation

UML – Unified Modeling Language

URL – Universal Resource Locator

CHAPTER 1 – INTRODUCTION

1.1 Introduction

The Industrilas Group Headquarter is situated in South Sweden. This is where main R&D center, tool shop, production, assembly as well as logistics, service center and Group Management are located. All worldwide activities are coordinated from here and Industrilas Asia is a full service hub of Asia which located in Sri Lanka. Their main production items are latches, Hinges and Swing handles.

1.2 Motivation of the Project

Presently spreadsheet applications and manual(paper) systems are being used to handle operations by Industrilas Asia Pvt Ltd. As a globally recognized manufacturing company efficiency of the production processes and systems are key factors for them to be more competitive in the industry.

- New orders are managed by using spreadsheet application and there are lot of human errors.
- There is no proper system to monitor Forecast plan of the future orders.
- Production speed monitoring system is also need to be implemented.
- Finished good stock also needs to be managed systematically.
- Shipping documents (Export Invoice, Packing List) are also creating from spreadsheet applications – so it is very difficult to data analysis.
- Customers can't track their order status online.

Migrating to the automated online system will facilitate to overcome the aforementioned lapses and it will improve the productivity too.

1.3 Objectives of the System

Following are the main objectives of the system.

- Through an automated system for order management company will be able to increase production volume and able to provide quality products before due dates.
- High accuracy of the information required to the top management for data analysis and decision making in a timely manner to prevent manual mistakes.
- Since this is a web based online system company get the advantage of expanding its existing market and can tap the new market.
- Buyers can track their order status online from the system anywhere at any time.
- Company will be able to review the forecasting plan in advance and take corrective action as required.

1.4 Scope of the Proposed Project

- Online order placement (automatic system alert)
- Buyer details Management
- Product Information Management
- Order status Management
- Forecast Planning and production Planning
- Finish goods Inventory
- Export document management
- Generating reports with Excel and PDF format for top management
- System account management

1.5 Structure of the Dissertation

Dissertation structure is as follows.

Chapter 02-Analysis

Systems analysis is a process of collecting factual data, understand the processes involved, identifying problems and recommending feasible suggestions for improving the system functioning. This involves studying the business processes, details of the manual system, functional nonfunctional requirements and details of the existing systems.

Chapter 03-Design

This is the most crucial phase in the development of a system and this chapter explains the use case diagram of the proposed system, database design of the system and main interfaces of the system.

Chapter 04-Implementation

Implementation is the stage of a project during which theory is turned into practice. This chapter explains the hardware software requirements, development tools which are used for the system, code features and reused modules of the system.

Chapter 05-Evaluation

This chapter explains the techniques of testing, details of software testing, high level test plan of the system and client evaluation of the system.

Chapter 06-Conclusion

This is the final chapter and it explains the future enhancements of the system and lesson learnt of the overall project work.

CHAPTER 2 – ANALYSIS

2.1 Introduction

System analysis is the process of determining user expectations for a new or modified system. Farther, requirements gathering, draw backs of the present system, functional and non- functional requirements of the proposed system and finally, the similar system reviews are contained in this chapter.

Before analyzing the system, first, the requirements should be gathered by using the fact finding techniques, such as interviews, observations, sample documents etc.

2.2 Fact Gathering Techniques

Fact Finding is the formal process of using research, interviews, questionnaires, and other techniques to collect information about systems and requirements. It is also called information gathering or data collection.

Several interviews were conducted with IT Manager and Internal Staff as the main fact gathering technique. Lots of questions were asked and answers were helped in order to gather requirements. Then following sample documents were being collected.

- Purchase Order
- Production Plan
- Export Invoice
- Export Packing List

Through document review technique, it would help to get a clear idea about the system.

2.3 Analyzing the Current Manual System

Figure 2.1 shows the use case diagram of the existing system.
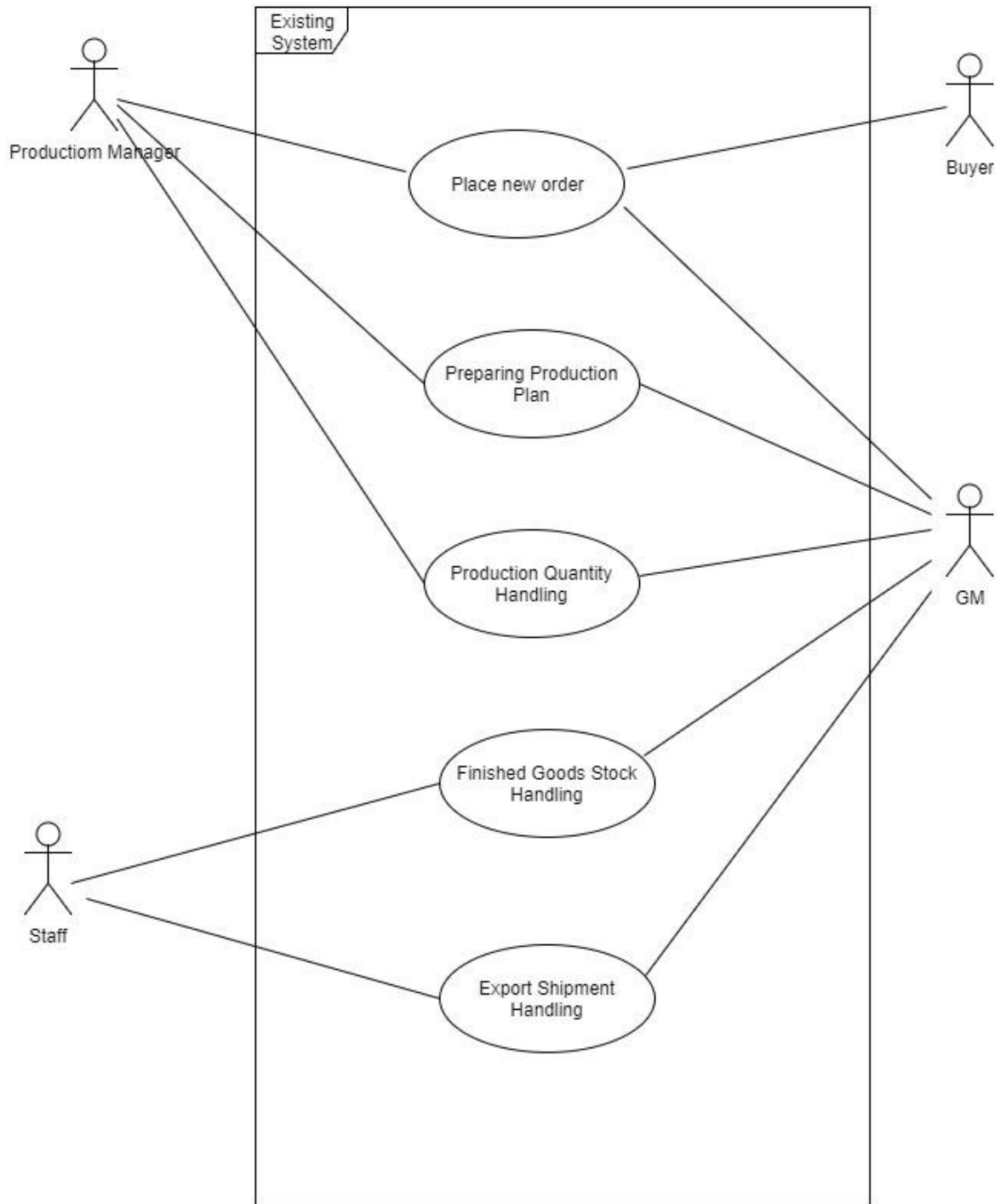
Figure 2.1: Use Case Diagram for the existing system

2.4 Current System and Drawbacks

- Buyers are sending their orders as Purchase Order via email and currently company does not have a proper way to keep records of Purchase Orders.

- As a first document, Purchase Order has lots of important data and it is very difficult to search historical data.

- Spreadsheet application is used to keep all details about Product Models and Quantities.

- According to the total orders received, need to plan production and that is also doing by a manual system. So some time orders got delayed due to planning problems.

- There is no systematic way to monitor future order situation and total order quantity, Product model wise order quantity calculation also very much difficult.

- After the completion of production, finished goods are moved to finished goods stores and data is kept on manual paper records.

- Then logistic department arranges export shipment – Export Invoice and Packing list documents are crated using a spreadsheet application.

- Information which is required to the top management needs to be updated via email every day.

- Less number of Management Information System(MIS) Reports and data inconsistency of current reports.

2.5 Literature Review and Existing Similar System

The trial version of the similar systems was studied to get knowledge of the area.

- ERPNext - https://erpnext.com

"In ERPNext all projects are linked to Tasks, Timesheets, Expenses, Purchases, Budgets so you get a full view of your activities." [1]

Features are as follows:

➢ Billing and Invoicing

➢ HR, Leave and Payroll

➢ Sales

➢ Roll Based Access

➢ Workflow Engine

➢ Email Integration

Main dashboard page illustrates on Figure 2.2 and add item page illustrate on Figure 2.3.
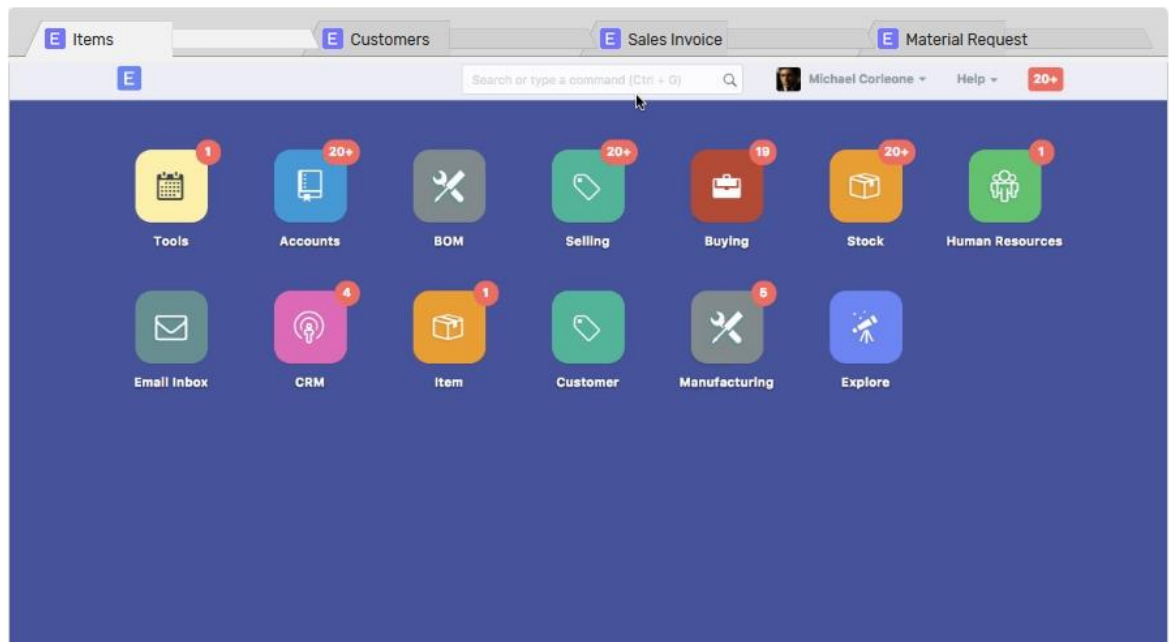
Figure 2.2: Dashboard of ERPNext System
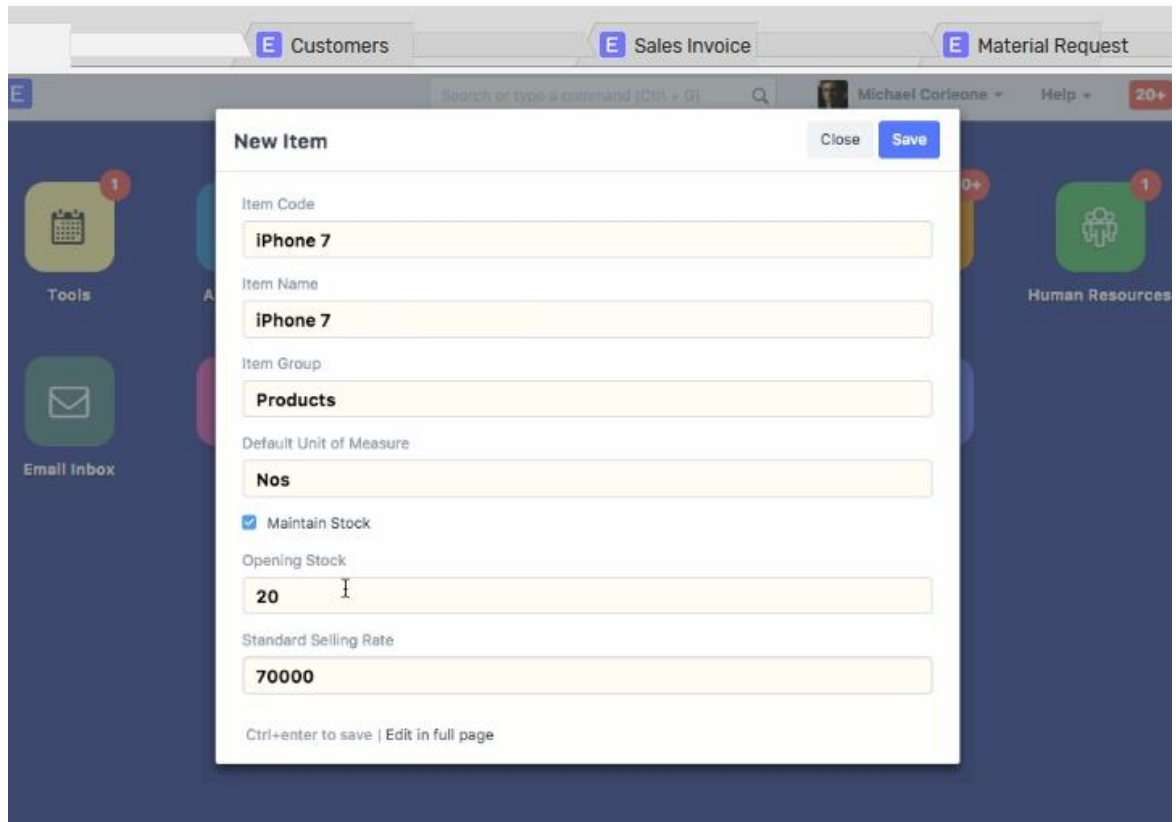
Figure 2.3: ERPNext - Add Items

- Dolibarr ERP/CRM - https://www.dolibarr.org

Dolibarr ERP & CRM is a modern and easy to use software package to manage customers, invoices, orders, products, stocks, shipments, etc.

Features are as follows:

- ➤ Human Relationship (HR)
- ➤ Product and Stock
- ➤ CRM / Sales
- ➤ E-Commerce
- ➤ Finance and Billing
- ➤ Marketing

Main dashboard page illustrates on Figure 2.4.
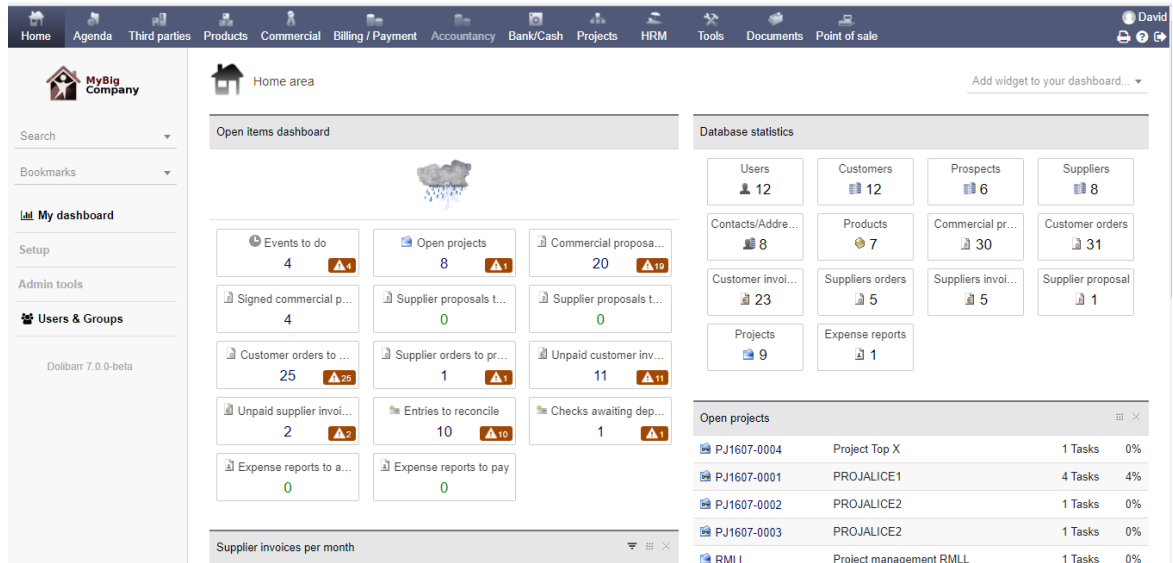
Figure 2.4: Dashboard of Dolibarr ERP/CRM System

Above systems are high cost and may not match the client requirements. There were bulks of unnecessary functions which are not related to the proposed system. So that the best option is to make bespoke software to match with the client's requirements.

2.6 Functional Requirements

In Software engineering and systems engineering, a functional requirement states how the system reacts to a particular input and what kind of an output or process is carried out through the system.

Following are a list of functional requirements that are identified during the analysis stage:

2.6.1 System User Accounts Management

- Add, Edit, Delete user accounts.
- User login module with different type of user rolls.

2.6.2 Order Management

- Buyers can place their order (PO – Purchase Order) online.
- Company will receive automatic system alert when a new PO is created.
- Then generating Sales Confirmation(SC) from the system and send it to the buyer to confirm the order.

2.6.3 Planning Module

- Forecast Plan for future months – According to the current production capacity, try to get more orders in advance or if the production capacity exceeded, can discuss with buyers to get a delivery extension.
- Weekly Production Plan.

2.6.4 Production Module

- Daily production data input order number wise.

2.6.5 Finish Goods Stock Management

- After production is finished, finished goods need to be moved from production department to finished good stores – Goods Received Note (GRN) at Finished Goods Stores(FGS).
- Before loading goods for export need to make Dispatch Note. Goods dispatch note acts as a source to generate an export invoice.

2.6.6 Shipping Module

- Export Invoice and Export Packing list are created from the system.

2.6.7 Track Order Status

- Buyers can login to the system from their web portal to check the status of their orders and order status details are listed below in Table 2.1.

Order No	21050
Delivery Date	3/3/2017

Date	Description
1/1/2017	Order Placement
3/1/2017	order has been Confirmed
25/2/2017	Planned to Production
26/2/2017	Production Start
28/2/2017	Production completed
1/3/2017	Moved to FGS
3/3/2017	Dispatch from FGS
5/3/2017	ETD - Colombo
25/3/2017	ETA - India

Table 2.1: Order Status

2.6.8 Report Generation Module

The system has facilitated to generate following reports.

- Buyer wise, Product wise order detail report
- Date wise, product wise production report
- Daily finished goods stock as at report

2.7 Non Functional Requirements

A non-functional requirement (NFR) is used to judge the operation of a system, rather than specific behaviors and success of this system is dependent on both functional and non-functional requirements.

Following are the non-functional requirements.

- Extensibility – Should be able to add new features easily.
- Backup – Backup plan should be maintained properly.
- Security – System should be highly secured to prevent unauthorized access.
- Response time – System response time for the user request is an important performance matrix.

2.8 Methodology for the Proposed System

Rational Unified Process (RUP) has been selected for the proposed system, because RUP is an object-oriented and Web-enabled program development methodology. It provides guidelines, templates, and examples for all aspects and stages of program development. RUP provides a prototype at the end of each iteration and that helps to satisfied client. Because some requirements which are not defined properly will be going to be changed many times in future. Main advantages of RUP are this methodology emphasizes on accurate documentation, it is able to resolve the project risks that are associated with the clients and it uses Unified Modeling Language(UML) models to design the static view as well as the dynamic view of the system. Phases of the RUP lifecycle are as follows and Figure 2.2 shows Diagram of RUP.

- Inception Phase – "The idea for the project is stated. The development team determines if the project is worth pursuing and what resources will be needed."

- Elaboration – "The project's architecture and required resources are further evaluated. Developers consider possible applications of the software and costs associated with the development."

- Construction – "The project is developed and completed. The software is designed, written, and tested."

- Transition – "The software is released to the public. Final adjustments or updates are made based on feedback from end users." **[2]**
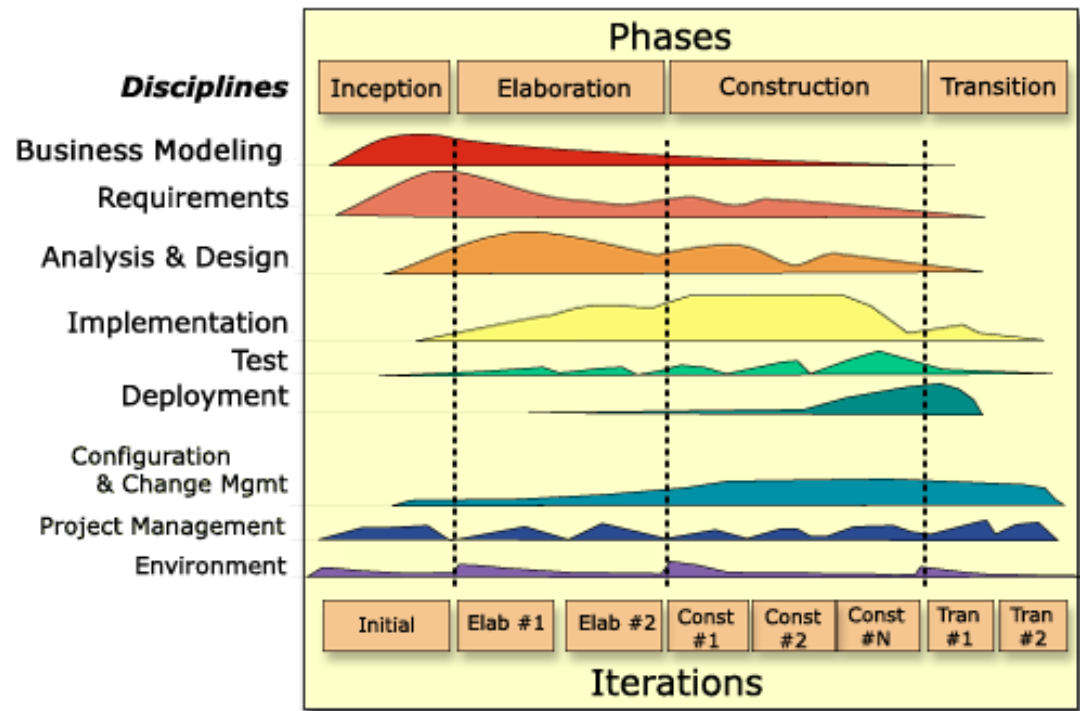
Figure 2.5: Rational Unified Process

CHAPTER 3 – DESIGN

3.1 Introduction

Software design deals with transforming the customer requirements, as described in the requirement specification, into a form that is suitable for implementation in a programming language. A good design should correctly implement all the functionalities identified in the requirement specification and it should be easily understandable.

Object-oriented analysis and design methods with UML diagrams are becoming the most widely used methods for computer systems design. Alternative design methodologies are Rapid Application Development (RAD) and Joint Application Design (JAD)

- RAD – Lots of prototypes need to be designed until end user satisfied.
- JAD – Group of people collectively design and implementation of the system.

3.2 Object Oriented Designing

Object oriented design is one approach to software design and it is a method which is used to collaborate objects and attributes and methods of their objects. An object class contains each and every piece of code which are related to all user interfaces and all program logics. This design approach is a very efficient way to implement designing phase.

3.3 Alternative Solutions

Some alternative design solutions were studied prior to start the design phase and those are as follows:

3.3.1 Maintain system based on old file system

The entire factory working process based on the traditional file based system can be used by the client for keeping manual paper records. By choosing this method the client has to waste more time to get reports and searching historical data also very difficult.

3.3.2 Purchase Commercial stand-alone Software

Purchases of commercially developed software product is also another alternative solution. But main issues that can occur when using these kinds of software are as follows:

- Many of the features in pre-built software packages are unnecessary for the client
- Specific requirements were not available
- Cost is very high
- Platform dependence - Different kinds of operating systems are required by different kinds of software.

3.3.3 Open source free software

Free open source software can download from internet and the issue is the trustworthiness of those kinds of software. Even though the source code is allowed to edit, there can be more errors and need to spend more time on modifications. Most of the time that software may not match with client specific requirements.

3.4 Reason to choose a web based online system

Key benefit of the web based online system are as follows:

- Accessible anywhere - Unlike a standalone application, web systems can be accessible anytime, anywhere with a computer with an internet connection.

- Accessible for a range of devices - The system can be accessed from Computer/Laptop or even when needed through the phone or tablet. This will give the client extended access to the system.
- Easier installation and maintenance - With the web-based approach installation and maintenance becomes less complicated too. Once a new version or upgrade is installed on the host server all users can access it very easily and no need to update each and every computer.
- Increased Security - Since the application will be installed in one central server, Server administrator can maintain and monitor it.
- Adaptable to increased workload - If an application requires more power to perform tasks only the server hardware needs to be upgraded.

3.5 Design Techniques

Object-oriented analysis and design methods with UML diagrams are going to use as main design tools for the proposed system with following diagrams.

- Use-Case diagrams – it describes who will use the system and how user interact with the system
- Sequence diagrams – it describes how objects interact with each other via messages (sent and receive)
- Class diagrams – it shows object classes as well as relationships.

3.6 Relevant Design Diagrams

3.6.1 High Level Use Case Diagram for the proposed system

Figure 3.1 shows the high level use case diagram of the system.
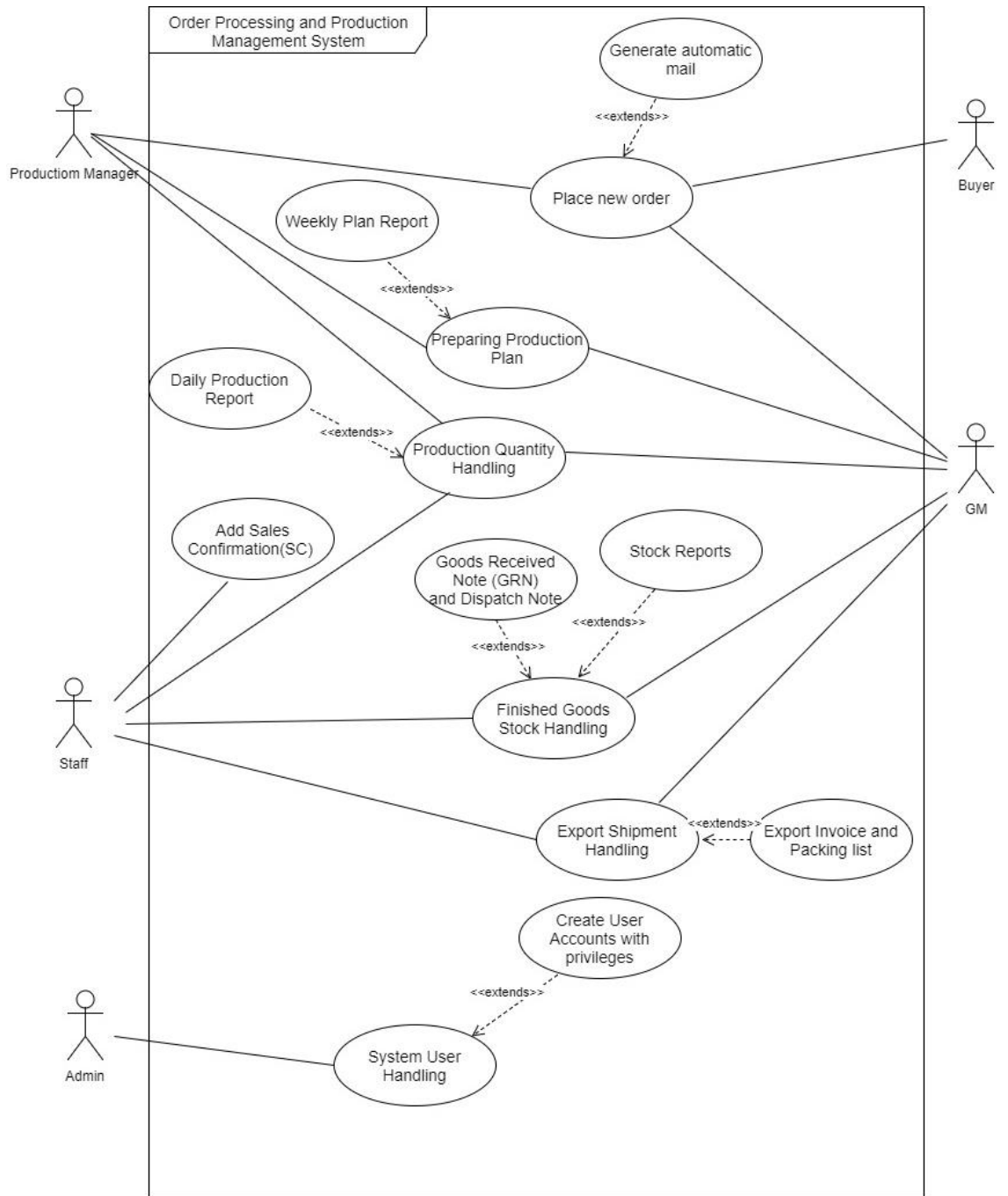
Figure 3.1: High Level Use Case Diagram

3.6.2 Class Diagram for the proposed system

Figure 3.2 shows the Class diagram of the system.
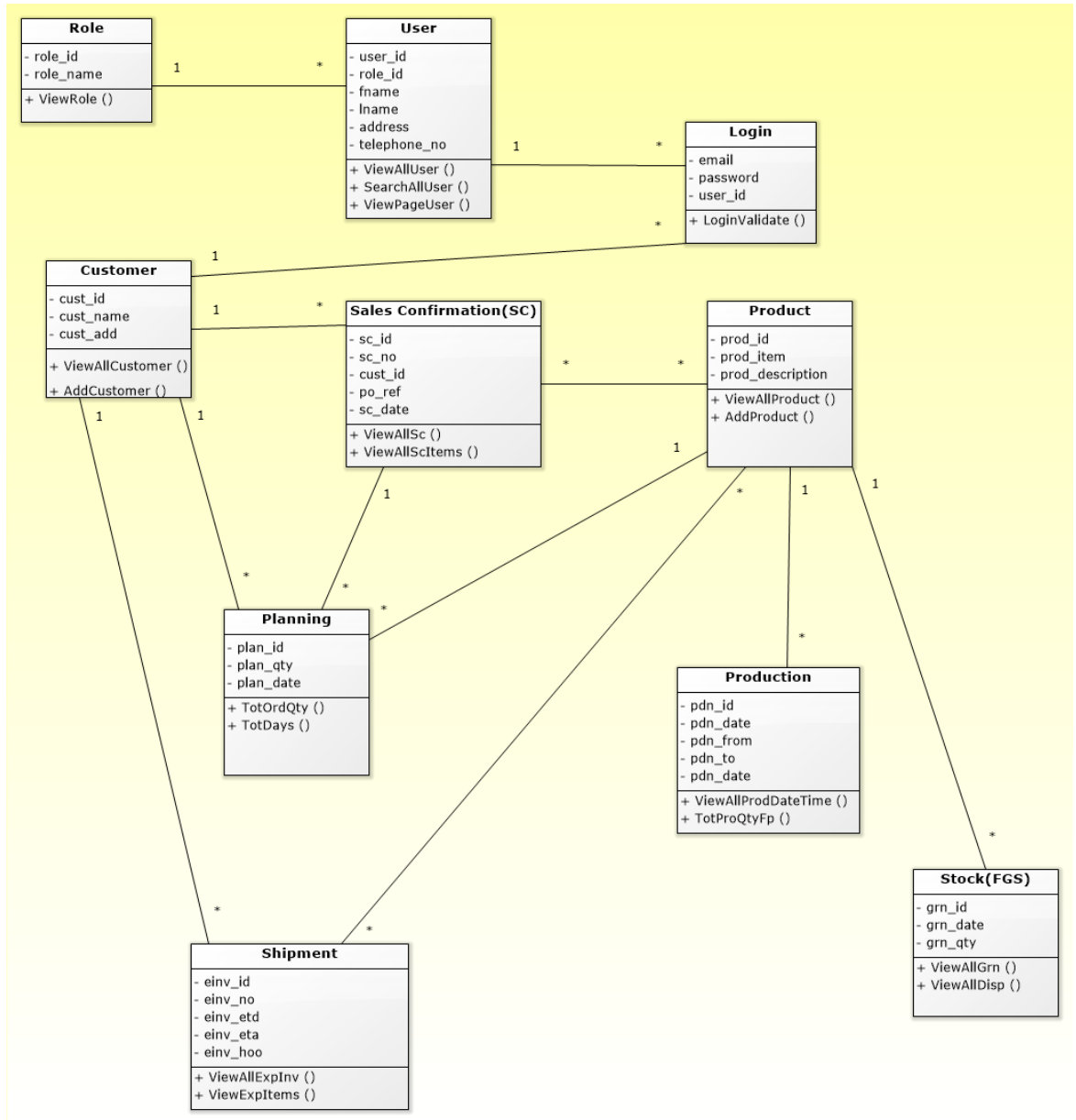
Figure 3.2: Class Diagram of the system

3.6.3 Activity Diagram for create new purchase order(PO)

The activity diagram which relates to create new PO is displayed by Figure 3.3.
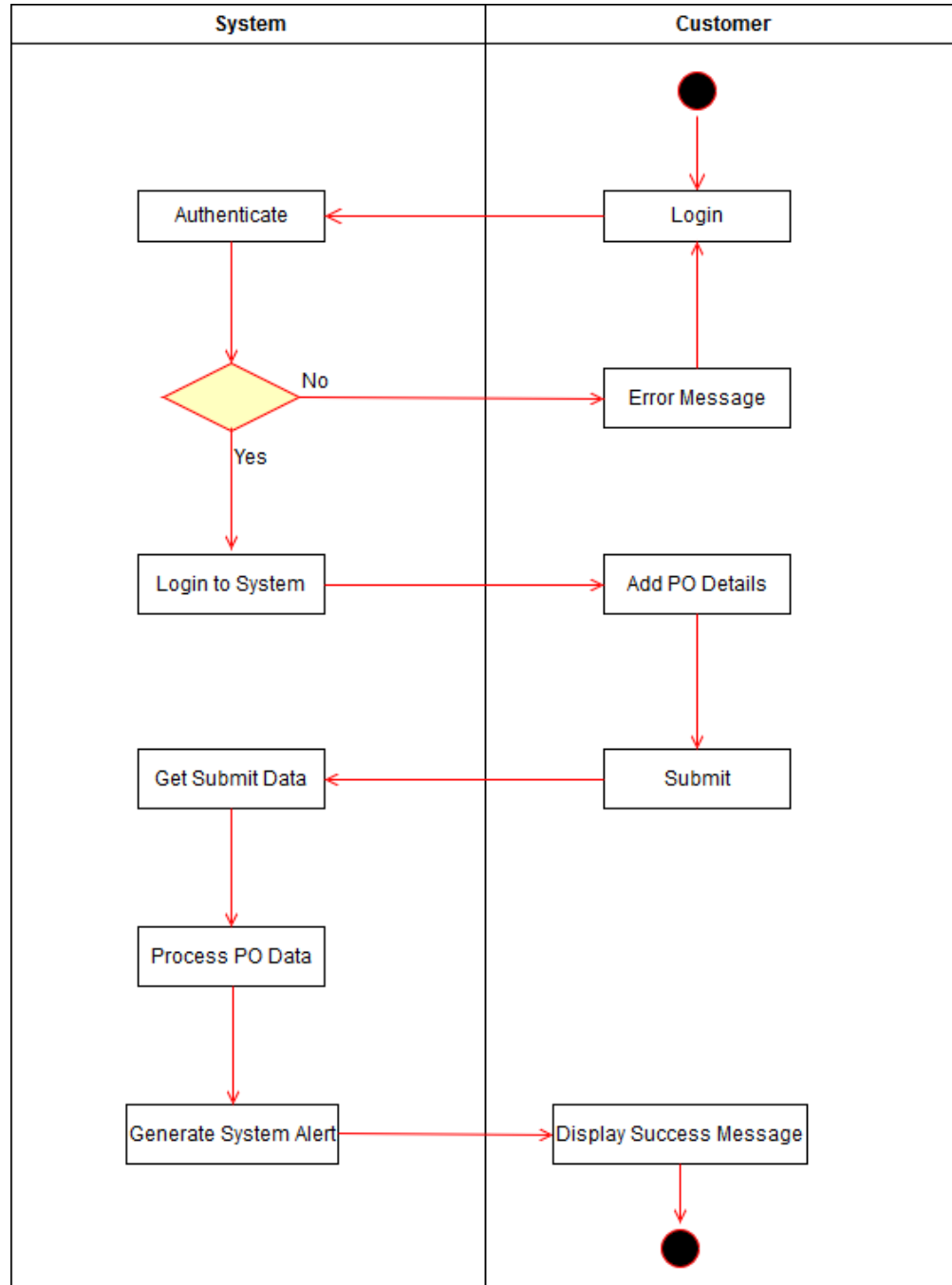
Figure 3.3: Activity Diagram for create new PO

3.6.4 Sequence Diagram for Adding New Sales Confirmation (SC).

The sequence diagram which relates to create new SC is displayed by Figure 3.4.
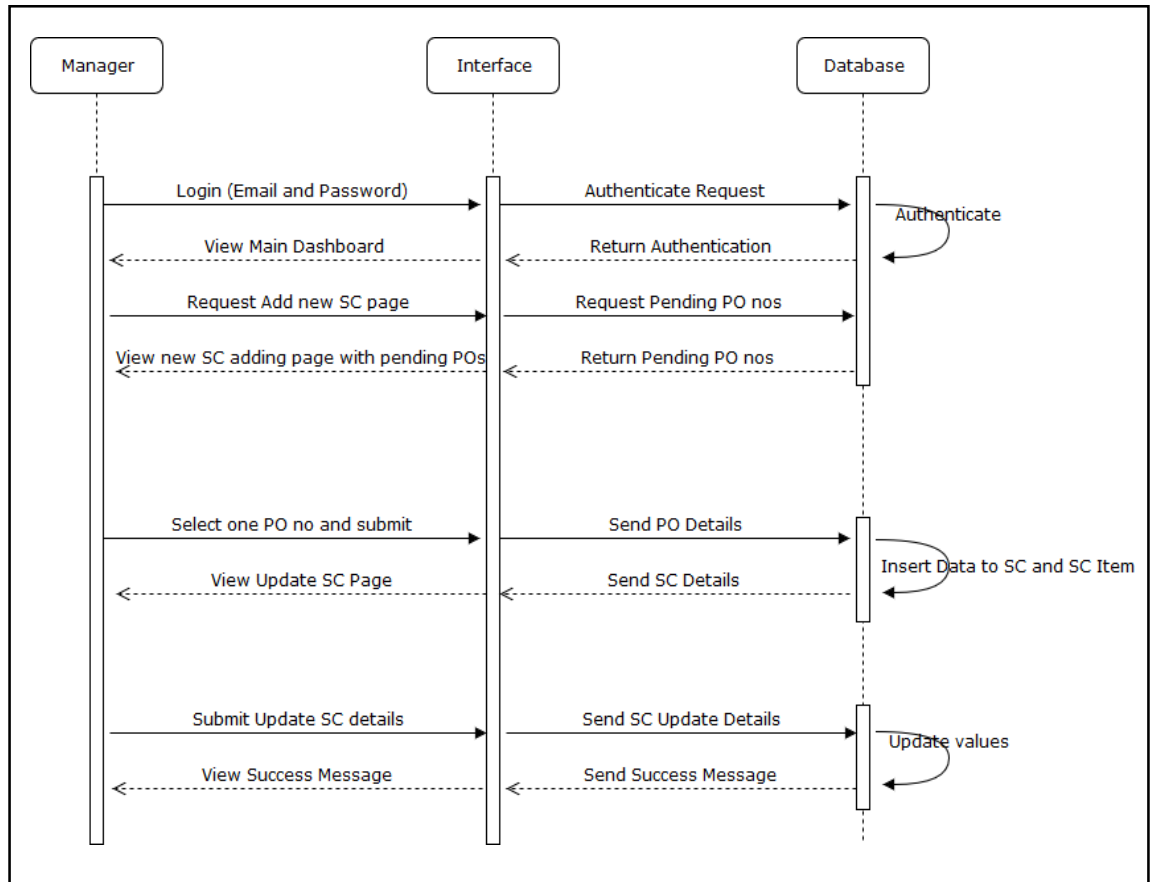
Figure 3.4: Sequence Diagram for Create New SC

3.7 Database Design

Figure 3.3 represents the table structure of the database for proposed system
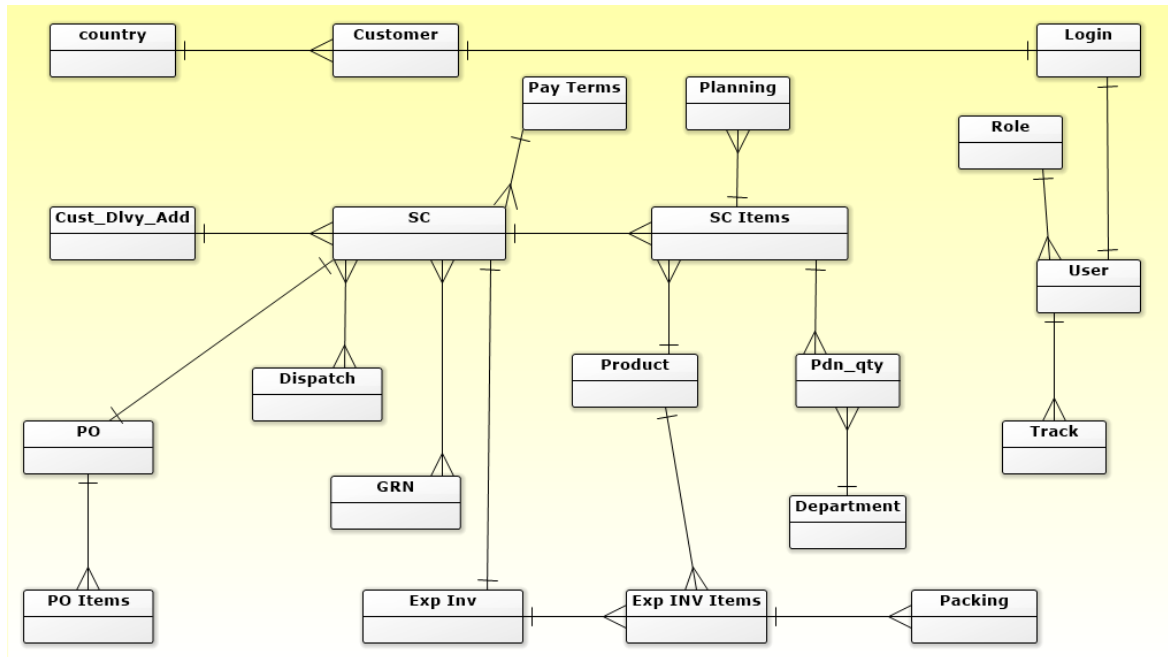
Figure 3.5: Database diagram

3.8 Interface Design

Interface designing part is a critical part of the overall software designing process. Because many user errors can be occurred, if the interface designing is poor. Good interface designing should be matched with the user expectation. That is the reason of criticalness of the user interface designing. When making user interface design decisions, you should take into asses the physical and mental capabilities of the people who use software. Following are the user interface design principles [3]

- User Familiarity
- Consistency
- User guidance
- Minimal surprise

Following are some actions which were taken to ensure the good and user friendly interfaces throughout the system.

- Meaningful color buttons were used in the system (Red color for De-active and Delete) as illustrate on Figure 3.4.

Figure 3.6: Color Buttons

- Meaningful alert boxes were used in the system. (Example: when click delete button it will display alert box as illustrate on Figure 3.5.
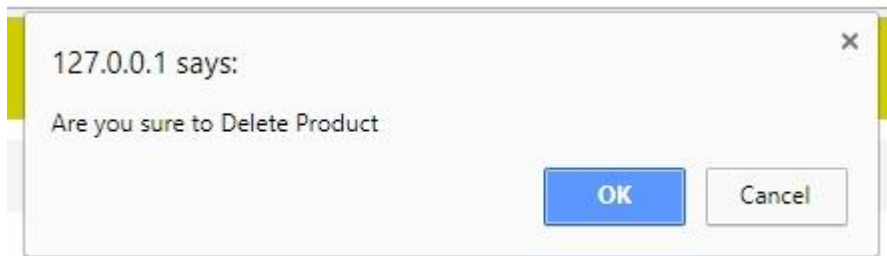
Figure 3.7: Meaningful Alert Box

- Keyboard enter key has used to enter data instead of mouse click – This will increase the effectiveness and speed of data input to the system.
- Structure – The system was designed on module basis. Figure 3.6 illustrates the main dashboard of the system.

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Figure 3.8: Main Dashboard

- Table View - consist of below capabilities,
  - ✓ Search option
  - ✓ Sorting option
  - ✓ Ability to customize number of rows per page
  - ✓ Pagination

Figure 3.7 illustrates the table view of Product list page.

	Item	Description	Unit	Type	Production Speed/Day			
	8-4006-01-1	Door Part	EA	Inventory Assembly	500	View	Update	Delete
	8-4006-01	Hinge PA6	EA	Inventory Assembly	500	View	Update	Delete
	5901-0500-0002	Bridge Clamp	EA	Inventory Assembly	500	View	Update	Delete
	321651	Hinge Insulated Door 95x50 Black	EA	Inventory Assembly	400	View	Update	Delete
	275015-01	3D Inteli Clamp Black	EA	Inventory Assembly	500	View	Update	Delete
	265078-S60-G40	Latching Unit	EA	Inventory Assembly	500	View	Update	Delete

Figure 3.9: Table View

3.8.1 Login Interface

Figure 3.8 represents the login interface of the system.
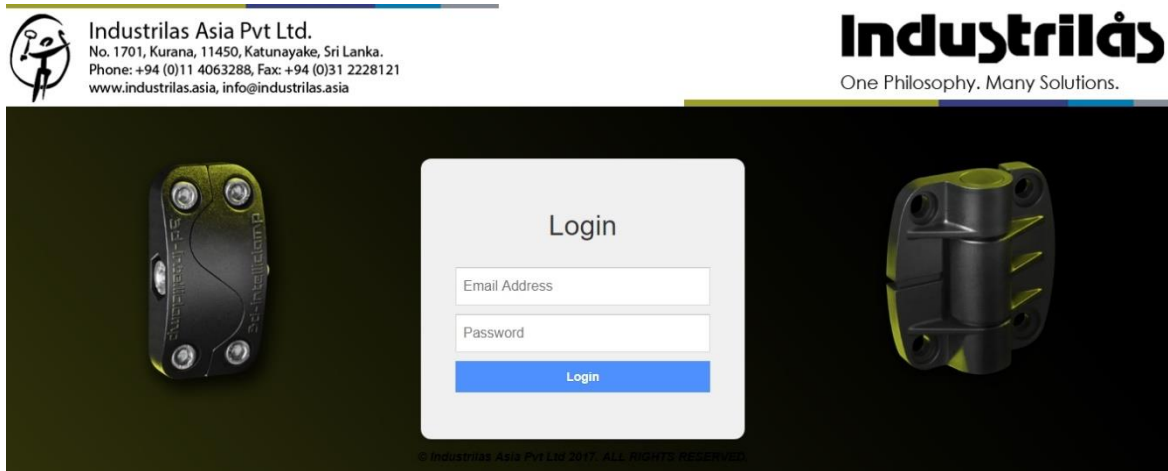
Figure 3.10: Login Interface for the system

3.8.2 User Creation Interface

Figure 3.9 represents the "Add User" interface of the system.
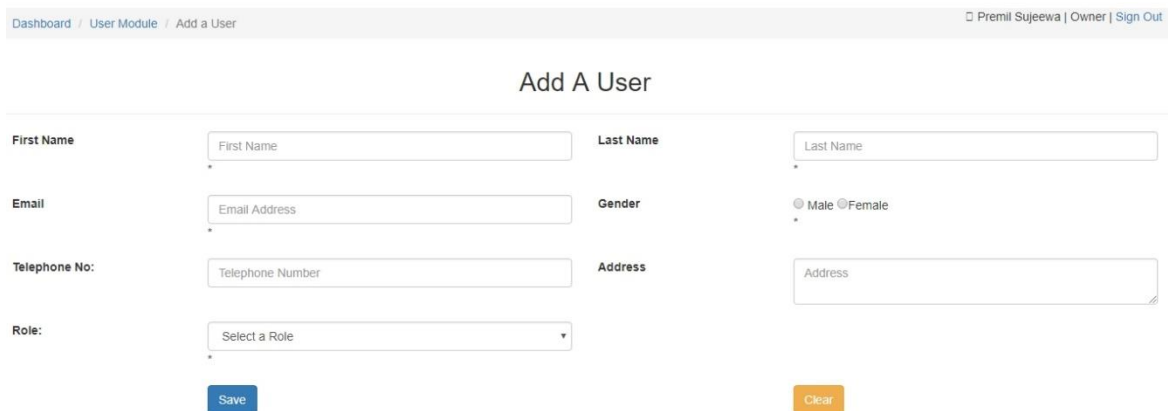
Figure 3.11: Add User

3.8.3 Add Customer Interface

Figure 3.10 represents the "Add Customer" interface of the system.

Figure 3.12: Add Customer

3.8.4 Add New Delivery Address Interface

Figure 3.11 represents the "Add new delivery address" interface of the system.

Figure 3.13: Add Delivery Address

CHAPTER 4 – IMPLEMENTATION

4.1 Introduction

In this phase, detail design is going to be converted into complete information system which can execute. When coding the system, adding comments is very important for future maintenance and improvements. Validations are also very important thing to consider and it is demonstrating that all completed software products comply with all system requirements.

This chapter mainly discusses about the implementation environment, the tools and techniques as well as the reusable components used to implement the system.

4.2 Implementation Environment

This can be divided into two categories as Hardware Environment and Software Environment.

4.2.1 Hardware Environment

- ✓ Intel(R) Core(TM) i5-7200U CPU @ 2.50 GHz
- ✓ 4GB RAM
- ✓ 500GB Hard Disk
- ✓ Printer

4.2.2 Software Environment

- ✓ Microsoft Windows 10 Home
- ✓ PHP Version 7.1.4
- ✓ Apache 2.4.25
- ✓ MySQL Client Version 5.5.20

4.3 System Developed Tools and Technologies

- NetBeans IDE 8.2

  This is free and open source tool and has been used to develop applications quickly and easily with PHP.

- PHP

  This is a server side object oriented scripting language which used when developing the system.

- MySQL

  This is the Database software which used to handle the database of the system.

- HTML

  This is the basic web related language and it helps to keep the system structure clear and conscious.

- JavaScript

  This is a Scripting language and this helps for client side validation and to dynamic the system components.

- Ajax

  Ajax is a JavaScript based technology and it supports updating the system components without refreshing the whole system page.

- CSS

  This is used for the styling of the system.

- JSON

  JSON is syntax for storing and exchanging text information. Much like XML. JSON is smaller than XML and faster and easier to parse.

- JQuery

  It is a JavaScript library and used as a reusable component when developing.

- Software Ideas Modeler

  Diagram designing had done by using this software.

4.4 Re-usable Components

The following Re-usable Components were used in the Online Order Processing System.

- Bootstrap - Bootstrap is the most popular HTML, CSS, and JS framework for developing responsive, mobile first projects on the web [4]. Bootstrap was used to design the user interface.

- JQuery Re-Usable Components – JQuery Data Tables plug-in has been used for Pagination, instant search and multi-column ordering. [5]

- CSS Re-usable Components - Division tag styling code has been used.

4.5 MVC Implementation

MVC Architecture is used for proposed system and it is dividing the application as model–view–controller. In addition, it defines the interactions between them and allowing for efficient code reuse and easy to maintain code.

Figure 4.1 illustrates the interactions within the MVC pattern.
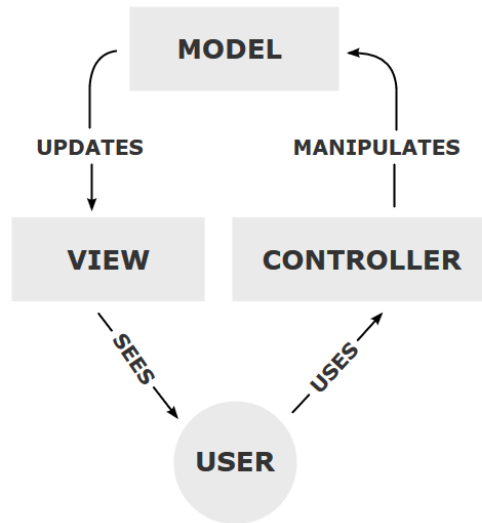
Figure 4.1: Diagram of interactions within the MVC pattern.

- **Model** - The model is the central component of the pattern and stores data that is retrieved according to commands from the controller and displayed in the view. [6]

- **View** - A view generates new output to the user based on changes in the model. [6]

- **Controller** - The controller, accepts input and converts it to commands for the model or view. [6]

Figure 4.2 illustrates the hierarchy of the project solution.
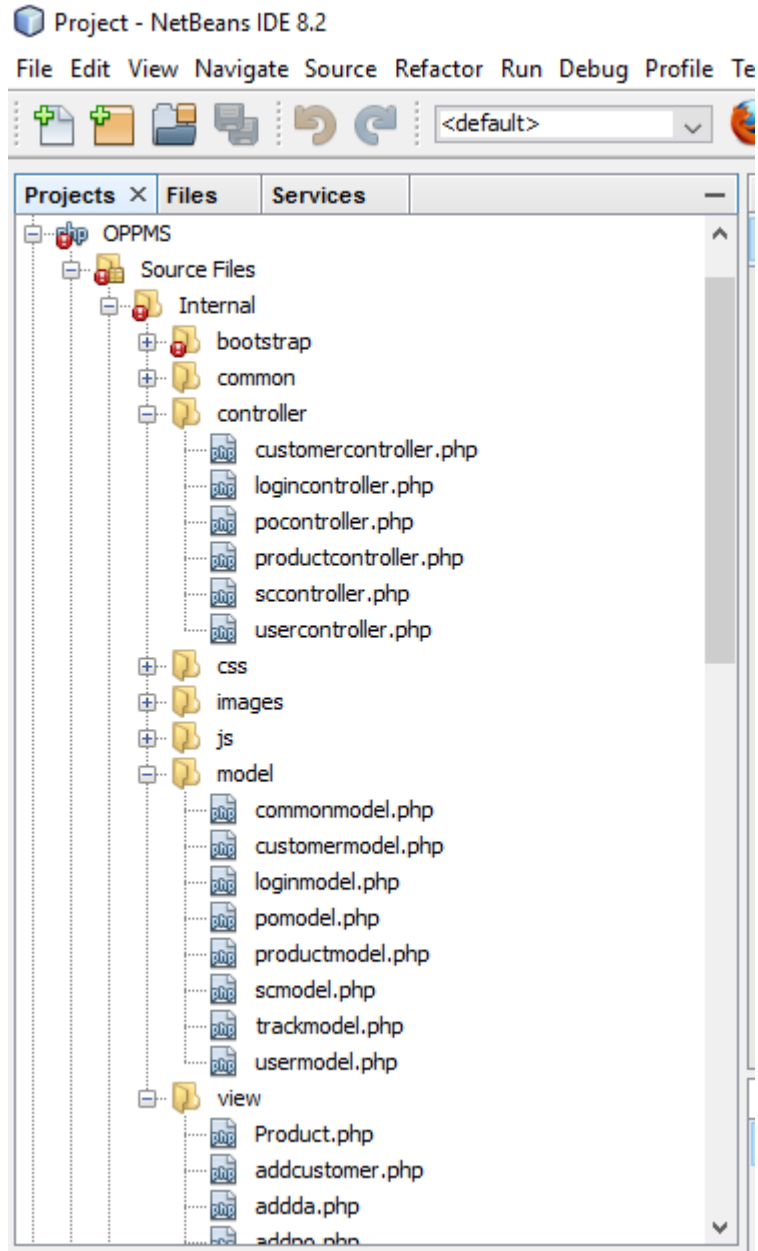
Figure 4.2: MVC Folder Hierarchy

4.6 Major Code Segmentation

The main code modules developed in the system with comments have been mentioned below by briefly describing their functionality.

- Database Connection Page

```php
<?php
// This php Class Makes the Database Connection
class dbconnection
{
    public $host="localhost";
    public $user="root";
    public $password="";
    public $db="oppms";

    // This Function Returns The Database Connection
    public function connection()
    {
    //Connection string
    $con=new mysqli($this->host, $this->user, $this->password, $this->db);
    return $con;
    }
}

?>
```

Systems always deal with databases and to add, edit and delete records, first need to connect to the database. Code segment given above illustrate how the system is connecting to its database.

- Login page with login controller and login model

  ✓ login.php

```php
<?php// When submit it will redirect to logincontroller.php ?>
<form action="../controller/logincontroller.php" method="post">
    <input type="text" id="email" name="email" placeholder="Email Address" />
    <input type="password" id="pass" name="pass" placeholder="Password"/>
    <input type="submit" name="login" value="Login" class="login login-submit"/>
</form>
```

According to the above code, need to input email ID and password and then need to submit the form. Then it will redirect to the logincontroller.php.

✓ logincontroller.php

```php
//to start the session
if(!isset($_SESSION))
{
 session_start();
}
//set default time zone
date_default_timezone_set("Asia/colombo");
```

Above code segment start the session and also set the default time zone.

```php
// Get the Connection Page
include '../common/dbconnection.php';
// Creating a new connection object
$ob=new dbconnection();
$con=$ob->connection();

//Get data from login page
$email = trim($_POST['email']);
$pass= sha1(trim($_POST['pass']));


//connect to the login model page
include '../model/loginmodel.php';
//creating a new login object
$obj=new login();
//execute loginvalidate function on the login class
$result2=$obj->loginvalidate($email, $pass);

$result3=$obj->loginvalidateCustomer($email, $pass);

//is_object - whether the given variable is an object
    if(is_object($result2) && $result2->num_rows==1)
    {
```

According to above code segment gets the database connection and checks whether there is any record which tally with input Email ID and Password. Please refer below

loginmodel.php. If record count is equal to one, then redirect to dashboard according to the user roll; otherwise, redirect to the login page with an error message.

✓ loginmodel.php

```php
<?php

//creating class
class login{
    public function loginvalidate($email,$pass)
    {
        //super globle variable
        $con=$GLOBALS['con'];

        //SQL Query
        $sql="SELECT * FROM login l, user u, role r WHERE l.email='$email' "
                . "AND l.password='$pass' "
                . "AND l.user_id=u.user_id AND u.role_id=r.role_id";

        //execute query
        $result=$con->query($sql);

        return $result;


    }
```

Code segment given below gets the user's IP address, login date and time and user id which needs to be stored in the database. Then pass those data to the track class on the track model.

```php
class track
{
    public function trackin($in,$user_id,$ip)
    {
        $sql="INSERT INTO track(track_in,user_id,ip) "
             . "VALUES ('$in','$user_id','$ip')";
        $con=$GLOBALS['con'];
        $result=$con->query($sql);
        $track_id=$con->insert_id;//last index
        return $track_id;

    }
```

- Validate Inputs when Adding New Users

Addition of users to the system is a main requirement identified at the requirement analysis stage. Code segments given below validate user inputs using Java Script technology and handles user input errors before it is transmitted to the server.

```javascript
$(document).ready(function(){
    $('form').submit(function(){
//Get the User Inputs
var fname=$('#fname').val();
var lname=$('#lname').val();
var user_email=$('#email').val();
//Set Regular Expressions
var email=/^([a-zA-Z0-9_\.\-])+\@(([a-zA-Z0-9\-])+\.)+([a-zA-Z]{2,6})+$/;
var fname2=/^([a-zA-Z\.\-]{2,6})+$/;
        if(fname==""){
            $('#msg').text("Empty First Name");
            $('#fname').focus();
            return false;
        }
        if(!fname.match(fname2)){
          $('#msg').text("First Name-Spaces are not allowed and only allowed a to z and A to Z");
          $('#fname').focus();
          return false;
        }
        if(lname==""){
            $('#msg').text("Empty Last Name");
            $('#lname').focus();
            return false;
        }

        if(!lname.match(fname2)){
          $('#msg').text("Last Name-Spaces are not allowed and only allowed a to z and A to Z").
          $('#lname').focus();
          return false;
        }
```

```javascript
        if(!user_email.match(email)){
            $('#msg').text("Invalid Email");
            $('#email').focus();
            $('#email').select();
            return false;
        }
```

CHAPTER 5 – EVALUATION

5.1 Introduction

Online order processing system was evaluated to ensure that it matches with the project requirement specification and tested according to the set of standards to ensure that the system is error free.

5.2 Software Testing

Software testing is done during the development phase and it is a verification and validation process.

Verification – Verification is the process to make sure the proposed system behaves the way we want it to.

Validation – Validation is the process to make sure the proposed system is built as per customer requirements.

5.3 Techniques of Software Testing

There are two techniques as follows for software testing.

- Black box Testing
  Black box testing is also known as behavioral testing and it is focused on the output generated against any input and execution of the system. It is also called functional testing. This is used for validation.

- White box Testing

  White box testing is also known as structural testing and it takes into account the internal mechanism of a system. It is also called clear box testing and glass box testing. This is used for verification.

5.4 Types of Testing

5.4.1 Unit Testing

Unit testing is the testing of an individual unit or group of program modules together with associated control data. A unit is more commonly an individual function or procedure. Unit testing is often done by the software developers to test that code meets its design and it is producing expected output against given input.

5.4.2 Integration Testing

Integration testing is testing in which individual modules are combined and tested as a group. The purpose of this level of testing is to disclose errors in the interaction between integrated units.

5.4.3 Functional Testing

Functional testing is the software testing process to ensure that system has all the required functionality that's specified within its functional requirements. Functional testing also involves evaluating and comparing each software function with the business requirement specification.

5.4.4 System Testing

The entire system was tested as a whole in an implementation environment to evaluate the system's compliance with the specified requirements.

5.4.5 Acceptance Testing

Acceptance testing is level of software testing where it is often done by the customer to ensure that the delivered product meets the requirements and works as the customer expected.

5.5 Test Plan and Test Cases

A software test plan is a detailed document describing the testing scope, activities and test priority.

Creating test cases are also an important part of the testing procedure and it consists of description of the test case, expected output and status.

Table 5.1 illustrate the high level test plan of the system and please refer Appendix E for other test cases.

Module Name	Function Name	Test Priority
User Module	Add User Details	High
	Update User Details	High
	View User Details	Low
	Login Users	High
	Deactivate User	High
	Confirm to Deactivate User	High
	Activate User	High
	Change Password after 90 days	High
Customer Module	Add Customer Details	High
	Update Customer Details	High
	Delete Customer Details	High
	Confirm deletion of Customer	High
	View Customer Details	Low
	Login Customer	High
	Change Password after 90 days	High
Product Module	Add Product Details	High
	Update Product Details	High
	Delete Product Details	High
	Confirm deletion of Product	High
	View Product Details	Low
	Search Product Details	High
Purchase Order(PO) Module	Add PO Details	High
	Update PO Details	High
	Delete PO Details	High

	Confirm deletion of PO	High
	Print PO Details	Low
	Search PO Details	High
	New PO System Alert	High
Order Module (SC)	Add SC Details	High
	Update SC Details	High
	Delete SC Details	High
	Confirm deletion of SC	High
	Print SC Details	Low
	Search SC Details	High
	Automatically PO status changing to "Confirmed" and block the PO	High
Planning Module	Weekly Production Plan	High
	Monthly Forecast Plan	High
Production Module	Add Daily Production Quantity	High
	Update Production Quantity	High
	Delete Production Quantity	High
	Confirm deletion of Production Quantity	High
FGS Stock Module	Add GRN(Goods Received Note)	High
	Update GRN	High
	Delete GRN	High
	Confirm deletion of GRN	High
	Print GRN	Low
	Add Dispatch Note	High
	Update Dispatch Note	High

	Delete Dispatch Note	High
	Confirm deletion of Dispatch Note	High
	Print Dispatch Note	Low
Shipping Module	Add Export Invoice	High
	Update Export Invoice	High
	Delete Export Invoice	High
	Confirm deletion of Export Invoice	High
	Print Export Invoice	Low
	Add Packing List	High
	Update Packing List	High
	Delete Packing List	High
	Confirm deletion of Packing List	High
	Print Packing List	Low
Track Order Status	Print Order Status details automatically SC No wise	High
Reports	Generate Customer wise sales reports	High
	Generate Product wise sales reports	High
	Generate Daily Production reports	High
	Generate Production Speed Analysis reports	High
	Generate FGS Stock as at report	High
	Generate Monthly Total Export Report	High

Table 5.1: High level test plan

5.6 User Evaluation

User Evaluation is done by the end users to make sure that the Online Order Processing System is running according to the requirement specification. The system was tested by different level of users and minor modifications which were pointed out by them were been fixed. User evaluation questionnaire was given to target population and results has summarized.

Figure 5.1 illustrates the user rating. The scale starts with very good and degrades to very poor.

A	B	C	D	E
Very Good	Good	Average	Poor	Very Poor

Figure 5.1: User rating scale

Figure 5.2 illustrates the user feedback graph. The graph shows that majority of the user provided a positive feedback.

	A	B	C	D	E
■ %	55	38	5	2	0
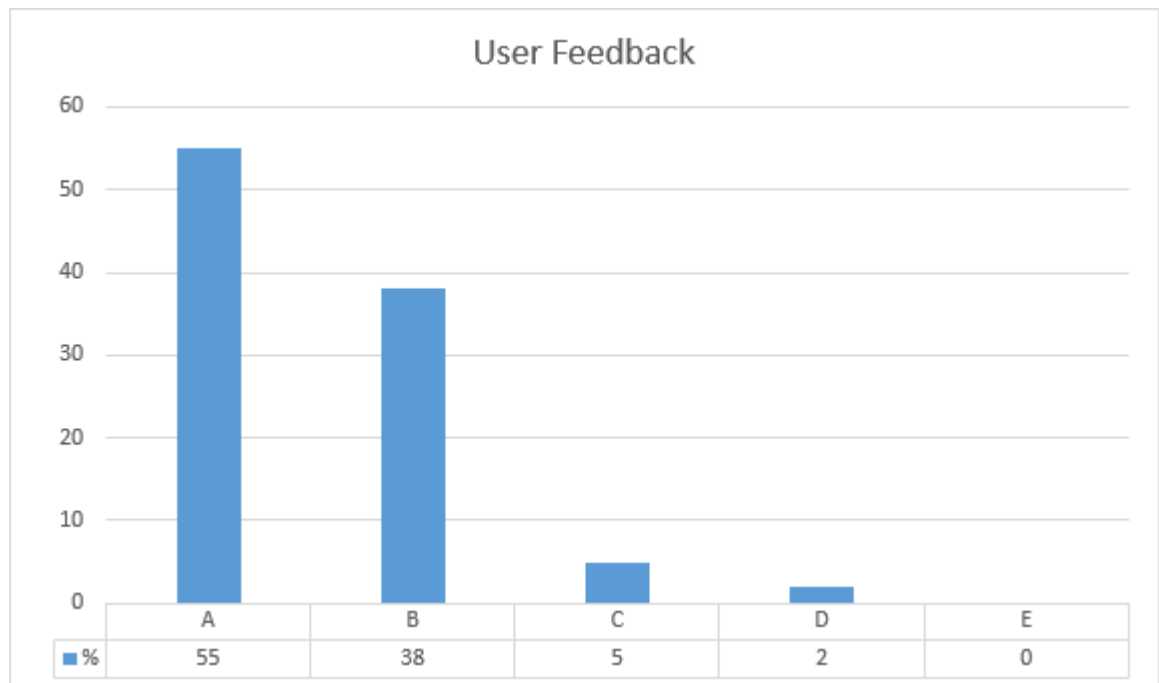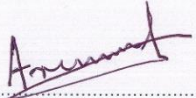
Figure 5.2: User feedback chart

The overall system was tested by IT Manager and Figure 5.2 shows user evaluation questionnaire.

User Evaluation Questionnaire

| User Name | Aruna Fernando |
| Designation | IT Manager |

	Evaluating Item	Very Good	Good	Average	Poor	Very Poor
	Common Items					
1	Overall attractiveness	✓				
2	System Navigation	✓				
3	Response Time		✓			
4	Ease of usage	✓				
5	Ease of learning	✓				
6	Colors and Readability		✓			
	Module wise Items					
1	User accounts creation page		✓			
2	New order creation page	✓				
3	Planning Reports	✓				
4	Daily Production input page	✓				
5	FGS data input pages	✓				
6	Invoice and Packing data input	✓				
7	Order Tracking page			✓		
8	System Reports		✓			

....
User Signature

2017 | 11 | 01
Date

Figure 5.3: User Evaluation Form

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CHAPTER 6 – CONCLUSION

6.1 Introduction

Industrilas Asia is a leading service provider in the field of latching solutions and their main products are different type of Latches, Hinges and Swing Handles. Its Group Headquarter is situated in South Sweden where all operations are being monitored. But still, Industrilas Asia main operations such as order management, planning, warehouse and logistics are being done by using spread sheet applications. This resulted lot of manual errors, poor planning and so many negative feedbacks from customers.

Introducing the Online Order Processing system for Industrilas Asia, as a globally recognize manufacturing company, now they can enhance their business easily.

6.2 Critical Assessment of Project

- The system facilitates online order placement from customer login system with automatic system alert. It greatly increases the efficiency of the Order management.

- Automatic Forecast Plan for future months and weekly production plan which are generating from the system, it reduces the time and effort being spent on creating a production plan manually.

- The system is able to keep master records of Users, Customers and Products which could increase the data consistency.

- Finished goods stock management system also provides valuable information that helps decision making more efficient and effective.

- The system facilitates systematic export invoice and packing document management. It greatly reduces the time and effort being spent on creating those

documents using a spreadsheet application. Shipping historical data also can search easily.

- Customers were much appreciated and happy about new Online Order Status Tracking system.

- Report module provides additional information for management to take decisions in advance or on time.

6.3 Lessons Learned

This BIT project was a great opportunity for me to get more experience while working practically throughout the complete software development life cycle. Following are some of the lessons learned.

- Main lesson learned - Time management to achieved deadlines

- Programming knowledge improved high level. Because always tried to search new codes online and tried to find solutions online for coding related errors.

- Learned lot of new technologies and tools (Designing tool, MVC, Bootstrap, AJAX, SQL etc.) which are very useful for the future enhancement of the system.

- Learned to improve performance with proper data base normalization and table indexing.

- Skills were gained while desiging interactive reports according to the client requirements.

- An experience of working with a client – Great help for my future carrier.

6.4 Future Work

This proposed Online Order Processing System was developed within the limited time and scope. Future enhancements of the system are as follows.

- Integration of Import module with raw material inventory management
- Integration of payroll system
- Integration of Bar code system for finished goods stock.
- Order wise Profit/Lost calculation
- Improving reports with Graphs
- Integration of export shipping other payments

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Appendix A – System Documentation

This document consists of guidelines which need to be followed when deploying the Online Order Processing System. When installing the system this document can be followed step by step.

Hardware Requirements

Table A.1 illustrate the hardware requirements of the system.

Hardware	Minimum Requirements
Processor	Intel(R) Core(TM) i5, 2.50 GHz
Memory	4 GB
Hard Disk	500 GB
Display	1024*768 Resolution Monitor
Printer	Inkjet Printer or LaserJet Printer
Internet	ADSL Connection (Minimum Speed 512Kbps)

Table A.1: Hardware Requirements

Software Requirements

Table A.2 illustrate the software requirements of the system.

Software	Minimum Requirements
Operating System	Windows 7/Windows 8/Windows 10 O/S
XAMPP	XAMPP Version (7.1.4) or Separate Installation of Apache 2.4.25 / MySQL 5.7 / PHP 7.1.14 / phpMyAdmin 4.7.0
Web Browser	Google chrome (Version 61.0.3163.100), Firefox(Version 56.0.1) Web browser
Image Editor	Adobe Photoshop CC (Need for future Developments)
Code Editor	NetBeans IDE 8.2(Need for future Developments)
PDF Converter	Foxit Reader PDF Plugin or similar PDF converter

Table A.2: Software Requirements

Step One

Installing XAMPP

- Download and install XAMPP for Windows (refer Table A.2 for the Minimum Version) from http://www.apachefriends.org. according to Figure A.1. Give installation path to C:\xampp of the computer.

Figure A.1: Apache Friends Website

Installing Web Browsers

- Install Browsers (Refer Table A.2 for the Version and Recommended Browsers).

Step Two

Files Extraction

- Open the CD and copy the OPPMS folder and paste it to the directory path "C:\xampp\htdocs"

Step Three

Database Installation

- Open the web browser and type the URL http://localhost/phpmyadmin/ and enter Username and Password (if you set username and password).
- Create an empty database by providing the name as "oppms" and navigate to the "Import" tab and click "Browse" button. Then browse the CD and select the "oppms.sql" file by opening Database folder.
- Then Press "GO" button located at the bottom of the page.

Figure A.2 illustrate how to install the database.

Figure A.2: Database Installation
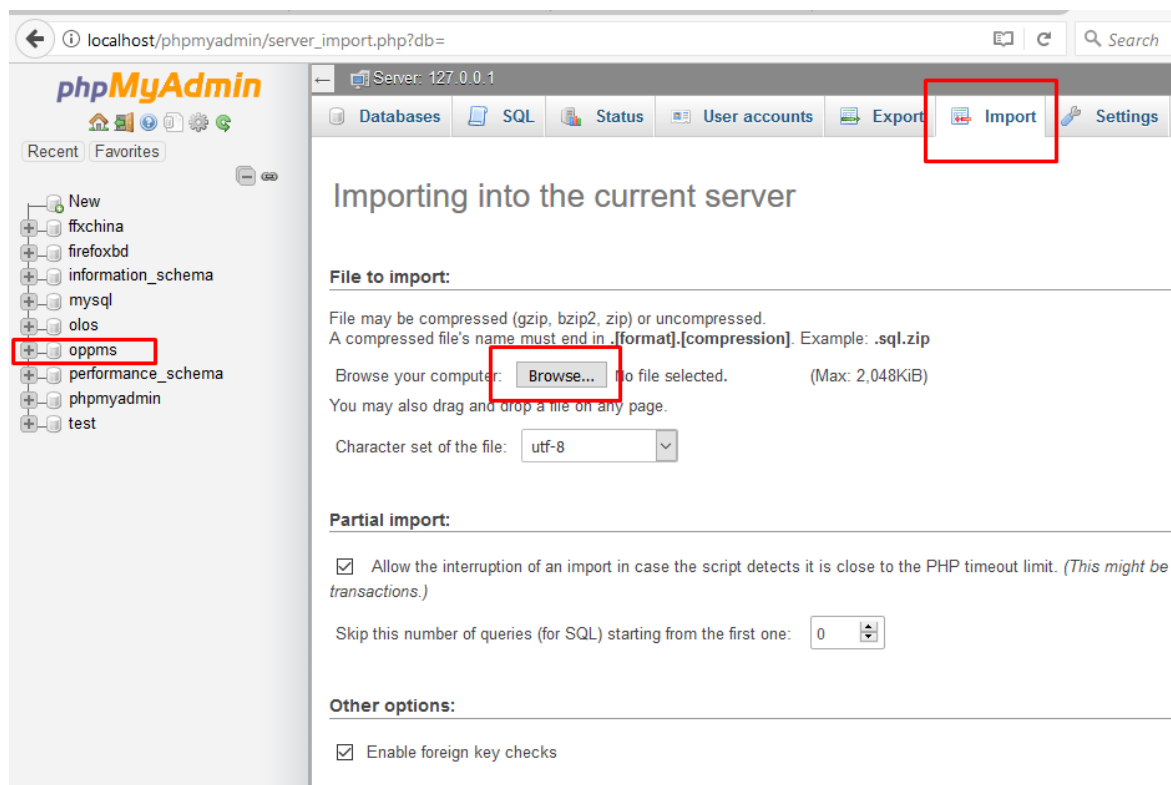
Final Step (Launching System)

- Verify the XAMPP is running, go to the "C:\xampp\" and open the control panel and verify whether Apache, PHP, MySQL is running. (Figure A.3 illustrate the Apache Status)
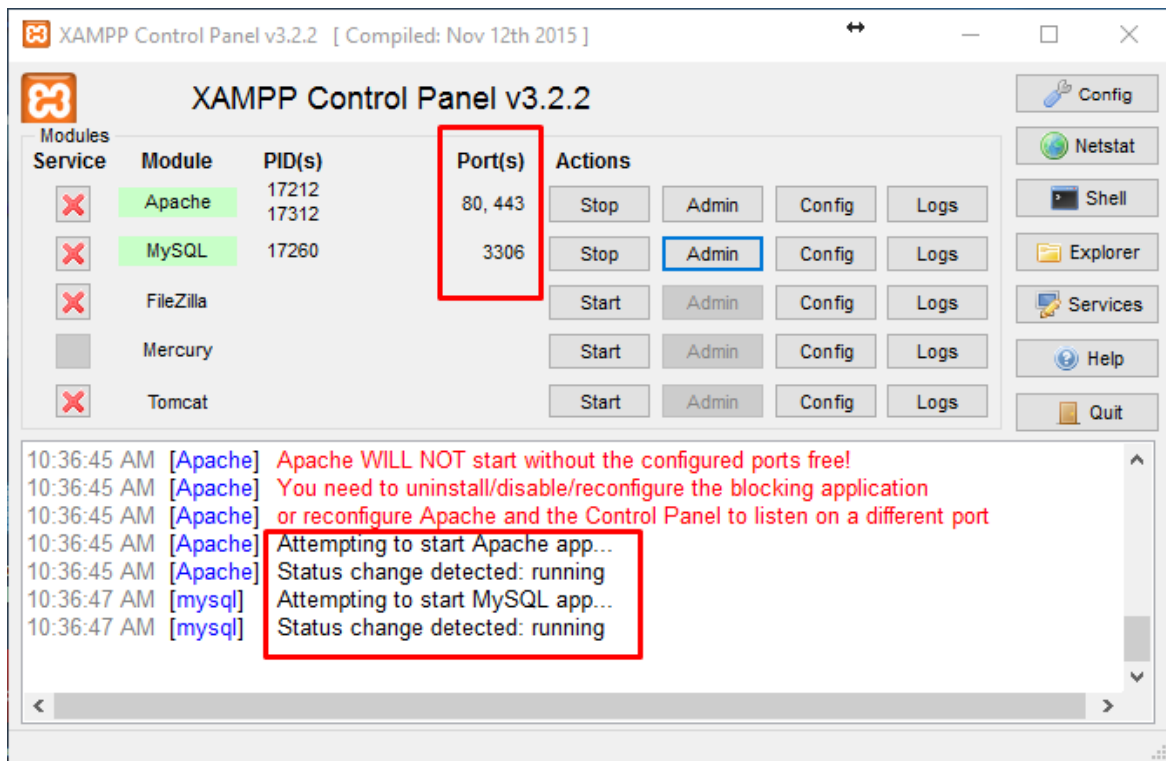
Figure A.3: Apache Status

- Open the installed web browser and type the URL http://localhost/OPPMS or http://127.0.0.1/OPPMS/ and press "Enter" button to access the system.

Appendix B - Design Documentation

Use case diagrams and description

- Figure B.1 illustrate the use case diagram of the Place New Order(PO).
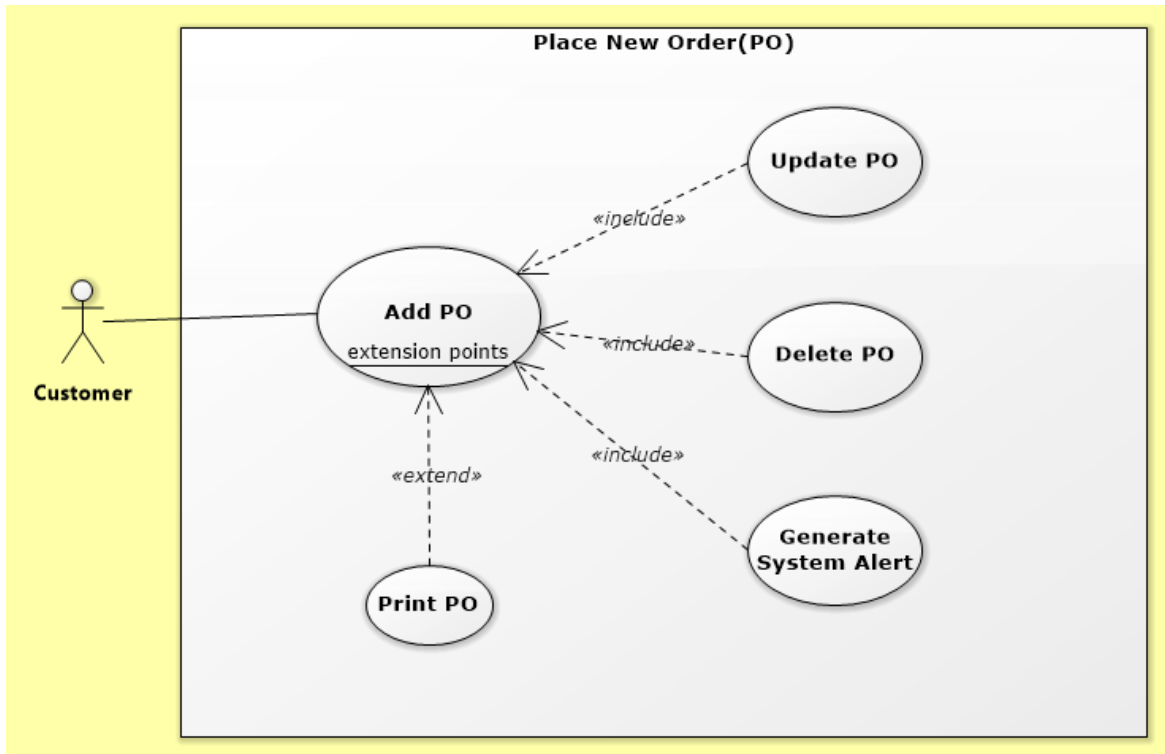
Figure B.1: Use case diagram of the Place New Order(PO)

Table B.1 illustrate the use case description of Add PO.

Use case name	Add PO
Actor	Customer
Description	Adding new PO to the system
Pre-conditions	- Customer should have access to the system. - Product records, Delivery address records should have maintained in the system
Flow Of Events	- Customer logs into the system. - Click "Create PO" on the dashboard page.

	• Go to "Create A PO" page and input main data (PO No, Delivery Date, Delivery address etc...) • Then go to Item page and add required quantities with product details
Post Conditions	Automatically system alert will be generated.

Table B.1: Use case description of Add PO

• Figure B.2 illustrate the use case diagram of the Sales Confirmation(SC).
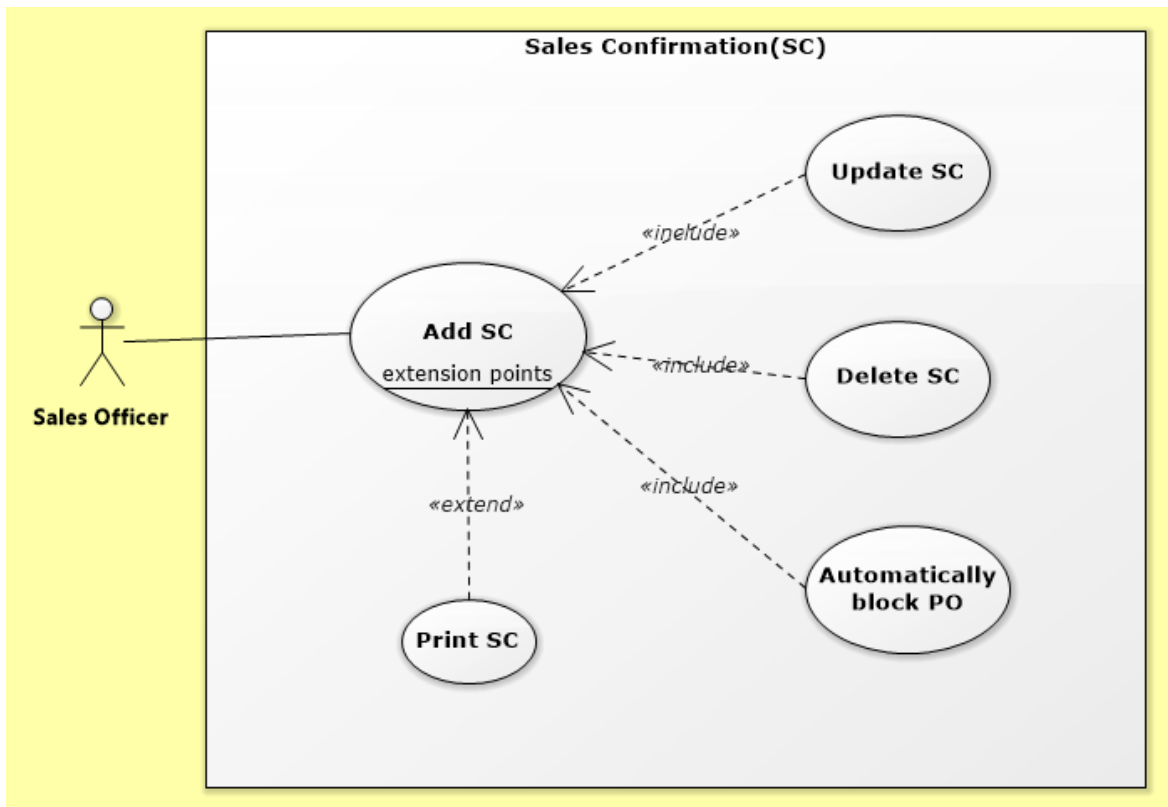

Figure B.2: Use case diagram of the Sales Confirmation(SC)

Table B.2 illustrate the use case description of Add SC.

Use case name	Add SC
Actor	Sales Officer
Description	Adding new SC to the system
Pre-conditions	• Sales Officer should have access to the system. • PO records should have maintained in the system. • "New PO" system alert displayed automatically.
Flow Of Events	• Sales Officer logs into the system. • Click "Order Module" on the dashboard page. • Go to "Add New SC" page and it will display only pending POs on the drop down list • Select the relevant PO no and submit. • Then most of the main data and item data will add automatically from PO to SC. • Add additional data (Pay Term, Transport Mode, Item Price etc..) and save.
Post Conditions	Automatically PO (which related to above SC) will be blocked and will not allow to update or delete from customer side.

Table B.2: Use case description of Add SC

- Figure B.3 illustrate the use case diagram of the User Module.
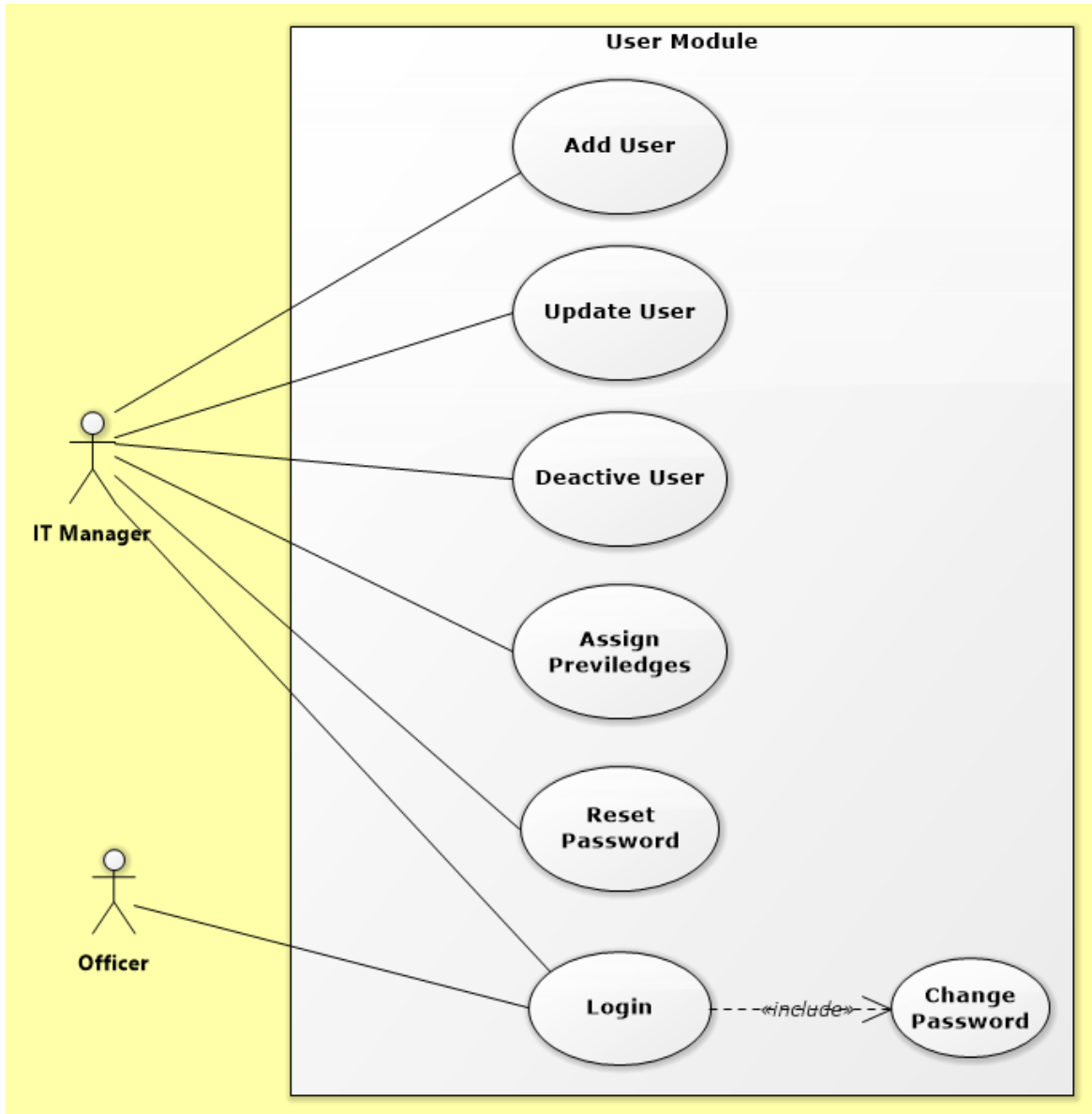
Figure B.3: Use case diagram of the User Module

Table B.3 illustrate the use case description of Add User.

Use case name	Add User
Actor	IT Manager
Description	IT Manager create a new user
Pre-conditions	IT Manager should have access to the system.

Flow Of Events	• IT Manager logs into the system. • Click "User Module" on the dashboard page. • Go to "Add User" page and input user role and input other user information and click save.
Post Conditions	The data are saved in the database.

Table B.3: Use case description of Add User

- Figure B.4 illustrate the use case diagram of the Report Module.
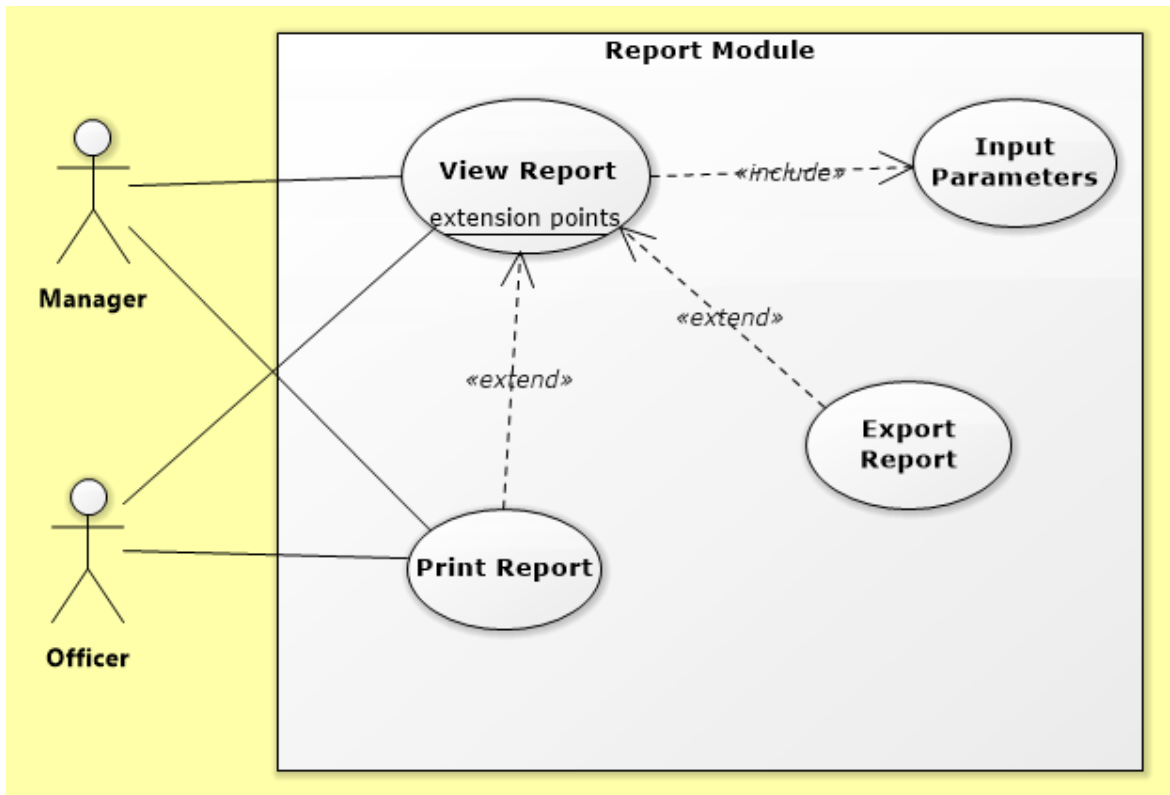
Figure B.4: Use case diagram of the Report Module

Appendix C - User Documentation

- Login form

Open the web browser and type the URL http://localhost/OPPMS and it can find the login page. Following Figure C.1 shows user login form which allows all levels of users to log into the system. When a user tries to log into the system check whether this email id and password are valid or not otherwise system display error message. And at the same time, it will check last password change date, if the password is older than three months automatically redirect to change password page which illustrates on Figure C.2.

Figure C.1: Login Form

Figure C.2: Change Password

- Dashboard

After successfully login dashboard page will display as follows which illustrate on Figure C.3.
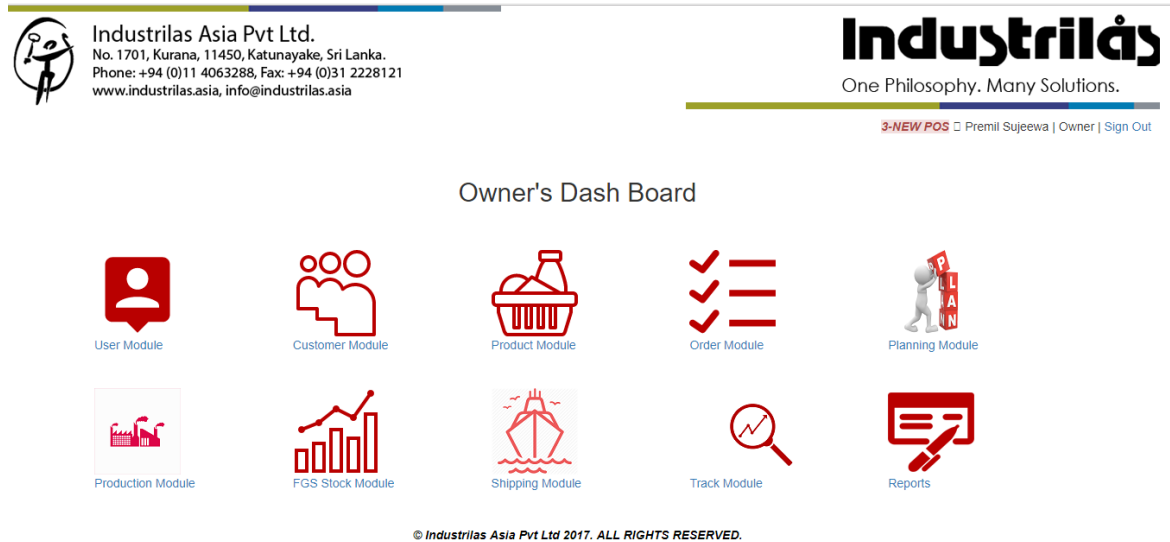
Figure C.3: Dashboard

- Customer Dashboard

Customers also can login to the system using same login form (Above Figure C.1) and check whether their email id and password are valid or not otherwise system display error message. And at the same time, it will check last password change date, if the password is older than three months automatically redirect to change password page which same as Figure C.2.

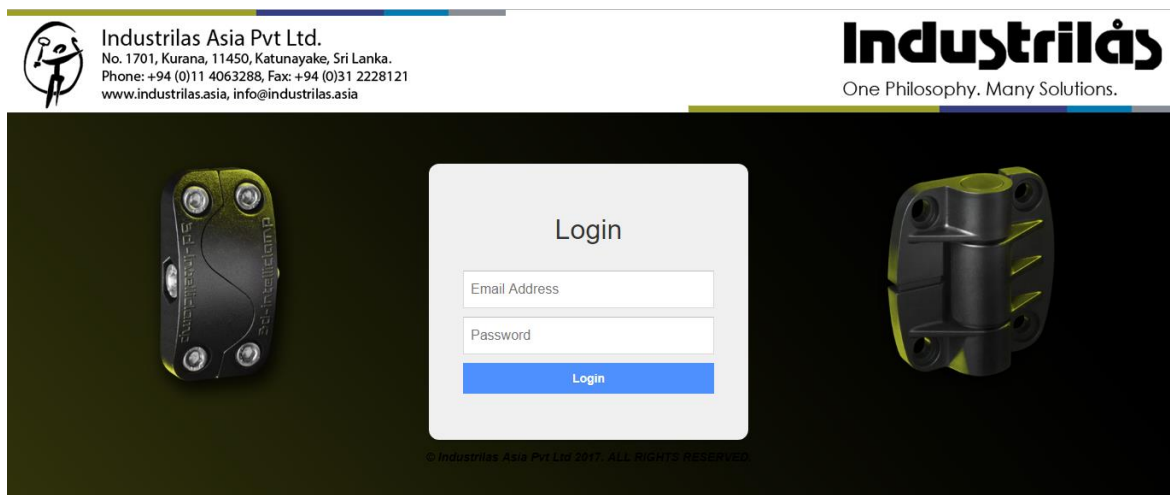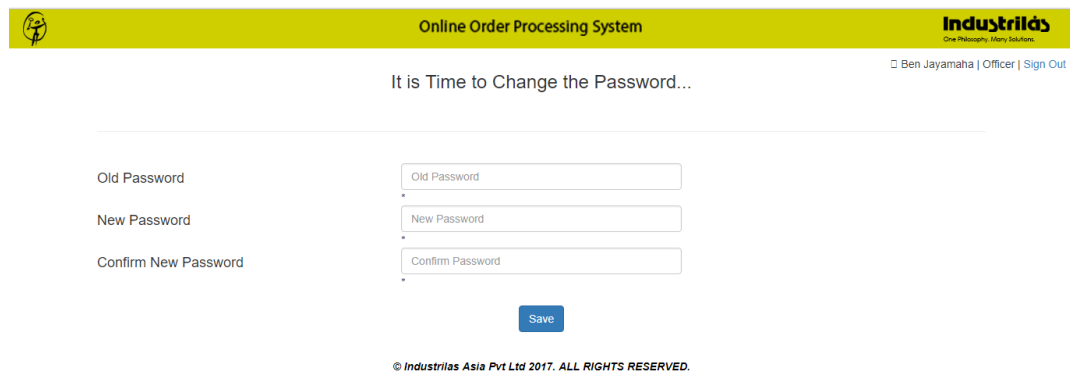Dashboard of the successful login Customers, illustrate on below Figure C.4.

Figure C.4: Customer Dashboard

- Purchase Order

Customers will login to the system and then they can create their purchase orders online by clicking "Purchase Order" and at the same window they can View/Search previous POs as illustrate on Figure C.5.

Figure C.5: PO List Page

Above numbers of the figure are described as follows.

1 - Create a PO – To create a new PO

2 - Items – To add new items to the PO

3 - Confirmed – After SC has been crated, PO will be confirmed automatically and system will not allow to update or delete from the customer side.

4 - Search – Can search any data

To add a new PO, click "Create a PO" button (Refer Figure C.5). Then the below page will be open (Figure C.6) and then fill the form with valid data, and Click "Add".

Create A PO

PO Ref	PO Reference *	Attn	Attention
Date	11/06/2017 *	Dlvy Add Name	Select a Dlvy Add Name ▾ *
Dlvy Date	mm/dd/yyyy	Currency	Please Select ▾ *
Remarks	Remarks		

Add

Figure C.6: Create PO Page

To edit a PO, click "Update" button on relevant record (Refer Figure C.5). Then change the necessary field and click "Update" button.

- Add PO Items

First, click "Items" (Refer Figure C.5) on the PO list page and it will open Item list page as illustrate on Figure C.7.

Online Order Processing System — **Industrilás** One Philosophy. Many Solutions.

ABC/XYZ/6/2017- Items

Add New Item

Show 10 ▾ entries   Search:

Item	Description	Type	Unit	QTY	Unit Price		
263079-S60-G40	Door Part	Inventory Assembly	EA	200	0	Update	Delete
265078-303-1	Hinge PA6	Inventory Assembly	EA	450	0	Update	Delete

Showing 1 to 2 of 2 entries   Previous **1** Next

Figure C.7: Item List Page

To add a new PO Item, click "Add New Item" button. Then the below page will be open as Figure C.8 and then fill the form with valid data, and Click "Add".

Figure C.8: Add PO Item

To update Item data click "Update" button on the item list page as Figure C.7 and Figure C.9 illustrate the update item page.

Figure C.9: Update PO Item Page

- Automatic System Alert (Main Dashboard)

Above PO has been created from customer login system and when login to the main system, automatic system alert message as illustrate on Figure C.10 which will display "Total no of new POs" of different customers. (Open POs)

Figure C.10: Automatic System Alert

- Sales Confirmation (SC) – (Main Dashboard →Order Module)

Figure C.11 illustrate the Sales Confirmation list page.
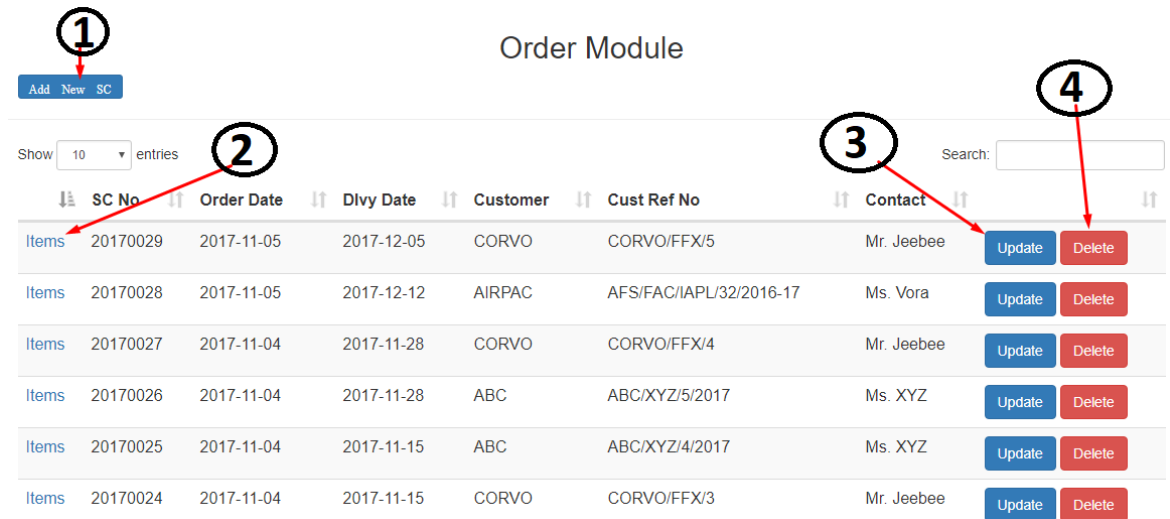
Figure C.11: SC List Page

1 – To add New SC

2 – To Add/Update items

3, 4 – To Update, Delete SC

To add a new SC, click "Add New SC" button (Refer Figure C.11). Then the below page will be open as Figure C.12 and from the drop down list (will display only open POs) select one PO and click "Save"

Figure C.12: Add New SC

Then automatically PO data will be loaded to SC and redirect to SC update page which illustrates on Figure C.13. SC No will be generating auto and PO items also adding automatically to SC Items with the option to update. Further customer side PO will be blocked automatically and not allow to update or delete.

Figure C.13: SC Update Page

Then change the necessary field and click "Update" button.

- Planning Module(Main Dashboard➔Planning Module)

Figure C.14 illustrate the Planning Module page.

Figure C.14: Planning Module Page

- Forecast Planning – Next Month

Click "Next Month" link under Forecast Planning (Refer Figure C.14) and it will display forecast planning details as illustrate on Figure C.15.

Forecast Planning

Dlvy From	Dlvy To	Tot Ord Qty	Tot Prod Days	Bal Days
2017-12-01	2017-12-31	7675	14.8	6.2

Show 10 ▾ entries   Search:

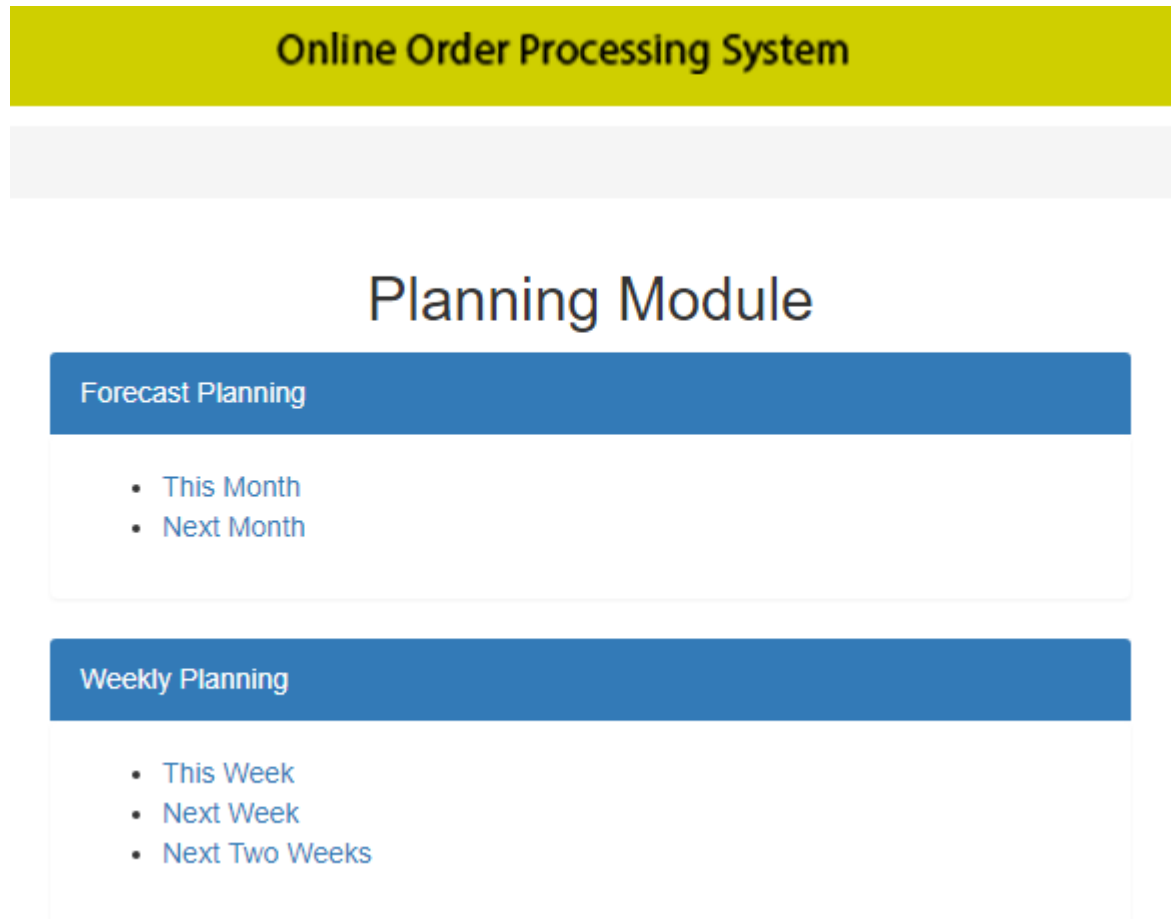| SC #	Cust	Cust Ref	Dlvy Dt	Tot Ord Qty	Tot Hours	Req Prod Days
20170013	ABC	ABC/XYZ/2/2017	2017-12-05	3175	50.8	6.4
20170029	CORVO	CORVO/FFX/5	2017-12-05	2000	27.4	3.4
20170028	AIRPAC	AFS/FAC/IAPL/32/2016-17	2017-12-12	1000	16.0	2.0
20170016	CORVO	CORVO/FFX/2	2017-12-15	1500	24.0	3.0

Showing 1 to 4 of 4 entries   Previous 1 Next

Figure C.15: Forecast Planning for Next Month

- Weekly Planning – Next week

Click "Next Week" link under Weekly Planning (Refer Figure C.14) and it will display weekly planning details as illustrate on Figure C.16.

Weekly Planning

Dlvy From	Dlvy To	Tot Ord Qty	Tot Prod Days	Bal Days
2017-11-13	2017-11-19	12200	26.4	-21.4

Show 10 ▾ entries   Search:

SC #	Cust	Plan Dt	Item	Des	Tot Ord Qty	Tot Hours	Req Prod Days	
20170014	AIRPAC	2017-11-14	8-4006-01-1	Door Part	900	14.4	1.8	Update
20170014	AIRPAC	2017-11-14	265078-303-1	Hinge AAA1	500	8.0	1.0	Update
20170014	AIRPAC	2017-11-14	8-4006-01	Hinge PA6	3000	48.0	6.0	Update
20170024	CORVO	2017-11-15	263079-S50-G40	Door Part	500	8.0	1.0	Update
20170011	AIRPAC	2017-11-15	265078-S60-G40	HANDLE PIN	500	8.0	1.0	Update
20170024	CORVO	2017-11-15	263079-S60-G40	Hinge PA6	800	12.8	1.6	Update

Figure C.16: Next week Planning

Required total no of production days will calculate automatically according to the production speed of items and can change item wise plan production dates (Click "Update") accordingly.

- Add Production (Dashboard →Production Module → Production Input)

Figure C.17 illustrate the department wise production summary page.

Department Wise Production Summary

SC No	Item	Description	Ord Qty
20170014	8-4006-01	Hinge PA6	3000

Add   Production

Show 10 ▼ entries   Search:

Department	Produced QTY	Bal Qty	
Final Packing	650	2350	View Details
Main Assembly	700	2300	View Details
Sub Assembly1	700	2300	View Details
Sub Assembly2	700	2300	View Details

Figure C.17: Production Summary

To add production details, click "Add Production" button and Figure C.18 illustrate the add production page.

Add Daily Production

SC No	Item	Description	Ord Qty
20170014	8-4006-01	Hinge PA6	3000

Date   11/06/2017
                              *
Department   Please Select   ▼
                              *
From(Start Time)   --:-- --
                              *
To(End Time)   --:-- --
                              *
Produced QTY   Produced Quantity
                              *

Save   Clear

Figure C.18: Add Production Page

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To view production details department wise, click "View Details" button and Figure C.19 illustrate the view page.

Figure C.19: View Production Details

- Finished goods store(FGS) – Goods received note(GRN)(Dashboard→FGS Stock Module→GRN)

Figure C.20 illustrate the Product wise GRN details which related to one order.

Figure C.20: GRN Details

To add new GRN, click "Add a GRN" button and Figure C.21 illustrate the add GRN page.

Figure C.21: Add New GRN

- Export Invoice List (Dashboard→Shipping→Export INV)

Figure C.22 illustrate the Export Invoice list page as follows.

Figure C.22: Export Invoice List

1 – To add packing list remarks

2 – To add export invoice items

3 – To print an invoice

4 – To print a packing list

- Export Packing Details (Dashboard→Shipping→INV→Items→Packing)

Figure C.23 illustrate the Export Invoice packing details page as follows.

Figure C.23: Packing Details

1 – To add packing details cartoon wise

2 – If the carton quantity and size same, then can repeat it and can add new carton automatically.

- Report Module (Dashboard→Reports)

Figure C.24 illustrate the Reports Module main page as follows.

Online Order Processing System

Report Module

Order Module

- Sales Report By Order Date/Customer/Sales Rep/Product

Planning Module

- Forecast Planning By Delivery Date/Customer

Production Module

- Daily Production Report - Target vs Actual

FGS Module

- FGS Stock as at Today
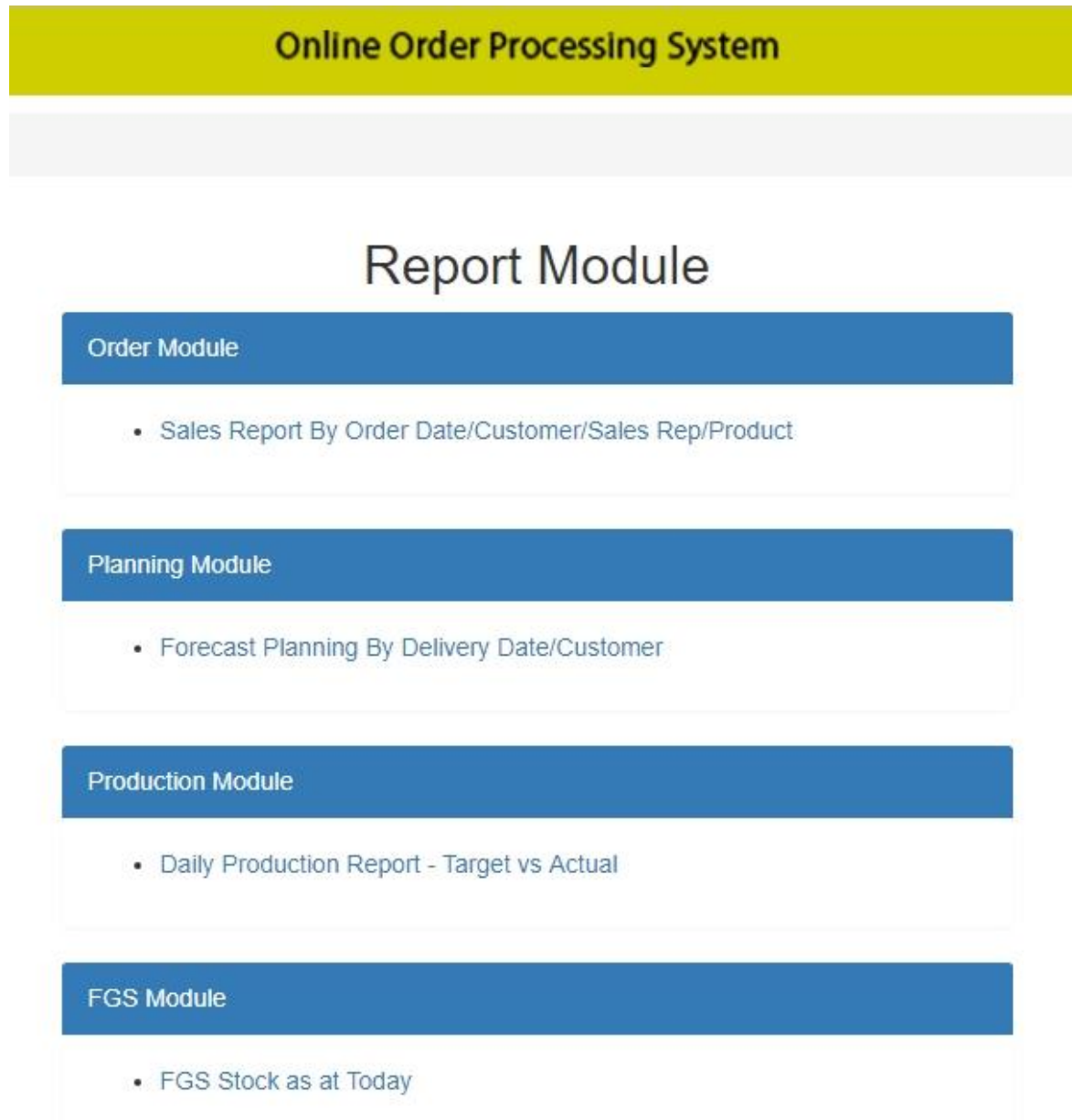
Figure C.24: Reports

Appendix D - Management Reports

Sales Confirmation (SC) Reports

Figure D.1 illustrates the SC search criteria and can apply different combinations at the same time.

Figure D.1: SC Search Criteria

Figure D.2 illustrate the SC Reports which was search by SC Date from 2017-11-01 to 2017-11-30 and total sales confirmations which was done by S. N. Pandey (Sales Representative).

Industrilas Asia Pvt Ltd
Sales Confirmation Report

SC Date: From 2017-11-01 To 2017-11-30 Sales Rep: S.N. Pandey

SC	Customer	Cust Ref	SC Date	SC Dlvy	Sales Rep	Item Code	Unit Price	Ord Qty	Value (USD)
20170018	AIRPAC	AFS/FAC/IAPL/24/2016-17	11/4/2017	10/31/2017	S.N. Pandey	2321S09	5.55	350	1942.5
						265078-S60-G40	10.75	200	2150
						211301	2	450	900
20170019	AIRPAC	AFS/FAC/IAPL/25/2016-17	11/4/2017	11/5/2017	S.N. Pandey	265078-303-1	20	300	6000
						5901-0500-0002	15	500	7500
20170021	AIRPAC	AFS/FAC/IAPL/27/2016-17	11/4/2017	11/16/2017	S.N. Pandey	321651	1.75	2000	3500
						5901-0500-0002	2.5	1000	2500
20170028	AIRPAC	AFS/FAC/IAPL/32/2016-17	11/5/2017	12/12/2017	S.N. Pandey	5901-0500-0002	23	1000	23000
Total								5800	47492.5

Figure D.2: SC Report By Sales Rep

Figure D.3 illustrates the SC Reports which was search by SC Date from 2017-11-01 to 2017-11-30.

Industrilas Asia Pvt Ltd
Sales Confirmation Report

SC Date: From 2017-11-01 To 2017-11-30

SC	Customer	Cust Ref	SC Date	SC Dlvy	Sales Rep	Item Code	Unit Price	Ord Qty	Value (USD)
20170016	CORVO	CORVO/FFX/2	11/4/2017	12/15/2017	Kamal Perera	5901-0500-0002	15	1000	15000
						26507601	10	500	5000
20170018	AIRPAC	AFS/FAC/IAPL/24/2016-17	11/4/2017	10/31/2017	S.N. Pandey	265078-S60-G40	10.75	200	2150
						211301	2	450	900
						2321S09	5.55	350	1942.5
20170019	AIRPAC	AFS/FAC/IAPL/25/2016-17	11/4/2017	11/5/2017	S.N. Pandey	265078-303-1	20	300	6000
						5901-0500-0002	15	500	7500
20170020	AIRPAC	AFS/FAC/IAPL/26/2016-17	11/4/2017	11/9/2017	PHJ Senavirathne	211301	23	1000	23000
						231107	11	200	2200
20170021	AIRPAC	AFS/FAC/IAPL/27/2016-17	11/4/2017	11/16/2017	S.N. Pandey	5901-0500-0002	2.5	1000	2500
						321651	1.75	2000	3500
20170022	AIRPAC	AFS/FAC/IAPL/28/2016-17	11/4/2017	11/22/2017	PHJ Senavirathne	26507601	4	200	800
						263079-S50-G40	3	300	900
20170023	AIRPAC	AFS/FAC/IAPL/29/2016-17	11/4/2017	11/28/2017	PHJ Senavirathne	2321S09	23	100	2300
						8-4006-01-1	12	200	2400
20170024	CORVO	CORVO/FFX/3	11/4/2017	11/15/2017	Kamal Perera	263079-S60-G40	10	800	8000
						263079-S50-G40	5	500	2500
20170025	ABC	ABC/XYZ/4/2017	11/4/2017	11/15/2017	Kamal Perera	263079-S60-G40	5.5	200	1100
						321651	6	1000	6000
20170026	ABC	ABC/XYZ/5/2017	11/4/2017	11/28/2017	Kamal Perera	231107	11	500	5500
						231107	22	200	4400
20170027	CORVO	CORVO/FFX/4	11/4/2017	11/28/2017	PHJ Senavirathne	265078-303-1	11	500	5500
						321651	3	200	600
20170028	AIRPAC	AFS/FAC/IAPL/32/2016-17	11/5/2017	12/12/2017	S.N. Pandey	5901-0500-0002	23	1000	23000
20170029	CORVO	CORVO/FFX/5	11/5/2017	12/5/2017	Kamal Perera	275015-01	5	1000	5000
						231107	12	1000	12000
Total								15200	149692.5

Figure D.3: SC Report By SC Date

Forecast Planning Report

Figure D.4 illustrate the forecast planning report which was search by SC delivery date from 2017-11-01 to 2017-11-30. Total hours and days required for the production will calculate automatically.

Industrilas Asia Pvt Ltd

Forecast Planning

SC #	Cust	Cust Ref	Dlvy Dt	Tot Ord Qty	Tot Hours	Req Prod Days
20170019	AIRPAC	AFS/FAC/IAPL/25/2016-17	2017-11-05	800	12.8	1.6
20170020	AIRPAC	AFS/FAC/IAPL/26/2016-17	2017-11-09	1200	18.3	2.3
20170014	AIRPAC	AFS/FAC/IAPL/23/2016-17	2017-11-14	4400	70.4	8.8
20170024	CORVO	CORVO/FFX/3	2017-11-15	1300	20.8	2.6
20170011	AIRPAC	AFS/FAC/IAPL/21/2016-17	2017-11-15	2300	40.8	5.1
20170025	ABC	ABC/XYZ/4/2017	2017-11-15	1200	23.2	2.9
20170021	AIRPAC	AFS/FAC/IAPL/27/2016-17	2017-11-16	3000	56	7
20170022	AIRPAC	AFS/FAC/IAPL/28/2016-17	2017-11-22	500	8	1
20170015	ABC	ABC/XYZ/3/2017	2017-11-24	2775	44.4	5.6
20170010	ABC	ABC/XYZ/1/2017	2017-11-25	2900	50	6.3
20170023	AIRPAC	AFS/FAC/IAPL/29/2016-17	2017-11-28	300	4.8	0.6
20170026	ABC	ABC/XYZ/5/2017	2017-11-28	700	8	1
20170027	CORVO	CORVO/FFX/4	2017-11-28	700	12	1.5
				22075	369.5	46.3
				Tot Working Days		21
				Bal		-25.3

Delivery Date: From 2017-11-01 To 2017-11-30

Figure D.4: Forecast Planning

Daily Production Report – Actual vs Target with Variance

Figure D.5 illustrate the daily production report which was search by production date and department.

Industrilas Asia Pvt Ltd
Daily Production Report

Date: 2017-10-27 Department: Final Packing

SC	Item	Ord Qty	Dept	Date	From	To	Prod Qty	Prod Hr	Target Qty	Target Hr	Variance Qty	Variance Hr
20170025	321651	1000	Final Packing	10/27/2017	8:00:00	10:00:00	100	2	100	2	0	0
Total							100	2				
20170026	231107	200	Final Packing	10/27/2017	10:00:00	12:00:00	70	2	175	0.8	-105	-1.2
Total							70	2				
20170028	5901-0500-0002	1000	Final Packing	10/27/2017	13:00:00	15:00:00	150	2	125	2.4	25	0.4
Total							150	2				
20170029	275015-01	1000	Final Packing	10/27/2017	15:00:00	17:00:00	120	2	125	1.92	-5	-0.08
Total							120	2				
Grand Total							440	8				

Figure D.5: Daily Production Report

Finished Goods Store – Stock Valuation Report

Figure D.6 illustrate the stock valuation report.

Industrilas Asia Pvt Ltd
FGS Stock Valuation

Date : 2017-11-01

SC No	Cus	Item	Description	Unit	Ord QTY	Prod QTY	Tot GRN	Tot DISP	FGS Stock	Value(USD)
20170029	CORVO	231107	Hinge PA6	EA	1000	100	100	50	50	600
20170029	CORVO	275015-01	Door Part	EA	1000	500	500	475	25	125
20170028	AIRPAC	5901-0500-0002	Hinge PA6	EA	1000	500	500	490	10	230
20170015	ABC	26507601	Hinge AAA	EA	475	400	400	300	100	3000
20170015	ABC	2321S09	Door Part	EA	800	200	200	190	10	200
20170014	AIRPAC	8-4006-01-1	Door Part	EA	900	500	500	450	50	500
20170014	AIRPAC	8-4006-01	Hinge PA6	EA	3000	650	150	145	5	27.5
20170013	ABC	211301	AAAS XDSS11	EA	500	500	300	200	100	200
20170013	ABC	263079-S50-G40	FDGGT ASWQ	EA	2500	2500	2500	2000	500	1775
20170013	ABC	8-4006-01-1	sdfsdf sdfdsf	EA	175	175	175	170	5	27.5
20170012	AIRPAC	26507601	L-Handle	EA	700	200	200	100	100	2200
		Total			12050	6225	5525	4570	955	8885

Figure D.6: Stock Valuation Report

Export Summary Report

Figure D.7 illustrate the export summary report which was search by order date.

Industrilas Asia Pvt Ltd

Export Summary Order Wise

Order Date: From 2017-10-01 To 2017-11-30

SC No	Order Date	Dlvy Date	Customer	Cust Ref No	Contact	Tot Ord Qty	Tot Exp Qty	Bal	Exp Value(USD)
20170027	2017-11-04	2017-11-28	CORVO	CORVO/FFX/4	Mr. Jeebee	700		700	
20170026	2017-11-04	2017-11-28	ABC	ABC/XYZ/5/2017	Ms. XYZ	700		700	
20170025	2017-11-04	2017-11-15	ABC	ABC/XYZ/4/2017	Ms. XYZ	1200		1200	
20170024	2017-11-04	2017-11-15	CORVO	CORVO/FFX/3	Mr. Jeebee	1300		1300	
20170023	2017-11-04	2017-11-28	AIRPAC	AFS/FAC/IAPL/29/2016-17	Ms. Vora	300		300	
20170022	2017-11-04	2017-11-22	AIRPAC	AFS/FAC/IAPL/28/2016-17	Ms. Vora	500		500	
20170021	2017-11-04	2017-11-16	AIRPAC	AFS/FAC/IAPL/27/2016-17	Ms. Vora	3000		3000	
20170020	2017-11-04	2017-11-09	AIRPAC	AFS/FAC/IAPL/26/2016-17	Ms. Vora	1200		1200	
20170019	2017-11-04	2017-11-05	AIRPAC	AFS/FAC/IAPL/25/2016-17	Ms. Vora	800		800	
20170018	2017-11-04	2017-10-31	AIRPAC	AFS/FAC/IAPL/24/2016-17	Ms. Vora	1000		1000	
20170016	2017-11-04	2017-12-15	CORVO	CORVO/FFX/2	Mr. Jeebee	1500		1500	
20170015	2017-10-29	2017-11-24	ABC	ABC/XYZ/3/2017	Ms. XYZ	2775	50	2725	2500
20170014	2017-10-14	2017-11-14	AIRPAC	AFS/FAC/IAPL/23/2016-17	Ms. Vora	4400		4400	
20170013	2017-10-13	2017-12-05	ABC	ABC/XYZ/2/2017	Ms. XYZ	3175		3175	
20170012	2017-10-13	2017-10-25	AIRPAC	AFS/FAC/IAPL/22/2016-17	Ms. Vora	2700	2000	700	64000
20170011	2017-10-13	2017-11-15	AIRPAC	AFS/FAC/IAPL/21/2016-17	Ms. Vora	2300		2300	
20170010	2017-10-13	2017-11-25	ABC	ABC/XYZ/1/2017	Ms. XYZ	2900		2900	
						30450	2050	28400	66500

Figure D.7: Export Summary Report

Appendix E - Test Cases and Test Results

Major test cases at the evaluation stage along with test results are contained in this chapter.

Test Results for User Authentication

The test cases with results which relate to User Authentication are displayed by Table E.1.

Test Number	Steps to Test	Expected Result	Status
1	Enter correct username Enter correct password	Successfully Login into the system Aruna Fernando | Webadmin | Sign Out	Pass
2	Enter correct username Enter incorrect password	Display error message "Wrong username or password" Login Invalid Email Address or Password	Pass
3	Enter incorrect username Enter correct password	Display error message "Wrong username or password" Login Invalid Email Address or Password	Pass
4	Enter both username and password incorrectly	Display error message "Wrong username or password" Login Invalid Email Address or Password	Pass

Table E.1: Test Results for User Authentication

Test Results for User Module

The test cases with results which relate to User Module are displayed by Figure E.2.

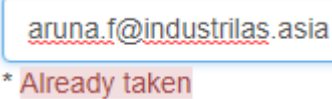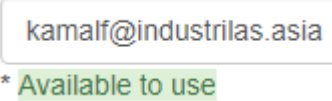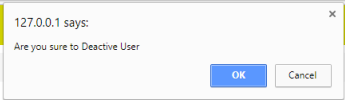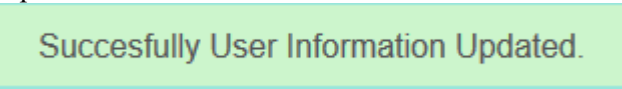| Test Number	Steps to Test	Expected Result	Status
1	Add Information with relevant details	Display Message "Successfully User inserted" with his name Succefully User Kamal Perera inserted.	Pass
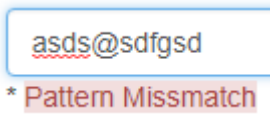
2	Try to add information by keeping all fields in empty	Display error message for the first field *Empty First Name*	Pass
3	Enter all fields without a First name.	Display error message "Empty First Name" *Empty First Name*	Pass
4	Add Spaces or numbers to the First name	Display error message "First Name-Spaces are not allowed and only allowed a to z and A to Z" *First Name-Spaces are not allowed and only allowed a to z and A to Z*	Pass
5	Enter all fields without Last name.	Display error message "Empty Last Name" *Empty Last Name*	Pass
6	Add Spaces or numbers to the Last name	Display error message "Last Name-Spaces are not allowed and only allowed a to z and A to Z" *Last Name-Spaces are not allowed and only allowed a to z and A to Z*	Pass
7	Add wrong pattern Email address	Display error message "Pattern Miss match" asds@sdfgsd * Pattern Missmatch	Pass
8	Enter existing Email address	Display error message "Already taken" aruna.f@industrilas.asia * Already taken	Pass
9	Input correct Email Address	Display message "Available to use" kamalf@industrilas.asia * Available to use	Pass
10	Enter all fields without Gender.	Display error message "Please select your gender" *Please select your gender*	Pass
11	Select a user and click on Deactive icon	Display message "Are you sure to Deactive User" 127.0.0.1 says: Are you sure to Deactive User OK Cancel	Pass
12	Select user, click the update button to update user information.	Display a message "Successfully User Information Updated" Succesfully User Information Updated.	Pass

Table E.2: Test Results for User Module

Test Results for Customer Module

The test cases with results which relate to Customer Module are displayed in Figure E.3.

Test Number	Steps to Test	Expected Result	Status
1	Add Information with relevant details	Display Message "Successfully Customer Inserted" Succesfully Customer Inserted.	Pass
2	Try to add information by keeping all fields in empty	Display error message for the first field ! Please fill out this field.	Pass
3	Enter all fields without a name.	Display error message "Please fill out this field" ! Please fill out this field.	Pass
4	Add wrong pattern Email address	Display error message "Pattern Miss match" asds@sdfgsd * Pattern Missmatch	Pass
5	Enter existing Email address	Display error message "Already taken" aruna.f@industrilas.asia * Already taken	Pass
6	Input correct Email Address	Display message "Available to use" kamalf@industrilas.asia * Available to use	Pass
7	Select a user and click on Delete icon	Display message "Are you sure to Delete Customer" 127.0.0.1 says: × Are you sure to Delete Customer OK Cancel	Pass
8	Select Customer, click the update button to update Customer information.	Display a message "Successfully Customer Information Updated" Succesfully Customer Information Updated.	Pass

Table E.3: Test Results for Customer Module

Test Results for Adding Customer Delivery Address

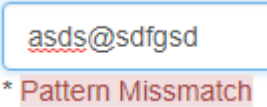The test cases with results which relate to Customer Delivery Address are displayed in Figure E.4.
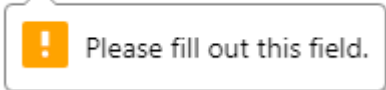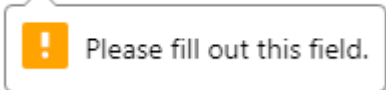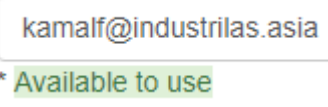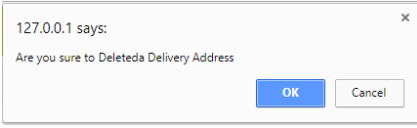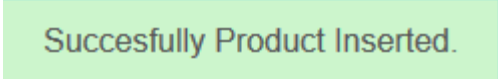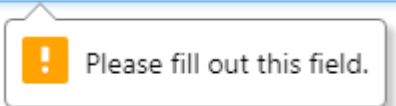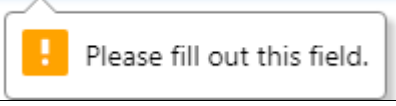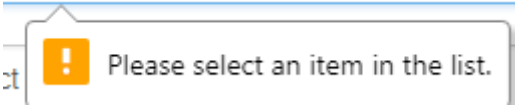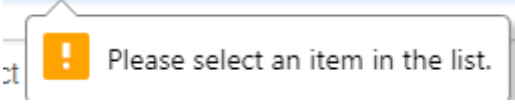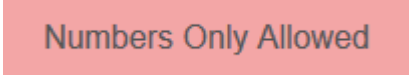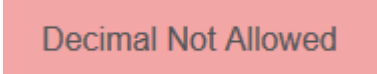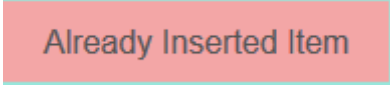
Test Number	Steps to Test	Expected Result	Status
1	Add Information with relevant details	Display Message "Successfully Delivery Address Inserted" Succesfully Delivery Address Inserted.	Pass
2	Try to add information by keeping all fields in empty	Display error message for the first field ! Please fill out this field.	Pass
3	Enter all fields without a name.	Display error message "Please fill out this field" ! Please fill out this field.	Pass
4	Add wrong pattern Email address	Display error message "Pattern Miss match" asds@sdfgsd * Pattern Missmatch	Pass
5	Enter existing Email address	Display error message "Already taken" aruna.f@industrilas.asia * Already taken	Pass
6	Input correct Email Address	Display message "Available to use" kamalf@industrilas.asia * Available to use	Pass
7	Select a Delivery Address and click on Delete icon	Display message "Are you sure to Delete Delivery Address" 127.0.0.1 says: Are you sure to Deleteda Delivery Address OK Cancel	Pass
8	Select Delivery Address, click the update button to update Delivery Address information.	Display a message "Successfully Delivery Address Updated" Succesfully Delivery Address Updated.	Pass

Table E.4: Test Results for Adding Customer Delivery Address

Test Results for Product Module

The test cases with results which relate to Product Module are displayed by Figure E.5.

Test Number	Steps to Test	Expected Result	Status
1	Add Information with relevant details	Display Message "Successfully Product Inserted" Succesfully Product Inserted.	Pass
2	Try to add information by keeping all fields in empty	Display error message for the first field ! Please fill out this field.	Pass
3	Enter all fields without Item Code.	Display error message "Please fill out this field" ! Please fill out this field.	Pass
4	Enter all fields without Item Unit.	Display error message "Please Select an item in the list" ct ! Please select an item in the list.	Pass
5	Enter all fields without Item Type.	Display error message "Please Select an item in the list" ct ! Please select an item in the list.	Pass
6	Enter characters for Production Speed/Day	Display error message "Numbers only Allowed" Numbers Only Allowed	Pass
7	Enter Decimal places for Production Speed/Day	Display error message "Numbers only Allowed" Decimal Not Allowed	Pass
8	Add Item Code that already in the system	Display error message "Already Inserted Item" Already Inserted Item	Pass
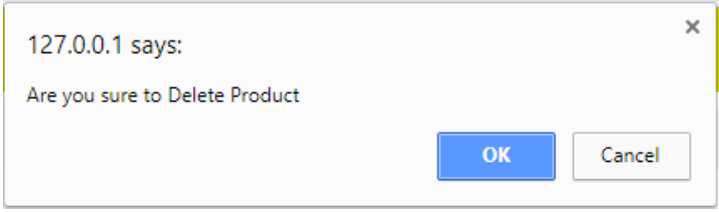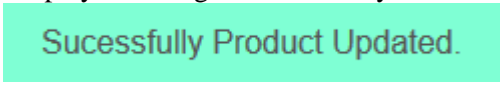
9	Select a Product and click on Delete icon	Display message "Are you sure to Delete Product" 127.0.0.1 says: Are you sure to Delete Product OK Cancel	Pass
10	Select Product, click the update button to update Product information.	Display a message "Successfully Product Updated" Sucessfully Product Updated.	Pass

Table E.5: Test Results for Product Module

Appendix F - Code Listing

This document contains some important code list. Please refer the CD-ROM for complete source code.

- Code for System Alert

```php
<?php

class po
{

    public function CountNewPo()
    {
        $con=$GLOBALS['conn'];//without having global keyword $conn function cannot call
        //To get total count of new pos
        $sql="SELECT COUNT(po_id) as count FROM po WHERE po_sc_status=0"; //tablename ,variable name
        //execute query
        $result=$con->query($sql);//take the result to variable
        return $result;


    }
```

```php
    include '../common/dbconnection.php';//To get connection string
    $obj=new dbconnection();
    $conn=$obj->connection();

    include '../model/pomodel.php';//To call PO model
    $obp=new po();//To create an object using PO class
    $result=$obp->CountNewPo();//To get the total count of new POs
    $rowcount=$result->fetch_array();
    $count=$rowcount['count'];
    //echo $count;
    ?>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html" charset="UTF-8">
        <title>Order Processing and Production Management System</title>
        <link rel="stylesheet" type="text/css" href="../bootstrap/css/bootstrap.min.css"/>
        <link rel="stylesheet" type="text/css" href="../css/loginlayout.css"/>

    </head>
    <body>
        <div id="maindiv">
            <div id="headerdiv">
            </div>

        <div id="sessiondiv">
            <div class="alignr">
                <?php if($count!=0){


                 ?>
                <?php if($role_name!="Customer"){


                 ?>
                <i class="alert-danger"><b><?php echo $count;  ?>-NEW POS</b></i>
```

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- Code for Automatically password expiry after 90 days

```php
$pass_changed_dt=$row['pass_changed_dt'];
//Date convert into timestamp
$cid1=strtotime($pass_changed_dt);
//to get the today date
$cdate=date("Y-m-d");
//Date convert into timestamp
$cid2=strtotime($cdate);
//calculation
$dif=$cid2-$cid1;
//timestamp converting to no of days
$dif_days=floor($dif / (60 * 60 * 24));
if ($dif_days>90)
{
    //redirect to change password window
    header("Location:../view/changepass.php");
}else{
    //redirect to dashboard
    header("Location:../view/dashboard.php");
    }
```

- Code for automatically adding records to SC, SC Items and Weekly plan

```php
case "addsc":
    $arr=$_POST;
    $po_id=$arr['po_id'];
    //to get PO data
    $resultp=$obp->ViewOnePo($po_id);
    $rowp=$resultp->fetch_array();
    $cust_id=$rowp['cust_id'];
    $po_ref=$rowp['po_ref'];
    $cda_id=$rowp['cda_id'];
    $sc_date=date("Y-m-d");
    $sc_dlvy_date=$rowp['po_dlvy_date'];
    $curr_id=$rowp['curr_id'];
    //to get current year
    $y=date("Y");
    //to get maximum SC ID
    $results=$obs->maxScId();
    $rows=$results->fetch_array();
    $mx=$rows['mx'];
    //next new SC No generating
    $next=$mx+1;
    $nextl=str_pad( "$next", 4, "0", STR_PAD_LEFT );
    $sc_no=$y.$nextl;
    //Adding PO data to SC automatically
    $resultss=$obs->addSc($sc_no, $cust_id, $cda_id, $po_ref, $sc_date, $sc_dlvy_date, $curr_id);
    //PO Block status updating
    $resultpp=$obp->updatePoStatus($po_id);
    //get PO item data
    $resultpi=$obp->ViewAllOnePoItems($po_id);
    while($rowpi=$resultpi->fetch_array())
    {
        $prod_id=$rowpi['prod_id'];
        $sci_description=$rowpi['poi_description'];
        $sci_qty=$rowpi['poi_qty'];
        $sci_unit_price=$rowpi['poi_unit_price'];

        //Adding PO items to SC automatically
        $resultsi=$obs->addScItems($resultss, $prod_id, $sci_description, $sci_qty, $sci_unit_price);
        //add items to weekly plan automatically
        $resultplan=$obs->addPlanItem($resultss, $resultsi, $prod_id, $sci_qty, $sc_dlvy_date);
    }
    header("Location:../view/updatesc.php?sc_id=$resultss&status=Update");
```

Appendix G - Client Certificate

Industrilas

6th November 2017,

Project Examination Board,
University of Colombo School of Computing,
221/2A, Dharmapala Mawatha,
Colombo 07.

Dear Sir / Madam,

Certification of Online Order Processing System

This is to certify that Mr. B. D. P. B. Sujeewa successfully developed an Online Order Processing System for Industrilas Asia (Pvt) Ltd as his Bachelor of Information Technology final year project.

He has gathered data and information from our premises for develop the system and it is in the testing phase.

The Management of Industrilas Asia (Pvt) Ltd has decided to accept the system for use after the modifications we proposed and completion of testing, since it is satisfying our major requirements.

We would like to take this opportunity to thank Mr. B. D. P. B. Sujeewa for his dedication and professionalism throughout this project and wish him all the success.

Thanking You,
Yours Sincerely,

Aruna Frenando
IT Manager

Glossary

- AJAX – Stands for Asynchronous JavaScript and XML. Combine collection of technologies. Running on the Client side and helps to develop interactive web applications.
- HTML – Stands for Hyper Text Markup Language. Use to build Web pages.
- MySQL – One of the most popular Database management system can handle big amount of data related to different types.
- PHP – Stand for PHP Hypertext Preprocessor. Object oriented supported server side scripting language.
- SQL - Stands for Structured Query Language. Help to retrieve data base details.
- XAMPP – Open source Bundled software package. Include Apache, PHP, MYSQL, and Perl.

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