

**Jewellery Shop Management System
for ORIX Gems and Jewellers Mount
Lavinia**

**H.W.N. De Silva
2020**



Jewellery Shop Management System for ORIX Gems and Jewellers Mount Lavinia

**A dissertation submitted for the Degree of Master of
Information Technology**

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Abstract

Inventory management has become a vital factor in the modern business environment. This is because it involves mainly in maintaining the inventory of the shop or marketplace, which could include a system to analyses data and find new trends for the business.

Most inventory control management systems provide inventory for continuous sales, provide a scientific basis for inventory planning, ensure management makes the right decisions and minimize waste while saving time.

As with any business venture, it is important to have a well-organized inventory management system to keep the business running smoothly. Therefore, like everyone else, jewellers are interested in software solutions to maintain their inventory and keep their business records in order.

ORIX gem and jewellers are one of the well-known in the jewellery business and they were using methods of bookkeeping for their business record management and inventory management. With the increase in business transaction and not having a proper inventory management system, the business process made burdens for the management to make decisions about purchases and sales.

They were in search of the inventory management software solution for their business to overcome those issues. As a solution to their software needs, this sophisticated software system was created for both information and inventory management.

This software solution facilitates to overcome existing problems in their manual process and gives a reliable means of coping with the modern world.

Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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Date: 2020/11/

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under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by:

Supervisor Name: Dr. K.L. Jayaratne

Signature:

Date: 2020/11

Acknowledgment

I would like to extend my sincere gratitude to all those who have given me the opportunity to complete this project. I am especially grateful to my supervisor, Dr. K.L. Jayaratne who has supported and guided me to carry out the project.

Also, I would like to appreciate the critical role of the owner and staff of ORIX gems & Jewellers-Mount Lavinia, who have been permitted to use all the documentation and business data necessary to complete the project.

Then, I take this opportunity to thank my friends and colleagues who have given me endless support and advice in the development of this project.

Finally, I am indebted to my parents and my dear wife. Without the continued support and encouragement, they provide, especially in those difficult times, I would not have reached the end of this difficult journey.

H.W.N. De Silva

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Chapter 1 Introduction

1.1 Motivation and Statement of the Problems

ORIX Gems and Jewellers is one of the highly reputed jewellers for handcraft jewellery in Mount Lavinia. They have won various awards for their finest products throughout their journey including a Gold award at the Presidential awards 2018 for the best silver jewellery item. They have been in the market for nearly 35 years.

Even though they have that much of history in the field, still they are using methods of bookkeeping for their business record management and inventory management.

For past years with the separate books for purchases and sales with separate page selection they have maintained their inventory database. But as demand for products increases and database size increases, more books need to be used before making decisions, and as time passes, more and more books become impractical when making decisions.

Due to constant market changes, the price of raw materials and products has to be updated daily. When considering bookkeeping, this is a time-consuming and repetitive process.

As a solution, they run a spreadsheet-based database parallel to bookkeeping. Since the data entering process hasn't done in periodically and properly, has created more overdue extra works and a backlog for inventory update.

With the increase business transaction and not having a proper inventory management system, Day today business process makes some burdens for the management to make decisions about purchases and sales.

Since keeping separate books for sales and purchases with the separated selection of pages with a spreadsheet-based database doesn't eliminate or alleviate the problems, they are in the phase of searching proper software solution for their business to overcome those problems.

1.2 Objectives of Project

The main objective of this project is to provide a software solution to the current manual system to overcome existing and predicted problems. It will facilitate decision making, future market forecasting and more convenient and reliable means of coping with the modern world while addressing the main problem.

With Successful implementation of this software solution,

- Provide a User-friendly System with relevant functions
- Centralized data management
- Extra works (Repetitive works related to the existing method) and time cost will be significantly reduced.
- Will be given the reports more easily and timely for the decision-making process
- Will be able to increase the accuracy of the data about the stock and product
- Will have the facility to feed data automatically and manually
- Will improve the reliability, efficiency, in the business process
- Will automate the calculations of Profit
- Will have a more convenient way to access customer details
- Will mitigate errors in business process
- Will reduce paper usage as much as possible
- Will have more tools to improve the business
- Will increase data security and data reliability
- Will have a System that suit to the modern world and the functionalities as updated with the technology.... etc.

1.3 Scope of the Project

This system includes both the Information Management and Inventory Management System.

The proposed software solution will be automated or facilitate

- Centralized data management
- Data entering (Capturing through Barcode reader or excel sheet uploading)
- Manual data entering facility (When needed)
- Generation of variety of reports
 - ❖ All sales report (Daily, Weekly, Monthly, Yearly)
 - ❖ Product-wise sales report (Daily, Weekly, Monthly, Yearly)
 - ❖ All purchases report (Weekly, Monthly, Yearly)
 - ❖ Raw materials wise purchases report (Weekly, Monthly, Yearly)
 - ❖ Customer details
 - ❖ ...etc.
- Printing facility of above reports
- Printing facility of receipt after payment acceptance
- Generation of above reports as excel or pdf formats according to the requirements
- Variety of Search option
 - ❖ Search by raw materials
 - ❖ Search by product name
 - ❖ Search by costumer name
 - ❖ Search by date, month, year
 - ❖ ...etc.
- Customization facility for database management
- Graphical representation about sales and purchases
- Analysing facility of purchases and sales
- Reminder facility about order placement and backup etc.
- Backups facility (Should be done daily/weekly/monthly)

Other than these system functions, this software solution will have two major categories (Administrator category, user category) of users for mange above system functions availability with the organized secure way.

Chapter 2 Background

The analysis phase is mainly focused on gathering requirements, searching for facts and identifying the functional and non-functional requirements of the system. Besides, analysis of existing inventory management systems in the market is discussed. At the end of the analysis phase, the system can move on to the design phase, which considers software architecture and primary diagram design.

2.1 Requirement Analysis

Requirements gathering is an important part of any system development. It is important to come up with actionable conclusions to make the analysis phase a success. Often, finding the problem right is what a potential client need. In the beginning, it might not be so obvious. However, it can be made more meaningful while moving forward.

In theory, identifying real requirements can be a challenge. If we fail to meet the requirements, the whole project will fail. Therefore, understanding the actual requirement is vital.

The following strategies have been used to meet the requirements.

2.1.1 Fact Gathering

➤ **Observation and follow similar systems**

There are plenty of inventory systems in the market. For this project, many functions and behaviours of existing systems were reviewed and actively monitored

➤ **Interviews**

An interview is one of the best sources for tracking the flow of a requirements gathering process. Every professional prefers to customize the flows that they can adapt to. Choosing the best flow for the process is a challenge based on many needs. However, associating with a few people on the list may determine the optimal flow.

➤ **Prototyping**

In requirement gathering process, prototyping was used for clarifying some functions and making sure the requirements were correctly identified. In this process, we've created some prototypes using prototype creating software solution (online tool-<https://moqups.com/>, <https://app.creately.com/> and MS Excel) and used those to identify further needed modifications for the function automation.

➤ **Structured Interviews**

Pre-defined certain list of questions maintained to inquire from the interviewee.

➤ **Review of available documents and manuals**

Reviewed the available company documentations and charts, of the inventory management systems.

2.1.2 Identifying Functional and Non-Functional requirements

Functional requirement

- ❖ Inventory management
 - Gem & Jewellery Stock
 - Item Purchases
 - Item Sales
- ❖ Enter data
 - Manual data entering facility
 - Excel file upload facility
 - Data capturing using barcode reader
- ❖ Login User Management (Data Privacy)
 - Check username and password (password protected)
 - Create, Update and delete user profiles
 - Search details about users
 - Password change facility
 - User access log
- ❖ Customer Details Management
 - Add, Update and delete Customer Details
 - Search details about Customers
- ❖ Supplier Details Management
 - Add, Update and delete Customer Details
 - Search details about Customers
- ❖ System backup
 - Backup history maintenance
 - Periodic backups as prefer
 - Encrypt backup data
- ❖ Reports (View, Print)
 - Sales Report (Daily, Weekly, Monthly, Yearly)
 - Item wise Sales report (Daily, Weekly, Monthly, Yearly)
 - Purchase reports (Daily, Weekly, Monthly, Yearly)
 - Item wise purchase report (Daily, Weekly, Monthly, Yearly)
 - Customer details
 - Supplier details
- ❖ Graphical representation of sales and purchases
 - Bar charts, Pie charts, etc.
- ❖ Get data from the system
 - Export data in multi formats (EXCEL, PDF, Etc)
 - Print reports

Non-Functional requirement

❖ Performance

The System should respond quickly to the request made by the users. The data will be readily available as soon as the request is made and the information request from the system will be readily accessible at a single click.

❖ Reliability

No computational error should occur. The proposed system will be written in a client- server environment and used web methods to implement all services then it makes easy to modify when required.

❖ Availability

The System will be available to the user for 24 hours a day, 7 days a week. To minimize inconvenience all pre-planned down times are informed early

❖ Security

The system will be Prevent unauthorized access and follow other standard software security features

❖ Maintainability

The System will be maintained by an authorized officers of ORIX gems and jewellers and periodic backups of the system can be done as for their preferences.

2.1.3 Hardware and Software requirements

Hardware Requirements

Table 2.1.3 1: Hardware requirements

Hardware Module	Requirement
Processor	Intel 2Ghz or higher
RAM	2 GB/4 GB or higher
Hard Disk	250MB free Disk space or more
Internet Connection	Not Essential
Resolution	Minimum 1024 x 768

Software Requirements

➤ Development

PHP and MySQL were used as development languages for the server-side development (CodeIgniter-3.1.11 were used as an application development framework and bootstrap-4.4.1 frontend framework) including HTML, JavaScript, and CSS for the browser side.

➤ Client

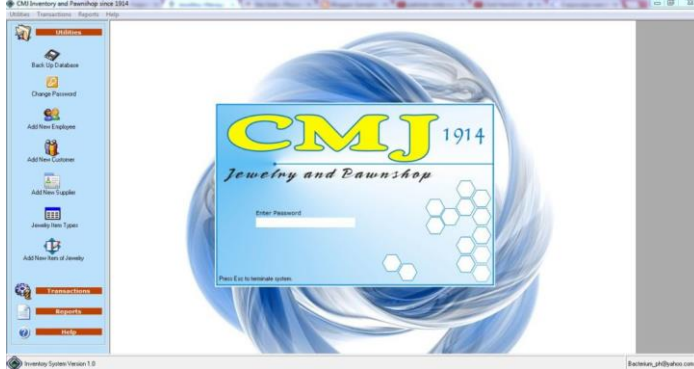
Web browsers like Microsoft Edge, Mozilla Firefox and Google Chrome newer versions, etc.

Table 2.1.3 2: Software requirements

Software Module	Requirement
Operating System	Windows 8 or Later
Database	MySQL server 5.6 or Later
PHP	PHP 7.4 version or Later

2.2 Review of Similar System

<https://www.studentprojectguide.com/visual-basic-6-0/jewellery-shop-management-system/>



This software solution was developed using Visual basic and all the transaction record stores in Access Database. This System has features of Jewel types, Jewellery records, Purchase and sales inventory, data backup, Etc.

Even though this application is standalone and developed in visual basic, I've referred the basic functions and interfaces with the interactivity. It helped to understand and make some ideas towards the software solution developed.

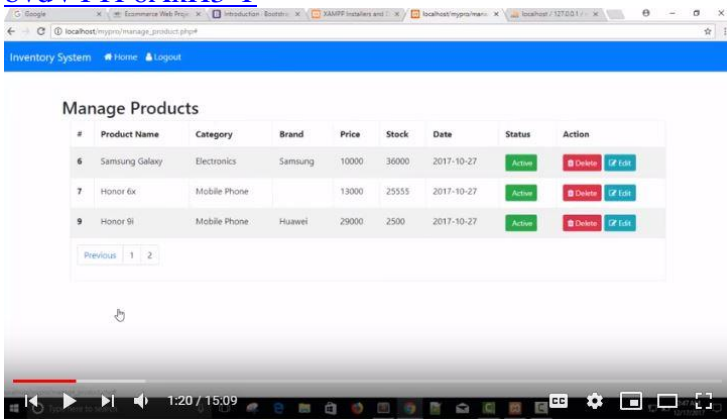
<http://www.micansinfotech.com/APPLICATION/DOTNET/ONLINE-JEWELLERY-MANAGEMENT-SYSTEM.html>



This software solution was developed using asp.net and all the transaction record stores in Microsoft SQL server Database.

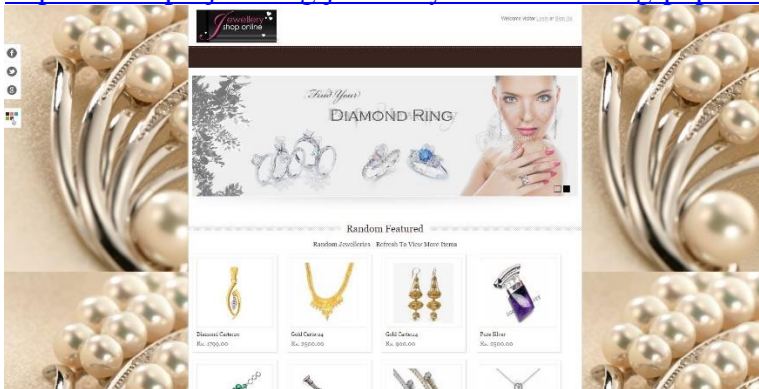
Even though this application is standalone and developed in visual basic, I've referred the basic functions and interfaces with the interactivity. It helped to understand and make some ideas towards the software solution developed.

https://www.youtube.com/watch?v=zwm-1OAhLbQ&list=PLB_Wd4-5SGAYCmzk21-bvdVTTF6AkH3-T



This software solution was developed using PHP and all the record stores in MySQL Database. This is an inventory management System and the developer made a video introduction in YouTube. This helps me to get ideas about the inventory management systems and functionality in brief.

<https://code-projects.org/jewellery-store-site-using-php-source-code/>



This is a sample project of Jewellery store management system which has customer interaction and online payment facility. Even though it was mainly addressing the online sales, helps me to get knowledge through the demo system about the online functionalities and online interactivity.

2.3 Comparison of alternative design strategies

Table 2.1.3 3: Comparison of alternative design strategies

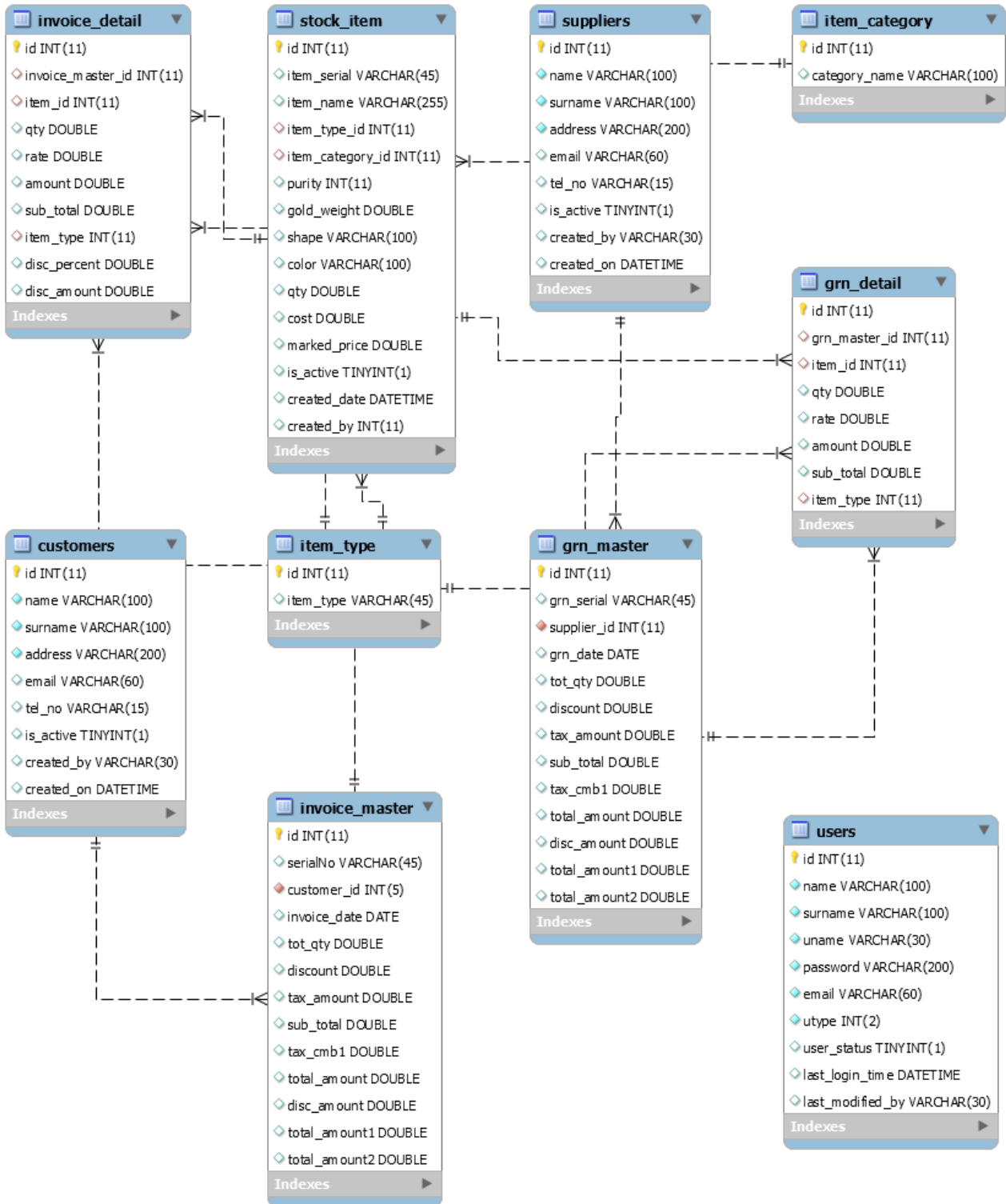
Functions	CMJ Jewellery and pawn shop Management System	DD Online Jewellery Management System	B B Online Jewellery Shop Management	Jewellery Shop Management System for ORIX Gems and Jewellers-Mount Lavinia
Stock management	YES	YES	YES	YES
Data Entering Facility	YES	YES	YES	YES
Login User Management	YES	YES	YES	YES
Customer Details Management	YES	YES	YES	YES
Supplier Details Management	YES	NO	NO	YES
Reports (view and print)	YES	YES	YES	YES
Data Backup	YES	NO	NO	YES
Get Data in Multiple formats (EXCEL, PDF)	NO	NO	NO	YES
Online payment portal	NO	YES	YES	NO

Chapter 3 Methodology

3.1 Description and Design

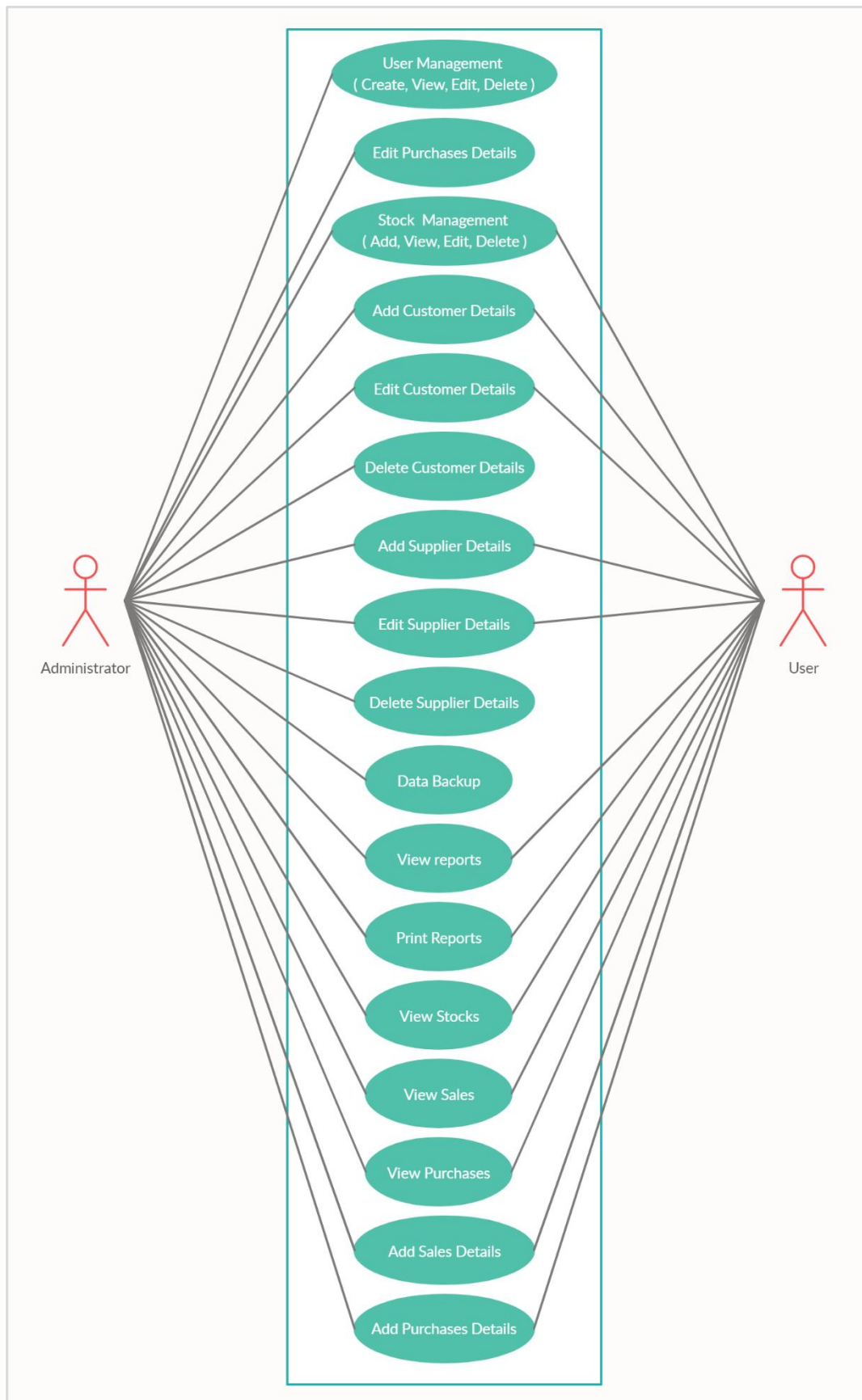
3.1.1 EER Diagram

Figure 1 : EER Diagram (Generated automatically by using MySQL workbench 8.0.20)



3.1.2 Use-Case Diagram

Figure 2 : Use-Case Diagram (created by using <https://creately.com/diagram-type/use-case>)

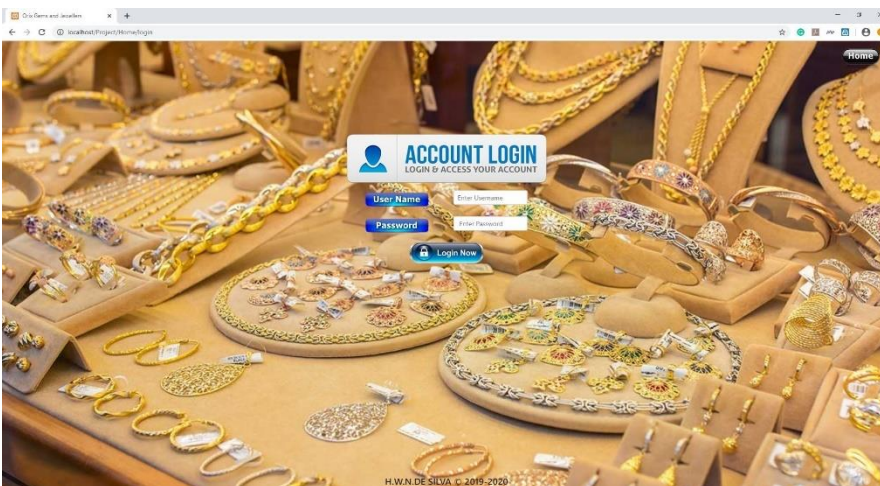


3.1.3 User Interfaces



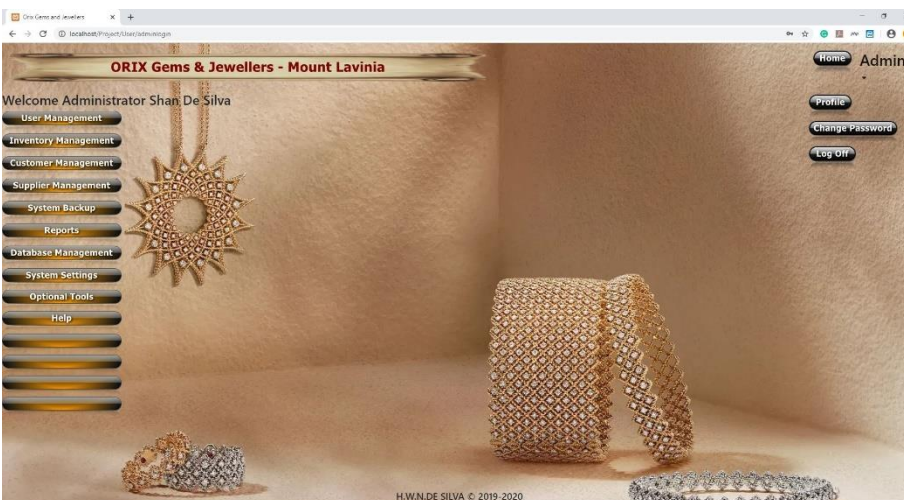
This is the home page of the software solution and it has some modifications to do. Currently, it has working digital clock and carousel image transition.

Figure 3 : Home page



This is the login screen. If the username or password is wrong, it gives some errors. Password is encrypted and protected from standard cyber-attacks.

Figure 4 : Login page



This is the Admin users home screen. All the functions, including administrative functions are here to access and control the system conveniently.

Figure 5 : Admin user home page



This is the General users home screen. All the functions, excluding administrative functions are here. General users can do their routine works within this limited access environment.

Figure 6 : General user home page

First Name	Last Name	User Name	Email	User Type	User Status	Last Login	Edit	Change User status
Shan	De Silva	Admin	admin@gmail.com	Administrator	Enabled	2020-06-20 23:45:26	Update	Disable
Nadeeshan	De Silva	User	user@gmail.com	User	Enabled	2020-06-20 21:09:21	Update	Disable
Sarath	Gamini	Sarath	sarath@gmail.com	Administrator	Enabled		Update	Disable
Dilani	Guruge	Guruge	guruge@gmail.com	User	Enabled		Update	Disable
Ajith	Susantha	susantha	susantha@gmail.com	Administrator	Enabled		Update	Disable
Ajith	Guruge	ajith	ajith@gmail.com	User	Enabled		Update	Disable
Irosha	Dilani	irosha	irosha@gmail.com	Administrator	Enabled		Update	Disable
AKA	Ramani	Ramani	ramani@gmail.com	Administrator	Enabled		Update	Disable
Asanka	Chaturanga	asanka	asanka@gmail.com	User	Enabled		Update	Disable

This is the user management screen with details search and details sort facilities. Using this screen, administrator users can create, edit, enable, disable the user profiles very easily.

Figure 7 : User management page

Item Name	Item Category	Item Type	Qty	Edit	Delete
Sapphire	Precious	Gem		Update	Delete
CatsEyeMoonstone	Semi-Precious	Gem		Update	Delete
Bracelets	Caret 22	Jewellery		Update	Delete
Almandine Garnet	Semi-Precious	Gem		Update	Delete
CHRYSOBERYL	Precious	Gem		Update	Delete
Neckless	Caret 24	Jewellery		Update	Delete

This is the stock management screen with details search and details sort facilities. Using this screen, users can add, edit, delete stock items very easily.

Figure 8 : Stock Management page

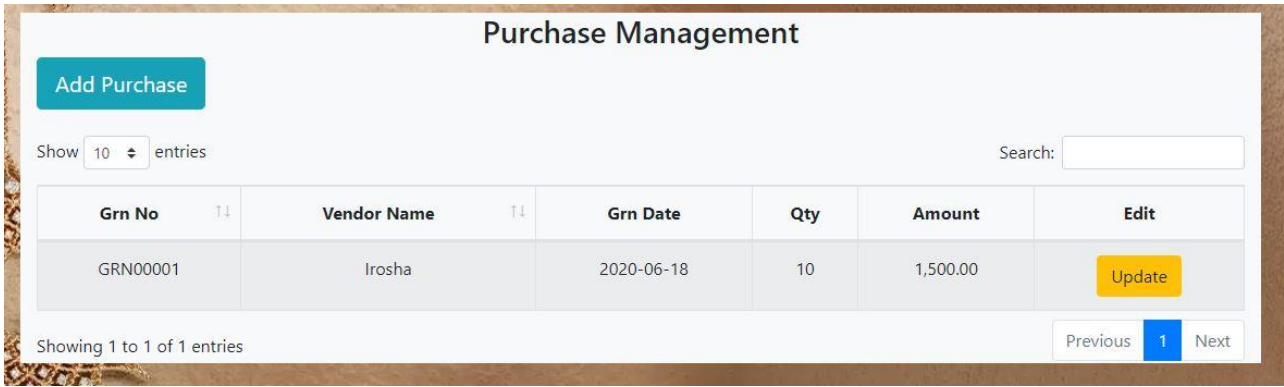


Figure 9 : Purchases Management page

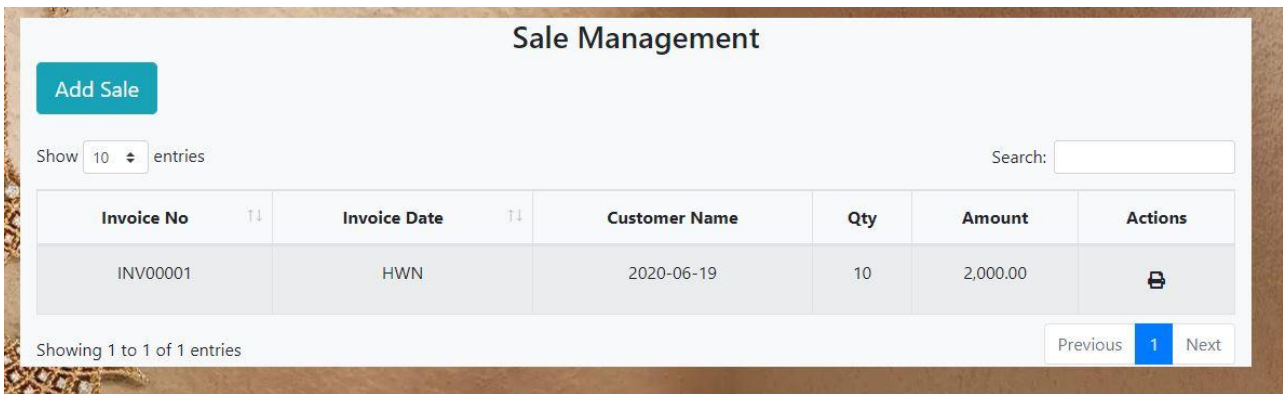


Figure 10 : Sales Management page

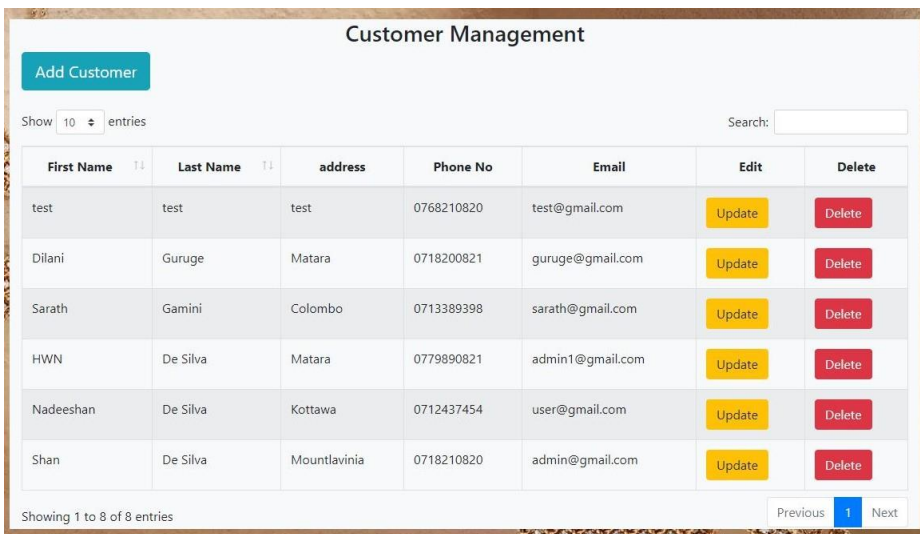


Figure 11: Customer management page

This is the customer management screen with details search and details sort facilities. Using this screen, users can add, edit, delete customers very easily.

Supplier Management

Add Supplier

Show entries Search:

First Name	Last Name	Address	Phone No	Email	Edit	Delete
shan	desilva	colombo	0768210820	hwndesilva@gmail.com	Update	Delete
test1	test1	Boralesgamuwa	0718210821	test2@gmail.com	Update	Delete
Nadeeshan	Silva	Panadura	0712351730	shan@gmail.com	Update	Delete
Henda	Witharanage	Dehiwala	0713389398	henda@gmail.com	Update	Delete
dilani	irosha	colombo	0718210820	test1@gmail.com	Update	Delete
Irosha	guruge	Kottawa	0712237894	test@gmail.com	Update	Delete

Showing 1 to 8 of 8 entries Previous **1** Next

This is the supplier management screen with details search and details sort facilities. Using this screen, users can add, edit, delete suppliers very easily.

Figure 12 : Supplier management page

Item Report

Date From Date To Item

[Search](#) [Export Pdf](#) [Export Excel](#)

#	Item No	Item Name	Item Type	Category	Qty	Cost	Marked Price
1	IT00001	Bracelet	Gem	BlueShaphier	10	1,500.00	2,500.00

Figure 13 : Item Report page

Purchase Report

Date From Date To Supplier Item

[Search](#) [Export Pdf](#) [Export Excel](#)

#	GRN no	GRN Date	Supplier Name	Amount
1	GRN00001	2020/06/10	Saman	1,500.00

Figure 14 : Purchase Report page

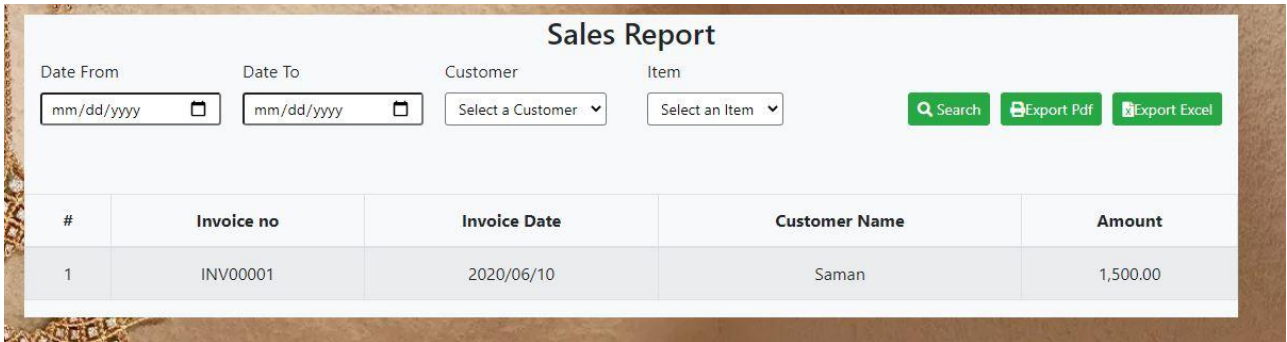


Figure 15 : Sales Report page

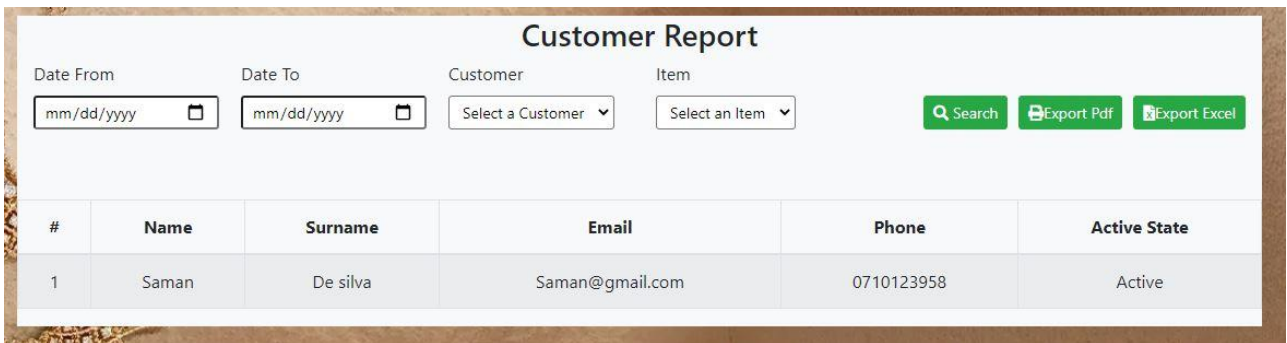


Figure 16 : Customer report page

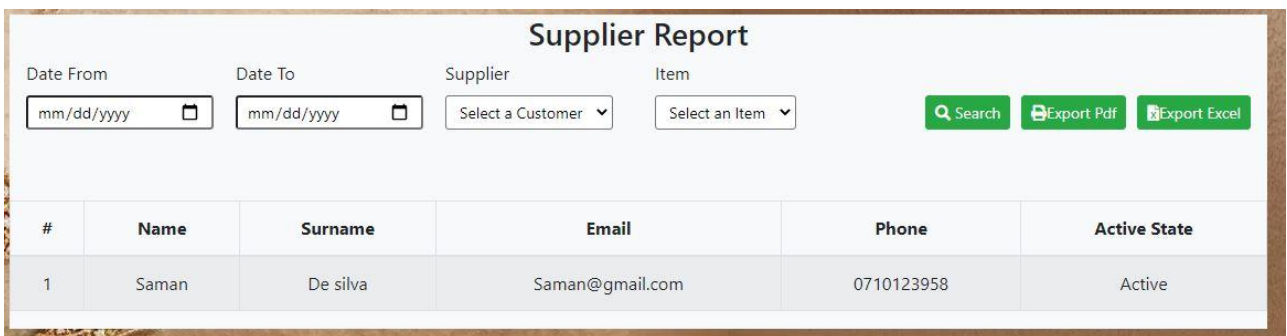


Figure 17 : Supplier report page

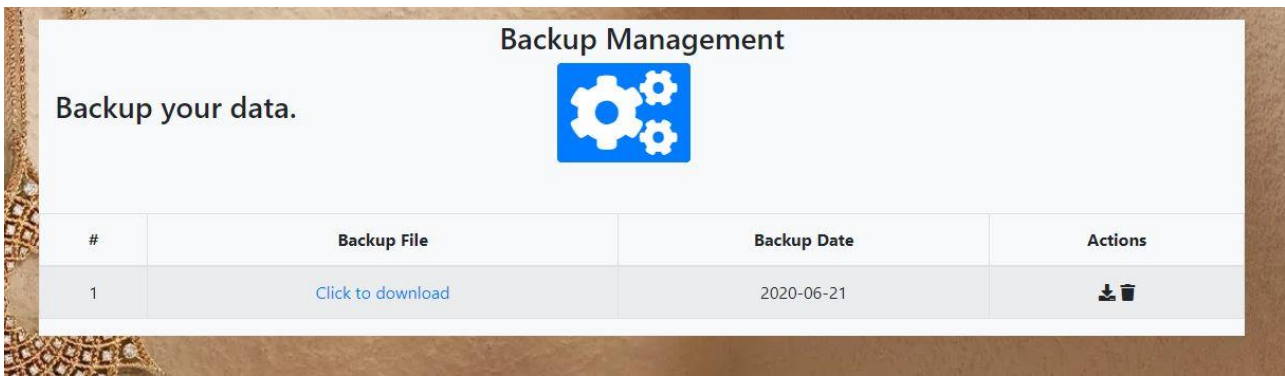


Figure 18 : Backup Management page

3.1.4 Database Structure

DESCRIBE users

Field	Type	Null	Key	Default	Extra
id	int(11) unsigned	NO	PRI	NULL	auto_increment
name	varchar(100)	NO		NULL	
surname	varchar(100)	NO		NULL	
uname	varchar(30)	NO	UNI	NULL	
password	varchar(200)	NO		NULL	
email	varchar(60)	NO		NULL	
utype	int(2)	NO		NULL	
user_status	tinyint(1)	YES		1	
last_login_time	datetime	YES		NULL	
last_modified_by	varchar(30)	YES		NULL	

Figure 20 : users Table structure

DESCRIBE suppliers

Field	Type	Null	Key	Default	Extra
id	int(11) unsigned	NO	PRI	NULL	auto_increment
name	varchar(100)	NO		NULL	
surname	varchar(100)	NO		NULL	
address	varchar(200)	NO		NULL	
email	varchar(60)	YES	UNI	NULL	
tel_no	varchar(15)	YES		NULL	
is_active	tinyint(1)	YES		1	
created_by	varchar(30)	YES		NULL	
created_on	datetime	YES		current_timestamp()	

Figure 19 : suppliers Table structure

DESCRIBE customers

Field	Type	Null	Key	Default	Extra
id	int(11) unsigned	NO	PRI	NULL	auto_increment
name	varchar(100)	NO		NULL	
surname	varchar(100)	NO		NULL	
address	varchar(200)	NO		NULL	
email	varchar(60)	YES	UNI	NULL	
tel_no	varchar(15)	YES		NULL	
is_active	tinyint(1)	YES		1	
created_by	varchar(30)	YES		NULL	
created_on	datetime	YES		current_timestamp()	

Figure 21 : customers Table structure

DESCRIBE invoice_master

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
serialNo	varchar(45)	YES		NULL	
customer_id	int(5) unsigned zerofill	NO	MUL	NULL	
invoice_date	date	YES		NULL	
tot_qty	double	YES		NULL	
discount	double	YES		NULL	
tax_amount	double	YES		NULL	
sub_total	double	YES		NULL	
tax_cmb1	double	YES		NULL	
total_amount	double	YES		NULL	
disc_amount	double	YES		NULL	
total_amount1	double	YES		NULL	
total_amount2	double	YES		NULL	

Figure 22 : invoice_master Table structure

```
DESCRIBE invoice_detail
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
invoice_master_id	int(11)	YES	MUL	NULL	
item_id	int(11)	YES	MUL	NULL	
qty	double	YES		NULL	
rate	double	YES		NULL	
amount	double	YES		NULL	
sub_total	double	YES		NULL	
item_type	int(11)	YES	MUL	NULL	
disc_percent	double	YES		NULL	
disc_amount	double	YES		NULL	

Figure 23: invoice_detail Table structure

```
DESCRIBE grn_master
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
grn_serial	varchar(45)	YES		NULL	
supplier_id	int(11) unsigned	NO	MUL	NULL	
grn_date	date	YES		NULL	
tot_qty	double	YES		NULL	
discount	double	YES		NULL	
tax_amount	double	YES		NULL	
sub_total	double	YES		NULL	
tax_cmb1	double	YES		NULL	
total_amount	double	YES		NULL	
disc_amount	double	YES		NULL	
total_amount1	double	YES		NULL	
total_amount2	double	YES		NULL	

Figure 24 : grn_master table structure

```
DESCRIBE grn_detail
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
grn_master_id	int(11)	YES	MUL	NULL	
item_id	int(11)	YES	MUL	NULL	
qty	double	YES		NULL	
rate	double	YES		NULL	
amount	double	YES		NULL	
sub_total	double	YES		NULL	
item_type	int(11)	YES	MUL	NULL	

Figure 25: grn_detail table structure

```
DESCRIBE stock_item
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
item_serial	varchar(45)	YES		NULL	
item_name	varchar(255)	YES		NULL	
item_type_id	int(11)	YES	MUL	NULL	
item_category_id	int(11)	YES	MUL	NULL	
item_weight	double	YES		NULL	
shape	varchar(100)	YES		NULL	
color	varchar(100)	YES		NULL	
qty	double	YES		NULL	
cost	double	YES		NULL	
marked_price	double	YES		NULL	
is_active	tinyint(1)	YES		1	
created_date	datetime	YES		NULL	
created_by	int(11)	YES		NULL	

Figure 26: stock_item table structure

```
DESCRIBE item_category
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
category_name	varchar(100)	YES		NULL	
item_type_id	int(11)	YES	MUL	NULL	

Figure 27: item_category table structure

```
DESCRIBE item_type
```

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
item_type	varchar(45)	YES		NULL	

Figure 28: item_type table structure

Chapter 4 Evaluation and Testing

4.1 Introduction

The evaluation stage is used to test the usability and accuracy of the system using a variety of testing methods. In this case, if the system component does not meet the requirements, they will be reworked.

This chapter outlines the work done during the evaluation phase of this project.

4.2 Testing

If the tests are done successfully (according to the objectives mentioned earlier), it detects the errors in the software. As a benefit, tests show that the software functions in accordance with the specifications and meets the behavioral and performance requirements.

In addition, the data being tested provides a good indication of software reliability and some indication of the quality of the software. But testing cannot show the absence of errors and defects, it can show only that software errors and defects are present. However, there are chances to avoid or minimize errors by testing.

4.2.1 Test Cases

➤ Validation for login

Checking whether the username and password are filled in or not.

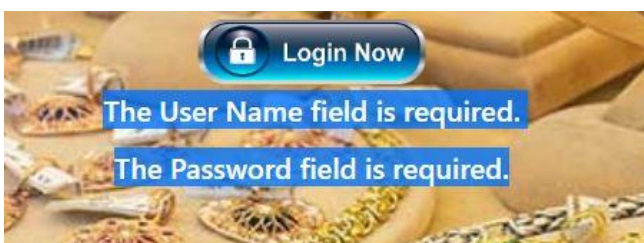


Figure 30 : login validation message 2



Figure 29 : login validation message 1

➤ **Validation for User Management**

Validation Add User

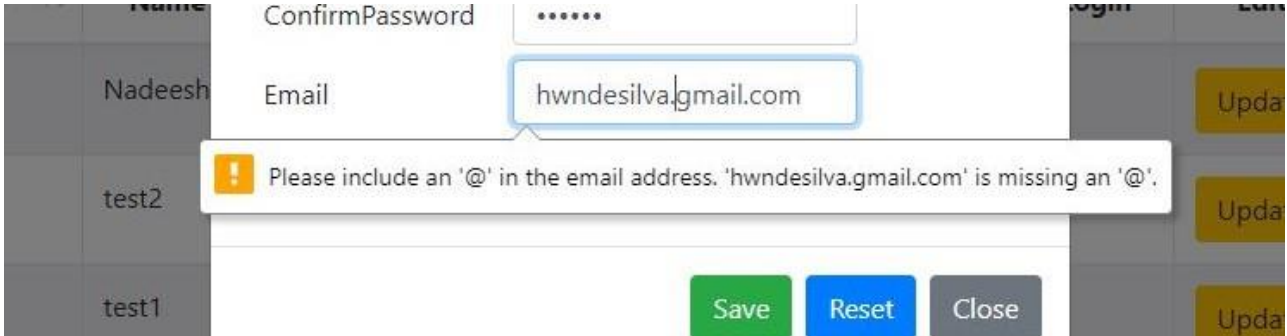


Figure 31: Add user validation message 1

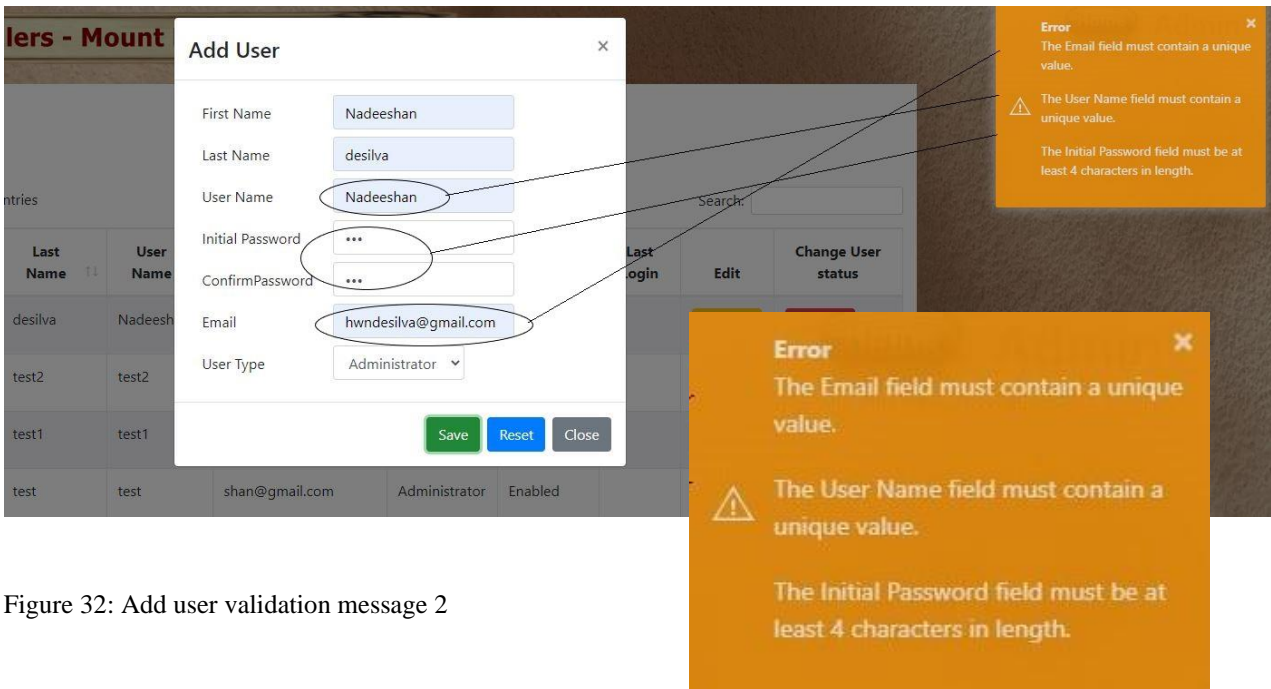


Figure 32: Add user validation message 2

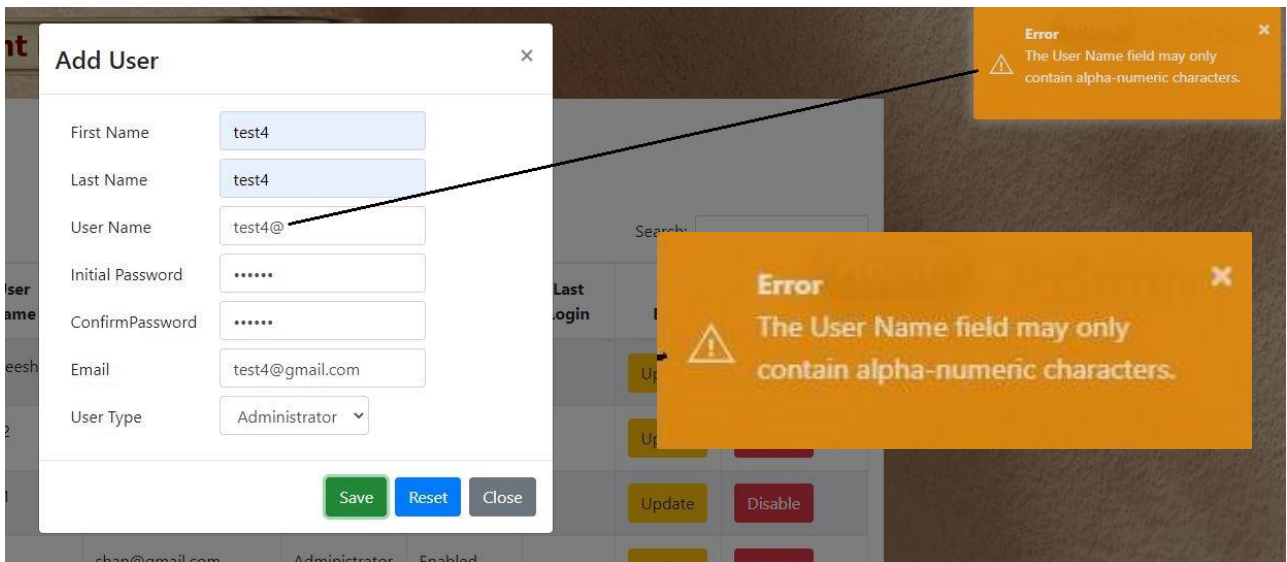


Figure 33 : Add user validation message 3

If all fields filled correctly



Figure 34 : Add user success message

User Disabling and Enabling

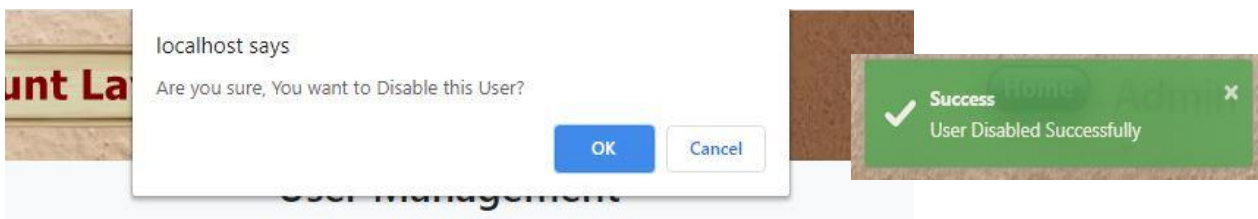


Figure 35: user disable confirmation message

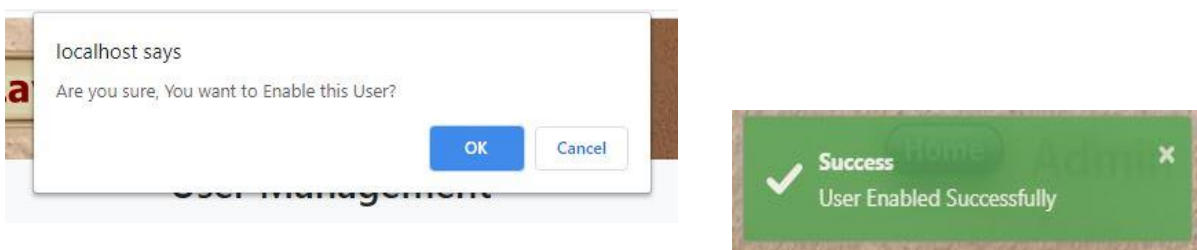
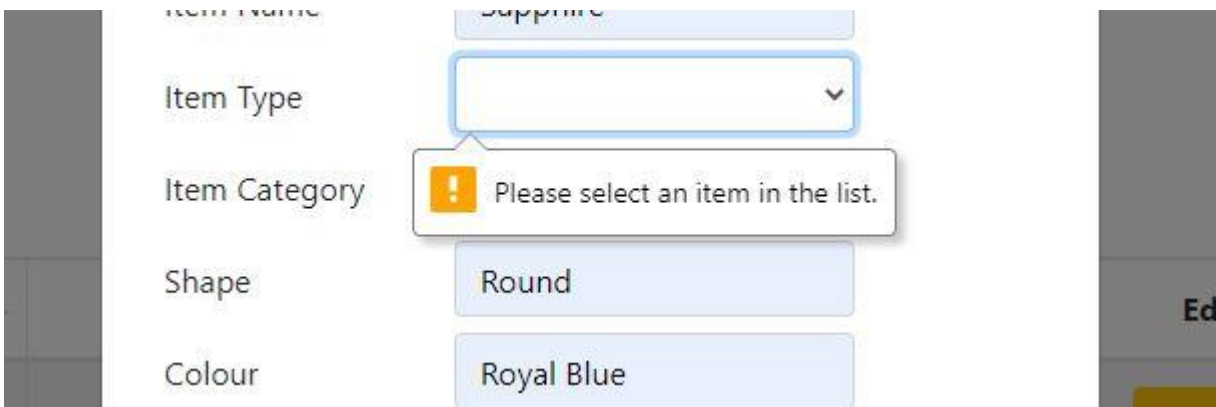


Figure 36: user enable confirmation message

➤ **Validation for Inventory Management**



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

- Item Name: Supply
- Item Type: (empty dropdown menu)
- Item Category: (empty dropdown menu with a validation error message: "Please select an item in the list.")
- Shape: Round
- Colour: Royal Blue

Figure 37

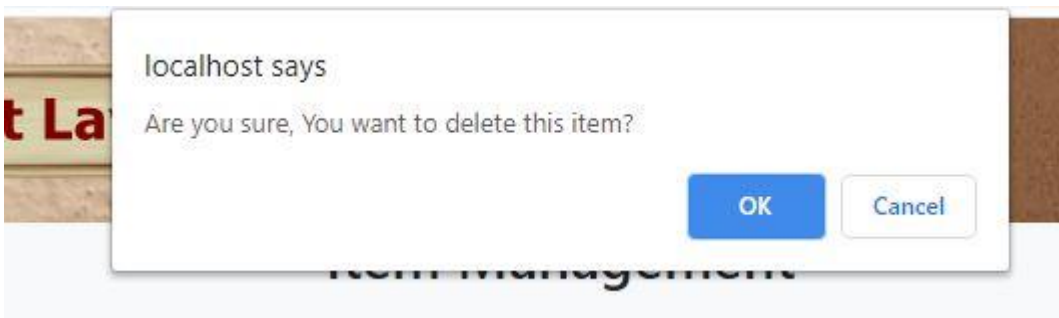
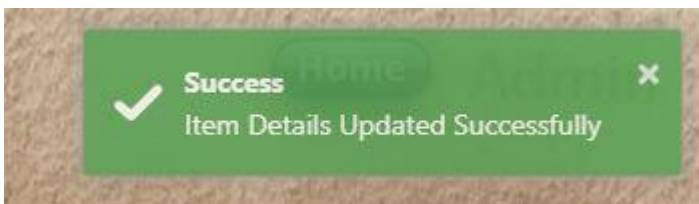
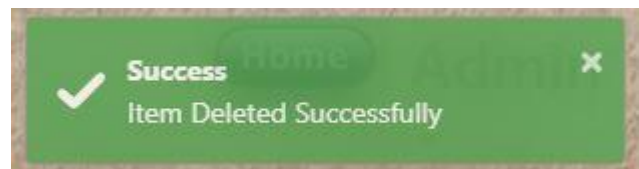


Figure 38



➤ **Validation for Customer Management**

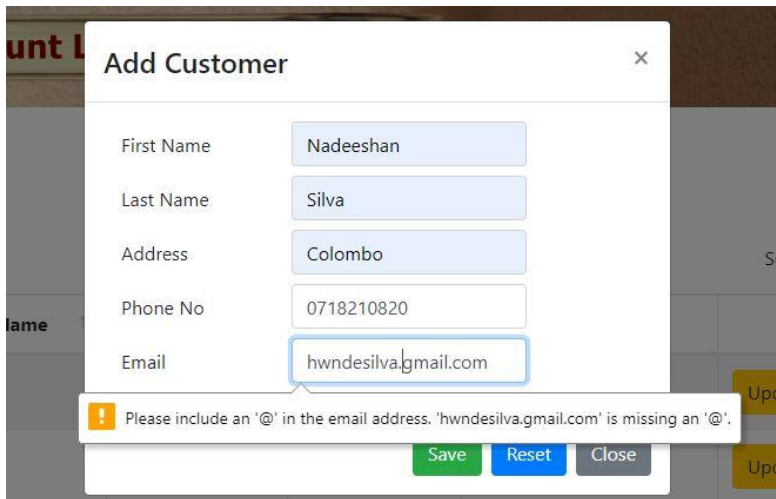


Figure 39

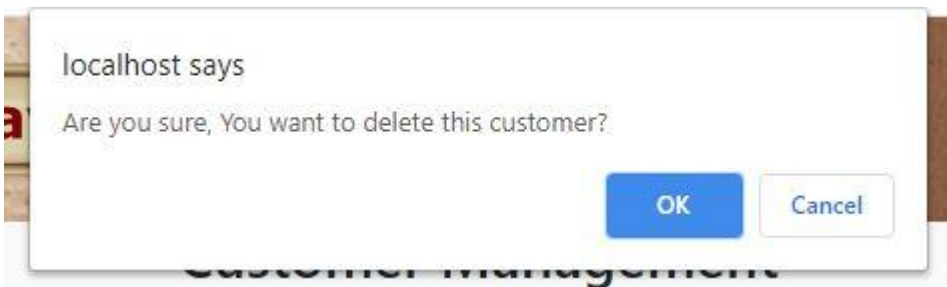
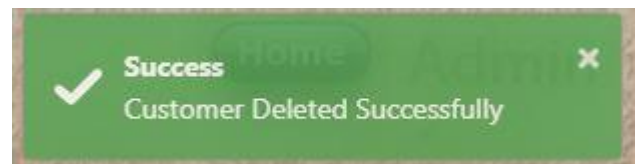


Figure 40



➤ **Validation for Supplier Management**

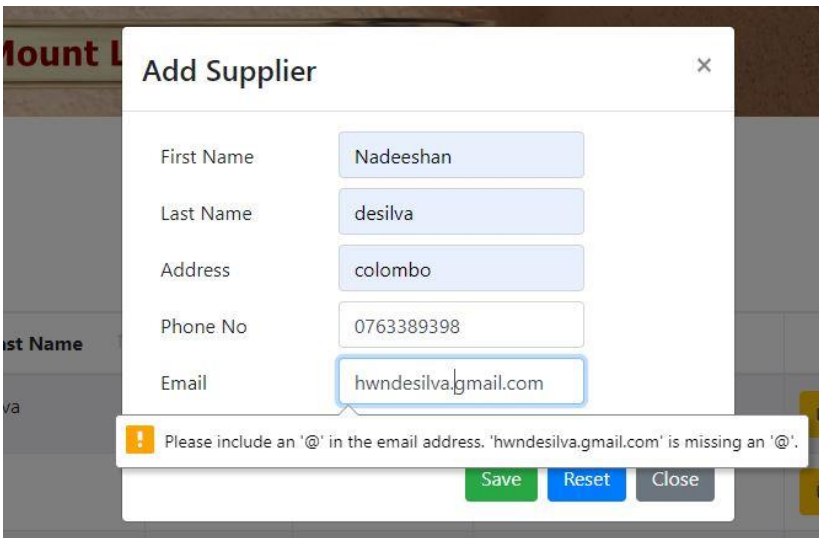


Figure 41

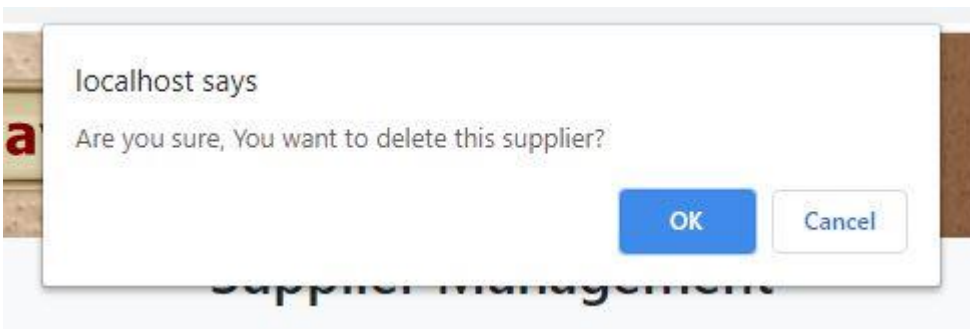
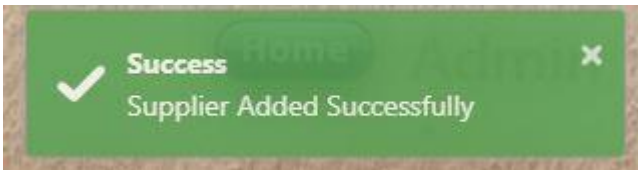
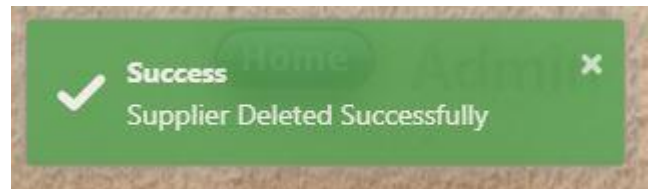


Figure 42



Chapter 5 Conclusion and Future work

5.1 Lesson learned

The implementation of this project was required knowledge from several areas. Such as requirements gathering, requirements analysis, design, frontend and backend development, software testing, infrastructure development and documentation. It was like an A to Z process with the roles of System Analyst, Developer, Tester, Network Administrator, Content Writing and Project Manager. The confidence to complete the project on time was a huge challenge for me and it has become a self-fulfilling goal for me.

5.2 Conclusion

There is always room for improvement and the software we created can also be improved. However, the software which we have developed addressed the main issues which were in their manual system.

5.3 Future Work

As the business expands and more shops open in the country, the existing data base will be insufficient. Hosting a cloud database or remote access to a database from another site should be designed to solve this problem in the future.

References

- [1]. "PHP Tutorial," [Online] Available: <https://www.w3schools.com/php/default.asp>
- [2]. "SQL Tutorial," [Online] Available: <https://www.w3schools.com/sql/default.asp>
- [3]. "CodeIgniter User Guide," [Online] Available: <https://codeigniter.com/userguide3/index.html>
- [4]. "CodeIgniter introduction Sinhala tutorial," [Online] Available: <https://www.youtube.com/watch?v=S9C4HM7pU8A>
- [5]. "CodeIgniter Tutorials," [Online] Available: https://www.youtube.com/watch?v=OcZL17LvDUk&list=PLxl69kCRkiI2eALgWF5H5Eka_R1RBmN9N
- [6]. "Bootstrap Introduction," [Online] Available: <https://getbootstrap.com/docs/4.0/getting-started/introduction/>
- [7]. "Bootstrap basic," [Online] Available: <https://www.tutorialrepublic.com/twitter-bootstrap-tutorial/bootstrap-tables.php>
- [8]. "AJAX Introduction," [Online] Available: https://www.w3schools.com/xml/ajax_intro.asp
- [9]. "code for working digital clock," [Online] Available: <https://www.codexworld.com/create-digital-clock-with-date-javascript/>
- [10]. "Use case diagram," [Online] Available: <https://creately.com/diagram-type/use-case>
- [11]. "Create EER Diagram using an existing Database in MySQL Workbench (reverse engineering)"
." [Online] Available: <https://medium.com/@tushar0618/how-to-create-er-diagram-of-a-database-in-mysql-workbench-209fbf63fd03>
- [12]. "Entity Relationship Diagram," [Online] Available: <https://www.smartdraw.com/entity-relationship-diagram/>

Appendix - Questionnaire

Table 2.1.3 4 : Questionnaire

Name of Employee	
Working Experience -	<input type="checkbox"/> 1 – 3 Years <input type="checkbox"/> 3 – 5 Years <input type="checkbox"/> 5 – 10 Years <input type="checkbox"/> Over 10 Years
1. Is the Initial interface is attractive? Do you like it?	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
2. Always, different interfaces are not complicated, I feel comfortable	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
3. Processes involved in the software, are not found complex. I feel comfortable.	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
4. How would you rate the speed of Application Software?	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
5. Message and instructions receiving from software are available wherever we need	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
6. I am satisfied with the response and attendance to enquiries made	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
7. I am satisfied totally with the whole software provided	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
8. I am fully satisfied with the service provided with the software	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied

	<input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
9. All, in process needs within the systems of the institution are fulfilled by this software	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
10. Titles used in the general process are similar and find no issues within the used titles of the software.	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
11. No misleading guides were found within the software and Manual.	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
12. Compatibility with other application software's?	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
13. How often does our software freeze or crash?	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied
14. Would you recommend our software to others?	<input type="radio"/> Extremely Satisfied <input type="radio"/> Very Satisfied <input type="radio"/> Somewhat Satisfied <input type="radio"/> Not so Satisfied