SLTC

PROJECT REPORT

EQUIPMENT RENTING SYSTEM

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DECLARATION

We declare that this project report or part of it was not a copy of a document done by any organization, university, any other institute or a previous student project group at SLTC and was not copied from the Internet or other sources.

Project Details

Project Title	**Equipment Renting System**

Group Members

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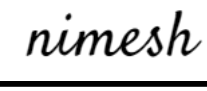
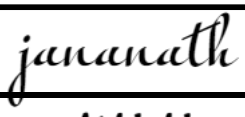
AA1424	Nimesh Mendis	
AA2025	Ishara Madhushan	
AA1600	M.C Jananath Bandara	
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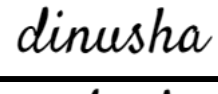
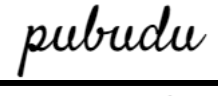
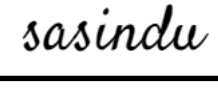
AA1391	Dinusha Werapitiya	
AA2048	Pubudu Karunaratne	
AA2209	Sasindu Iduwara	

ABSTRACT

This report is a full-fledged documentation of the project Equipment Renting System built for any business that provides services of renting equipment. For example, Building equipment like ladders, shovels, drills etc. The system was built to switch from the current manual system to the automated system to overcome the issues raised upon relying on manual processes.

The system consists of 5 main components such as borrowing equipment, adding new users, borrowing history, adding new equipment and adding a function that helps to add a penalty fee when items are delivered late.

To keep up with the current software development trends java is utilized for the project implementation.

ACKNOWLEDGEMENT

We would like to thank our lecturers, parents and friends who helped us a lot in completing this project within the short period of time.

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1.0 INTRODUCTION

1.1 Problem Statement

In Sri Lanka due to equipment being very expensive many equipment renting services are established. But due to many customers, many equipment, many number of times the equipment is rented it is hard to keep track of them. Also due to the corona pandemic physical interactions are mostly limited. So if the equipment renting and managing can be done by online it would be a great advantage. This system can be modified to any renting service.

1.1.1 Major Problems the renting service providers are currently facing

- **Difficulty of finding data -**
  In using a manual system it is very hard to find the data required when necessary

- **High Cost –**
  To maintain the data correctly we may even have to take a secretary to help us keep the data organized.

- **Low productivity due to access time -**
  Due to excessive time dealing with the books/papers filing system the productivity will automatically reduce.

- **Duplication of data entry -**
  In a manual system, the chance of duplication in records is much high.

- **Lack of efficiency and reliability in using manual system -**
  Human process can never achieve the efficiency and reliability of the automated machine process.

- **Hard to make changes or Update -**
  Every time when making a change or update, should have to make a copy to ensure not to destroy the original document.

1.2 Product Scope

As a solution for above problems we decided to switch an automated system for this equipment renting business. Equipment renting management System is a powerful, user-friendly platform that automates and facilitates the management of day-to-day renting services. It is aimed to bring about effective standardization and efficiency in renting operations, equipment management, and provide a better service to the customers.

The equipment renting System allows capturing, storing and retrieving critical information at any point in time. The system will be used to store and retrieve critical renting records, such as rented item, rented time period, if the equipment was delivered on time.

Breaking the traditional norm of manual time consumable tasks, this software's scientifically designed and customizable modules render it suitable for automation of all renting activities, ranging from adding new equipment and calculating penalty fees when the equipment is not delivered in time.

1.3 Aim and objective

The main goal of this project is to develop a software to ease the daily work of an equipment renting service providing shop by implementing an equipment renting service using an object oriented programming language.

Objectives of the project are,

1. Understanding the basic concept of a renting service
2. Identify the necessary functions needed in a renting system
3. Developing the necessary functions according to the requirement.
4. Designing the UI in user friendly way and the to the requirements
5. Connecting the user interface and the functions.

1.4 Typical use case

This system is used by the owner or an employee of the renting service. Therefore, it needs all the functions of adding new users, adding new equipment, adding penalty fees, etc.
Main window includes the main functions: borrow equipment, add new user, borrow history and add new equipments. Also it includes the total number of tools rented, and the number of users rented the equipments and the total earning by renting the equipments.

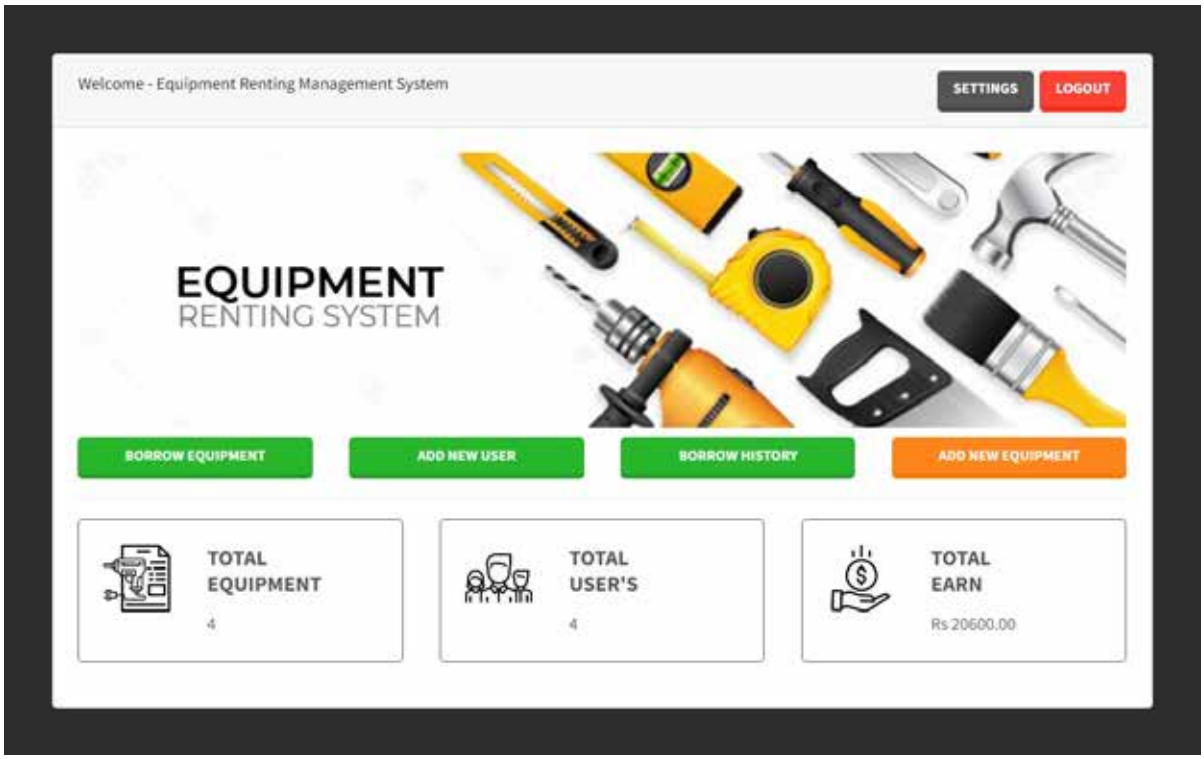

Figure 1 Main Window of the equipment renting system

The owner also could use,

- Borrow equipment window
- Add new user window
- Borrow history window
- Add new equipment window
- Settings window

★ Borrow equipment window

User uses this window to add details of the equipment that customer is renting. The required equipmemt can be selected from the first drop down box. To see the equipment in the drop down box, the equipment details should be added by using the “Add new equipment” function or else the equipment will not be shown. Secondly the customer details can be added. Customer details are added through the add user function. The customer details should be added to be able to see the name of the customer on the drop down box or it will not be available. Then the we can enter the return date of the equipment rented. The format is “mm/dd/yyyy”. After the details are entered, the process button should be pressed. When the process button is pressed the details of the rented item is saved in the database. Using the “Back” button the user can return back to the main window.

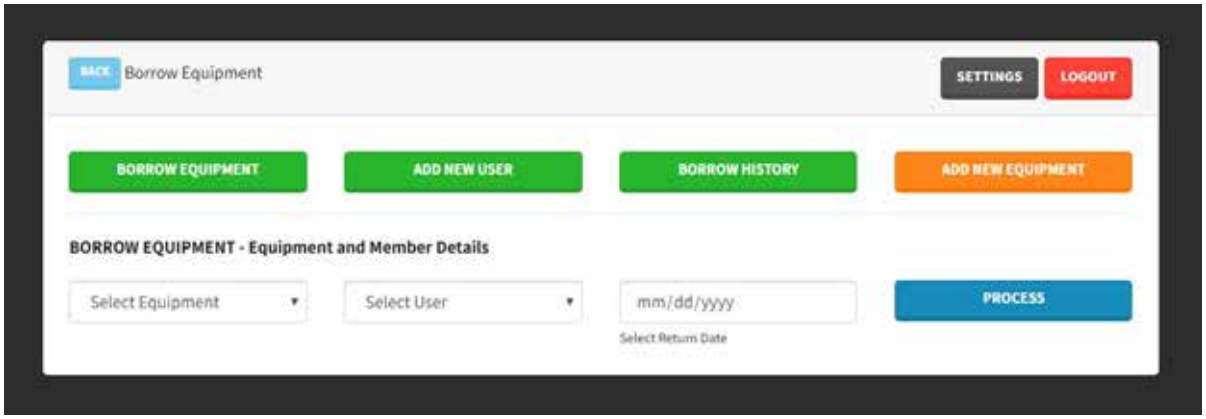

Figure 2 Main Window of the equipment renting system

★ Add new user window

Using the add new user window the customer details could be added. Firstly, the full name will be added. Then the mobile number and address can be added. When the add button is clicked the entered details will be shown in the table below. The entered details can be deleted by clicking the cross mark in the action column

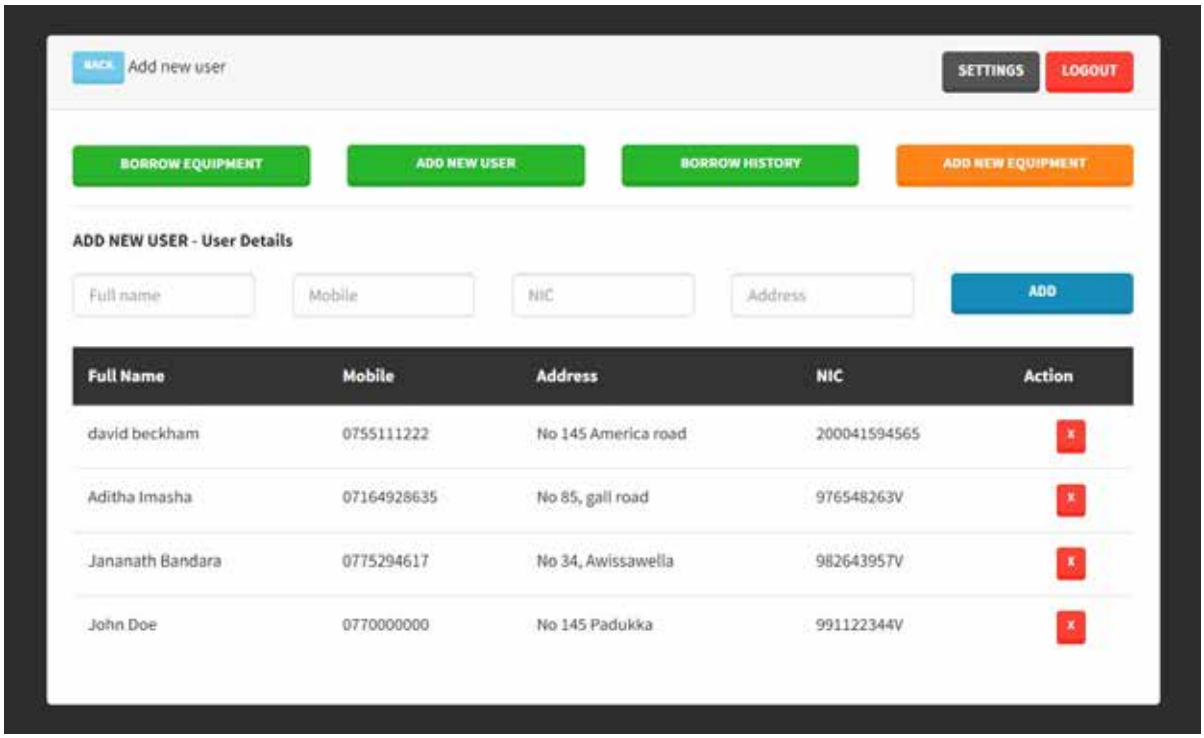

Figure 3 Main Window of the equipment renting system

★ Borrowed history window

The borrow history window will contain all the borrowed equipments and its details. It contains the issued date, return date, borrower ID, NIC of the borrower, the equipment name, and if the equipment is returned or not. If not returned it will display a green color box mentioning ongoing.

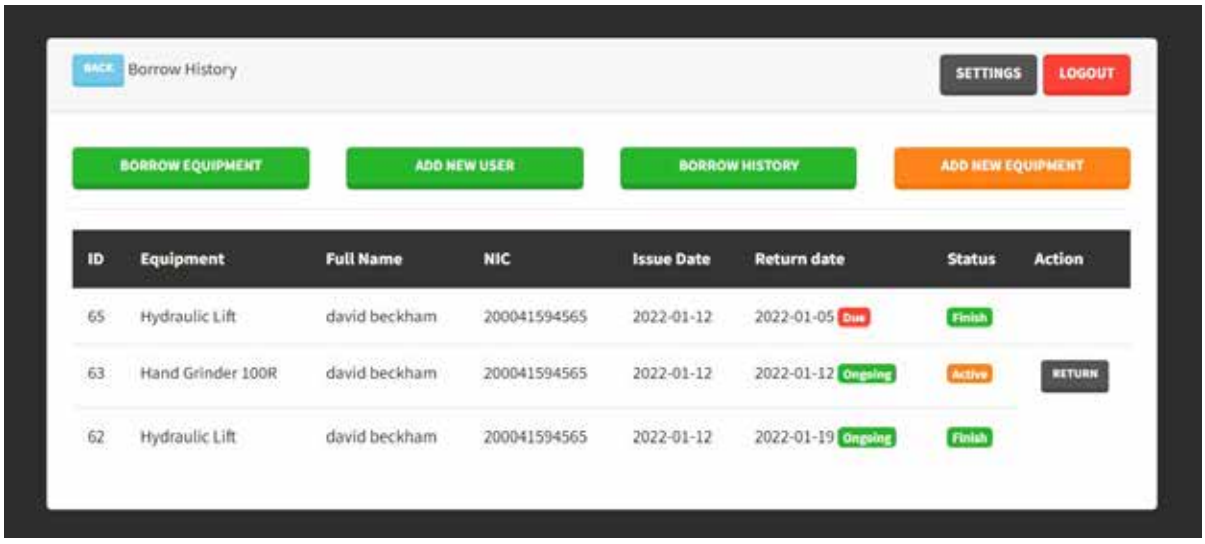

Figure 4 Borrow history - equipment when not returned

When the return button is clicked the user will be directed to a new window.

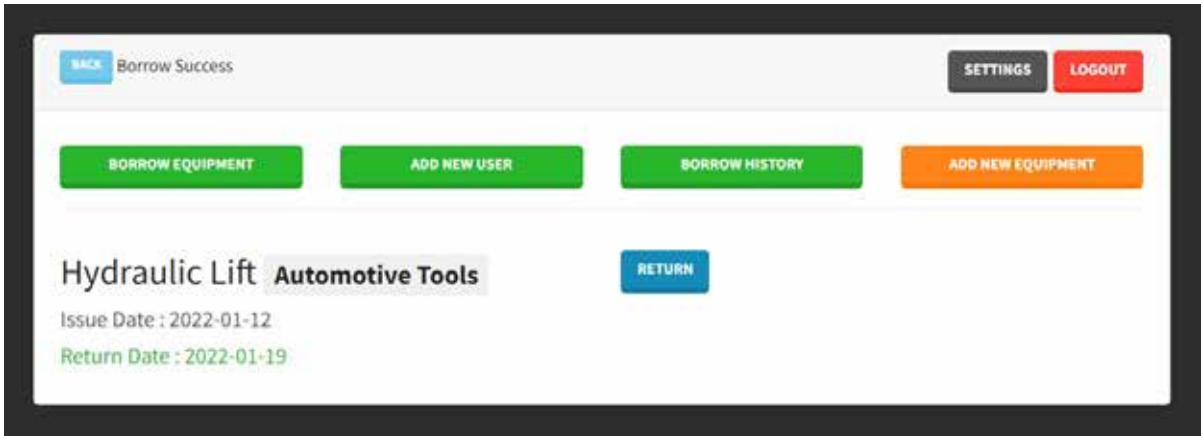

Figure 5.1 Borrow history- when return button is clicked (before due date)

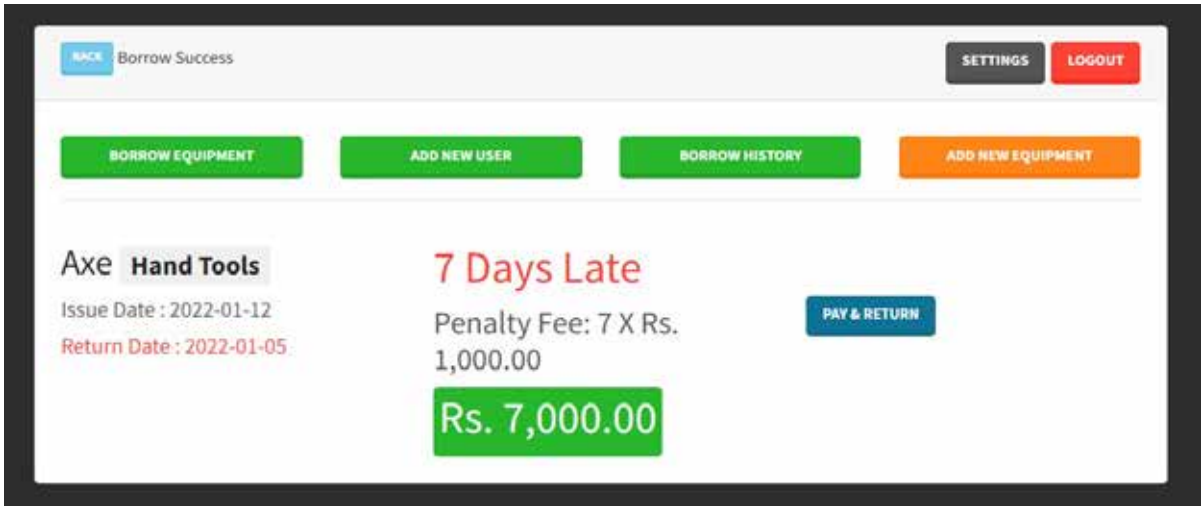

Figure 5.2 Borrow history- when return button is clicked (after due date)

When the return button is clicked again. The previous borrow history page will load. Now in the status bar it shows as finished. Because the equiment has been returned.

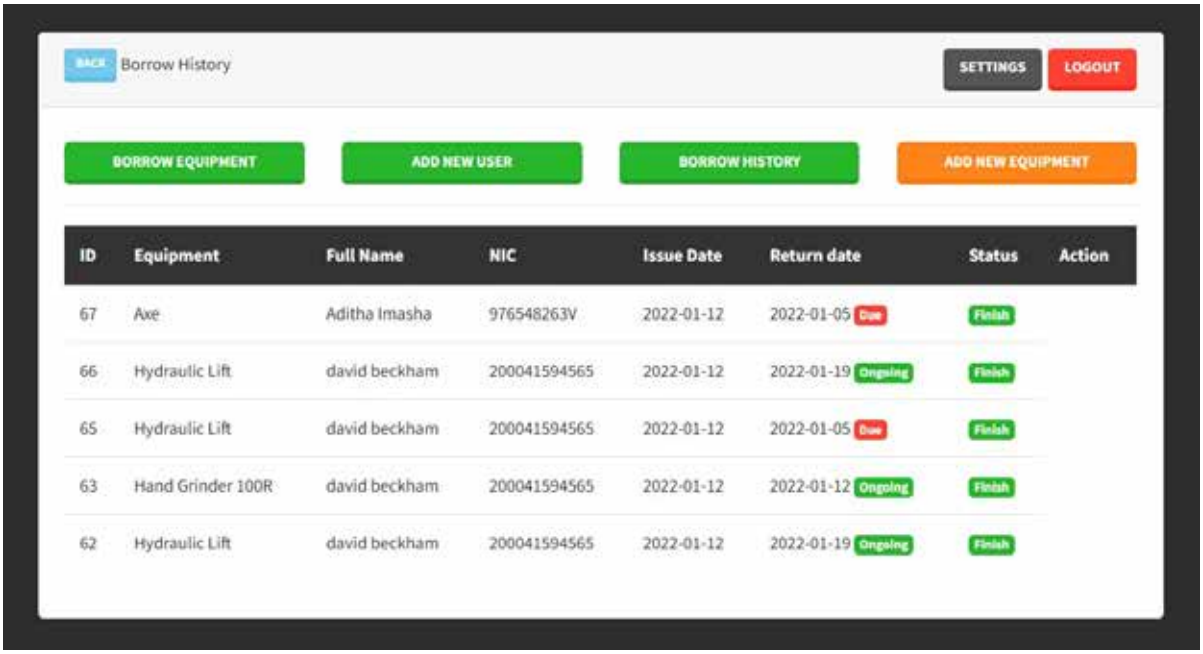

Figure 6 Borrow history - When the equipment have been returned

★ Add new equipment window

When “add new equipment” button is clicked a window will load and in that window equipment details can be added. Equipment name, Manufacturer, fee for the renting, category, availability status can be added. If the fee for rent should be discussed with the client, we can select the option “can be discussed”. If we do not add a fee value it will display “Rs. .00”. When the details are filled the “add” button should be clicked. Then the entered item will be shown in graph below. If the equipment should be removed, by clicking the corresponding red cross button we can remove the tool.

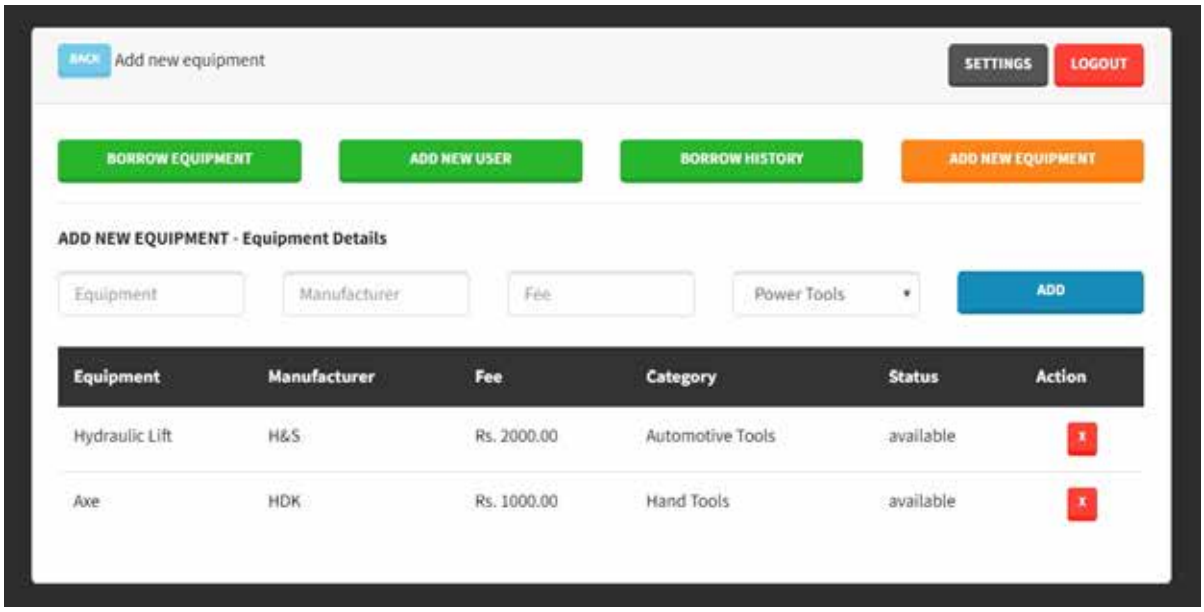

Figure 7 Borrow history - When the equipment have been returned

★ Settings window

By using the settings window we can add a penalty fee when equipment is returned late.

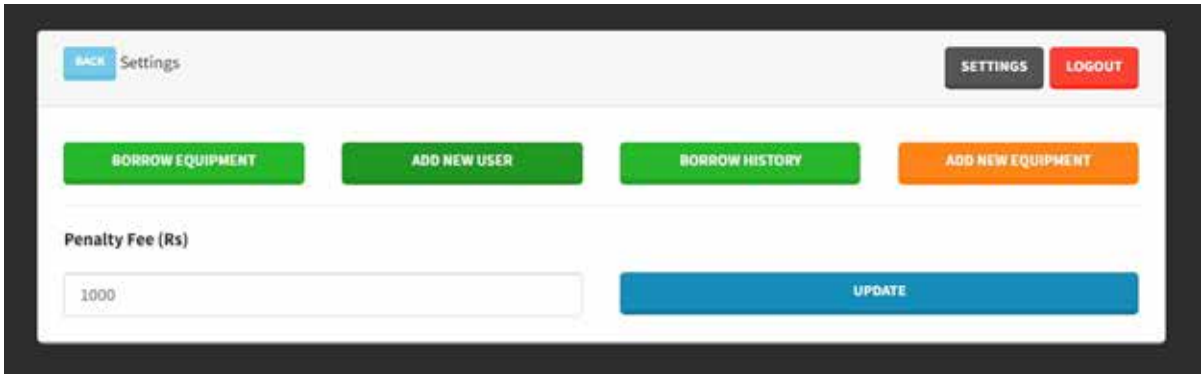

Figure 8 Borrow history - equipment when not returned

1.5 Scope of the project

Rest of the project report contains four main sections where more further more detailed sub sections .

1. Methodology

The methodology used for the project is discussed here comprehensively. Under methodology four main aspects explained.

a) Requirement Analysis

Detailed and specific requirements of the project discussed along with user stories, use case diagrams and activity diagrams
explaining the requirements.

b) Design

The Design aspect of the project explained here with the aid of
diagrams. UML diagrams such as class diagram, Sequence diagram, Activity diagrams and high level architecture diagram are used to demonstrate the software design. database design of the software explained using the ER diagram. User interface designs are included to get the idea about the UI design.

c) Implementation

This section covers the implementation details of the project. The selection of database management system and the frontend, back-end technologies and programming language used for implementation are discussed under here.

d) Testing

The test plan of the software is described here. How the system is verified and all the evidences to prove that all the major aspects are tested properly are included here in the tabular format of all the test cases and results accordingly along with The graphical UI results.

2. Conclusion

This section summarizes the entire project. The realization of the original objective and goals are discussed here. The limitations and weaknesses of the proposed methodology and solution also discussed here.

3. References

All the list of sources that were consulted during the course of the study and the writing of the report are included here.

4. Appendixes

All the additional information regarding the project is included here. More test results and selected code listing can be found here.

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1.6 Outline of the rest of the dissertation

The equipment renting system consist of the basic and essential features of a renting service. User can add new equipments, add new client details, check the availability of an equipment. Also calculate the earnings by renting the equipments.

2.0 BACKGROUND

2.1 Analysis

2.1.1 Functional requirements

As mention above the developer should understand the basic requirements of the renting service. So the basic requirements can be added as functions in the software. Knowing the appropriate functions play major role in the software development process. The basic requirements for the equipment renting service can be identified as

- Saving the borrowers information
- Saving the equipment details
- Return date and issue dates
- Renting fee for the equipment
- Details of the Penalty fee

2.1.2 Non-functional requirements

There are four main aspects discussed under non-functional requirements of the system

1. Performance

The number of users of the system is small due to the software been used by the owner or an employee of the renting service provider. But the potential renters or borrowers could be a large number. So the system must be ready for a large number of borrowers. It is critical that the performance of the system could withstand the number of borrowers.

2.Availability

Availability is a most important requirement for the equipment renting system as the crucial renting activities have to be done anytime. So availability is a key point. If an equipment is not available, it cannot be given to a borrower. The owner or the user of the system must be indicated by the system that the equipment is not available.

3. User Friendly

The provide best user experience, all the system user interfaces are built user friendly. To achieve the user friendliness of the system various UI components are used, such as navigational component, information component and input controls.

4. Security

When maintaining the critical data of the clients it is very important to ensure the security measures in the system. If borrowers information is not safe, borrower will not tend to borrow equipments

2.1.3 The Approach

This project is all about developing software to make things more easy to manage. Due to the gathered information we know the basic requirements and the functions of the equipment renting service. So we can easily build the functions for the basic requirements. Also the equipment renting system can be implemented in any renting service. For a hardware store, For a movie renting store etc. Also by using the system can give a competitive advantage over other renting service businesses.

2.1.4 Challenges

- Lack of information and knowledge about developing softwares.
- Gathering information and requirements
- Proper coding standards
- Completing the task according to the time frame.

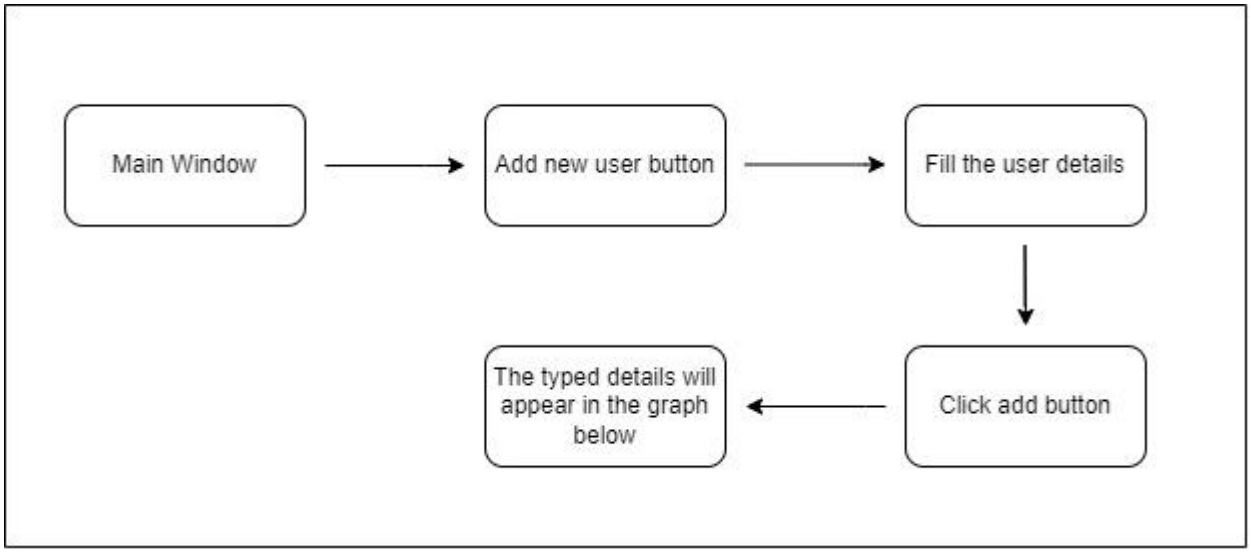
3.0 Design

3.1 System flow

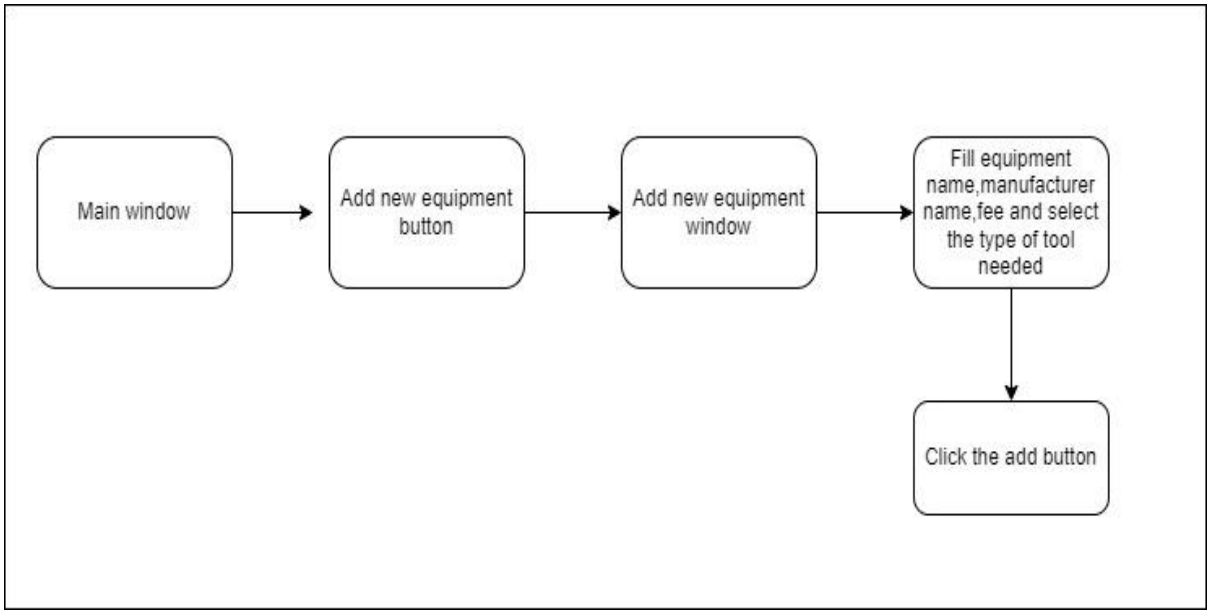
There are 6 buttons in the main window. When clicked they direct the user to 6 different windows. The 5 buttons represent 6 different basic functions of equipment renting system.

1. Add borrow equipment details
2. Add new user details
3. Borrow history details
4. Add new equipment details
5. Add penalty fee

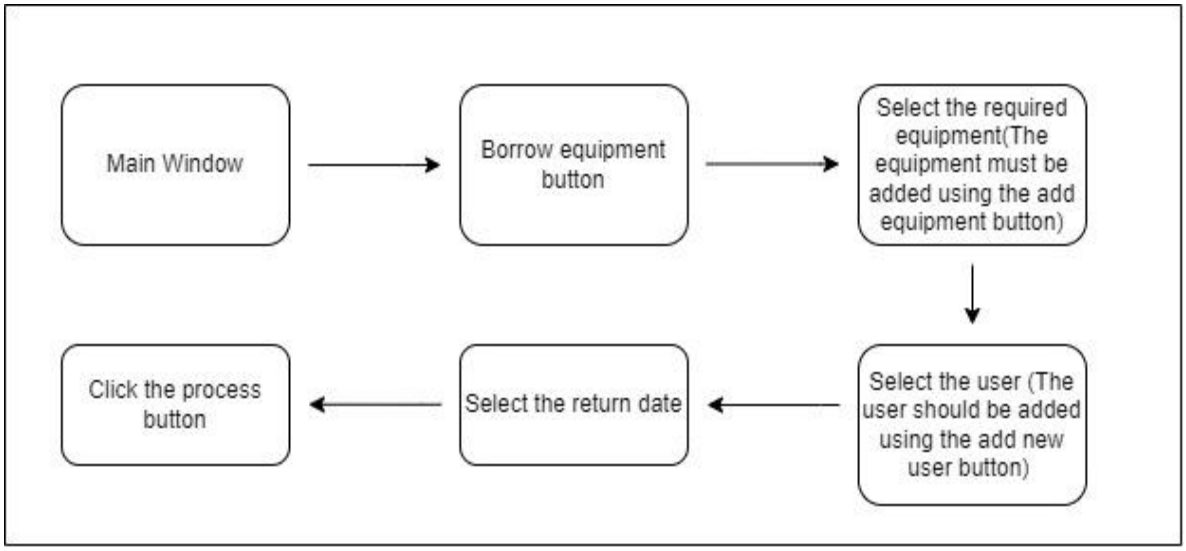
❖ Add new user details



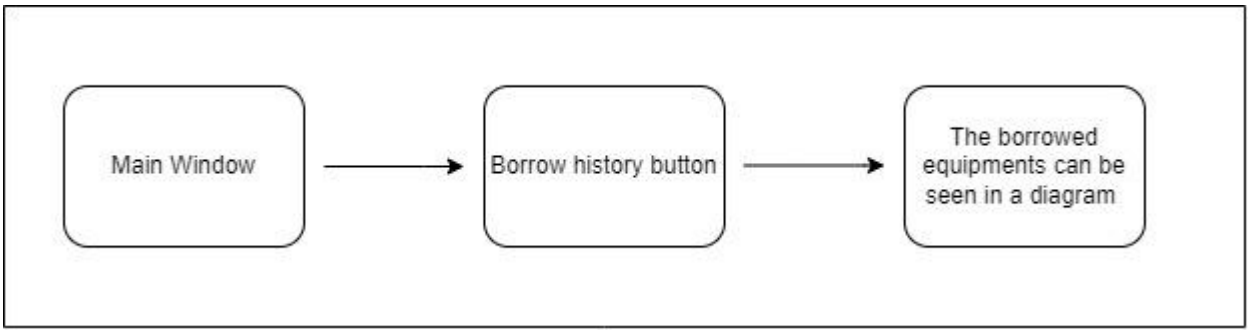
❖ Add new equipment details



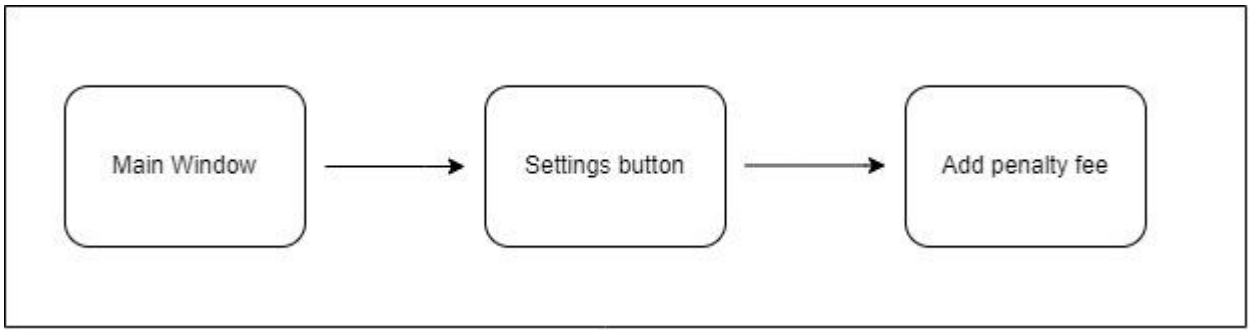
❖ Borrow equipment details



❖ Borrow history details

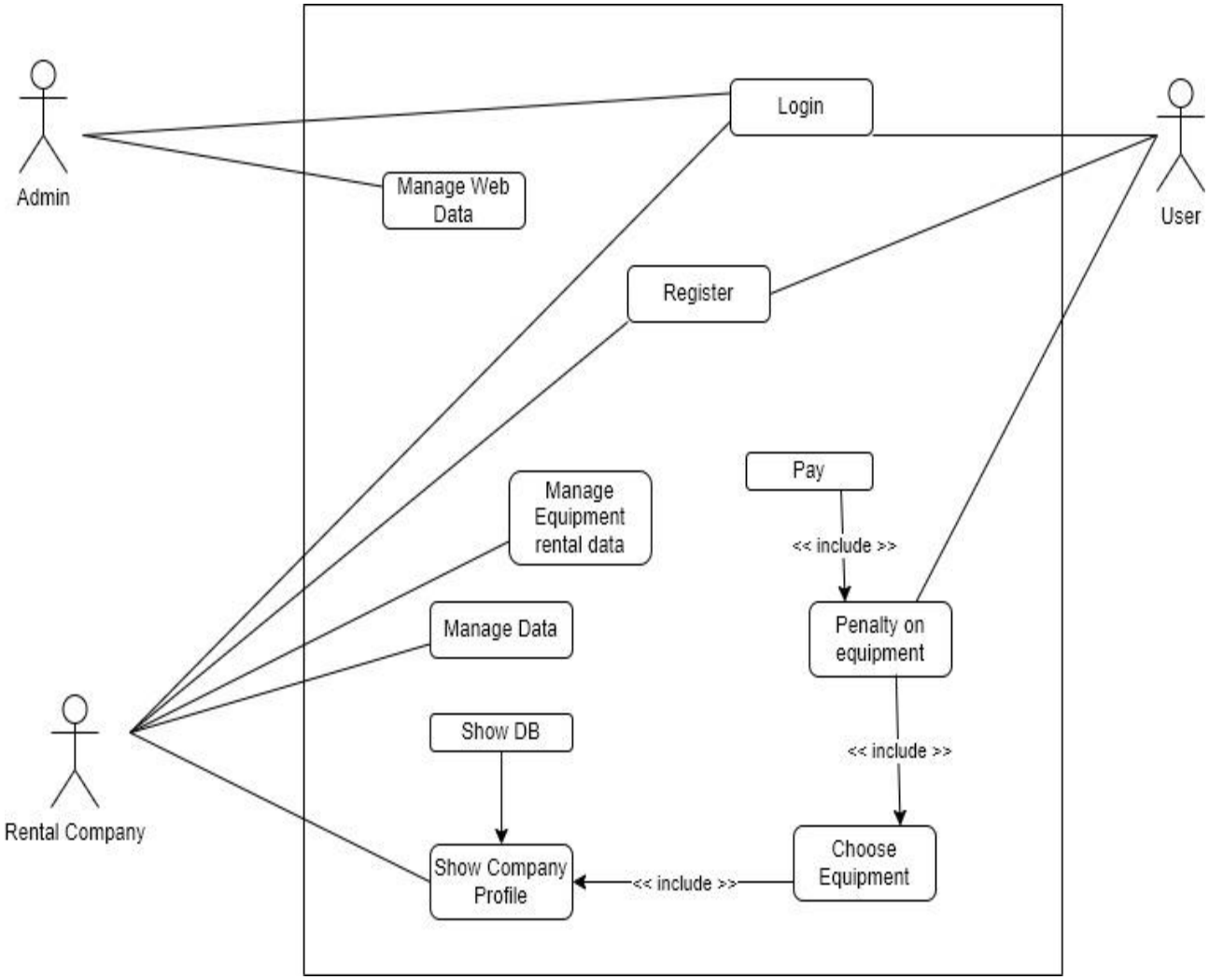


❖ Add penalty fee

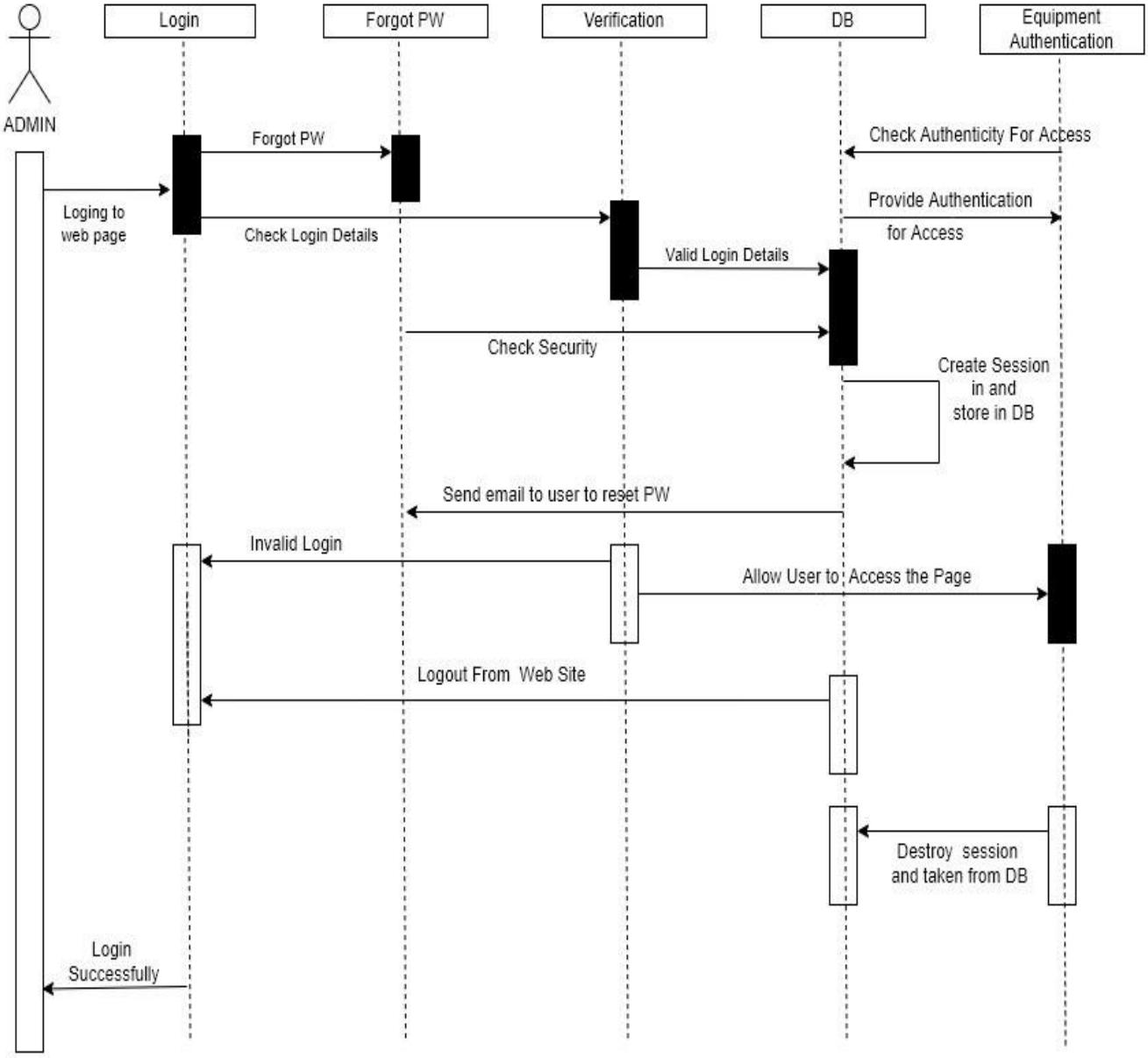


3.2 Architecture

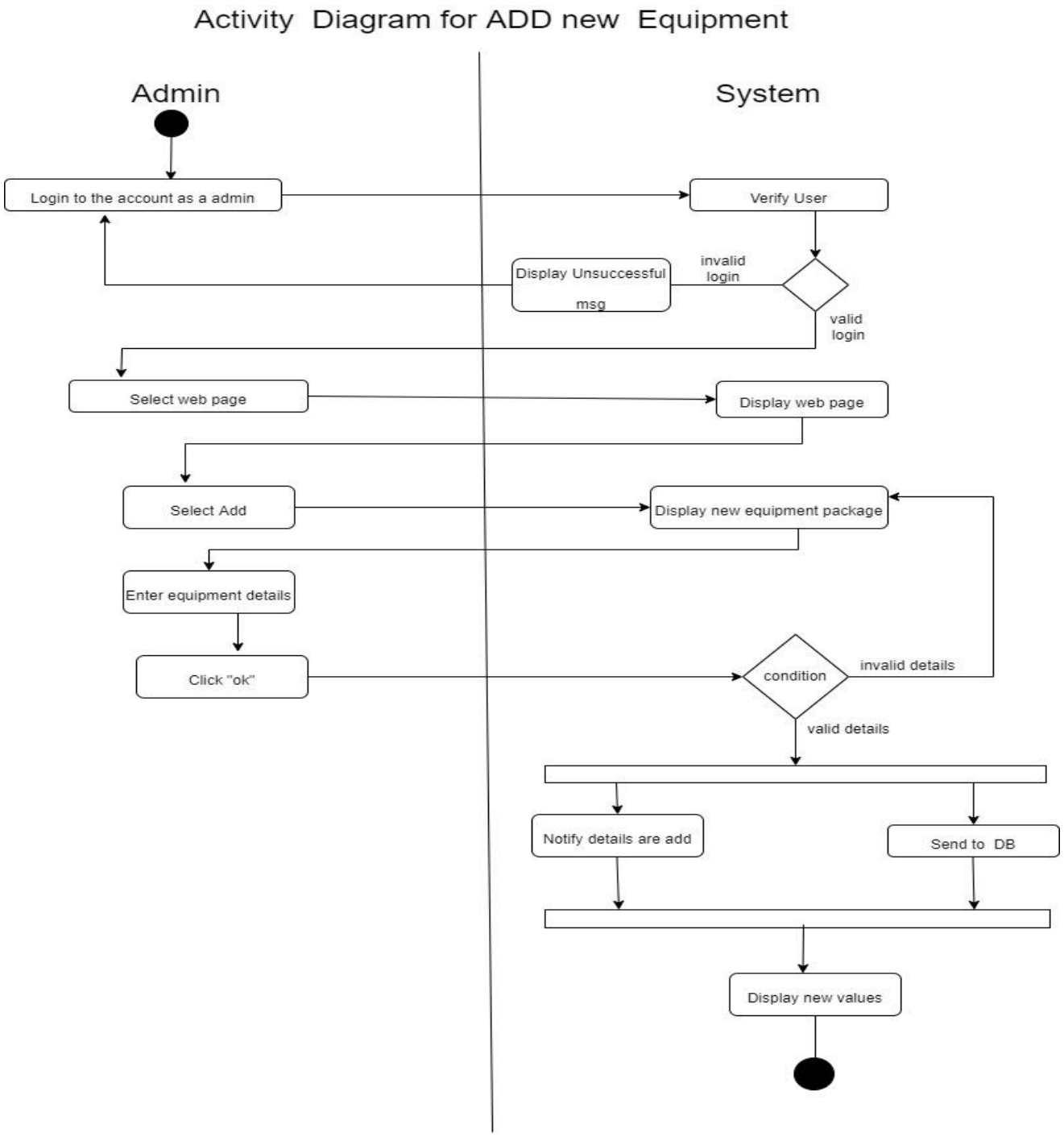
3.2.1 Use case diagram



3.2.2 Sequence diagram



3.2.3 Activity Diagram



3.2.4 Advantages of the system

- Secure
- Easy management
- User friendly
- Easy to use
- Data integrity

3.3.5 Disadvantages of the architecture

- Only the owner or the user has permission to view the system. (If the customers could view what equipment is available for rent, it would be easy.)
- Maintenance cost

4.0 Design solution

4.1 Difficulties faced

- Lack of programming knowledge
- Communication problems among team members
- Gathering information regarding equipment renting services
- Developing the system user friendly

4.2 Project plan

Theme	Epic stories	Backlog items
Equipment Management System	Responsibility of the user	• User needs to update daily according to the changes.
	Responsibility of the System	• Should store the data related to the equipments, customers, and the dates. • Ability to delete information from the database • Show data when required.

4.3 Work Allocation

Work Allocation	Team Member Name	Reg No	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Project Conception										
Suggesting ideas about the contents	Thisara Wickramaarachchi	AA2122								
	J.C.B. Kehelwatta	AA2129								
	Nimesh Mendis	AA1424								
	Ishara Madhushan	AA2025								
	M.C Jananath Bandara	AA1600								
Reviewing ideas	Adiththa Imasha	AA1378								
	Dinusha Werapitiya	AA1391								
	Pubudu Karunaratne	AA2048								
	Sasindu Iduwara	AA2209								
Finalizing the basic ideas										

Work Allocation	Team Member Name	Reg No	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Documentation										
Project Proposal	Thisara Wickramaarachchi J.C.B. Kehelwatta Nimesh Mendis Ishara Madhushan M.C Jananath Bandara Adiththa Imasha	AA2122 AA2129 AA1424 AA2025 AA1600 AA1378								
Project Presentation	Dinusha Werapitiya Pubudu Karunaratne Sasindu Iduwara	AA1391 AA2048 AA2209								
Project Report										

Work Allocation	Team Member Name	Reg No	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Initiation										
Getting a list of items that is essential for the system	Thisara Wickramaarachchi J.C.B. Kehelwatta Nimesh Mendis Ishara Madhushan	AA2122 AA2129 AA1424 AA2025								
Programming	M.C Jananath Bandara Adiththa Imasha Dinusha Werapitiya Pubudu Karunaratne	AA1600 AA1378 AA1391 AA2048								
Testing and Debugging	Sasindu Iduwara	AA2209								