Smart Office Equipment Management System

By

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PGDIT, IIT, JU

This project report is submitted to the Institute of Information Technology (IIT) in Jahangirnagar University
the Sub requirements for the Program of
Post Graduate Diploma in Information Technology (PGDIT).

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DECLARATION

I want to declare this project is based on Software as a Services (SaaS) by myself. This project “Smart Office Equipment Management System (SOEMS)” is organized by SRS requirement of project work found by different resources are depended on references. For motivation, projectsject can be managed by digital devices with addition, managing asset, rather than managing of Asset Management System. There are most of famous organization are using this as Software as Service, but small office doesn’t use. For this reason, I have created this management system due to small office smartly use, either in total or in part of any project, have been not submitted for any program.

_____

Md. Anisur Rahman

ID: 19117

CERTIFICATE

This is to certify that the title of this project is **"Smart Office Equipment Management System (SOEMS)"** submitted by Md. Anisur Rahman, ID: 19117, Session: Spring 2019, has been accepted as cordially in sub-requirements for the program of Post Graduate Diploma in Information Technology (PGDIT) on May 2022.

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Dr. Rashed Mazumder

Supervisor

Accepted and approved as the partial fulfillment of the Post Graduate Diploma in Information Technology (PGDIT) requirements.

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ABSTRACT

A fruitful way for creating any innovative system in a computing environment to integrate a sufficiently user-friendly interface with the ordinary end user. Smart Office Equipment Management System (SOEMS) is a project based on Software as a Services (SaaS). It can be managed all digital assets using this application SOEMS. Basically, this project review, it provides add devices, manage devices, edit devices, report as Asset Management System. Currently, ABC has an SOEMS system will be ready for smartly ways in all offices use. For motivation, the project can be managed digital devices with addition, managing asset, rather than managing of Asset Management System. There are most of famous organization are using this as Software as a Services, but small office doesn't use. Smart Office Equipment Management System (SOEMS) system is too easy to use, manage, control, secure and authentic way service provides. Sometime many organizations asset not found, missing, lost, hide as memory of mind, for this reason. It has created management system due to small office smartly use asset with an application that using PHP Framework, Star Schema Model and dashboard-based web platform, either in total or in part of any project, have been not submitted for any program.

Keywords: Asset, Management, HR, SRS, SOEMS, PHP, MySQL, Databases, Activity log, Risk Management.

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LIST OF ABBREVIATIONS

JU	Jahangirnagar University
IIT	Institute of Information Technology
PMIT	Professional Masters of IT
PGDIT	Post Graduate Diploma in IT
SRS	Software Requirement Specification
SaaS	Software as a Services
SQL	Structured Query Language
DBMS	Database Management System
HTML	Hyper-text Markup Language
CSS	Cascading-Style-Sheet**s**
PHP	Hyper-text Preprocessor
ERD	Entity Relationship Diagram
SOEMS	Smart Office Equipment Management System

ACKNOWLEDGEMENT

For creating project, I am thankfully to like our honorable teacher, faculty of IIT, Jahangirnagar University, he endless sacrifices and support me to solve any problem of project. Our teacher helps us about this project “Smart Office Equipment Management System (SOEMS)”.

I have introduced our teacher, Assistant Professor DR. Rashed Mazumder, our supervisor, mentor and friend. He is very helpful person to support us. I hope that his instruction will help us future project work. His time, efforts and insightful discussions throughout this degree are highly appreciable.

I am also grateful to PGDIT & PMIT committee members: Professor, K M Akkas Ali, Professor Dr. Fazlul Karim Patwary and Associate Professor DR. Jesmin Akhter for their helpful comments and suggestions and previous classes. System Analyst of IIT, JU, A N M Hasnat Tanvir Sir helps me for cooperation as an official program.

Finally, all classmates are given thanks by me due to be cooperated. It’s about time! Remember, it’s o.k. to stress just not to stress out. To all of you, thanks for always being there for me.

Md. Anisur Rahman

Id: 19117

PGDIT, IIT, Jahangirnagar Univer

CHAPTER I

Introduction

1.1 Overview

This project review is a software requirement specification (SRS) system of Smart Office Equipment Management System for the Asset Management System of HR Department Project. This project requirement meets an organization to manage smart device with asset management system.

1.2 Problem Definition

Now a day, many companies lost their equipment, not found some devices, where the device was, or many devices missing, so I have created a management system which manage the devices, user details, user location, device's location, who are responsible these devices. This project provides asset management with security. Smart Office Equipment's Management System is one of most asset management problems solves.

1.3 Purpose

Most of Institutes lost their equipment, not found some devices, where the device was, or many devices missing. For this, it provides add devices, manage devices, edit devices, report as Asset Management System. Currently, ABC has an SOEMS system will be ready for smartly ways in all offices use. For motivation, the project can be managed digital devices with addition, managing asset, rather than managing of Asset Management System. So, the project is responsible for Devices management system to control our asset management.

1.4 Objective

This Project Target is to assign device with smart way in any office to compute the asset management system. So, I have proposed some arguments according to objectives.

Design and Development Assessment:

- To add devices and users
- To edit devices and users
- To get ready user
- To get ready to deploy
- To view deployed user's details

Assessment Requirement:

- To view Employee Information
- To manage Equipment Information.
- To allocate and assign asset.

Implementation and Testing:

- To maintenance the management
- To get reports management
- To search for easily find out.

CHAPTER II

Background

2.1 Introduction

This is web-based software about HR department Asset Management System in Software Requirement Specification (SRS). This application was studied at feasibility into business purposes and manage asset's data, lost and found, assign to employee, Maintenance, requirement calculation of goods, reports, repairing, performance evaluation and so on.

2.2 Scope of Problems

This project review's definition is managing asset management with this application SOEMS project. It mainly includes the requirements for add devices & users, edit devices & users, Allocation-Assignment-buying devices, non-functional and control asset management system.

2.3 Information gathering from different sources

General Employees:

- Users can change their password and logout.
- User will login using their User id & Password.
- Employees will apply through online repairing and recognition form.

HR/Admin Executive:

- Employee information should be recorded such as Device, Official, References.
- Executive will check the current equipment status to manage all product.
- Equipment ID should be generated automatically while new equipment info is recorded.
- Equipment can be change for resigning employee.
- If anyone has lost equipment,

- Executive will allocate new equipment for his/her.
- Warning notification send via email or SMS for any problem found.

HR/Admin Manager:

- Manager will approve the new allocation by a single click (option to write down reason if rejected).
- Any data can be viewed, inserted, updated and deleted.

2.4 Related Works

Now a days Asset Management is essential part of our corporate life of Digital World. At present, most of all institutes use asset management system in briefly way. But some small offices can't use this system. For this situation, a lot of equipment lost, not found, or find out later by many queries. There are many IT & software related Companies use this application or created software for sale. In the advanced age in Bangladesh, Tiger IT is famous software making company make asset management system for client support or office equipment purpose. Now a days many Universities have started this system with asset management application.

So, this project under SRS is kind of web-based Smart Office Equipment Management System will very effective at small Offices or IT or HR Office. [1]

2.5 Challenges

To satisfaction the target forum, there are more challenges find out of our system architecture. Among these, we can complete our task about some challenges.

- Reach the target goals.
- Asset Tracing
- Reports Management
- Verification of Assets
- Secure assign Asset.
- Allocation, Buying and Exchanging Management
- Security Issues.

CHAPTER III

Software Requirement Specification

3.1 SOEMS Asset Management System Process

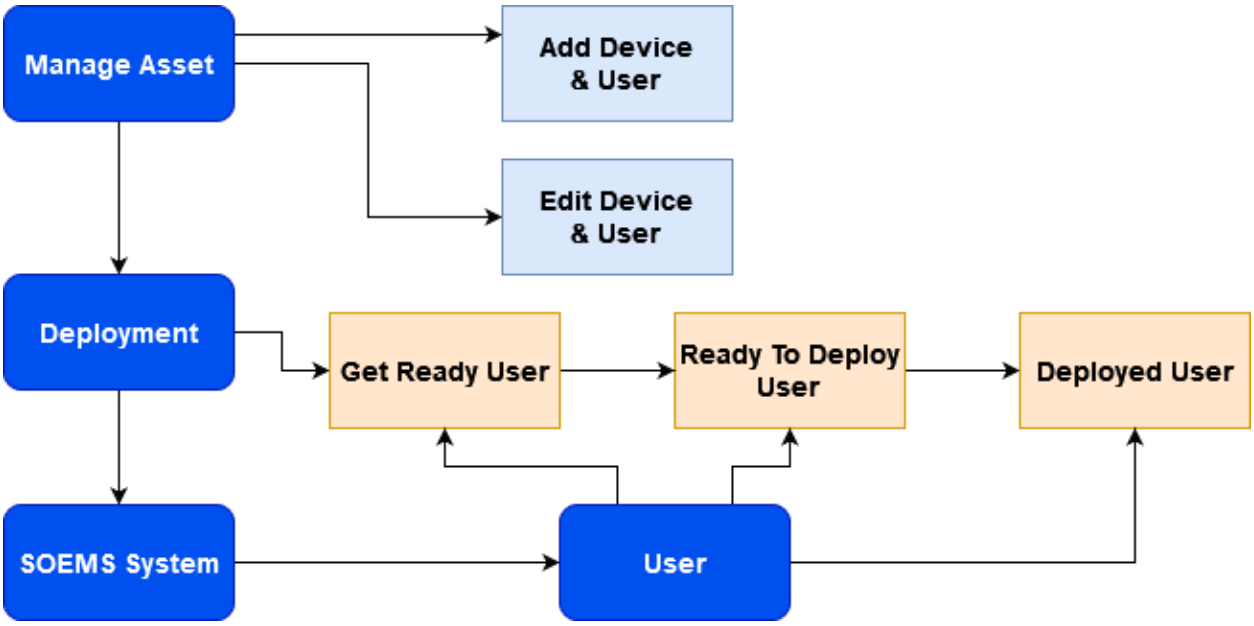


Figure 3.1: SOEMS Asset Management System Process

From Figure 3.1, Asset Management System Process in device is assigned to user by Manage Asset through add device and user, Edition in Smart Office Equipment Management System. Admin only control asset management system. Asset management is simply a system that assists businesses in keeping track of all of their assets, such as device, equipment, and investments. Keeping track of assets helps to track operations, especially when it comes to managing more disposing of them. [3]

3.2 Requirement Procedure and Analysis

Our Project "**Smart Office Equipment Management System**" has some specific requirements and procedures that our project can be smarter than other system. So, we want to find out some new apologies to build up our system procedures and analysis our system architecture. [4]

- Firstly, we shall identify our problems and try to find out our solutions.
- Secondly, to capture stakeholder requirement
- Categorizes requirements and Technical Support
- Our project prototype design
- Report Generated with categories
- Project Management for scheduling
- Gap Analysis
- Feasibility study of our requirement [6]

3.3 SOEMS Business Process Model

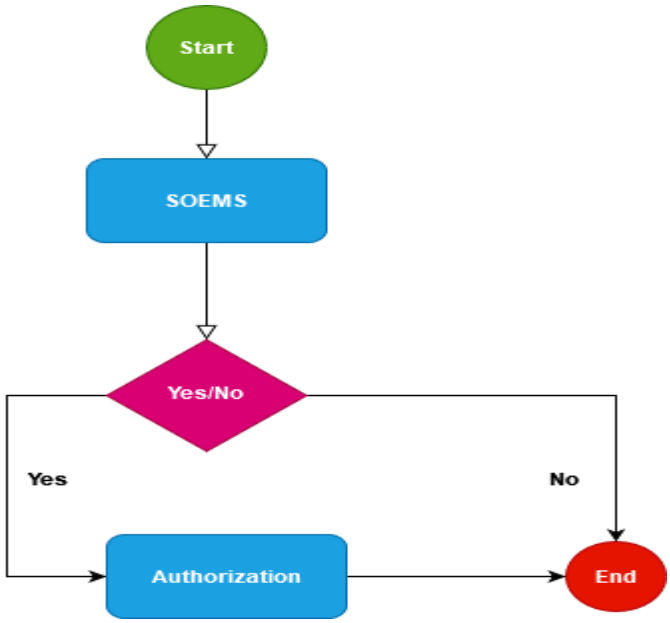


Figure 3.3: SOEMS Business Process Model

Business Process Model is connected with user interaction to system. **From Figure 3.3**, asset is calculating with this model. It is very effective part of any system architecture. SOEMS Model is feasibility to study and requirement support.

3.4 SOEMS Use Case Diagram

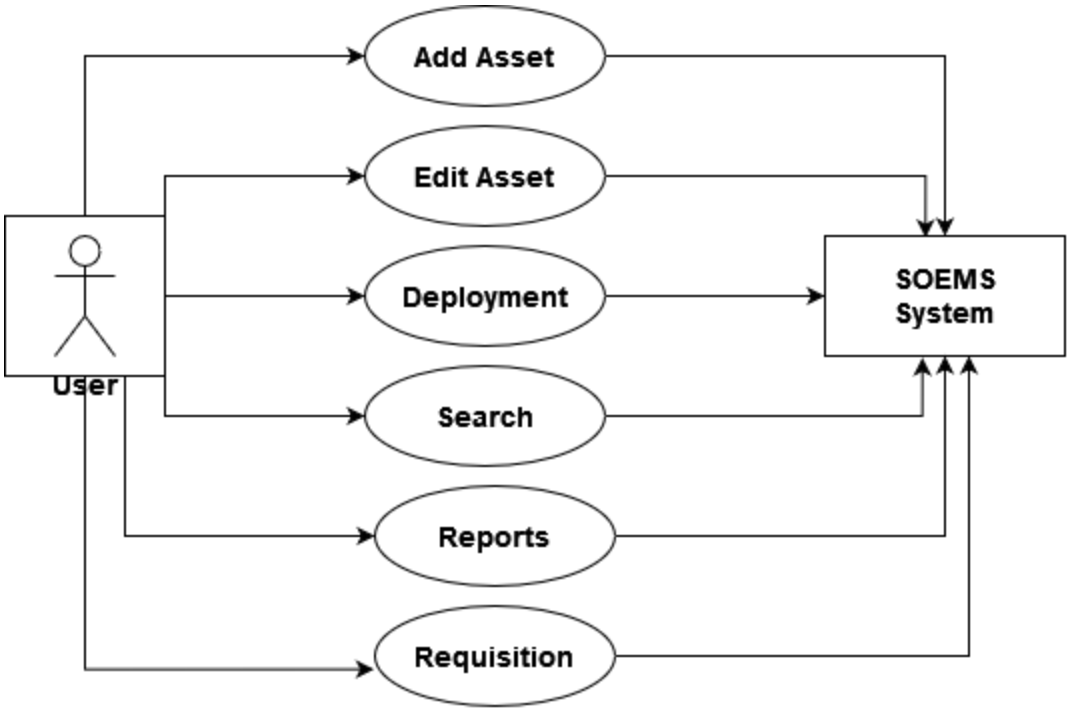


Figure 3.4: SOEMS Use Case Diagram

A use case diagram, Unified Modeling Language (UML) can summarize the details of your system's users (also known as actors) and their interactions with the system. To make one, you'll need a special set of symbols and connectors. **From Figure 3.4,** it can provide a Modeling system to use the project. It is also their interactions with the system.

3.5 Simple Entity Relationship Diagram (ERD) – SOEMS System

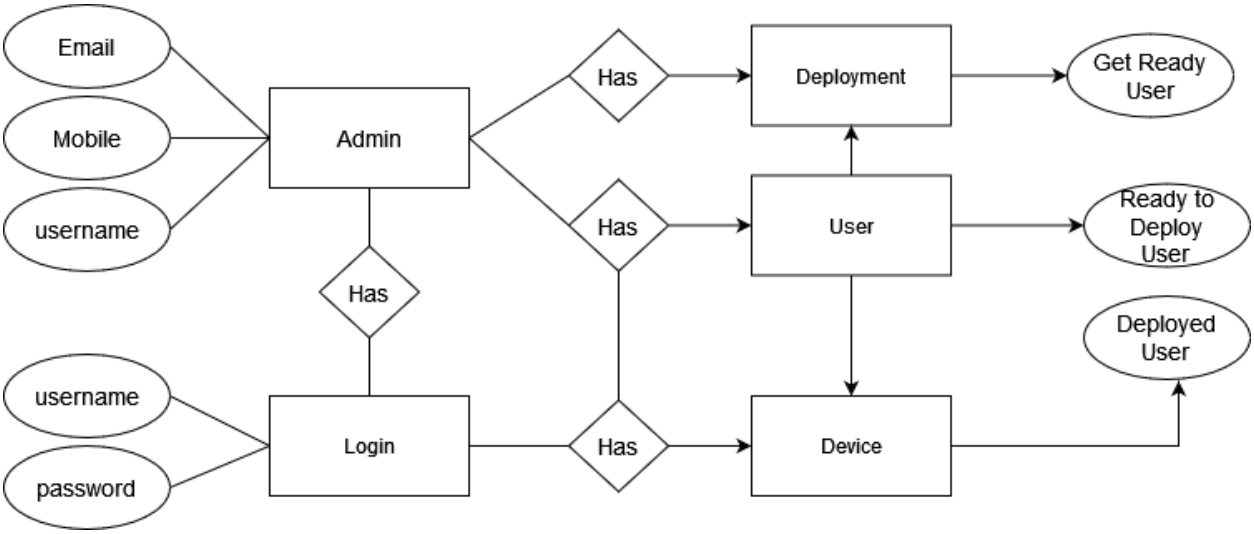


Figure 3.5: SOEMS System - Entity Relationship Diagram (ERD)

An Entity Relationship (ER) Diagram is a type of flowchart that shows how "entities" in a system, such as people, objects, or concepts, interact with one another. **From Figure 3.5**, ER Diagrams are most commonly used in the fields of software engineering, business information systems, education, and research to design or debug relational databases. They use a defined set of symbols such as rectangles, diamonds, ovals, and connecting lines to depict the interconnection of entities, relationships, and their attributes. They are also known as ERD or ER Models. They reflect grammatical structure, with entities acting as nouns and relationships acting as verbs.

3.6 Design and Development Requirement

Design and Development Requirement is most important part of system architecture. We have used some techniques and tools for design and development to create our project prototype. There are two options of our project design and development – Software Requirement and Hardware Requirement.

Software Requirement-

- Apache Server, MySQL, XAMMP Open-Source Software
- DBMS, Localhost (127.0.0.1 IP)
- PHP, HTML, CSS, JavaScript (Front-End & Back-End)
- Star schema Model [8]

Hardware Requirement-

- 8 GB RAM
- Computer Unit (220 GB SSD)
- Network Adapter
- Core-i7 intel Processor 4.8 GHz

3.7 Front-End Design and Development

3.7.1 HTML

HTLM (Hypertext Markup Language) is a client-based markup language which only run-in browser. In Front-End Design, HTML provides web contents design in the web platform. Some parameters of HTML are-

- View of web contents
- Using tags attribute for creating section of contents. (<html> </html>)
- Not difficult to codes.

3.7.2 CSS

CSS (Cascading Style Sheet) is also client-based design maintaining attributes. CSS provides web layout design of web pages. It displays web pages is smarter than HTML. Web pages go through design build up by CSS.

- Web Pages Layout Design
- Web Pages design measurement
- Web pages contents size apologies.
- Fit for responsive design using CSS
- Not very difficult to codes.
- Overall CSS web layout design and development.

3.7.3 JavaScript

JavaScript is one of the client-based scripting programming language to design of web platform. It provides the website more secure and calculating value of web contents.

- Client based script
- Calculating content with JavaScript
- Dynamic and Responsive
- Thread generates by JavaScript
- Loading in loop in same page not reload page
- Advanced web contents created

3.8 Back-End Design and Development

3.8.1 PHP

PHP (Hypertext Preprocessor) is one of the Back-End scripting programming language. [9]

- Fast to connect server
- Flexible to use
- Pragmatics for system
- Connect Databases

3.8.2 MySQL

MYSQL is a query-based language. Management service with OLTP and OLAP are depend on MySQL [8]

- CREATE DATABADE
- CREATE TABLE
- DROP, JOIN, ALTER, UPDATE with CRUD System

3.9 Front-End Part of the Project

I have created a web application front-end part using HTML, CSS. Some Screenshots of this web application front-end part show following figures of the project “Smart Office Equipment Management system”.

Dashboard of SOEMS

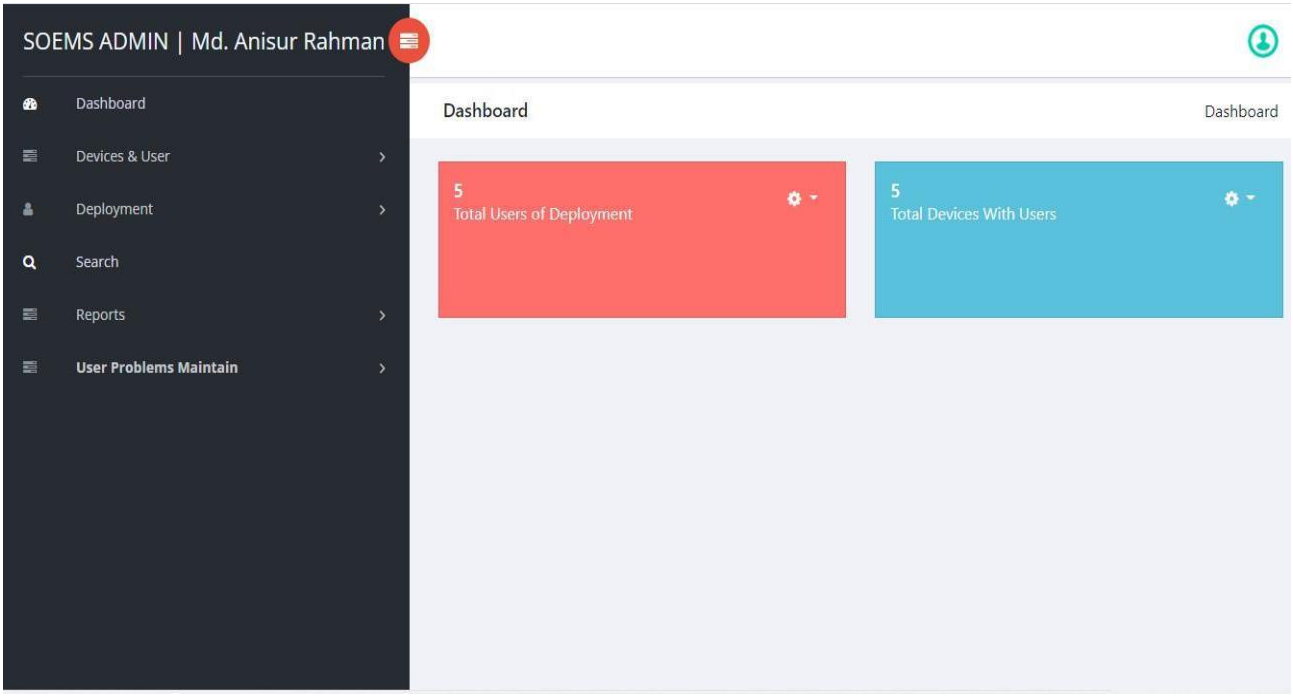


Figure 3.9.1: Dashboard of SOEMS

Dashboard is interactive page of software, In the dashboard we have two operations, Total users and total devices. It provides main page of software. Besides, it collection of resources of activities.

Add Device & User:

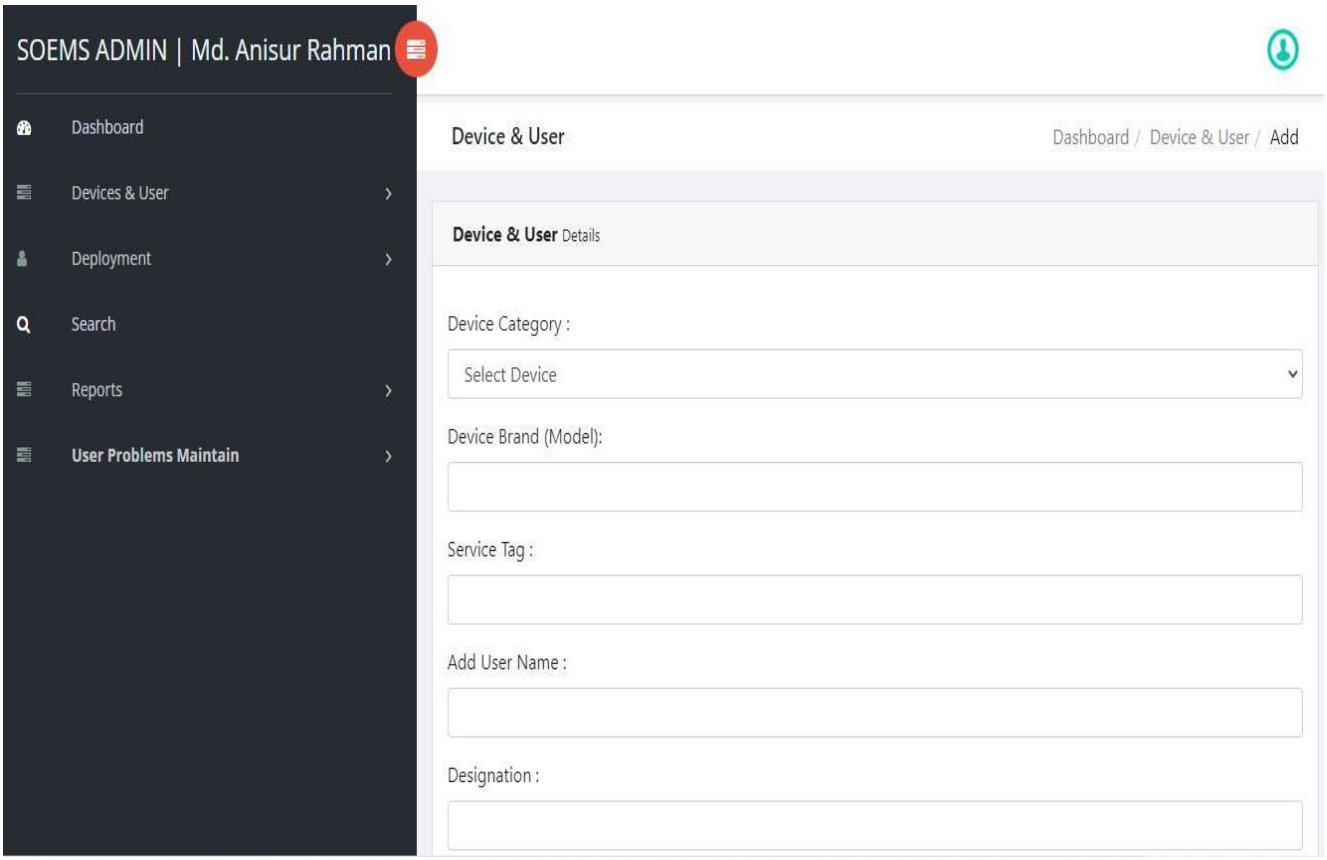


Figure 3.9.2: Add Device & User

Add device and user is a form of web page to insert data to database. It has user information to update this and manipulated devices and user's interaction.

Edit & Update Device & User:

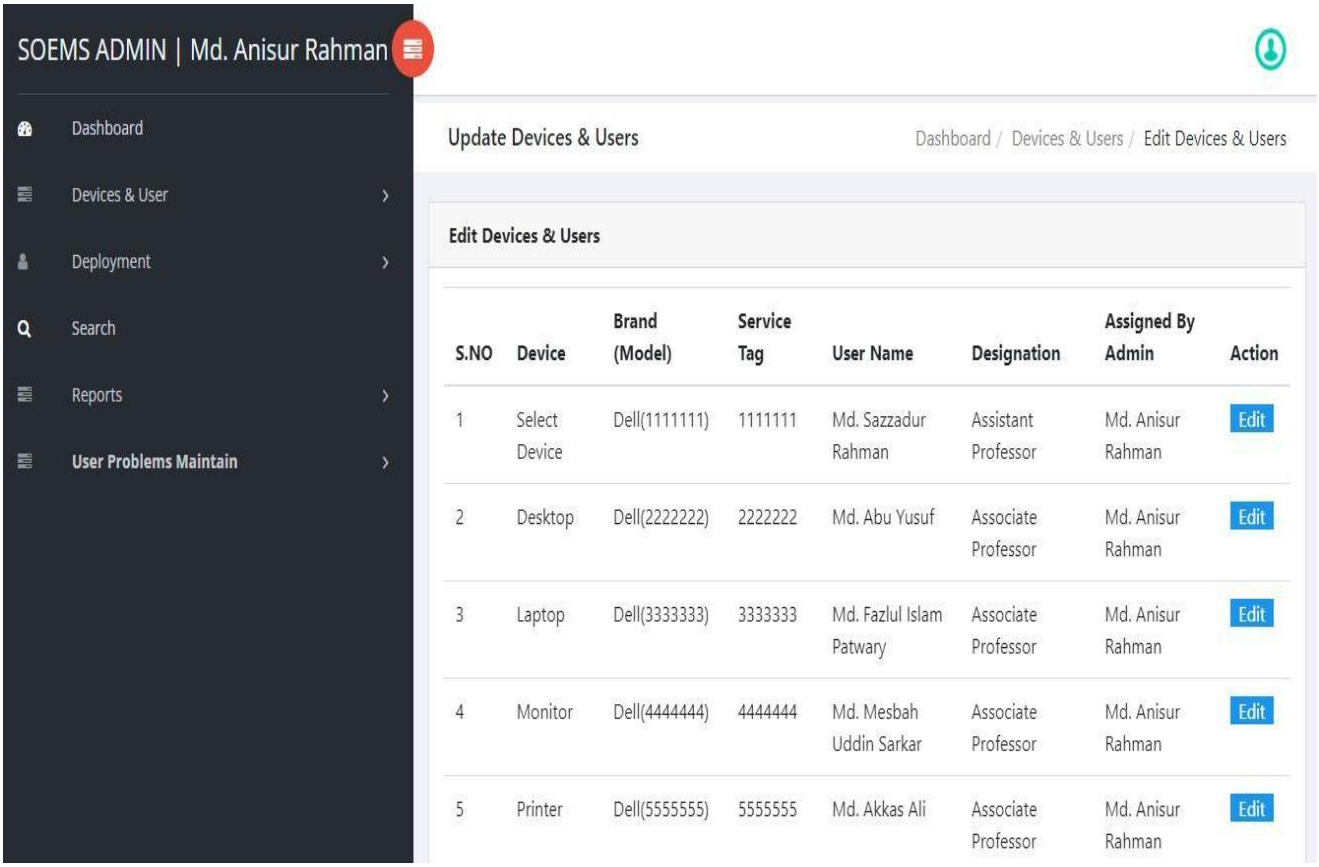


Figure 3.9.3: Edit and Update Device & User

It has user information to update this and manipulated devices and user's interaction. When some data input in wrong way, it has edit button to update information. When we see wrong information immediately edit to update data in database.

Get Ready User:

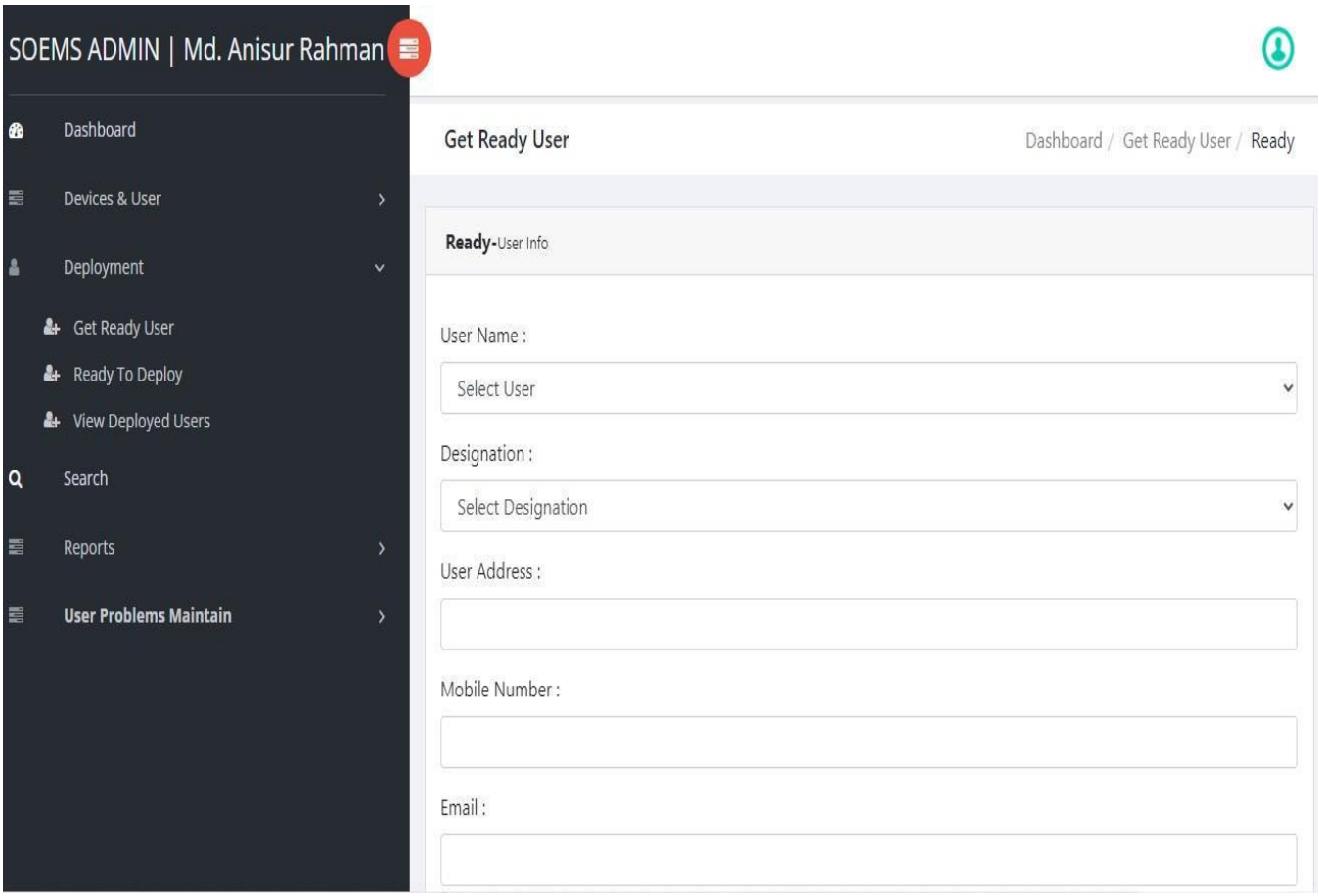


Figure 3.9.4: Get Ready User

Get ready user is a section to select user from database. Then User has ready to deploy then manipulated data properly. First we select user, select device, and insert information to database. It provides User get ready for deploying.

Ready To Deploy:

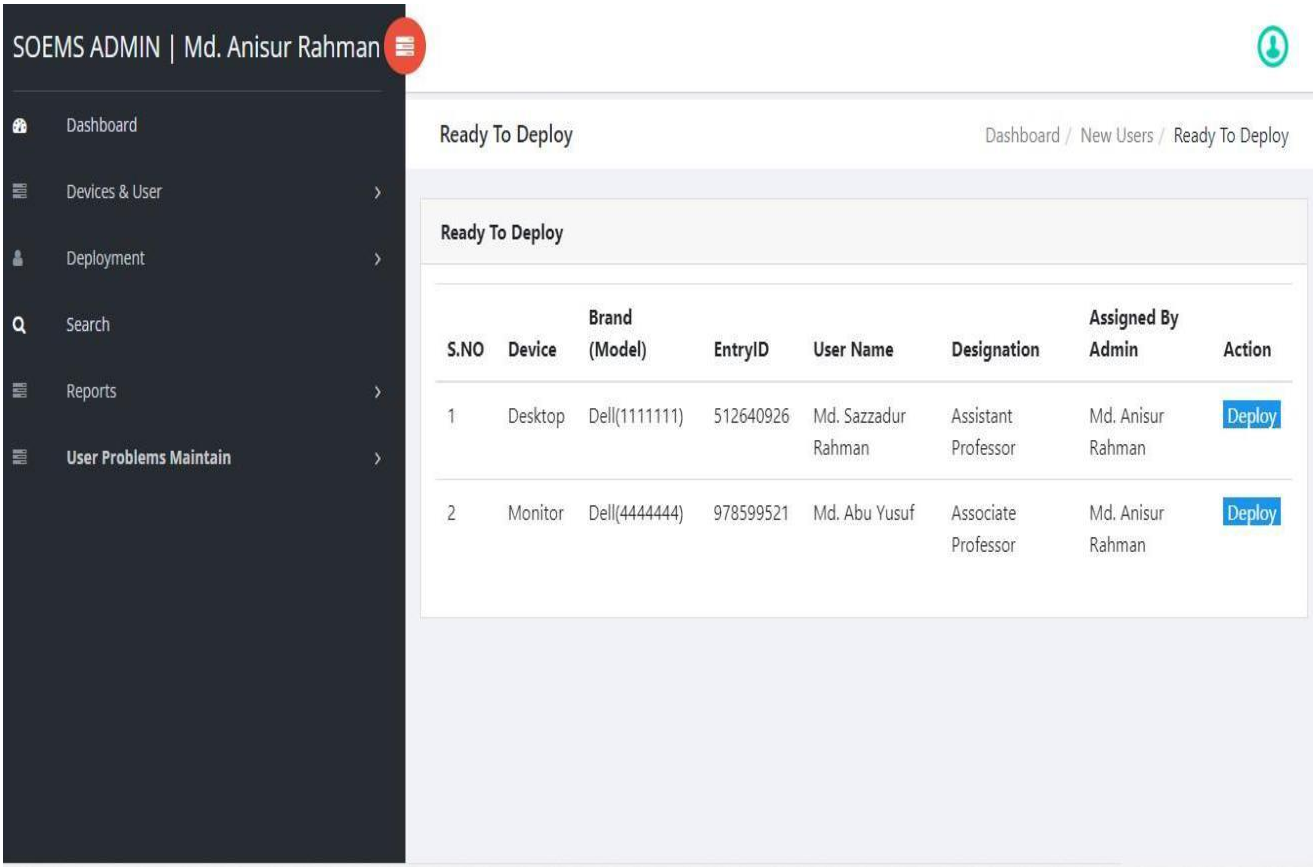


Figure 3.9.5: Ready to Deploy

Ready to deploy is an operation to ready user and then some perimeter has come for new update. It is a part of select user information to ready device to use and sometimes issue date for ready to deploy.

Deployed Users:

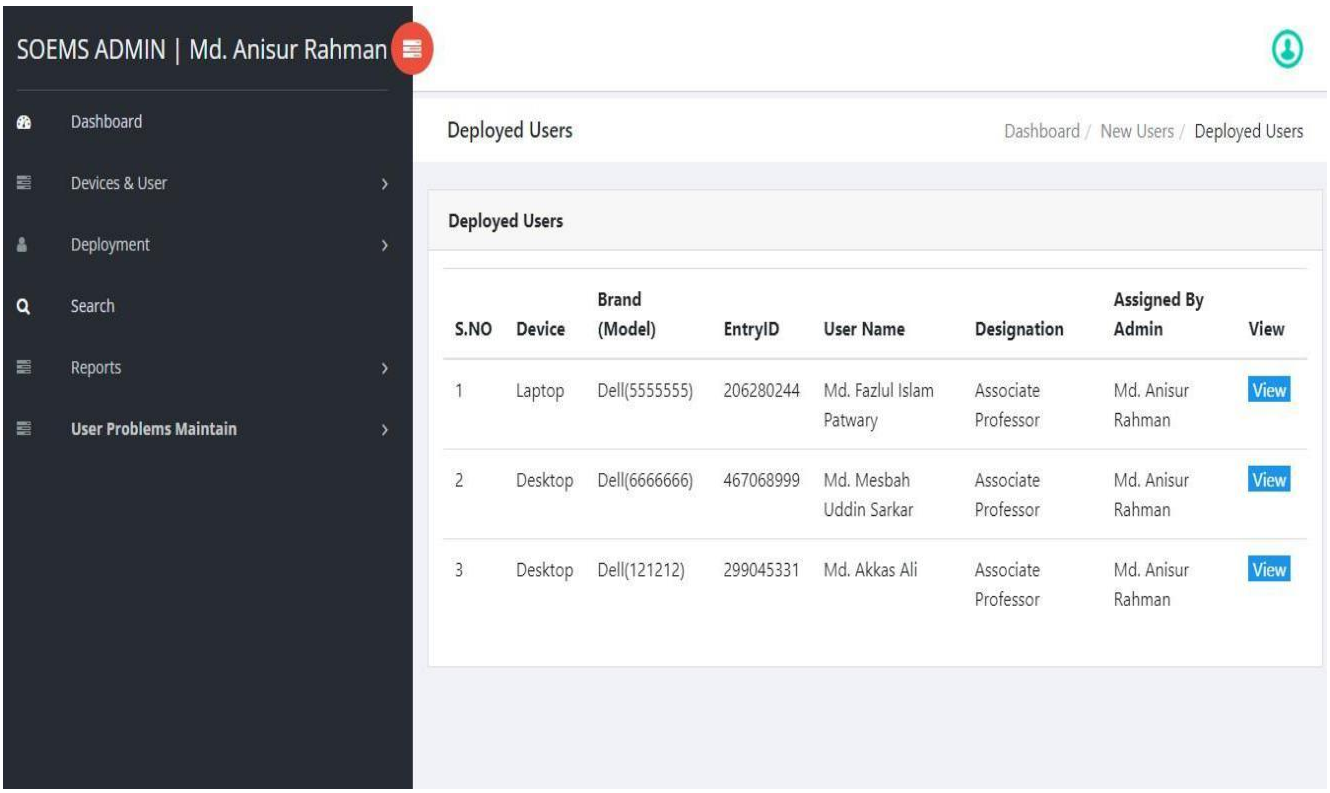
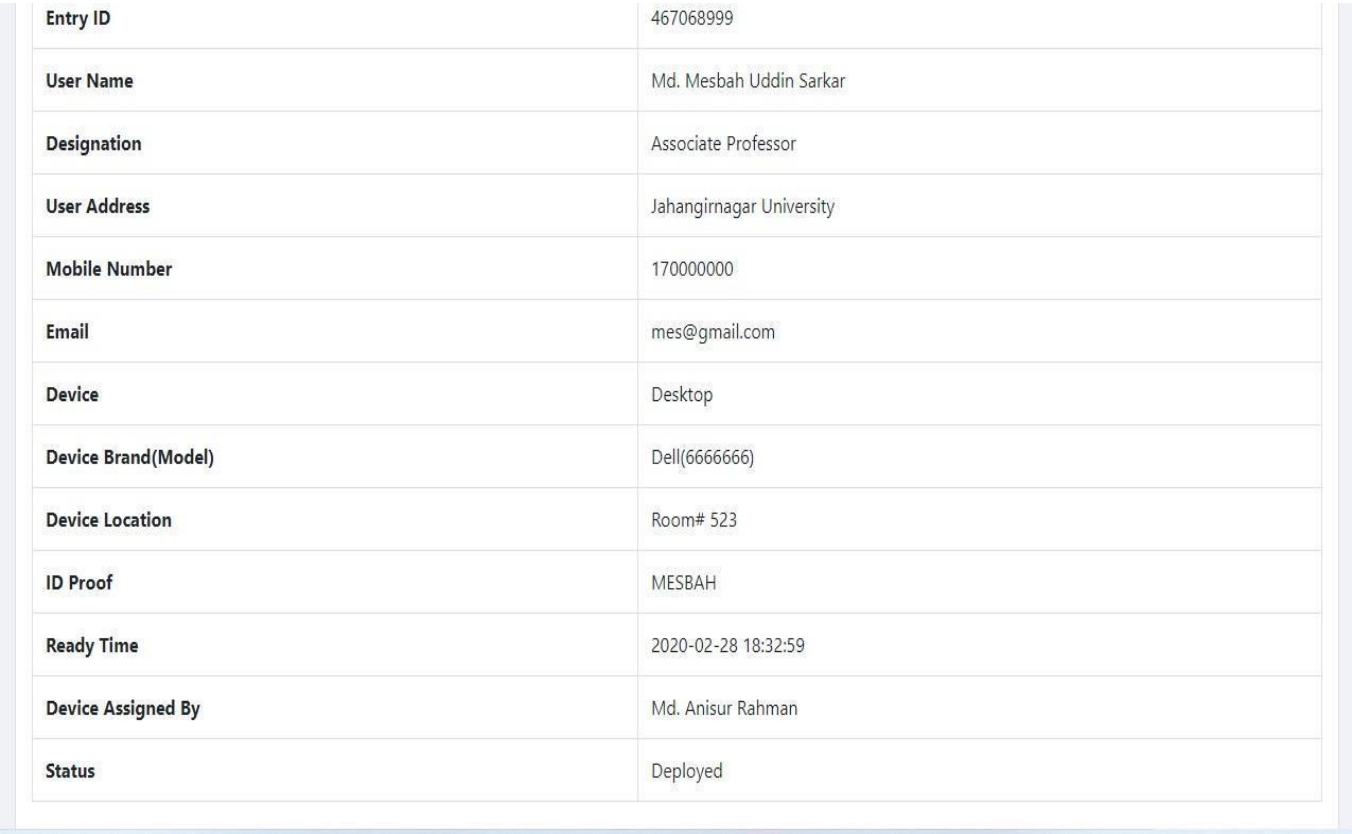


Figure 3.9.6: Deployed Users

When the ready user completes their operation for assigning asset for user is ready. The Database can access deployed user who are responsible for devices. It is a collection of device which are assigning for users.

View deployed user details who is assigned with device by admin:



Entry ID	467068999
User Name	Md. Mesbah Uddin Sarkar
Designation	Associate Professor
User Address	Jahangirnagar University
Mobile Number	170000000
Email	mes@gmail.com
Device	Desktop
Device Brand(Model)	Dell(6666666)
Device Location	Room# 523
ID Proof	MESBAH
Ready Time	2020-02-28 18:32:59
Device Assigned By	Md. Anisur Rahman
Status	Deployed

Figure 3.9.7: View deployed user details

It is a details of user who is responsible to use devices. It has issued date, user information, Location, Status, and admin assigns devices to users. It is a details of device which is assigned by admin to user.

3.10: Back-End Part of web Application

I have made a web application back-end part using PHP, phpMyAdmin, MySQL and Databases. Some Screenshots are given below:

Sign up Page:

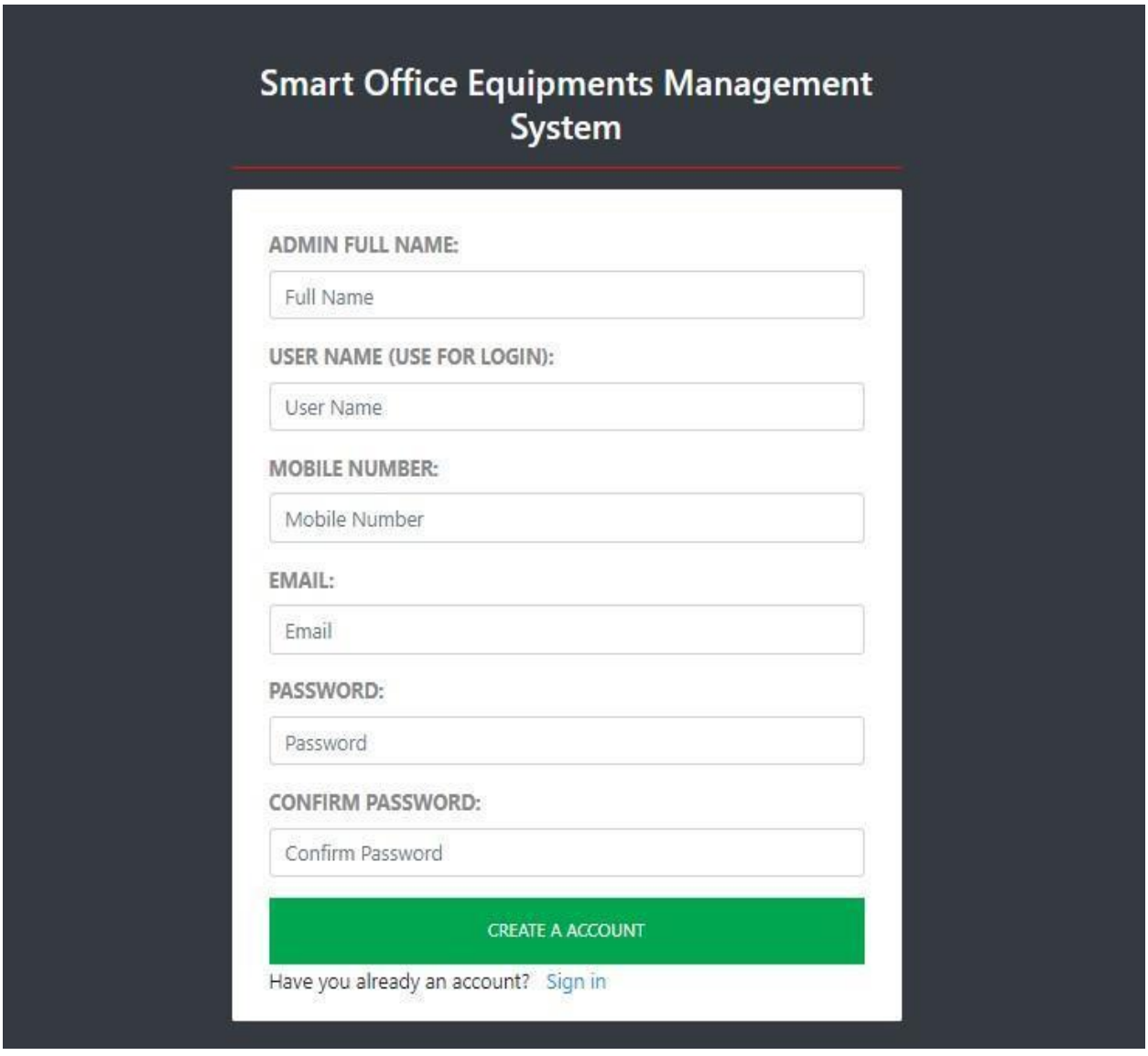


Figure 3.10.1: Sign up for Admin

Sign Up page provides user validation. When a user fills up the form to insert the date to database then data stored in database. A user first signs up the system for login with authentic way. It is an authentication process of system.

Login Page of application:

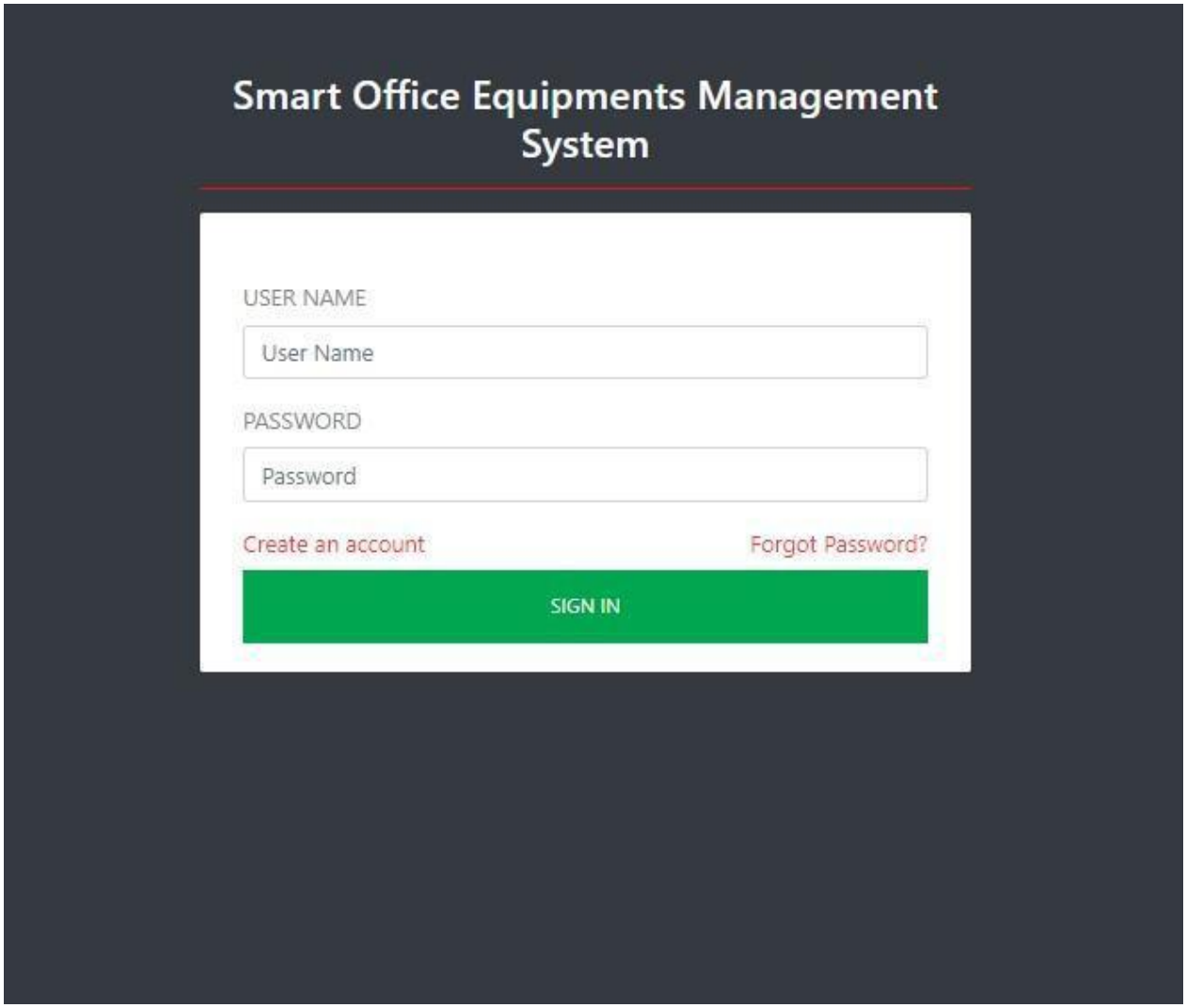


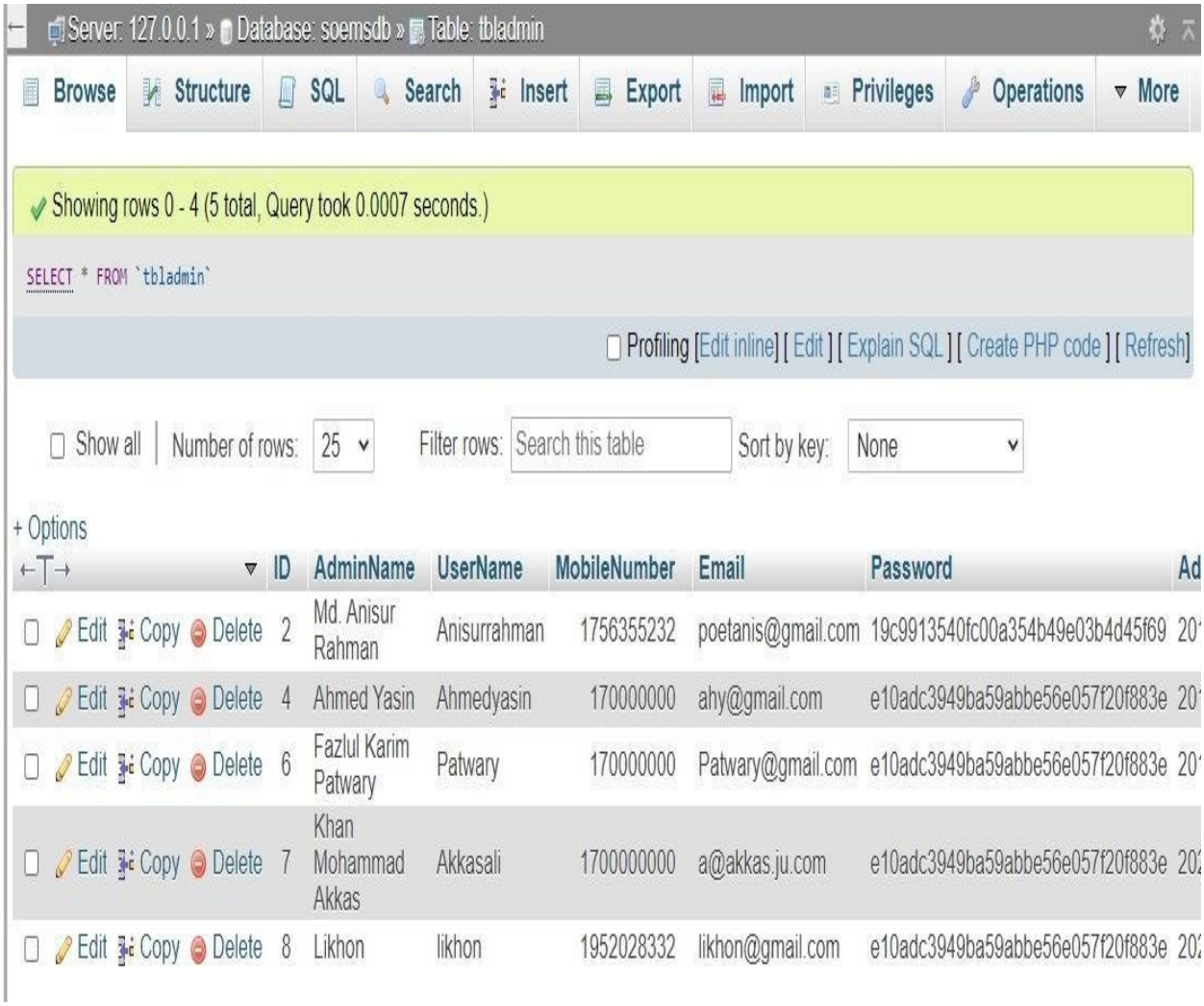
Figure 3.10.2: Login page of SOEMS

Login page control authentication with user validation. When a user login in a system they need a password to enter the system with authentic way. Login page also control authorization to control management system. It has HASH Techniques to encrypts the password with MD5. It provides secure and system security for security purposes.

3.11 Phpmyadmin Part of project

This Project Phpmyadmin some screenshots are given below: **Database Name: soemsdb**

Admin Table



	ID	AdminName	UserName	MobileNumber	Email	Password	Ad
Edit Copy Delete	2	Md. Anisur Rahman	Anisurrahman	1756355232	poetanis@gmail.com	19c9913540fc00a354b49e03b4d45f69	20
Edit Copy Delete	4	Ahmed Yasin	Ahmedyasin	170000000	ahy@gmail.com	e10adc3949ba59abbe56e057f20f883e	20
Edit Copy Delete	6	Fazlul Karim Patwary	Patwary	170000000	Patwary@gmail.com	e10adc3949ba59abbe56e057f20f883e	20
Edit Copy Delete	7	Khan Mohammad Akkas	Akkasali	1700000000	a@akkas.ju.com	e10adc3949ba59abbe56e057f20f883e	20
Edit Copy Delete	8	Likhon	likhon	1952028332	likhon@gmail.com	e10adc3949ba59abbe56e057f20f883e	20

Figure 3.11.1: Admin Table

This is a admin table of database. Sign up information are stored in here. A user fill-up the information, in admin table is responsible data of admin information. But also admin is a user that control all the system. But admin is authorized person of the system.

Devices Table

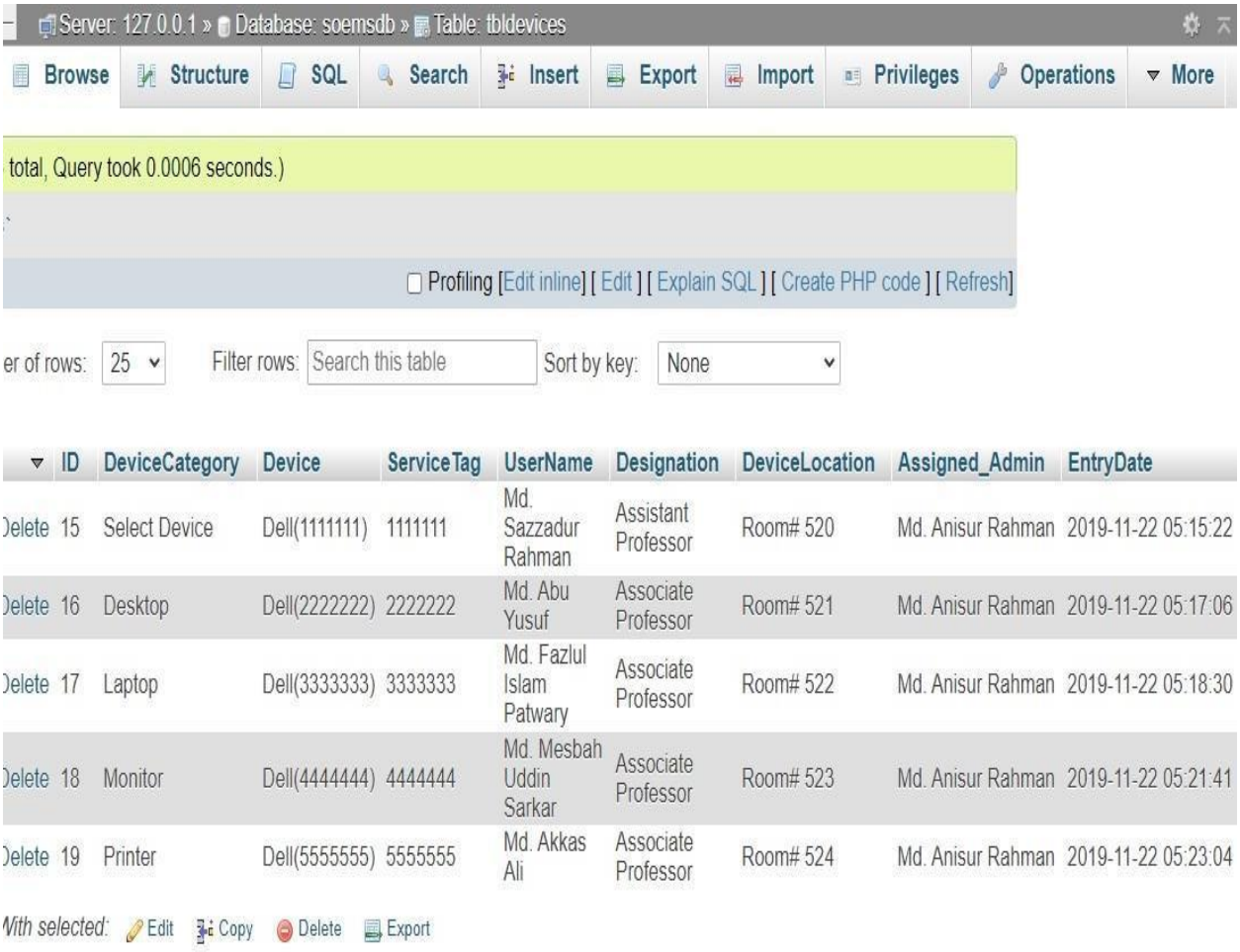
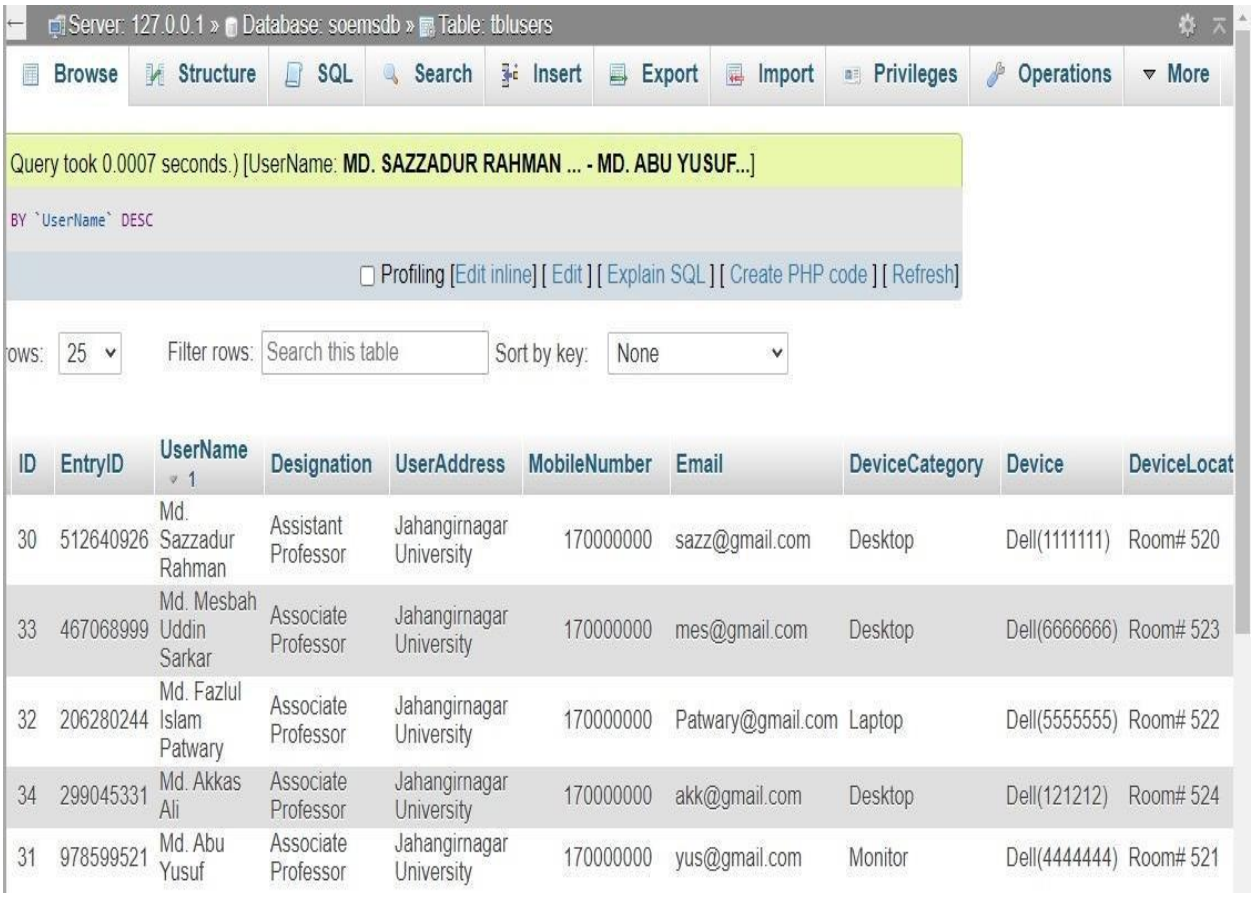


Figure 3.11.2: Devices Table

This is a Devices Table of database. It provides all devices information is stored here. All devices can be accessed by admin to control management. Asset management is part of this table. Device is managed with some query. It is an important table of database that asset management system.

Users Table



ID	EntryID	UserName 1	Designation	UserAddress	MobileNumber	Email	DeviceCategory	Device	DeviceLocat
30	512640926	Md. Sazzadur Rahman	Assistant Professor	Jahangirnagar University	170000000	sazz@gmail.com	Desktop	Dell(1111111)	Room# 520
33	467068999	Md. Mesbah Uddin Sarkar	Associate Professor	Jahangirnagar University	170000000	mes@gmail.com	Desktop	Dell(6666666)	Room# 523
32	206280244	Md. Fazlul Islam Patwary	Associate Professor	Jahangirnagar University	170000000	Patwary@gmail.com	Laptop	Dell(5555555)	Room# 522
34	299045331	Md. Akkas Ali	Associate Professor	Jahangirnagar University	170000000	akk@gmail.com	Desktop	Dell(121212)	Room# 524
31	978599521	Md. Abu Yusuf	Associate Professor	Jahangirnagar University	170000000	yus@gmail.com	Monitor	Dell(4444444)	Room# 521

Figure 3.11.3: User Table

This user table provides details information of the system. There are many information details show the system of database. This user table of database provides information who are responsible for using devices and managed by system. In user table we collect some user information of Jahangirnagar University (JU).

CHAPTER IV

Authentication and Requirement Validation

4.1 SOEMS Authentication & Authorization:

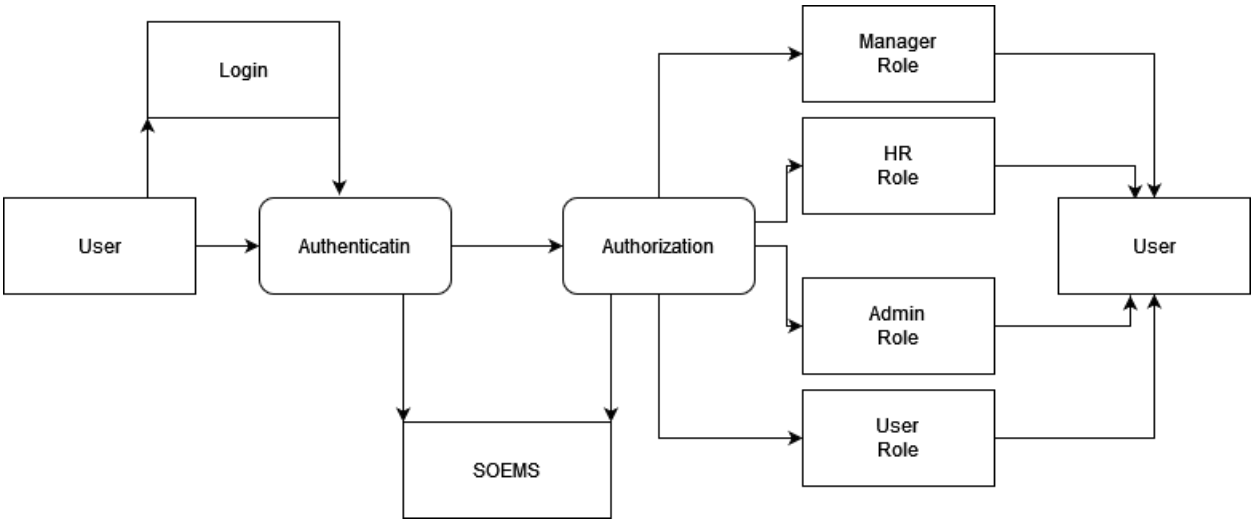


Figure 4.1.1: SOEMS Authentication & Authorization

Authentication Process:

Login: Administrative Personnel must be login to the SOEMS system with their own username and password.

Hash Password: Password is encrypted using hash MD5.

Web Privacy & Security: We provide our web app more privacy and security.

Authorization Process:

Authentic user does everything of data manipulated, but authorized user only control dashboard or limited data manipulated.

Example: Engineer can all of due to authentication, but a branch Manager only responsible with their part of system due to authorization. [7]

4.2 SOEMS Requirements Validation: Asset Management

Requirement's validation is completed to get sure are completion and consistent according to user requirements. Asset management information Model (AMIM).

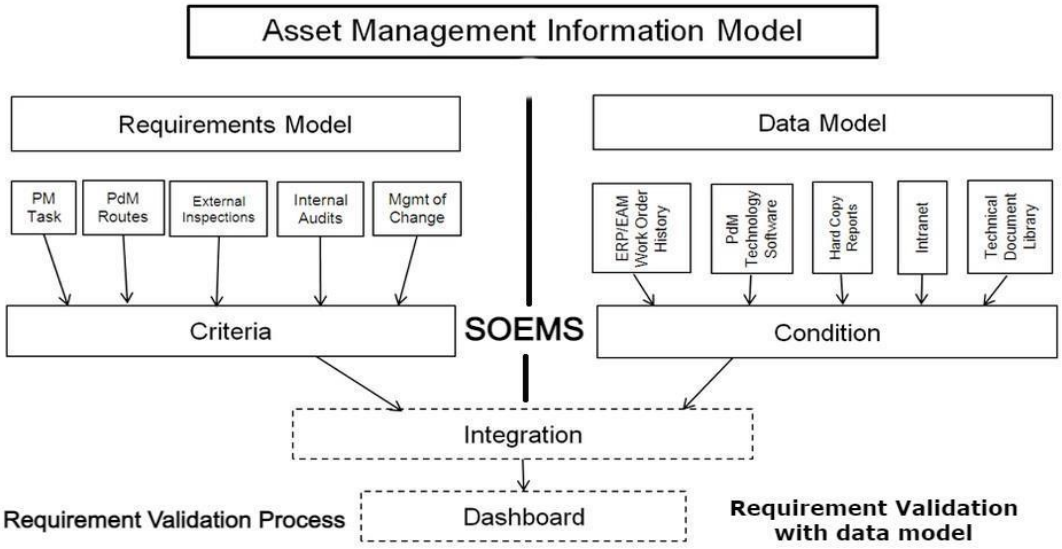


Figure 4.2.1: SOEMS Requirement Validation with Asset Management

The process of ensuring that the requirements defined for development define the system that the customer truly desires is known as requirements validation. We perform requirements validation to check for issues with requirements. **In Figure 4.2.1**, we can see Requirement Validation Process and Data Module.

4.3 Observations of Requirements Review Techniques

We have conducted **Informal/Technical/Inspection review** with different stakeholders respectively at various times to discuss about the drafted modules/features page-by-page and line-by-line of the upcoming SOEMS. We have listed the problems during the informal and formal discussion and agreed on the actions of detected problems. The agreed action states that found corrective actions to be incorporated in the SRS.

Observations1:

Table4.3.1: From Observation1 different stakeholders are given below:

Ref.	**Observations**	**Stakeholders involved**
[3]	Multi-Language & Foreign Currency option for foreign consultants, Pay slip download for individual employee	Accounts
	Privilege leave	HR
[4]	System should support any Hardware up gradation	Technical
	Performance	Technical
	Portability	Technical
[5]	After 3 wrong password system will lock the user's session, password should min 8 char, privilege user	Technical/ICT Security Unit

Observation 2 from top management**:**

In the formal meeting, top management given significant observations on the feature sets, as per their opinion all features to be self-explanatory i.e., brief descriptions/clarifications are required to understand each of the features/sub-functions.

4.4 SOEM Asset Management Information Model:

Requirement Validation Process

- Requirement Model
- Criteria

Requirement Validation with data Model. → Integration & Dashboard

- Data Model
- Condition

4.5 Data Module:

Data Module is one of the most attributes objects and relationship between data and tables. Every object is normalized for factor. This project data module are given below.

- TBL Admins
- TBL Devices
- TBL Users
- TBL Designation
- TBL Departments
- TBL Location

4.6 Constraints:

Every user must be an employee of HR Department of **any organization**. User has assigned equipment with controller HR and assignment by admin.

Hardware Limitations

We need 8 GB RAM, 100 GB data storages, Hardware Requirement but we only use to host the project 100 MB with databases. If the project grows up, we need more space of hardware requirement.

Agility & Scalability

The model should support high agility to respond quickly to a constantly changing environment. The environment should be loosely couple among the modules i.e., independent among the modules/components. Scalability concerns with software based as well as hardware-based, the system architecture should be modular, dynamic, independent & map-able among components or elements.

4.7 Risk Management of SOEMS

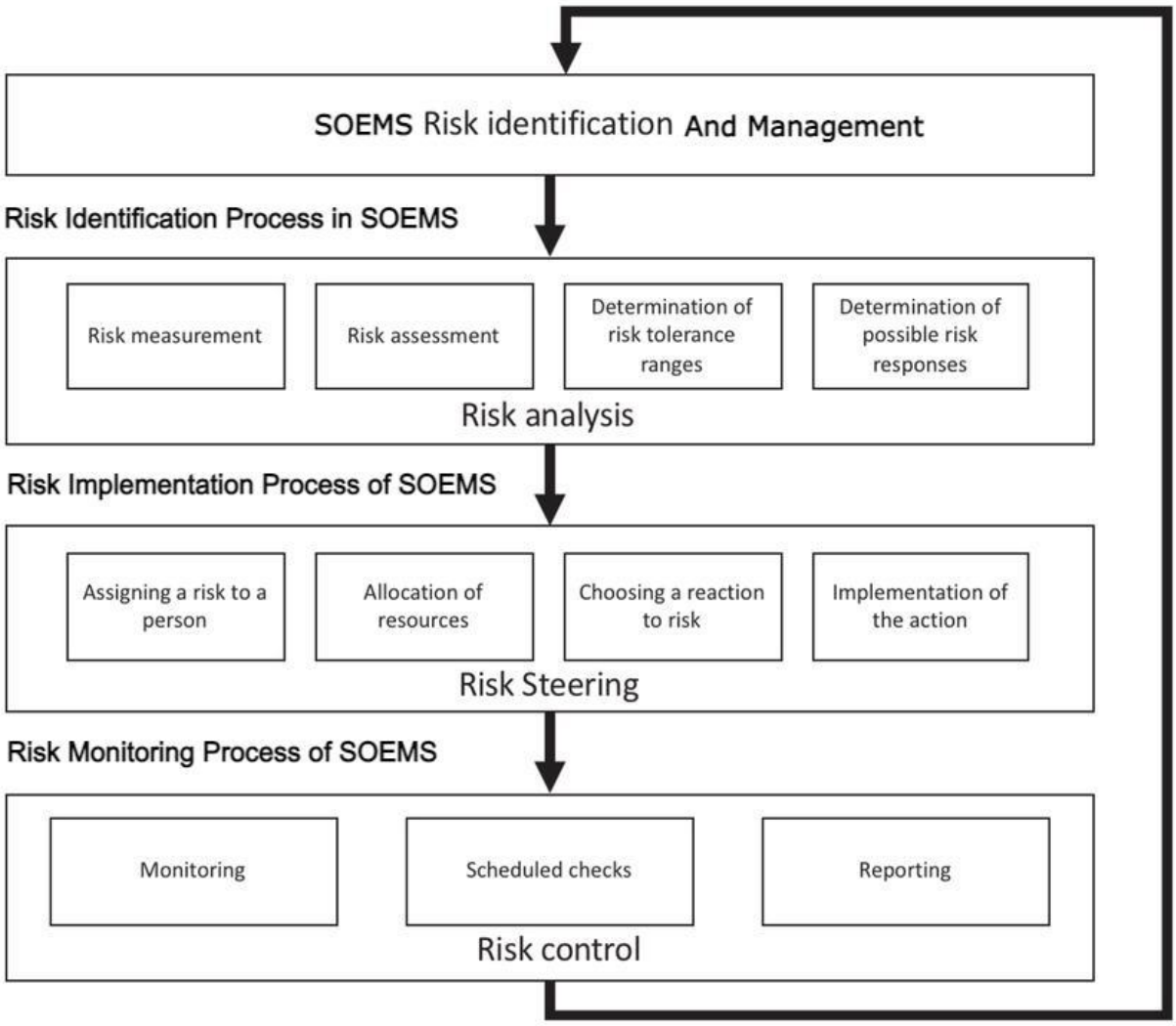


Figure 4.7.1: Risk management of SOEMS

The process of identifying, assessing, and controlling threats to an organization's capital and earnings is known as risk management [10]. These dangers arise from a variety of sources, including financial uncertainties, legal liabilities, technological issues, strategic management errors, accidents, and natural disasters. From Figure 4.7.1, represents to Risk management in SOEMS.

A successful risk management program assists an organization in considering all of the risks it faces. Risk management also investigates the relationship between risks and the potential consequences for an organization's strategic goals.

CHAPTER V

Implementation And Testing

5.1 Implementation and Testing

This project is an asset management system for managing devices, control devices reports, so a system is designed by me and I implement this project:

Admin implementation:

- SOEMS system add devices and users.
- SOEMS has some data to manipulated
- SOEMS system manages asset.
- Overall assignment devices by admin.

Admin Testing the application:

- SOEMS Dashboard panel show some attributes
- Calculate data of SOEMS System
- Get Ready user of SOEMS
- Ready to Deploy of SOEMS
- Deployed user to Deployment of SOEMS System
- Deployed user details
- Report with time based on SOEMS
- Search Devices with model or Tag
- Issue Devices with history.

Implementation Interaction: MVC (Model-View-Controller) is a software design pattern that is commonly used to implement user interfaces, data, and control logic. It emphasizes the separation of business logic and display in software. This "separation of concerns" allows for better labor division and maintenance. Other design patterns based on MVC include MVVM (Model-View-View Model), MVP (Model-View-Presenter), and MVW (Model-View-Web) (Model-View-Whatever).

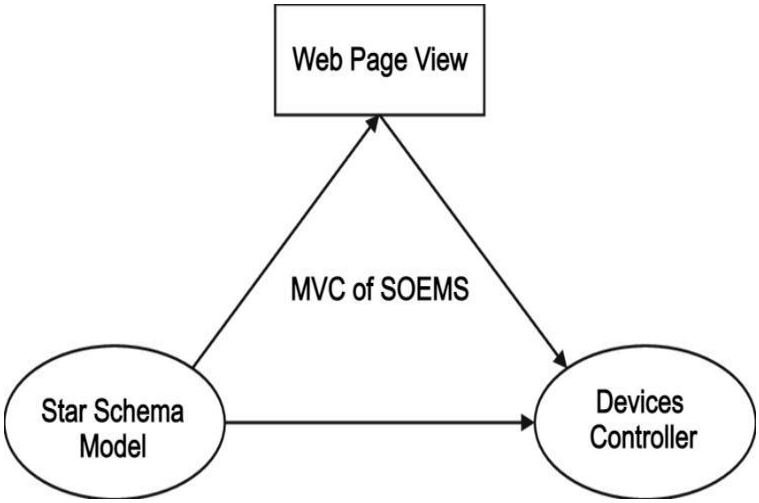


Figure 5.1.1: MVC of SOEMS

From Figure 5.1.1, The three components of the MVC software-design pattern are as follows:

- **Model**: Data and business logic are managed by the model.
- **View**: View is in charge of layout and display.
- **Controller**: This component routes commands to the model and view parts.

CHAPTER VI

Conclusion & Future Work

6.1 Conclusion

In Modern age, Asset management system is popular due to manage asset or devices. I have created a new system for all office to manipulated device information with user details. This system provides secure device management system smartly way. The project is one of most effective devices or asset management of all office requirement.

It is created for small office. Now a day's small office needs asset management system but there is no application. So, I have created "Smart Office Equipment Management System" for maintenance devices so that devices are not lost, missing, found easily by search through the project application.

6.2 Limitations

Hardware Limitations:

We require 8 GB of RAM, 100 GB of data storage, and hardware requirements, but we only use 100 MB to host the project's databases. If the project expands [11], we will require more hardware space limitation.

Resources Limitations:

When small company requires on works with limited resources [12], it can present both challenges and opportunities. While it will have little or no potential for doubt, this methodology can encourage team members [13] to perform at their season and be creative in their use of the limited resources at their disposal.

Software Limitations:

Software Limitations refers to any function that a client wants and needs that is not currently included in the Platform Specifications. A Software Limitation [14] is a feature or function that appears preferable but is not available for use of coding [15]

6.3 Future Works

Asset Management System is accelerated existing trends and forced organizations to rethink many aspects of their operations. This regularly updated collection of papers assembles our most recent thoughts on the future of work, workforce, and workplace. So resources of scalability are most important parts of our future works.

- Focus on Scalability of asset management system
- Increase System Opportunities of this project
- Establish this project into Professional uses.

6.4 References

[1] Asset Management Conference 2014, MANAGEMENT OF WATER AND HYDROCARBONS ASSETS: ARE YOU USING YOUR INSTINCT MORE OFTEN THAN YOUR INTELLECT? Dr Carla Boehl Senior Lecturer and Researcher, Western Australia School of Mines, Curtin University.

[2] OPTIMAL ASSET ALLOCATION IN ASSET LIABILITY MANAGEMENT Jules H. van Binsbergen Michael W. Brandt Working Paper 12970 http://www.nber.org/papers/w12970 NATIONAL BUREAU OF ECONOMIC RESEARCH 1050 Massachusetts Avenue Cambridge, MA 02138 March 2007.

[3] Asset management by the public sector: postal savings, Kampo and public pensions, 2010.

[4] Web Content Management System PHP and MySQL, 2011.

[5] Japanese households' financial assets by major asset types (end of fiscal 2010).

[6] Database Design Using Entity-Relationship Diagrams, May 26, 2010, second edition.

[7] University of Science & Technology Beijing, 2010.

[8] https://www.w3schools.com/sql/default.asp

[9] https://www.w3schools.com/php/default.asp

[10] Risk Management in Asset Management Gregory Connor* and Robert A. Korajczyk, January 17, 2003

[11] Wurl, Alexander & Falkner, Andreas & Filzmoser, Peter & Haselböck, Alois & Mazak, Alexandra & Sperl, Simon. (2019). A Comprehensive Prediction Approach for Hardware Asset Management. 10.1007/978-3-030-26636-3_2.

[12] January 2012: DOI:10.1007/978-3-642-29637-6_73: Advances in Technology and Management (pp.561-564)

[13] Looi, Chee-Kit & Patton, Charles & Chen, Wenli & Baldassarre, Maria & Bruno, Giovanni & Caivano, Danilo & Convertini, Nicola & Linley, P. & Yu, Chen & Smith, Linda & Schnyer, David & Born, Jan & Horner, Sherri & Adeyeri, Oluwadamilare & Nieuwenhuis-Mark, Ruth & Webb, Stuart & Iserbyt, Peter & Jin, Putai & Pepperberg, Irene & Wojtusiak, Janusz. (2012). Resource Limitations. 10.1007/978-1-4419-1428-6_5493.

[14] Nouh, Fadi. (2016). SAM Software Asset Management.

[15] Mausey, K. (2001). Enterprise asset management software comes of age. Power. 145. 57-+