ÇANKAYA UNIVERSITY

CENG407 PROJECT REPORT

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A. LITERATURE REVIEW

1. Abstract

Todays, there are many establishments that have personal and joint tenancy assets. Reaching information about inventories and assets is very important for establishments. Having these info's provides an advantage for elimination of deficiencies and productive usage. Many asset management systems that offers change to manage all types of assets were developed to provide these advantages. These systems are used in establishments like company. Besides they become popular different establishments. Using asset management system in universities brings some advantages because of elimination of deficiencies and productive usage features. Universities benefit many assets with today's technologies for reaching qualified person. Developing an asset management system that instructors and staffs can be got access enhances this quality of education. The aim of this project is designing and making actual user friendly and web-based asset management system that visualizes floor of Cankaya University with real plans. In this way all instructors, staffs' and directors can see all plans smoothly while they management inventories of Cankaya University.

1.1 Özet

Günümüzde, kişisel ve ortak kullanım varlıklarına sahip birçok kuruluş bulunmaktadır ve envanter ve varlıklara dair bilgilere erişim de kuruluşlar için önem arz etmektedir. Sahip olunan envanter ve varlıklar hakkında kısa sürede ve kolayca bilgi alabilmek; eksikliklerin giderilmesi, var olanların verimli kullanımı gibi birçok avantaj sağlamaktadır. Avantaja sahip olabilmek için tüm varlık ve türlerini ortak platformda yönetme imkanı sunan birçok varlık yönetim sistemleri geliştirilmiştir. Bu sistemler özellikle şirket gibi kuruluşlarda sıklıkla kullanılmaktadır. Bununla birlikte bu sistem farklı kuruluşlarda da yaygınlaşmaktadır. Varlıklara erişim, eksikliklerini tespit edebilme, mevcut envanteri keşfedebilme vb. imkanları düşünüldüğünde varlık yönetiminin üniversiteler için de kullanımı oldukça avantajlı olacaktır. Günümüz imkan ve teknolojisiyle üniversiteler, nitelikli insanı en iyi şekilde yetiştirebilmek için birçok varlıktan yararlanmaktadırlar. Üniversite öğretim elemanları, çalışanları tarafından erişim sağlanabilecek olan bir varlık yönetim sisteminin geliştirilmesi ise eğitim niteliğini daha da arttıracaktır. Bu projenin amacı Çankaya Üniversitesi tabanını zemine gerçek planlarla görselleştiren kullanıcı dostu web tabanlı envanter yönetim sistemini tasarlayıp hayata geçirmektir. Böylelikle öğretim

elemanları, çalışanlar ve yöneticiler, Çankaya Üniversitesi'nin envanterini yönetirken, tüm planlarını daha sorunsuz bir şekilde görebileceklerdir.

2. Introduction

In educational environments there is several materials which are allocated in various locations including but not limited to offices, laboratories, classes. These are not uniquely defined and there are inappropriate ways of monitoring the usage/consumption. These conditions create an environment, where optimal management procedures cannot be supported [1]. Provide innovative design solutions that reflect the future needs of technology-based education increase community use of school facilities; maximize value for money, ensure efficient and effective management of new and existing capital assets [2]. This paper, we mentioned asset management systems, related works and aim of this project.

2.1 Asset Management System

Asset management system is a dedicated application which is used to record and track an asset throughout its life cycle, from procurement to disposal. It provides an organization with information like where certain assets are located, who is using them, how they are being utilized and details about the asset [3]. The method and system also track the removal and stocking of items through unique identification strings, so that individual access, use, and theft of items can be monitored [4]. In many establishments specially, school's assets are registered to paper, listed as tables. In this way getting information about inventories and assets is time consuming. Also adding new assets and inventories or deleting them is hard. So, these systems are used in schools. Developing an inventory management system requires investment in systems and time. However, the advantages are immense, as inventory management puts you in complete control of procuring and maintaining of your assets [5]. In this project benefitting from these advantages is purposed.

2.2 Related Works

There are many works and projects about assets management system and analogously inventory management system. Inventory management system involves about selling product, stock etc. But asset management system is any process a company or organization uses to keep track of the equipment and inventory vital to day-to-day operation of their businesses [6]. For this project, related works about asset management system in schools must be exemplified.

A study has been conducted to design and develop a web-based system that supports material flows and related management processes in educational environments. The proposed system supports standardized handling of the resources in educational settings and structured management of assets and consumables. It consists of an application running on handheld/smartphone that supports record keeping of school materials [1]. The aim of this work was to design and develop a complete information system which will save valuable time for people involved as it will help for the easier, faster and effective inventory and management of assets.

One another previous study of the asset management system has been done for commercial banks to keep track of their assets. It is an essential tool for them because it provides to get rid of papers trials also they have a software tracking system for assets [8].

Another previous work of the asset management system is “Wise Track”. It provides to manage and track IT and lab equipment for schools. They also can make a check-in/check-out opportunity for an equipment for students. Wise Track also have asset management systems for many industries like military, government and museum [10].

2.3 Infrastructure needs/skills

The asset management system required two major skills; database and web development. A relational database is the most essential part of the project, the project requires a solid database system such as Microsoft SQL Server, Oracle or Sybase [9]. Also, the system must keep secure the inventory system to avoid problems. Moreover, the asset management system must be user friendly, so the programmer needs UX skills and web development skills to use the system effectively.

2.4 Aim of Asset Management System Project

Productive usage of assets will be supplied uber efficient. This contributes to our university regarding materiality. To achieve the school property track for related personnel to inquire anytime and anywhere, increase property management system transparency [7]. Getting information about assets in a class like if it works or if it broken will be possible. So, supply time will become shorter. Because of knowing count and types of assets, determining robbery situations will get easy. With this system university teachers can determine class that is favorable for class’s aim, student’s counts, class’s activities’ materials easily. Thus, quality of

education increases and save time. With this system deficiencies can be determined before academic year and can be supplied easily.

2.5 Conclusion

In summary, developing an asset management system requires investment in systems and time. Successful asset and equipment records are all about managing the information that you have about each individual asset in such a way that it can be accessed easily and quickly when the need arises. The traditional method of asset management renders works cumbersome and less efficient [8]. Also, the user spends less time for tracking the inventory for misplaced assets and it provides a cost savings due to shorter print cycle and increased return on investment (ROI) [9]. With this project, instructors, personnel's and managers can see all plans while they are managing inventories of Cankaya University.

B. SOFTWARE REQUIREMENTS SPECIFICATION

1.Introduction

The introduction of the Visual Asset Management System provides an overview, purpose and scope of the project, a glossary and references.

1.1 Purpose

The purpose of this document is describing The Visual Asset Management System for Cankaya University. This system aims to manage school assets and observe these from floor to floor on the web somehow more easily and user friendly. This document elaborates on detailed information about the project. In addition, the SRS document explains how users interact with the system for understanding the system clearly. The detailed requirements of the Visual Asset Management System are provided in this document.

1.2 Scope

The Visual Asset Management System is developed to provide asset information and asset management visually as floor to floor with real plans of Cankaya University to the users and administrator. In this way, the admin can manage and maintain asset of Cankaya University while monitoring the whole plans of floors more smoothly. The Visual Asset Management System has the following characteristics, features and attributes.

1. Management of asset components of present and acquisition that disposal including desktop, laptop, printer, telephone, LAN and WLAN electronics (modem, router, server), projection, projection remote control, projection screen, instructor desk, student desk, coffee table, instructor seat, student seat, white board, panel, coat hanger, bookcase, cabinet, curtain, table, bin.
2. Assets availability.
3. Asset current location.
4. Current assets user.
5. Authenticate the user/administration.
6. Administration can generate a unique id for every asset.
7. Administrator adds details of the new asset into the database, remove details of the asset that are obsolete from the database.
8. Administrator add new user to the system.
9. User can report his needs to the administrator [11].

1.3 Glossary

TERM	DEFINITION
Admin	The person who can manage the Asset Management System. Also, he has the authority to Add/Delete or Create school assets.
Stakeholders	Any person with an interest in the Project who is not a developer.
Staff	Any person who can observe the school assets in the system
Developer	A person who is responsible contributes code to the project.
Database	A structured set of data that is organized to be easily accessed and managed.
Asset Management	Refers to any system that monitors and maintains things of value to an entity.

1.4 Overview of the Document

The next parts of the document include functionalities of the Visual Asset Management System. The document broadly defined the user characteristics and the development methodology which we are going to use for the project and why are we using it. Also, the next chapter the document provides a Requirement Specification for software developers and includes detailed functional and nonfunctional requirements.

2. Overall Description

2.1 Development Methodology

For developing the project, we have planned to use, Agile Software Development Methodology Shortly Agile that means adapt quickly to change. Agile starts with Agile Manifesto in 2001. Before it announced, software delivery was too slow that it has a name "application delivery lag". Agile Manifesto was published to follow new principles to overcome this slowness. Major principle of manifesto is satisfying the customer, early and continuous delivery of software and welcome changing requirements, even late in

development. Since developers do continuous delivery customer can see the how the Agile Software Development is a lightweight software engineering framework that use iterative development in the project. We decided to use Agile since it can be easily and fast adaptable to changes during the project development [1, 2].

2.2 User Characteristic

2.2.1. Staff

2.2.1.1. Staff must be an employee of Cankaya University.

2.2.1.2. Staff must read and understand Turkish language due to Visual Asset Management System language is Turkish.

2.2.1.3. Staff must have knowledge of the Visual Asset Management System.

2.2.2. Admin

2.2.2.1. Admin must be an employee of Cankaya University.

2.2.2.2. Admin must read and understand Turkish language due to Asset Management System language is Turkish.

2.2.2.3. Admin must know how to use a computer.

2.2.2.4. Admin must have knowledge of the Visual Asset Management System.

3. REQUIREMENTS SPECIFICATIONS

3.1 External Interface Requirements

3.1.1. User interfaces

The user interface will be worked Google Chrome, Mozilla Firefox, Internet Explorer and Opera on Windows.

3.1.2. Software interfaces

The system requires an internet connection. Asset Management System requires register, user name and password.

3.1.3. Hardware interfaces

There are no need external hardware requirements.

3.1.4. Communications interfaces

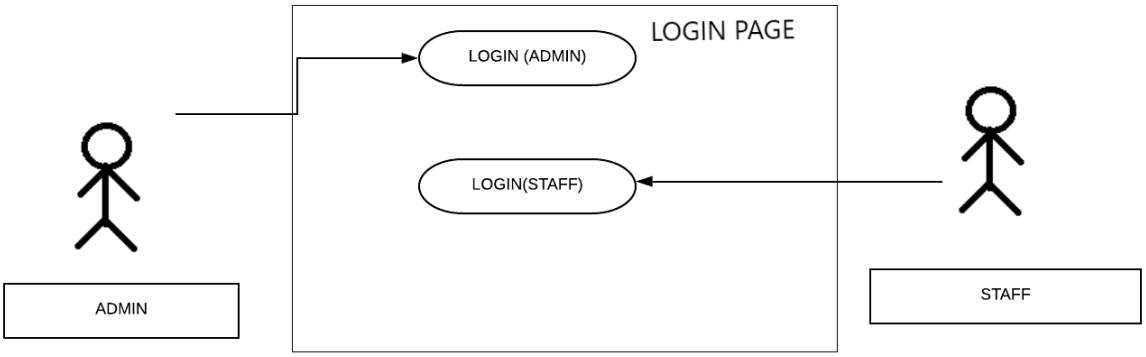
The system requires web browsers. (Google Chrome, Mozilla Firefox, Internet Explorer, Opera, etc.)

3.2 Functional Requirements

3.2.1 Login Page Use Case

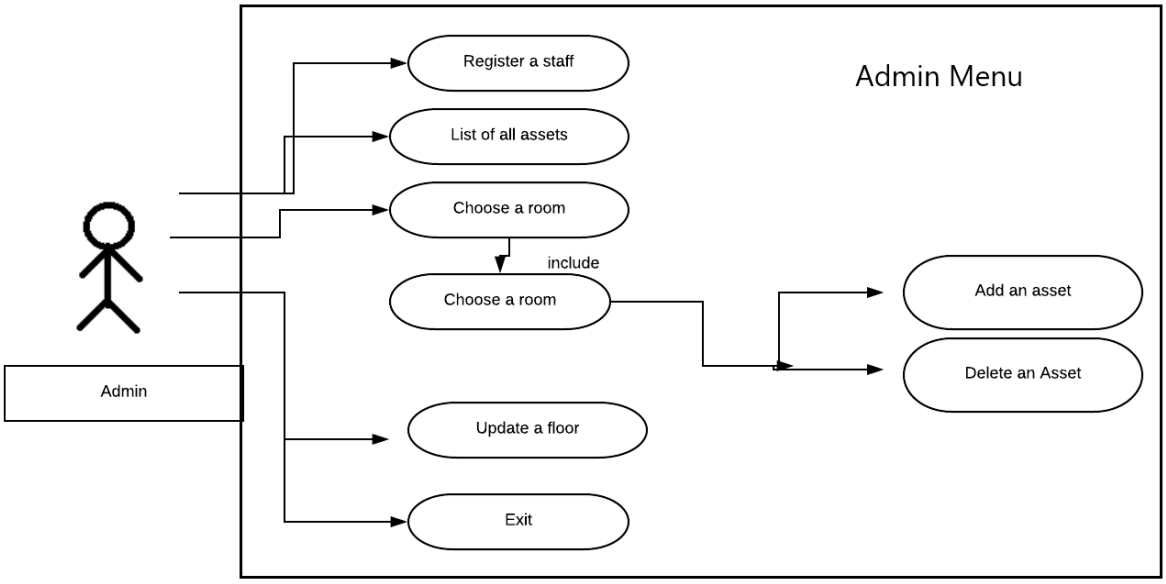
Use Case:

- Login as Admin
- Login as Staff



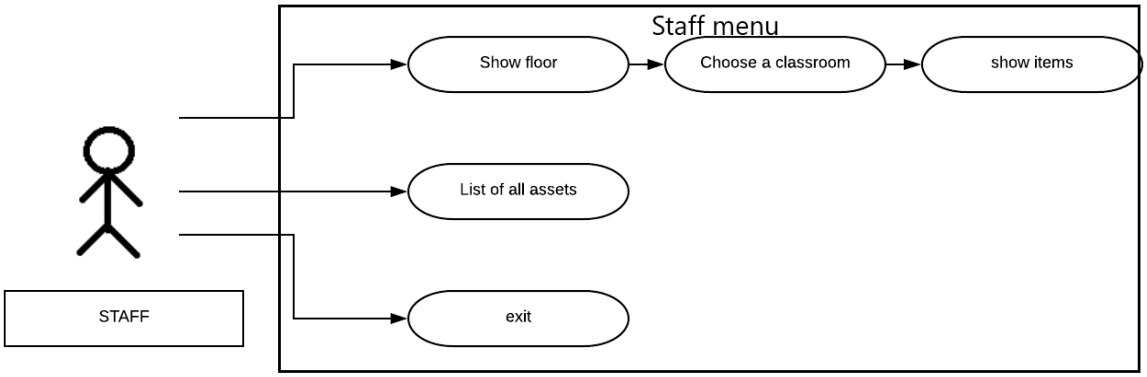
1. A guest shall not start the system without Login.
2. Admin and staff shall login to the system using their password.

3.2.2 Admin Menu Use Case



1. Only admin shall register a staff, make changes asset in the room. and update a floor.

3.2.3 Staff Menu Use Case



Staff shall not make change any assets in any classroom only can see where the item at.

Staff can request a list of all assets.

3.3 Performance Requirement

Asset management system does not need extensive system requirements.

Computers in today's technology will suffice. For instance;

1. CPU: 2 GHZ

2. GPU: 1 GB RAM

3. RAM: 2 GB

4. Operating System: Windows XP, Windows 7, Windows 8, Windows 10

3.4 Software System Attributes

3.4.1. Portability

* The Visual Asset Management System can usable in pc devices.

3.4.2. Performance

* Relational database should be used. Because, it has more performance.

* Staff, admin, and developer should connect less than 2 sec.

* Building and floor lists should appear less than 2 sec.

* The forms should create less than 5 sec.

* Objects, which are not seen by staff and admin, should not be rendered unless the staff and admin sees the object.

3.4.3 Usability

* System can be used by a lot of companies and schools which have different quality and peoples thanks to easy to access all forms and usage.

3.4.4 Adaptability

* System should send information if any error occurs.

* Weekly or monthly back-up should be taken.

3.4.5 Scalability

* System can be used by multiple users.

3.4.6 Security

* Staff, admin, and developer usernames should not be the same.

* Staff, admin, and developer passwords should contain numbers and characters with at least 6 characters long.

* If the user does not take any process in the system within half an hour, due to timeout the user should login again.

3.5 Safety Requirement

Database update times should be recorded according to defined time periods. Access to the system must be recorded by all personnel and the administrator. Database connection should always have controlled.

4. References

[1] “History: The Agile Manifesto”, agilemanifesto.org, 2018. [Online]. Available: http://agilemanifesto.org/history.html. [Accessed: 05-05-2018].

[2] “Manifesto for Agile Software Development”, agilemanifesto.org, 2018. [Online]. Available: http://agilemanifesto.org/history.html. [Accessed: 05-05-2018].

C. SOFTWARE DESIGN DOCUMENT

1. Introduction

The introduction of the Visual Asset Management System includes purpose, scope of the project, a glossary and an overview.

1.1 Purpose

The main aim of this software design document is providing the details of project titled as "The Visual Asset Management System".

The target audience is personnel of Cankaya University. The system's purpose is to facilitate and manage school assets and be able to observe them floor to floor from real plans. This document elaborates on detailed information about the project.

The purpose of the Visual Asset Management System is to design a user-friendly web page to design and manage the school assets from real plan of Cankaya University. The personnel can login to the system and be able to manage and observe assets easily. Also, he can add new assets or update rooms. By this means the system provide a user-friendly web page to the school.

1.2 Scope of the project

The document contains a complete description of the design of the Visual Asset Management System. The System uses a database to keep information about all assets in Cankaya University in Microsoft SQL Server. Our system will be run in Web. So, we will develop the website using .Net framework and C# programming language.ASP .Net is used to produce interaction, data-driven web applications over the Internet [12].

1.3 Glossary

SQL	Structured Query Language
SDD	Software Design Document
Block Diagram	The type of schema which components in the system are displayed in blocks
UML Diagram	Unified Modelling Language
Asset Management	Refers to any system that monitors and maintains things of value to an entity.
C#	An object-oriented programming language which is used in Software Engineering
Database	A structured set of data that is organized to be easily accessed and managed.

Admin	The person who can manage the Asset Management System. In addition, he has the authority to Add/Delete or Create school assets.
User	Any person who can observe the school assets in the system

1.4 Overview of the Document

The remaining parts of the document contains 2 parts. Architectural Design, which includes explanations of all attributes of the project according to SRS document. Use Case Realizations which includes diagrams use cases and explanations about them.

2.1 Deployment Diagram

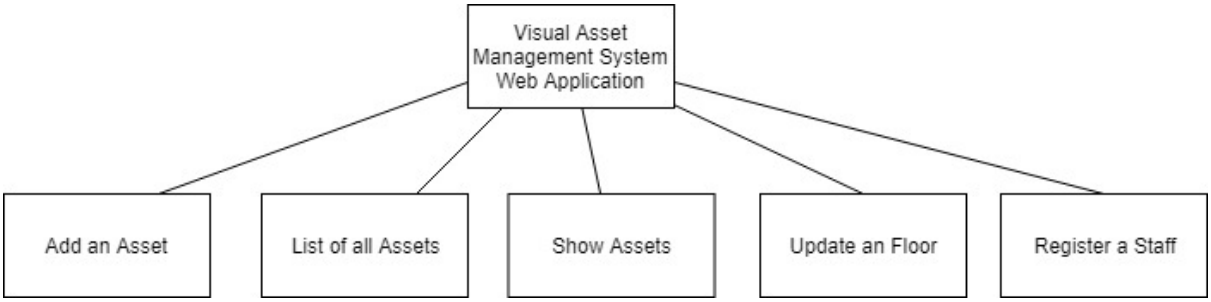


Figure 1 Deployment Diagram

2.2 Architecture Design of Asset Management System

2.2.1 Web Application

2.2.1.1 Login Page

Name: Login Page

Description: When staff or admin enter their usernames and passwords and click the login button, system directs the form pages according to the type of user. These pages are Admin Page and Staff Page.

Actor: Staff, Admin.

Precondition: User must open the web site.

Operations: If valid username and password has typed, staff or admin can login.

Arguments: Username and password.

Returns: If login fails gives an error message.

Pre-condition: Click the ‘Login’ button.

Post-condition: Login is successful.

Exceptions: If username or password is wrong, staff or admin cannot login and web page give an error message.

Basic Sequence:

1. User must register to system by admin if s/he doesn’t have an account.

2. User shall login to the system by entering his/her username and password.

3. System directs the form pages according to the type of user.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: High

2.2.1.2 Admin Page

Name: Admin Page

Description: There are some buttons named as register a staff, list of all assets, show assets, add an asset, update a floor, update user information, logout. By clicking these buttons, system directs the admin to form pages.

Actor: Admin

Precondition: Admin must be login.

Operations: Admin can reach other form pages with clicking buttons.

Arguments: None

Returns: None

Pre-condition: Click the button.

Post-condition: None

Exceptions: If clicked form page does not exist, admin cannot reach that form pages, and web page gives an error message.

Basic Sequence:

1. Admin clicks the button.

2. System directs the form pages according to the clicked button.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: High

2.2.1.3 Staff Page

Name: Staff Page

Description: There are some buttons named as list of all assets, show assets, update user information, logout. By clicking these buttons, system directs the staff to form pages.

Actor: Staff

Precondition: Staff must be login.

Operations: Staff can reach other form pages with clicking buttons.

Arguments: None

Returns: None

Pre-condition: Click the button.

Post-condition: None

Exceptions: If clicked form page does not exist, staff cannot reach that form pages, and web page gives an error message.

Basic Sequence:

1. Staff clicks the button.

2. System directs the form pages according to the clicked button.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: Low

2.2.1.4 Register a Staff

Name: Register a Staff Page

Description: There is one button and some text boxes. Admin enters the fields like name, surname, faculty, department, room, username and password. After finishing this, admin clicks the register button.

Actor: Admin

Precondition: None

Operations: Admin enter the fields then click the register button.

Arguments: Fields of registered staff.

Returns: None

Pre-condition: Click the 'Register a Staff' page button.

Post-condition: New staff registered successfully.

Exceptions: If staff has already existing or the fields are empty, web page gives an error message.

Basic Sequence:

1. Admin enters the fields.

2. Admin clicks the register button.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: Low

2.2.1.5 List of all Assets

Name: List of all Assets Page

Description: There is a grid view to list all assets and their total quantities.

Actor: Staff and admin

Precondition: None

Operations: User can list all the assets and their total quantities.

Arguments: None

Returns: List of all assets.

Pre-condition: Click the 'List of all Assets' page button.

Post-condition: Assets listed successfully.

Exceptions: If database connection failed, web page gives an error message.

Basic Sequence:

1. User clicks the list of all assets button in the user form page.
2. Page list the all the assets.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: Middle

2.2.1.6 Show Assets for Staff

Name: Show Assets Page

Description: There are three dropdown list and a grid view. All blocks, floors and rooms are listed in the dropdown lists. Staff choose the block, floor and room while seeing the plan of the chosen floor then, assets and their total quantities of the chosen room shown in the grid view.

Actor: Staff

Precondition: None

Operations: Staff can list the assets and their total quantities of the chosen room.

Arguments: None

Returns: List of all assets in the chosen room.

Pre-condition: Click the 'Show Assets' page button.

Post-condition: Assets shown successfully.

Exceptions: If database connection failed, web page gives an error message.

Basic Sequence:

1. Staff clicks the 'Show Assets' button in the staff form page.
2. Choose a block, floor and room then web page shows all the assets of the room.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: Middle

2.2.1.7 Show Assets for Admin

Name: Show Assets Page

Description: There are three dropdown list and a grid view and beside the grid view there are two checkboxes. All blocks, floors and rooms listed in the dropdown lists. Admin choose the block, floor and room while seeing the plan of the chosen floor then, assets and their total quantities of the chosen room shown in the grid view. Beside the grid view there are checkboxes for update and delete an asset.

Actor: Admin

Precondition: None

Operations: Admin can list the assets and their total quantities and can update and delete an asset of the chosen room.

Arguments: None

Returns: List of all assets in the chosen room.

Pre-condition: Click the ‘Show Assets’ page.

Post-condition: Assets shown successfully.

Exceptions: If database connection failed, web page gives an error message

Basic Sequence:

1. Admin clicks the ‘Show Assets’ button in the admin form page.
2. Admin choose a block, floor and room then web page shows all the assets of the room.
3. Admin can update and delete an asset.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: High

2.2.1.8 Add an Asset

Name: Add an Assets Page

Description: There is a button, some text boxes and dropdown lists. Admin enters the fields like asset name, quantity and choose the block, floor and room in the dropdown lists. After finishing this, admin clicks the add button.

Actor: Admin

Precondition: None

Operations: Admin can add the asset to the chosen room.

Arguments: Information of asset.

Returns: None

Pre-condition: Click the ‘Add Asset’ page.

Post-condition: Asset added successfully.

Exceptions: If database connection failed or the fields are empty, web page gives an error message.

Basic Sequence:

1. Admin clicks the ‘Add Asset’ button in the admin form page.
2. Admin choose a block, floor, room and field the information of asset.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: High

2.2.1.9 Update a Floor

Name: Update a Floor Page

Description: There is a button, three dropdown lists and file uploader. Admin choose the block, floor and upload new plan. After finishing this, admin clicks the update button.

Actor: Admin

Precondition: If the plan of the floor changed.

Operations: Admin can update a floor plan.

Arguments: None

Returns: None

Pre-condition: Click the ‘Update a Floor’ page.

Post-condition: Floor updated successfully.

Exceptions: If database connection failed, web page gives an error message.

Basic Sequence:

1. Admin clicks the ‘Update a Floor’ button in the admin form page.
2. Admin choose a block, floor and upload the new plan.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: Middle

2.2.1.10 Update User Information

Name: Update User Information Page

Description: When staff or admin want to change their information like username, passwords and room then, clicks the update button.

Actor: Staff, Admin.

Precondition: Admin or Staff shall be login.

Operations: User changed his/her information then click the update button.

Arguments: Fields for change.

Returns: None

Pre-condition: None

Post-condition: Updated successful.

Exceptions: If database connection failed or the fields are empty, web page gives an error message.

Basic Sequence:

1. User enter the fields.
2. User clicks the update button.

Exception: Internet and database connection can be fail.

Post Conditions: None

Priority: Low

2.2.2 Database Design

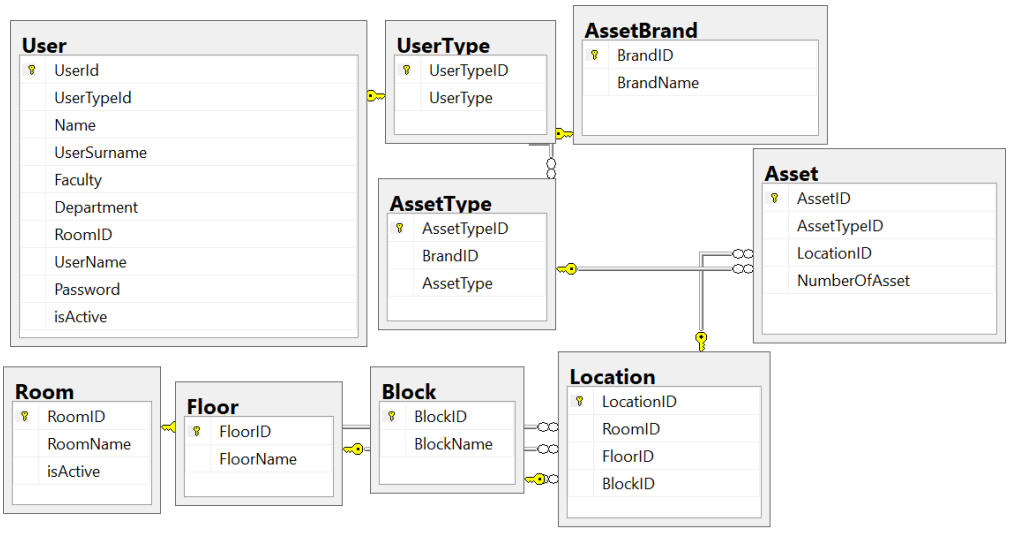


Figure 2 Database Diagram of the Project

2.2.2.1 User Table

User table holds the user's information. Users has attributes such as, userID, name, surname, faculty, department, room, username, password, isActive, userTypeID. UserID is primary key of table. UserTypeID is the foreign key.

2.2.2.2 User Type

User type table keeps the information of user type. User type has attributes such as, userTypeID and userType. UserTypeID is primary key of table.

2.2.2.3 Asset Table

Asset table holds the asset's information. Asset has attributes such as assetID, assetTypeID, numofAssets, locationID. AssetID is the primary key of table. AssetTypeID, locationID are foreign keys.

2.2.2.4 Asset Type Table

Asset type table holds the asset's type information. Asset type has attributes such as, typeID, assetType and assetsBrandID. TypeID is the primary key of table. AssetsBrandID is foreign key.

2.2.2.5 Asset Brand Table

Asset brand table holds the asset's brand information. It has attributes such as, assetsBrandID, brandName. BrandID is the primary key of table.

2.2.2.6 Room Table

Room table holds the room information. It has attributes such as, roomID and roomName and isActive. RoomID is the primary key of table.

2.2.2.7 Floor table

Floor table holds the floor information. It has attributes such as, floorID and floor. FloorID is the primary key of table.

2.2.2.8 Block Table

Block Table holds the block information. It has attributes such as, blockID and block. BlockID is the primary key of table.

2.2.2.9 Location Table

Location Table holds the location information of assets. It has attributes such as, locationID, blockID, floorID and roomID. LocationID is the primary key of table. BlockID, floorID and roomID are foreign keys. [13].

3. USE CASE REALIZATIONS

3.1 The Visual Asset Management System Block Diagram

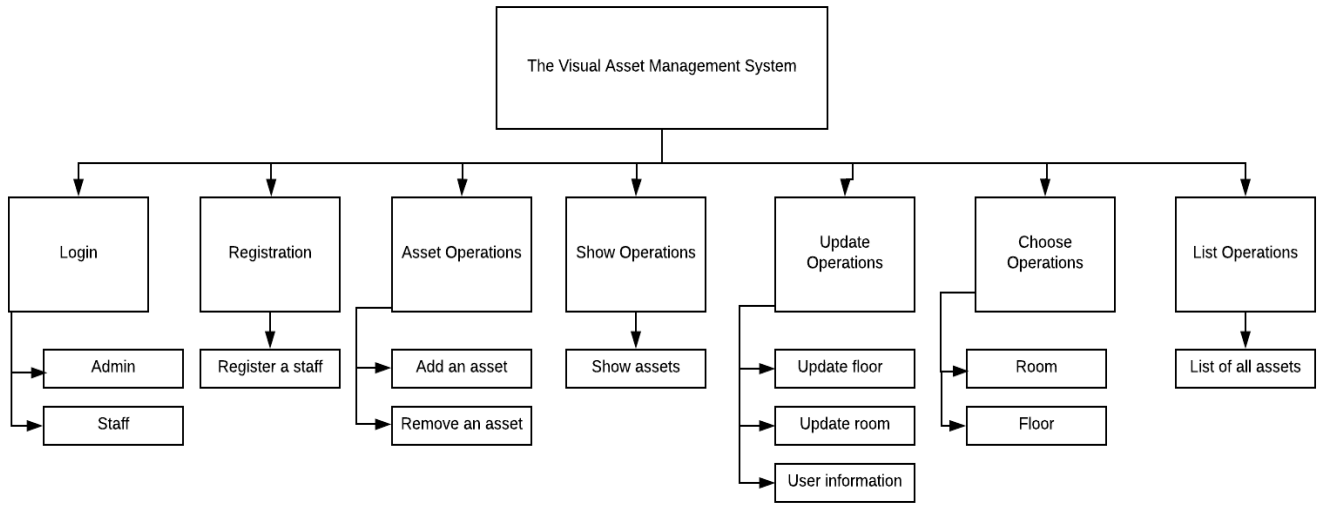


Figure 3 Use Case Diagram of the Project

3.2 Brief description of the block diagram

As we illustrated from the block diagram, there are 7 main components and their sub-components of the system. The main components are listed below:

3.2.1 Login Design

Login design provides to enter the website to make operations by their user type (Admin or staff).

3.2.2 Registration Design

Registration design provides to sign in attributes for staff. However, only admin can enter information's to register a staff.

3.2.3 Asset Operations Design

Asset operations provides Admin to make changes like adding or removing assets. It has 2 sub-components these are add an asset and remove an asset.

3.2.4 Show Operation Design

Show operation provides to observe assets from a specific floor or room to admin or staff.

3.2.5 Update Operations Design

Update operations provides to make changes about room plans or floor plans when a

3.2.6 Choose Operations Design

Choose operations provides Admin and Staff to choose a specific floor or room.

3.2.7 List Operations Design

List operation has only one sub-component that provides a list of all assets for Admin and Staff.

D. REFERENCES

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