Assets Usage and Tracking Using Wireless

Final Year Project

Session 2018-2022

A project submitted in partial fulfillment of the degree of

BS in Computer Science

Department of Computer Science

Faculty of Computer Science & Information Technology

Superior University, Lahore

Spring 2022

Type (Nature of project)	[✓] **D**evelopment [ ] **R**esearch [ ] **R**&**D**
Area of specialization	
FYP ID	FYP-BCSM-F21-044

Project Group Members

Sr.#	Reg. #	Student Name	Email ID	*Signature
(i)	BCSM-F18-308	Arbaz Ahmad Khan	bcsm-f18-308@superior.edu.pk	
(ii)	BCSM-F18-320	Shahzaib Safdar	bcsm-f18-320@superior.edu.pk	
(iii)	BCSM-F18-341	Muhammad Majid	bcsm-f18-341@superior.edu.pk	

*The candidates confirm that the work submitted is their own and appropriate credit has been given where reference has been made to work of others

Plagiarism Free Certificate

This is to certify that, I **Arbaz Ahmad Khan** S/O **Rana Nasrullah Khan**, group leader of **FYP-BCSM-F21-044** under registration no **BCSM-F18-308** at **Computer Science** Department, **The Superior University**, Lahore. I declare that my FYP report is checked by my supervisor.

Date: Name of Group Leader: Saleem Mustafa Signature: _____

Name of Supervisor: Mr.Saleem Mustafa

Designation: Lecturer

Signature: _____

HoD: Dr. Irfan Udin

Signature: _____

Project Report

[Assets Usage and Tracking System]

Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
	1.0		<Original Draft>	
			<Changes Based on Feedback from Supervisor>	
			<Changes Based on Feedback From Faculty>	
			<Added Project Plan>	
			<Changes Based on Feedback from Supervisor>	

APPROVAL

PROJECT SUPERVISOR

Comments: _____

_____

Name:_____

Date:_____ Signature:_____

PROJECT MANAGER

Comments: _____

_____

Date:_____ Signature:_____

HEAD OF THE DEPARTMENT

Comments: _____

_____

Date:_____ Signature:_____

Dedication

This work is dedicated to my Parents

Acknowledgements

I am really thankful to my supervisor who has guided us and Make us able to do this project.

Executive Summary

Asset usage and tracking is probably the most popular application of Real-Time Locating Systems. It is very similar to indoor navigation/wayfinding except that the interest is in tracking the moving objects, so it's a network-centric application. The technologies utilized in both applications are also similar and often identical.

The goal of asset tracking is to track different physical assets and their locations within a facility or contained area for various purposes, including:

- Improvement of asset utilization
- Tracking of assets in logistics
- Analysis of consumer behavior in a commercial setting
- Tracking of assets in a production facility

The data collected in the process of asset tracking is used to support decision making, prevent losses, and maximize asset utilization metrics. In the end, the goal is to save time and costs of business operations.

People have many problems like losing or misplacing their assets. They lost their mind peace as well as when they misplace or lost their assets like mobile, machinery and other things of need. They cannot locate their assets and cannot track their assets working. Now a days some people lost their bikes and cannot find them.

We inspired from **Defense Company.**

A defense company with over 60 years of experience came to us to fix an incredibly wide breadth of problems faced solely due to asset tracking issues. Despite many groundbreaking technological feats across the years, the company was losing sizeable amounts of profit due to mistakes being made over and over again. The problem was nobody knew how to fix the problems.

Replace the current system with new asset management software. Buy a completely new set of asset management software and equipment to provide optimal data compilation, asset tracking, and value retention (of both assets being tracked and the company itself). This route is

the most expensive but offers the most comprehensive and optimized solutions to the problems faced by the company and add by far the most value.

Table of Contents

List of Figures

List of Tables

Chapter 1

Introduction

Chapter 1: Introduction

Asset usage and tracking is probably the most popular application of Real-Time Locating Systems. It is very similar to indoor navigation/wayfinding except that the interest is in tracking the moving objects, so it's a network-centric application. The technologies utilized in both applications are also similar and often identical.

The goal of asset tracking is to track different physical assets and their locations within a facility or contained area for various purposes, including:

- Improvement of asset utilization
- Tracking of assets in logistics
- Analysis of consumer behavior in a commercial setting
- Tracking of assets in a production facility

The data collected in the process of asset tracking is used to support decision making, prevent losses, and maximize asset utilization metrics. In the end, the goal is to save time and costs of business operations.

1.1. Background

People have many problems like losing or misplacing their assets. They lost their mind peace as well as when they misplace or lost their assets like ,machinery and other things of need. They cannot locate their assets and cannot track their assets working.

1.2. Motivations and Challenges

We inspired from **Defense Company.**

A defense company with over 60 years of experience came to us to fix an incredibly wide breadth of problems faced solely due to asset tracking issues. Despite many groundbreaking technological feats across the years, the company was losing sizeable amounts of profit due to mistakes being made over and over again. The problem was nobody knew how to fix the problems.

Solution:

Replace the current system with new asset management software. Buy a completely new set of asset management software and equipment to provide optimal data compilation, asset tracking, and value retention (of both assets being tracked and the company itself). This route is the most expensive but offers the most comprehensive and optimized solutions to the problems faced by the company and add by far the most value.

1.3. Goals and Objectives

People have many problems like losing or misplacing their assets. They lost their mind peace as well as when they misplace or lost their assets. Here is problem for hospitals.

At hospitals equipment used is very cost and many times critical need overrules the cost due to life saving needs. They cannot locate their assets of need and lost precious lives and cannot track their assets working.

So our project basic goal to provide people a platform to solve their problems.

At hospitals equipment used is very cost and many times critical need overrules the cost due to life saving needs. With wireless solutions ATS a solution can be designed that can give locations of the assets on which app or web interface can be built to track the locations and usage of the equipment.

Asset usage and using wireless system provides facility to See your asset inventory and gain the peace of mind you are lacking by knowing where your assets are at all times, even in remote locations, See where your assets are.

1.4. Literature Review/Existing Solutions

Top 7 Best Free and Open Source Asset Tracking Software

PANGEA

Software	Open Source	Platform	Number of Assets
Snipe-IT	✓	Windows, Linux, Mac, server	Unlimited
Spiceworks	✗	Web	Unlimited
OpenMAINT	✓	Web, Android, iOS	Unlimited
Asset Tiger	✗	Web, Android, iOS	250GB
Reftab	✗	Web, Android, iOS	500GB
Ralph	✓	Web	Unlimited
ResourceSpace	✓	Web	100GB

1.5. Gap Analysis

This section derives salient gaps identified from the current analysis on Asset Usage and Tracking system. This will be performed by comparing the supply and demand of data:

- Existing manned information services.
- Existing unmanned information.
- The promised U-Space services.
- Comprehensive scenario analysis with consortium's expertise by systematically performing the above steps, we were able to see areas of possible limitations (gaps) and synergies Asset Usage and Tracking system.

1.6. Proposed Solution

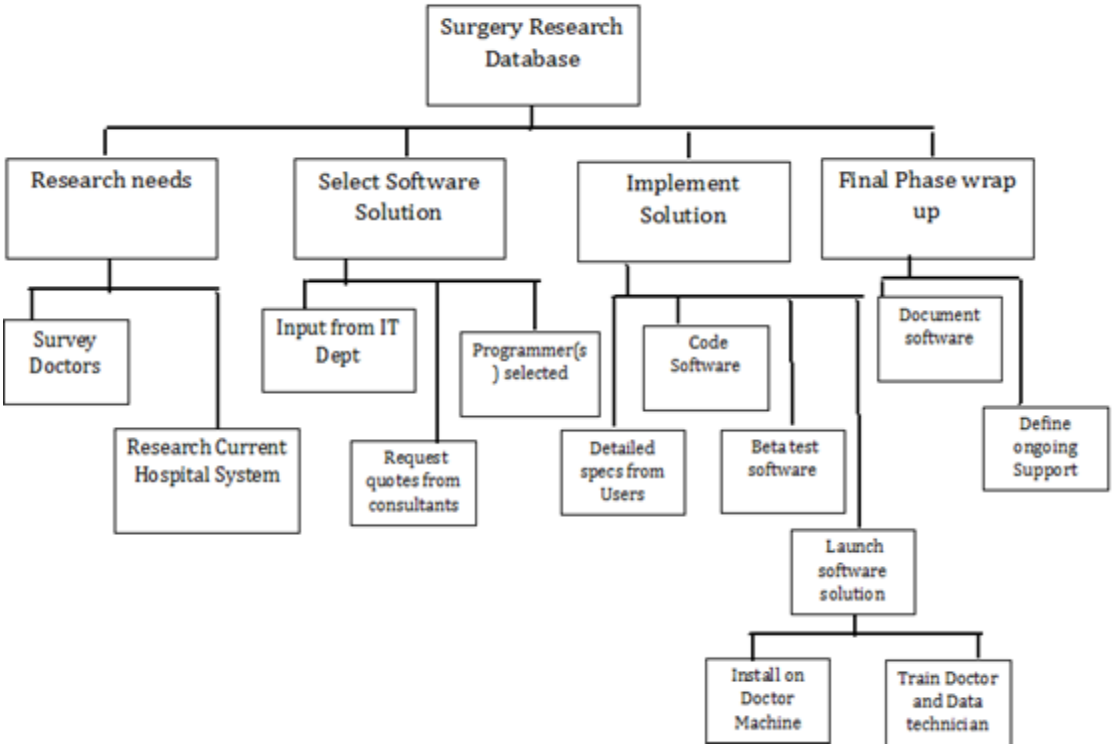
Asset usage and using wireless system provides facility to See your asset inventory and gain the peace of mind you are lacking by knowing where your assets are at all times, even in remote locations, See where your assets are.

In Future it will send Alerts on Movement Upon unauthorized vibrations/motions or geofence boundary exit, you will receive immediate alerts. You will continue to receive alerts in intervals of 10-60 minutes as long as the asset is moving.

1.7. Project Plan

- Our main priority is to establish one of the best website and mobile application in Pakistan. Later, our effort will be a further improve it as much that it will be used worldwide.
- This plan is prepared to make an Asset Usage and Tracking system. This will take some time to make our site to be used nationwide and it required too much effort and time to make it.

1.7.1. Work Breakdown Structure

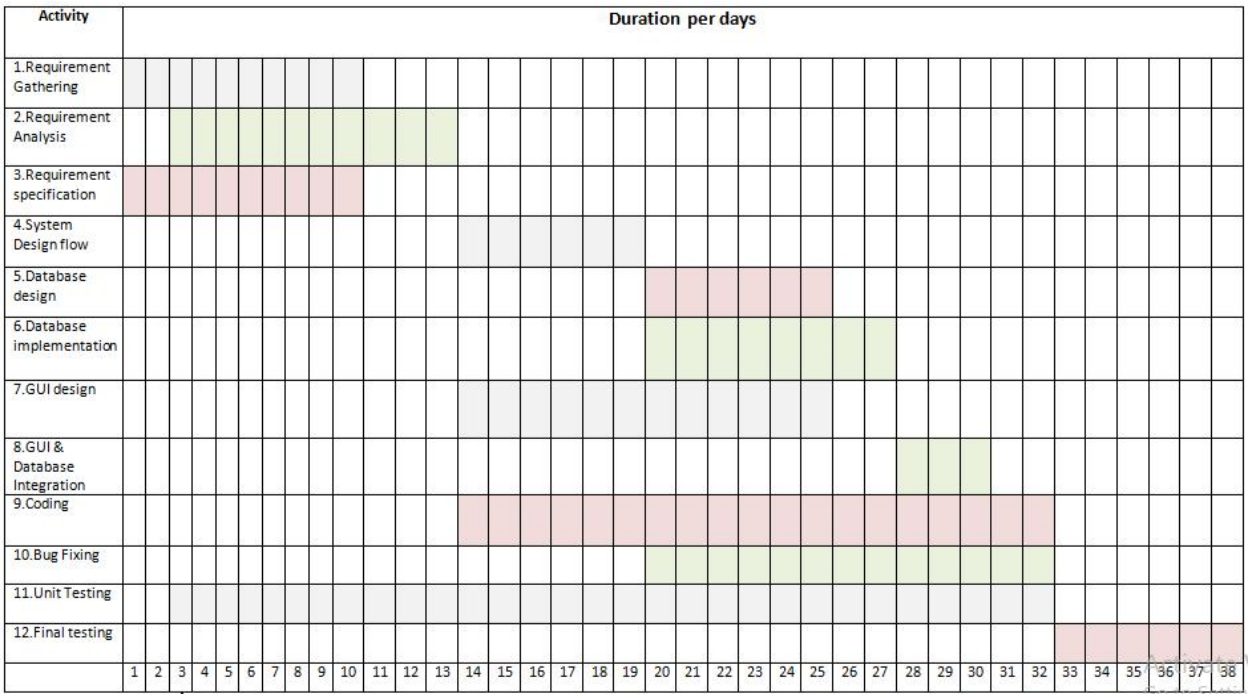


1.7.2. Roles & Responsibility Matrix

WBS #	WBS Deliverable	Activity #	Activity to Complete the Deliverable	Duration (# of Days)	Responsible Team Member(s) & Role(s)
01	Requirement gathering	1.0		6	All of us
02	System Design flow	1.1		7	All of Us
03	Database design	1.2		4	All of us
04	Database implementation	1.3		2	Muhammad Majid Arbaz Ahmad khan
05	GUI design	1.4		5	All of Us
06	GUI & Database Integration			4	Arbaz Ahmad Khan Shahzaib Safdar
07	Coding	1.5		10	All of us
08	Bug Fixing	1.6		--	Shahzaib Safdar

09	Final Testing	1.7		2	All of Us

1.7.3. Gantt Chart



1.8. Report Outline

This article includes all the information of our project included.

1. Introduction
2. Basics of functionality
3. Provided facilities.
4. Extreme with another competitor
5. Functionality of the system
6. User friendly interface
7. Project plan

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

2.1. Introduction

A Software Requirements Specification (SRS) is a document that describes the nature of a project, software, or application. In simple words, SRS document is a manual of a project provided it is prepared before you kick-start a project/application. This document is also known by the names SRS report, software document. A software document is primarily prepared for a project, software, or any kind of application.

There are a set of guidelines to be followed while preparing the software requirement specification document. This includes the purpose, scope, functional and nonfunctional requirements, software, and hardware requirements of the project. In addition to this, it also contains the information about environmental conditions required, safety and security requirements, software quality attributes of the project etc.

2.2. Purpose

Purpose of an SRS forms the basis of an organization's entire project. It sets out the framework that all the development teams will follow. It provides critical information to all the teams, including development, operations, quality assurance (QA) and maintenance, ensuring the teams agree.

The purpose of this document is to build an online system to manage flights and passengers to ease the flight management

2.3. Document Conventions

This document uses the following conventions.

DB	Database
DDB	Distributed Database
ER	Entity Relationship

2.4. Intended Audience and Reading Suggestions

This project is a prototype for the Asset Usage and Tracking system, and it is restricted within the University premises. This has been implemented under the guidance of University professors and ZAUQ Group. This project is useful for hospitals for tracking useful assets to save lives of people.

2.5. Product Scope

- At hospitals equipment used is very cost and many times critical need overrules the cost due to life saving needs.
- With wireless solutions ATS a solution can be designed that can give locations of the assets on which app or web interface can be built to track the locations and usage of the equipment.
- This system has a very wide scope in every field but in hospitals its scope is on peak.
- This can be used to track hospital's lifesaving things in very easy steps, and this can save many lives.

2.6. References

- Interviews with client.
- Interviews with users.
- According to user requirements
- Taking review from companies

2.7. Overall Description

2.7.1. Product Perspective

A distributed Assets database system stores the following information.

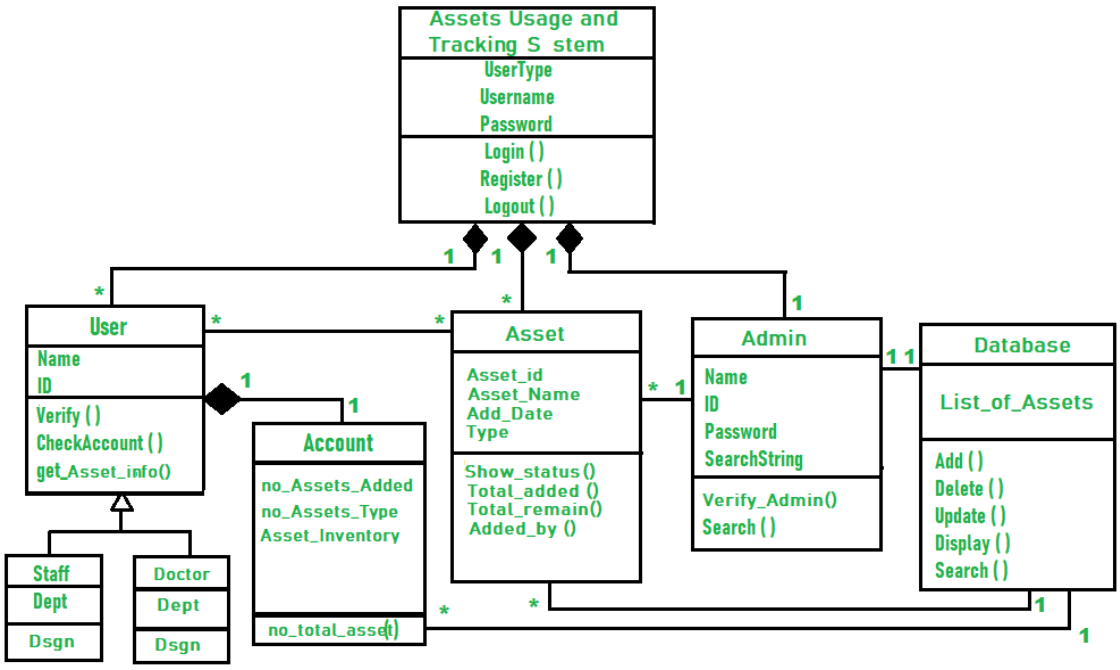
Asset details:

It includes the whole detail of asset with description of asset like name, code, type, location etc.

Customer description:

It includes customer code, name, address, and phone number. This information may be used for keeping the records of the customer for any emergency or for any other kind of information.

2.7.2. Product Functions



2.8. User Classes and Characteristics

This system is specially designed for the hospitals for locating their assets at the time of need. This system will allow the user to add an assets in the inventory. The user can Add/delete/update the asset, Whenever the user wants the user can locate its asset.

If the user has its required asset in the inventory, it will be show and can be located but if the asset is not available the user will be known that there is no asset available.

The system will support two types of user privileges, Customer, and Employee. The customer should be able to do the following functions:

- Add an Asset
- Delete an Asset
- Update information of an Asset

- Locate an Asset
- Search and view an Asset

2.9. Operating Environment

Operating environment for the Asset Usage and Tracking system is as listed below.

- distributed database
- client/server system
- Operating system: Windows.
- database: Sql + database or MongoDB.

2.10. Design and Implementation Constraints

The global schema, fragmentation schema, and allocation schema.

1. SQL commands for above queries/applications
2. How the response for application 1 and 2 will be generated. Assuming these are global queries. Explain how various fragments will be combined to do so.
3. Implement the database at least using a centralized database management system.

2.11. User Documentation

2.11.1. Assumptions and Dependencies

Let us assume that this is a distributed Asset Usage and Tracking system, and it is used in the following application:

- A request for Adding or deleting of an asset from any source. This will require information and user will add it or delete it
- The admin can manage assets by his/her requirements and can update the information. So user can avail asset at the time of need.

2.12. External Interface Requirements

2.12.1. User Interfaces

All the work will be done in PHP and Xampp will be used with it for database of SQL.

2.12.2. Hardware Interfaces

1. Windows.
2. *A browser which supports CGI, React JS*

2.12.3. Software Interfaces

Following are the software used for the flight management online application.

Software used	Description
Operating system	We have chosen Windows operating system for its best support and user-friendliness.
Database	To save the records, we have chosen SQL database.
VB.Net	To implement the project, we have chosen PHP language for its more interactive support.

2.12.4. Communications Interfaces

This project supports all types of web browsers. We are using simple electronic forms for filling the form of the detail of Asset.

2.13. System Features

This system has a lot of features which are given below

2.13.1. System Feature 1

<Don't really say "System Feature 1." State the feature name in just a few words.>

2.13.1.1. Description and Priority

The Asset Usage and Tracking system maintains information of Assets and update information. Of course, this project has a high priority because it is very difficult to locate important and useful assets at the need of time.

2.13.1.2. Stimulus/Response Sequences

1. Search for Asset which is required.
2. Displays a detailed list of available assets and locate it where it is.
3. Delete or Update Assets with you need

2.14. Functional Requirements

Asset Usage and Tracking system will locate the asset. This system is specially designed for the hospitals for locating their assets at the time of need. This system will allow the user to add an assets in the inventory. The user can Add/delete/update the asset, Whenever the user wants the user can locate its asset.

If the user has its required asset in the inventory, it will be show and can be located but if the asset is not available the user will be known that there is no asset available. The inventory will show the quantity of the assets that which are available for your login.

Home: This will show home page of the website.

About: Tis will have information about hospital.

Category: This will have categories of assets which are added.

Register: This will provide the facility to register yourself for using website.

Login: By this user can login to avail the services.

2.14.1. System Feature 2

2.14.2. System Feature 3 (and so on)

2.15. Other Nonfunctional Requirements

2.15.1. Performance Requirements

<If there are performance requirements for the product under various circumstances, state them here and explain their rationale, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.>

2.15.2. Safety Requirements

If there is extensive damage to a wide portion of the database due to catastrophic failure, such as a disk crash, the recovery method restores a past copy of the database that was backed up to archival storage (typically tape) and reconstructs a more current state by reapplying or redoing the operations of committed transactions from the backed-up log, up to the time of failure.

2.15.3. Security Requirements

Security systems need database storage just like many other applications. However, the special requirements of the security market mean that vendors must choose their database partner carefully.

2.15.4. Software Quality Attributes

AVAILABILITY: The flight should be available on the specified date and specified time as many customers are doing reservations.

CORRECTNESS: The flight should reach start from correct start terminal and should reach the correct destination.

MAINTAINABILITY: The administrators and flight in chargers should maintain correct schedules of flights.

USABILITY: The flight schedules should satisfy a maximum number of customer's needs.

2.16. Business Rules

<List any operating principles about the product, such as which individuals or roles can perform which functions under specific circumstances. These are not functional requirements in themselves, but they may imply certain functional requirements to enforce the rules.>

2.17. Other Requirements

There are no other requirements yet.

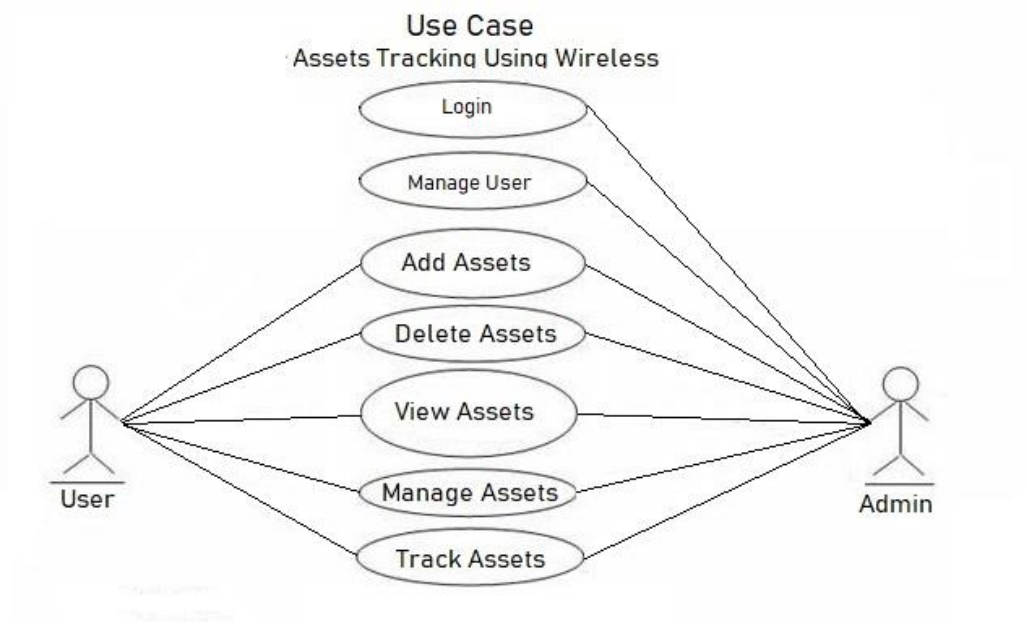
Chapter 3

Use Case Analysis

Chapter 3: System Analysis

This chapter consists of use case, use cases, and fully dressed use case modeling, which is mostly used to model interactions between a system and external actors.

3.1. Use Case Model



3.2. Use Case Descriptions

<table>
<tr><td>Use CaseID:</td><td>Search for Asset</td></tr>
<tr><td>Goal in Context:</td><td>A customer wishes to search for available Asset.</td></tr>
<tr><td>Scope:</td><td>Asset Usage and Tracking (AUT)</td></tr>
<tr><td>Pre-Condition:</td><td>Actor has successfully navigated to the main options screen.</td></tr>
<tr><td>Success End Condition:</td><td>A list of Asset matching the search criteria is presented.</td></tr>
<tr><td>Failed End Condition:</td><td>A list of Asset matching the search criteria is NOT presented.</td></tr>
<tr><td>Primary Actor:</td><td>Customer</td></tr>
<tr><td>Trigger Event:</td><td>Selects the "Search Asset" option.</td></tr>
<tr><td>Main scenario</td><td>
<table>
<tr><th><u>Step</u></th><th><u>Actor</u></th><th><u>Action Description</u></th></tr>
<tr><td>1</td><td>Customer</td><td>Selects the "Search Asset" option.</td></tr>
<tr><td>2</td><td>AUT</td><td>Displays a screen with input fields for Search Asset, type of Asset/ Required Asset to be entered.</td></tr>
<tr><td>3</td><td>customer</td><td>Enters all information and clicks the "Search" button.</td></tr>
<tr><td>4</td><td>AUT</td><td>Displays a listing of all Assets that match the customers input from step 3.</td></tr>
</table>
</td></tr>
</table>

Chapter 4

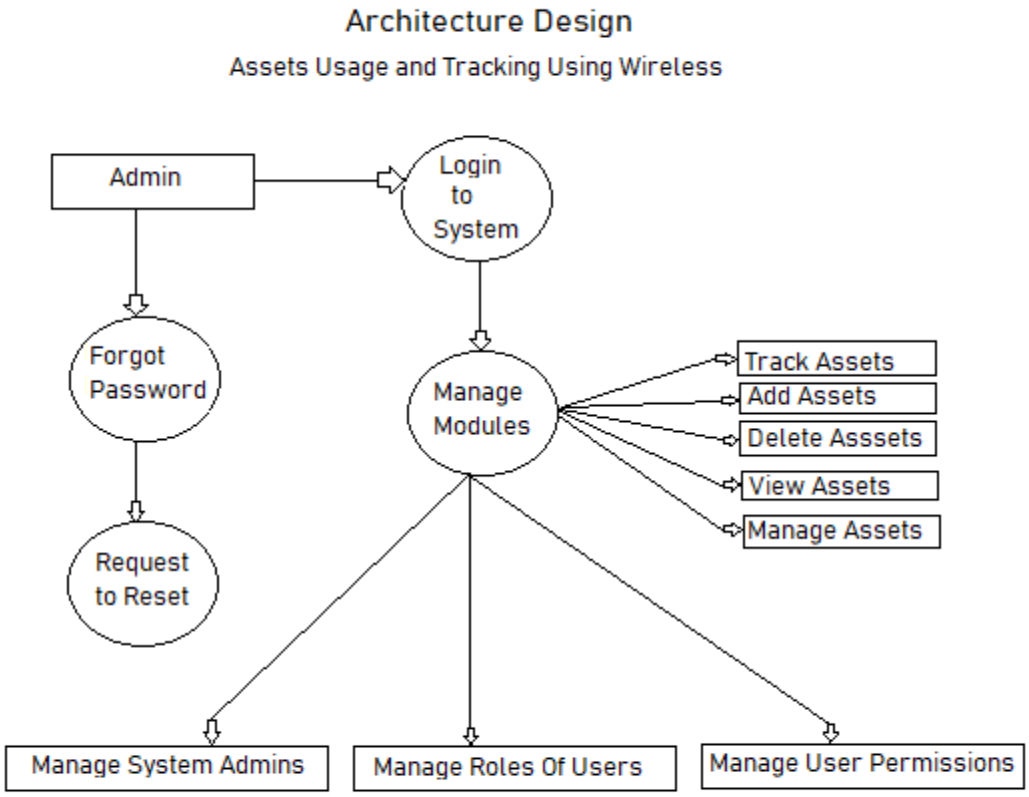
System Design

Chapter 4: System Design

This Chapter consists of system design of:

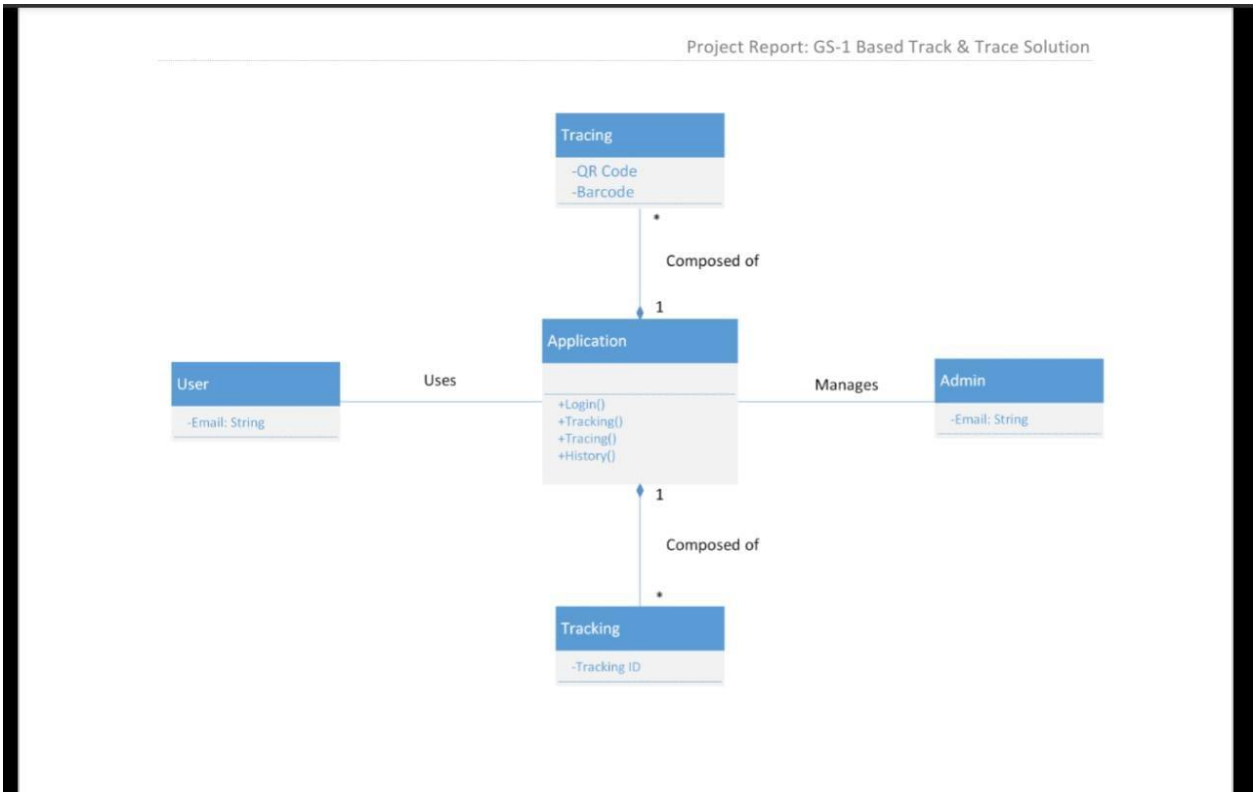
- Architecture Diagram
- Domain Model
- E-R Diagram
- class Diagram
- Sequence Diagram
- Operation Contracts
- Activity Diagram
- State Transition Diagram
- Component Diagram
- Deployment Diagram

4.1. Architecture Diagram



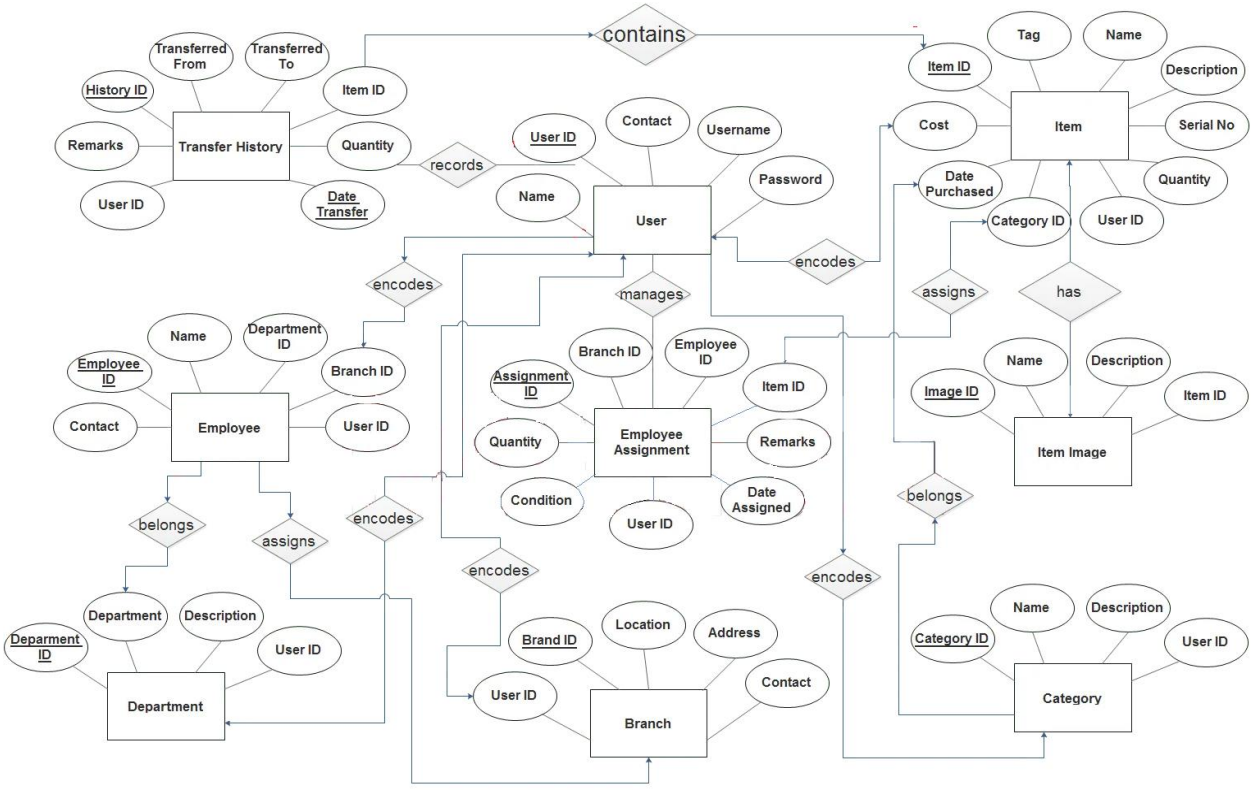
An architectural diagram is a visual representation that maps out the physical implementation for components of a software system. It shows the general structure of the software system and the associations, limitations, and boundaries between each element.

4.2. Domain Model



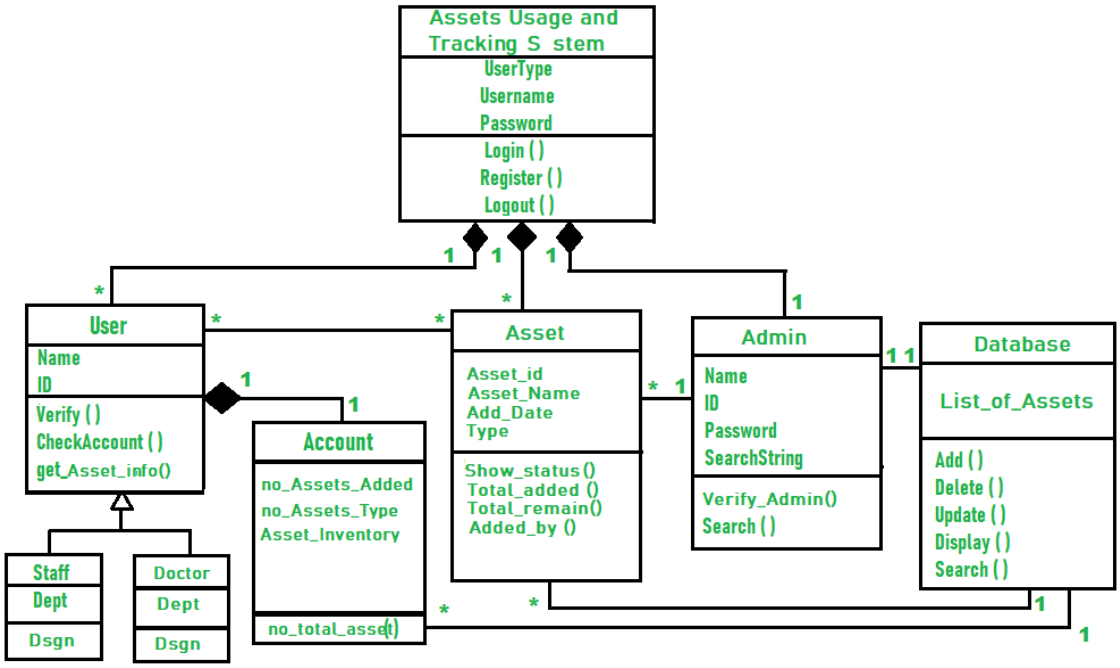
A DOMAIN MODEL IS THE MOST IMPORTANT OO ARTIFACT Its development entails identifying a rich set of conceptual classes, and is at the heart of object oriented analysis. It is a visual representation of the decomposition of a domain into individual conceptual classes or objects.

4.3. Entity Relationship Diagram with data dictionary



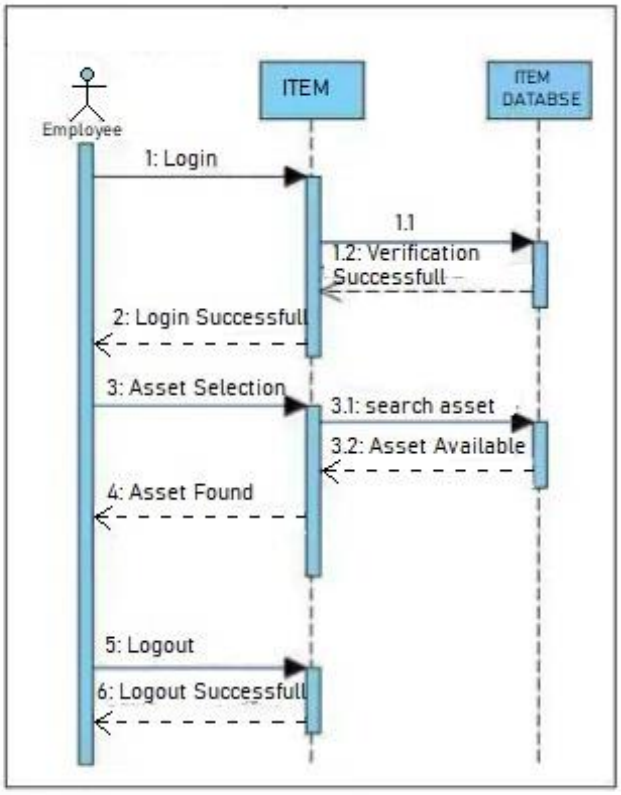
An entity relationship diagram (ERD), also known as an entity relationship model, is a graphical representation that depicts relationships among people, objects, places, concepts or events within an information technology (IT) system.

4.4. Class Diagram



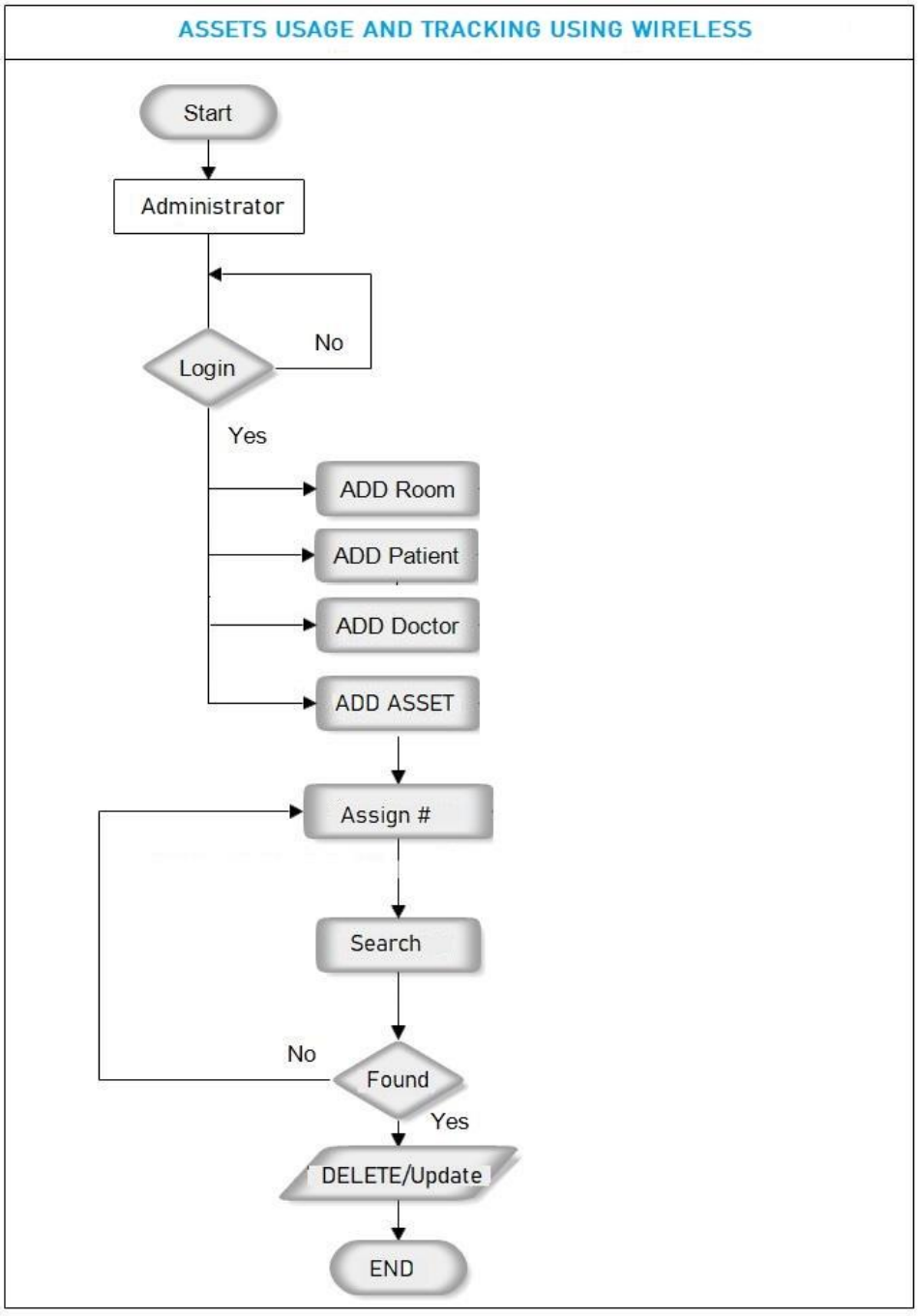
In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

4.5. Sequence / Collaboration Diagram



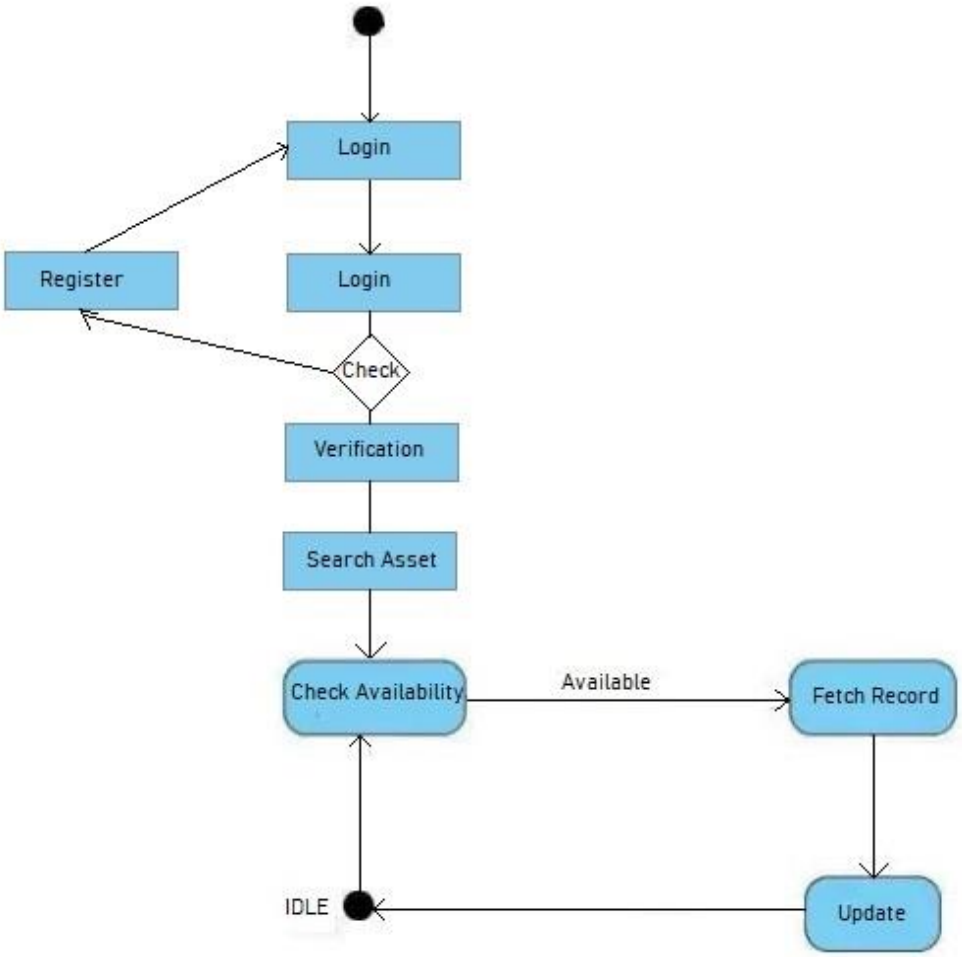
A sequence diagram is a type of interaction diagram because it describes how—and in what order—a group of objects works together. These diagrams are used by software developers and business professionals to understand requirements for a new system or to document an existing process.

4.6. Activity Diagram



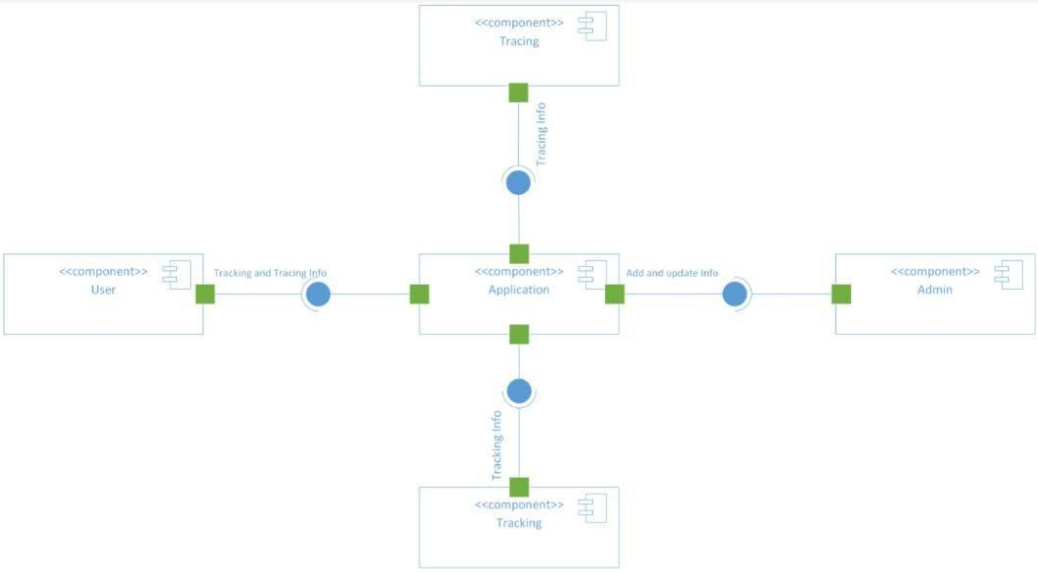
An activity diagram is a behavioral diagram i.e. it depicts the behavior of a system. An activity diagram portrays the control flow from a start point to a finish point showing the various decision paths that exist while the activity is being executed.

4.7. State Transition Diagram



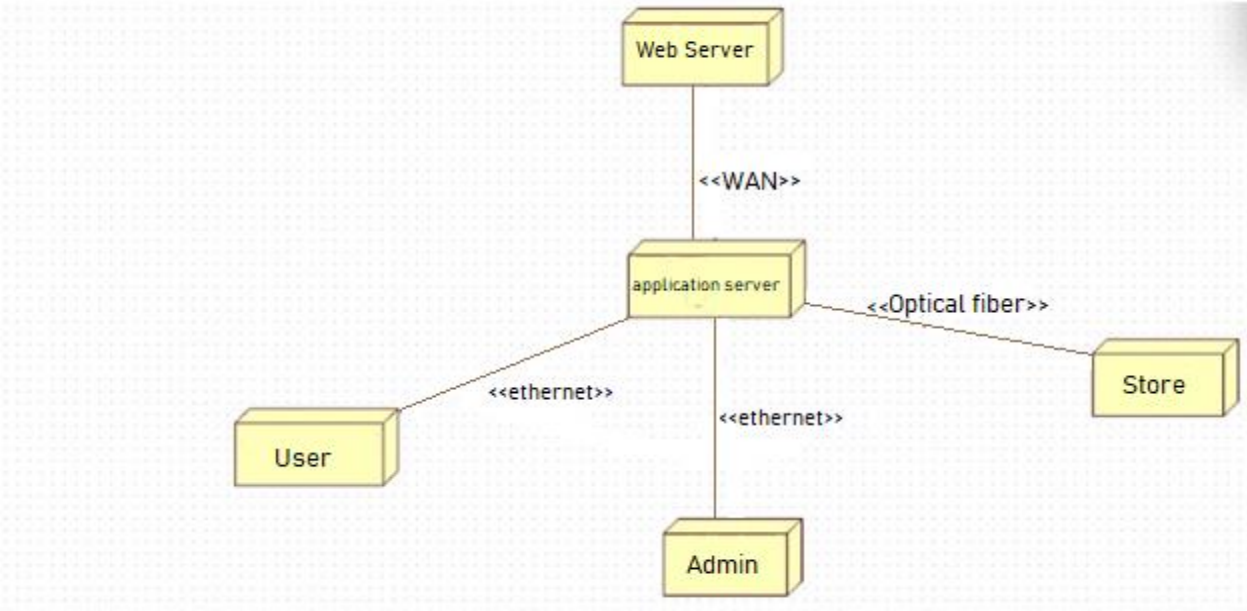
A state transition diagram is used to represent a finite state machine. These are used to model objects which have a finite number of possible states and whose interaction with the outside world can be described by its state changes in response to a finite number of events.

4.8. Component Diagram



A component diagram, also known as a UML component diagram, describes the organization and wiring of the physical components in a system. Component diagrams are often drawn to help model implementation details and double-check that every aspect of the system's required functions is covered by planned development.

4.9. Deployment Diagram



A deployment diagram is a UML diagram type that shows the execution architecture of a system, including nodes such as hardware or software execution environments, and the middleware connecting them. Deployment diagrams are typically used to visualize the physical hardware and software of a system.

Chapter 5
Implementation

Chapter 5: Implementation

This chapter is about implementation of Asset Usage and Tracking, the tools and techniques, coding standards, flow of program. It should help to understand how much this system is efficient and sufficient to meet functional requirements. This system is so efficient to overcome the difficulty locating important Assets.

5.1. Important Flow Control/Pseudo codes

There are three types of flow of control

- Sequential flow
- Selection or Conditional flow
- Iterative flow

Sequential Flow

Steps of the algorithm is executed one by one in a sequence.

Set sum = 0;

Read: x, y;

Set sum = x + y;

Print: sum;

Selection or Conditional Flow

Selection flow are of three types

- Single Alternative
- Double Alternative

- Multiple Alternative

Selection Flow – Single Alternative

Single Alternative

if expression then

statements

endif

Example

if x == 10 then

Print: “TEN”;

endif

Note! If the expression is TRUE then the statements inside the body of the if is executed otherwise it is ignored.

Selection Flow – Double Alternative

Double Alternative

```
if expression then
    statement-A
else
  statement-B
endif
```

Example

```
if x == 10 then
    Print: “TEN”;
else
    Print: “x is not TEN”;
endif
```

Note! If the expression is TRUE, then statement-A is executed otherwise statement-B is executed.

Selection Flow – Multiple Alternative

Multiple Alternative

```
if expression-1 then
    statement-1
else if expression-2 then
    statement-2
:
:
else if expression-n then
    statement-n
else
    statement-last
endif
```

Iterative Flow

Iterative flow is of three types

- for loop
- while loop
- do-while loop

Iterative Flow – for loop

Method 1

```
for i = r to s by t do
        statements
endfor
```

Example

```
for i = 1 to 5 by 1 do
        Print: i;
Endfor
```

This will print 1 2 3 4 5

Yet again, setting up organization's asset library is a simple technical implementation, done in just few minutes, but designing how it fits to organization's needs and the information architecture really needs some thinking. Benefits are obvious.

- If your library is having hundreds of items, think about dividing it to several libraries. for example, categorize your images like Icons, Fun, Offices, People, Our Products, etc.
- Add thumbnails to your libraries to make it look nice.
- If you are using folders, use clear naming.
- Really consider your options when you need to limit access to asset libraries.

5.2. Components, Libraries, Web Services and stubs

Web service stubs act as an isolation point for the code that does the following.

- Serializes the operation and parameter data into the Body portion of the SOAP request.
- Deserializes the return from the service provider from the parsed SOAP response

5.3. Deployment Environment

Asset deployment is a capability of Oracle Asset Tracking. The purpose of asset deployment is to signal the completion of operational tasks, to update item statuses in Oracle Install Base, and to initiate the asset creation and update processes in Oracle Projects and Oracle Assets.

Oracle Asset Tracking can be integrated with external systems. Oracle Asset Tracking provides an interface API as well as the Asset Deployment window for an external workforce management application to transmit transaction parameters to Oracle Asset Tracking.

5.4. Tools and Techniques

1. Barcode (QR Code)
2. Radio Frequency Identification (RFID)
3. Near Field Communication (NFC)
4. Bluetooth Low Energy (BLE)

5.5. Best Practices / Coding Standards

5.6. Version Control

At this point you should be able to do most of the important version control operations directly by right-clicking on the assets in the project view, instead of going through the version control client. The version control operations vary depending on which version control you choose

Chapter 6

Testing and Evaluation

Chapter 6: Testing and Evaluation

6.1. Use Case Testing

Main Success Scenario	Steps	Description

Login A: Actor S: System	1.	A: Enter Email and Password
	2.	S: Validate Email and Password
	3.	S: Allow Account Access
Extensions	2a	**Email not Valid** S: Try again or register new account
	2b.	**Password not Valid** S: Try again or click forget password to get new one

Main Success Scenario	Steps	Description
Register A: Actor S: System	1.	A: Enter new Email and Password
	2.	S: Check Email pattern and Password Length
	3.	S: Create new account and allow account access
Extensions	2a.	**Email Pattern not Correct** S: Write correct pattern of email
	2b.	**Password Length is short** S: Set password with length greater or equal to 6

Main Success Scenario	Steps	Description
Tracking A: Actor S: System	1.	A: Enter Tracking ID
	2.	S: Check for results in database against Tracking ID
	3.	S: Show results based on Tracking ID
Extensions	2a	**Invalid Tracking ID** S: System asks for valid Tracking ID

Main Success Scenario	Steps	Description
Tracing A: Actor	1.	A: Scan GS-1 label
	2.	S: Check for results in database against GS-1 label scanned

S: System	3.	S: Show results based on Tracking ID
Extensions	2a	**No result found** S: System asks for valid Tracking ID

Main Success Scenario	Steps	Description
Chatbot A: Actor S: System	1.	A: Asks Question
	2.	S: Searches for answer against question
	3.	S: Gives Answer

Main Success Scenario	Steps	Description
Order Dispatch A: Actor S: System	1.	A: Fill form
	2.	S: Checks for validations
	3.	S: Order dispatched to specific receiver on app
Extensions	2a.	**Empty Field** S: Please enter in this field.
	2b.	**Invalid Entry** S: Please Enter a valid entry.

Main Success Scenario	Steps	Description
Shipping A: Actor S: System	1.	A: Scans GS1 label
	2.	S: Shows Order Details
	3.	S: Order dispatched to specific receiver on app
Extensions	2a.	**Empty Field** S: Please enter in this field.
	2b.	**Invalid Entry**

		S: Please Enter a valid entry.

6.2. Equivalence partitioning

In **Register activity,** it is defined that the password must be greater than 5 digits and less than 20. If the password entered is less than 6 digits that will be an invalid password. But if the password will be greater than 5 digits, then the equivalence partitioning will show valid password.

Equivalence partitioning		
Invalid	Valid	Invalid
Digit < 6	Digit > 5	Digit<20

In **tracing activity,** each of the product has specific code against the GS1 label. We can search for product by scanning the GS1 label which contains that specific code for the product.
Here is the list of products, and user wants to find Dumore. Here we have some products with their codes.

Product	Code
Dumore	9867555559
Panadol	9456732145
Flagyl	6783265713
Pallete-red-01	1297458324
Grater-ch	4512384563

If user will write any code other than 9867555559 there will be an error. If user will enter the code 9867555559 then equivalence partitioning method will show a valid code.

Equivalence Partitioning		
Invalid	Invalid	Valid
1297458324	4512784563	9867555559

In **tracking activity,** each of the order has specific tracking ID. We can track order by giving the exact tracking order.

Suppose user wants to track an order with Tracking ID 22322315265855.

If user will write any code other than 22322315265855 there will be an error. If user will enter the code 22322315265855 then equivalence partitioning method will show a valid code.

Equivalence Partitioning		
Invalid	Invalid	Valid
12974583242356	45127845639878	22322315265855

6.1. Boundary value analysis

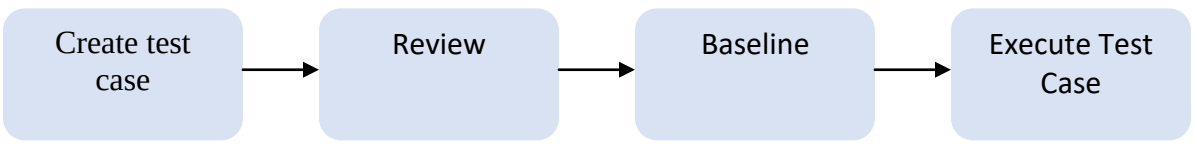
Boundary Value Analysis is based on testing the boundary values of valid and invalid partitions.

For Register,

Boundary Value Analysis		
Invalid(min-1)	Valid(min, min+1, nominal, max-1, max)	Invalid(max+1)
5	6,7,12,18,19	20

6.2. Unit testing

Workflow of Unit Testing:



Unit Testing tools for this application will be:

- Jtest
- Junit

6.3. Integration testing

The testing between two or more modules of a system is called integration testing.

For the integration testing of this system, we will use:

- Protractor
- Steam
- TESSY

6.4. Performance testing

Performance testing is done for checking the performance of the application. We will do the performance testing to check the Speed, Scalability, Stability and Reliability of the app.

Performance testing tools used will be:

- Jmeter
- Open STA

6.5. Stress Testing

Stress testing will be done for checking the robustness of the system. It will be done using these tools:

- Jmeter

Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

7.1 Project summary

Tracking an asset's location and movement provides all hospital with better accuracy and visibility. By keeping track of asset maintenance, expenses, downtime, and other hospital, your team is better equipped to make informed decisions about the most important assets in your hospital's portfolio. In order for your assets to perform at their optimal level, you must do regular maintenance and replacements on them.

People have many problems like losing or misplacing their assets. They lost their mind peace as well as when they misplace or lost their assets like mobile, machinery and other things of need. They cannot locate their assets and cannot track their assets working. Now a days some people lost their bikes and cannot find them.

Asset usage tracking & tracking system is a Web-based Application which let admin to manage all their asset .

7.2 Future Enhancements

An **Asset usage and tracking system** can help enhance the accuracy and efficiency of routine equipment maintenance by providing near-real-time reports on operational health and asset status depending on the given indicators. As a result of verified, paperless asset inspections, on-the-job safety, equipment productivity, and overall job efficiency are improved. Regardless of the equipment manufacturer, a comprehensive and integrated asset tracking system provides a comprehensive insight into maintenance warnings, particularly alerts for when parts need to be replaced. In the long run, this may help to avoid costly downtime caused by malfunctions.

7.3 Lessons Learnt

Some people are traditionalists by nature. They take pride in "holding out" on following or adopting new trends, technology, and processes. They are stuck in their old ways of doing things, not willing to admit that there may be a better way. This mentality applies to a number

of topics, but in this case, we're talking about the adoption and use of asset usage and tracking system.

7.4 Conclusion

Clearly, asset tracking has web base applications that more hospitals are beginning to investigate. To track and manage assets on the move, however, you'll always need a robust system .Only one brand can provide such a potent solution. An asset tracking solution that has been recommended by experts and is currently used in hospitals around the world. Every asset tracking solution has a secret sauce.

7.5 Achievements and Improvements

Asset tracking is an important part of modern-day workplace management. If you don't know what you own (or lease), you have no idea how much it's costing you and whether it's still working properly. Asset tracking software brings all your equipment data into one place you can access at your fingertips so you can find things easier, take a more proactive approach to maintenance, and make smarter purchasing decisions by understanding the total cost of ownership.

1. View and track any asset by type, location, assignment, and contract details
2. Add photos, warranty info, or manuals to asset profiles via a mobile app
3. Prioritize, categorize, assign, and fulfill service tickets on assets
4. Determine the total cost of ownership throughout asset lifecycle
5. Create real-time transparency with configurable, role-based dashboards

Reference and Bibliography

Reference and Bibliography

1. Visual paradigm tool
2. Sniping tool
3. Zoom
4. Paint tool
5. https://creately.com/
6. https://www.google.com/