Software Requirements Specification

for

A5-TrackIt

Version 1.0

Prepared by

Team Number: 03

BATTHALA VINOD KUMAR	**B191060CS**
CHALLA SAKETH	**B190161CS**
SUDDALA VARUN	**B190321CS**
MOTURU MANOGNA	**B190695CS**
UTTKARSH RAJ	**B190955CS**
MASINA SAI BHARGAV TEJA	**B190432CS**

Project Owner: Ms. Anjaly

Course: CS4096D Software Engineering Laboratory

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This template is based on the one available from the GMU site by Dr. Rob Pettit. Modifications specific to NITC are made and will be used for academic purposes only.

Table of Contents

Revisions

Version	Primary Author(s)	Description of Version	Date Completed
Version 1.0	BATTHALA VINOD KUMAR CHALLA SAKETH MASINA SAI BHARGAV TEJA SUDDALA VARUN UTTKARSH RAJ MOTURU MANOGNA	SRS of the project is made.	05-02-2022

1 Introduction

The project work proposes a TrackIt mobile application where lab admins can add and get reports of the lab equipment present in various labs and all users can search or get details of different devices residing in the lab. From this section, you get to know a brief introduction of what this document explains and the scope of this project and its audience.

1.1 Document Purpose

The purpose of this document is to provide a detailed description of the requirements for the TrackIt mobile application. The application aims to help users to keep track of details of all the available devices in labs and allows lab administrators to add/edit details/get reports of devices.

The document contains a general description, the functional, interface, and performance requirements for the application, a list of other relevant attributes, application usage scenarios, and use case diagrams.

1.2 Product Scope

The objective of TrackIt is to simplify the work of lab administrators at different stages like adding a new device, changing the present state of the device, etc. It also helps all the users to know about the details and the state of the device just by scanning QR or by typing the unique Id provided.

The application will bring many benefits like making the maintenance of different devices in labs efficient and getting an overall view of all current devices which would be difficult without this app.

1.3 Intended Audience and Document Overview

This document is intended for several users which include:

1. The developers who use the SRS to design the system in such a way that it meets the requirements of the client.
2. The Project Owner / Client.
3. The testers who will test whether the software meets all the requirements.

The next section, the Overall Description section, of this document gives an overview of the functionality of the product. The third section, the Specific Requirements section, of this document is written primarily for the developers and describes the details of the functionality of the product in technical terms. The later sections of this document specify more requirements related to this project.

1.4 Definitions, Acronyms, and Abbreviations

SNo.	Term/Abbreviation	Definition
1	AMC	Annual Maintenance Contract
2	NITC	National Institute of Technology, Calicut
3	SRS	System Requirement Specification

Definitions:

1. User – a student or faculty or lab administrator based on scenario

1.5 Document Conventions

This document follows the IEEE formatting requirements. The document text is single-spaced and 1” margins are maintained.

H1 heading:

Font name	Times
Font size	18

H2 heading:

Font name	Times
Font size	14

Body:

Font name	Arial
Font size	11

1.6 References and Acknowledgments

- IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998

2 Overall Description

2.1 Product Overview

Keeping a record of the details of every machine is very important in the labs of college. But currently, in NITC all these records of machines are kept offline and are not available to everyone at the same time. So, to remove all the paperwork that happens offline and to get all the records of machines in labs in a good categorized way and available to all at the same time we are creating Trackit. Trackit is going to be an android application that will supply a user-friendly interface to lab admins to manage all the data records of machines and all this information will be available to the other people in the college. This product is a replacement for the existing system.

In the Trackit android application, Lab admins are going to log in using the account credentials provided by Trackit super admins. The lab admin has to add the new machines or other devices with all the details like product name, description, warranty period, supplier information, price, annual maintenance date. While adding the device the application will automatically generate a unique id and a unique QR code which can be pasted on the machines and can be scanned using the application to get all the details regarding the machine. The details of the devices will be available to all the NITC people. Students can also scan the QR code to get all the data regarding that particular device. The TrackIt application will also be able to generate statistical reports about how many devices are working and how many of them are not working, how many are under warranty, and how many are not. The application will contain records of all the labs so to get data in a well-ordered way it will be categorized according to labs and departments. The application will contain categorized data about devices. The lab admin is also allowed to delete a device in case the device is completely destroyed or can’t be repaired. The application will also provide a feature to search the device.

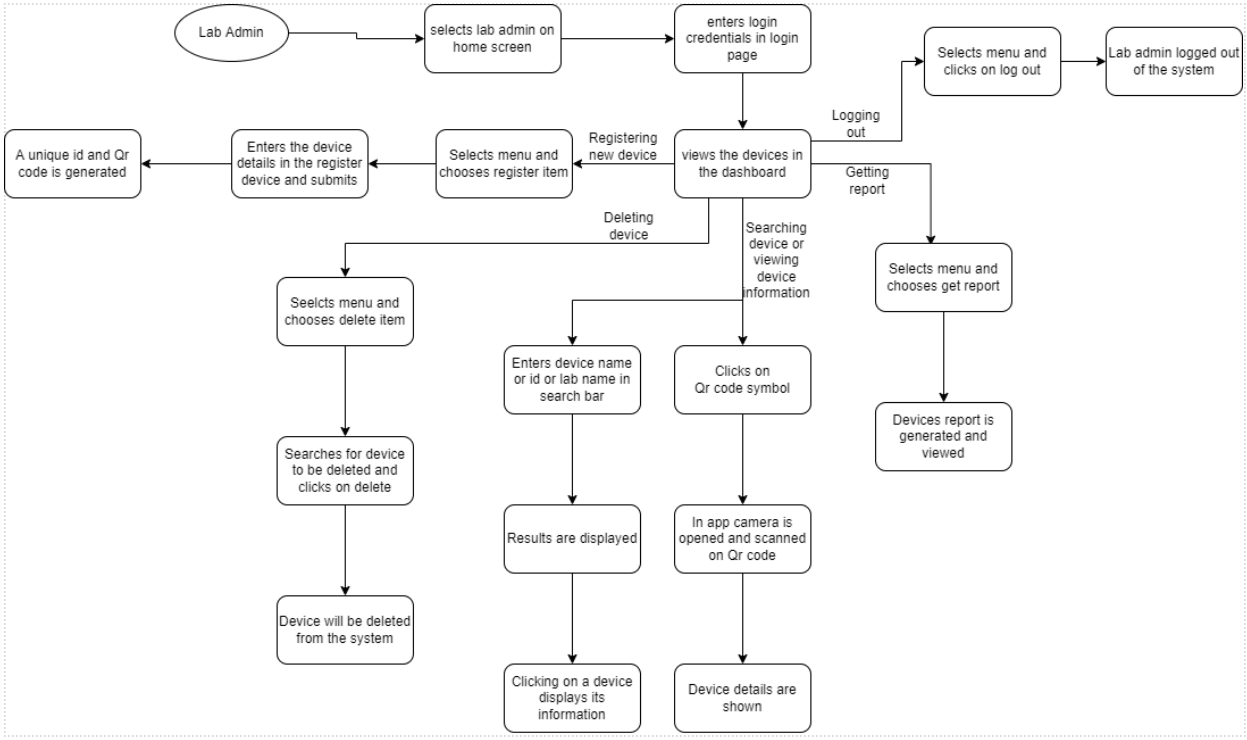


Fig: Flowchart of Lab admin as user

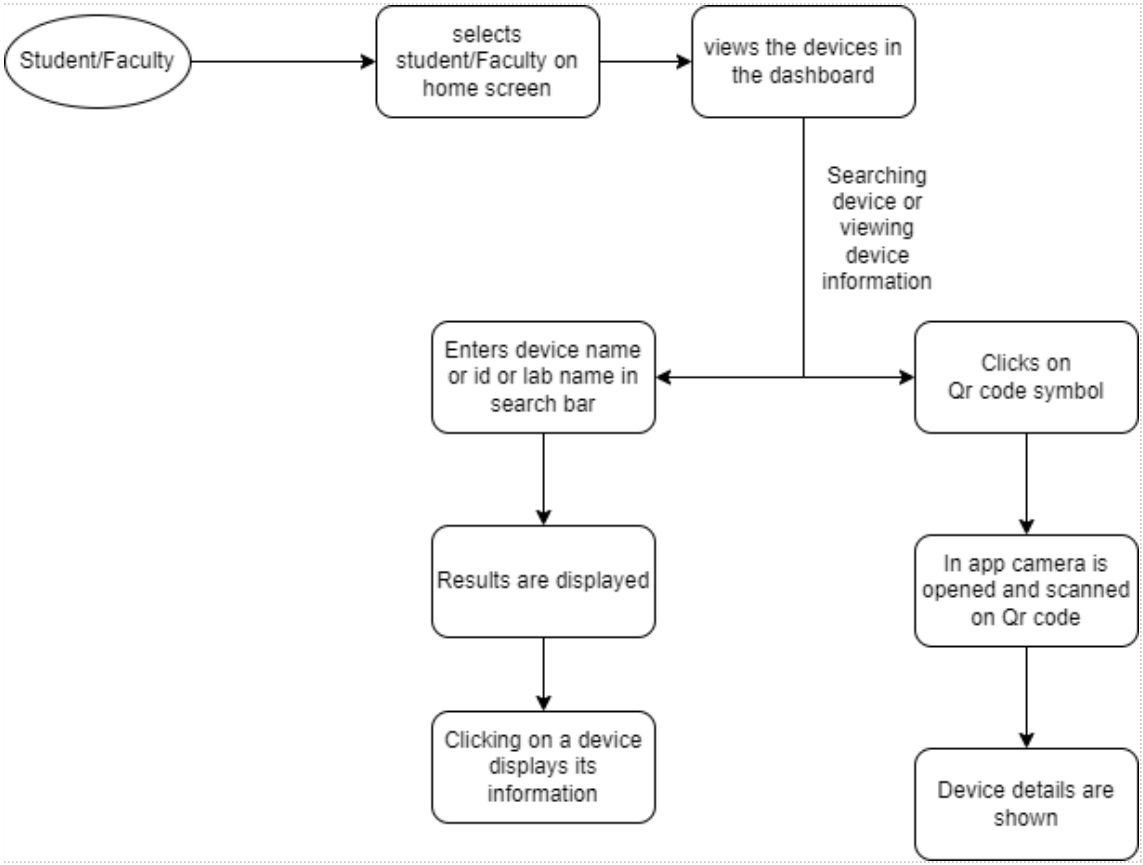


Fig: Flowchart of student/faculty as user

2.2 Product Functionality

The TrackIt app:

- Logs in users
- adds devices
- edits device details
- deletes devices
- generates Qr code and a unique id for devices
- shows the device list
- search for device
- show device's description
- generate report of devices

2.3 Design and Implementation Constraints

- The product Trackit is a mobile-based application, so the development environment used for the application must be Android Studio.
- The database used should be able to store all the device details present on the campus. The application should not be allowed to make any changes to the database data directly.
- Since the application makes use of vital information about the institute, all communications should be encrypted using Transport Layer Security(TLS).
- This application development process must follow the principles specified by the Software Development Lifecycle (SDLC).

2.4 Assumptions and Dependencies

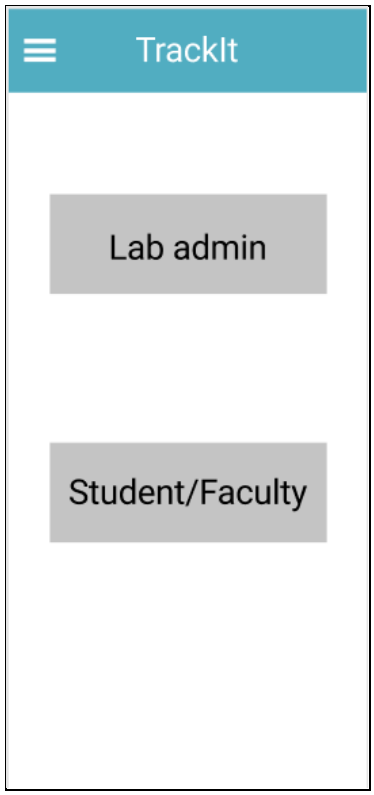
- All the user devices are running on Android OS 7.0 or higher.
- The application will be used to manage the data of NITC Labs only.
- The login credentials to the Lab admin accounts are pre-made and do not require separate registration.
- The application will be mainly and frequently used by the lab admins.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces.

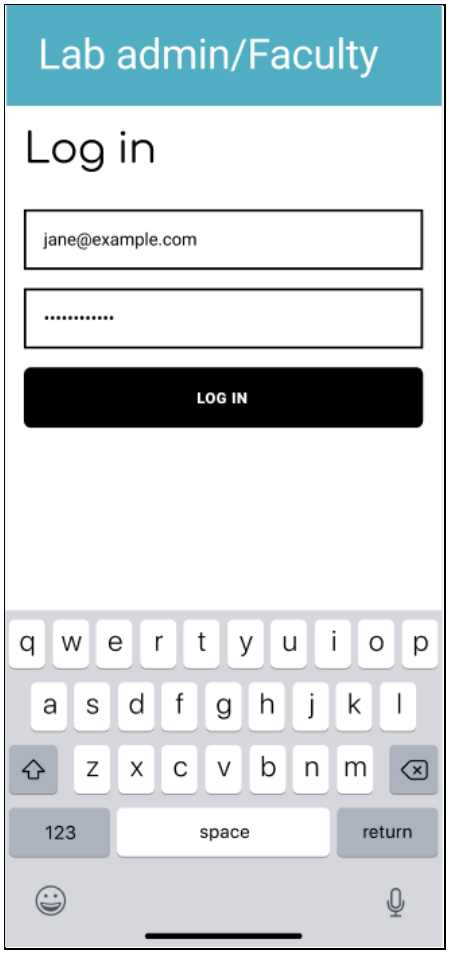
- ***Home Page:***



On the home page, there will be two buttons 'Lab admin' and 'Student/Faculty'.The Lab admin button will be for Lab admins after selecting which they will be redirected to the login page where they can enter the credential and login in the system. The Student/Faculty button will be used by the NITC students and all the faculties where they can access the data without any credentials.

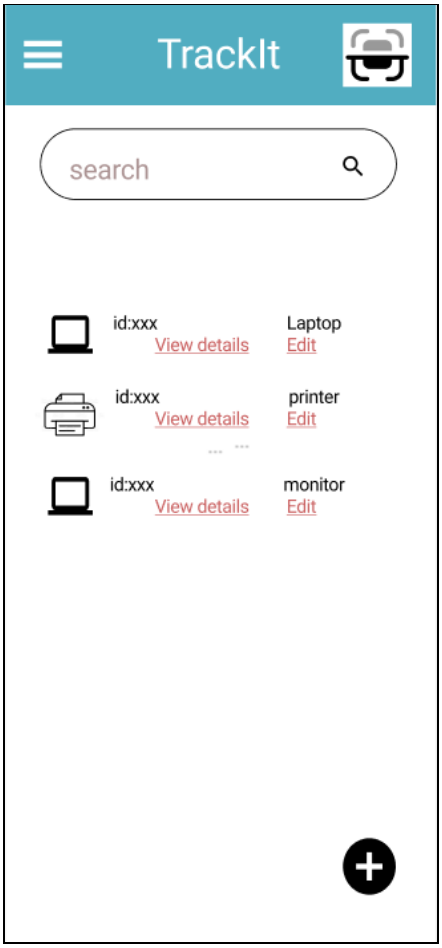
3.1.1.1 User is Lab administrator

- **Login interface:**



In this interface, there will be two text fields namely username and password along with the login button. From this interface, the authorized personnel can log in to the portal with root credentials. If credentials are right, then the lab admin will be redirected to the 'Dashboard Page of admin' screen. In case if the credentials entered are wrong the error message will be displayed and will ask the lab admin to enter credentials again.

- **Dashboard**

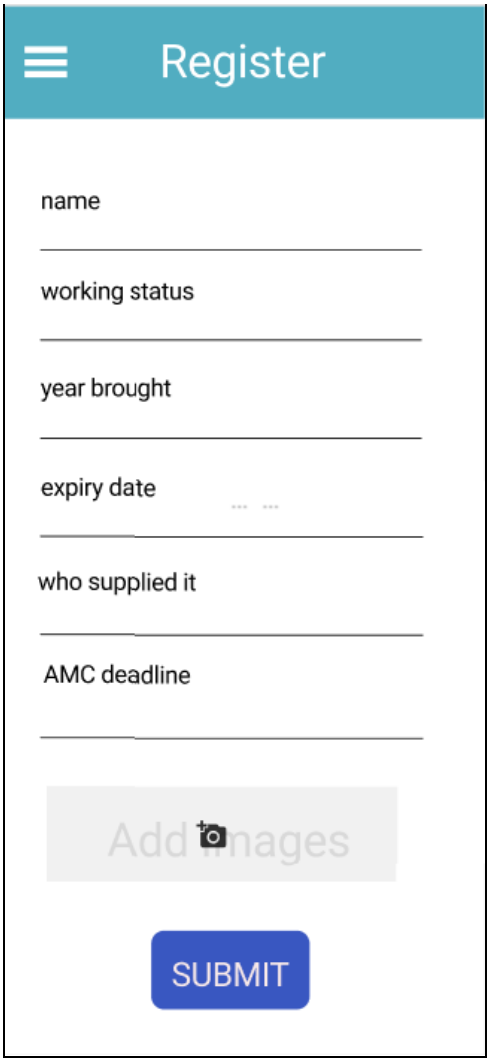


On the admin dashboard there are different buttons like add symbol button on the bottom, QR code scanner button at the top right corner and Menu button on the top left corner. On the screen Admin can see the list of all the devices in the lab. Admin can add the new item by clicking on the Add symbol button after which the add details page will appear on the screen. Admin can search for any device by searching in the search box or by scanning the Qr code which is at the top right corner. On the admin dashboard admin will also have the option to view details of the item and edit the details of the item at the bottom of every item.

- **Menu**

On the admin dashboard there is the menu option on the top left corner from where he can access the menu. The menu will contain the different options like Register item, Delete item, Get report and Logout. The admin can go to the add item page by clicking on the Register button, and the admin can go to the Delete item page by clicking on Delete item. The admin can log out of the system by clicking on log out in the menu.

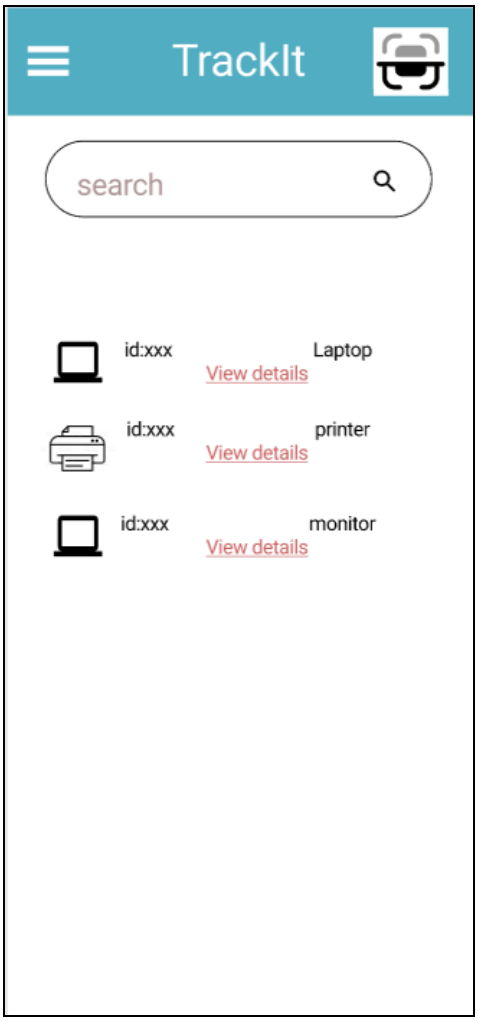
- **Device registration**



On the Registration page admin can add a new device by filling in all the details like name,working status, date of purchase, warranty period, who supplied the device and can add pictures of the device. Clicking on the submit button will register the device and in turn, create a unique id and QR code of the device which later can be used to fetch the device details.

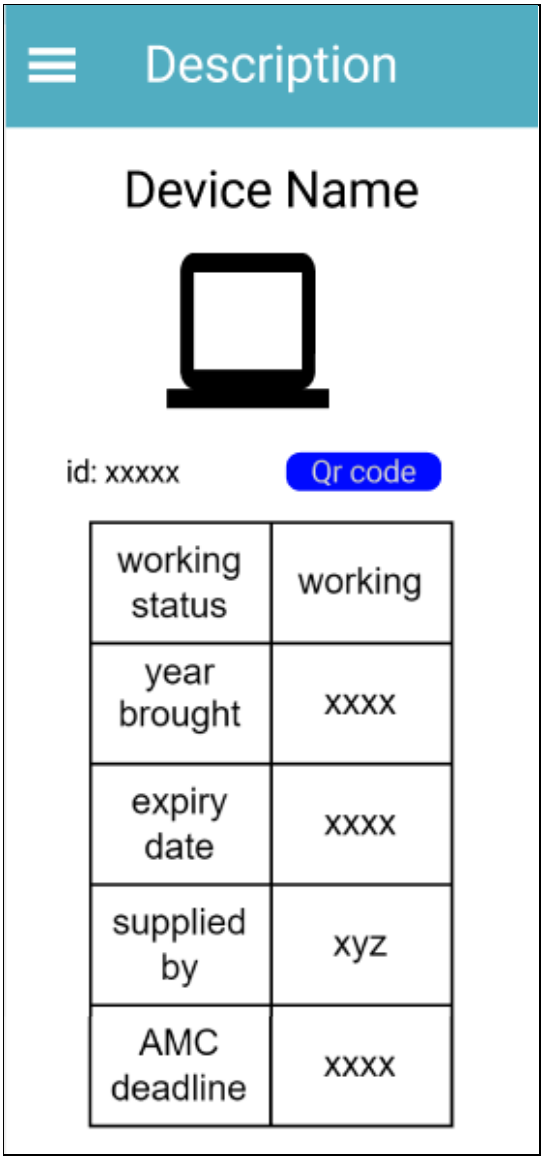
3.1.1.2 User is Student/Faculty

- **Dashboard**



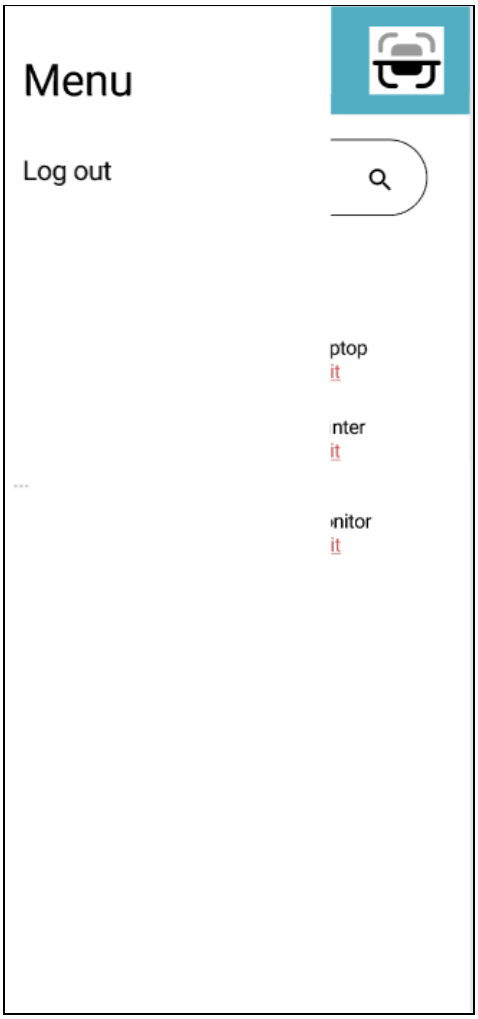
On the student/faculty dashboard there are different buttons like QR code scanner which will be on the top right corner, menu button on the top left corner, and search device option. A student/ Faculty can search for any device using the search box or by scanning the QR code, Student/Faculty can also access the menu by clicking on the top left corner. Students/Faculty can also see the details of the device using the view details button available at the bottom of every item.

- **Device Description**



Users can view the details of the Device on the device description page like date of purchase, price, working condition, AMC deadline etc.

- **Menu**



Users other than lab admins have no extra features and can just log out which will take the user to the home page.

3.1.2 Hardware Interfaces

As the application is an android application any particular hardware interfaces are not required for this software and the application is compatible with any Android/ios device.

3.1.3 Software Interfaces

No additional required as this is a stand-alone app.

3.2 Functional Requirements

F1:The system shall verify the user details while they are logging in.
F2:The system shall log out the user from the application.
F3:The system shall allow lab admins to add the devices to the database.
F4:The system shall notify if the device searched does not exist.
F5:The system shall be able to scan the QR code of a device.
F6:The system shall display the device details.
F7:The system shall generate a QR code, unique id for the newly registered device.
F8:The system shall allow lab admins to edit the device details.
F9:The system shall allow lab admins to delete the devices registered.
F10:The system shall generate reports of the devices.
F11: The system shall allow users to search devices using the device name.
F12: The system shall allow users to search devices using a unique device id.
F13: The system shall allow users to search devices using lab names.

3.3 Use Case Model

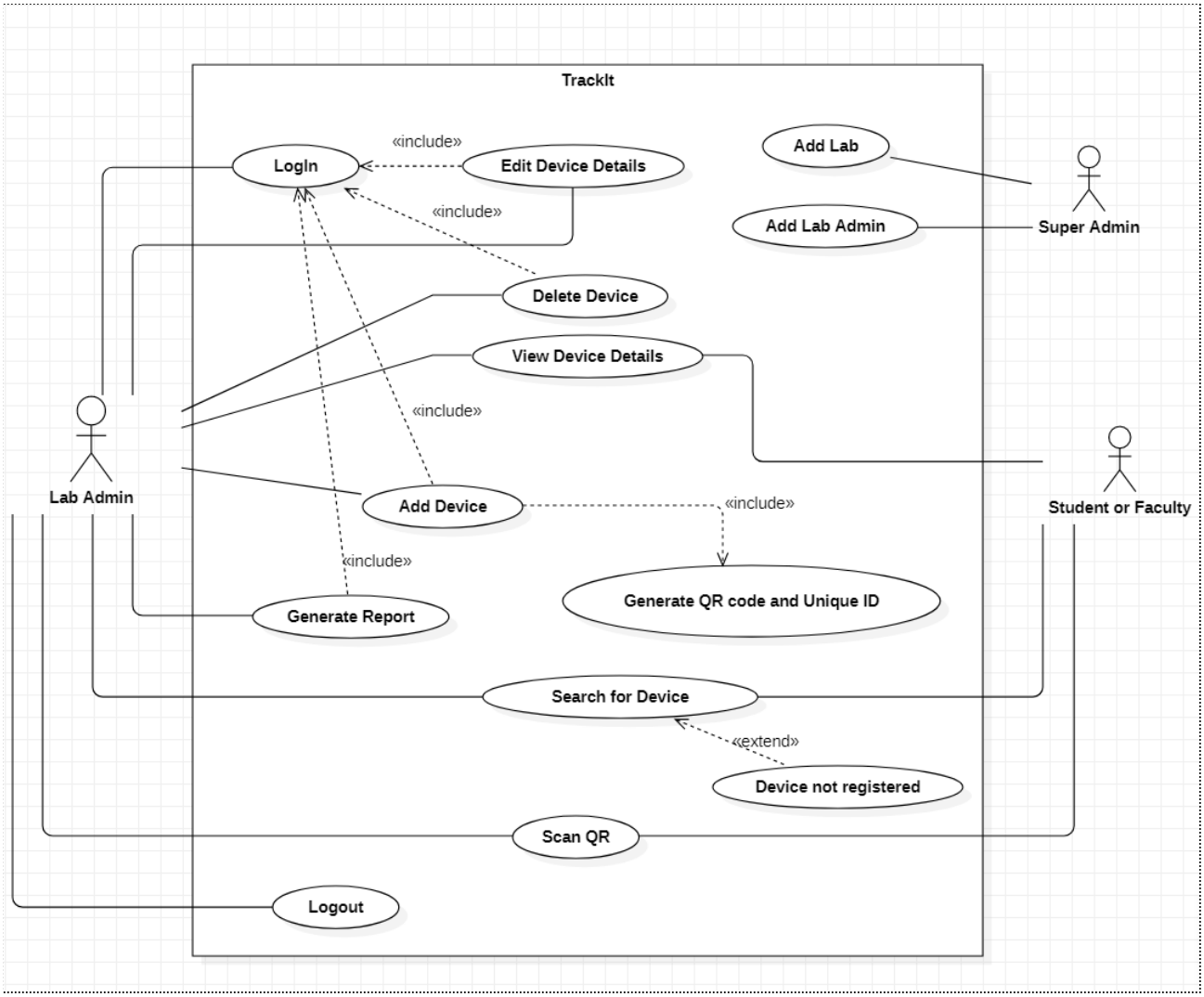


Fig: Use Case diagram for TrackIt project

3.3.1 Use Case #1 (Log In - U1)

Author – Batthala Vinod Kumar

Purpose - To login as a Lab Admin

Requirements Traceability – F1

Priority - High

Preconditions - Lab Admin must be registered in the system

Post conditions - Lab Admin will be able to use the system

Actors – Lab Administrator

Extends – None

Flow of Events

1. Basic Flow:

Actor's action	System's response
Admin clicks on app icon	System opens the app
Admin clicks on lab admin button	System prompts the login page
Admin enters his/her credentials	
Admin clicks on login submit button	System verifies the user's details
	System logins the user and shows home page

2. Exceptions:

Actor's action	System's response
Admin enters his/her credentials wrongly	
Admin clicks on login button	System displays the error message and resets the credentials on login page

Includes - None

3.3.2 Use Case #2 (Add Device - U2)

Author – Suddala Varun

Purpose - To add a new device.

Requirements Traceability – F3

Priority - High.

Preconditions - Lab admin must be logged in to the system.

Post conditions - The details of the new device will be added.

Actors – Lab administrator.

Extends – None

Flow of Events

1. Basic Flow:

Actor's Action	System's Response
Lab admin clicks on the register device option.	System shows a dialog box to enter necessary details like device name, working status, year bought, AMC deadline, location, lab, etc.
Lab admin fills in all these necessary details and hits the register device option.	System verifies the details filled and checks if details are appropriate, if the verification is successful then it displays two options whether to proceed or cancel the process.
Lab admin presses the proceed button.	System adds the new device to the list and displays the newly added device in the list of devices.

2. Alternative Flow:

Actor's Action	System's Response
Lab admin after giving necessary details and hitting register device option,clicks on cancel button.	System redirects to the admin's home page.

3. Exceptions:

Actor's Action	System's Response
Admin doesn't give appropriate details of the device.	System displays error message stating that device is not added.

Includes - Login, Generate Qr code and unique id

3.3.3 Use Case #3(Delete Device - U3)

Author – Suddala Varun

Purpose - To delete device details from the system

Requirements Traceability – F9

Priority - Medium

Preconditions - Lab admin must be logged in to the system.

Post conditions - The device along with its details will be deleted from the system.

Actors – Lab administrator

Extends – None

Flow of Events

1. Basic Flow -

Actor's Action	System's Response
Lab admin searches for a device by giving Id or with QR code	System displays the device.
Lab admin clicks the delete option.	System asks for confirmation by giving options whether to proceed or cancel.
Lab admin clicks on the proceed option.	System deletes the device and its details from the database and the list.

2. Alternative Flow -

Actor's Action	System's Response
Lab admin after hitting the delete device option, clicks on the cancel button.	System redirects to the admin's home page.

3. Exceptions -

Actor's Action	System's Response
Device deletion is unsuccessful due to some issue.	System displays an error message stating the reason.

Includes - Login

3.3.4 Use Case #4 (Edit device details - U4)

Author - Masina Sai Bhargav Teja

Purpose - Admin should be able to edit the Device details

Requirements Traceability – F8

Priority - Medium

Preconditions - Lab admin must be logged in to the system.

Post conditions - The details of the device are successfully edited by the admin and are updated.

Actors – Lab Administrator

Extends – None

Flow of Events

1. Basic flow

Actor's Action	System's response
Admin searches for a device by giving its Id or with QR code.	System displays the device.

Admin clicks on the Edit details button.	System displays a dialogue box facilitating the user to modify details entered previously.
Admin edits the device details and clicks the save button.	System asks for confirmation.
Admin clicks on proceed and save.	System updates the details of the device and notifies the admin stating “Device details updated successfully”.

2. Alternate flow:

Actor’s Action	System’s response
Admin after hitting the save button, clicks on the cancel button.	System redirects to the admin's home page.

3. Exceptions

Actor’s Action	System’s response
The updated details don't meet requirements.	System displays an error message stating the reason

Includes – Login

3.3.5 Use Case #5 (Search Item - U5)

Author – Moturu Manogna

Purpose - Users should be able to search items by entering the unique id or by device name or lab name in the search box to get all the information regarding the device.

Requirements Traceability – F11,F12,F13.

Priority - High

Preconditions - If the user is a lab administrator, he/she must be logged in

Post conditions - After a successful search, the user should be able to see all the device details on the screen.

Actors – Lab administrator, students, faculty

Extends – Device not registered(U-11).

Flow of Events

1. Basic Flow:

Actor's action	System's response
User clicks on Search item option	System opens the search dialog box
User enters unique id or device name or lab name in the search box	System will search for the device in the database
User clicks on the Enter button	System will display the device/lab information on the screen.

Includes -None

3.3.6 Use Case #6 (Scan QR Code - U6)

Author – Uttkarsh Raj

Purpose - Users can scan the QR code for getting the details of the product.

Requirements Traceability – F5

Priority - High

Preconditions - User Should Scan the Qr code Correctly.

Post conditions - After Scanning the QR code user will get all the details of the product on the screen.

Actors – Lab administrator, students, faculty

Extends – None

Flow of Events

1. Basic Flow:

Actor's action	System's response

User clicks on Scan QR code	System opens the camera to scan the QR code
User Scans the QR code	System will search for the item in the database
Now user can see all the details of the product	

Includes - None

3.3.7 Use Case #7 (Logout -U7)

Author - Uttkarsh Raj

Purpose - After Lab admin is done with the work, he/she can log out of the system which won't allow any other person to access the system without the credentials.

Requirements Traceability – F2

Priority - High

Preconditions - Users should be logged in.

Post conditions - The user is successfully logged out of the system.

Actors –Lab Admin

Extends – None

Flow of Events

1. Basic Flow:

Actor's action	System's response
User clicks on the 'Logout' button	System will display a pop up asking for confirmation.
User Click 'Confirm'	System will redirect user to the Login page

2. Alternate FLow:

Actor's action	System's response
User clicks on the 'Logout' button	System will display a pop up asking for confirmation.
User Click 'Cancel'	System will cancel the logout operation

Includes - None

3.3.8 Use Case#8 (Generate report - U8)

Author - Masina Sai Bhargav Teja

Purpose - To allow admin to generate and view report

Requirements Traceability – F10

Priority - Medium

Preconditions - Lab admin must be logged in to the system

Post conditions - The report of the devices in the laboratory are successfully generated and can be viewed by the admin.

Actors – Lab Administrator

Extends – None

Flow of Events

1. Basic flow

Actor's action	System's response
Lab Admin clicks on generate report	System will display the report giving details about devices and their working status and other info.

Includes - Login

3.3.9 Use Case #9 (View Device details - U9)

Author – Challa Saketh

Purpose - To view details of a particular device.

Requirements Traceability – F6.

Priority - High.

Preconditions - The device must be registered in the system.

Post conditions - User will be able to view the device details successfully.

Actors – Student, Lab administrator, Faculty

Extends – None

Flow of Events

1. Basic Flow -

Actor's actions	System Response
Admin searches for a device by giving its Id or with QR code.	System displays the device.
User clicks on the view details of the device button	System loads and displays the details of the device

2. Alternate Flow -

Actor's Action	System Response
	System displays the details of the device.
User clicks on Qr code button.	System displays the QR and ID of the device.

Includes - U1(Log In)

3.3.10 Use Case #10 (generate QR code - U10)

Author – Challa Saketh

Purpose - To generate QR code and Unique ID on successfully registering a new device.

Requirements Traceability – F7

Priority - High

Preconditions - User must be logged into the system and successfully add a new device.

Post conditions - A Unique ID and QR code will be generated for the newly added device.

Actors – Lab Administrator

Extends – None

Flow of Events

1. Basic Flow -

Actor's Action	System Response
	System adds the new device to the list and displays the newly added device in the list of devices.
Admin clicks on view details.	System displays details of the device.
Admin clicks on Qr code button.	System displays the QR and ID of the device.

Includes - U1(Log In)

3.3.11 Use Case #11 (Device not found - U11)

Author – Moturu Manogna

Purpose - To notify the user if the searched device is not registered in the system

Requirements Traceability – F4

Priority - Low

Preconditions - User searched for a device

Post conditions - System successfully notified the user that device is not found.

Actors – Lab Administrator, Student, Faculty

Extends – U5(Search item)

Flow of Events

1. Basic Flow -

Actor's Action	System Response
User enters invalid device name or id in the search bar.	System displays the message that the searched device is not found.

Includes - None

4 Other Non-functional Requirements

4.1 Performance Requirements

- Generating Qr code and unique id should be fast.
- Searching for devices should not be taking much time to load.
- Workload should be maximum. The total workload is a combination of user queries, applications, and system commands directed through the database at any given time.
- The android application must be able to run concurrently on multiple devices.

4.2 Safety and Security Requirements

- System will use a secured database.
- System will have different types of users and every user has access constraints.
- Proper user authentication will be provided.
- There should be separate types of accounts for admin and members such that no member can access the database and only admin has the rights to update the database.

4.3 Software Quality Attributes

4.3.1 Usability

The application will satisfy a maximum number of customer needs.

4.3.2 Correctness

The application will be correct in terms of functionality and will adhere to functional requirements.

4.3.3 Maintainability

The development team will follow best practices for clean code and software modularity in order to maintain a better application.

5 Other Requirements

- In the database, integer, double, varchar, date type of information will be held.
- The database should support storing at least 1000 device details.

Appendix A - Activity Log

Group meetings

S. No	Date	Timings
1	02-02-2022	6 PM – 10 PM
2	04-02-2022	7 PM – 10 PM
3	05-02-2022	4 PM – 6 PM

CONTRIBUTIONS

1. Introduction – Moturu Manogna, Masina Sai Bhargav Teja
2. Overall Description – Uttkarsh Raj, Suddala Varun
3.1 External Interface Requirements – Uttkarsh Raj, Batthala Vinod Kumar
3.2 Functional Requirements – Challa Saketh, Suddala Varun
4 Other Non-functional Requirements – Masina Sai Bhargav Teja, Moturu Manogna
5 Other Requirements – Challa Saketh

Use Case Diagram – Challa Saketh
Flow chart Diagrams - Batthala Vinod Kumar
GUI Interface diagrams - Batthala Vinod Kumar

S. No	Use Cases	Team Member
1	1	Batthala Vinod Kumar
2	9,10	Challa Saketh
3	4,8	Masina Sai Bhargav Teja
4	5,11	Moturu Manogna
5	6,7	Uttkarsh Raj
6	2,3	Suddala Varun