Product Requirements

Project: Smart IT Inventory Management System with Barcode Integration

Team: Zero One

Team Members: -

1. James Cruz – james.cruz@my.unt.edu (Project Coordinator)
2. Reddy Likhitha Narravula- reddylikhithanarravula@my.unt.edu (Lead&UI Developer)
3. Sai Greeshma Yeruva - Saigreeshmayeruva@my.unt.edu (Software Architect)
4. Sai Praneeth Kankanala - Saipraneethkankanala@my.unt.edu (Tester)
5. Yashwanth Kirla - yashwanthkirla@my.unt.edu (Documentation Specialist)

Revision History

Date	Version	Description	Author
01-26-2025	1.0	Software Requirement	ZERO ONE
02-09-2025	2.0	Requirements with Use Cases, Workflows, and Descriptions of the use case features, Including Functional and Non-Functional Requirements.	ZERO ONE

Brief problem statement

Small- and medium-sized enterprises (SMEs) find IT inventory management a very cumbersome process: tedious processes, chances of human error, and many complicated systems make handling IT inventories easier said than done. Existing solutions mostly become part of a weighty single-fix-all package that does nothing but make handling even more burdensome, making them even more difficult to use efficiently. This complexity often leads to expensive errors, loss of valuable assets, or mismanagement. A better approach would be to develop such solutions that could specifically fit the needs of SMEs with the focus on automation and simplicity. Key improvements to address these challenges include**:**

Modular Software:

To make the software simpler and more appropriate for SMBs needs through asset management totally. Companies pay for the use of certain features, while modular approaches eliminate unnecessary features from the systems. This makes system use simple, saves training time, and speeds up company adoption.

Cloud-based Solutions:

Platforms that are cloud-based make scalability, management, and access simpler. Reduced hardware expenses, automatic updates, and remote accessible for teams in different locations are all advantages for SMBs. Additionally, real-time tracking is supported by cloud solutions, which reduces errors or delays in inventory updates and guarantees that companies always have a correct picture of their assets.

Barcode Integration:

The use of barcode in asset tracking has indeed increased the efficiency of inventory management. This brings speed and accuracy to the process of checking equipment, check in or check out through automated scanning, with a lower likelihood of human error. Visibility is improved for both loss and theft and ensures the proper control of assets from acquisition to decommissioning.

Automation & Alerts:

Automation features would considerably reduce manual effort, along with chances of human errors, Increase redundancy in repetitive work like hardware maintenance schedules or software license renewals. Alerts can be configured to notify the team about upcoming due dates or possible issues so that nothing is missed, and everything keeps going smooth. This proactive approach helps avoid critical due dates and asset expirations.

Open-Source Tools:

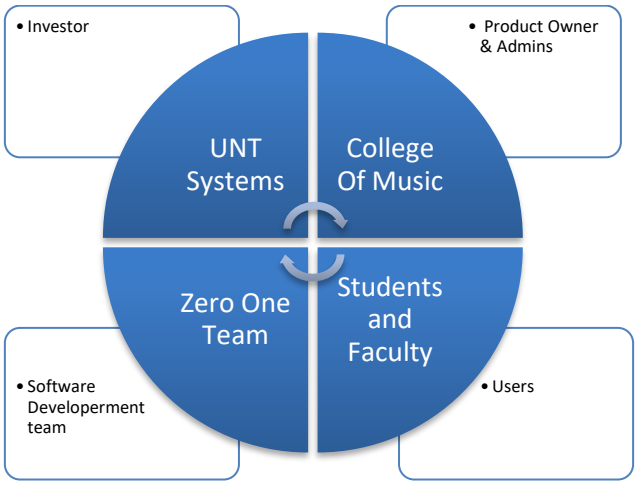
Without the high costs of proprietary software, open-source IT management tools like Snipe-IT and GLPI are highly customizable to SMB asset management. Since these tools are community-driven, they keep improving over time. These are perfect solutions for small-scale companies needing an efficient but budget-friendly solution with no extra bloated feature overloads in most big enterprise-level systems.

System Integration:

Ensuring exchange of data across departments can happen when the IT management software is orchestrated with other business software like accounting, HR, procurement, and so on. Streamlined workflows, consistency maintained with reduced duplication effort. Such as hardware assigned to a particular employee that can link with HR records for easier tracking, or if an asset is bought or sold, it is automatically recorded in the financial records.

SMBs can further simplify the management of IT assets by a determined focus on these improvements. This enhances operational efficiency and accuracy of inventory along with easier usability. In sum, it leads to easier, less expensive, and error-prone inventory management, thus allowing businesses to devote more time to their core competencies.

Stakeholders



College Of Music IT Department - System Admin Users

The College of Music IT Department is responsible for the management of the system. They have responsibility for its proper functioning and troubleshooting of any problems therein, and they assist the faculty and students in operating the system. Their responsibility also includes:

- Deployment and maintenance of the system.
- Explain the requirements as needed
- Compatibility with the existing infrastructure.
- Providing first-tier technical support.
- Institutionalized monitoring of system performance and security activities.

University UNT Systems IT Management - Investor and Board of Directors

The management team funds and approves the implementation of the inventory system. They need regular reports and insights regarding IT asset utilization, losses, and lifecycle management.

Students and Faculty - End Users

Students, Employees and Faculty use the system to check in/out IT equipment, request asset transfers, and report issues. They interact with barcode scanning features to facilitate quick inventory updates.

Software Engineering Team

The development team devises, maintains, and improves the system. The team is tasked with:

- Setting technical requirements and project scope.
- Developing and managing project system features.
- Conducting an exhaustive test and debug of the system.
- Assigning and tracking tasks within the project.
- Overcoming technical difficulties and enhancing system performance.

College of Music Technical Support Team Uses the Software as follows:

The support team relies on the inventory system to quickly locate and manage assets needing maintenance or repairs. The system helps them track service histories and warranty information.

- IT Inventory Tracking
- Check-In/Check-Out System
- Automated Alerts and Notifications
- Report on Generation & Audits
- Cloud-Based Access
- Adding/Deleting Inventory and additional

The Users use it as

- IT staff, employees, and management are involved in asset tracking.
- Must be familiar with barcode scanning.
- They should understand basic inventory management functions.
- Must regularly update asset statuses and report issues through the system.

System requirements

Hardware Requirements

- Server (for local or self-hosted deployment or any cloud server, if needed):
  - Processor: Dual-core or higher (Intel i5, Ryzen 5, or equivalent).
  - RAM: 4GB to 8GB (for small to medium workloads).
  - Storage: 50GB SSD (enough for logs and caching, since Firebase handles storage).

- Client Devices:
  - Any modern desktop, laptop, tablet, or smartphone with a camera for QR scanning.

- Barcode Scanner (optional):
  - Needed only for faster asset check-in/check-out in bulk processing.

❖ **Requirements for the development of Software**

Development Environment Technologies and Tools

➢ Operating Systems: Windows, macOS.

➢ Programming Languages: Python (backend), JavaScript (frontend).

Frameworks and Libraries

➢ Backend: Flask.

➢ Frontend: React.js.

➢ QR Code Generation: qrcode (Python).

➢ Barcode Scanning: html5-qrcode (JavaScript).

Database and Hosting

➢ Database: Firebase (Firestore - NoSQL cloud database).

➢ Hosting: Firebase Hosting (Frontend) and Google Cloud Run (Backend).

Development Tools

➢ IDE: VS Code and Google Co-Lab

➢ Version Control: GitHub.

Feature requirements

1. Functional

No.	User Story Name	Description	Release
1	Landing Page	Landing page for both user and admins, From where they can choose either there are users or admin and the procced with registration.	R1
2	Registration	The system shall allow registration with personal details (Name, Email, EUID, Employee ID, Department etc.) and set a password.	R1
3	Login	Users shall be able to log in using their credentials. Based on the set user role either Admin or Normal user they will land in different dashboards. Admins will have access to manage inventory.	R1
4	User Dashboard	User Dashboard where they have all details about their Assets	R1
5	Admin Dashboard	Admin Dashboard where they have all details about total Assets and inventory status with adding and deleting and edit access.	
6	Asset Registration	The system shall allow admins to register IT assets by entering details like asset name, type, serial number, and location it will be used in.	R1
7	QR code/ Barcode Generation	Each asset shall have a unique QR code/barcode generated by the system.	R1
8	QR code/ Barcode Scanning	The system shall support QR code/barcode scanning using mobile devices or dedicated scanners.	R1
9	Asset Add or Delete	Admins can add or delete Assets	R1

10	Check-in/Check-out System	The system shall allow users to check out an asset and return it, updating the asset's status.	R1
11	Check Asset Status	The system should provide overall asset details, availability, condition, and who has it.	R1
12	Maintenance request	Users shall be able to log maintenance requests, and report issues.	R2
13	Notifications & Alerts	The system shall send alerts for maintenance due dates, and asset warranty expirations.	R2
12	Reporting	The system shall generate reports on asset usage, stock levels, and depreciation.	R2
14	Request New Asset	Users can request new assets	R3
15	Total Assets in dashboard	Admins can view total assets and functional and nonfunctional.	R3

Non-Functional

Usability

- The system can have an intuitive and user-friendly interface.
- The UI will provide error tolerance and be easy to navigate.

Accessibility

- The system will be accessible for both normal and disabled users.
- The system will provide all text for images to support screen readers.

Reliability & Availability

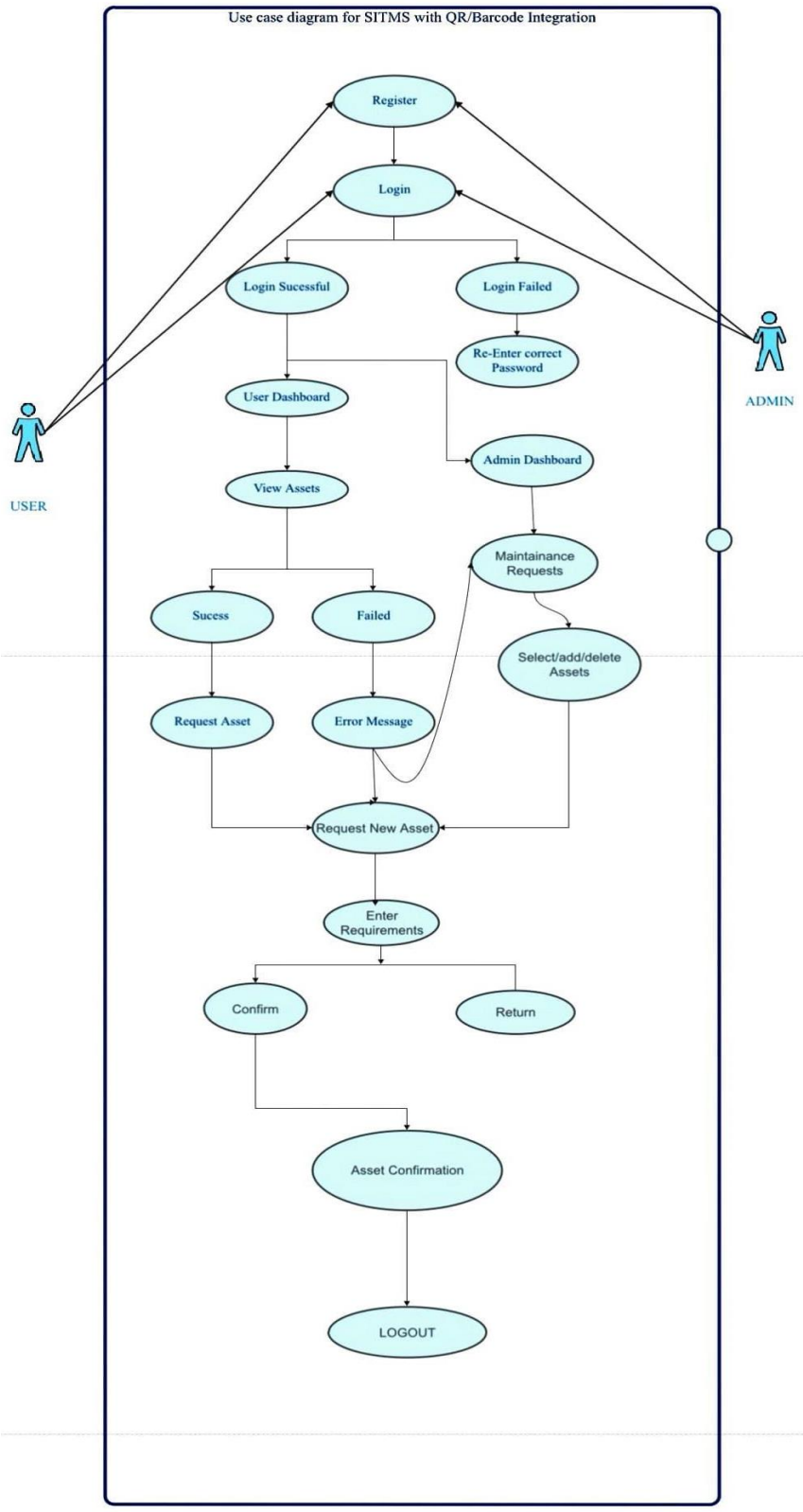
- The system shall handle many assets and users without failure.
- The system shall have **99.9999% availability** and ensure minimal downtime.
- The system shall support automatic database backups.

Performance

- The system shall show response times fast, even with large inventory data.
- Client internet connection and hardware depended on system performance.

Security

- The system will log out users who did not engage in the use of the system after a certain defined period.
- The system should authorize a user to prevent access by not allowing any unauthorized intrusion through a privilege.
- Access to the database will be limited to administrators only.
- The system will encrypt passwords and sensitive information.



Use case diagram

Fig.2 Use Case Diagram

Link – [Diagram Link]

Use case description

Use Case Number	UC-01
Use Case Name	User Registration
Overview	The user registers and gain access to system.
Actor(s)	User
Pre-condition(s)	The user need to give valid registration details.
Scenario Flow	The user enters the required information. The system validates and stores the details. The user receives confirmation of successful registration.
Alternate Flows	Registration fails due to invalid details, prompting an error message.
Post Condition	The user is successfully registered in the system.

Use Case Number	UC-02
Use Case Name	User Login
Overview	The user logs in to access their dashboard.
Actor(s)	User
Pre-condition(s)	•The user must be registered in the system.

Scenario Flow	The user enters their credentials. The system verifies the credentials. If valid, the user is granted access to the dashboard.
Alternate Flows	If login fails, the user is prompted to re-enter correct credentials.
Post Condition	The user is successfully logged into their dashboard.

Use Case Number	UC-03
Use Case Name	View Assets
Overview	The user views available assets from their dashboard.
Actor(s)	User
Pre-condition(s)	The user must be logged into their dashboard.
Scenario Flow	The user navigates to the "View Assets" section. The system displays a list of available assets.
Alternate Flows	No assets are available, and an empty list is shown.
Post Condition	The system displays the assets successfully.

Use Case Number	UC-04
Use Case Name	Request Asset
Overview	The user requests an asset from the system.
Actor(s)	user
Pre-condition(s)	The user must be logged in and able to view assets.
Scenario Flow	The user selects an asset to request. The system processes the request. The system confirms the request if successful.
Alternate Flows	The request fails, and an error message is displayed.
Post Condition	The system either successfully requests the asset or notifies the user of failure.

Use Case Number	UC-05
Use Case Name	Admin Dashboard Access
Overview	The admin accesses their dashboard to manage system assets.
Actor(s)	Admin
Pre-condition(s)	The admin logs into their account. The system verifies credentials and grants access. The admin dashboard is displayed.
Alternate Flows	Incorrect credentials prompt the admin to re-enter them.
Post Condition	The admin is successfully logged into their dashboard.

Use Case Number	UC-06
Use Case Name	Maintain Assets
Overview	The admin manages assets by adding, deleting, or updating them.
Actor(s)	Admin
Pre-condition(s)	The admin must be logged into their dashboard.
Scenario Flow	The admin selects the maintenance section. The admin can add, delete, or update asset details. The system processes the changes and updates the asset list.
Alternate Flows	The system fails to update, and an error message is displayed.
Post Condition	The asset list is updated successfully.

Use Case Number	UC-07
Use Case Name	Logout
Overview	The user or admin logs out of the system.
Actor(s)	User, Admin
Pre-condition(s)	The user or admin must be logged into their account.
Scenario Flow	The user or admin clicks on the logout button. The system logs them out and redirects them to the login page.
Alternate Flows	None
Post Condition	The user or admin is successfully logged out.

Use Case Number	UC-08
Use Case Name	Asset Add or Delete
Overview	The admin adds or delete
Actor(s)	Admin
Pre-condition(s)	The admin needs to give valid registration details.
Scenario Flow	The admin enters the required information. The system validates and stores the details. The user receives confirmation of the successful addition.
Alternate Flows	Adding assets failed due to invalid details, prompting an error message.
Post Condition	The user is successfully registered in the system.

Use Case Number	UC-09
Use Case Name	Report
Overview	The admin uses report to generate a pdf/CVS of all assets
Actor(s)	Admin
Pre-condition(s)	The admin needs login to Admin Dashboard and click on report
Scenario Flow	The admin from Dashboard clicks on reports,
Alternate Flows	Prompting an error message.
Post Condition	The admin is successfully able to generate report.

Contribution: -

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5. Yashwanth Kirla – (Programmer)- 20%