A Major Project on

NCIT Inventory and Fixed Asset Management System

Submitted in Partial Fulfillment of the Requirements for
the Degree of Bachelor in BEIT
under Pokhara University

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ABSTRACT

This report presents Management Information System for NCIT College for the purpose of automating operations especially inventory and distribution. All the requirements collected are based on the interviews and questionnaires arranged and coordinated with college store manager and related staff members. Systems relating to either inventory or distribution management of some selective colleges and schools were reviewed which made our research more easy and constructive. NCIT Management System is the web based application designed for managing the inventory system of NCIT College. The application will be maintained by the administrator and authorities can generate the reports. This web application will be used to store details of the inventory, stock maintenance, update the inventory based on the distribution details, generate distribution and inventory reports on daily or weekly based. In this system we are solving different problem affecting to direct purchase management and distribution management.

***Keywords**: Automating, Interviews, Management System, Inventory, purchase & distribution, archive.*

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1. INTRODUCTION

In today's world, information management systems have become crucial and are playing critical role in contemporary society and dramatically changing business and economy. Day to day record transactions is conducted in a global environment and simply could not serve without computer based information systems. The use of information systems especially is often understood to be changing the way colleges work as well as help store personal to reduce uncertainty in decision making.

The design and implementation of a NCIT Management System is to replace the current paper records. The web application utilizes user authentication by displaying only information necessary for an individual's duties. Additionally, each sub-system has authentication allowing authorized users to create or update information in that subsystem. All data is thoroughly validated and reviewed on the server before actual record alteration occurs. All data are stored securely on SQL servers managed by the college administrator and ensures highest possible level of security. The system features a secure logging system to track all users' access and ensure conformity to data access guidelines. Thus, it will increase the efficiency of the college record management by decreasing the working hours.

The project NCIT Management System will be a complete web based application designed on Dot Net technology using Visual Studio Software. This project also helps to develop Inventory Management System Model software in which all the information regarding the stock of the organization will be presented. It will be an intranet based application which has admin component to manage the inventory and maintenance of the inventory system.

This web application is based on the management of stock of a college. The application contains general college profile, distribution, details. Purchase details and the remaining stock that are presented in the college. This application also provides the details of the balance of as well transaction remaining balance of the stock

Each new stock is created and entitled with the named and the entry date of that stock and it can also be update any time while per the transaction or the distribution is returned in case.

1.1 PROBLEM STATEMENT

Today's existing system, include the tedious work of writing down all the list of the assets and inventories on a register book. This is the repetitive process and tedious, this also includes the keep record of all the invoices and letters. Loss of invoice by the store manager or other respective staffs, possible forgery of an invoice, signature and stamp of the distribution personnel. However, management does not have access to the warehouses at the convenient of their college unless they contact the vendors. Notification of low stock is not accurately and easily provided and the warehouses are not centrally connected. Annual reports and financial statement take time to be generated whenever they may be required. There is no security for the college files and to keep secure we need to maintain the database.

The major problem statements are:

- Repetitive and tedious paper work in the current system.
- Past record are hard to find as they are in written form.
- Lost or damage of past invoice and records may occur.
- Delay in the inventory distribution occurs, as it required multiple approval from different authority.

1.2 OBJECTIVES

The main objectives of this system are as follows:

1.2.1 General Objective

The main objective of this system is to develop a Distribution and Inventory Management Information System for NCIT College which will facilitate the college items transactions in an efficient and convenient way.

1.2.2 Specific Objectives

- To study the literature and existing system of the college.
- To analyze and design the Distribution and Inventory Management Information System.
- To implement the Distribution and Inventory Management Information System.
- To make the stock manageable and simplify the use of inventory in the College.
- To make the system more secure.
- To handle the inventory system details like purchase details, distribution details and balance stock details.
- To edit stored data and procedure easily. (systematic way)

1.2.3 Scope

The developed system only covers NCIT College distribution and inventory activities. The system provides NCIT College with a web-based and centralized database solution that can help the college to make distribution activities easily and provide information about the stock level.

1.3 SIGNIFICANCE OF STUDY

The study is significant to the college in the sense that it provides easy-to-use and easy-accessed system such that procedure of asset and inventory management can be more reliable and faster that they do not have to hire personnel to do these type of tasks. This study is important to the store departmental staffs because it provides easy-to-use system so their work can be faster and easier.

The system would benefit the future researchers by means of exact report of purchase and distribution of items. The study could be a source of information and would be the foundation of a new and improved management system. This study is a great achievement for the proponents because it improves their skills in constructing similar program.

The experiences, while doing the research, build up their characters and teach them values like creativity, hard work, team building and responsibility and time management. It also builds friendship among the group mates. It also trains them to prepare them for the competitive professional field.

The requirement of the user is to:

- Access/Search information.
- Login to the system through the starting page of the system.
- Change the password after logging the system.
- View/change details.
- Members can give feedback on particular subject.
- Administrator/s should be present who can read as well as remove any uploads.

2. TEAM MEMBERS AND DIVIDED ROLES

Table 2. 1 Team Members and Divided Roles

Name	Roles	Responsibilities
Dibas Paudel	Project Manager	• Review and approve all project deliverables • Provide overall project oversight and Technical Project manager to keep project on track.
	Security and Authorizations Expert	• Create and Maintain system security (authentication, user profiles, assignment of users to profiles)
	Assets System Developer	• Define and execute development requirement for asset purchase and distribute to respective departments.
Sushant Maharjan	Inventory and Distribution System Designer	• Develop system interfaces • Test system interfaces
	Inventory and Distribution System Developer	• Define and execute development requirement for inventory and distribution of those items.
	Department Process Experts	• Participate in analysis, requirement gathering, preparation of specification • Identify improvement opportunities
Sujan Maharjan	End user documentation expert	• Participate In testing • Develop documentation
	Work Flow Design Expert	• Diagrammatic representor of work details
	Theming and UI design	• Design the UI for the system
Shristi Awale	End user documentation expert	• Develop documentation

3. METHODOLOGY

3.1.Software Development Life Cycle

The framework we followed in developing the project is in agile model, in which the whole requirement is divided into various builds. AGILE methodology is a practice that promotes continuous iteration of development and testing throughout the software development lifecycle of the project. Both development and testing activities are concurrent.
The agile software development emphasizes on four core values.

- Individual and team interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

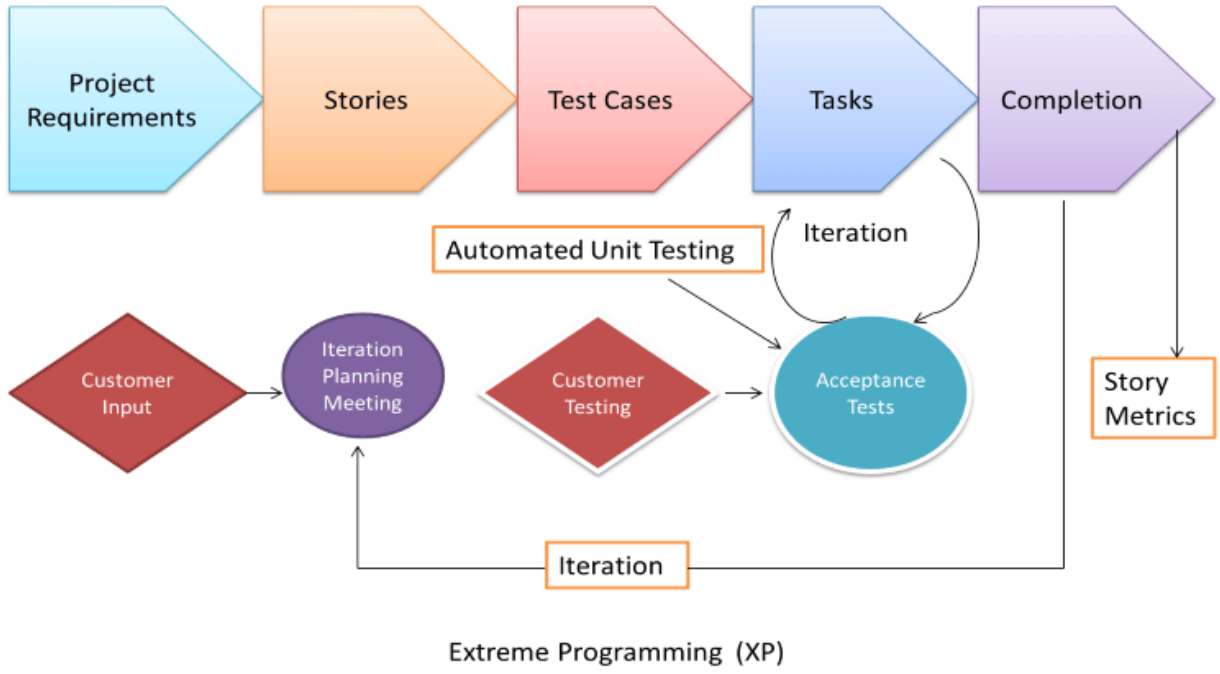

Figure 3. 1 Agile Method

3.1.1. Planning

- Identification of stakeholders and sponsors
- Infrastructure Requirements
- Security related information and gathering
- Service Level Agreements and its conditions

3.1.2. Analysis

- Capturing of Stories in Parking lot
- Prioritize stories in Parking lot
- Scrubbing of stories for estimation
- Define Iteration SPAN (Time)
- Resource planning for both Development and QA teams

3.1.3. Design

- Break down of tasks
- Test Scenario preparation for each task
- Regression Automation Framework

3.1.4. Execution

- Coding
- Unit Testing
- Execution of Manual test scenarios
- Defect Report generation
- Conversion of Manual to Automation regression test cases
- Mid Iteration review
- End of Iteration review

3.1.5. Wrapping

- Small Releases
- Regression Testing
- Demos and reviews
- Develop new stories based on the need
- Process Improvements based on end of iteration review comments

3.1.6. Closure

- Pilot Launch
- Training
- Production Launch
- SLA Guarantee assurance

Table 3. 1 Tools and Technique

TOOLS	PURPOSE
Visual Studio Enterprise 2019	Text Editor
Draw.io	Design
Microsoft SQL Server Tool 2018	Manage Server and Database
Web Browser	Application Testing

Table 3. 2 Task and Time Schedule

The project schedule was designed as per requirements and constraints involved. This project was scheduled and completed in about 90 days. Requirement analysis was given more emphasis. Research and database management was done first and well documented. Debugging and Testing was done prior to the completion of the project.

TASK	***APPROX DURATION (in days)***
Requirement Analysis and Specification	11
Undertake Analysis of the System	9
Design System	16
Produce Requirement Specifications	15
Development and coding	72
Testing and Debugging	10
Test System Modules	9
Overall System Test	1
Develop Documentation	60

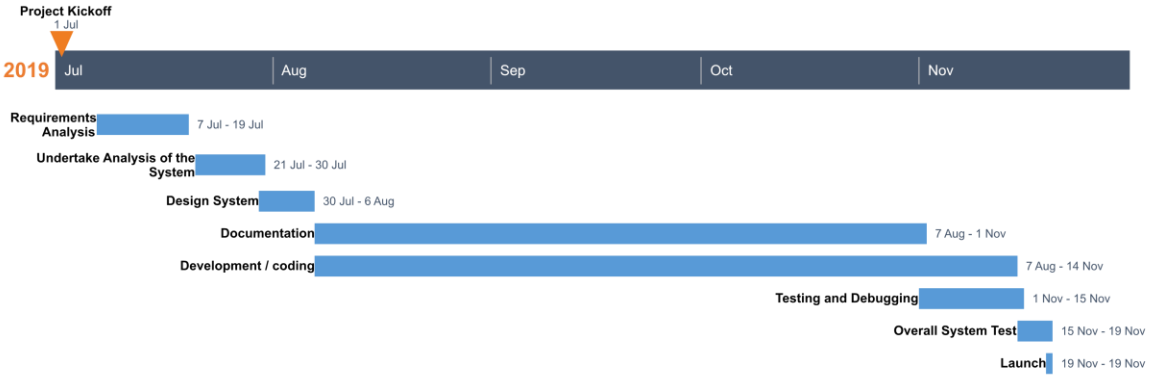

Figure 3. 2 Gantt chart

4. LITERATURE REVIEW

4.1. Inventory and Distribution

Inventory is the blocked working capital of an organization in the form of items. As this is the blocked working capital of the organization, theoretically, it should be zero, although it is impossible to do so (Narayan, 2009).

Distribution is the process of making a service or product available for the user. This can be done directly by the service provider or producer, or using indirect channels with intermediaries or distributors.

4.2. Information Systems

It is interesting to note that most authors would agree that information systems are playing an increasingly important role in organizations of all types, regardless of their size (Lucey, 2005; Hicks, 1997; Gordon & Olson, 1985; Ward & Peppard, 2002). According to Thompson and Beer (2000) in addition to more traditional systems which assist in the day-to-day business operations, information system is increasingly providing a competitive advantage for the organization.

According to Lucey et al. (2005) and Haag and Cummings (2006), information systems support decision making in organizations and vary among managerial levels. Information systems are especially important to managers at the lower or operational level since it appears that they receive the most aid, since computers and information systems are best able to deal with well-structured problems for which these managers are responsible (Hanic, 1998; Davis and Olson, 1985).

4.3. Management Information Systems

Management Inform1ation Systems (MIS) is an information system that provides output to a main admin. The term ‘manager’ refers to decision-makers in organizations only, which is admittedly a somewhat narrow view of the concept. This is of course not to suggest that MISs cannot be developed to manage other things, say, your personal wealth (Maria, 2009). The main purpose of MIS is to provide the information support to the managerial functions of an organization (Shajahan, 2004).

4.4.Types of MIS

4.4.1. Transaction-Processing Systems

Transaction-processing systems deals with a large quantity of recurring transactions. Intermediaries Many business people use them in their business i.e Banks and Multipurpose Savings use them to record deposits and withdrawals from accounts. Retailers use them to record of inventory and distribution. These systems control billing system, payroll and other types of payments.

4.4.2. Operations Information Systems

An operations information system takes large quantities of data and organizes it so managers can use it. This type of system uses information from transaction processing systems. Employees and managers use it to track inventory, distribution and other related accounting information.

4.4.3. Expert Systems and Artificial Intelligence

Expert systems and artificial intelligence organize human knowledge to troubleshoot problems that other humans would need to. This helps free up personnel for other duties. The computer system recognizes and resolves problems. These systems act as a teacher and explain their reasoning to the user.

4.4.4. Decision Support Systems

Decision Support Systems (DSS) allow managers to use them without the aid of computer experts. The systems provide managers with the pertinent information to make educated decisions. DSS had three primary functions: a database management system, which stores large volumes of data, a model-based management system that transforms information used for decision making, and a dialog generation and management system, which has a user-friendly formation so employees without vast computer knowledge can use it.

Based on the types of MIS mentioned above, the one that best suit our project is Transaction Processing System. This is basically because the developed system focuses highly on the company’s inventory and distribution record.

4.5.Advantages and Disadvantages of MIS

Today's businesses have been leveraging management information systems (MIS) to manage order, organize and manipulate the masses and gigabytes of information generated for various purposes. MIS helps businesses optimize business processes, collect and analyses information needs of employees and various stakeholders and take strategic decisions. It has its advantages and disadvantages depending on organizational deployment and usage.

4.5.1. Advantages

- Management info systems have modified the dynamics of running businesses expeditiously. Decentralization is one among the most important advantages; it permits observance of operations at low levels and frees up resources for division managers to devote time to strategic activities. Coordination of specialized comes and activities is far higher and call manufacturers within the organization are attentive to problems and issues altogether departments. Another advantage of MIS is that it minimizes info overload, which may be quite common with typical businesses within the epoch.

- MIS needs to be designed and managed in such method that it aggregates info, monitors the company's activities and operations and enhances communication and collaboration among workers. This ensures higher coming up with for all activities and higher ways in which to live performance, manage resources and facilitate compliance with business and government rules. Management helps in prognostication, getting ready correct budgets and providing the tools and important info to workers, high management and business partners.

- The purpose of MIS is to get synthesized and processed info from computerized/automated and bound manual systems. Info distribution to any or all levels of company managers, professionals and key executives becomes quite seamless with efficient MIS. Managers are able to build fast, timely and au fait choices. High management and board members will take strategic choices, arrange future growth and business growth activities supported the info and knowledge generated by MIS.

4.5.2. Disadvantages

- Depending on organization readying, usage and extraneous factors, some disadvantages associated with Management info Systems will come back to the fore. Allocation of budgets for MIS upgrades, modifications and alternative revisions will be quite tough now and then. If budgets don't seem to be allotted uniformly or as per immediate needs, key functionalities would possibly get affected and edges won't be complete systematically. Integration problems with inheritance systems will have an effect on the standard of output and important business intelligence reports.

- Change in management, exits or departures of department managers and alternative senior executives incorporates a broad result on the operating and observance of bound organization practices as well as MIS systems. Since MIS may be a crucial element of associate degree

organization's risk management strategy and allied systems, constant observance is important to confirm its effectiveness. Quality of inputs into MIS has to be monitored; otherwise consistency within the quality of information and knowledge generated gets settled. Managers don't seem to be able to direct business, operational and decision-making activities with the requisite flexibility.

4.6. Review of other Distribution and Inventory MIS

Other relevant systems would here be quoted and critically reviewed to some extent as to what limitations they have and how the developed system cover such limitations.

4.6.1. Suppliers Inventory-MS Access version

Suppliers Inventory MIS is developed for those organizations that lack in-house experience to style and develop their own Distribution and Inventory MIS. Tiny scale organizations can notice Suppliers Inventory- MS Access version appropriate because it is loaded with options and functions that are common to organizations.

Limitations of the system

- The system doesn't contemplate distribution or distribution operation of the organization in question. Customers' details and transactions functionalities aren't caterpillar-tracked that the developed system covers.
- The system could be a complete system which suggests it will solely be used on one laptop at a time and not on-line because the developed system tracks inventory similarly as distribution operations together with the customers' and merchandise details.
- The system doesn't offer associate degree invoice to customers whereas buying a product.

4.6.2. ABC Inventory software

ABC Inventory software is totally free inventory software package for tiny and mid-sized businesses. There's no limit on variety of records within the information. there's no limit on variety of workstations that often put in on. If you opt to use our free license, you'll get facilitate at this forum. In any case, you'll continually upgrade basics Inventory software package to Almyta Control system software package. All of your information are going to be preserved.

Limitations of ABC Inventory software

- The system has so many features and functions, but it is very complex to handle.
- The system is a stand-alone system which means it can only be used on a single computer at a time and not online as the proposed system will be tracking inventory as well as distribution operations including the users and items details.

4.6.3. Conclusion

Reviewing the above systems has broadened our knowledge about Inventory and Distribution Management System, and helped us in making better and informative decisions. The issues that have been identified as the limitations of the reviewed systems are addressed in the system that we developed. We have learnt the importance of capturing data, printing of receipts and generating reports.

5. WORK DETAILS

5.1.Diagrams

5.1.1. Activity diagram

5.1.1.1. Activity diagram of admin

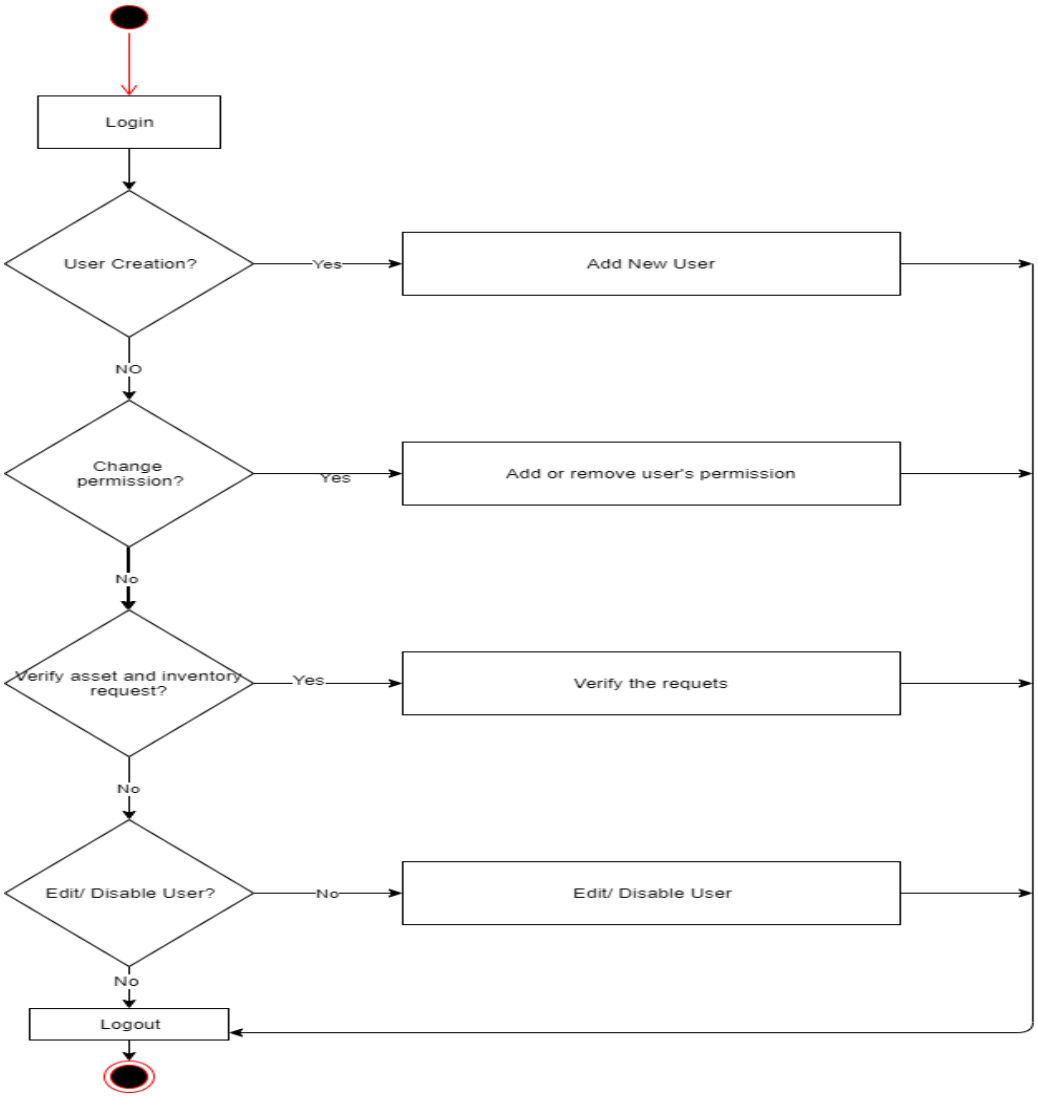

Figure 5. 1 Activity Diagram of admin

Figure 5.1 shows the activity/ task that can be done by the admin of the system. This contains major tasks such as creating new users, changing user's permissions, verifying the requests and disable users.

5.1.1.2. Activity Diagram of Store Manager

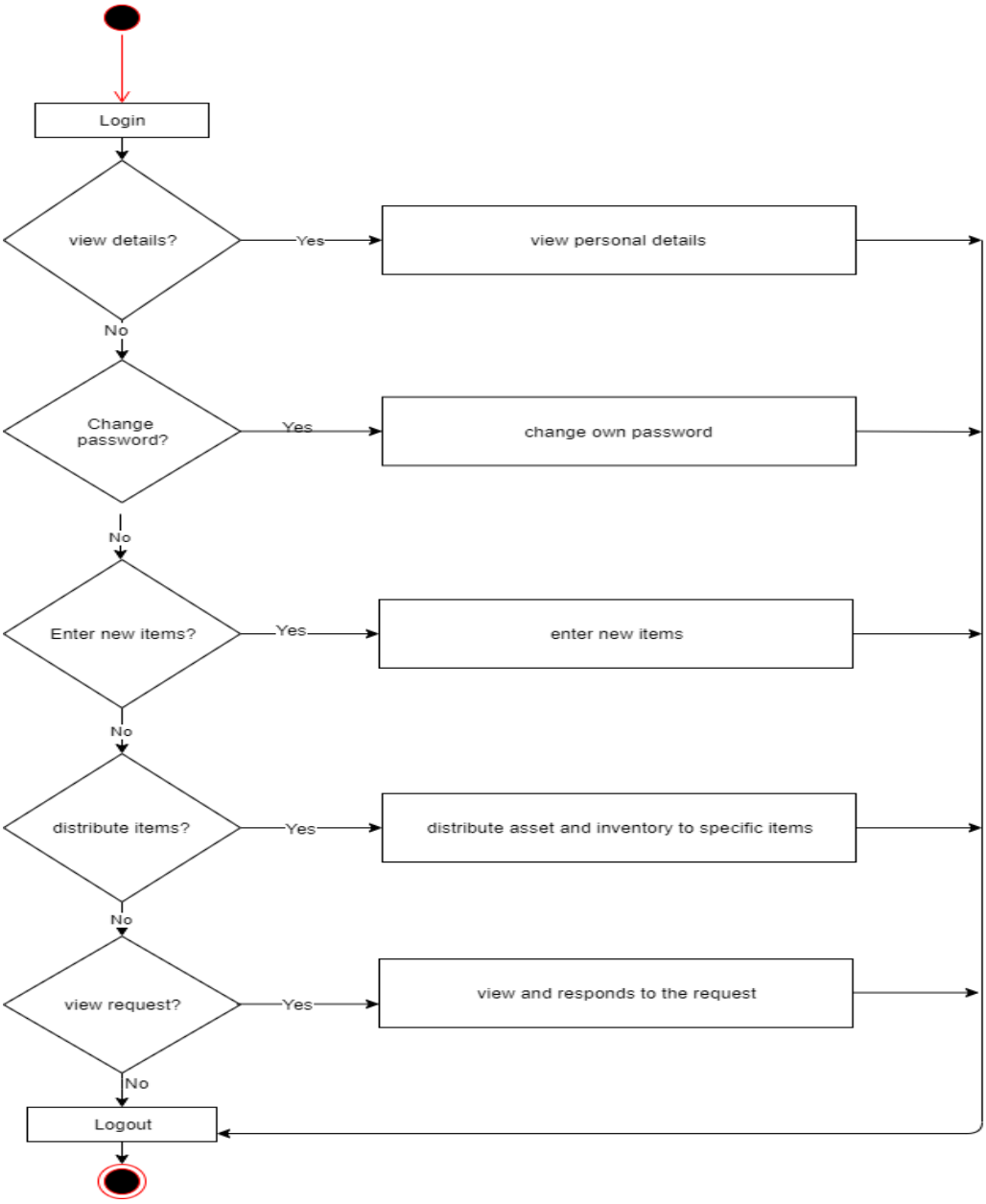

Figure 5. 2 Activity Diagram of Store Manager

Figure 5.2 show the activity of the store manager. This includes the activities that can the done by the store manager. This includes the major tasks such as entering new items, view asset requests and recording the distributed items.

5.1.1.3. Activity diagram of user

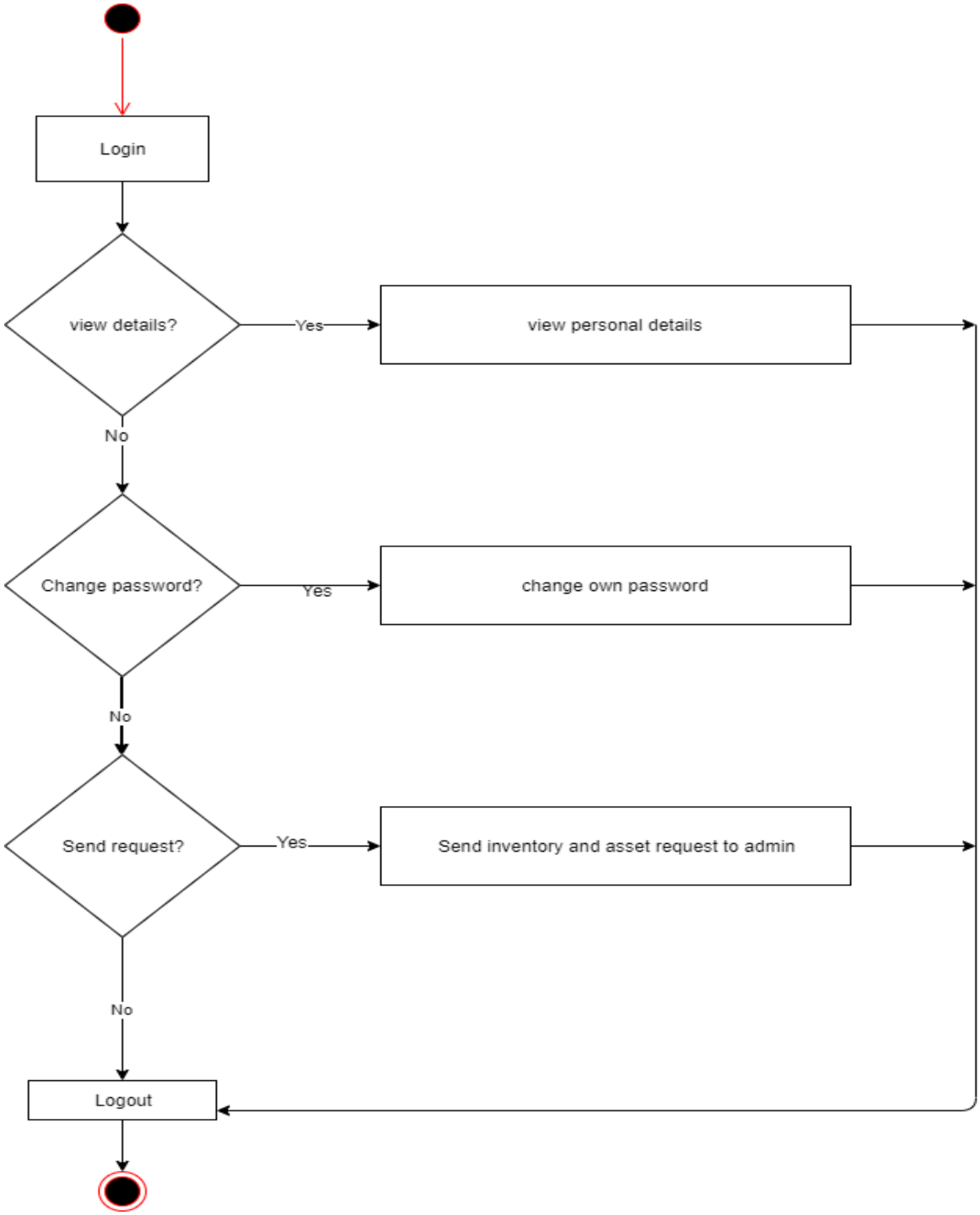

Figure 5. 3 Activity diagram of User

Figure 5.3 shows the activities of the user the major activity of the user is to send the asset request to the admin.

5.1.2. Data Flow Diagram

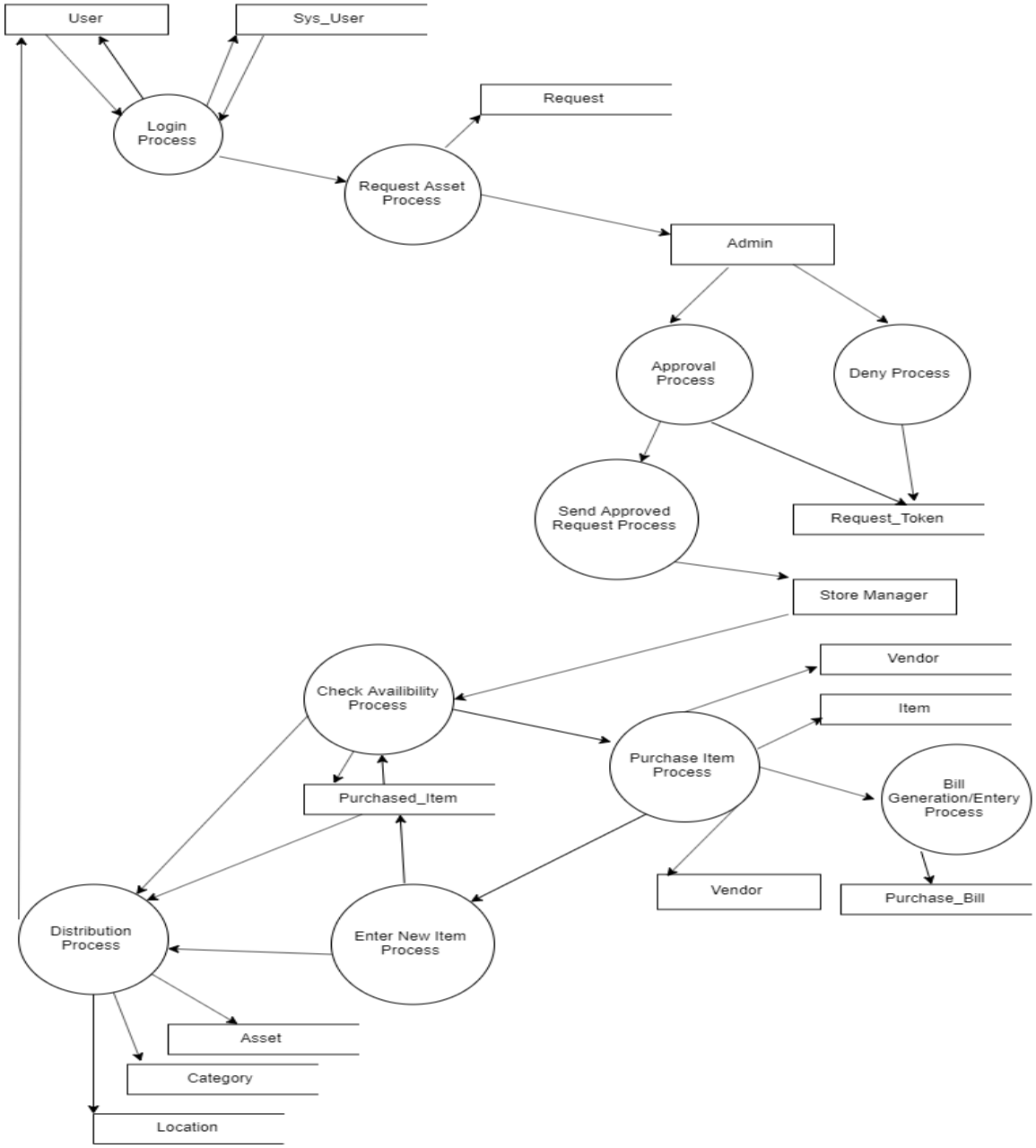

Figure 5. 4 Data Flow Diagram for Assets

Figure 5.4 describes the data flow in the system, from the request of the asset to the distribution, it also includes the process of purchase with the asset in not available.

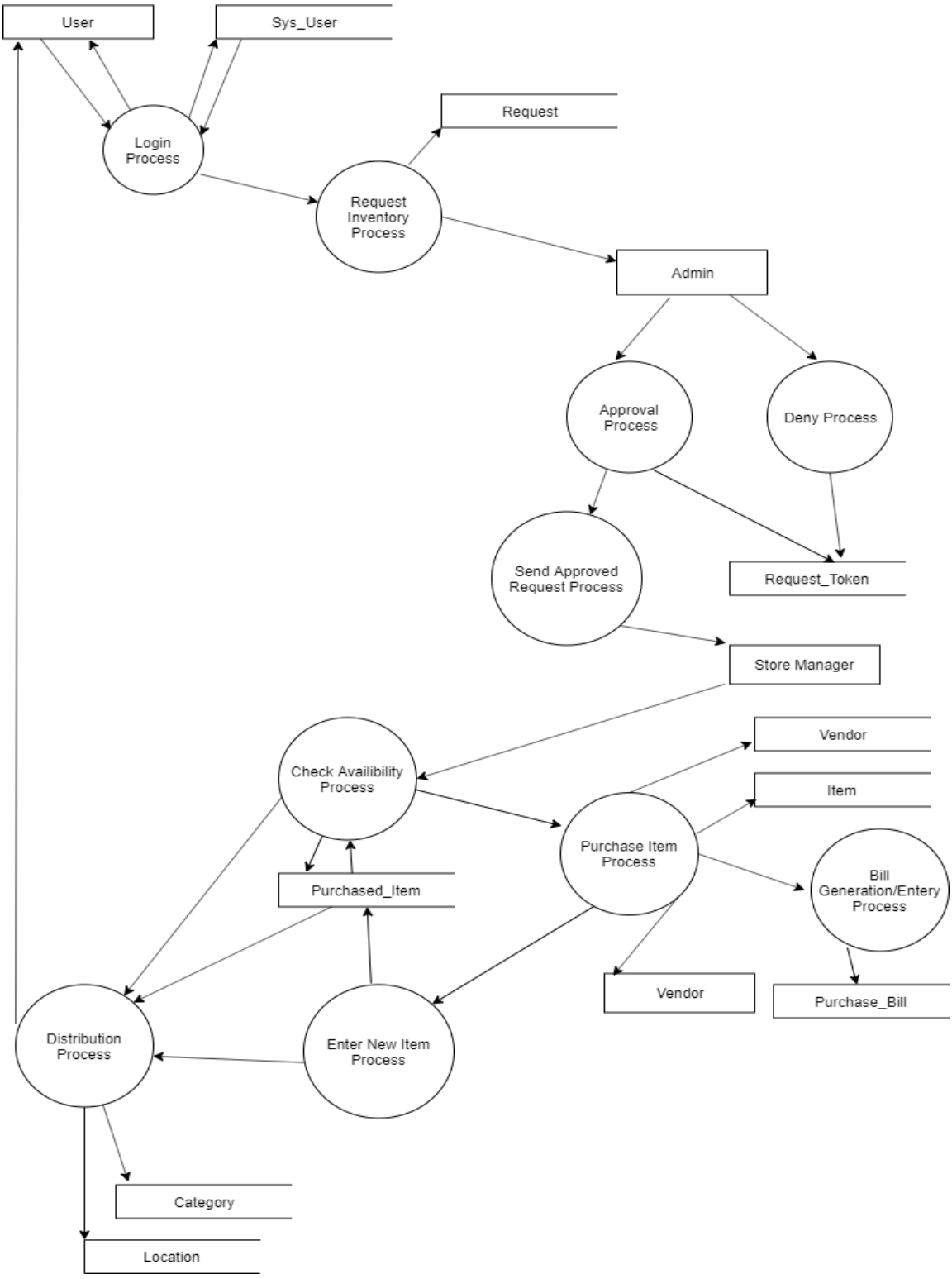

Figure 5. 5 Data Flow Diagram for Inventory

Figure 5.5 describes the data flow in the system, from the request of the inventory purchase to the distribution, it also includes the process of purchase with the inventory in not available.

5.1.3. Entity Relation Diagram

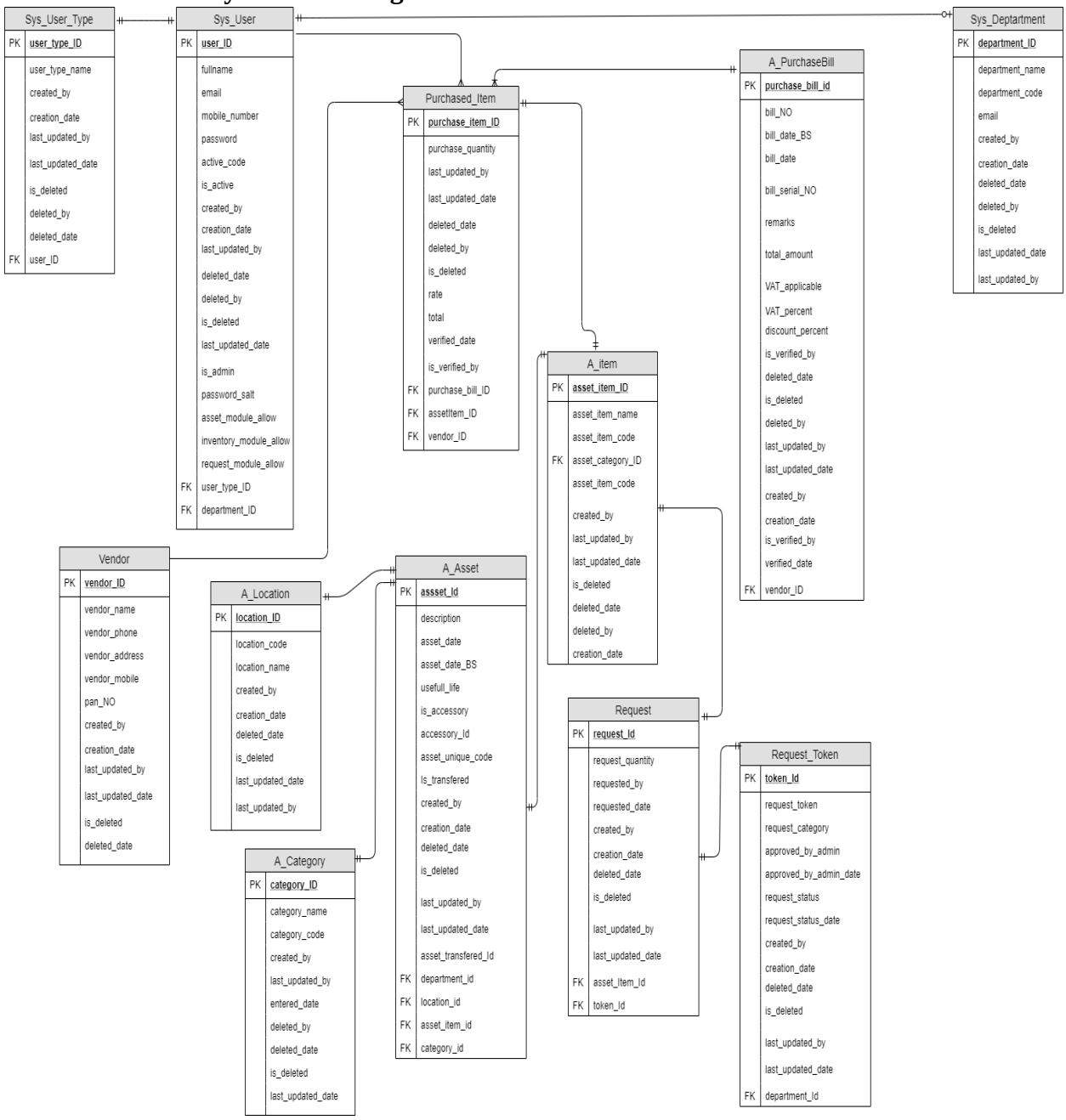

Figure 5. 6 ER Diagram of assets

Figure 5.6 describes the Entity Relation of the Assets in the system, with respect the data set tables and their relationships.

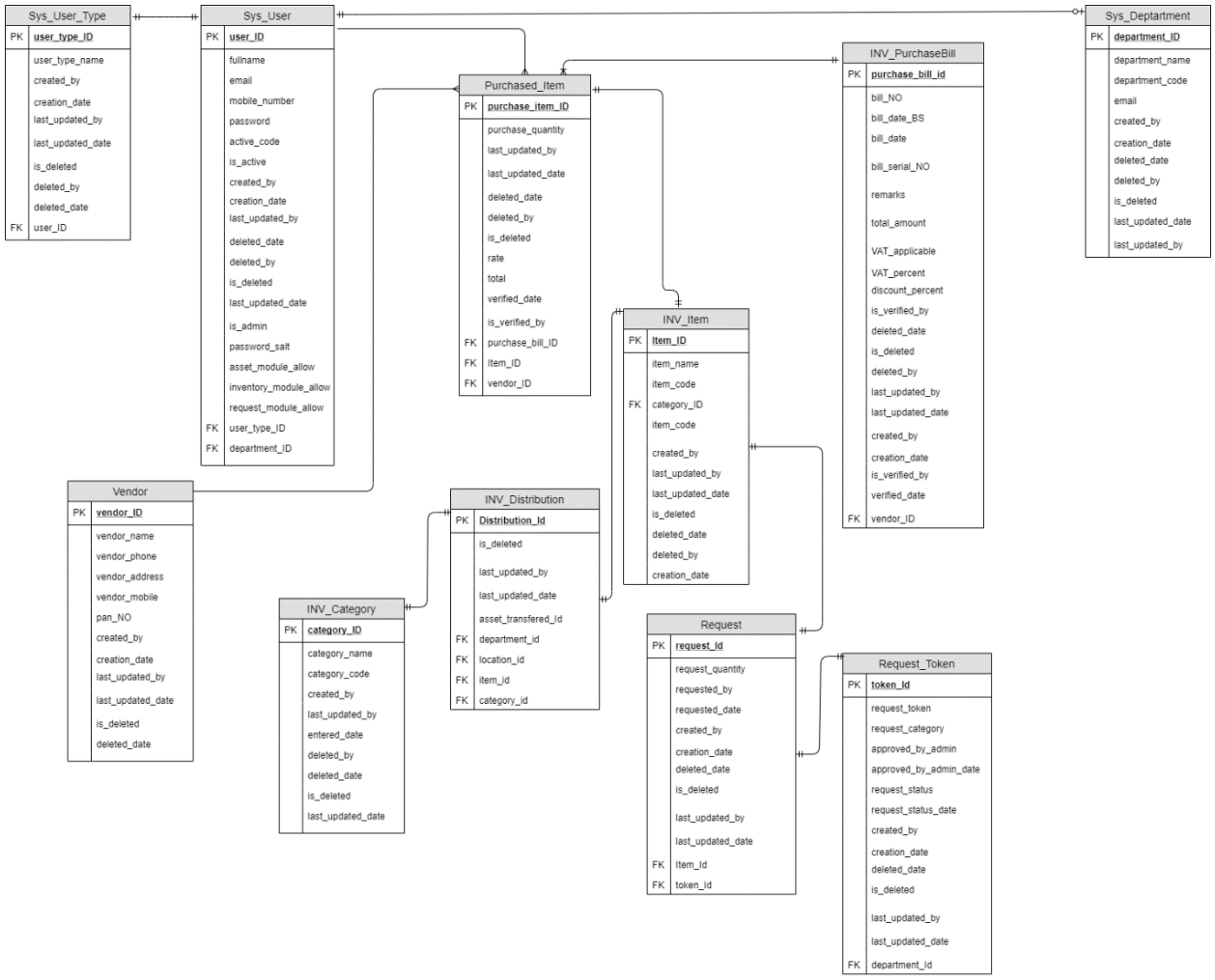

Figure 5. 7 ER Diagram of Inventory

Figure 5.7 describes the Entity Relation of Inventory and Distribution in the system, with respect the data set tables and their relationships.

5.1.4. Sequence Diagram

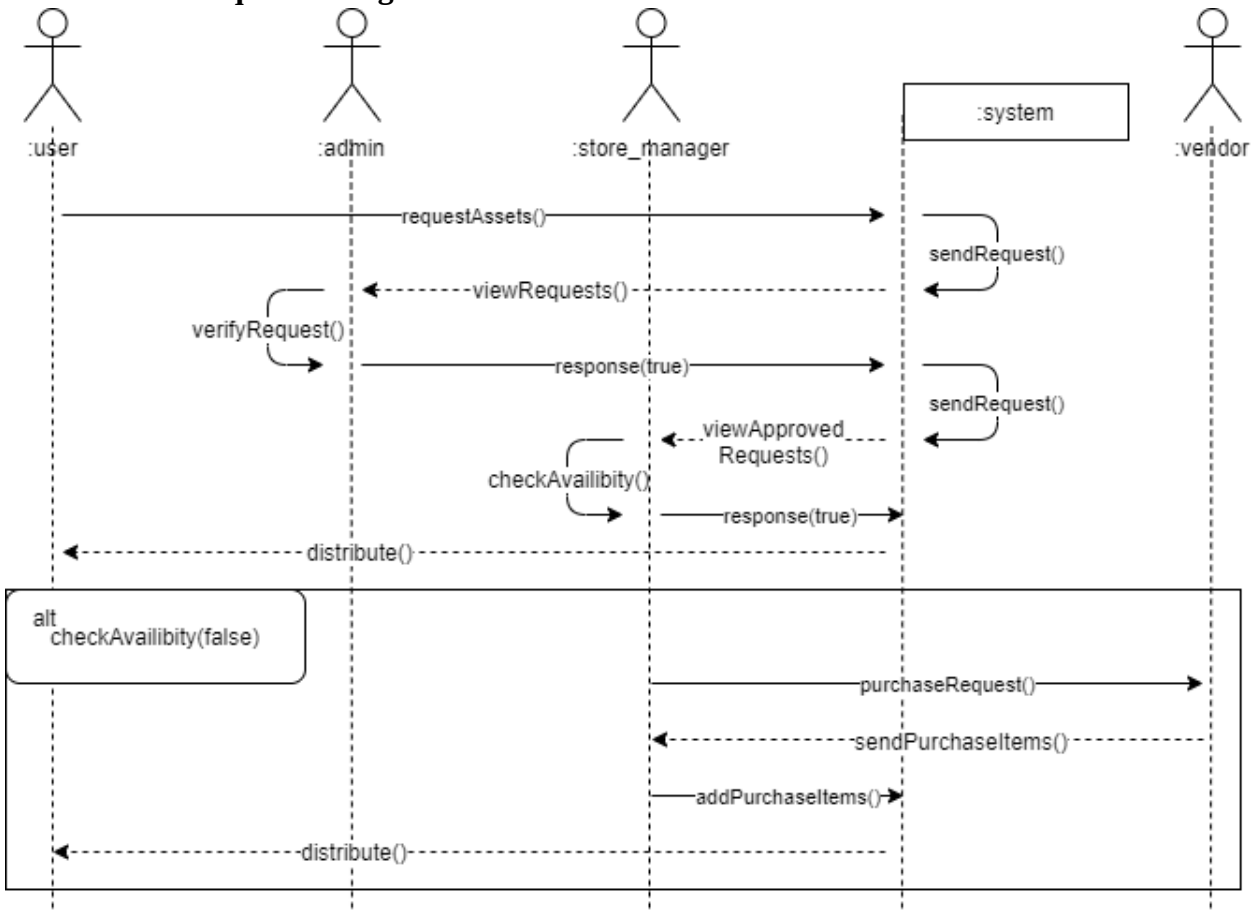

Figure 5. 8 Sequence Diagram

Figure 5.8 show the sequence of the activities required for the overall process from request of the item to the distribution, an alternate case is describes the activity where the purchase is required.

5.1.5. Use Case Diagram

5.1.5.1. Use Case Diagram of Store Manger

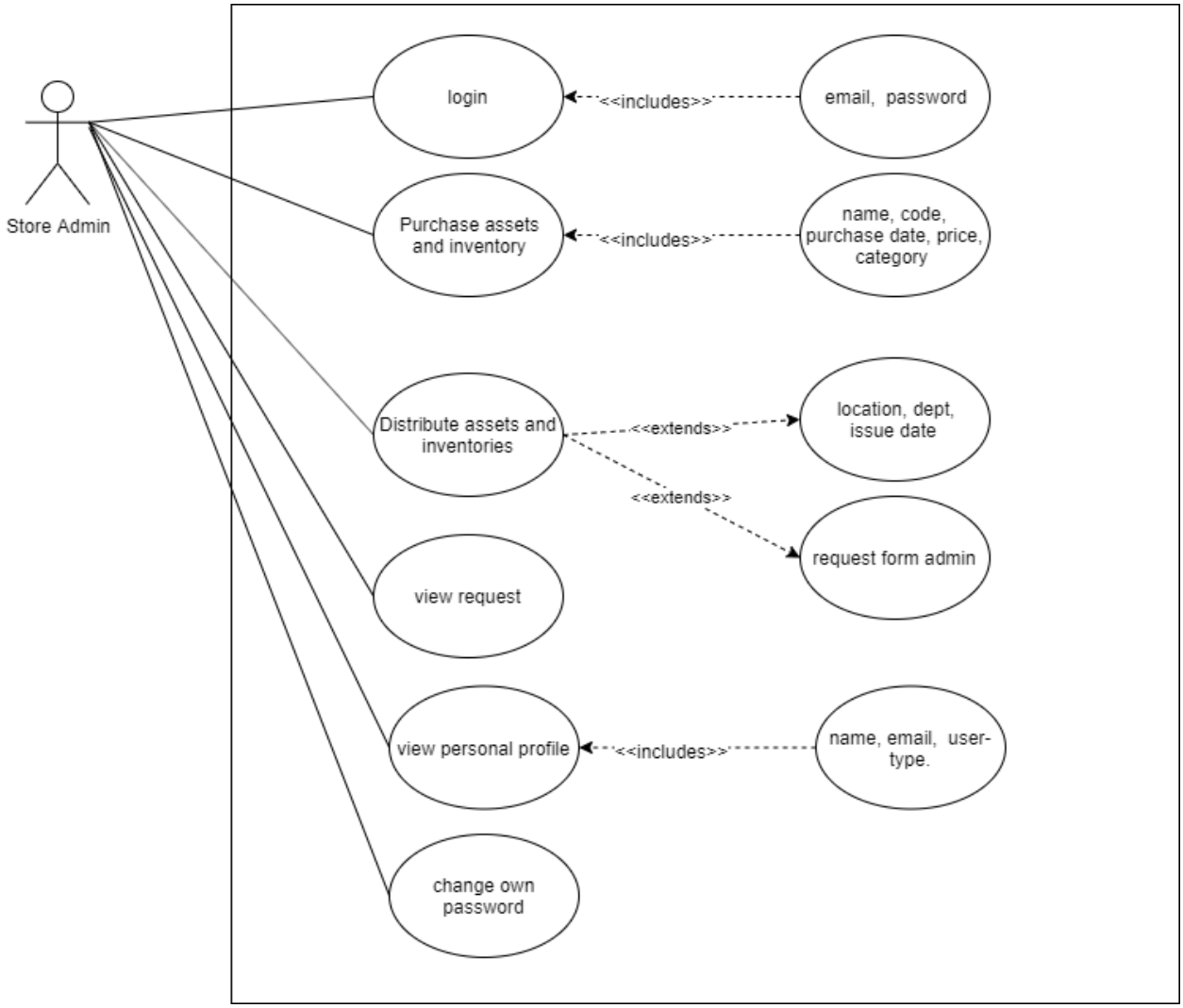

Figure 5. 9 Use Case of Store Admin

Figure 5.9 show the use cases for the store manager.

5.1.5.2. Use Case Diagram of Admin

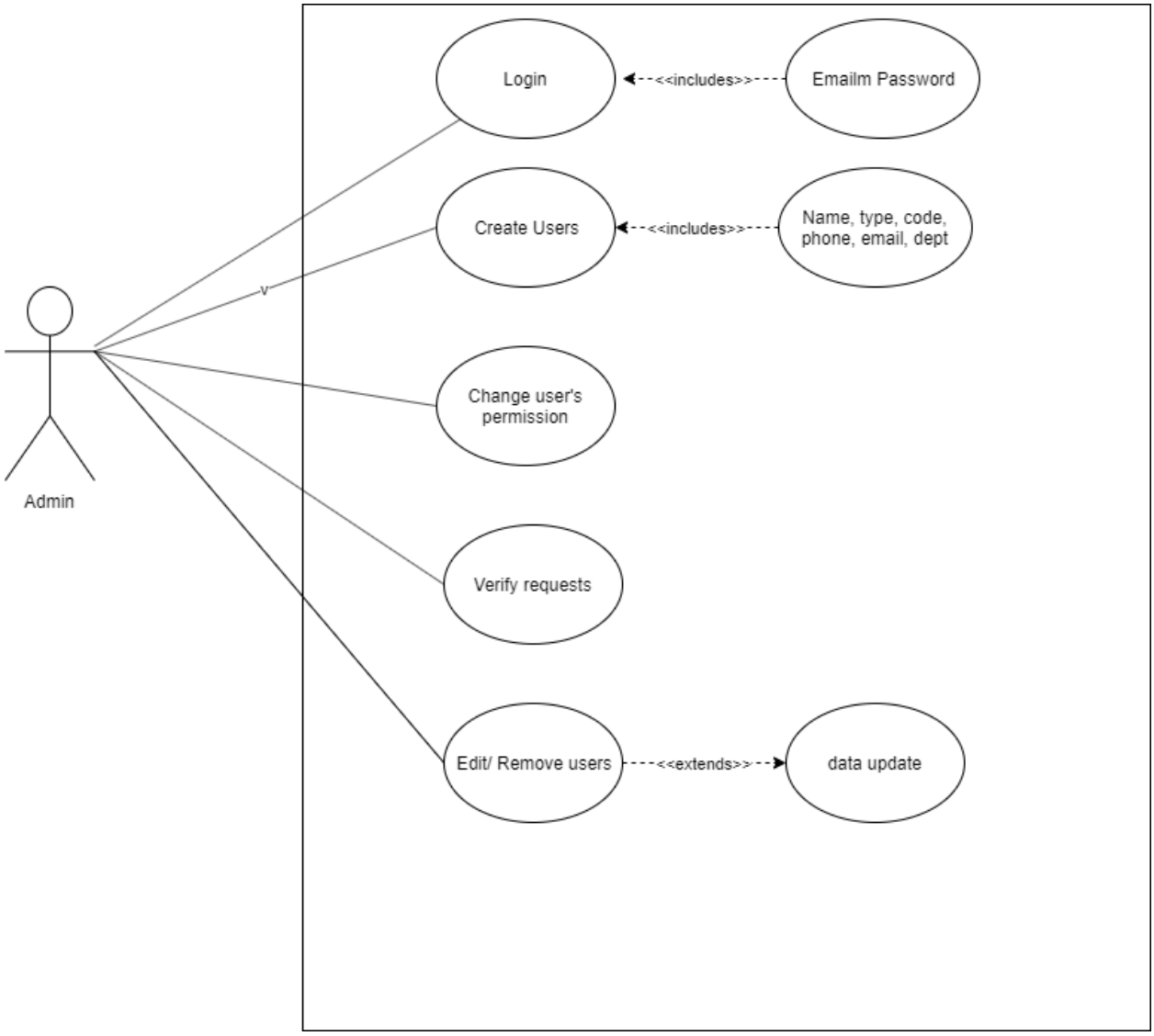

Figure 5. 10 Use Case of Admin

Figure 5.10 show the use cases for the admin.

5.1.5.3. Use Case of User

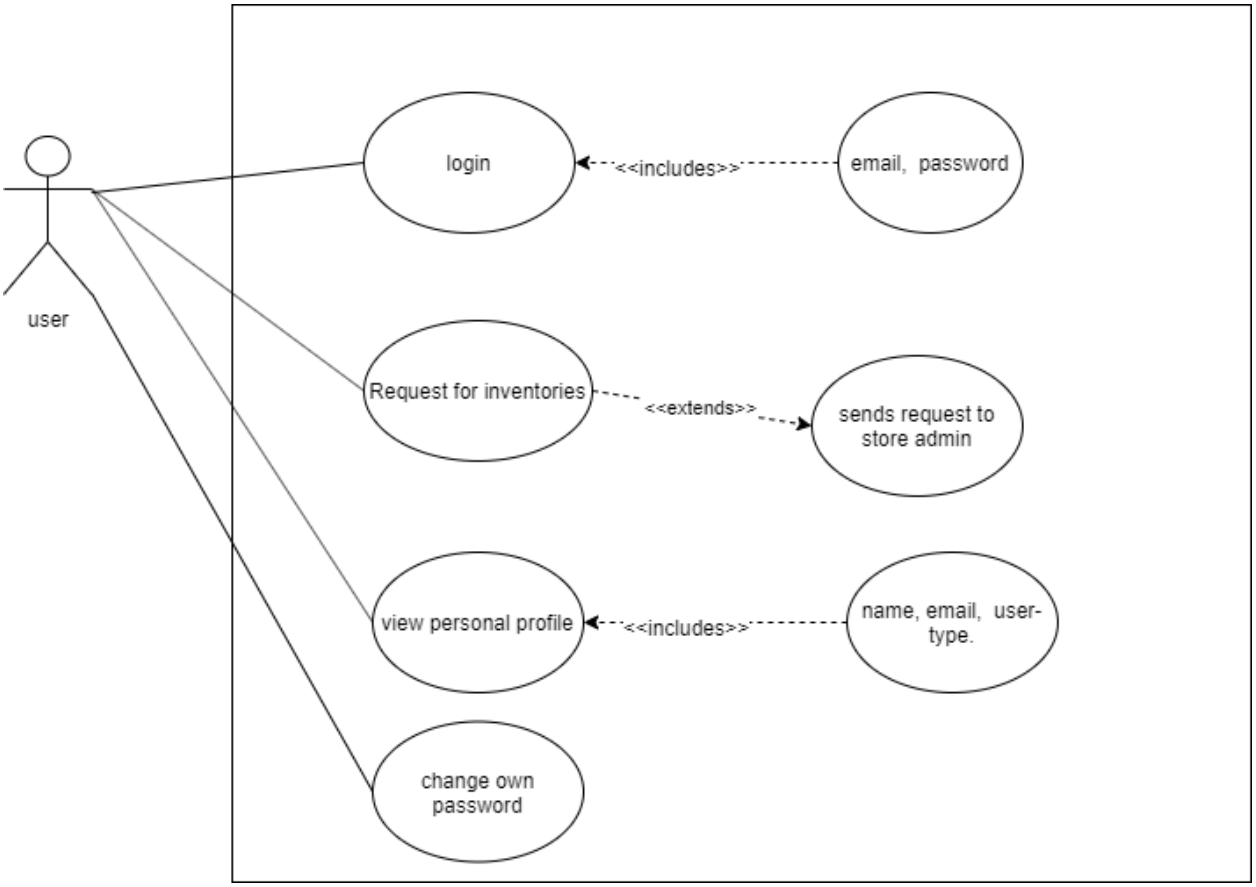

Figure 5. 11 Use case of User

Figure 5.11 show the use cases for the user.

5.2. Application Screenshots

5.2.1. Login Page

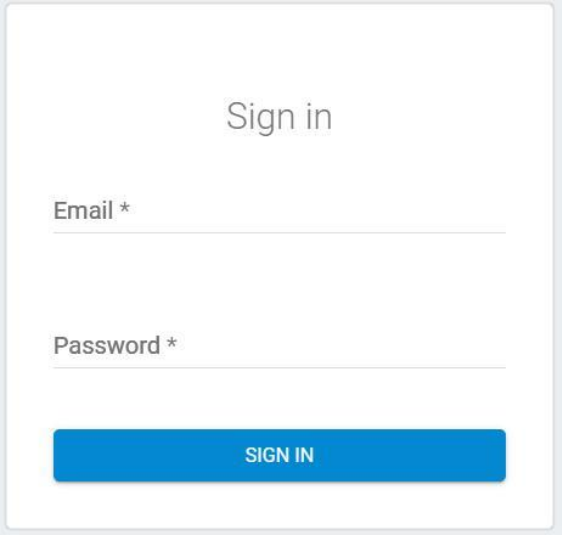

Figure 5. 12 Login page

Figure 5.12 is the initial part of the application where the user login in into the system.

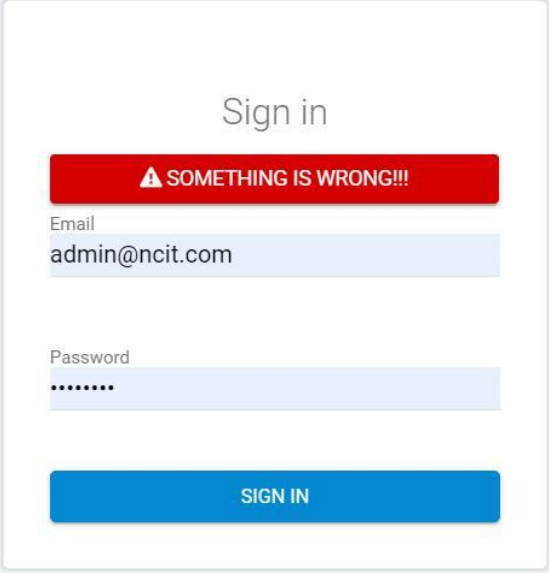

Figure 5. 13 Login page with error message

Figure 5.13 is the login page with error message, the error is generated when there is email or password invalid

5.2.2. User Section

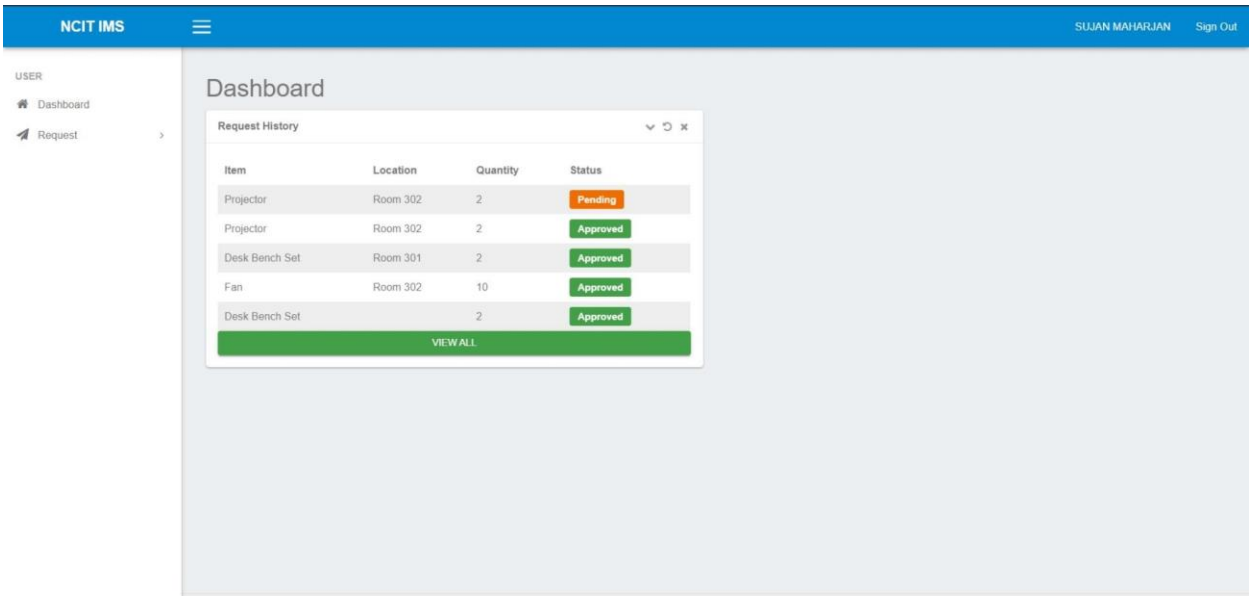

Figure 5. 14 User Dashboard

Figure 5.14 contains the dashboard of the user, which is show his/her past requests with their state respectively.

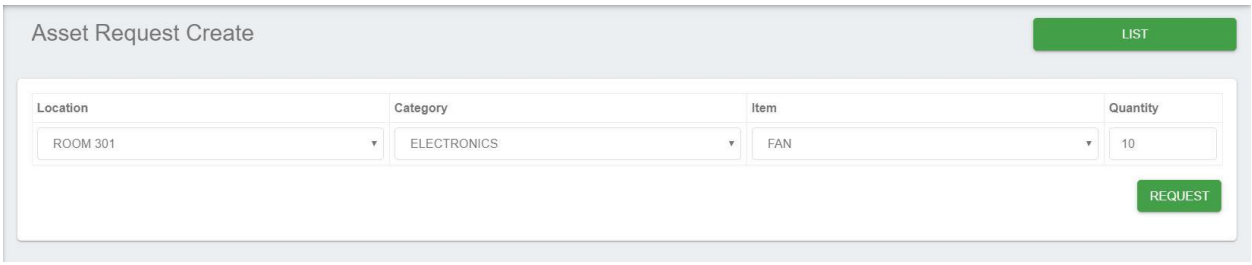

Figure 5. 15 Creating Asset Request

Figure 5.15 contains the asset request form where the filled such are location, category, item and quantity are filled up by the user.

5.2.3. Admin Section

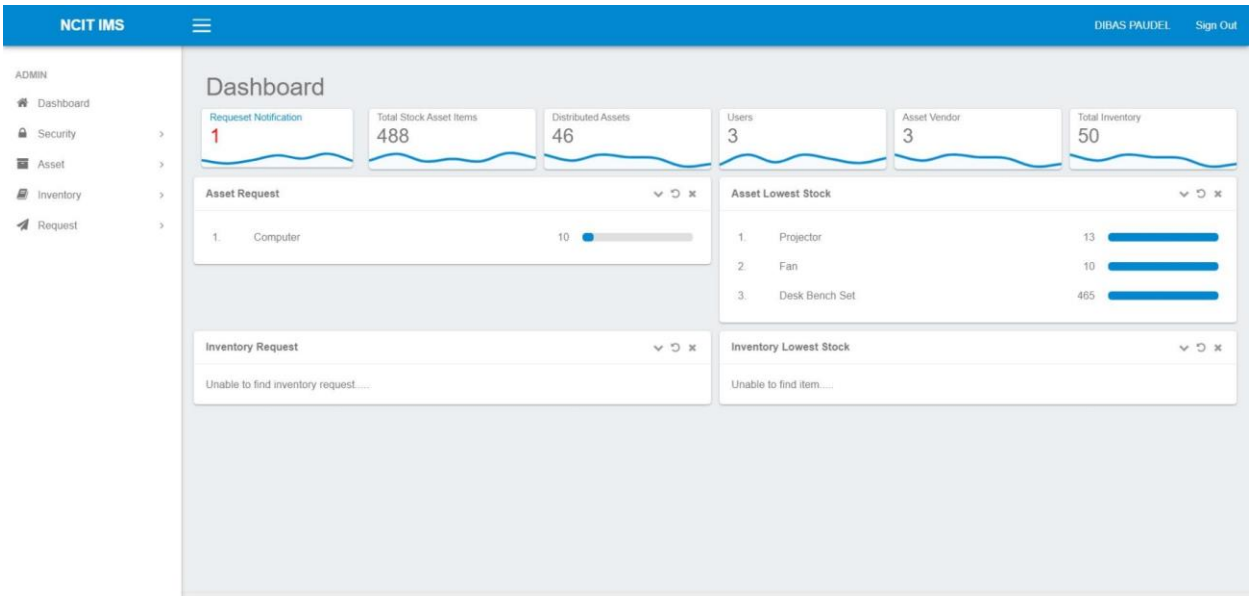

Figure 5. 16 Admin Dashboard

Figure 5.16 contains the admin dashboard, where he/she can view the status of requests, total stock, number of users etc.

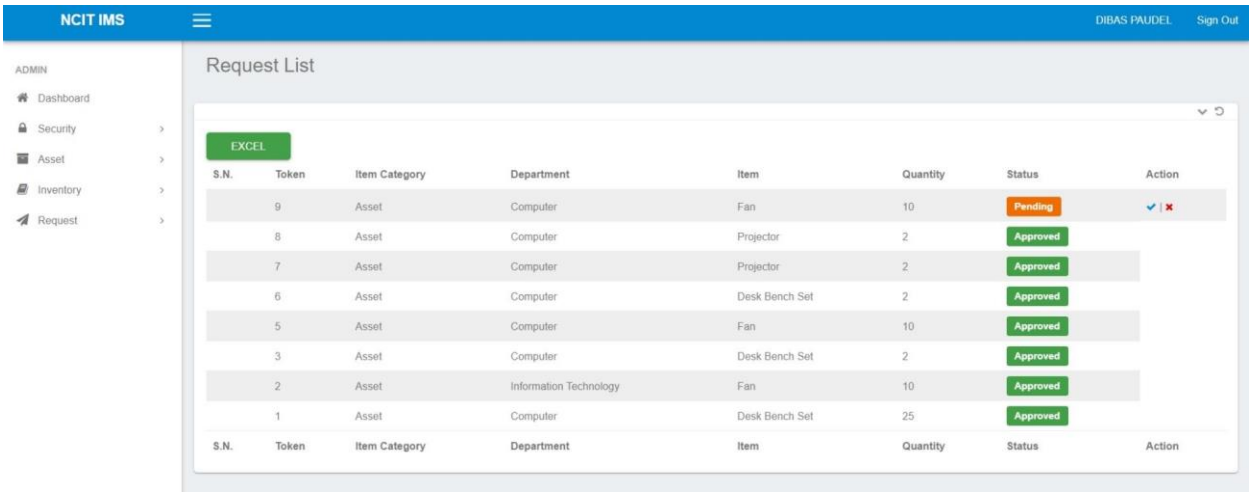

Figure 5. 17 Assets Request List

Figure 5.17 contains the assets request list in the admin section, from where the admin can reject or approve the request.

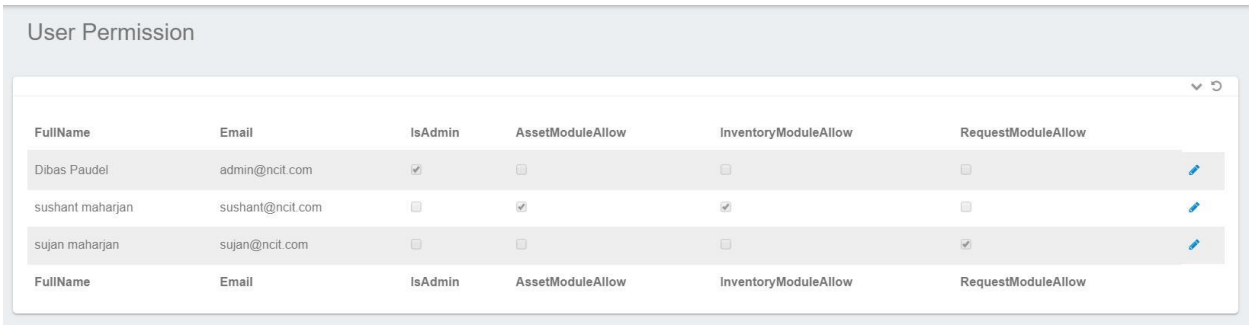

Figure 5. 18 User Permission

Figure 5.18 contains the user permission section from where the admin can change the permission of the specific user.

5.2.4. Store Admin Manager

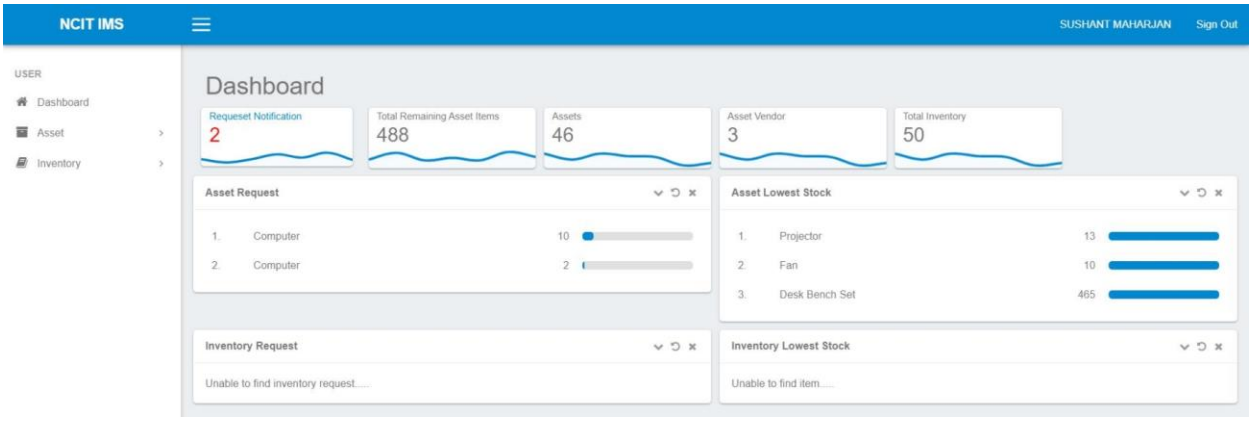

Figure 5. 19 Store Manager Dashboard

Figure 5.19 contains the store manager dashboard, where he/she can view the requests and stock quantity in the store.

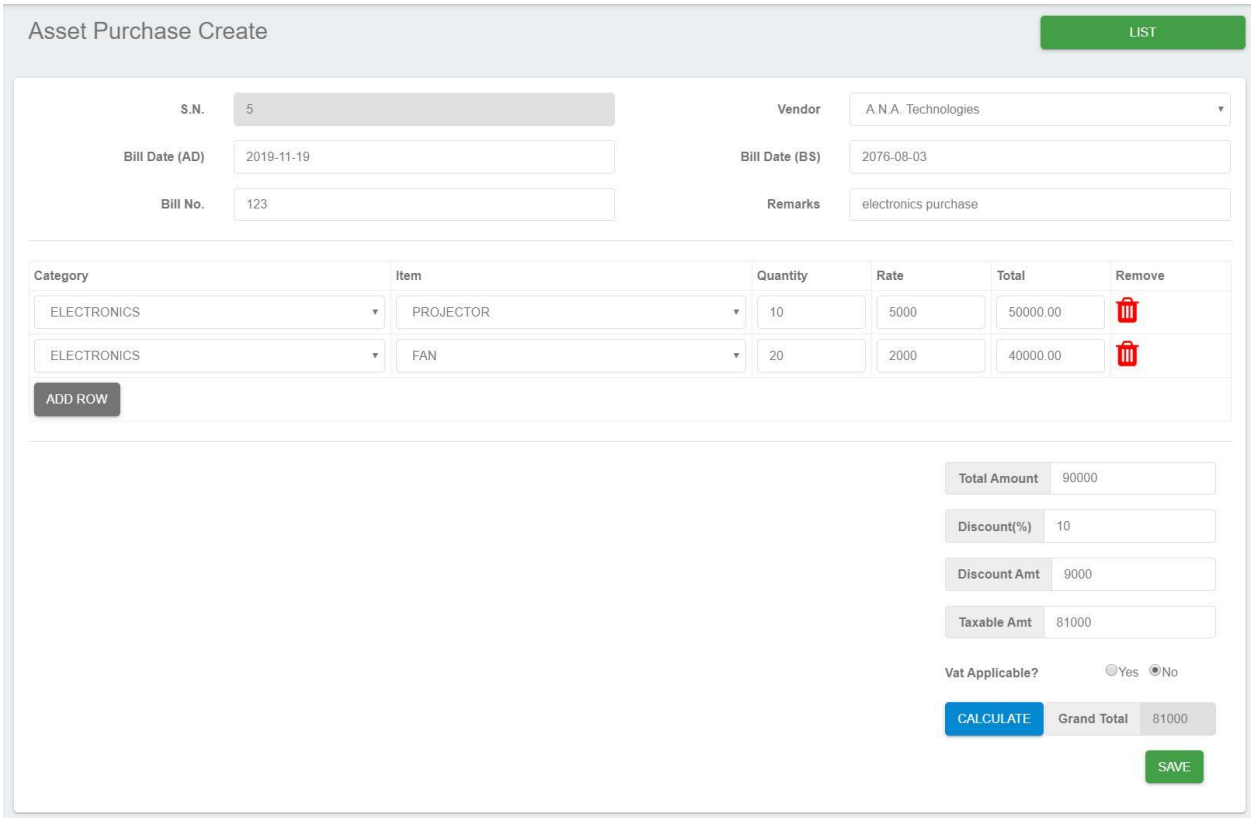

Figure 5. 20 Create Asset Purchase

Figure 5.20 contains the panel for the creating of purchase item from where the store manager enters the purchase item list with respective to vendor, quantity, rate, date etc.

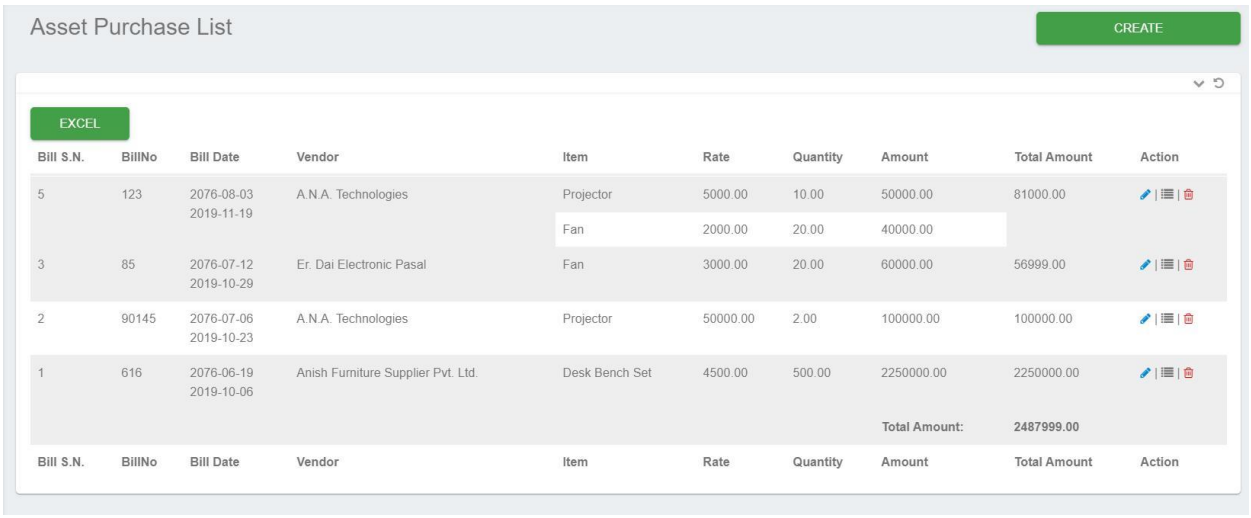

Figure 5. 21 Purchase Item List

Figure 5.21 includes the past purchase list.

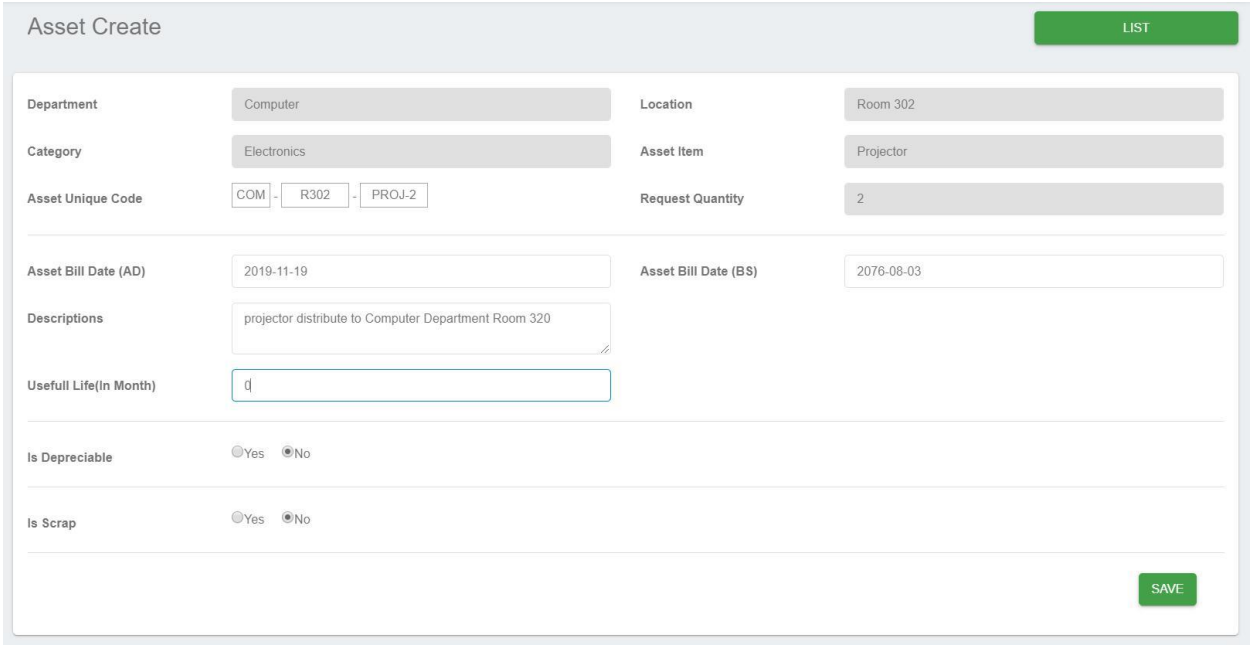

Figure 5. 22 Asset Creation

Figure 5.22 includes the asset creation panel, where the asset are created to distribute into departments.

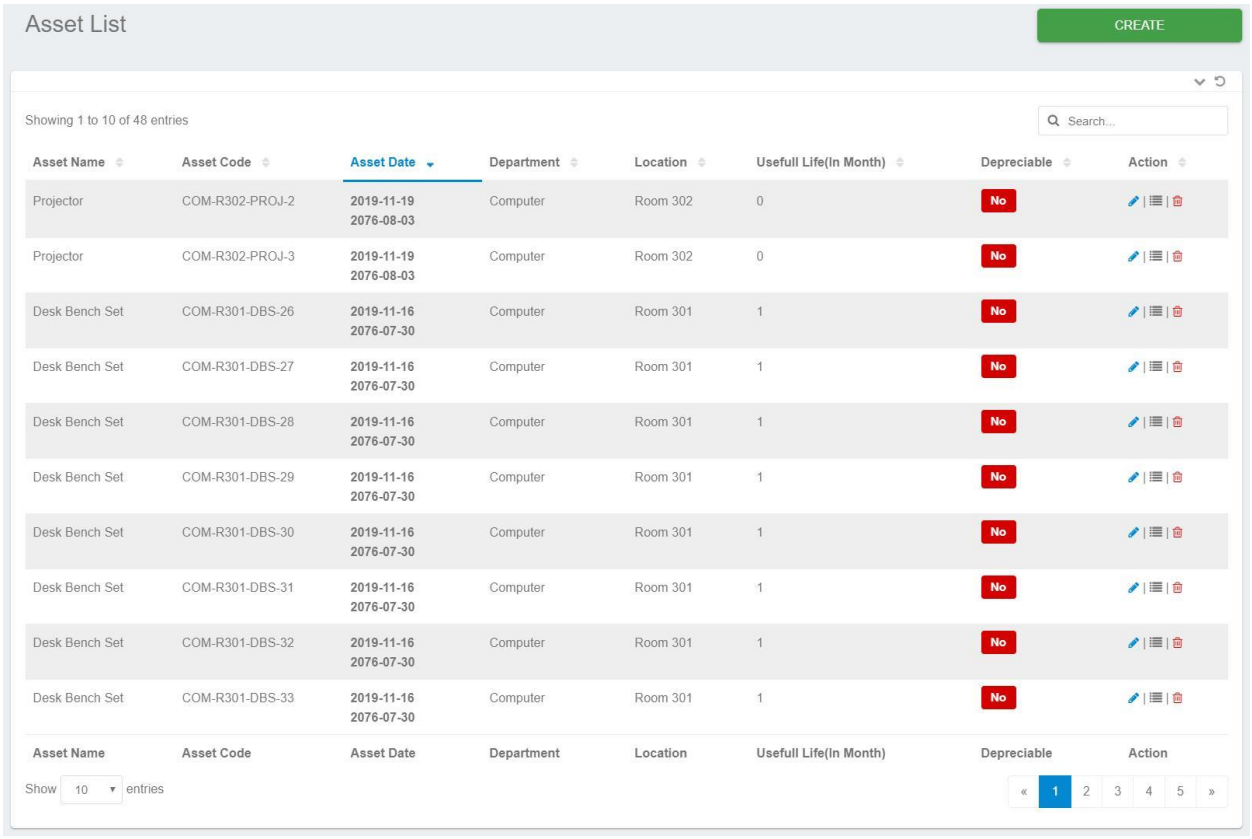

Figure 5. 23 Asset list

Figure 5.23 contains the list of past assets.

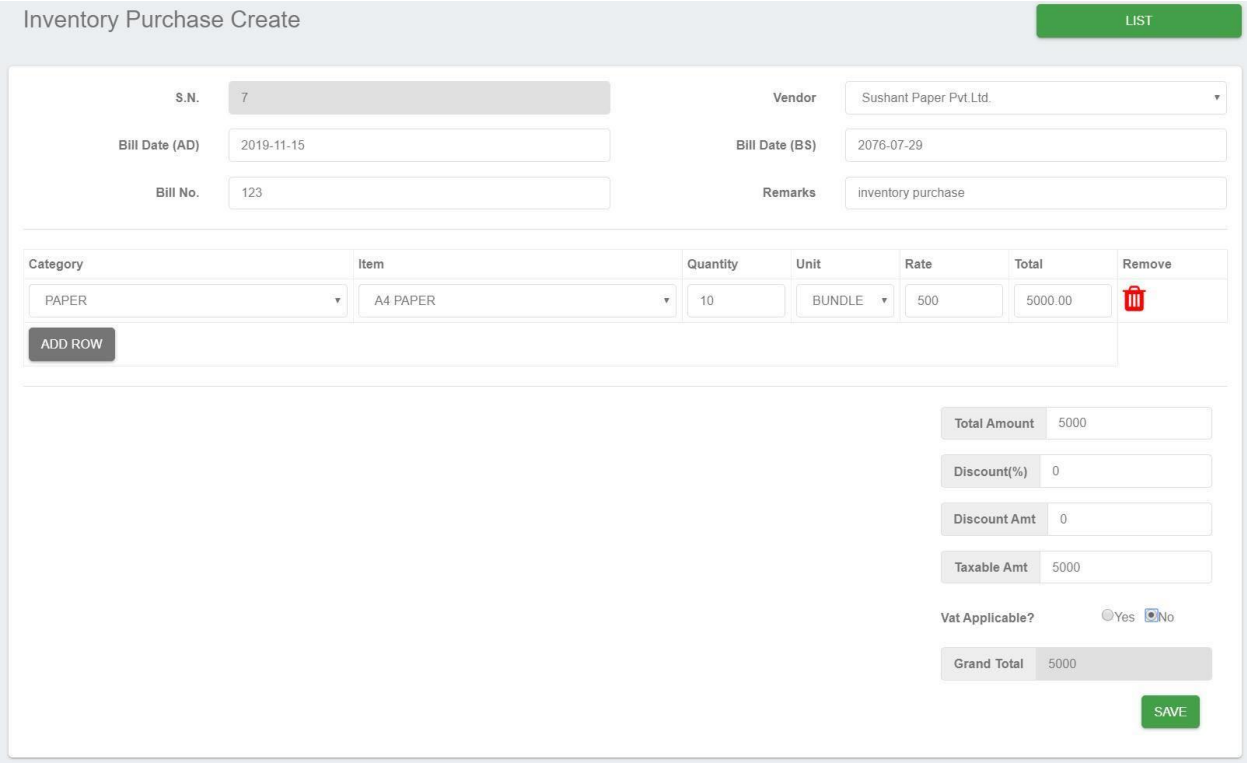

Figure 5. 24 Purchase Item Create

Figure 5.24 contains the panel for creating the inventory purchase item from where the store manager enters the purchase item list with respective to vendor, quantity, rate, date, unit etc.

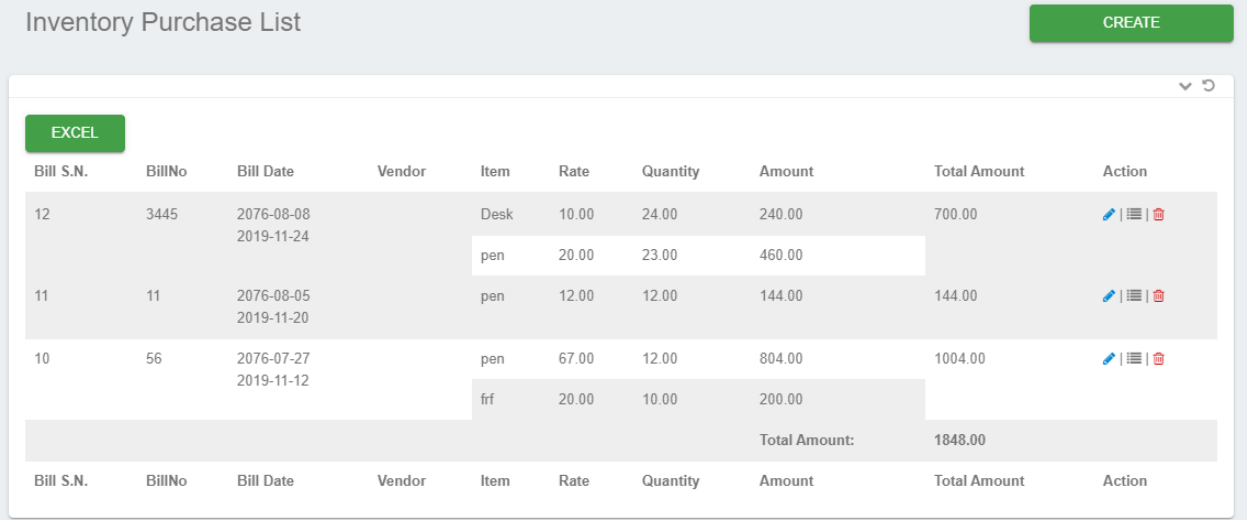

Figure 5. 25 Purchase Item List

Figure 5.25 includes the past inventory purchase list.

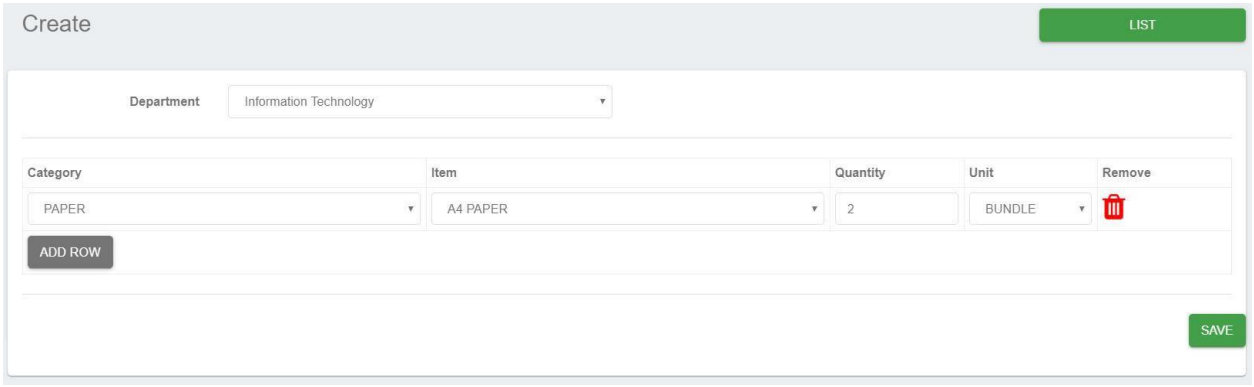

Figure 5. 26 Purchase Item Create

Figure 5.26 contains the panel for creating the inventory distribution from where the store manager enters the purchase item list with respective to quantity, rate, unit etc.

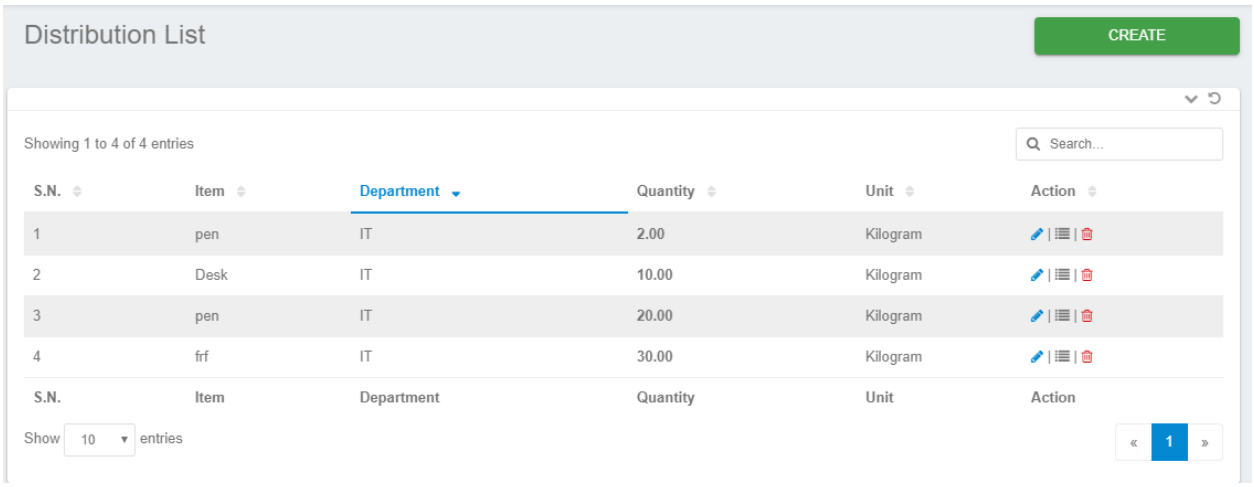

Figure 5. 27 Inventory list

Figure 5.27 contains the list of past Inventory.

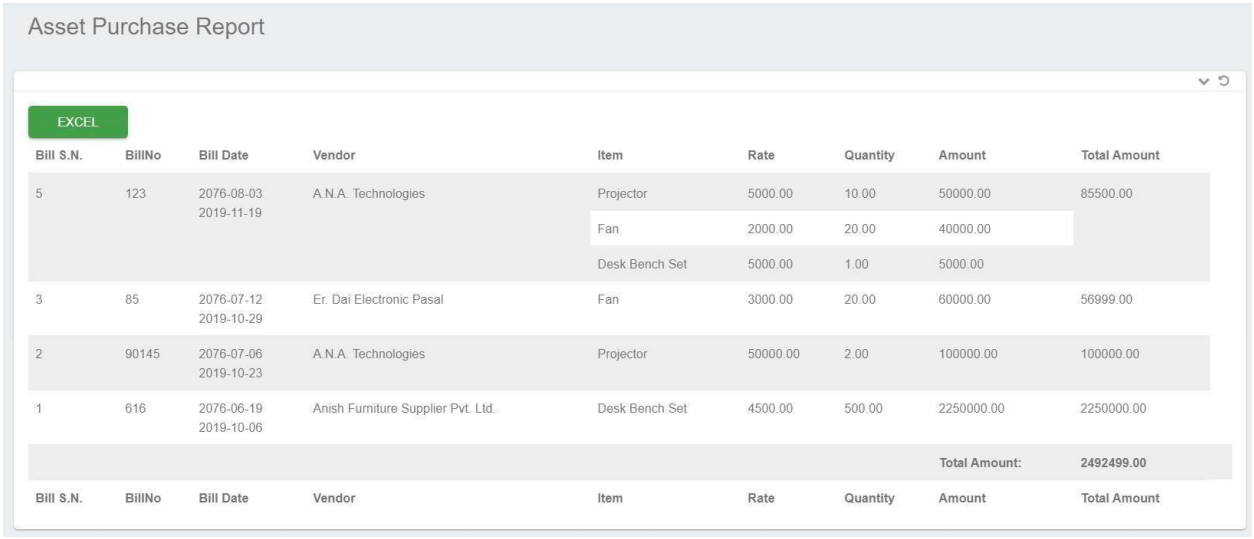

Figure 5. 28 Report of Asset Purchase

Figure 5.28 contains the report of purchased asset with respective to vendor, date, item, quantity, rate etc.

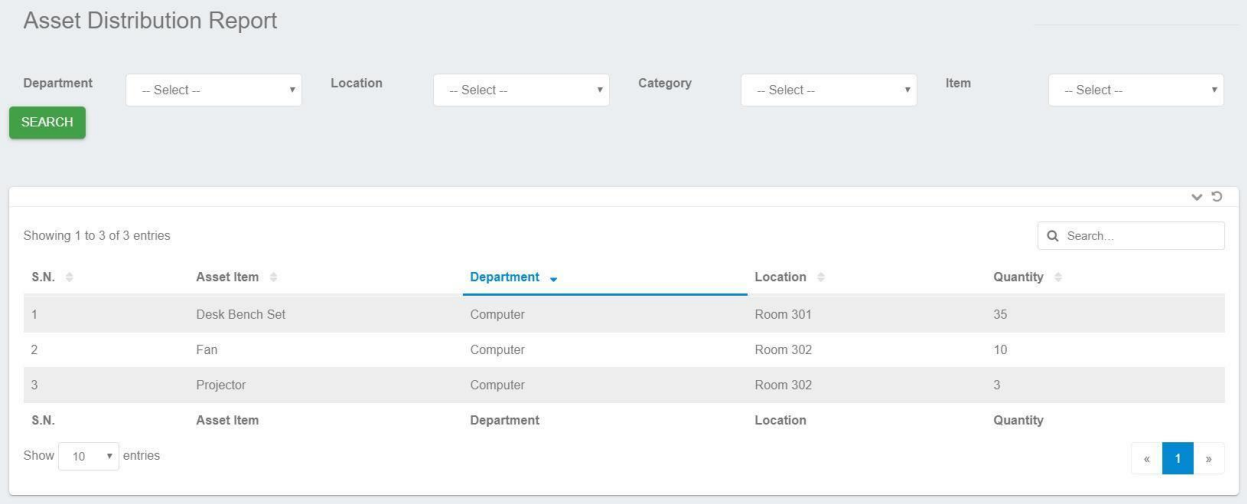

Figure 5. 29 Report of Asset Distribution

Figure 5.29 contains the report of distributed asset with respective to item, department, location quantity etc.

6. Conclusion

The gist of our project was to make a convenient way for the college to have a better asset and inventory management system. By shifting the procedure from a conventional paper work to digital records through our project have been able to deliver this.

We had first analyzed the current systems and listed out its problem statement and design our system to conquer those problems. After designing the system we create minor prototypes and conducted tests. We had used agile method to develop the overall system, creating and testing individual model and taking the feedbacks. The overall process took around 90 days to accomplish.

To upgrade the traditional system of asset and inventory management into to digital and web based model. Our system divides the users into the types (i.e normal/ departmental user, store manager and admin). Request is made by the departmental user to the admin, the admin can approve or reject the request. The approved request passes down to the store manager and the store manager delivers the request asset to the departmental admin and record the event. Store manager also records all the purchase details.

Our whole system in based on these activities. The additional actives such as reports, dashboard views, user creations and permission management are also present in the system. Hence, through our project we have been able to create a convenient way for the college to have a better assets and inventory management system.

7. Further Works

The major drawback of our work is that our project does not integrates with the financial and accounting part. The assets for the college program such as sports and charity events doesn't have specific defined panel. Thus the further works can be as follows:

- Developing a proper workflow for the financial and accounting section.
- Developing a panel for assets used in events.
- Developing a proper canteen inventory of college.

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