Systems Design

Optimizing The Asset Management For Initech

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Background

Problem Statement

The scope of the company has reduced due to business priority changes. The asset stages, reporting dashboard and the two processes namely support and retire, have been removed. The team must meet the security requirements of the system. The company will be working on only 2 business functions, that are: Serialized asset tracking and stockroom management. In addition, the processes which will be supported are:

1)asset entry process

2)user request process

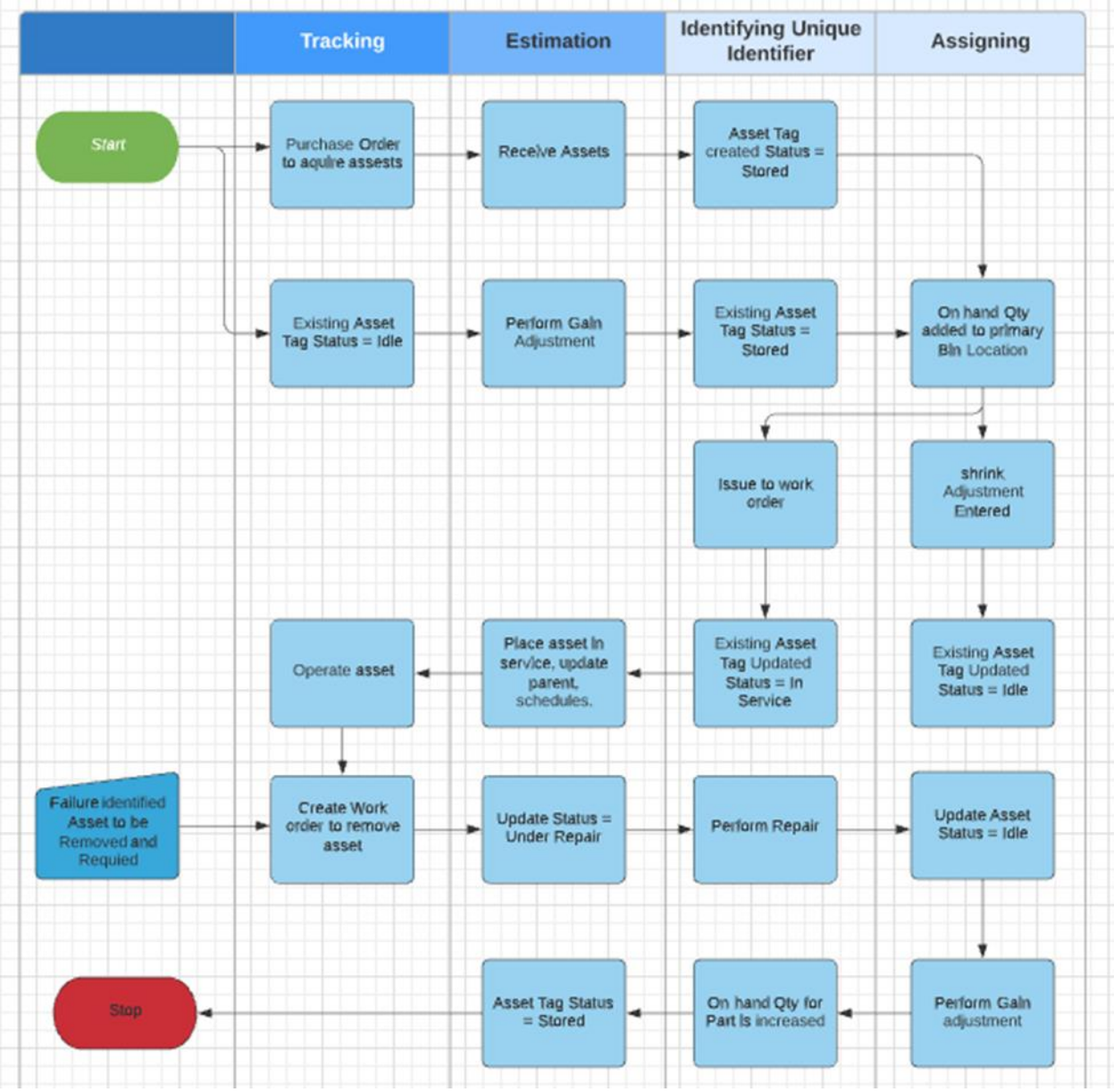
3)fulfillment process

Technology Solution

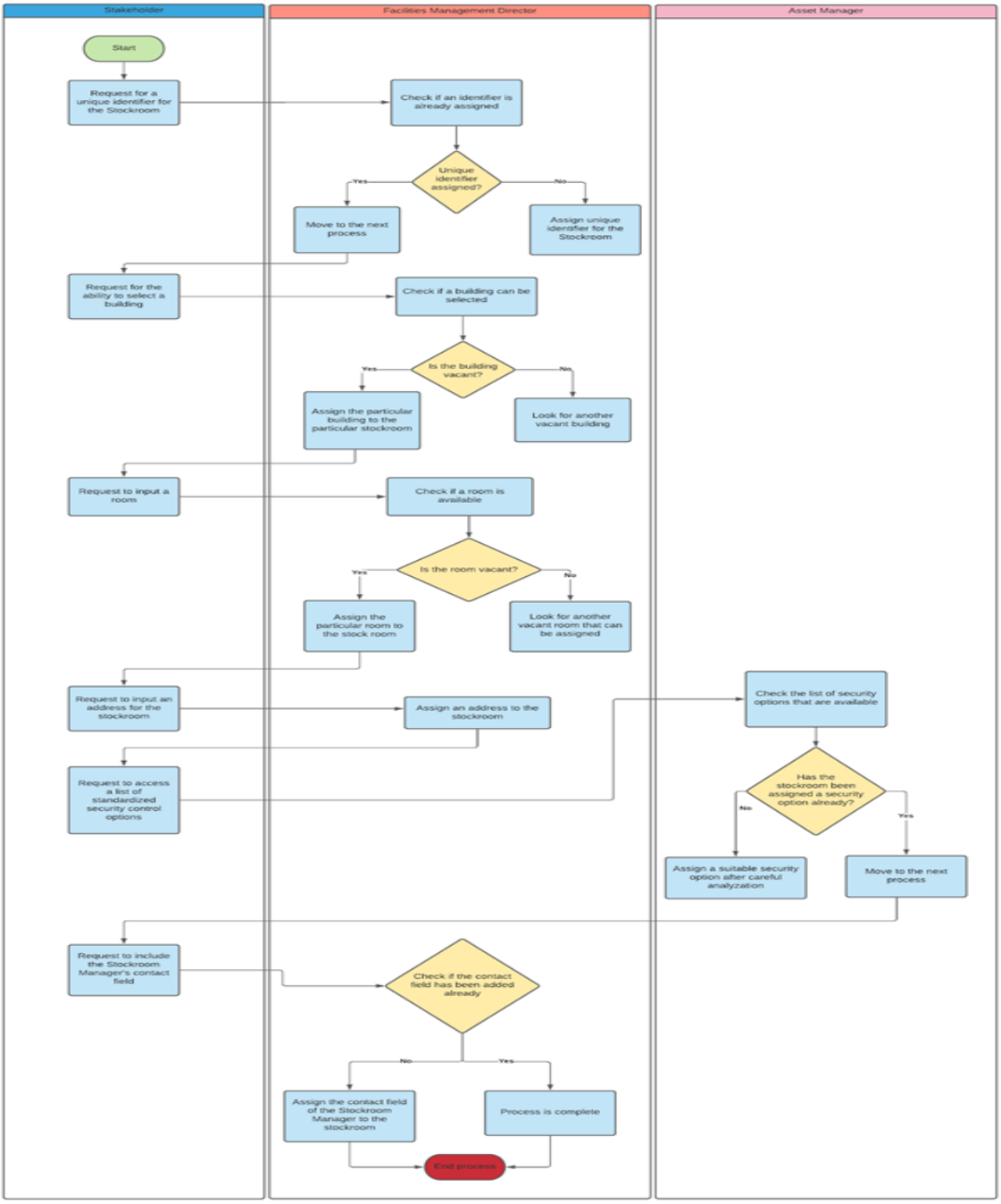
A centralized web-based application connected to a database maintaining the asset data along with its proper serialized and uniquely identifiable tags and state supporting report generation feature. Serialized assets, Stockroom Management, Asset Entry that includes Request Process and System Security are the four major functions that can be completed by the user.

Process Maps

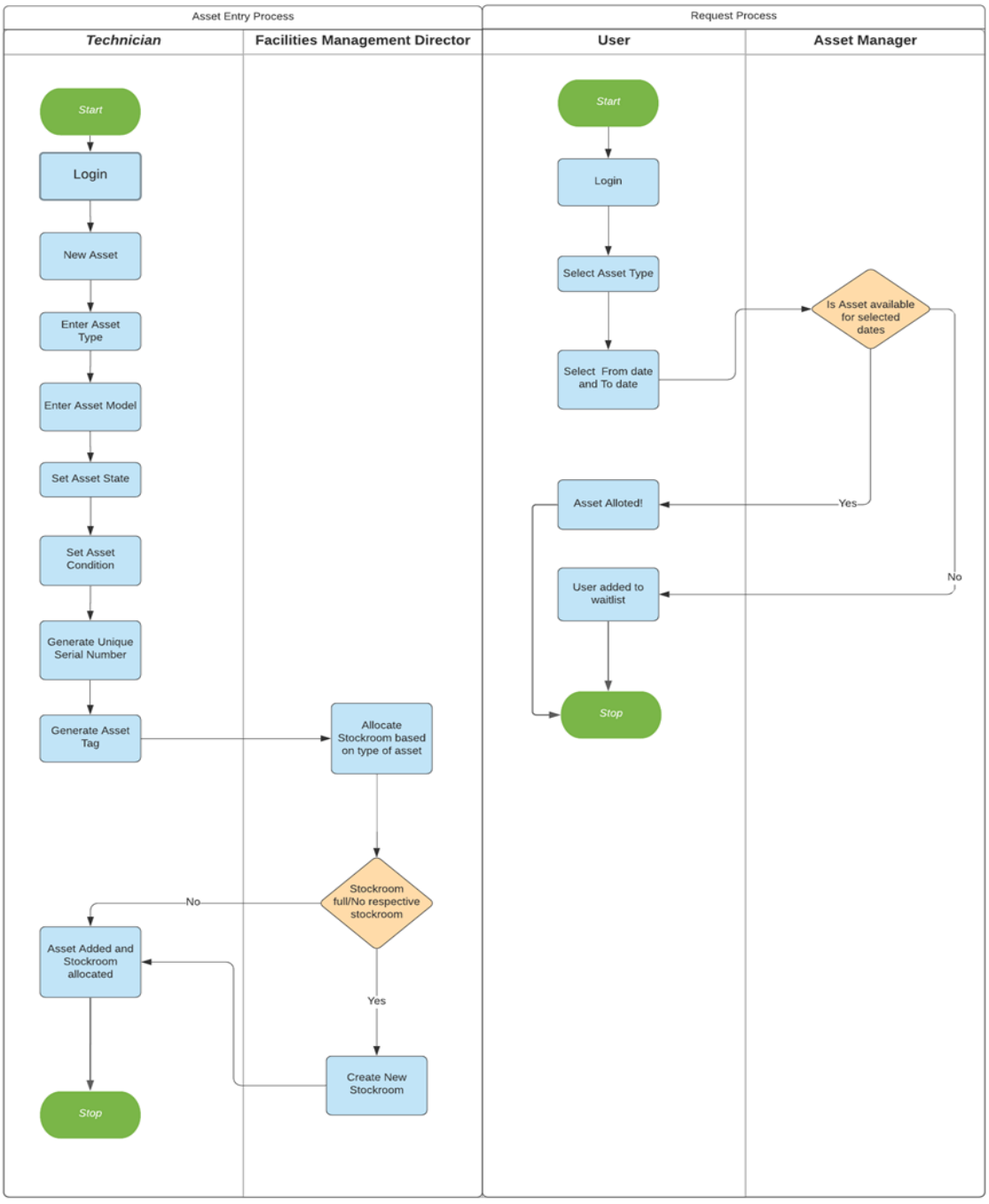
1. Serialized Assets Business Flow:



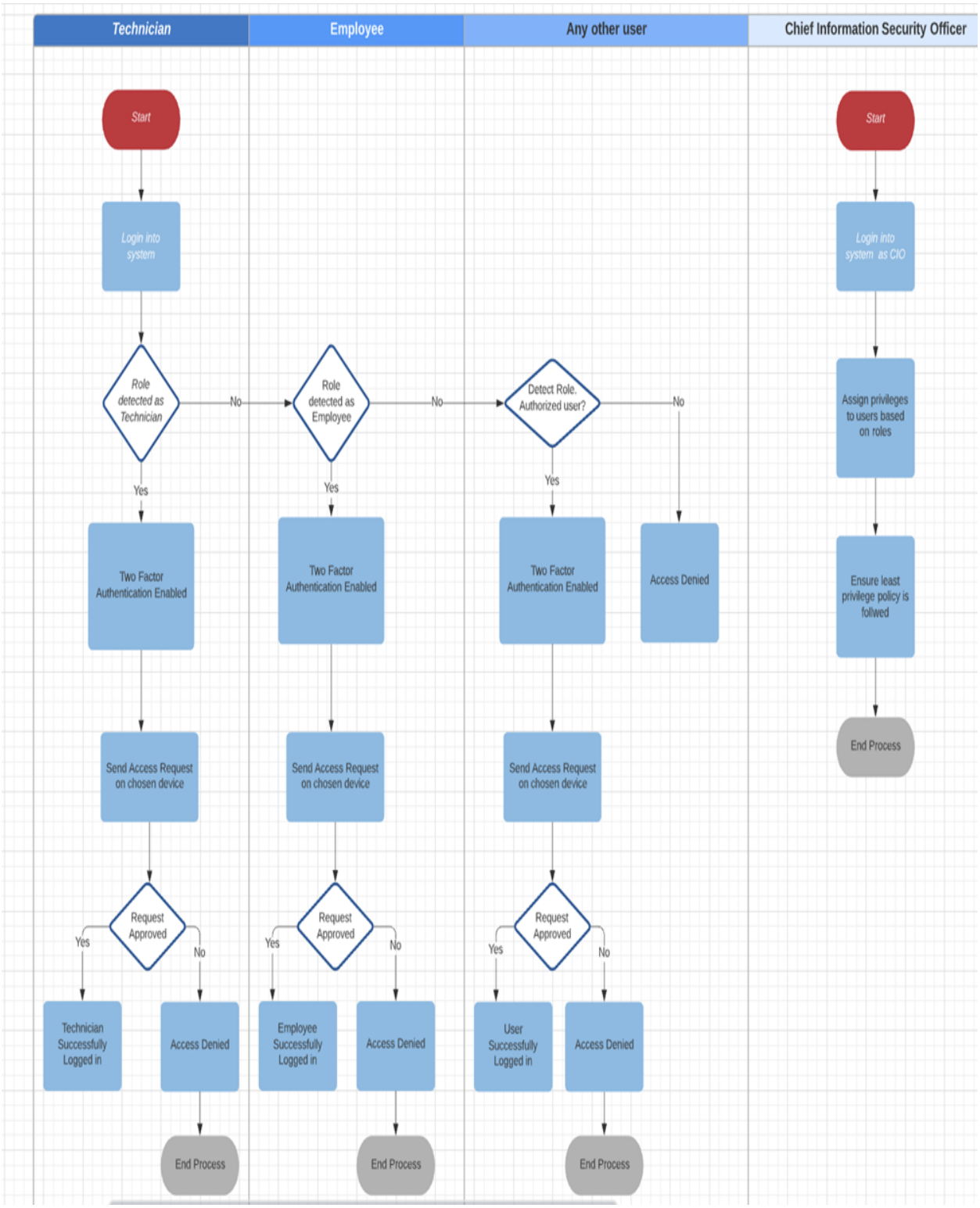
2. Stockroom Management Business flow:



3. ITAM – IT Asset Management



4. System Security



Functions and Requirements Table

FUNCTION	REQUIREMENTS
Serialized Asset Tracking	• Serialized Asset inventory will track the on-hand quantity for a Stock Item and a serial number for a specific unit. • The serialized units will be placed into service, removed, repaired, returned to stock and re-issued for service. • The Serial Numbers, which also serve as the Asset Tag ID will be specified. • A Stock Item will be selected from a Stock Item record. • The items in the stock will be assigned by the Asset Manager if it is in use.
Stockroom Management	• There will be a unique identifier for each stockroom in the system. • The system will give the stakeholders the ability to input a room.

	• The system will allow the users to input an address. • The system will give the stakeholders the ability to select a building.
ITAM – IT Asset Management	• Technicians will be able add new asset entries in the system. • The fields include a Serial Number, Asset tag, State, Model, Condition, Location and Assigned to. • Serial Number is unique for each asset. **Request Process** • All users will be able to request an available asset from storage. • Users will be able to select the type of asset required from the following options: Laptop, Monitor, Keyboard, Mouse, CPU, Printer and Scanner. • If the asset is available, the user will be able to place a request. If the asset is not available, the user will be able to wait-list themselves.

System Security	• The system will incorporate Single Sign-On with Two-factor Authentication mode enabled. • Only authorized users will have access to the application. • All the users will be expected to enable Two-factor authentication. • The system will follow the principle of least privilege for roles. • Users will have privileges aligned to their roles only.

User Interface

Wireframe 1: ASSET STATUS

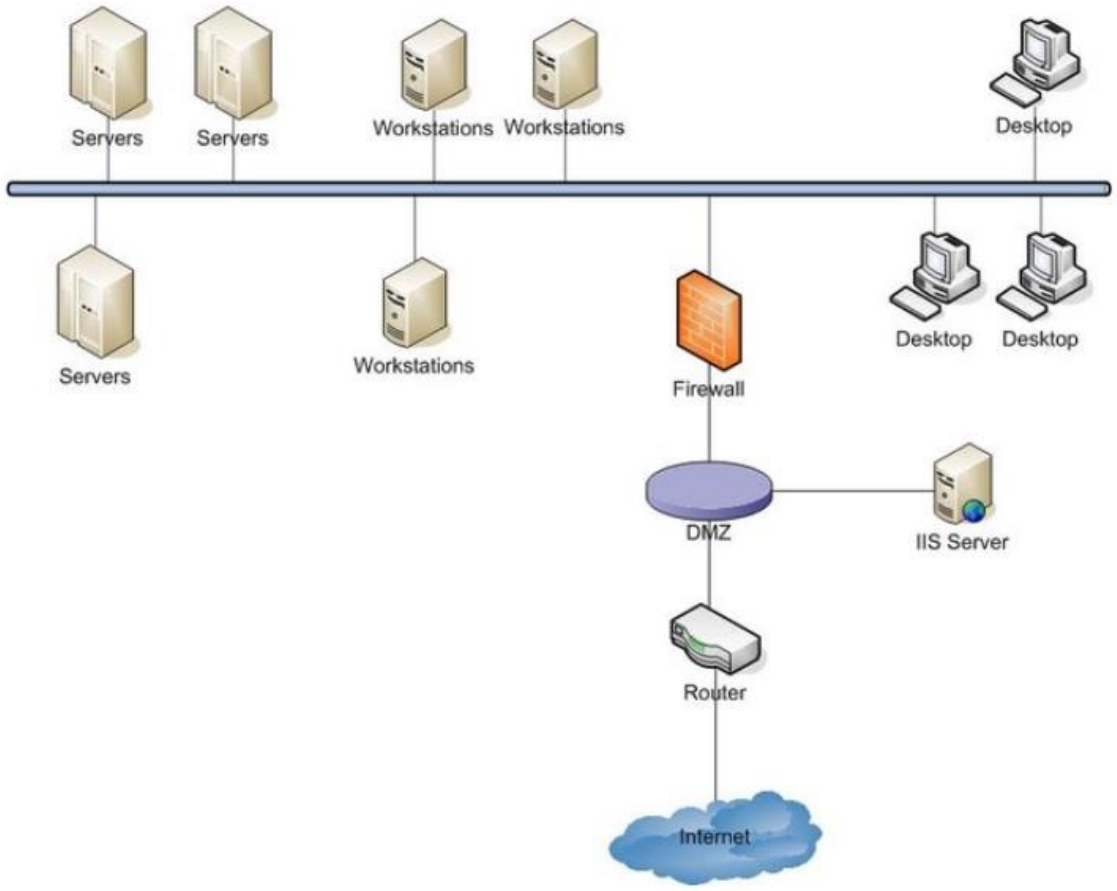
This window and dialogue box pops up when the stockroom manager and Asset manager tracks the status of the assets. If the assets are in condition and new they will be allowed to store. If not they will be marked as repaired, allow for repair and store them.

Wireframe 2: STOCKROOM CREATION

In rare occasions, when the user wants to add a stockroom to the database, he/she can do so using the Create Stockroom menu. he user will have to add details of the stockroom, such as stockroom number, size of the stockroom(in terms of number of items), location of the stockroom and what it contains/will contain. After clicking the submit button, the user will be redirected to a screen where the success message will be displayed.

Infrastructure Architecture

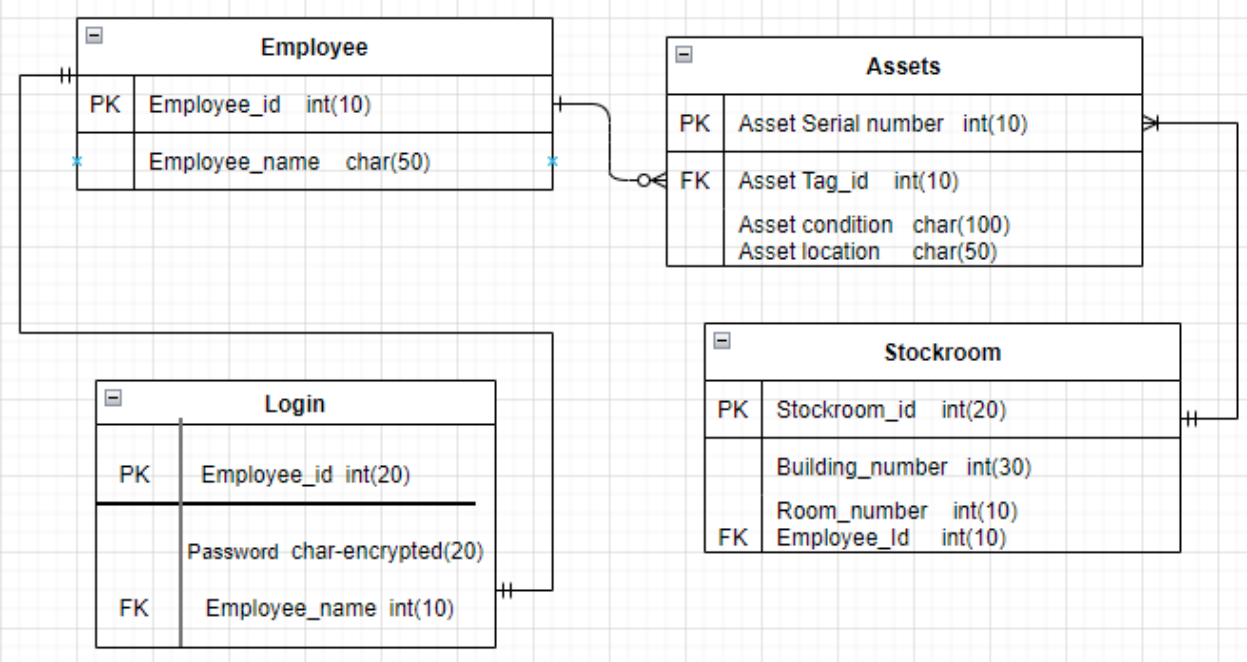
Network Topology



Network topology refers to the physical and logical view of the network. It helps illustrate how the different modules interact to form a network and provide access to all the servers and databases to different parts/departments of a company. To meet the demands of the current market tendencies, our asset management system will follow the WAN network, where diverse parts of the network will be connected to a central access point and all the wireless clients will be able to connect to this central access point/wireless access point and will be able to pull data from it.

Information Architecture

Entity Relationship Diagram



Security and Privacy Architecture

The system will include 2 factor authentication for the security purpose. It will help in ensuring the authenticity of the user and help him in getting the access to the system. Privilege policy will also be implemented, so that the users can be restricted to their respective roles and responsibilities.

Business Requirements:

- Only authorized users have access to application
- All users are expected to enable Two Factor authentication
- The system follows the principle of least privilege for roles
- Users will have privileges aligned to their roles only

Programming

Access Conversion Tool:

We will have an access conversion tool to convert data that were stored in multiple different old spreadsheets so that it can be stored in our database.

Database technology:

Appropriate database technology is to be chosen which would fulfill our requirements and could be maintained for a long period. Many criteria must be taken into consideration while choosing a database.

The criteria are:

- Data sizes — MBs, GBs, TBs, PBs
- Point queries or bulk data queries — Redis, Key-Value Stores, Snowflake, Google Cloud SQL.
- Quick response time requirements — Elasticsearch, MemSQL
- Many concurrent users — Use of caching, Redis, DynamoDB
- Balanced read-write, mostly read, mostly write, transactions and analytical processing
- Document data (JSON), Geographical data (GIS), Time data, Multimedia data
- Rapid ingestion with large volumes, trickle feeds, scheduled jobs, Data Lakes

A database architecture must make sure to choose the right option in each of the given criteria to reduce the complexity of the database and also the cost of the operation.

Database Security Tools:

Database security tools perform vulnerability assessments, monitor database access and activity to detect intrusion, and attempt to prevent threats and block malicious or unauthorized behavior that may lead to data loss.

Unauthorized access to a database compromises a potential lack of data confidentiality, integrity, and availability. Since company databases frequently comprise valuable customer data and different sensitive information, protecting databases from malicious motives is of high priority.

Best Database Security Tools include Oracle Audit Vault and Database Firewall, Sophos Intercept X for Server, IBM Security Guardium, Imperva Data Security (formerly SecureSphere for Data), Symantec Data Center Security, McAfee Data Center Security Suite, Trend Micro ServerProtect, DbProtect, FortiDB, and Cisco Secure Workload (Tetration).

web development tools:

We will be creating a web application that connects the user through the front-end and has separate databases for asset management. The application will get user input and add it to the tables in the database and at the same time the user will be able to view expenses, reports, charts, expense projections, etc. through the front-end.

Creating a web-application consists of 3 things:

1) Backend
2) Frontend
3) API that connects both

The Technology Tools we will be using in this project are as follows:

- **Python & Django:**

  Python is a multi-purpose programming language and will be using Django as the backend web framework. It is an easy-to-learn and flexible language and will be able to incorporate all the features needed for this project using python. Python has multiple libraries for the recent technologies, which will be useful for further extension of the project. In addition to all this, python is an open-source language and hence the licensing costs are nil. This will make a huge positive impact in our budget.

For implementing both Python and Django, we will be using the Pycharm Integrated Development environment as it is already inbuilt with both python and Django and will make development an easy task. Auto complete and smart syntax completion is an added plus.

- **HTML, CSS, Javascript and Jquery:**

HTML and CSS will be employed for our frontend purposes and on top of that, we will be using JavaScript and Jquery for further web-page fluidity. HTML provides the basic structure of sites, which is enhanced and modified by other technologies like CSS and JavaScript. CSS is used to control presentation, formatting, and layout. JavaScript is used to control the behavior of different elements. Javascript also enhances the user experience by manipulating the behavior of HTML and CSS with the use of functions.

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