Systems Design

Milestone 3 Systems Design

Richard Davis

Dr. Rhonda Johnson

February 11, 2024

Table of Contents

Background

Problem Statement

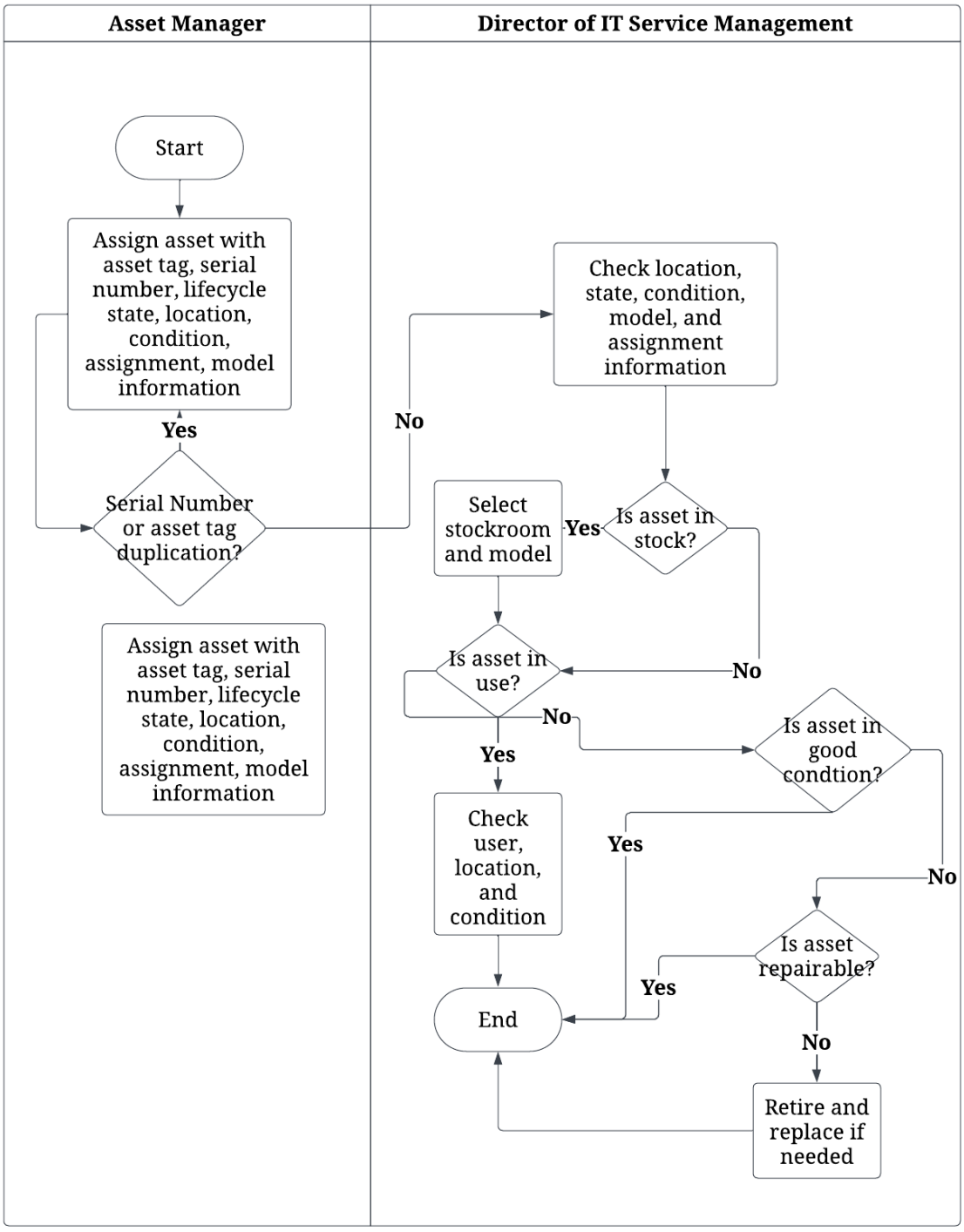
Inefficient ITAM processes compromise data accuracy, model consistency, and asset tracking; impeding the organization's decision-making capabilities and operational efficiency.

Technology Solution

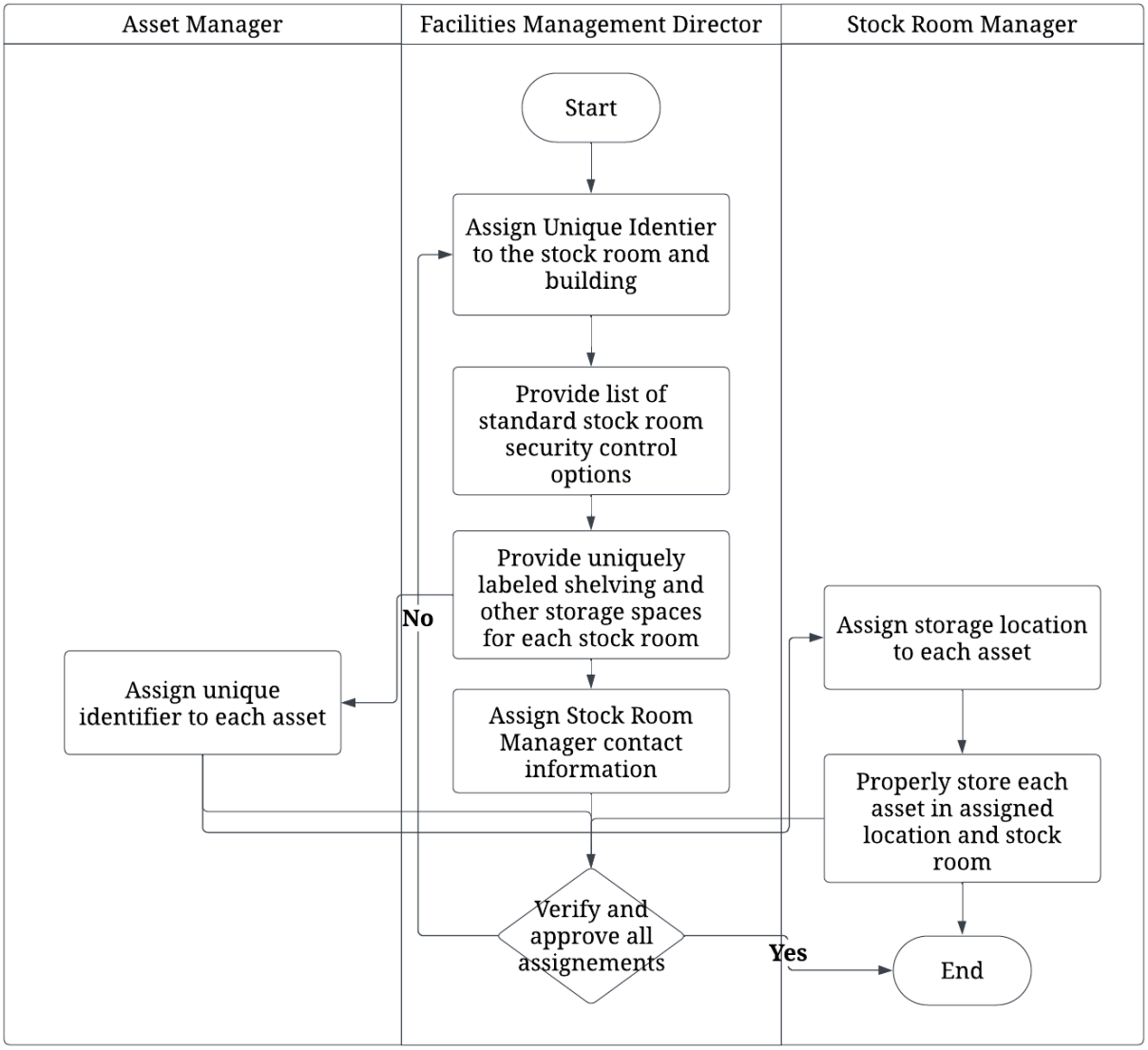
Implementing an integrated ITAM system with serialized tracking and stockroom management functionalities to address the data inconsistencies, model duplication, and streamline asset lifecycle tracking.

Process Maps

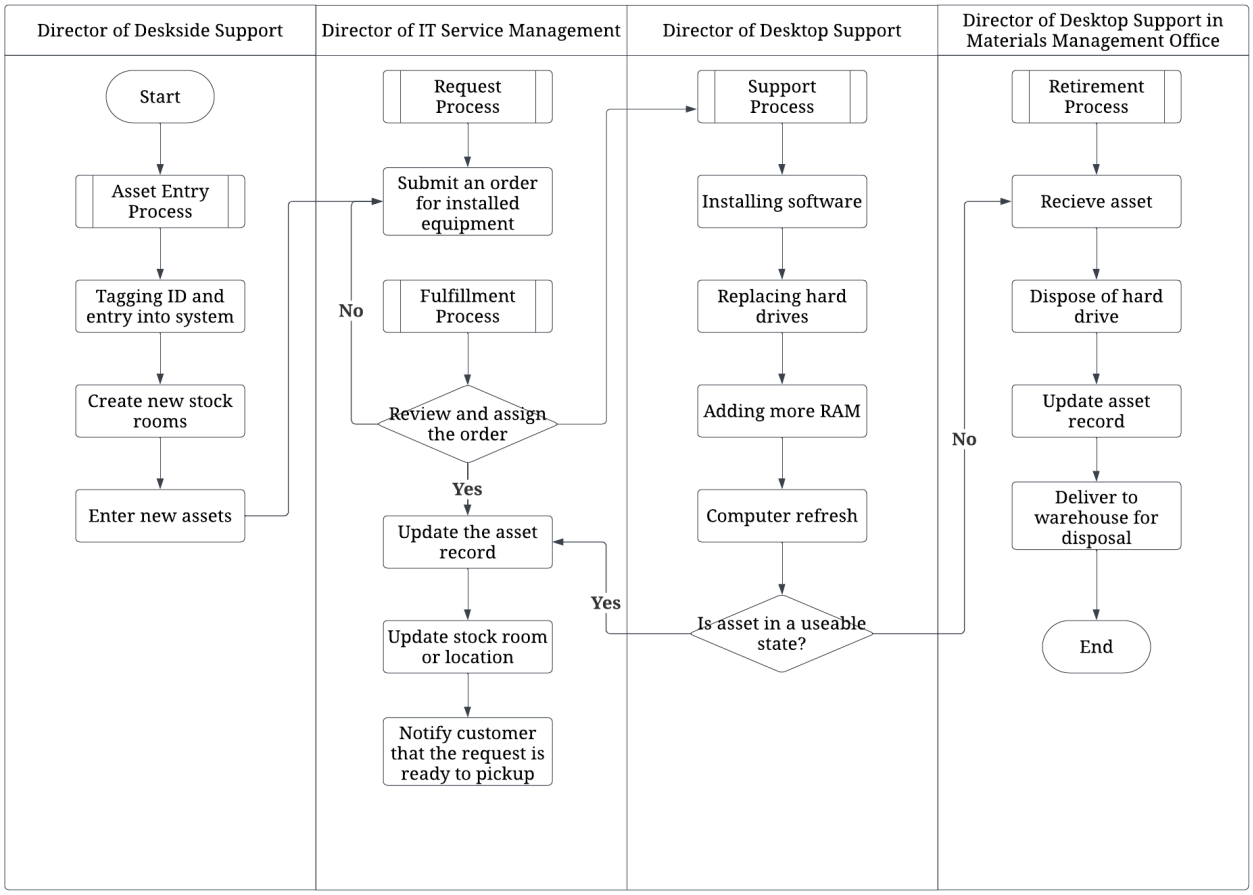
Business Function 1: Serialized Assets



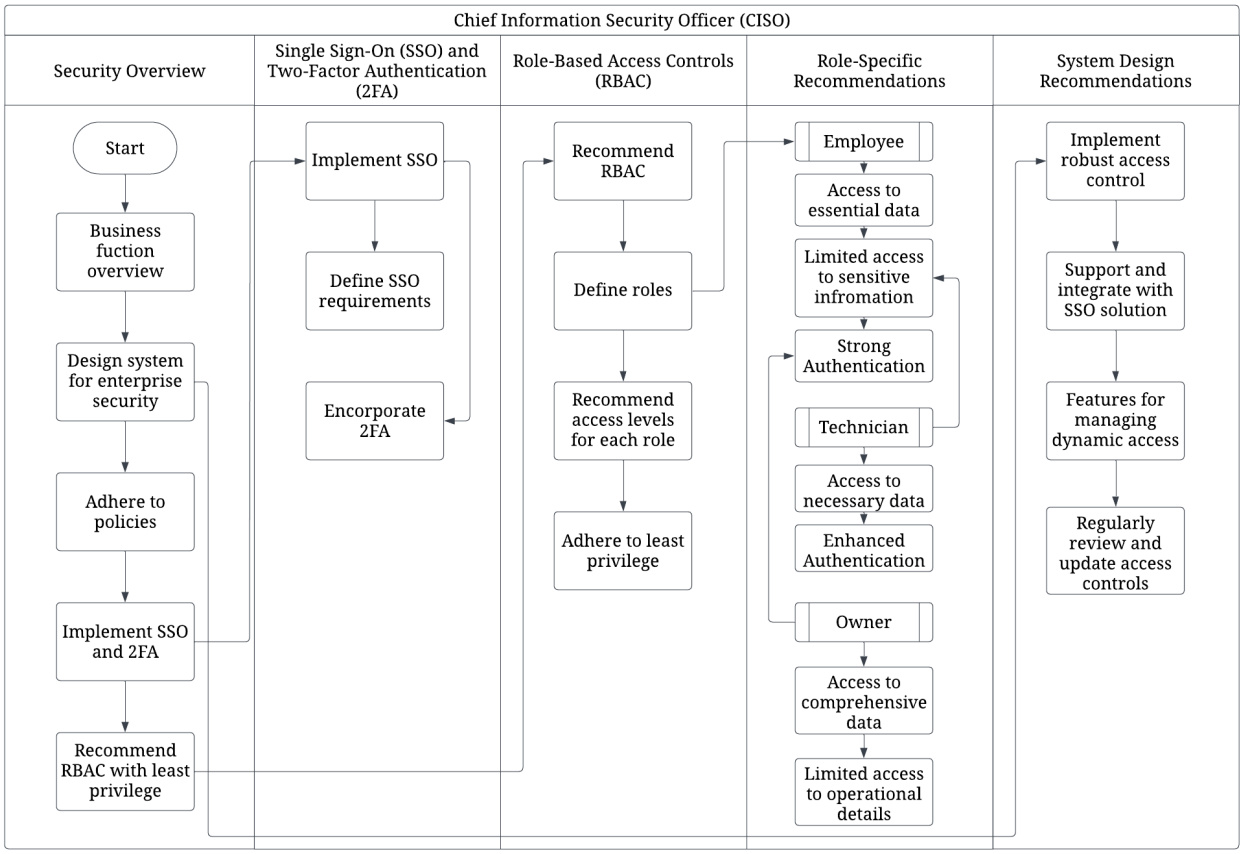
Business Function 2: Stock Room Management



Business Function 3: IT Asset Management



Business Function 4: System Security



Functions and Requirements Table

FUNCTION	REQUIREMENTS
Serialized Asset Serialized assets play a crucial role in enhancing the user experience by providing a streamlined and efficient way to manage and track assets within an organization. The primary purpose of serialized assets is to establish a unique identification system for each asset. Generally, identification is done through serial numbers and asset tags, ensuring that each asset is accurately and distinctly identifiable. This allows for precise asset tracking throughout the asset's lifecycle. For users, this means a more transparent and accountable process when accessing and utilizing IT resources. Serialization of assets enables quick access to asset information such as status, location, and user assignment. This also allows for proactive maintenance and security measures to be implemented and maintained.	o The user will keep track of serialized assets in a repository. o The system will have unique identifiers. o The user will see different asset states including in use, available, on order, lost, stolen, retired. o The user will choose a model from available stock via a web interface. o The user will select an available stock room for an asset via a web interface. o The user will assign assets to users via a web interface.
Stock Room Management Stock room management serves as a fundamental component in optimizing user experiences within an organization. This optimization is done by ensuring efficient and organized control over the inventory. The main purpose is to provide users responsible for inventory management with a streamlined and accessible system to track, monitor, and replenish assets when needed. Effective stock room management allows users to easily locate and	o Each stock room will have unique identifiers. o The stock room buildings will have unique combination assignments. o The user will add room numbers. o The user will add addresses. o The user will provide a standard selection of security control options for each stock room. o The user will provide a standard selection of security control options for each building. o The system will show the contact information for stock room manager for each stock room.

retrieve assets, without wasting time searching and disrupting workflow. The system improves user experience by maintaining accurate and up-to-date information on an assets status and location. By having an effective stock room management system, user experience is enhanced by ensuring assets are readily available and locatable.	
IT Asset Management IT asset management plays a vital role in improving user experience by providing a systematic and user-friendly approach to oversee the lifecycle of IT assets within an organization. The main purpose of IT asset management is to streamline the tracking, maintenance, and utilization of resources, making sure that users have access to the tools they need in a timely manner that allows for optimal productivity. Efficient asset management allows users to easily identify and locate assets, resulting in a reduction of downtime from equipment availability issues or delays in accessing necessary resources. By centralizing asset information, a more transparent and accountable environment is created, allowing users to focus on tasks while ensuring that IT resources align with the goals of the organization. Ultimately, the purpose of IT asset management is to create a positive user experience by promoting accessibility, reliability, and efficiency in the use of IT assets throughout their entire life cycle.	o The user will create new stock rooms. o The system allows assets to be tagged for identification. o The user will enter new assets into the system. o The system will include different phases of the asset lifecycle as labeled as states. o Each asset that is tagged for identification will have a unique identification number in the system. o Each asset will have its own state label in the system. o The user will update each asset's state label in the system as needed. o Each asset will have its own condition label in the system. o The user will update each asset's condition label in the system as needed. o Each asset will have a location label in the system. o The user will update each asset's location label in the system as needed. o Each asset will have a model label in the system. o Each user will request an asset for use in the system. o Each user will request the type of asset for use in the system. o The system will notify the user when the asset is available for use. o The user will install software. o The user will replace hard drives. o The user will add RAM. o The user will refresh computers. o The user will retire assets that are not up to standards.

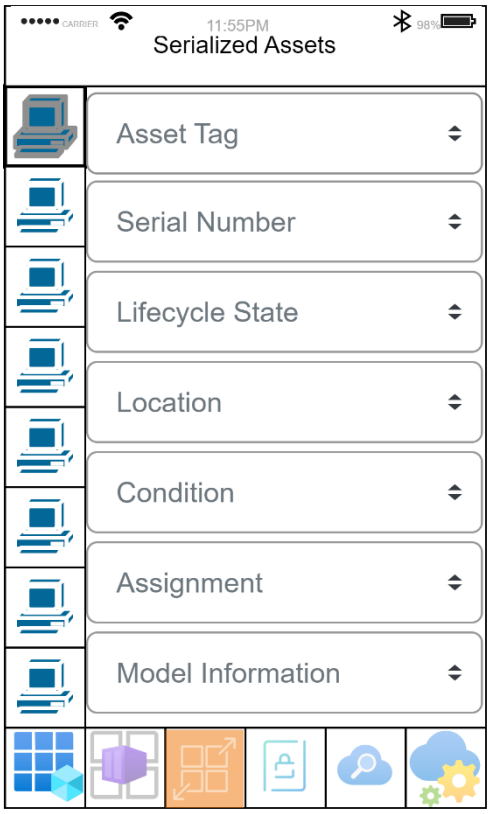
	○ The user will receive retiring assets. ○ The user will properly dispose of the hard drive. ○ The user will deliver dismantled assets to disposal warehouse. ○ The user will update the asset's condition in the system.
System Security System security aims to protect sensitive data, mitigate risks, and safeguard the integrity of IT assets from potential threats. The purpose of system security is essential to ensuring a secure and reliable user experience through the entire IT asset life cycle. By implementing robust security measures, IT asset management enhances user confidence in the safety and privacy of asset information. This helps to make a more positive user experience by assuring users that their data is securely handled and that the IT assets they use are protected well against vulnerabilities. Those vulnerabilities include unauthorized access, data breaches, and cyber attacks. A strong security framework in IT asset management supports a more transparent and accountable environment, allowing users to interact with IT assets while maintaining trust in the integrity and security of the system.	○ The system will have a single sign-in authentication for each user. ○ The system will have a two-factor authentication procedure for each user. ○ The user will be granted access to the system after the two-factor authentication process is completed. ○ Access to data within the system will be granted with the concept of least privilege. ○ Access to sensitive information within the system will be granted with the concept of least privilege. ○ Each user role will have their own level of access.

User Interface

Wireframe 1: Serialized Assets

Description:

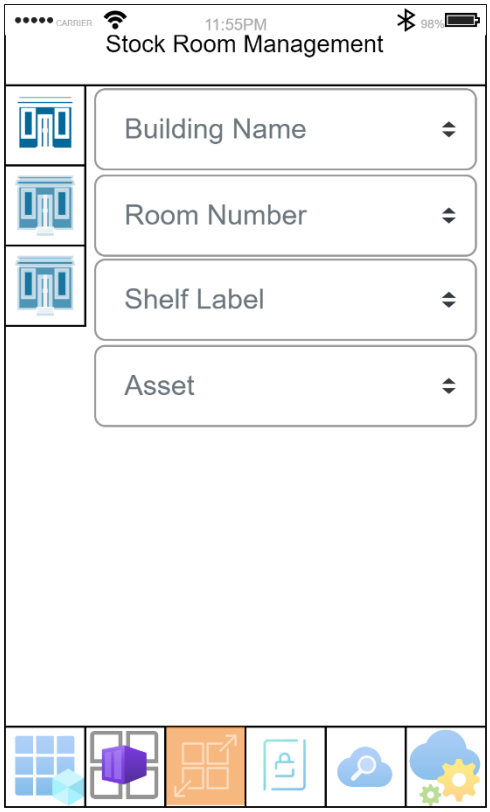
The serialized assets application allows the user to select a device and view or assign the asset tag, serial number, lifecycle state, location, condition, assignment, and model information.



Wireframe 2: Stock Room Management

Description:

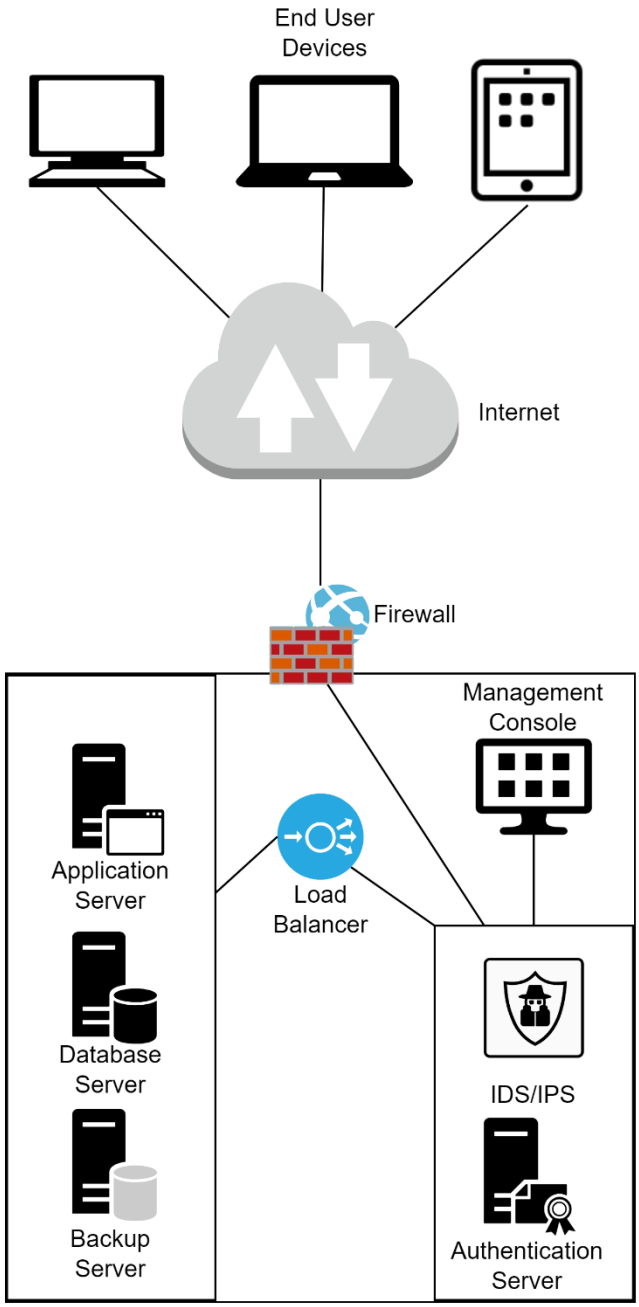
The Stock Room Management application allows the user to select and assign the building, stock room number, shelf label, and asset.



Infrastructure Architecture

A strong network infrastructure is essential to support the solution requirements. This infrastructure contains various components across different layers of network topology. At the client device level, workstations and mobile devices provide access to the ITAM system, while network infrastructure such as switches, routers, firewalls, and wireless access points ensure connectivity and secure communication. Server infrastructure such as database servers, application servers, and backup servers host the ITAM system's software application and stores critical information and provide safeguards against data loss and ensure business continuity. Monitoring and management tools ensure optimal performance, security, and availability to the system.

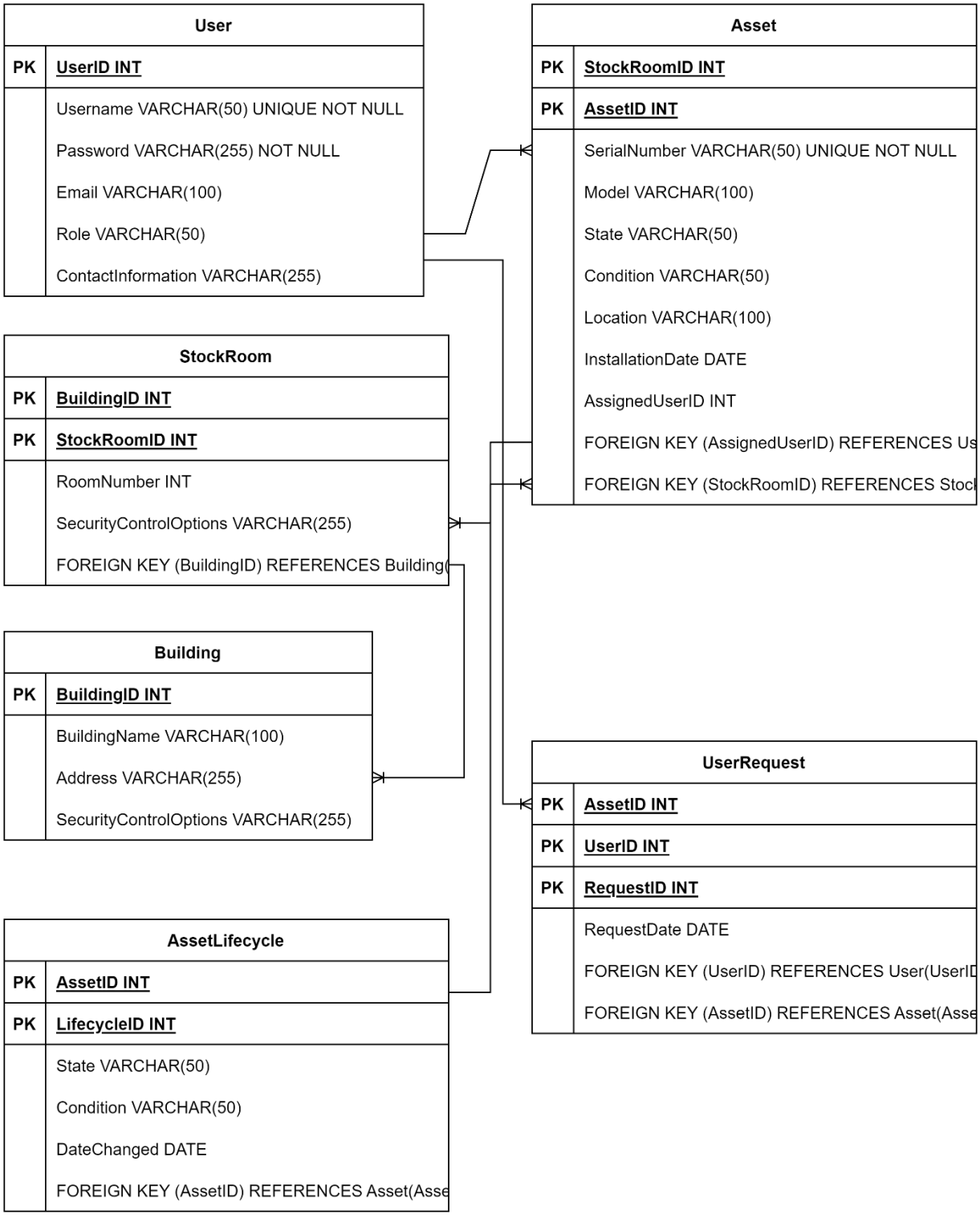
Network Topology



Information Architecture

The information architecture can be represented by an Entity Relationship Diagram by delineating an ITAM's entities and relationships. The IT Asset Management system revolves around the primary entities: User, Asset, StockRoom, and Building. The User entity represents the individuals interacting with the system and the Asset entity encompasses all the information about the IT assets being managed within the system. The relationship between User and Asset shows the assignment of assets to users. The StockRoom entity represents the physical locations where the assets are stored, linked with the Asset entity to track each asset's location. The relationship between StockRoom and Building represents the organization of stock rooms within buildings.

Entity Relationship Diagram



Security and Privacy Architecture

Security and privacy are essential to the development of the system, “As the physical design is translated into specific hardware and software, the analyst must consider security issues and determine how the company will address them” (Tilley, 2019, p. 320). The security and privacy architecture will embed a single sign-in authentication framework, simplifying user access while improving defenses against unauthorized entry and credential compromise. A two-factor authentication protocol for each user will be utilized, fortifying the authentication process for a heightened security resilience. Upon successful completion of the two-factor authentication process, users will gain access to the system. Access control will be established with the concept of least privilege, allowing each user to access only the highest level of the system that is needed to perform their job functions. Stringent access restrictions will protect sensitive information withing the system to reduce unauthorized access. Individual user roles will be assigned distinct access levels, specific to their assigned operational requirements and organization mandates.

Programming

Leveraging strong technologies is crucial for efficiency and scalability. Microsoft SQL Server stands out as a leading relational database management system choice, offering features such as data security, high performance, and integration with other Microsoft products. Another option is Oracle Database with great scalability, reliability, and advanced data management capabilities, making it ideal for large-scale ITAM systems. IBM InfoSphere MDM and Informatica MDM are top options for data management, providing solutions for managing data across heterogeneous systems. ServiceNow's Jira Service management includes ticketing, incident management, and change management processes. For data visualization and analytics, Tableau and Power BI are industry leading tools with intuitive interfaces, powerful analytics capabilities, and seamless integration with various data sources. For development tools, technology, and programming languages, using Microsoft's Visual Studio IDE, a "creative launching pad that you can use to edit, debug, and build code, and then publish an app" (*Visual Studio: IDE and Code Editor for Software Developers and Teams*, 2024), with C++ or PHP would be a great choice for the backend logic of the ITAM system, while HTML and the stylesheet language CSS would be good for the frontend development to make user-friendly interface. Python is a good choice for scripting tasks, data manipulation, and automation.

References

Atlassian. (n.d.). *ITSM Software Features | Atlassian*. https://www.atlassian.com/software/jira/service-management/features/itsm#configuration-management

Cost-optimized and High-Performance database. (n.d.). https://www.oracle.com/database/

Coursera Staff. (Ed.) (2024, February 1). *8 Front-End languages to learn*. Coursera. https://www.coursera.org/articles/front-end-languages

Coursera Staff. (Ed.). (2024, February 1). *Front-End vs. Back-End Developer: Understanding the Differences*. Coursera. https://www.coursera.org/articles/front-end-vs-back-end

Edwards, J., Ketchen, D., & Short, J. (2014). Mastering Strategic Management. BCcampus.

IBM InfoSphere Master Data Management. (n.d.). https://www.ibm.com/products/ibm-infosphere-master-data-management

Informatica. (n.d.). *Master Data Management (MDM) Solutions and Tools | Informatica*. https://www.informatica.com/products/master-data-management.html

IT Asset Management - ITAM - ServiceNow. (n.d.). ServiceNow. https://www.servicenow.com/products/it-asset-management.html

Ketchen, D., & Short, J. C. (2011). *Mastering Strategic Management*. http://doer.col.org/handle/123456789/5642

Our platform. (n.d.). Tableau. https://www.tableau.com/products/our-platform

Power BI - Data Visualization | Microsoft Power Platform. (n.d.). https://www.microsoft.com/en-us/power-platform/products/power-bi#tabs-pill-bar-ocb9d418_tab0

SQL Server 2019 | Microsoft. (n.d.). https://www.microsoft.com/en-us/sql-server/sql-server-2019

Tilley, S. (2019). Systems analysis and design (12th ed.). Boston, MA: Cengage Learning.

Visual Studio: IDE and code editor for software developers and teams. (2024, January 30). Visual Studio. https://visualstudio.microsoft.com/