LUMMUS TECHNOLOGY

Capital Acquisition Request

System Design Document

Table of Contents

List of Tables

Table of Figures

1. Introduction

This document aims to provide application and deployment architecture details, network, connectivity, ports, and configuration requirements for CAR Application, and other related software components.

1.1 Purpose

This document only covers the solution, hardware, and software requirements that can accommodate CAR application upgrades.

The document covers the architecture at the application level only and does not delve into any end-user computing devices.

1.2 Terms and Definitions

This section lists all the terms and their definitions used in the document.

Terms	Definition
CAR	Capital Acquisition Request
GUI	Graphical User Interface
ERP	Enterprise Resource Planning

Table 1: List of Terms and Definitions

1.2.1 Document Audience

This document is primarily intended for solution architects and technical leads responsible for implementing and managing the associated infrastructure.

2 Solution Overview

The capital Acquisition Request application is used to create an approval workflow for any capital expenditure on a new acquisition. The CAR application helps the requestor to get approval for any assets and expenditures that go to various patrons before the request is sent to the procurement group for final purchase.

2.1 Solution Architecture

This section displays the logical solution architecture used to build the CAR application.

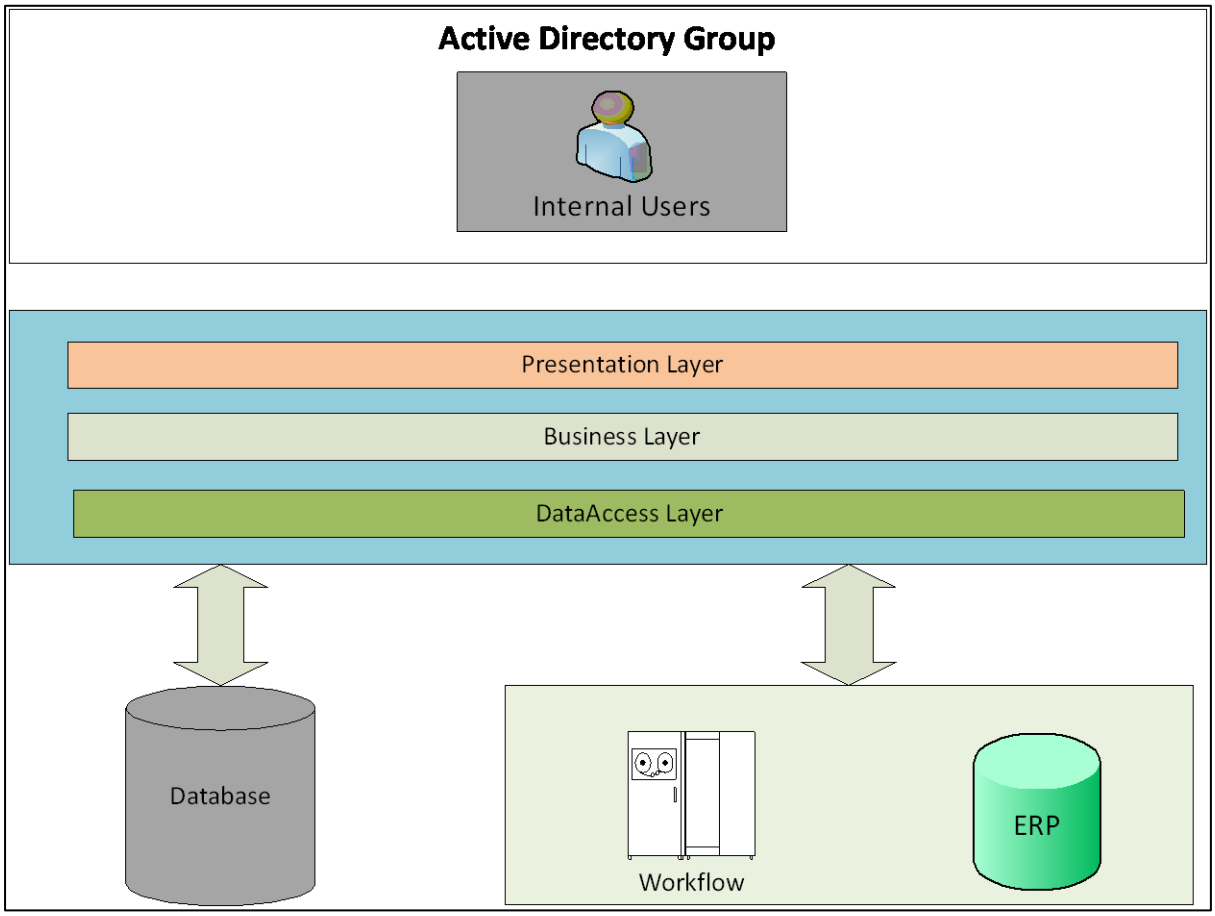

Figure 1: Overall Solution Architecture

3 Application Architecture

The user interface of the application uses the below design pattern.

The presentation layer works on powerapps and leverages the active directory. The business layer mechanism is built on MS PowerApps. The data access layer supports the database and enterprise resource planning solution, and the cross-cutting layer takes care of authentication, authorization, and notification functionalities built in MS authentication provided by PowerApps.

The overall logical solution architecture is shown below.

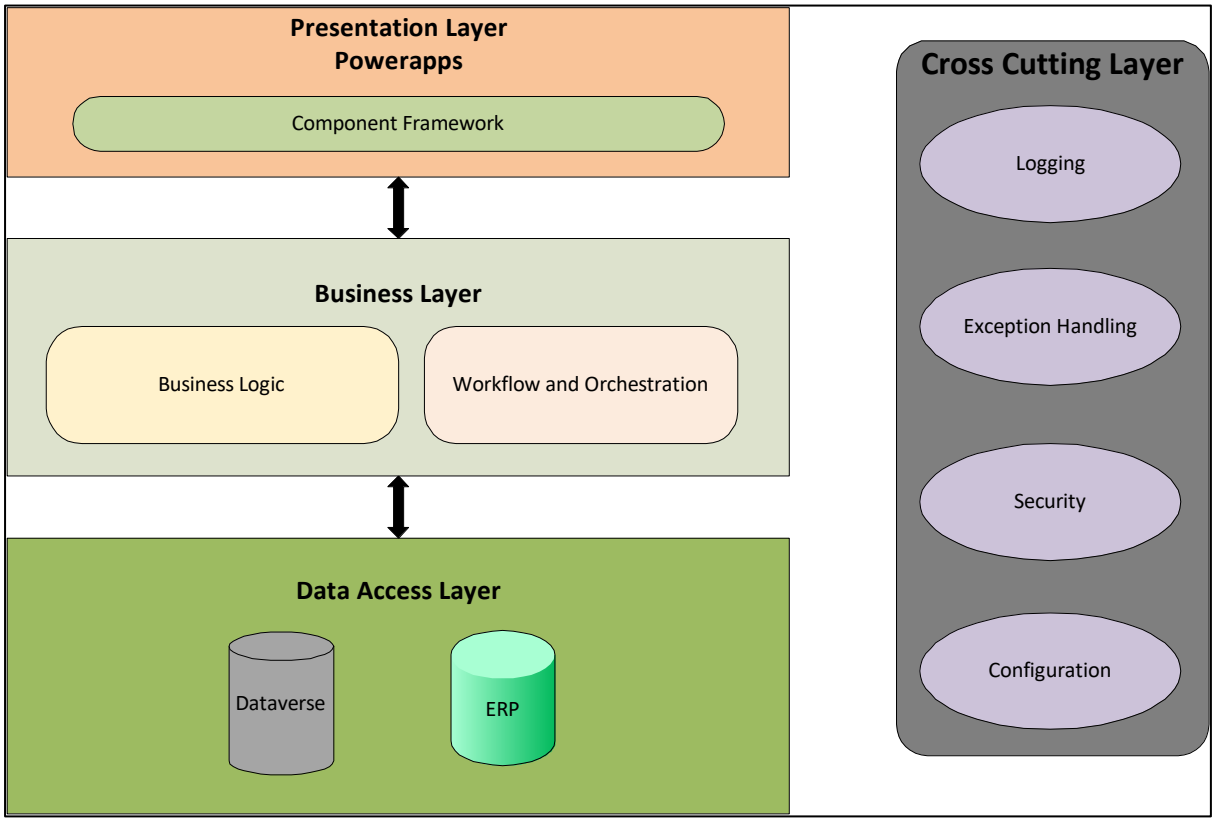

Figure 2: Application Architecture

3.1 New Capital Acquisition Request Fields

This section displays the new capital acquisition request should have fields in the form –

1. Requestor Details
    - Requestor Name
    - Requestor ID
    - Immediate Supervisor
    - Location
    - Project specific details
        - Relevant user attachments
2. Asset Details
    - New Asset
    - Modify Asset
    - Replace Asset
    - Description of the purchase
    - Attachments
3. Currency Details
    - Local Currency
    - Exchange Rate
    - Exchange Date
    - Estimated Cost
    - Variance against Budget
4. Finance Details
    - Company Code
    - Object Code
    - Useful Life
    - Budget Reference Number
5. IT Purchase
    - IT Classification
    - IT Comments

4 Data Model

This section describes the data model design of the application.

4.1 New Database Structure

The diagram below shows the new database structure proposed for the application. This does not include external feeds from JDE.

The data architecture design describes the type of data structures applied to manage data and it provides easy way for data processing. The data architecture defines how the data is stored and retrieved.

The new database model describes the managing tasks such as extracting, storing, transferring, processing, and securing the data by dividing into unique tables.

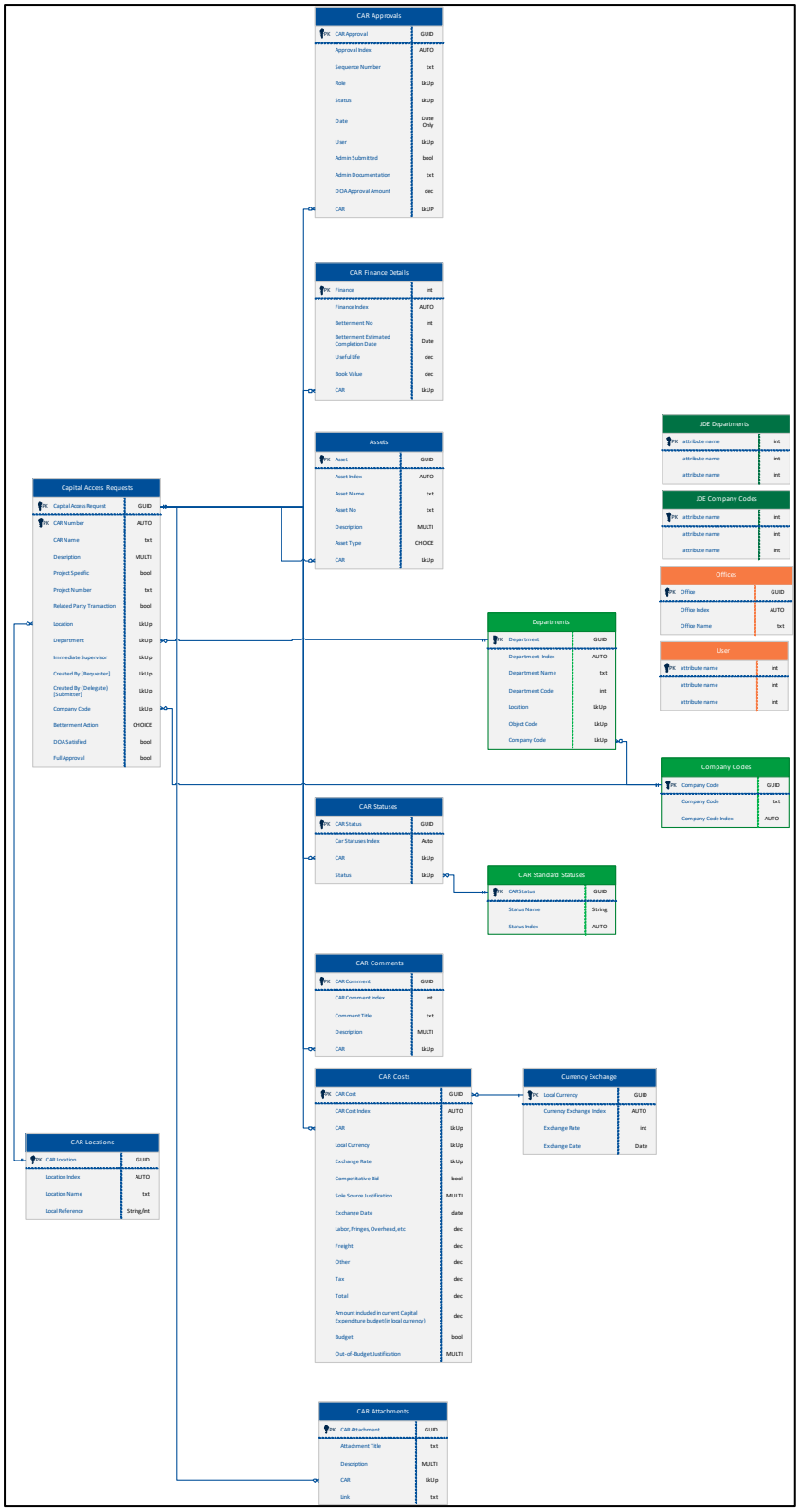

Figure 3: Database Structure

4.2 Process Model

This section describes the workflow of the application to request a new capital acquisition request and the roles of stakeholders.

4.2.1 Workflow

Below is the workflow diagram.

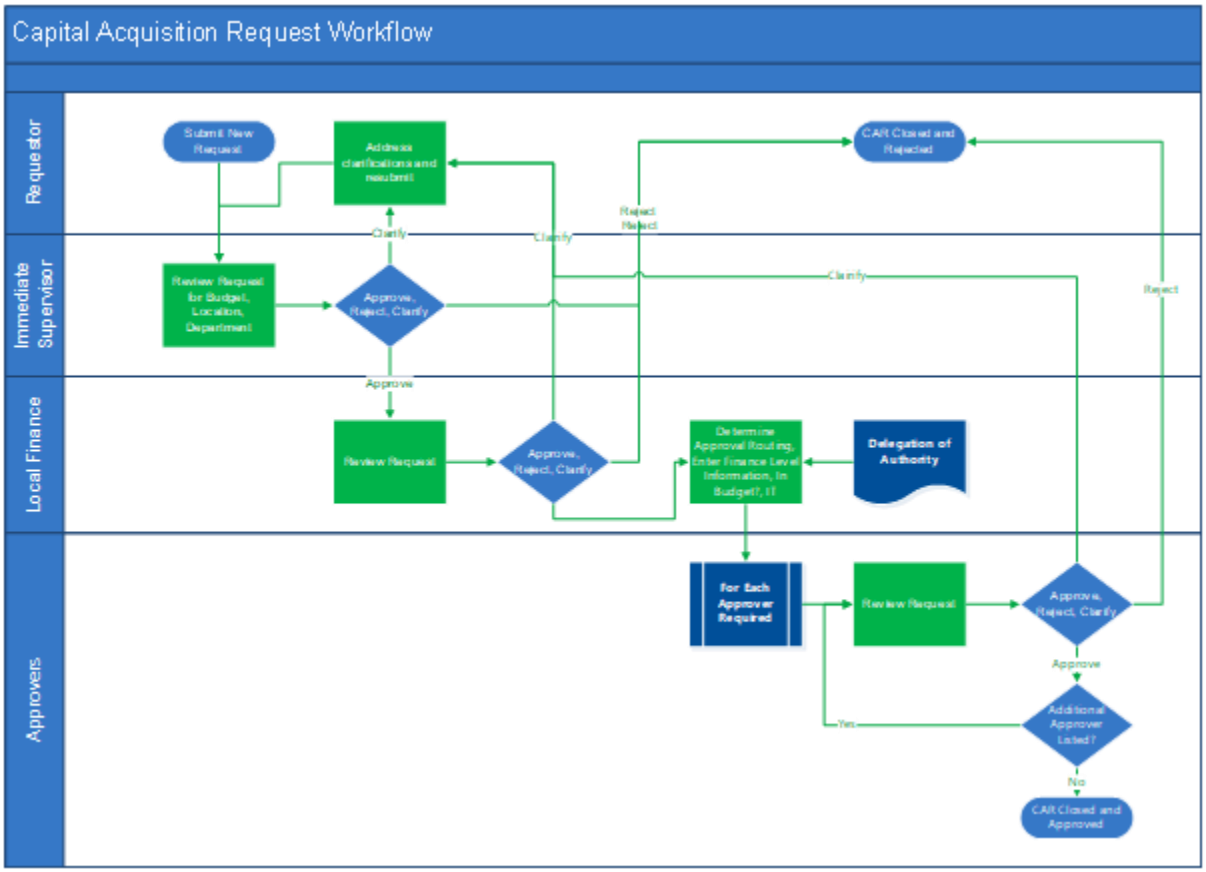

Figure 4: Process Workflow

4.3 Application Flow

This section displays the application flow as described in the above sections.

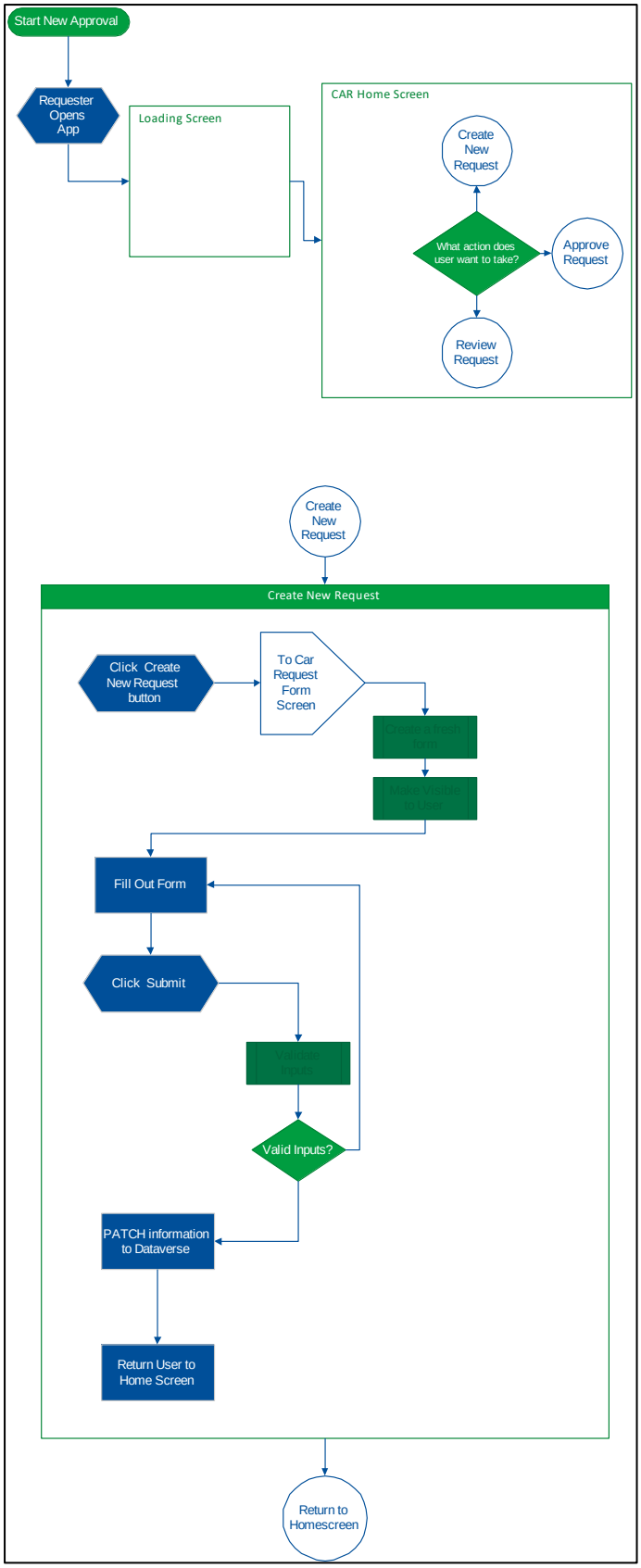

Figure 5: Application Workflow

4.3.1 Roles

This section lists the roles and responsibilities of the stakeholders involved in analyzing the new CAR application form.

Roles	Description
Requestor	Internal user with access to view all requests sent by the user or on their behalf as well as send new requests. Administrator access to view all the new requests submitted online. User can submit a request on behalf of another user. User can only edit and is responsible for the requestor fields and update their immediate supervisor if it is not correct in Active Directory.
Supervisor	Internal user with access to view all requests that have been submitted. Carries privileges of Requestor, supervisor validates the data provided in the new CAR application form. User must approve submission for it to be sent to local Finance. Role is primarily set by Active Directory
Local Finance	Carries privileges of Requestor. Internal user with access to view all requests that have been received as well as all requests sent to locations they manage. Responsible for entering all finance specific data and setting up approval routing to follow the current DOA. Authenticates the requests and verifies the estimated cost. This role is in set responsibility table,
IT Executive Approver	Carries privileges of Requestor. Internal user with access to view all requests that have been received and all IT based submissions. All IT based CARs must be reviewed by this user. Reviews the details in the CAR form and approves or rejects the request based on budget and merits. Can also request for additional clarifications. Role is set by variable in system.
DOA Approvers	Carries privileges of Requestor. Internal user with access to view all requests that have been received. Reviews the details in the CAR form and approves or rejects the request based on budget and merits. Can also request additional clarifications. Approval role is set manually based on DOA by Local Finance.

Roles	Description
Executive Approvers	Carries privileges of Requestor. Internal user with access to view all requests and their status. Executive approvers can view the queue of requests awaiting their approval. Review the details in the CAR form and approves or rejects the request based on budget and merits. Can also request additional clarifications. Approval role is requested manually based on DOA by Local Finance. This role is provided to CEO or CFO of the organization.
Finance Executive	Internal user with administrator access to view all the new requests sent by the executives of other departments. Authenticates the requests and verifies the estimated cost. Enters the local currency and exchange rate as per the exchange date and processes the request. If cost of the asset is more than the estimated cost, it is sent back to the requestor asking for more details. The application can be approved or rejected. • Approved – Send for final approval. • Rejected – CAR application form is closed.
Management Executive	Internal user with administrator access. Check for valid business justification for the new asset request. The management executive validates and authorizes the new buy. The application can be approved or rejected.
Admin	Internal user with administrator access. • Can see and update all aspects of the system. • Can Impersonate users for testing. • Can change out approvers after a submission has started. • Can approve on behalf of a user with attachment proof.

Table 2: Roles and Description with workflow

4.4 Technology Stack

This section describes the tools, framework and integrated development environment recommended and used for the development, testing, and production deployment of the CAR application.

The below table list details mentioned above –

Environment	Tool/Framework
Development Environment	PowerApps Studio
Development Framework	PowerApps Component Frameworks
Process Automation	Power Automate
Reporting and Dashboard	Power BI
Database	Dataverse
ERP	JD Edwards

Table 3: Technology Stack details

5 Integration

The new CAR application is planned to be integrated with the Lummus ERP system, JD Edwards. This integration is staged and the initial implementation of pulling data on a schedule to tables in the dataverse for use in the application. After a digital DOA is built, there is a plan to integrate into that system as well. User profiles will be integrated via a link with Azure Active Directory which will also control user access.

6 Design Implementation

This section describes the rules of implementation of the new CAR application.

6.1 Front End

The new Graphical User Interface (GUI) is versatile and adaptive to the evolving technology. It is a centrally deployed and cloud-based solution that can be updated effortlessly based in the Microsoft Power Platform.

6.2 Middle Layer

All workflows and notifications will be handled using Microsoft Power Automate.

6.3 Back End

The main data storage for the application is in the Microsoft Dataverse. This consists of custom tables and standard tables that will be used to securely store and manage the data.

Secondarily, there will be data accessed from the Lummus ERP system JD Edwards. The information receiving from this system is stored in the Dataverse for use in the application. This information includes company numbers, department numbers, betterment numbers etc.

Additionally, there will need to be document storage for attachments. This will be performed in blob storage or in SharePoint.

7 Access Control

A combination of Active Directory groups and Microsoft Dataverse security roles is used to secure the data and the application as described in the below sections.

7.1 Application Access

The application is shared with an Active Directory group of CAR users. All users for the CAR system should be a member of this group. Admin level access to the application will be handled with a CAR Admin Active Directory group.

7.2 Table Security

The tables in the Dataverse are secured and is only accessible by members of the Active Directory group of CAR users by utilizing a Dataverse security role.

Admin access to the tables will be controlled with an additional Active Directory group of CAR Admin users paired with a Dataverse security role.

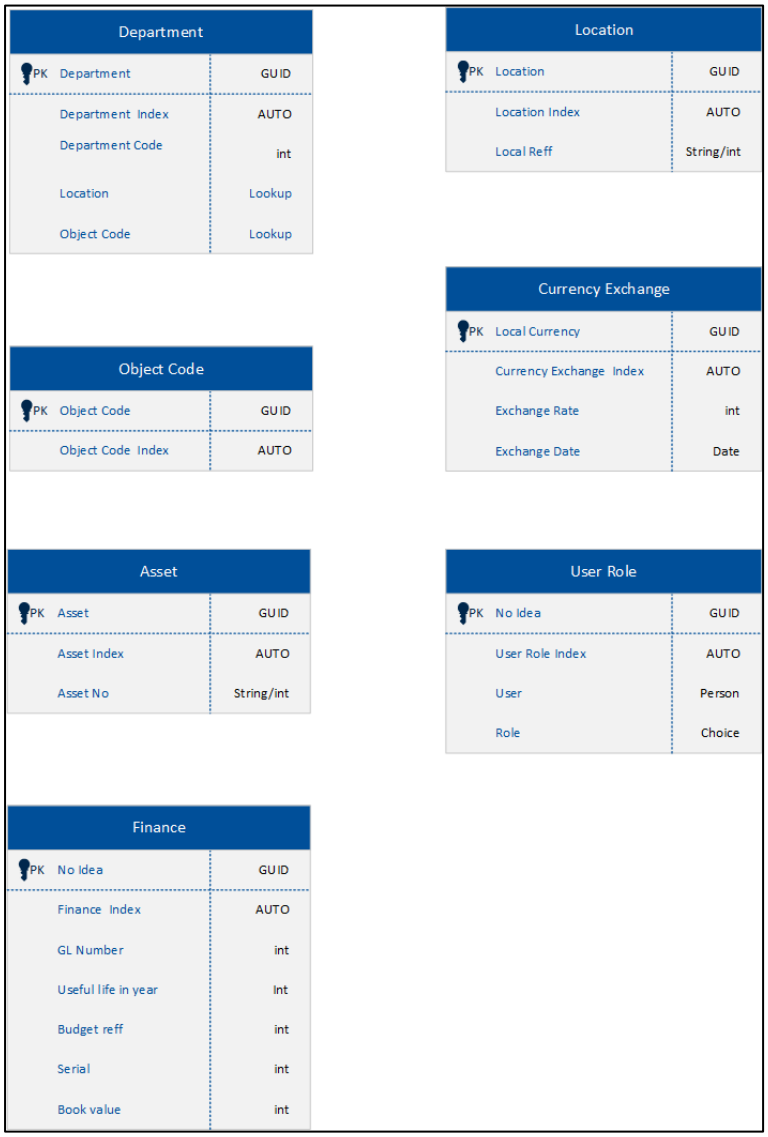

Figure 6: Table Security in Dataverse

8 Long-term Support

8.1 Back-up and Retention

Backups of the Database will be taken in accordance with Lummus standards. The retention of the data will also meet the Lummus Standards.

8.2 Source Code Control

The solution for this application will be version controlled and stored in GitHub. All bugs and updates will be tracked and logged in Azure DevOps.