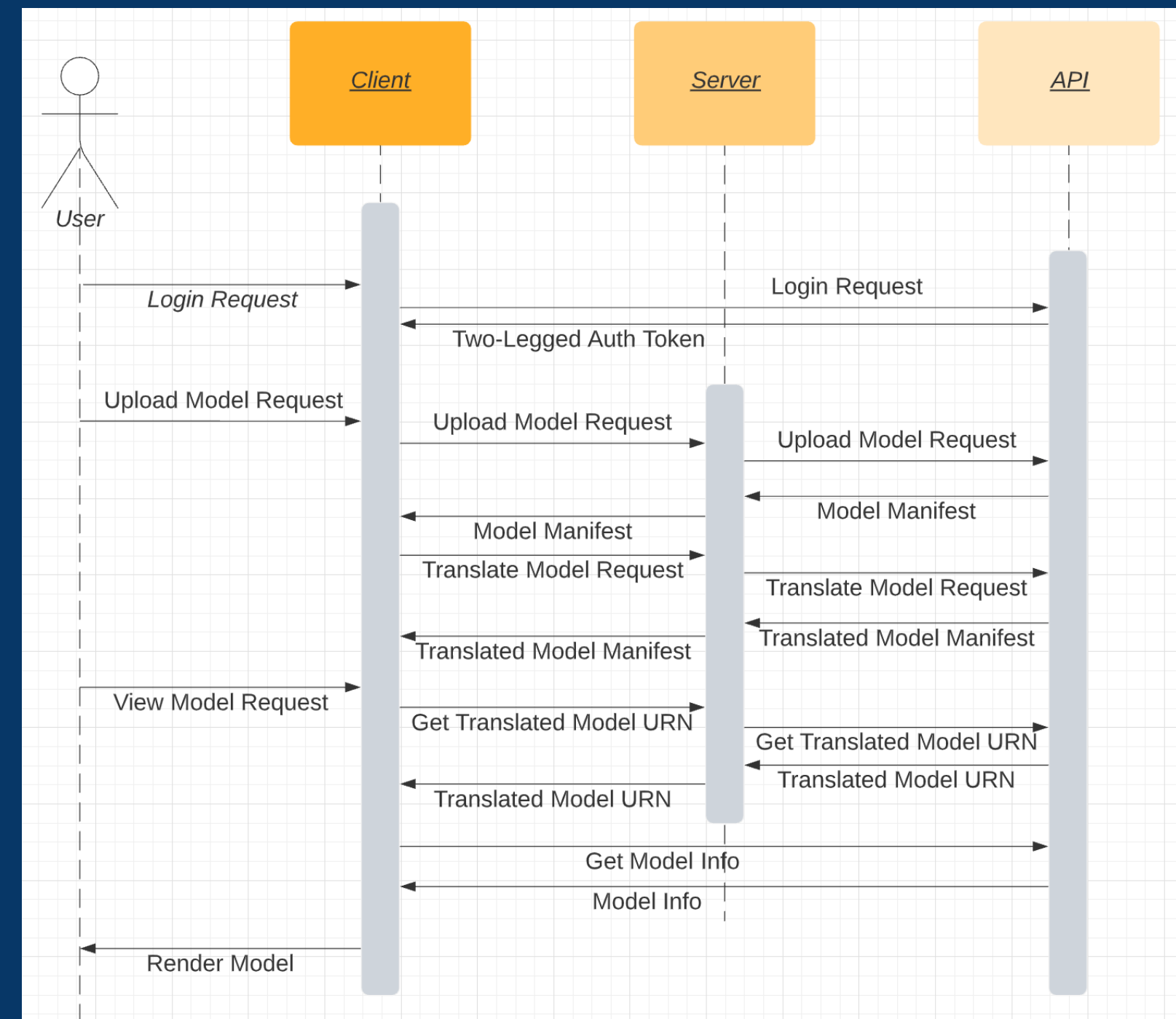
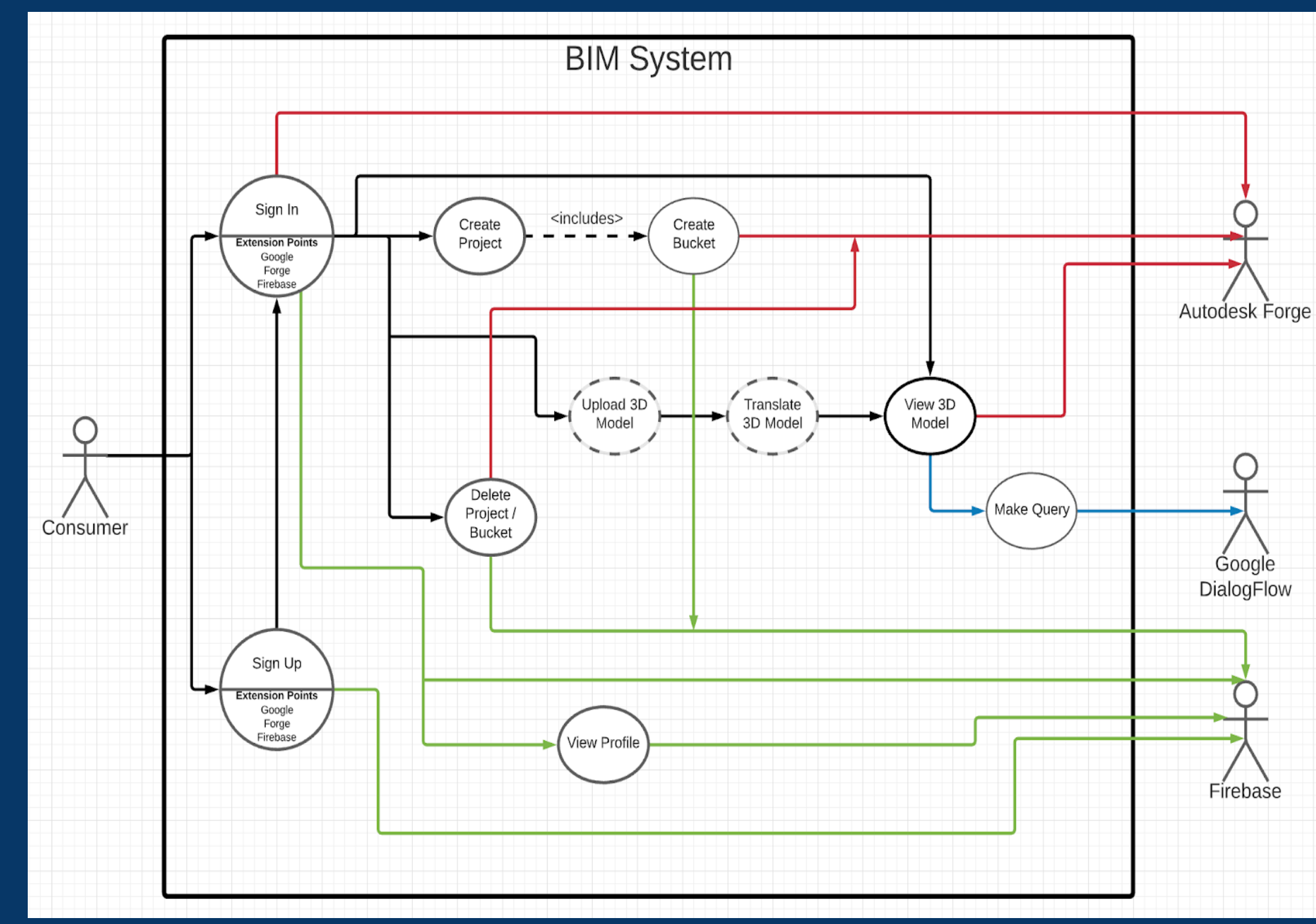


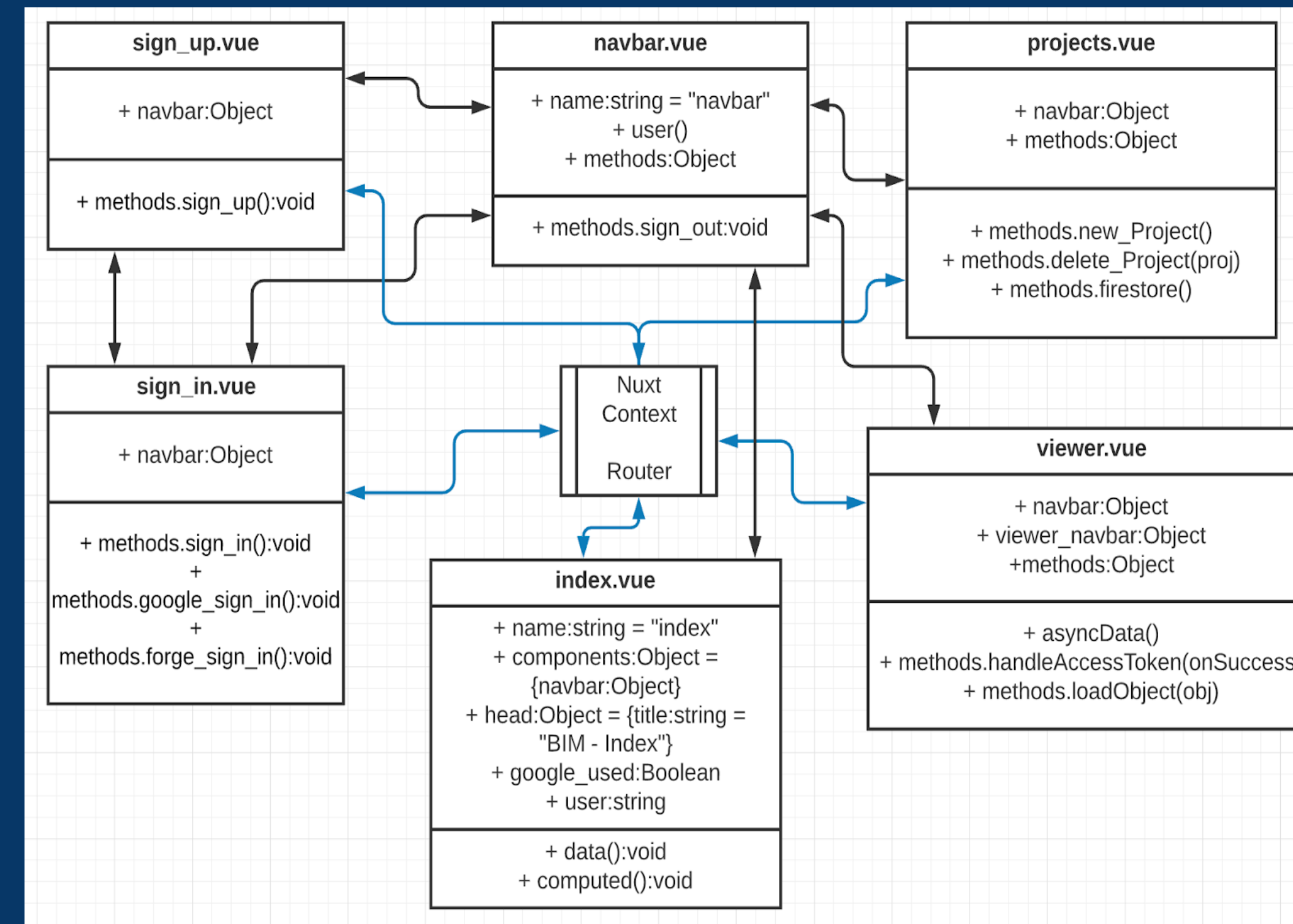
System Design



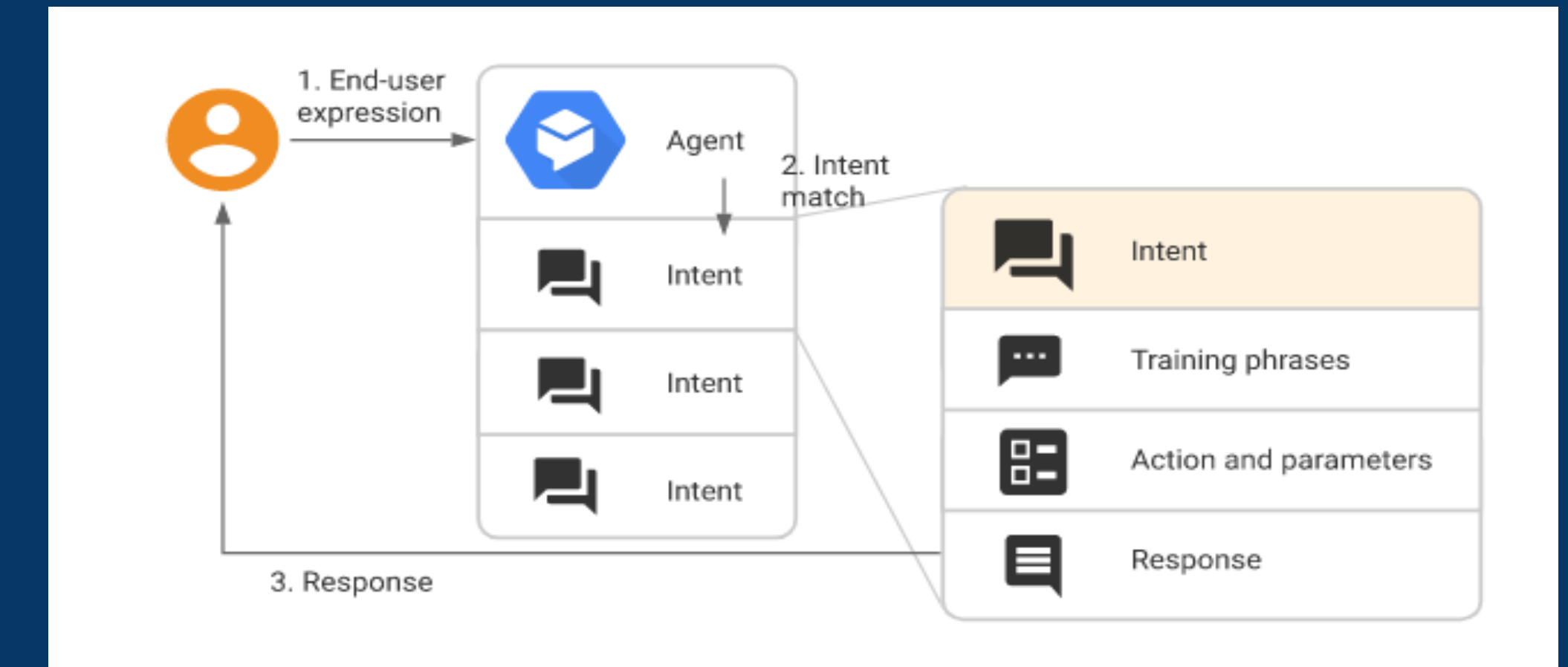
Client/Server Diagram



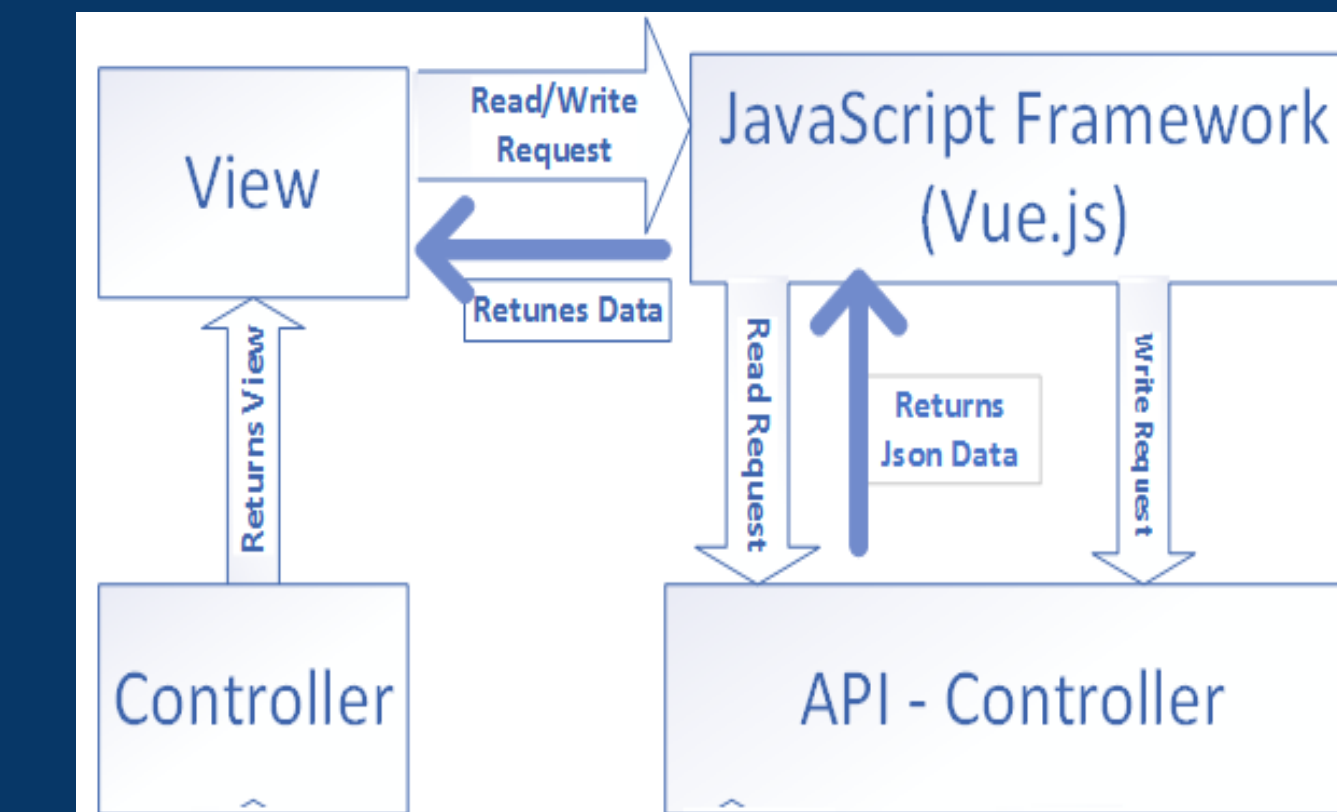
API Use Case Diagram



Class Diagram



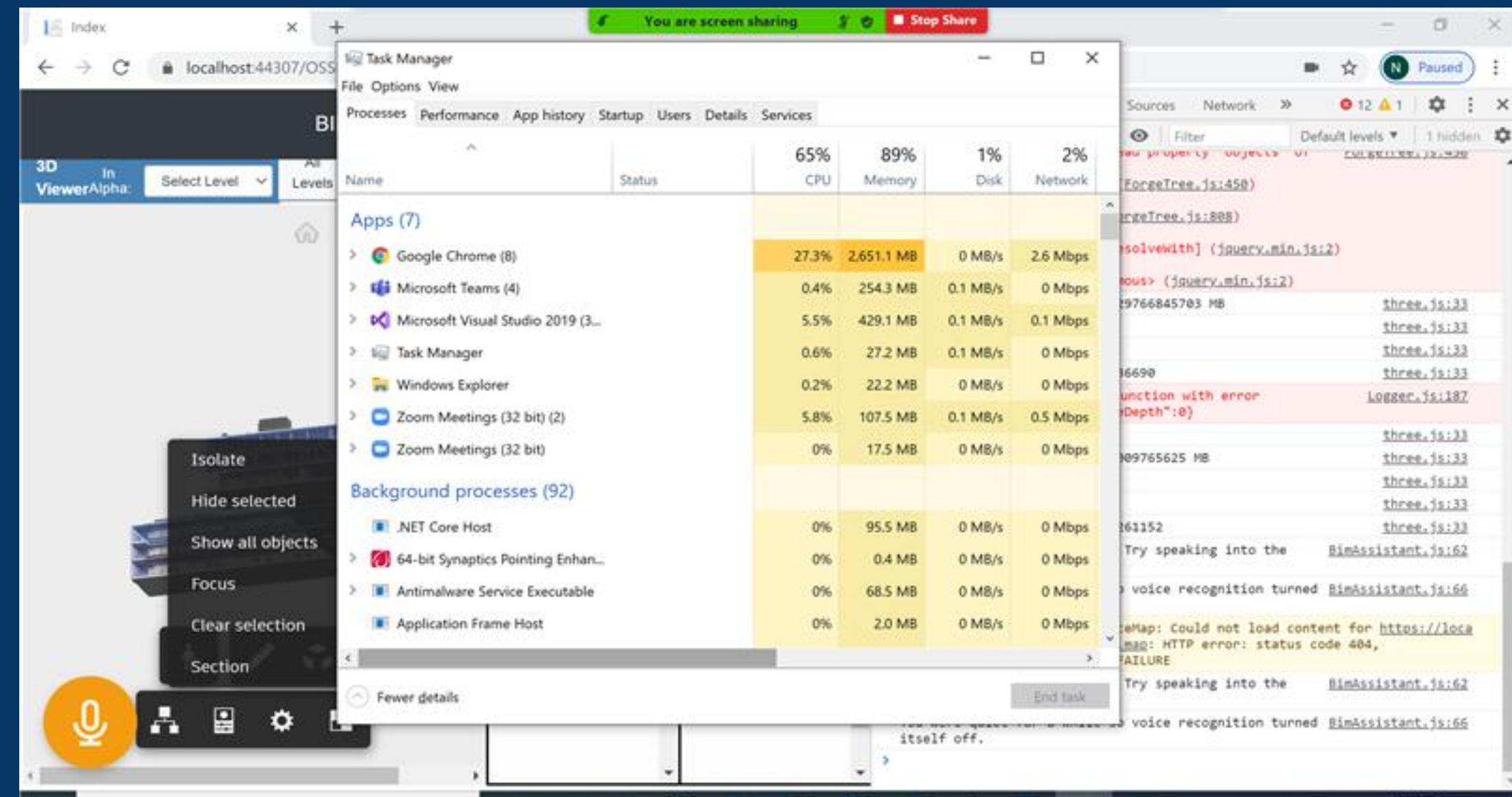
Virtual Assistant Sequence Diagram



Class Diagram

Problems

Despite being handed a version from a past semester built on the .Net framework, it had much outdated code, bad practices, and vulnerabilities. It was riddled with memory leaks that our team could not work with, ultimately giving us the decision to start the project fresh on a new framework.



Summary

This is the release 3.5 of Intelligent BIM Virtual Assistant, a web application that renders 3D models and 2D floor plans for BIM objects of different formats with an implemented speech recognition feature for design-based queries.

It is considered the game changing innovation for the AEC (Architecture, Engineering, Construction) industry boasting its operational efficiency providing insights and tools to more efficiently plan, design, construct, and manage building and infrastructure.

Current System

- ❑ A modern and user-friendly web application with options for user registration/login process including external login services using Google and Autodesk.
- ❑ Allows users to explore models in a 3D and inspect specific elements and their properties.
- ❑ Allows user to create and delete projects, where each one may contain their collection of objects for that project.
- ❑ Contains a Virtual Assistant which uses voice queries and a natural language processing user interface.
- ❑ Keeps track of user info for future role management feature.

Requirements

- ❑ Google Chrome to have access to the Virtual Assistant.
- ❑ A microphone to be able to speak commands to the Virtual Assistant.
- ❑ A custom user account, or a Google or Autodesk account for external log-in.

Implementation

- User is authenticated externally through Google and Autodesk by the exchange of tokens.
- Creation/deletion of buckets sends data to Forge as well as Firebase.
- User activates the virtual assistant by clicking the blue icon in the bottom left.
- Natural language processing provides the Virtual Assistant via the Dialogflow API.
- 3D Navigation of models implemented through Autodesk Forge API
- Collection of objects stored into an array for project file browser display

Screenshots

