

Problem

- Memory Leaks
- Dangerous Security Vulnerabilities & Risks
- Cluttered & Messy UI/UX
- Unnecessary project code (SPEECHKIT)
- Large portions of code are now rendered "obsolete"
- However... A strong base during development

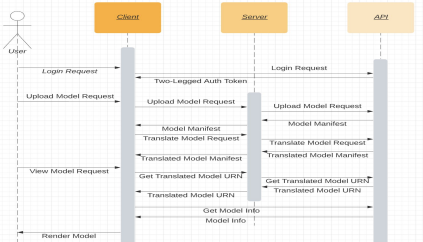
Current System

- A navigable and user-friendly web-application with a standard user registration/login process and external login services. (Forge Implementation in-progress)
- The system allows users to upload models, translate their file format to the required SVF format, delete/manipulate them, and visualize them using 2D and 3D viewers. The user can further inspect specific components and their attributes.
- Allows users to dynamically delete/create their own personal buckets or "Projects".
- Contains a Virtual Assistant which uses voice queries and a natural language processing user interface to deliver individualized and context-sensitive BIM information.

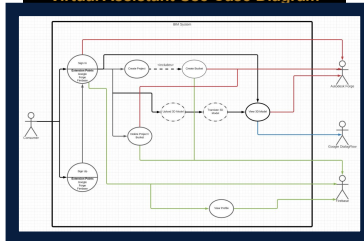
Requirements

- Google Chrome must be used in order to have access to the Virtual Assistant.
- A microphone in order to give commands to the Virtual Assistant.
- A custom user account, or a Google or Autodesk account for external log-in.

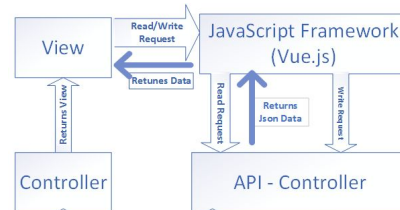
Model Viewer Sequence Diagram



Virtual Assistant Use Case Diagram



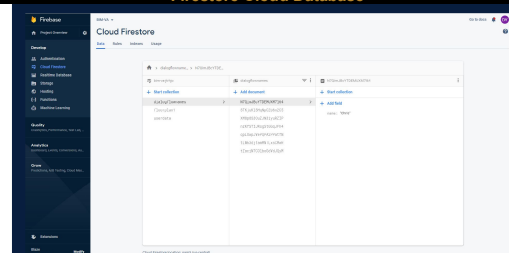
System Design



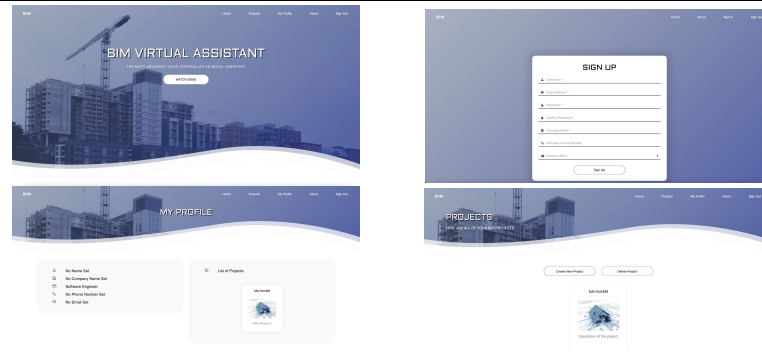
Implementation

- Classifying buckets by user and project space.
- Sharing of buckets (to be implemented)
- External authentication via third-party services: Google & Autodesk Forge
- Natural language processing for the Virtual Assistant via Google's Dialog Flow API.
- Collecting of model information and storage of the same to Firestore for later gathering.
- Voice commands

Firestore Cloud Database



Screenshots



Verification

- Used Webstorm IDE by JetBrains to develop & test the functions of the APIs as well as all other functionalities.
- Performed manual tests to verify program efficiency.

Summary

This is the in-development rework of Intelligent BIM Virtual Assistant, a web application that renders 3D models and 2D floor plans for BIM objects of different formats.

The main goal of this version of the project was to create an efficient and modernized Virtual Assistant with the ability to comprehend language and perform certain actions based on the user's vocal commands.