

MICHIGAN STATE

U N I V E R S I T Y

Project Plan Presentation

Composable 3D Model for a Manufacturing plant

The Capstone Experience

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*From Students...
...to Professionals*

Project Sponsor Overview

- Global automotive supplier founded in 1957.
- Exterior & Chassis, Power & Vision, Complete Vehicles, E-Propulsion & Autonomous Driving.
- Focus on innovation & sustainability.



Project Functional Specifications

The Problem:

- Magna lacks a low level of entry 3D environment for plant representation
- Current applications are missing specific integrations they require

What they want:

- Easily accessible & usable software
- Display & maintain plant layout
- Emulate physical plant in real-time

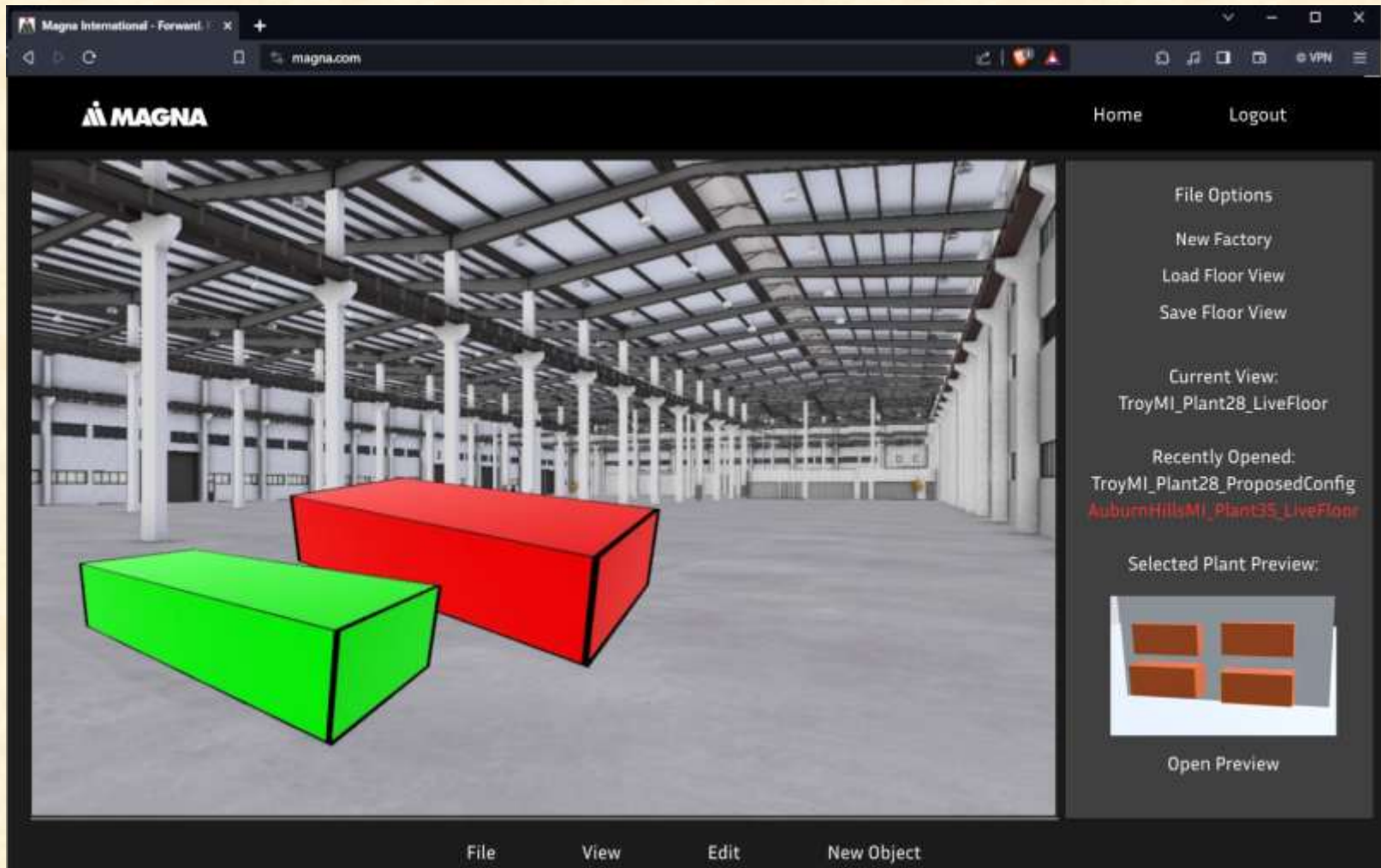


Project Design Specifications

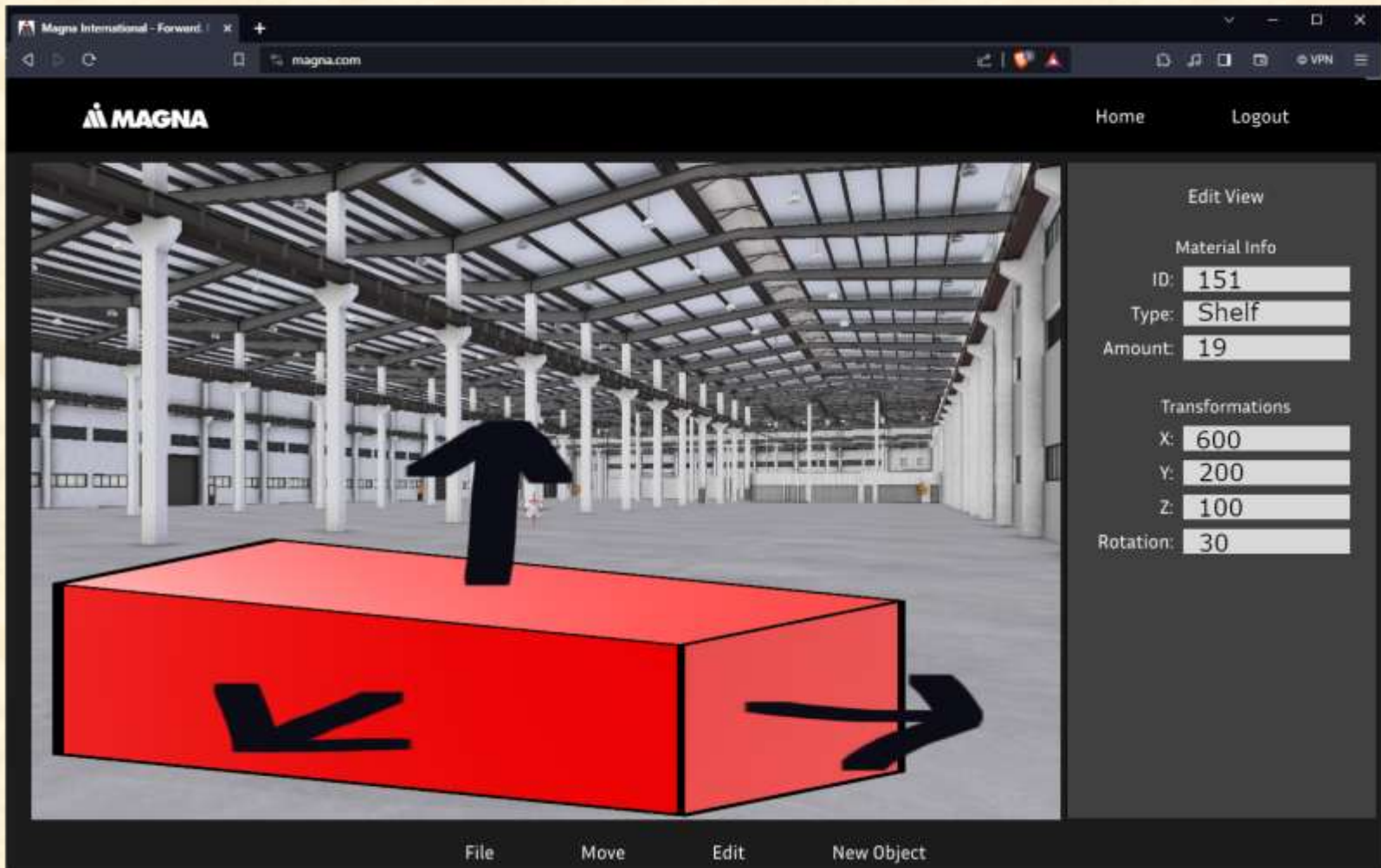
- Creating a 3D model that represents each factory entirely
- Ability for users to dynamically adjust model to their requirements
- Integrate with processes Magna is already using
- The key to the project is to ensure that it is data driven



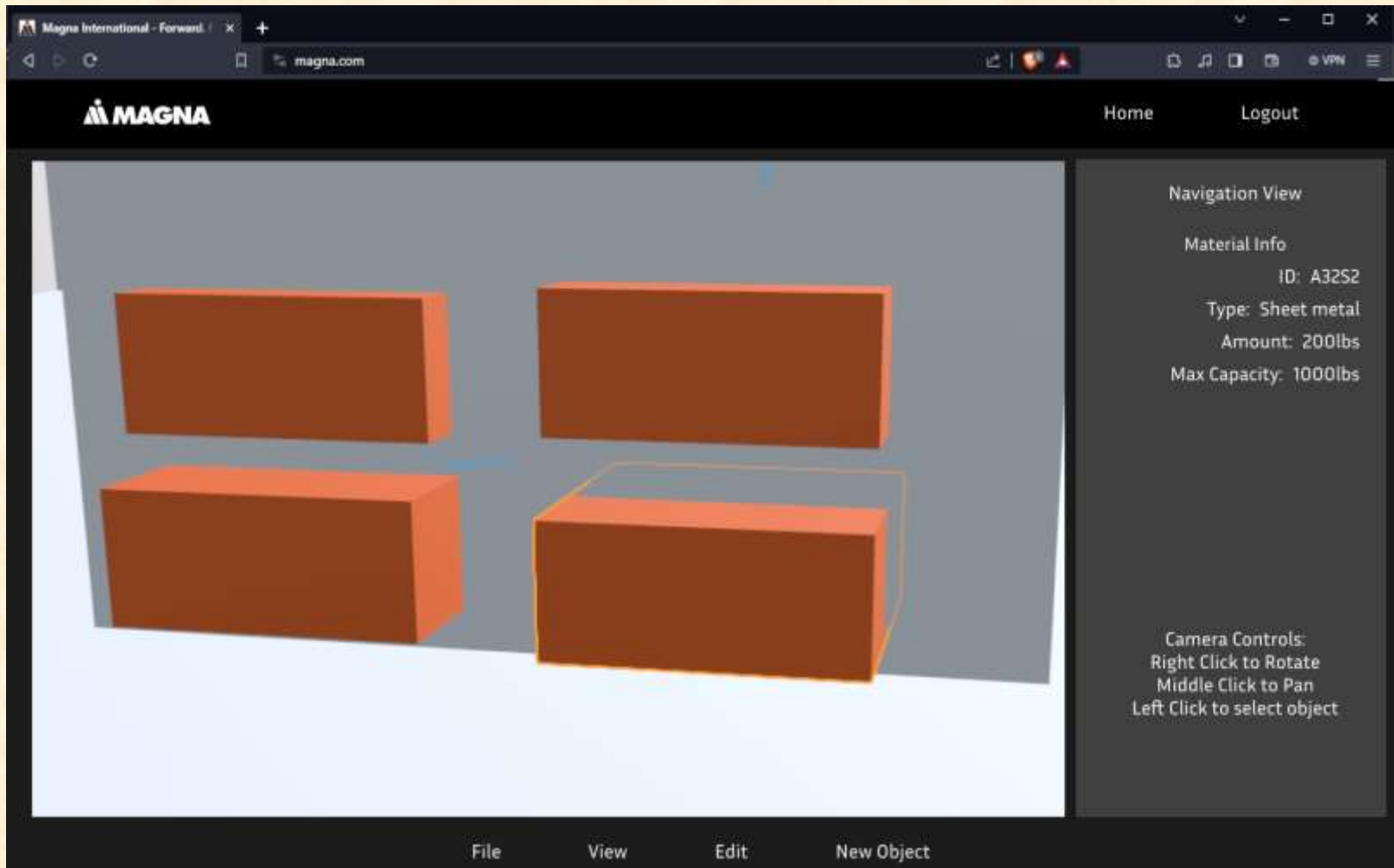
Screen Mockup: File Screen



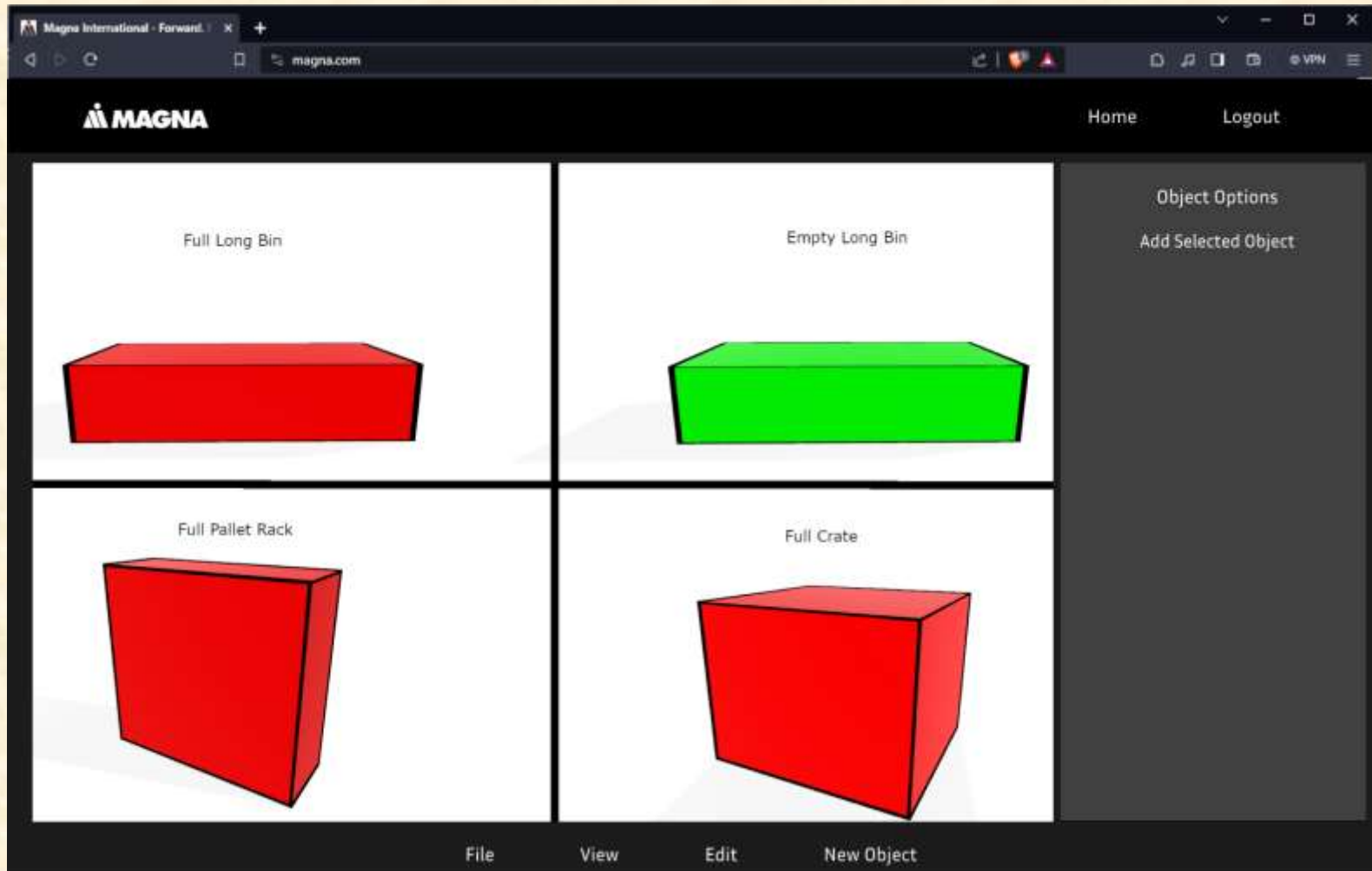
Screen Mockup: Edit Screen



Screen Mockup: View Screen



Screen Mockup: New Object Gallery

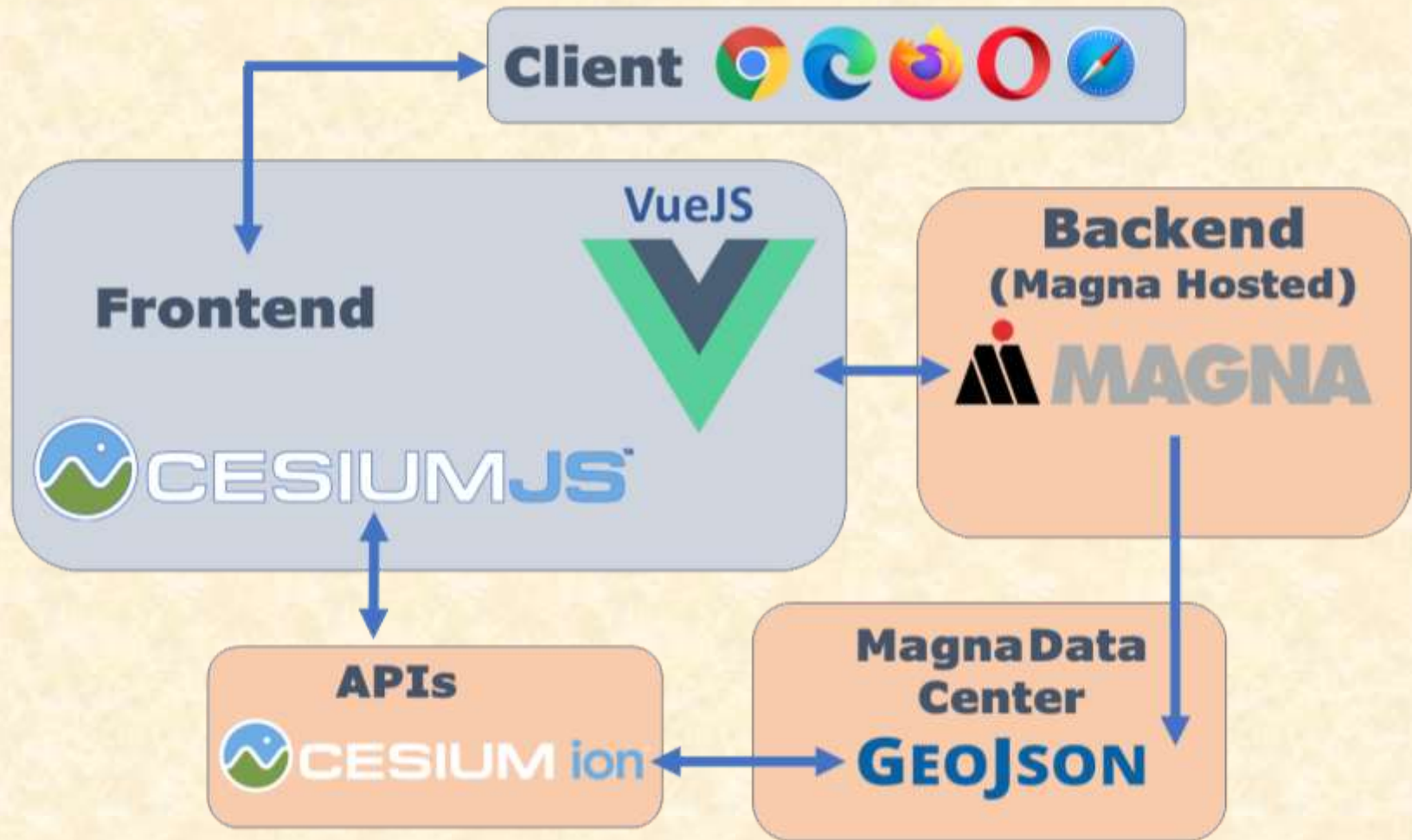


Project Technical Specifications

- Front End
 - Factory will be viewed in CesiumJS, stored as a GeoJSON
 - Web page will be structured with Vuetify, VueJS, and CSS
- Back End
 - Magna has informed us that they will provide the Back End



Project System Architecture



Project System Components

- Hardware Platforms
 - Browser Based Web app
- Software Platforms / Technologies
 - CesiumJS – Open-source JS library for geospatial visualization
 - GeoJSON – JSON format for encoding structures
 - Format for one 3D object: location, ID, capacity, color
 - VueJS – Front end Architecture for our web app



Project Risks

- JSON to 3D Models
 - Entire factory represented leads to a massive JSON file
 - Starting Small with a dorm-room sized area
- Scope Creep of Visualization
 - Magna has not been clear on exactly what they want
 - Ask more concrete questions and solidify the final concept
- CesiumJS Optimization Issues
 - The CesiumJS Demos are sluggish
 - Approaching the 3D Modeling with optimization as a priority



Questions?

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