MICHIGAN STATE UNIVERSITY

Project Plan Presentation

[Project Title 36pt]

The Capstone Experience

Team Delta Dental CDUIF

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From Students…
…to Professionals

Project Sponsor Overview

- Non-profit that provides Dental Insurance at an affordable price for 80-85 million Americans, based off Okemos, Michigan.
- The Knowledge team at Delta Dental maintains several applications which can be customized and extended to fit a variety of customers.
- Don’t have the ability to achieve complex functionality differences depending on business/user context.

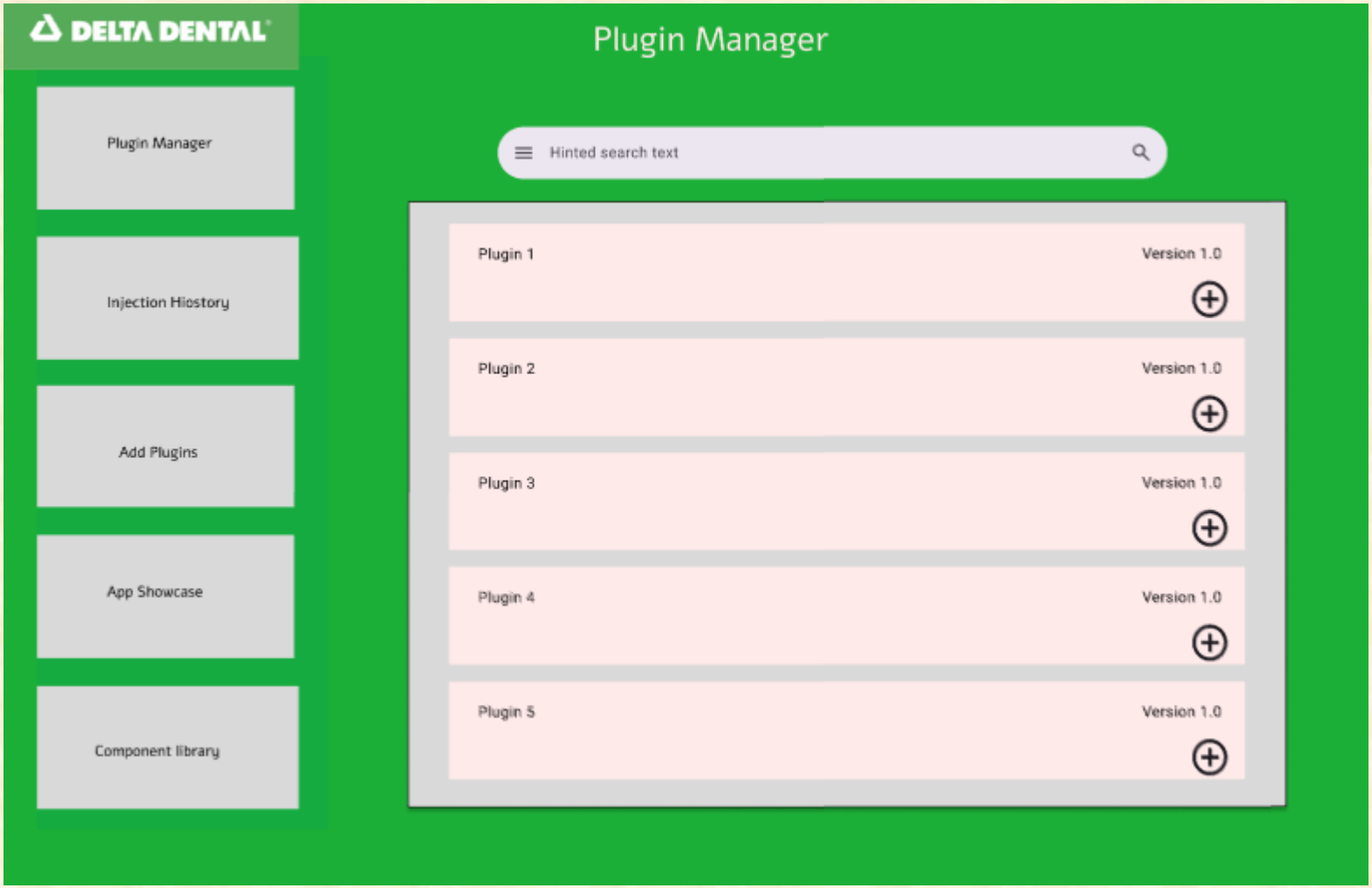
Project Functional Specifications

- Develop a highly adaptable and dynamic system that accurately and properly manages executable code (Plugins) depending on user context
- A backend service performs persistence operations and enables frontend capabilities
- Develop a base library(Bootstrap),with an ability to be imported into the plugins

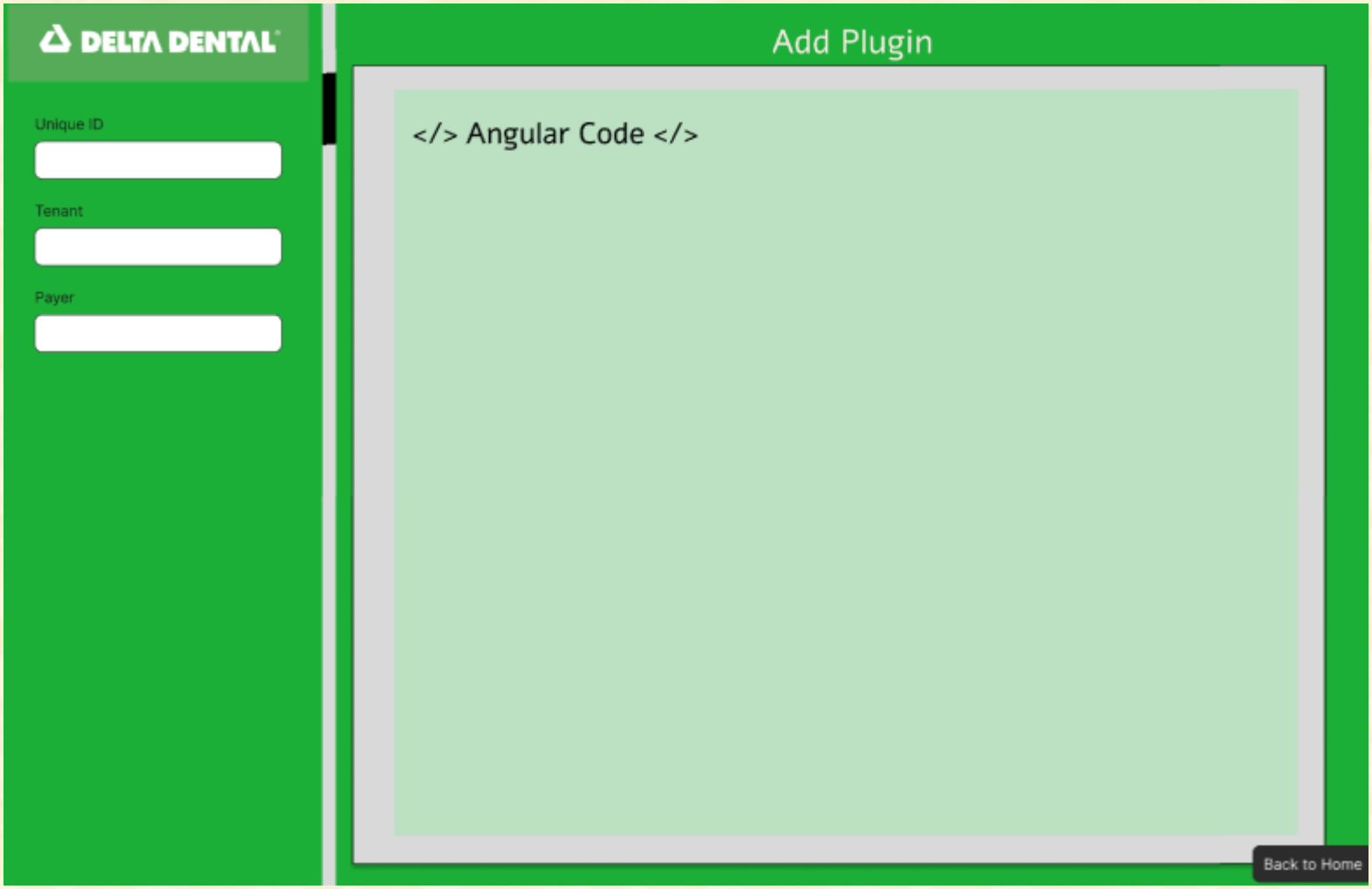
Project Design Specifications

- Standalone Web Application
- Side Navigation Bar
  - Easy access to application features
- Plugin Manager to access plugin information
  - Button to add plugins
  - Scroll bar
  - Search bar
- Showcase application ran based on plugin
  - Dynamic container view based on chosen plugin

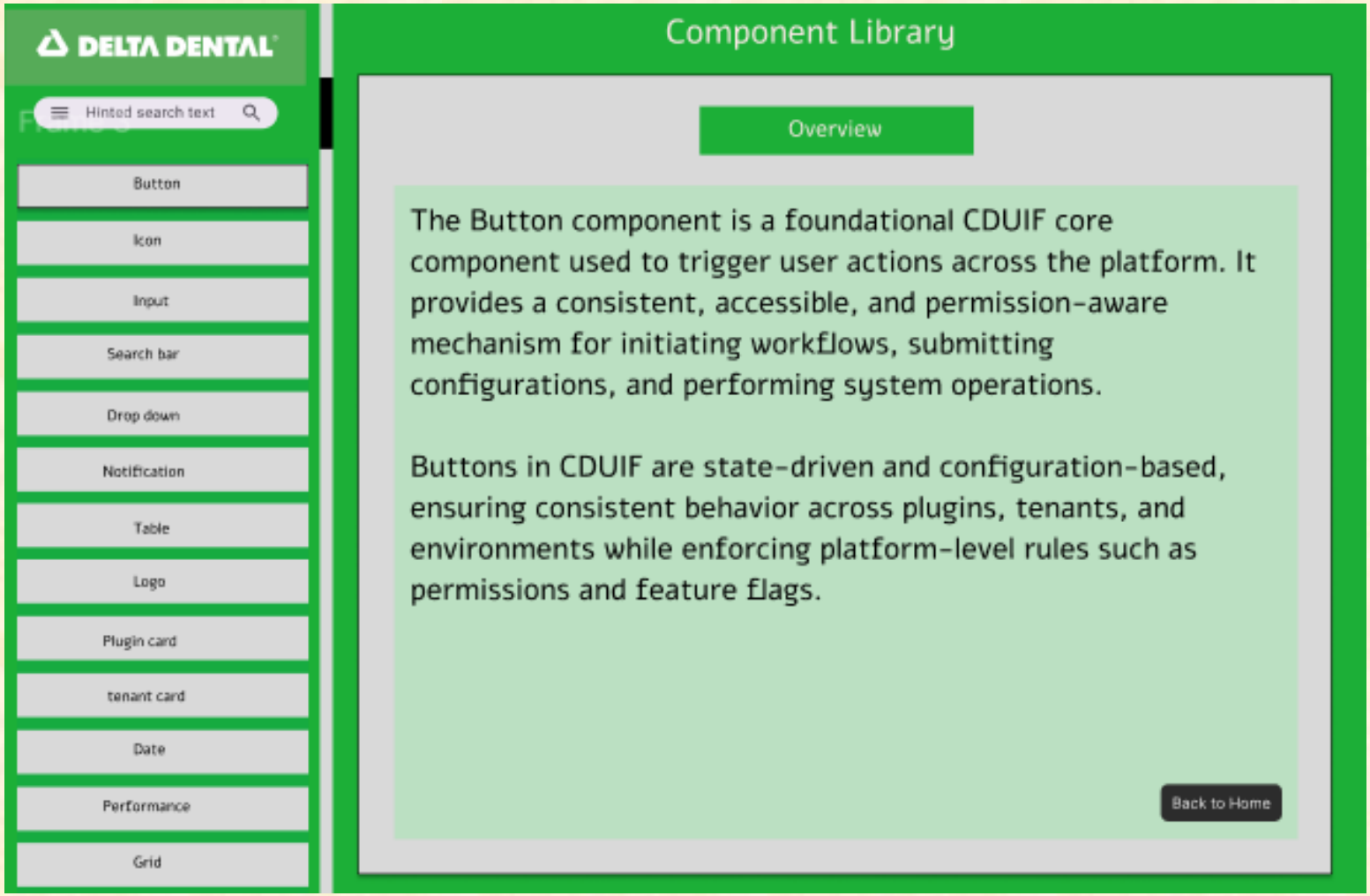
Screen Mockup: Plugin Dashboard



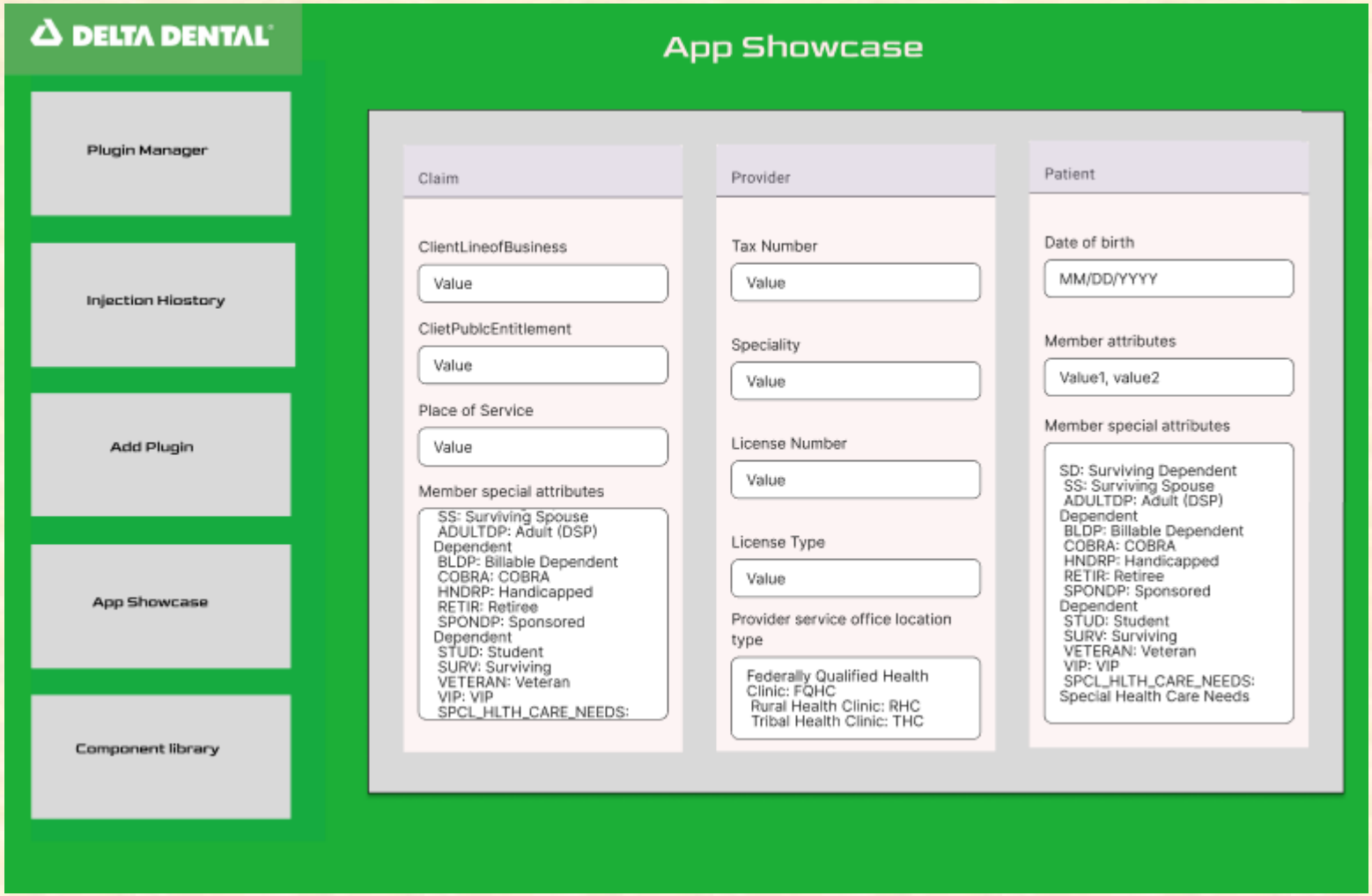
Screen Mockup: Add Plugin



Screen Mockup: Core Component Library



Screen Mockup: App Showcase



Project Technical Specifications

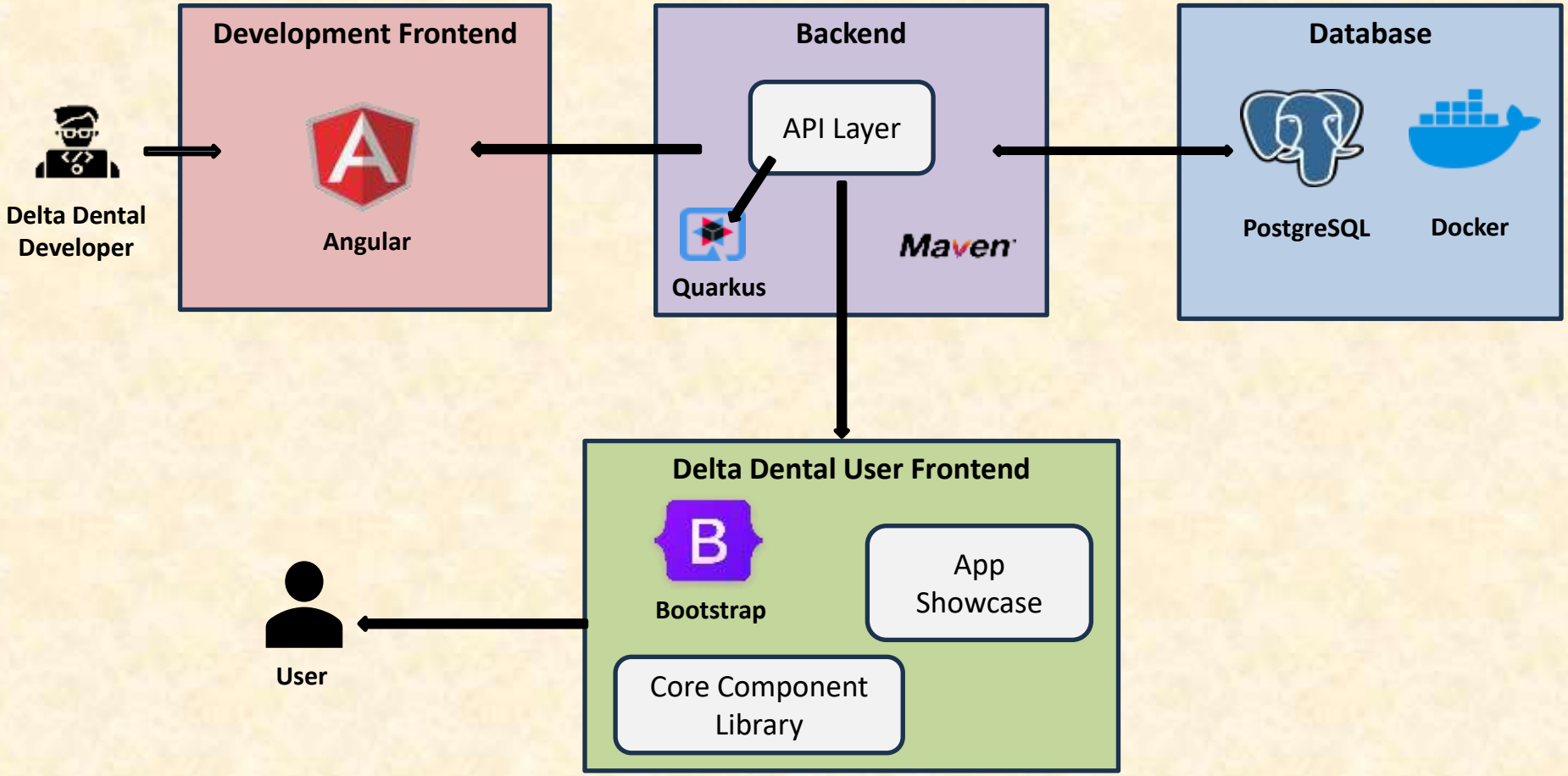
- Backend runs on Java/Quarkus with Maven for dependency managements. Configured on our pom.xml and application.properties files.
- CORS: Enables cross-origin communication between frontend server/port to Quarkus backend port.
- Angular's HttpClient is constructor-injected into the API service class, with universal methods called from app.component.ts using RxJS Observables and subscribe()
- API Test Rest Endpoint: B-E to F-E comms & B-E connectivity.JSON
- Error Handling: Helper method, "HandleError" logs the error into browser console instead of crashing the website.RxJS ->Catcherror
- Database Containerized in Docker Desktop



Project Technical Specifications – Cont.

- JSONB Database Table with context column for storing flexible tenant/user metadata alongside plugin name and bundle content. Efficient searching and indexing.
- Plugin Management UI in Angular for developers to create, update, and delete plugins through the frontend
- Context-driven API endpoints that queries the database and returns only the plugins matching a given user or tenant context
- Build Core Component Library in Bootstrap to establish a consistent look and feel across all plugin contexts

Project System Architecture



Project System Components

- Hardware Platforms
  - Virtual Machine/ IMAC
- Software Platforms / Technologies
  - Download Maven- Apache
  - Download and setup Docker Desktop
  - Download Java JDK 17+
  - Download Node.js and Angular
  - Download PostgreSQL

Project Risks

- Risk 1: Lack of Real Plugin Data
  - The sponsor is unable to provide real code for these Angular plugins
  - Work with them to create mock plugins
- Risk 2: Simulating End-User Experience
  - We won't be able to launch the UI from the user's end and determine if it's injecting the right plugin properly
  - Make a showcase UI running inside the application
- Risk 3: Plugin Execution and Dependency Compatibility
  - Dynamic runtime injection may not be supported by Angular, which will cause the application to crash
  - Shared Component Library dependencies/Embedded Angular application
- Risk 4: Plugin Optimization
  - It will be difficult to ensure that plugins will run efficiently regardless of number/size of plugins added
  - Selective loading and performance testing



Questions?

