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Technology Stack and Tools

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Technology Stack

Hosting

Technology: **Firebase**.

Reasoning: Firebase natively integrates with Firestore and Authentication, and provides direct access to the Gemini Developer API for AI services.

Alternatives: Azure.

Authentication

Technology: **Firebase Authentication**.

Reasoning: Has built in support for email/password, phone, and SSO logins. It is secure and natively integrated with Firestore.

Alternatives: ASP.NET Identity.

Storage

Technology: **Firestore** and **RoomDB**.

Reasoning: Firestore supports flexible data structure and real-time sync. RoomDB ensures contractors and clients can work offline and sync once they regain internet connection.

Alternatives: Hybrid SQL + NoSQL.

Frontend

Technology: **ASP.NET MVC**.

Reasoning: Familiarity with the framework, clean MVC architecture, and easy integration with REST APIs.

Alternatives: React.

Backend

Technology: **C# ASP.NET**.

Reasoning: Strong type safety, mature framework, and direct integration with Firebase SDK.

Alternative: Node.js.

Mobile App

Technology: **Kotlin**.

Reasoning: Native android language and integrates with RoomDB.

Alternative: React Native.

AI

Technology: **Gemini API**.

Reasoning: Integrated directly into Firebase services, and will be used for blueprint parsing, quotation generation and project risk flagging.

Alternative: OpenAI API.

Tools:

CI/CD

Tool: **GitHub Actions**.

Reasoning: Automates builds, testing and deployment directly from the GitHub repository.

Version Control

Tool: **GitHub**.

Reasoning: Centralized code repository, branch management, and pull request workflows.

Testing

Tools: **xUnit, Junit, Regression** and **UI testing**.

Reasoning: Ensures functional correctness, stability and usability across both backend and mobile. Regression testing will prevent old bugs from reappearing.

Project Management

Tool: **Trello**.

Reasoning: Visual kanban board for sprint planning and progress tracking.

