**Bahria University**



**Discovering Knowledge**

**FYP Proposal Defense Proforma**

**2024-25**

**<< Builder Management System >>**

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1. **Introduction**

In the residential construction industry, **seamless communication, transparency, and efficient project management** between customers, builders, and tradies are crucial for the success of building projects. This proposal outlines the development of a Builder Management Software aimed at solving key pain points faced by both customers and builders. The proposed solution will offer a **centralized platform** where all parties can track and manage residential construction projects in real-time, ensuring transparency, communication, and accountability at all stages.

1. **Background**

Currently, the market offers several builder management software solutions such as BuildTools, Houzz Pro, Procore, CoConstruct, and Buildertrend. While these platforms address some construction management issues, there remain gaps in transparency, real-time communication, and customer-builder collaboration that we aim to fill with our software.

The existing solutions provide functionalities like project management, budget tracking, and progress updates but lack critical features that enhance the customer experience, particularly around personalized communication and real-time documentation of decisions. Our unique features, such as **AI-powered documentation**, when entered my documentation, the AI generate WBS, MAPs, customizable project tracking, and a direct communication channel between customers, builders, and tradies, distinguish us from these solutions.

Notable Builder Software Platforms:

* BuildTools: <https://www.buildtools.com/>
* Procore: <https://www.procore.com/>
* CoConstruct: <https://www.coconstruct.com/>
* Buildertrend: <https://www.buildertrend.com/>

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| **Existing Builder Software Features** | **Our Unique Functionalities** |
| **Project Management**: Manage tasks, timelines, and resources. | **AI-Powered Documentation**: Automatically generate real-time documentation of decisions and progress. |
| **Budget Tracking**: Monitor project expenses and stay within budget. | **Customizable Project Tracking**: Tailor project tracking dashboards to suit specific client needs. |
| **Progress Updates**: Track and report project status. | **Real-Time Documentation**: Provide up-to-the-minute records of project milestones and decisions. |
| **Client Portal**: Limited client visibility into project details. | **Personalized Communication**: Direct, customizable communication channels between clients, builders, and tradies. |
| **Task Scheduling**: Allocate tasks and manage schedules. | **Enhanced Collaboration Tools**: Real-time communication and decision documentation for all stakeholders. |
| **Change Order Management**: Handle project scope changes. | **Real-Time Change Tracking**: Immediate documentation and approval of changes by all parties involved. |
| **Subcontractor Management**: Manage tradies and subcontractors. | **Direct Tradie-Builder-Customer Channel**: A direct, real-time communication system for seamless collaboration. |
| **Progress Photos/Updates**: Upload and share progress pictures. | **Interactive Progress Reports**: Real-time, interactive reports with updates, photos, and documents. |
| **Budget Tracking**: Monitor project expenses and stay within budget. | **Customizable Project Tracking**: Tailor project tracking dashboards to suit specific client needs. |

1. **Problem Statement**

In the residential building industry, customers face significant challenges in managing communication and expectations with builders during the construction process. After selecting a builder and signing a contract, many customers experience frustration due to a **lack of transparency, poor communication, and missing documented evidence** of important discussions and agreements made during the project. Key project details, such as selected materials, appliances, and finishes, are often discussed verbally but not properly tracked, leading to misunderstandings and disputes over what was promised versus what is delivered.

Moreover, customers struggle to stay up to date on the progress of their projects, particularly in understanding which phase of construction has been completed, which payments are due, and whether the builder is adhering to the agreed-upon specifications. The absence of a centralized platform where both parties can track and update the project scope, agreements on items, and any variations in real-time exacerbates these issues, leaving customers feeling disconnected and uninformed.

This lack of transparency and accountability leads to customer dissatisfaction, project delays, and potential cost overruns due to unforeseen variations or changes that weren’t clearly documented or agreed upon.

The proposed web application aims to solve these problems by providing a centralized platform where customers and builders can seamlessly manage their residential construction projects. This platform will allow customers to create and track project details, agree on itemized lists with builders, and ensure that every decision is properly documented and agreed upon before the contract is signed. Additionally, it will provide continuous communication and progress updates throughout the building process, helping both parties stay aligned and informed, thus reducing misunderstandings and disputes.

1. **Proposed Solution**

Our Builder Management Software will provide an **all-in-one platform** that integrates project management, customer communication, document tracking, and financial oversight. Key features are designed to address the core issues outlined in the problem statement, while offering enhanced functionality not found in existing builder software solutions.

* **Features of the Project:**

1. **Chatting & Communication:** A real-time messaging system allowing customers, builders, and tradies to communicate seamlessly.
2. **Products Selection & Documentation**: Tracking customer selections for materials, appliances, and finishes with documented agreements.
3. **Profile Management**: Comprehensive profile pages for customers, custom builders, and tradies.
4. **Project Management:** Features for customers and builders to add and track projects, including descriptions, images, and building links.
5. **Companies Section:** A dedicated section for listing companies involved in a project, visible in the sidebar for easy navigation.
6. **Project and Task Dashboard:** Centralized project dashboards for tracking progress, deadlines, payments, and key milestones.
7. **AI Documentation:** Automatic generation of project-related documents, and search keywords from documents.
8. **Customer Reviews:** A system for customers to leave feedback about builders and companies.
9. **Notifications System:** Real-time alerts for project updates, task completions, and document approvals.
10. **Task Management:** A task assignment system where customers can assign tasks to builders and track progress.
11. **Payment Milestones:** Track payment schedules and milestone achievements.
12. **Mobile Integration (optional):** A mobile-friendly platform allowing access to project updates on-the-go.
13. **Verified Builders Status:** A status system for verifying builders’ credentials and project compliance with Victorian standards.

* **Methodology/Algorithm:**

**Agile Development Process:**

* **Sprints and Iterations**: The project will be divided into **sprints**, with each sprint lasting between 2 to 4 weeks. Each sprint will focus on completing specific deliverables (e.g., frontend design, backend integration, AI functionality).
* **Daily Stand-ups**: Short daily meetings with the development team to discuss progress, roadblocks, and tasks for the day.
* **User Stories and Backlog**: User stories (specific requirements) will be created and prioritized in the product backlog to ensure that the most important features (e.g., real-time communication, AI documentation) are developed first.
* **Continuous Integration and Delivery (CI/CD)**: New code will be continuously integrated, and regular testing will ensure that new features don’t break the system. This allows for frequent, reliable releases.
* **Feedback Loops**: The system will undergo **User Acceptance Testing (UAT)** during multiple stages of the project, incorporating feedback from builders, clients, and tradies to improve the product continuously.
* **Technologies to be Used:**
* **Frontend:** React.js
* **Backend/Database:** Firebase
* **Real-Time Communication:** Real time Firebase Database
* **AI Tools:** OpenAI API for automatic documentation
* **Task Scheduling & Progress Tracking:** Firebase Firestore for scheduled tasks
* **Mobile Integration (optional):** React Native for mobile access
* **Sustainable Development Goals Mappings:**

This project aligns with the following SDGs:

* **Goal 9: Industry, Innovation, and Infrastructure:** Promoting sustainable construction innovation through digital platforms.
* **Goal 11: Sustainable Cities and Communities:** Supporting well-managed and transparent urban residential projects.

1. **Project Scope**
2. **Chatting & Communication:** A real-time messaging system allowing customers, builders, and tradies to communicate seamlessly.
3. **Products Selection & Documentation**: Tracking customer selections for materials, appliances, and finishes with documented agreements.
4. **Profile Management**: Comprehensive profile pages for customers, custom builders, and tradies.
5. **Project Management:** Features for customers and builders to add and track projects, including descriptions, images, and building links.
6. **Companies Section:** A dedicated section for listing companies involved in a project, visible in the sidebar for easy navigation.
7. **Project and Task Dashboard:** Centralized project dashboards for tracking progress, deadlines, payments, and key milestones.
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10. **Task Management:** A task assignment system where customers can assign tasks to builders and track progress.
11. **Mobile Integration (optional):** A mobile-friendly platform allowing access to project updates on-the-go.
12. **Verified Builders Status:** A status system for verifying builders’ credentials and project compliance with Victorian standards.

**6. Work Breakdown Structure / Gantt Chart:**

### **Work Breakdown Structure (WBS) - Builder Management System**

1. **Project Initialization**
   * 1.1 Project Planning
     + 1.1.1 Define project goals and scope
     + 1.1.2 Stakeholder identification and consultation
   * 1.2 Requirements Gathering
     + 1.2.1 Market analysis
     + 1.2.2 Competitor software analysis (BuildTools, Procore, etc.)
2. **Design and Architecture**
   * 2.1 System Design
     + 2.1.1 Wireframe design (UI/UX)
   * 2.2 Architecture Setup
     + 2.2.1 Firebase real-time database integration
3. **Development**
   * 3.1 Frontend Development (React.js)
     + 3.1.1 Dashboard and task management UI
     + 3.1.2 Real-time communication system
   * 3.2 Backend Development (Firebase)
     + 3.2.1 Database setup
     + 3.2.2 AI Documentation engine
4. **Testing and Quality Assurance**
   * 4.1 Unit Testing
     + 4.1.1 Component and functionality testing
   * 4.2 User Acceptance Testing
     + 4.2.1 Beta testing with builders and clients
     + 4.2.2 Feedback gathering and analysis
5. **Deployment and Launch**
   * 5.1 Deployment Setup
     + 5.1.1 Cloud server setup
     + 5.1.2 Domain and security configuration
   * 5.2 Launch
     + 5.2.1 Marketing and user onboarding
     + 5.2.2 Final launch and deployment
6. **Post-Launch**
   * 6.1 Maintenance and Updates
     + 6.1.1 Bug fixing
     + 6.1.2 User support

### **Gantt Chart - Builder Management System:**

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| --- | --- | --- | --- |
| **Task** | **Duration** | **Start Date** | **End Date** |
| 1. Project Initialization | 3 Weeks | Month 1 | Month 1.75 |
| 1.1 Project Planning | 1 Week | Week 1 | Week 2 |
| 1.2 Requirements Gathering | 2 Weeks | Week 2 | Week 4 |
| 2. Design and Architecture | 5 Weeks | Month 1.75 | Month 3 |
| 2.1 System Design | 2 Weeks | Week 5 | Week 7 |
| 2.2 Architecture Setup | 2 Weeks | Week 8 | Week 10 |
| 2.3 AI-Enhanced Documentation Design | 1 Week | Week 11 | Week 12 |
| 3. Development | 12 Weeks | Month 3 | Month 5 |
| 3.1 Frontend Development (React.js) | 6 Weeks | Week 13 | Week 19 |
| 3.2 Backend Development (Firebase) | 8 Weeks | Week 13 | Week 21 |
| 3.3 Mobile App Development (React Native) | 4 Weeks | Week 19 | Week 23 |
| 4. Testing and Quality Assurance | 4 Weeks | Month 6 | Month 5.75 |
| 4.1 Unit Testing | 2 Weeks | Week 21 | Week 23 |
| 4.2 User Acceptance Testing | 2 Weeks | Week 23 | Week 25 |
| 5. Deployment and Launch | 2 Weeks | Month 6.75 | Month 7 |

### **Timeline Summary**

1. **Month 1-1.75**: Project Initialization
2. **Month 1.75-3**: Design and Architecture
3. **Month 3-6**: Development (Frontend, Backend, or Mobile)
4. **Month 6-6.75**: Testin’g and QA
5. **Month 6.75-7**: Deployment and Launch
6. **Post-Month 7**: Post-Launch Maintenance

**7. References**

1. BuildTools - <https://www.buildtools.com/>
2. Procore - <https://www.procore.com/>
3. CoConstruct - <https://www.coconstruct.com/>
4. Buildertrend - <https://www.buildertrend.com/>