

Guide Approval (initials/date): _____

CAP4001 - Capstone Project Proposal Report

(Individual Report)

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| Student Name | Thokala Sravan |
| Student Register Number | 22BCE9745 |
| Programme | Bachelor of Technology |
| Semester/Year | Fall sem (2025-26) |
| Guide(s) | Saroj Kumar Panigrahy |
| Project Title | A Real-Time Player Finding System |

Team Composition

Provide the information below for each member of the project team. Include all project team members, not just those in your discipline or those enrolled for Capstone project. Please also include yourself!

| Reg. No | Name | Major | Specialization |
|----------------|--------------------|--------------|-----------------------|
| 22BCE9357 | Adnan Hasshad Md | CSE | Core |
| 22BCE20420 | Tatikonda Srilekha | CSE | Core |
| 22BCE9911 | Mayakuntla Lokesh | CSE | Core |
| 22BCE9745 | Thokala Sravan | CSE | Core |

Project and Task Description

Provide a brief (one or two page) technical description of the design project and your specific tasks, as outlined below: (use a separate sheet)

Provide a summary of the project

The project, "A Real-Time Player Finding System," is an MVP (Minimum Viable Product) social platform designed to help users find and connect with others for specific gaming activities. The app's purpose is to address the common problem of finding compatible teammates or opponents for online games. The MVP focuses on core functionality and a good UI, including user profiles, a public request board, a 1v1 and team finder. The approach is to build a modern, serverless application that prioritizes immediate, action-oriented requests.

Describe the specific role and tasks that you individually will be completing

- (1) Configure React with Vite, establish component structure, setup Tailwind CSS and dark mode, implement Wouter routing.
- (2) Design UI components using shadcn/ui, create forms for input, develop layouts for profiles and request board, implement modals.
- (3) Create landing page, design dashboard, build player finder interface with filtering, implement notification center.
- (4) Integrate TanStack React Query for data fetching, implement custom hooks, setup error handling and loading states, manage authentication state.
- (5) Connect WebSocket for live updates, implement notifications, integrate with backend APIs, conduct responsive testing.

Discuss in detail the specific approach that will be used to complete your portion of the design

Phase 1 (Week 1-2): UI/UX design specification, component library setup, design system creation, responsive breakpoints.

Phase 2 (Week 3-4): Core page development (landing, dashboard, finder), form implementation, routing, TanStack Query setup.

Phase 3 (Week 5-6): Real-time features with WebSocket, notification system, state management optimization, data fetching tests.

Phase 4 (Week 7-8): Responsive design refinement, accessibility improvements, performance optimization, final testing.

Describe the phases of the design process

Phase 1 (Week 1-2): Planning, requirements analysis, architecture design, technology selection, database schema planning.

Phase 2 (Week 3-4): Core infrastructure development, API implementation, authentication setup.

Phase 3 (Week 5-6): Real-time features, request board logic, system integration, performance optimization.

Phase 4 (Week 7-8): Testing, documentation, deployment preparation, quality assurance.

Outcome Matrix

Describe your plan to demonstrate each of the outcomes below.

| Outcomes | Plan for demonstrating outcome |
|--|--|
| a) an ability to apply knowledge of mathematics, science, and engineering | Will apply software engineering principles, data structures for algorithms, relational database theory, and distributed systems patterns. |
| c) an ability to design a system, component, or process to meet desired needs within realistic constraints | Will design system architecture balancing feature completeness, performance, scalability, 8-week timeline, and free/low-cost cloud platform constraints. |
| d) an ability to function on multidisciplinary teams | Will collaborate with team members, facilitate communication, coordinate efforts across frontend, backend, and management roles. |
| e) an ability to identify, formulate, and solve engineering problems | Will identify bottlenecks, formulate solutions for challenges, solve scalability issues, and troubleshoot integration problems. |
| g) an ability to communicate effectively | Will create technical documentation, communicate decisions clearly, provide guidance, and maintain code documentation. |
| k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice | Will utilize React, Express.js, TypeScript, PostgreSQL, Drizzle ORM, WebSocket API, OAuth 2.0, Cloudflare R2, and Git. |

Realistic Constraints

Development Timeline: 8-week cycle with MVP prioritization. **Team Resources:** 4-member team requiring coordination. **Infrastructure:** Free/low-cost cloud platform (Replit, Neon PostgreSQL). **Technical Complexity:** Real-time request board, WebSocket connectivity, service integration. **Performance:** Responsive design across devices with acceptable load times. **Scalability:** MVP design with extensible architecture for future growth.

Engineering Standards

Code Standards: TypeScript strict mode, ESLint configuration, consistent naming. **Database:** Normalized design (3NF), proper indexing, referential integrity. **API:** RESTful principles, HTTP status codes, Zod validation, documentation. **Security:** Input validation, SQL injection prevention, OAuth 2.0, CORS headers. **Testing:** Unit, integration, end-to-end tests. **Documentation:** API docs, architecture diagrams, code comments. **Version Control:** Meaningful commits, branch management, code reviews.