CAP4001 – Capstone Project Proposal Report

Individual Report

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Student Register Number:	22BCE9911
Programme:	Bachelor of Technology
Semester/Year:	Fall sem (2025-26)
Guide(s):	Saroj Kumar Panigrahy
Project Title:	A Real-Time Gaming Social Platform

Team Composition

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

Project Summary

A Real-Time Gaming Social Platform designed to help users find and connect with others for gaming activities. Users create profiles with gaming stats, achievements, and preferences, then discover and connect with teammates or opponents through smart search and filtering (by skill level, playstyle, language, game preferences). The platform enables real-time communication through text chat and voice channels with 100ms integration, supports game portfolios to showcase clips and achievements, and functions as a Progressive Web App (PWA) for native-like experience. Core features include: user authentication (Google OAuth, Firebase), smart player discovery with advanced filtering, game portfolios, real-time voice/chat communication, match requests, connection management, notifications, and a system-level voice overlay on Android.

Individual Role and Tasks

As backend developer, I will: (1) Configure Express.js server, establish project structure, setup environments, configure middleware; (2) Design database schema with Drizzle ORM, create tables for users/profiles/requests/notifications, implement indexing and migrations; (3) Develop 15+ REST API endpoints, implement request validation with Zod, build authorization logic; (4) Implement player discovery and search with filtering, build user management, develop notification system, create WebSocket handlers; (5) Integrate third-party services, implement WebSocket support, conduct API testing, optimize database queries.

Approach

Phase 1 (Week 1-2): Backend setup, database schema design, architecture planning. Phase 2 (Week 3-4): API development, database implementation, authentication setup. Phase 3 (Week 5-6): Business logic, WebSocket integration, service integration, notifications. Phase 4 (Week 7-8): Optimization, testing, documentation, refinements.

Outcome Matrix

Outcome	Plan for demonstrating outcome
a) Apply knowledge of mathematics, science, and engineering	Will apply software engineering principles and data structures for player discovery; utilize relational database theory; implement distributed systems patterns.
c) Design system to meet needs within realistic constraints	Will design comprehensive system architecture balancing feature completeness, performance, scalability, 8-week timeline, and free/low-cost cloud platform constraints.
d) Function on multidisciplinary teams	Will collaborate effectively with team members across frontend, backend, and project coordination roles; facilitate communication and teamwork.
e) Identify, formulate, and solve engineering problems	Will identify system bottlenecks, formulate solutions for challenges, and troubleshoot issues across multiple system components.
g) Communicate effectively	Will create comprehensive documentation, clearly communicate requirements and decisions, provide technical guidance, and maintain code documentation.
k) Use modern engineering tools	Will utilize React, Express.js, TypeScript, PostgreSQL, Drizzle ORM, WebSocket API, OAuth 2.0, 100ms SDK, Cloudflare R2 API, and version control systems.

Realistic Constraints

Time: 8-week development cycle requiring prioritization of core features. **Team:** 4-member team with varying expertise levels. **Resources:** Free/low-cost cloud infrastructure (Replit, Neon PostgreSQL, Cloudflare). **Technical:** Real-time voice communication, multiple service integrations, database scalability. **Scope:** MVP focus with extensible architecture for future scaling. **Performance:** Browser compatibility, responsive design across devices, fast load times.

Engineering Standards

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