CHITKARA UNIVERSITY

PROJECT SYNOPSIS

ON

Multiplayer Gaming Platform

SUBMITTED
TO
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING FOR
Full Stack Engineering

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1) Problem Statement:

With the growing popularity of online multiplayer games, players often seek a platform that not only enables them to play interactive games with friends but also provides a seamless and engaging user experience. The current landscape, however, presents several hurdles that diminish accessibility and user satisfaction.

2) Title of project:

Multiplayer Gaming Platform

3) Objective & Key Learnings:

The objective of this project is to develop an interactive and engaging real-time multiplayer gaming platform that enhances user engagement and fosters a sense of community. The platform will leverage the MERN stack and Socket.io to offer seamless multiplayer interaction and live updates. Data security will be ensured through JWT-based authentication and secure password handling. A scalable cloud-based infrastructure will support a growing user base, and a futuristic, intuitive user-friendly interface will enable seamless navigation for all players.

Key Learnings:

- MERN Stack Development and Real-Time Functionality: Gained experience building a full-stack application with MongoDB, Express.js, Node.js, and React.js,
- Frontend Development & UI/UX Design: Applied modern design principles to create a futuristic and intuitive user interface with responsive layouts and interactive elements for better user engagement.
- Database Design and Cloud Deployment: Learned to structure and manage a NoSQL database (MongoDB Atlas) for user profiles and game states and gained experience deploying the application on cloud platforms like Vercel.

4) Options available to execute the project:

- **Web-Based Platform (MERN Stack + React)** • Accessible on both desktop and mobile.

- Allows smooth integration with cloud-based analytics.
- Supports real-time updates and interactive user experience.
- Enables modular and scalable development. • Provides cross-platform compatibility with responsive design.

- **Cloud-Based Solution (AWS, Firebase, Google Cloud)**

- Ensures seamless data synchronization and scalability.
- Provides security, storage, and backup management.
- Supports high availability and fault tolerance.
- Enables serverless computing for cost efficiency.
- Facilitates AI-driven insights and automation.

5) Advantages/ Disadvantages:

Advantages:

1. Real-Time Multiplayer Gameplay: The platform supports multiple players in the same room simultaneously, with live updates powered by Socket.io to make gameplay smooth and interactive.
2. Cross-Device Accessibility: As a web-based platform, it requires no heavy installations, allowing users to play from different devices with flexibility.

User-Centric Features: The platform includes login/signup, dashboards, leaderboards, friend management, and match history, allowing players to track stats.

Strong Security Measures: JWT-based authentication ensures secure login and session management, while passwords are encrypted to protect sensitive user data.

Disadvantages:

Limited Game Variety: Initially, the platform only offers Tic-Tac-Toe, with other popular games like Chess and Connect 4 still under development. This might limit user engagement for those seeking a wider variety of games.

Dependence on Internet Connection: As a real-time multiplayer platform, a stable internet connection is crucial for a smooth experience. Gameplay may lag or be disrupted for users with poor connectivity.

Initial Load Time: The use of a feature-rich framework like React, combined with modern animations and effects, may lead to a slightly longer initial load time for new users.

6) REFERENCES

- **Node.js:** Official Documentation
- **Express.js:** Documentation
- **MongoDB:** Basics
- **EJS:** Documentation
- **GitHub Actions:** Documentation
- **React:** Documentation