Project Report

On

"InterviewPrep - Interview Preparation Platform"

COMPUTER SCIENCE AND ENGINEERING

B.E. Batch-2022

In

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Under the Guidance of: **Submitted By:**

Ms. Preenu Mittan   Garv Goyal

                                                                       2210991565

Department of Computer Science and Engineering
Chitkara University Institute of Engineering & Technology,
Chitkara University, Punjab

<u>CERTIFICATE</u>

This is to be certified that the project titled "**InterviewPrep - Interview Preparation Platform**" has been submitted for the Bachelor of Computer Science Engineering at Chitkara University, Punjab during the academic semester Jan 2025-June 2025 is a Bonafede piece of project work carried out by **Garvit Goyal (2210991565)** towards the partial fulfillment for the award of the course Full Stack Engineering under the guidance of **Ms. Preenu Mittan** and supervision.

Sign. of Project Guide:

Ms. Preenu Mittan

CANDIDATE'S DECLARATION

I, **Garvit Goyal (2210991565) G-19**, B.E.-2022 of the Chitkara University, Punjab hereby declare that the Full Stack Engineering Report entitled "**InterviewPrep - Interview Preparation Platform**" is an original work and data provided in the study is authentic to the best of our knowledge. This report has not been submitted to any other Institute for the award of any other course.

Garvit Goyal

2210991565

Place: Chitkara University

Date: Apr 15, 2025

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Garvit Goyal
2210991565

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1. Abstract

InterviewPrep is a web-based platform designed to help Full Stack Developer candidates prepare for technical interviews through mock interview simulations, real-time feedback, and structured assessments. It allows users to schedule mock interviews, participate in text-based or video interviews, and track progress using an analytics board.

Built with the MERN stack (MongoDB, Express.js, React.js, Node.js), InterviewPrep ensures scalability and efficiency while integrating secure authentication, role-based access control, and AI-powered Speech-to-Text (SST) for improved interview analysis.

By providing expert feedback, a discussion forum, and performance tracking, InterviewPrep bridges the gap between learning and real-world hiring, helping candidates gain confidence and excel in technical interviews.

2. Introduction

2.1 Background

Traditional interview preparation methods often lack structured practice, real-time feedback, and effective performance tracking. Candidates face challenges such as limited access to mock interviews, inefficient feedback mechanisms, and the absence of a collaborative learning environment.

InterviewPrep addresses these issues by offering a comprehensive mock interview platform that includes scheduled interviews, expert feedback, real-time analytics, and a discussion forum. With secure authentication, role-based access control, and AI-powered speech-to-text for interview analysis, InterviewPrep provides an efficient and structured approach to technical interview preparation.

2.2 Problem Statement

Limited Mock Interview Opportunities: Candidates often struggle to find structured mock interviews with real-time feedback.

Ineffective Feedback Mechanisms: Traditional preparation methods lack detailed insights into strengths and weaknesses.

Absence of Performance Tracking: Candidates do not receive analytics on their progress over time.

Lack of Interactive Learning: Most platforms do not offer discussion forums or collaborative learning spaces.

Security and Accessibility Concerns: Ensuring data privacy and a scalable infrastructure is crucial for seamless interview simulations.

InterviewPrep overcomes these challenges by providing scheduled mock interviews, expert feedback, real-time analytics, and AI-powered speech-to-text analysis, ensuring a structured and effective interview preparation experience.

3. Software and Hardware Requirements

3.1 Code Editor / IDE
- **Tool**: Visual Studio Code
- **Availability:** Free download from the official website

3.2 Programming / Working Environment

- **Programming Languages and Frameworks**
  - **JavaScript (Frontend & Backend)**
    - o **Tools:** Node.js runtime, npm (Node Package Manager).
    - o **Availability:** Free download from the official Node.js website.

    Frontend Libraries and Frameworks
    - o **React.js:** Installed via npm (npm install react).
    - o **Tailwind CSS:** Installed via npm (npm install tailwindcss).
    - o **Availability:** Official documentation is available on the React and Tailwind CSS websites.

    Backend Frameworks
    - o **Express.js:** Installed via npm (npm install express).
    - o **Availability:** Official documentation accessible on the Express.js website.

3.3 Requirements to Run the Application

- **Database Management System (DBMS)**
  - **MongoDB (NoSQL Database)**
    - o **Tools:** MongoDB, MongoDB Atlas (for cloud database), Mongoose (ODM).
    - o **Availability:**

- MongoDB is available for free on the official MongoDB website.
- MongoDB Atlas provides a free tier for cloud-based database hosting.

4. Key Features

4.1 Job Application System

- Users can apply for jobs directly through the platform.
- Resume uploads allow candidates to submit job applications seamlessly.

4.2 AI-Generated Interview Questions

- AI-powered system dynamically generates interview questions based on job roles.
- Questions are categorized into Easy, Medium, and Hard difficulty levels.

4.3 Authentication & Role-Based Access

- Secure authentication using JWT for login and registration.
- Role-based access control for Candidates and Interviewers.

4.4 Profile Management & Resume Upload

- Candidates can create and manage their profiles with details like skills, experience, and certifications.
- Resume upload feature enables users to store and update their resumes for job applications.

4.5 Community Forum

- A dedicated space where users can post questions, share knowledge, and engage in discussions related to job preparation, interviews, and career guidance.
- Supports commenting on posts, allowing collaborative problem-solving and community interaction.

4.6 Visual Analytics with Charts

- Interactive charts provide visual insights into a candidate's job application journey.
- Summarizes applications by status (e.g., Accepted, Rejected, Pending)
- Visualizes application trends over time for performance tracking.

4.7 Interview Question Difficulty Levels

- Users can select from Easy, Medium, or Hard difficulty levels for practice and mock interviews.

5. Dependencies Installed

5.1 Frontend Core Dependencies

- **React.js** – Frontend framework for UI development.

- **React Router DOM** – Handles navigation between pages.

- **Tailwind CSS** – Utility-based styling for a modern UI.

- **React Toastify** – Displays notifications.

5.2 Backend Core Dependencies

- **Express.js** – Web framework for handling API requests

- **Cors** – Enables cross-origin requests

- **Dotenv** – Manages environment variables

- **Mongoose** – ODM for MongoDB

- **Bcryptjs** – Secure password hashing

- **Jsonwebtoken (JWT)** – Handles authentication

- **Multer** – Handles file uploads (e.g., resume uploads)

5.3 Deployment & Development Tools

- **Nodemon –** Automatically restarts the server during development
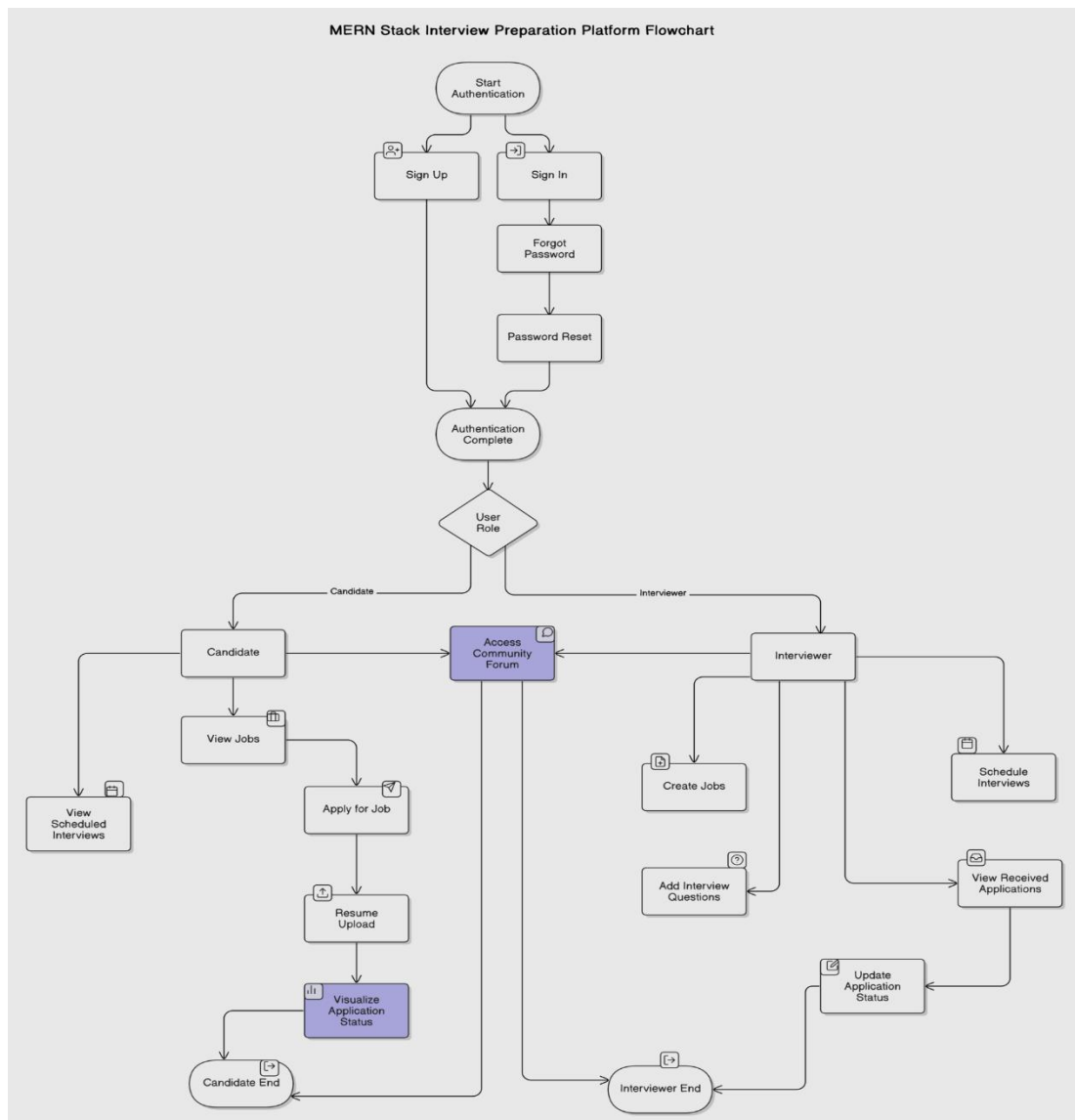
- **Dotenv –** Manages environment variables

5.4 Start Backend Server

- node index.js

5.5 Start Frontend Server

- node run dev

6. Diagram:

MERN Stack Interview Preparation Platform Flowchart

- **Wireframing:** Create visual representations of the user interface layout and structure.
- **Prototyping:** Develop interactive prototypes to test and refine the user experience.
- **GUI Development:** Implement the user interface using **Tailwind CSS** and **React.js** for a responsive and dynamic design.

7. Application Architecture

7.1 Presentation Layer (Frontend)

- **React.js:** Handles the user interface by creating reusable UI components, managing user interactions, and maintaining application state.

7.2 Application Logic Layer (Backend)

- **Node.js:** Serves as the runtime environment for executing server-side JavaScript, managing client requests and responses.
- **Express.js:** A web framework for Node.js used to create RESTful APIs, handle routing, and integrate middleware.

7.3 Data Layer (Database)

- **MongoDB:** A NoSQL database that stores and manages application data using a document-oriented structure for scalability and flexibility.

8. Conclusion

InterviewPrep is a comprehensive platform designed to bridge the gap between theoretical learning and real-world technical interview preparation. Traditional interview preparation methods often lack structured practice, real-time feedback, and effective performance tracking, leaving candidates unprepared for real hiring scenarios. InterviewPrep addresses these challenges by providing a feature-rich solution that enables candidates to schedule mock interviews, participate in text-based or video interviews, receive expert feedback, and engage in discussions with peers.

The platform leverages a scalable MERN stack architecture to ensure high performance and seamless user experience. With secure authentication, AI-powered speech-to-text (SST) analysis, real-time analytics, and role-based access control, InterviewPrep enhances the interview process by offering personalized insights, structured interview simulations, and a collaborative learning environment.

By integrating these advanced features, InterviewPrep empowers aspiring Full Stack Developers to gain confidence, improve problem-solving skills, and excel in technical interviews, making them well-prepared for industry demands. The platform ensures accessibility, security, and scalability, providing an effective solution for both candidates and interviewers in the evolving job market

9. Future Scope:

9.1 AI-Powered Speech-to-Text (SST)
- Implementing **speech-to-text conversion** for analyzing spoken responses in interviews.

- Enhancing accessibility and improving evaluation accuracy.

9.2 Score Analysis & Performance Insights
- Providing **detailed performance analytics** for candidates.
- AI-driven **strength and weakness assessment** based on interview responses.

9.3 Video and Text-Based Interviews
- Expanding to **real-time video interviews** with AI-driven feedback.
- Enhancing **text-based interview mode** for users who prefer written interactions.

9.4 Live Chat and Interactive Interview Sessions
- Introducing **live chat** for candidates to communicate with interviewers in real-time.
- Implementing **interactive interviews** with dynamic question adjustments based on responses.

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