Industrial Internship Report

Elecon Engineering Co. Ltd.

Submitted by

Khushi Pragneshkumar Ka.Patel

12102040701089

In partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

In

Computer Engineering

Madhuben & BhanuBhai Institute Of Technology

The Charutar Vidya Mandal (CVM) University,

Vallabh Vidyanagar – 388120

[March,2025]

Madhuben & BhanuBhai Institute Of Technology,Anand

CERTIFICATE

This is to certify that **Khushi Pragneshkumar Kapatel (12102040701089)** has submitted the Industrial Internship report based on internship undergone at **Elecon Engineering Co.Ltd.** for a period of **16** weeks from **1-1-2025** to **30-4-2025** in partial fulfillment for the degree of Bachelor of Engineering in **Computer Engineering , Madhuben & Bhanubhai Institute Of Technology** at The Charutar Vidya Mandal (CVM) University, Vallabh Vidyanagar during the academic year 2024 – 25.

Prof. Jitendra Raulji
Internal Guide

Dr. Gopi Bhatt
Head of the Department

Madhuben and Bhanubhai Patel Institute of Technology, Anand

DECLARATION

I, Khushi Pragneshkumar kapatel (12102040701089), hereby declare that the Industrial Internship report submitted in partial fulfillment for the degree of Bachelor of Engineering in Computer Engineering, **,** Madhuben & Bhanubhai Institute Of Technology, The Charutar Vidya Mandal (CVM) University, Vallabh Vidyanagar, is a bonafide record of work carried out by me at Elecon Engineering Co.Ltd. under the supervision of Prof. Jitendra Raulji and that no part of this report has been directly copied from any students' reports or taken from any other source, without providing due reference.

Khushi Kapatel

Name of the Student Sign of Student

ACKNOWLEDGMENT

I would like to express my sincere gratitude to all those who have supported me throughout the course of this project.

First and foremost, I extend my deepest appreciation to my project guide, **Mr. Satyam Raval Sir** whose expertise, guidance, and encouragement were invaluable throughout this project. Their insights and feedback played a crucial role in shaping this work.

I am also grateful to Tech Elecon Pvt. Ltd. for providing the necessary resources and facilities to conduct my research and also for their assistance and support in accessing data and resources.

My heartfelt thanks to my colleagues and friends, for their continuous support and constructive suggestions. Their help in brainstorming and problem-solving was essential in overcoming various challenges.

I am indebted to my family, particularly my parents, for their unwavering support, patience, and encouragement throughout this journey. Their belief in me has been a source of strength and motivation.

Lastly, I acknowledge the contributions of everyone who indirectly supported this project. To all those who provided their time, knowledge, and resources, I am profoundly grateful.

Thank you all.

ABSTRACT

This internship report documents the experience gained during a 16 weeks' internship at Tech Elecon Pvt. Ltd. as a junior developer intern. The purpose of the internship was to fulfill the core equipment for the award of bachelor's degree in Computer Engineering and gain practical experience in the IT industry.

During the internship, I worked on various projects that involved frontend and backend development and learned many new computer languages. The main project that I worked on was the **Recruitment system**, which aimed to streamline the hiring process for new employees. The report describes the system's main functions, the users, and how it could be useful in a real world setting.

Through the internship, I gained valuable experience in different tasks, working in an operational environment, and understanding the operations in the IT industry. During my internship, I was able to achieve my goal of developing and improving my skills and competencies in my career field. This opportunity provided me with the chance to enhance my knowledge and experience in a practical work environment.

TECHELECON
TECHNOLOGY SIMPLIFIED

HR/TEPL/211 01.01.2025

To,
Madhuben & Bhanubhai Patel Institute of Technology,
V V Nagar.

Permission for Internship

Dear Sir/M'am,

With reference to your letter dated.17.12.2024, we are pleased to grant permission to ***Ms.Khushi Pragneshkumar Patel*** *student of* ***Computer Engineering*** *for* ***Internship*** in our organization from ***01.01.2025 to 30.04.2025.***

The following points are to be adhered by the student.

- Laptops, Pen-Drives & other hard drives are not permitted inside the company premises.
- Appropriate dressing & grooming will be appreciated. Jeans & T Shirts are not allowed.
- Female students have to wear dress and Kurtis only.
- Photography & Videography is strictly prohibited in the premises.
- Trainee/s has to strictly comply with the Company's timings & schedule.
- In case of any casualty the Company will not be held responsible.
- On Completion of training the trainee/s has to submit a copy of Training Report duly signed by concern guide to obtain the Training Certificate.
- In case of any ambiguity / difficulty, the trainee is required to approach HR Department. The detailed guideline are attached overleaf.

For, Tech Elecon Pvt.Ltd.

Nirali Trivedi
Group HR Head
Cc. Satyam Raval

TECH ELECON PVT. LTD.
Anand Sojitra Road, Vallabh Vidyanagar - 388 120, Gujarat, India | Email: inquiry@techelecon.com | Web: www.techelecon.com
Phone: +91 2692 227292/91. CIN: U72900GJ2012PTC070532
Branch Office: **Vadodara:** FF/106, Panorama Complex, R. C. Dutt Road, Alkapuri, Vadodara – 390005. Mobile: +91 90990 36045 E-mail: inquiry@techelecon.com
Kolkata: 68, Sarat Bose Road, Kolkata - 700025. Ph. No: 033 24761861 / 24760904

Date: 30/04/2025

TO WHOM IT MAY CONCERN

This is to certify that **KHUSHI PRAGNESHKUMAR KAPATEL,** a student of **MADHUBEN AND BHANUBHAI PATEL INSTITUTE OF TECHNOLOGY, V.V. NAGAR** has successfully completed her internship in the field of React.js from **01/01/2025 to 30/04/2025** under the guidance of **Mr. Satyam Raval,** Deputy General Manager at **Tech Elecon Pvt Ltd.**

Her internship activities include successful completion of the assigned project at the given period of time along with abiding by companies' rules and regulation.

During the period of her internship program with us, she had been exposed to different processes and was found diligent, hardworking, and inquisitive.

We Wish her every success in her life and career.

For, Tech Elecon Pvt. Ltd.

List Of Figure

List of Tables

Table Of Content

CHAPTER 1: OVERVIEW OF THE COMPANY

1.1 History

Tech Elecon Pvt. Ltd is the IT division of the Elecon group of companies and has more than 25 years of experience in the fields of hardware, software, and networking solutions. Situated in the heart of Vitthal, Udyognagar Industrial Estate and in the proximity of the educational town of Vallabh Vidyanagar. Tech Elecon is all set to reach new heights in the field of IT solutions.

Tech Elecon is ready with all sorts of solutions and deliver any application that is web based and further our solutions are designed to adapt your business rather than your business adapting the software. Their solutions are 100% fruitful and empower you to take control of client's business online and in real time.

Tech Elecon have more than 100 employees with specialized skills in software development, custom software development, and e-commerce software development using custom software programming including.NET, C#.NET, PHP, and Open Source and Oracle.

Tech Elecon delivers quality products and services with a focus on integrating the same with existing technologies, providing the required automation to our customers to help them achieve their business objectives.

Mr. Nilesh Naik, the company's general manager, is at the helm of the Techelecon organization. Mr. Satyam Raval, as Senior Manager, and after that, Manager and Associate Manager Positions are listed. At the bottom, there are trainees at entry level, who follow up to engineer, senior engineer, also executive and senior executive engineer.

1.2 Company Profile

Company Name	Tech Elecon Pvt. Ltd.
Company Type	Service Base
Company Address	Anand - Sojitra Road, Vithal Udyognagar, Vallabh Vidyanagar-388120, Anand, Gujarat.
Contact No.	+91 90990 36045
Email ID	
Website	http://www.techelecon.com/
Location	Anand, Gujarat
Company Manager	Mr. Satyam Raval

Table 1.2 Company Profile Table

1.3 Different Products Of The Company

Tech Elecon has extensive experience in providing IT services and has successfully adapted to technological advancements, making it the leading IT infrastructure management service provider in the region. Our cutting-edge delivery model covers all stages of the solution lifecycle, including planning, deploying, managing, maintaining, auditing, upgrading, and improving.

Tech Elecon recognize that each client has unique needs and expectations when it comes to infrastructure and service providers. Our clients have the flexibility to choose from a wide range of IT infrastructure management and performance services based on their specific requirements. They can opt for on-site services or hybrid solutions that include on site troubleshooting and support services.

Tech Elecon Provide Following Service for Business

- Hardware maintenance and repairing
- Service desk management
- Desktop management
- Network management
- Messaging administration
- Back-up management

Other Services

- Software Development Services
- Software Licensing
- Microsoft Product Implementation
- Linux Servers / Desktop Implementation

1.4 Capacity Of The Company

Currently our company holds over more than 100 employees. But as the company is growing rapidly, capacity is going higher and higher.

CHAPTER 2: OVERVIEW OF DIFFERENT DEPARTMENT

2.1 DIFFERENT DEPARTMENT

ERP: The ERP (Enterprise Resource Planning) department is responsible for implementing, maintaining, and upgrading the ERP system in an organization. The ERP system integrates various business processes such as accounting, human resources, procurement, inventory, and customer relationship management into a single system to increase efficiency and streamline operations. The ERP department works closely with other departments to ensure the system meets the organization's needs and provides support and training to end-users**.**

Software: This department is responsible for maintaining the company's IT infrastructure and supporting employees. They develop web applications using technologies such as .Net and ReactJS and provide technical assistance to clients and employees to resolve any issues they may encounter. Their focus is to ensure smooth functioning of the IT systems and provide reliable technical support to the organization.

Networking and Hardware: The hardware department is responsible for the physical components of a computer system, including design, construction, maintenance, troubleshooting, and repair, while the network department is responsible for the setup, configuration, and maintenance of computer networks, including hardware and software components, protocols, addressing, security, monitoring, and troubleshooting.

Elecon have long-standing relationships with all the major OEMs in information networking, including Juniper, Cisco, HP, Dell and Brocade. They start with an audit of their existing networking infrastructure, prepare reports and based on these reports; they define which OME suits the client requirements and according to that their team work.

2.2 SEQUENCE OF OPERATION FOR MANUFACTURING OF END PRODUCT

Main end product of our company is mostly the software. Software is a very different thing other than industry's End products. Its process is very different. The main flow of software development is as per below:

1. **Client requirement understanding:** First step to build something is to know what to build. Specially in the case of software it is very important to understand the client requirement completely as if the requirement changes, then it will create huge problems in later part of the development. Often a requirement document is created which is called a client requirement document to make things clearer.

2. **Planning:** Second step to build something is to know how to build. In software development, we need to decide the entire flow of the process like which technology stack will be used? Which type of architecture will be used? Etc.

3. **Development:** After sufficient planning comes the development part. In this part actual software is built. Or at least part of the software is built in methods like agile delivery methods.

4. **Review and QA:** Internal review and QA is done to ensure the quality of the final product as in software in this case. It also helps to identify the bugs before releasing the software.

5. **Release or Deployment:** In this phase the software is delivered to the client either the direct code or hosted service.

6. **Maintenance:** This part comes in picture after the final delivery of the software. This phase includes tasks such as making sure the service is always running, bug fixes etc.

2.3 DIFFERENT STAGES OF PRODUCTION

At our company we mostly use an agile development process in which the software is delivered in different parts or phases which are called the sprints. Each sprint contains the upgraded version of the software, and it is kept upgrading unless we reach the final product.

Fig 2.3 Agile Process

CHAPTER 3: INTRODUCTION TO INTERNSHIP AND PROJECT

3.1 Internship Summary

Internship is part of our curriculum. I have joined TEPL as Intern and my major role is to contribute to Web Development (React js). It was in offline mode. My training phase and project work was done in offline mode.

Project Title: Recruitment Process System

A **Recruitment Process System (RPS)** is a digital solution designed to streamline and automate the hiring process. It helps organizations attract, assess, and hire the best candidates efficiently.

Key Features:

1. **Job Posting & Advertising** – Distributes job openings across multiple platforms.
2. **Applicant Tracking System (ATS)** – Manages candidate applications and progress.
3. **Resume Screening** – Uses AI or filters to shortlist qualified candidates.
4. **Interview Scheduling** – Automates interview invitations and scheduling.
5. **Candidate Assessment** – Conducts skill tests, psychometric tests, or AI-driven evaluations.
6. **Communication & Notifications** – Sends automated updates to candidates and recruiters.
7. **Onboarding Integration** – Helps with document collection, training, and induction.

Benefits:

- Saves time and reduces manual work.
- Improves candidate experience.
- Enhances hiring accuracy with AI-driven insights.

3.2 Purpose

The Recruitment Process System is a web-based application designed to assist organizations in managing their hiring process efficiently. It enables HR teams to post job openings, track applications, schedule interviews, and evaluate candidates. The system streamlines the recruitment workflow, enhances candidate experience, and improves hiring decisions through automation and data-driven insights.

Key Objectives:

1. **Improve Hiring Efficiency** – Reduces manual efforts by automating job postings, resume screening, and interview scheduling.
2. **Enhance Candidate Experience** – Provides timely updates, smooth communication, and a user-friendly application process.
3. **Reduce Time-to-Hire** – Speeds up recruitment by automating workflows and eliminating bottlenecks.
4. **Ensure Quality Hiring** – Uses AI, assessments, and data-driven insights to select the best candidates.
5. **Maintain Compliance** – Ensures legal and company policy adherence in hiring procedures.
6. **Centralized Data Management** – Stores and tracks all recruitment-related information in one place for better decision-making.

3.3 Objective Of Project

The objective of the recruitment process is to attract, identify, and hire the most suitable candidates for a job within an organization. It ensures that the company gets skilled, qualified, and motivated employees who align with its goals and culture.

Key Objectives of Recruitment Process:

1. Identify Talent Needs – Determine the number and type of employees required for business success.

2. Attract Qualified Candidates – Use various recruitment channels to find skilled individuals.
3. Ensure a Fair & Efficient Process – Conduct a structured selection process that is transparent and unbiased.
4. Reduce Hiring Time & Costs – Optimize resources to ensure cost-effective and timely hiring.
5. Enhance Employer Brand – Maintain a positive company image to attract top talent.
6. Improve Employee Retention – Select candidates who are the best fit, reducing turnover.
7. Support Organizational Goals – Align hiring with the company's long-term strategy and workforce planning.

3.4 Scope

The Recruitment Process System provides a centralized platform for managing end-to-end hiring activities. Key functionalities include:

- Job posting and candidate application management
- Resume screening and ranking
- Interview scheduling and evaluation tracking
- Candidate communication and notifications
- Role-based access for HR, recruiters, and interviewers
- Compliance tracking and reporting

3.5 Tools And Technology

- **Editor:** Visual Studio Code

  Visual Studio Code, also known as VS Code, is a highly versatile and powerful source-code editor created by Microsoft for Windows, Linux, macOS, and even web browsers. It comes with a wide range of features such as debugging, syntax highlighting, intelligent code completion, and more. Developers are drawn to VS Code not only for its comprehensive features but also for its ability to adapt to

different programming needs. Using VS Code can lead to increased productivity and provide an accessible way to handle complex programming projects effectively.

- **Language:** JSX (JavaScript XML)

  JSX is a syntax extension of JavaScript that looks similar to HTML and is used in React to define UI components in a more readable and declarative way. It allows developers to write UI code efficiently by embedding HTML elements directly within JavaScript.

  - **Improves Readability** – Makes UI components easy to understand.
  - **Faster Development** – Looks like HTML but integrates seamlessly with JavaScript.
  - **Prevents Injection Attacks** – JSX escapes any injected values to prevent security risks.
  - **Optimized for React** – Works well with the component-based structure of React.

- **Libraries:**
  - **React js:** React.js is a JavaScript library for building fast, interactive, and scalable user interfaces, mainly for single-page applications (SPAs). It was developed by Facebook (Meta) and is widely used for modern web development.
    - **Faster Performance** (Thanks to Virtual DOM).
    - **Reusable Components** (Saves time and effort).
    - **Strong Community Support** (Used by Facebook, Instagram, Netflix, etc.).
    - **Easy Integration** (Works with backend APIs, React Native, and third-party libraries).

- **Framework:**
  - **Nodejs:**A framework is a collection of various libraries and tools that are required in the development process of a software application. It acts as a base on which different software applications can be developed. A node framework is a workspace platform that supports the use of Node.js and which allows developers to use JavaScript for developing front end as well as the back end of an application. Node frameworks are a wide collection of frameworks built on Node and that extend its properties and functionalities further.

- **Database:**

  MoongoDB Compass: MongoDB is a source-available, cross-platform, document-oriented Database program. Classified as a NoSQL Database, it employs JSON-like documents with optional schemas and is known for its ability to manage large amounts of data while ensuring high availability and easy scalability.

  MongoDB Compass is the official GUI for MongoDB tools. It provides a graphical view of your MongoDB schema without needing the use of Query language. With MongoDB Compass, you can explore and interact with your data, understand the distribution of values in your schema, and perform various operations like building queries, indexing, and more. It acts as a bridge between non-technical and technical stakeholders by providing a clear view of the data and its structure.

3.6 Project Planning

An effective recruitment process is a step-by-step approach to bringing in talented and qualified people who will help the company grow further. It is aimed at finding the right fit for the right job at the right time.

Steps In Recruitment Process

The process of recruitment undergoes 5 inter-related steps in order to find the perfect fit for your organization. They are:

1. **Creating a Recruitment Plan-** If a job opening has been newly formed, or vacated recently, it is important to find out what the position, and eventually your organization, needs in a candidate who will assume the position.

2. **Talent Search-** Finding the best sources of recruitment, identifying the right talent, attracting and motivating them to apply for the job help you bring in a fresh perspective to your organization**.**

3. **Screening & Short-listing**- In order to zero-in on the right candidate for the job and move along with the recruitment process, it is important to effectively screen your candidates.

4. **Interviewing-** Short-listed candidates will move to the interview process after which you will determine whether the candidate is to be offered the job or rejected.

5. **Evaluation & Offer of Employment-** Once you have screened through all the potential candidates, you will have to offer the position to the most deserving one(s) who will be evaluated for credibility prior to the offer.

Fig.3.6 Recruitment Phase

3.7 Project Scheduling

There were about 13 weeks of the project. Breaking the project down into smaller tasks and calculating the length of each phase is necessary to develop a project

Phase 1: Requirement Analysis (Week 1-2)

- Define project goals, scope, and user roles
- Finalize technical stack (React, Node.js, MongoDB, etc.)
- Document key system requirements

Phase 2: Development (Week 3-8)

- Build frontend (React.js UI components, dashboards)
- Develop backend (Node.js API, authentication, job management)
- Implement database (MongoDB or MySQL integration)
- Connect APIs for third-party job platforms (LinkedIn, email notifications)
- Implement **role-based access control (Admin, HR, Candidate, Hiring Manager)**

Phase 3: Testing & QA (Week 9-11)

- Perform unit testing for components & APIs
- Conduct integration testing to verify data flow
- User Acceptance Testing (UAT) by HR team
- Identify and fix major bugs

Phase 4: Deployment (Week 17-18)

- Set up cloud deployment (AWS, Azure, Digital Ocean)
- Configure security settings (SSL, authentication layers)
- Launch **beta version** for limited users

CHAPTER 4: SYSTEM ANALYSIS

4.1 STUDY OF CURRENT SYSTEM

The study of current recruitment processes involves examining various models and methods that organizations use to attract and select candidates. Key areas of focus include the effectiveness of different recruitment techniques, the role of technology, and the psychological aspects influencing both applicants and recruiters.

Key Components of Recruitment Process

- **Recruitment Techniques**
    - Traditional methods: job postings, referrals, and recruitment agencies.
    - Modern methods: social media recruiting, online job boards, and AI-driven tools.
- **Selection Procedures**
    - Screening resumes and applications.
    - Conducting interviews: structured vs. unstructured formats.
    - Assessment tests: cognitive ability tests, personality assessments, and skills evaluations.
- **Role of Technology**
    - Applicant Tracking Systems (ATS) for managing applications.
    - Use of data analytics to improve recruitment strategies.
    - Virtual interviews and remote assessment tools.
- **Psychological Aspects**
    - Candidate experience and its impact on employer branding.
    - Bias in recruitment: understanding and mitigating unconscious bias.
    - The importance of cultural fit and diversity in hiring decisions.

4.2 PROBLEM AND WEAKNESS OF CURRENT SYSTEM

The current recruitment process system, while structured, has several limitations that impact its efficiency and effectiveness. Below are some key problems and weaknesses:

- **Time-Consuming Process**

- Manual resume screening and multiple interview rounds increase hiring duration.
- Delays in scheduling interviews lead to candidate drop-offs.
- Long decision-making processes slow down hiring.

- **High Cost of Hiring**

- Expenses related to job advertisements, recruitment agencies, and hiring software add financial strain.
- Cost of bad hires impacts company performance and productivity.
- Frequent rehiring due to poor retention increases costs.

- **Limited Talent Pool**

- Over-reliance on specific job portals restricts access to a diverse pool of candidates.
- Lack of proactive candidate sourcing strategies leads to a shortage of skilled professionals.
- Geographical limitations reduce access to global talent.

- **Dependence on Manual Processes**

- Many organizations still rely on outdated, paper-based systems.
- Lack of automation increases administrative burden on HR teams.

- **Poor Diversity and Inclusion Practices**

- Unconscious biases in hiring lead to a lack of diversity.
- Failure to implement inclusive hiring strategies affects workplace innovation.

The current recruitment process has multiple inefficiencies, including time delays, high costs, poor candidate experience, and reliance on outdated methods.

4.3 REQUIREMENT OF NEW SYSTEM

To address the weaknesses and challenges of the current recruitment process, organizations need to implement a new system that is more efficient, inclusive, and aligned with modern workforce expectations. Here are the key requirements for a new recruitment system:

1. Streamlined Processes

- **Automated Workflows**: Implement automation tools to streamline repetitive tasks such as resume screening, interview scheduling, and candidate communication.
- **Shortened Hiring Cycles**: Establish clear timelines and benchmarks to reduce the time taken to fill positions without compromising quality.

2. Enhanced Candidate Experience

- **User -Friendly Application Process**: Simplify the application process with intuitive interfaces and mobile-friendly options to encourage more candidates to apply.
- **Regular Communication**: Maintain consistent communication with candidates throughout the recruitment process to keep them informed and engaged.

3. Data-Driven Decision Making

- **Analytics and Reporting**: Implement data analytics tools to track key performance indicators (KPIs) such as time-to-hire, candidate quality, and source effectiveness.
- **Feedback Mechanisms**: Collect feedback from candidates and hiring managers to continuously improve the recruitment process.

4. Integration of Technology

- **Advanced Applicant Tracking Systems (ATS)**: Invest in a modern ATS that integrates seamlessly with other HR systems and provides a comprehensive view of the recruitment pipeline.
- **AI and Machine Learning**: Leverage AI-driven tools for resume screening, candidate matching, and predictive analytics to enhance decision-making.

4.4 SYSTEM FEASIBILITY

When evaluating the feasibility of a new recruitment process system, it is essential to consider several dimensions: technical, economic, operational, and legal feasibility. Each of these aspects helps determine whether the proposed system can be successfully implemented and sustained within the organization. Below is a breakdown of each type of feasibility:

1. Technical Feasibility

- **Technology Requirements**: Assess whether the necessary technology (software, hardware, and infrastructure) is available or can be developed. This includes evaluating applicant tracking systems (ATS), AI tools, and data analytics platforms.
- **Integration Capabilities**: Determine if the new system can integrate with existing HR systems, payroll, and other relevant software to ensure seamless data flow and communication.
- **User Accessibility**: Evaluate whether the system can be easily accessed by all stakeholders, including recruiters, hiring managers, and candidates, across various devices (desktop, mobile).
- **Scalability**: Consider whether the system can scale to accommodate future growth in hiring needs or changes in organizational structure.

2. Economic Feasibility

- **Cost-Benefit Analysis**: Conduct a thorough analysis of the costs associated with implementing the new system (software purchase, training, maintenance) versus the expected benefits (reduced time-to-hire, improved candidate quality, lower turnover rates).
- **Return on Investment (ROI)**: Estimate the potential ROI by quantifying the financial benefits of improved recruitment efficiency and effectiveness.
- **Budget Constraints**: Assess whether the organization has the budget to support the implementation and ongoing costs of the new system.

3. Operational Feasibility

- **Alignment with Organizational Goals**: Ensure that the new recruitment process aligns with the overall strategic goals and objectives of the organization.
- **Impact on Current Processes**: Evaluate how the new system will affect existing recruitment processes and whether it will require significant changes in workflows or roles.
- **Training and Support**: Determine the training needs for HR staff and hiring managers to effectively use the new system and ensure they have the necessary support during the transition.
- **Change Management**: Assess the organization's readiness for change and the potential resistance from employees. Develop a change management plan to facilitate a smooth transition.

4. Legal Feasibility

- **Compliance with Labor Laws**: Ensure that the new recruitment process complies with all relevant labor laws and regulations, including anti-discrimination laws and data protection regulations (e.g., GDPR).
- **Data Security and Privacy**: Evaluate the system's ability to protect candidate data and ensure that it meets legal requirements for data handling and storage.
- **Documentation and Record-Keeping**: Assess whether the new system can maintain proper documentation and records to support compliance audits and reporting requirements.

By evaluating technical, economic, operational, and legal aspects, organizations can make informed decisions about whether to proceed with the new system, identify potential challenges, and develop strategies to mitigate risks.

4.5 FEATURES OF SYSTEM

A modern recruitment process system should incorporate a variety of features that enhance efficiency, improve candidate experience, and support the overall goals of the organization. Here are some key features that should be included in an effective recruitment process system:

1. Applicant Tracking System (ATS)

- **Resume Parsing**: Automatically extract relevant information from resumes to streamline the screening process.
- **Candidate Profiles**: Create comprehensive profiles for each candidate, including their resumes, application history, and interview feedback.

2. Job Posting and Distribution

- **Multi-Channel Job Posting**: Post job openings across multiple platforms, including job boards, social media, and the company website, from a single interface.
- **Customizable Job Templates**: Use pre-defined templates to create consistent and attractive job postings.

3. Candidate Sourcing Tools

- **Talent Pool Management**: Maintain a database of potential candidates for future openings, allowing recruiters to proactively reach out to qualified individuals.
- **Social Media Integration**: Leverage social media platforms for sourcing candidates and promoting job openings.

4. Collaboration and Communication Tools

- **Internal Collaboration**: Enable hiring teams to collaborate on candidate evaluations and share feedback in real-time.
- **Candidate Communication**: Automate communication with candidates through email notifications, interview scheduling, and status updates.

4.6 SELECTION OF HARDWARE AND SOFTWARE

The software and hardware requirements may vary depending on the specific needs and size of the project.

Software Requirements:

- Operating System: Windows
- Visual Studio
- HTML, CSS, Java Script
- Reactjs
- Database Management System such as MySQL or MongoDB
- Any additional libraries and frameworks that are required for the project

Hardware Requirements:

- CPU: Intel Core i5 or above
- RAM: 8GB or more
- Hard Drive Space: 50GB or more
- Internet connection to download necessary libraries and frameworks

CHAPTER 5: SYSTEM DESIGN

5.1 SYSTEM DESIGN & METHODOLOGY

The system design for the Recruitment system will follow an iterative approach that incorporates user feedback throughout the development process. The design methodology will be based on the agile methodology, which emphasizes flexibility and collaboration among team members. The development team will be divided into smaller sub-teams to focus on specific tasks, with regular meetings to ensure progress and address any issues.

5.2 DATABASE DESIGN / DATA STRUCTURE DESIGN / CIRCUIT DESIGN / PROCESS DESIGN / STRUCTURE DESIGN

The Recruitment system will require a database to store all user information, job listings, and other relevant data. The database design will follow a relational model, with tables for users, jobs, applications, and other entities. The data structure design will focus on optimizing data access and minimizing data redundancy.

5.3 DIAGRAM FOR THE PROJECT

5.3.1 ENTITY RELATIONSHIP DIAGRAM

- An Entity-Relationship (ER) Diagram is a visual representation of a database structure that helps in designing and understanding database relationships. It is widely used in database modeling to describe how data is stored, connected, and organized

- **Components of an ER Diagram**:

  An ER diagram is composed of entities, attributes, and relationships

A. Entities (Objects)

- Definition: An entity represents a real-world object or concept with meaningful data.
- Types of Entities:
  1. **Strong Entity:** Exists independently (e.g., User, Employer, Job).
  2. **Weak Entity**: Depends on another entity (e.g., Job Application depends on Job and Candidate).

- Notation: Represented as a rectangle in the diagram.

Example Entities in a Job Portal System:

- Candidate
- Employer
- Job
- Application

B. Attributes (Properties)

- **Definition**: Attributes define properties of an entity.
- **Types of Attributes:**
  1. **Simple Attribute**: Cannot be broken down (e.g., Name, Age).
  2. **Composite Attribute:** Can be divided into smaller parts (e.g., Full Name → First Name, Last Name)
  3. **Derived Attribute:** Derived from other attributes (e.g., Age derived from Date of Birth).
  4. **Multivalued Attribute:** Can have multiple values (e.g., Phone Numbers).
  5. **Key Attribute:** Uniquely identifies an entity (e.g., CandidateID).
- **Notation:** Represented as an oval connected to the entity.

Example Attributes for Candidate:

- CandidateID (Primary Key)
- Name · Email
- Phone · Skills
- Date of Birth

C. **Relationships (Connections)**

- **Definition:** A relationship shows how two entities are connected.
- **Types of Relationships:**

  1. **One-to-One (1:1):** One entity is related to only one other entity (e.g., Candidate ↔ Profile).
  2. **One-to-Many (1:M):** One entity is related to multiple other entities (e.g., Employer ↔ Jobs).
  3. **Many-to-Many (M:N):** Multiple entities are related to multiple entities (e.g., Candidates ↔ Jobs through Applications)

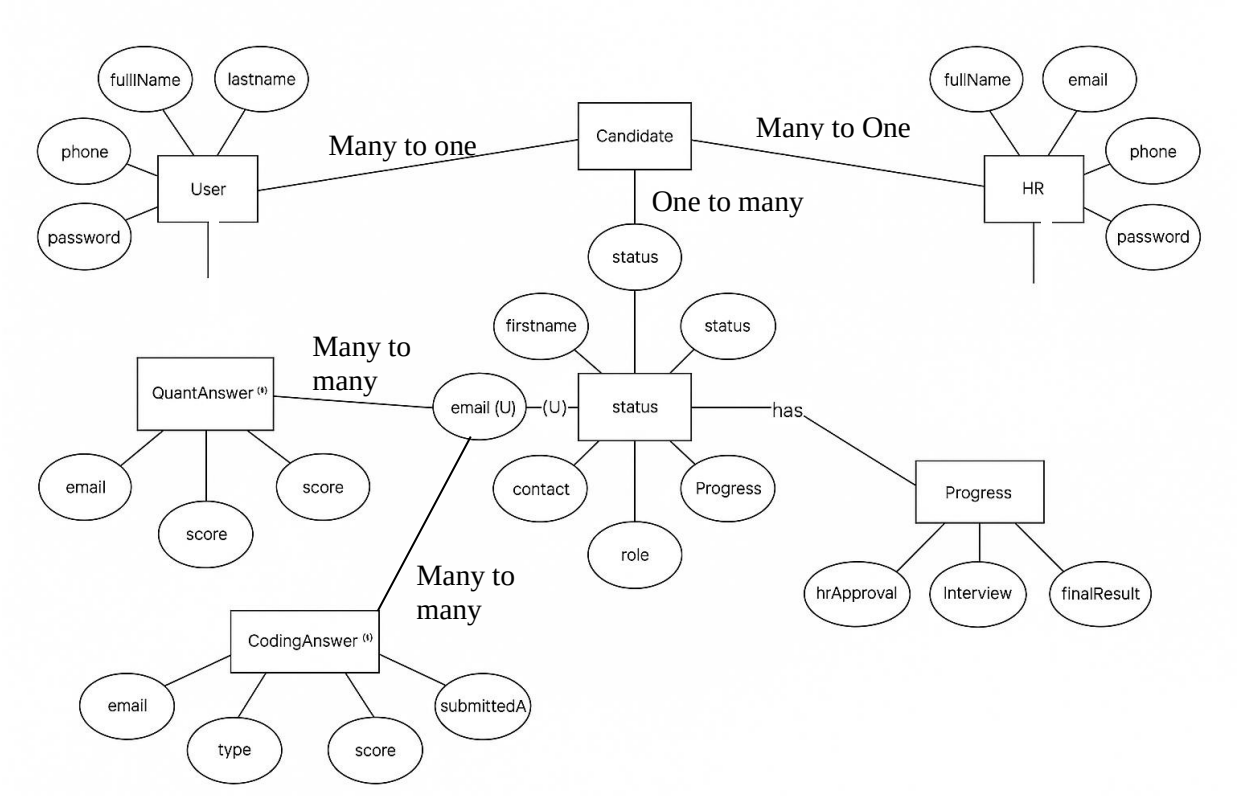
- **Notation:** Represented as a diamond.

Example Relationship:

- Candidate applies for multiple Jobs.
- Employer posts multiple Jobs

❖ ER Diagram Notations

Symbol	Meaning
Rectangle	Represents an Entity
Oval	Represents an Attribute
Diamond	Represents a Relationship
Line	Connects Entities & Relationships



5.3.1 ER Diagram

5.3.2 USE CASE DIAGRAM

- In UML (Unified Modeling Language), use case diagrams are like a picture that shows how different people (or things) interact with a system, like a website or app.

  - Actors are the people or things using the system. It could be a customer, admin, or any other entity that interacts with the system.
  - The system is the website or application being built, and use cases are the things the system helps the actor do (like logging in, buying a product, etc.).

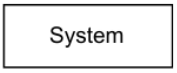
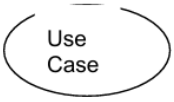
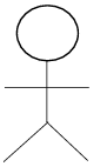
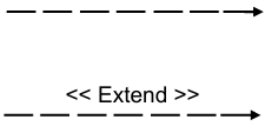
- Use case diagrams help you understand:
  1. Who is using the system (the actors).
  2. What the actors can do with the system (the use cases).
  3. The goals that the system is helping the actors achieve.
- Use case diagrams give a big-picture view of how the system works and what it can do for its users, helping you define the boundaries and goals of the system.

❖ **Uses of Use Case Diagram:**

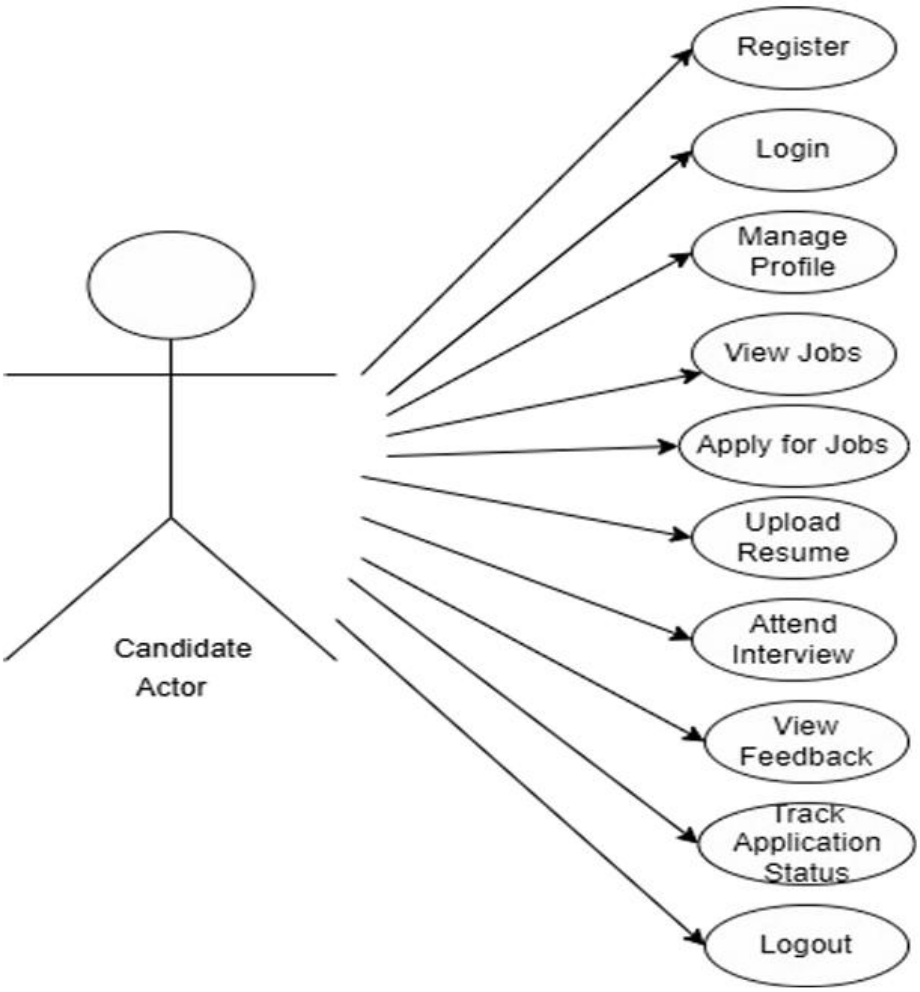
- **Show the big picture:** Use case diagrams help show what the system is supposed to do and what goals it helps the user (the actor) achieve when interacting with it.
- **Illustrate interactions**: They show how the actor (like a user) and the system interact, and how things generally work when the actor performs actions (like signing up, making a purchase, etc.).
- **Identify influencing factors**: Use case diagrams can help spot things inside or outside the system that could affect how things go when actors use it—like special rules or conditions that might change the result.
- **Don't show the sequence**: Use case diagrams don't show the exact order of actions. They only focus on what can be done, not how or when things happen in a sequence.

❖ **Use Case Diagram Symbols:**

The most commonly used symbols for use case diagrams are follows:

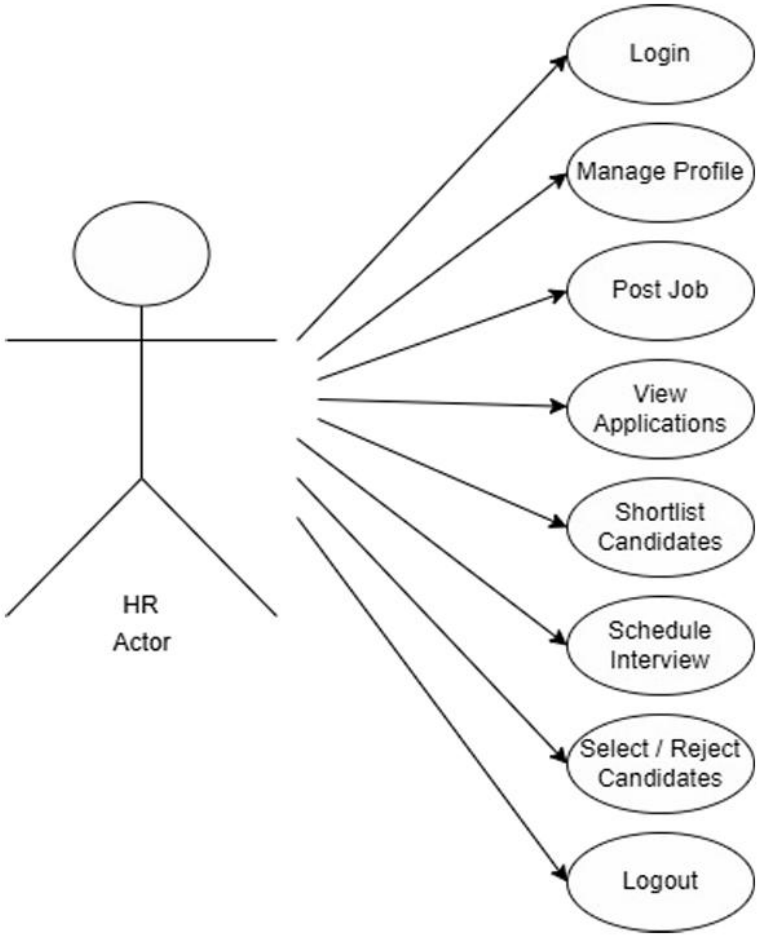
SYMBOL	DESCRIPTION
	➢ The rectangular boundary is the system. Use cases fall inside it, and actors will be placed outside it.
	➢ An oval shape represents a use case. Use cases represent the functionality of the system, as well as the end-goal of the actor. Use cases should be placed inside the system.
 Actor	➢ When an actor interacts with the system, it triggers a use case. Actors should be places outside the system ➢ Actor specifies a role played by a user or any other system that interacts with the subject.
	➢ Arrows are used to indicate a relationship between an actor and a use case, or between two use cases. ➢ An inclusion represents one use case using the functionality of another use case.
	➢ An extension indicates that one use case may include the behavior of another use case.
Communication Link	➢ The participation of an actor in a use case is shown by connecting an actor to a use case by a solid link.

❖ **Use Case Diagram (Candidate Side)**



5.3.2.1 Use case Diagram (Candidate side)

❖ **Use Case Diagram (HR Side)**



5.3.2.2 use case diagram (HR side)

5.3.3 ACTIVITY DIAGRAM

❖ **What is Activity Diagram?**

- An activity diagram is a type of diagram used in software and systems design to show how processes or activities flow from one to another within a system. Think of it like a map that shows the steps in a task and how they are connected.
- **Focus on Work done by the Object:** The diagram shows what the system or an object does, step by step. For example, if it's an online shopping system, it might show the steps a user takes to make a purchase.
- **Flow of Control:** It shows how control moves through the system, meaning which steps happen first, second, and so on. This is not about how the system is implemented, but rather how things flow logically from one activity to another.

- **Sequential, Branching, and Concurrent Flows:** The flow between activities can happen in three ways:
  - **Sequential:** One activity happens after another, like steps in a recipe.
  - **Branching:** A decision point, where the flow can go in different directions depending on conditions (like choosing between two options).
  - **Concurrent:** Multiple activities happen at the same time, like doing two things in parallel (e.g., cooking while watching TV).

- **Forks and Joins:** To handle different types of flow, the diagram uses special symbols like forks (for starting parallel tasks) and joins (for bringing parallel tasks back together).

❖ **Purpose of an Activity Diagram:**

- To show the flow of activities in a system, like how tasks or steps are connected.
- To describe the sequence of actions that occur from one activity to the next.
- To represent activities that can happen together (concurrent) or in different branches based on decisions.

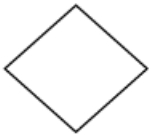
❖ **Use of Activity Diagram:**

- Activity diagrams are helpful in several situations, especially when you need to understand or explain how a system or process works. Here's how they are commonly used:

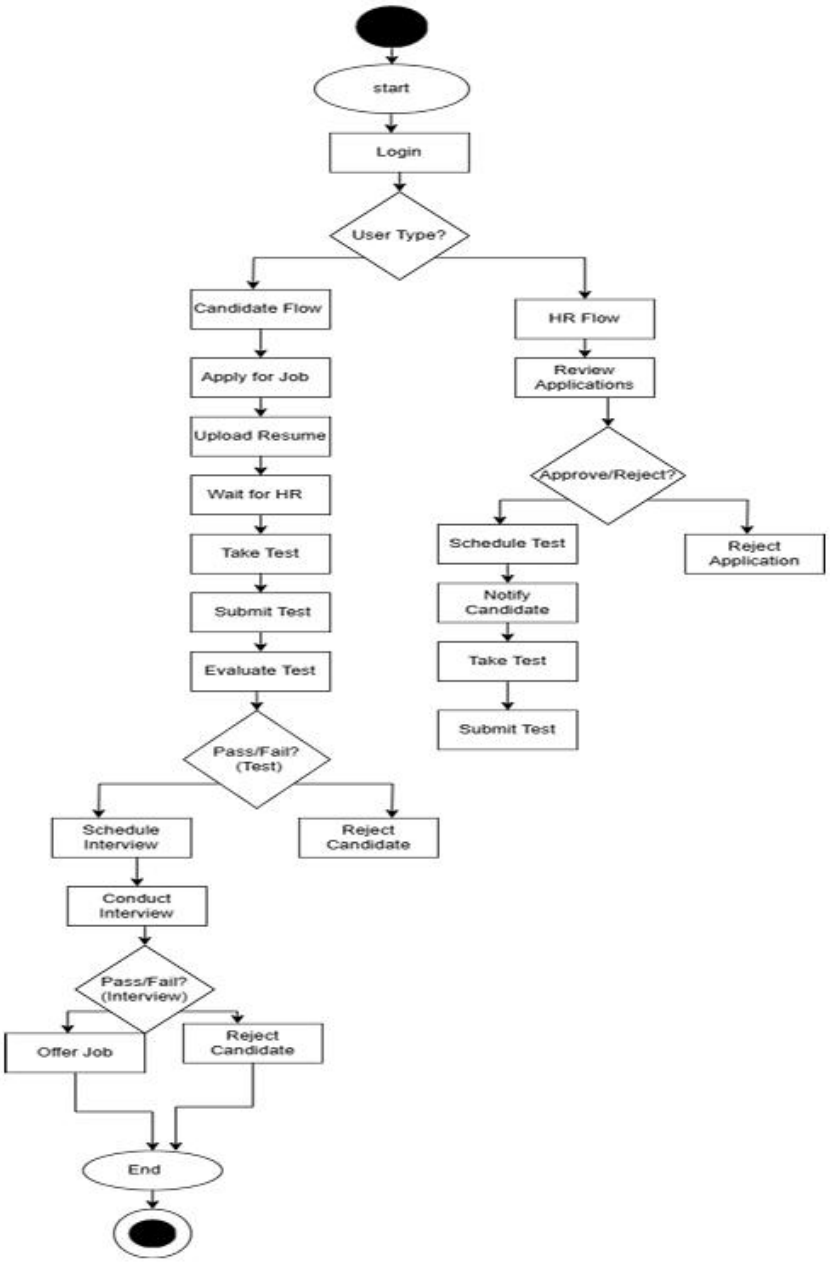
1. **Show the Sequence and Logic of Activities:** Activity diagrams help to clearly show what happens first, second, third, etc., in a system. They also show the logic behind how activities flow, so you can easily understand the order of actions.
2. **Illustrate Business Processes between a User and the System:** These diagrams can describe how a user interacts with the system. For example, it might show all the steps a customer takes when using an online store, from browsing to checking out.
3. **Model Methods, Functions, and Other Software Elements:** Activity diagrams can be used to model how different parts of a software program work. For instance, they can help visualize how a specific function or operation within the system behaves or flows.
4. **Show Concurrent Activities**: Sometimes, different activities can happen at the same time. Activity diagrams help represent these parallel processes (like working on two tasks at once), making it clear that multiple things are happening simultaneously.
5. **Capture a System's Dynamic Elements:** They also help to capture how a system behaves dynamically—meaning, how it reacts or changes over time as different activities or steps are taken.

❖ Shapes, Symbols and Notations in Activity Diagram:

➢ As with any diagram, shapes, symbols and notation are used, here are some commonly used ones in an activity diagram.

SYMBOL	DESCRIPTION
	• A small filled circle followed by an arrow represents the initial action state or the start point for any activity diagram.
 Activity/Action	• An action state represents the non-interrupter action of objects. You can draw an action state in Smart Draw using a rectangle with rounded corners.
Action Flow	• Shown by an arrow connecting one action box to another.
 Decision or Merge/Branch	• A diamond symbol used when there are at least two alternate paths for the user to choose from.
 Final State or End Point	• Completion of all process flows.

❖ Activity Diagram (Employer Side & Candidate Side)



5.3.3. activity diagram

5.4 DATA DICTIONARY

- A data dictionary is a collection of metadata such as object name, data type, size, classification, and relationships with other data assets. Think of it as a list along with a description of tables, fields, and columns. The primary goal of a data dictionary is to help data teams understand data assets.
- Data Dictionary can be defined as collection of information of all data elements or contents of databases such as data types, text descriptions of system. It makes it easier for user and analyst to use data as well as understand and have common knowledge about inputs, outputs, components of a database, and intermediate calculations.
- A data dictionary is catalogue-responsibility-of the element in a system. As the name suggests, these elements are structured around data in a way to meet the use and the organization requirements. A data dictionary is a list of elements that composes all the data flow process through the system. It stores details and description of the flow, data store and processes.
- If analyst wants to know by what other means a table or a data item is referenced in the system or where it is being used, the answers are properly developed in the data dictionary.

5.4.1 FEATURE OF DATA DICTIONARY

- The volume of data in most information system is substantial more than a single analyst can easily keep track of the same. When the teams of analyst work on assistance the task of co-coordinating data definition becomes more complex. Individual depends on the information provided by others with their assumptions and the specification made by them.
- Data Dictionary is integral component of structured analysis. Since data flow diagram by themselves do not fully describe the subject of the investigation. The data dictionary provides additional information about system.

5.4.2 ANALYST USER THE DATA DIACTIONARY FOR FIVE IMPORTANT REASONS

1. To manage the detail in the large system.
2. To communicate a common meaning for all system element.
3. To facilitate analysis in order to determine where the changes are to be made.
4. To locate errors and omissions in the system.
5. To documents the features of the system.

- **Candidate Table**

Field Name	Data Type	Constraint	Description
firstname	String	-	Candidate's first name
Lastname	String	-	Candidate's last name
Email	String	Unique, Required	Candidate's email
Contact	String	-	Candidate's contact number
Role	String	-	Applied role/position
Resume	String	-	Resume file path/link
Status	String	Default: 'Pending'	Application status

5.4.2.1 candidate table

- **Coding answer Table**

Field Name	Data Type	Constraint	Description
Fullname	String	Required	Candidate's full name
Email	String	Required	Candidate's email
Score	Number	Required	Test score
SubmittedAt	Date	Default: Now	Submission timestamp
status	String	Default: 'Not Submitted'	Submission status

5.4.2.2 coding answer table

- **Role Table**

Field Name	Data Type	Constraint	Description
applicantName	String	Required	Name of the applicant
jobRole	String	Required	Applied job role/position
appliedAt	Date	Default: Now	Application submission date

5.4.2.3 role table

- **Progress Table**

Field Name	Data Type	Constraint	Description
CandidateId	ObjectId	Required, Unique	Reference to Candidate
Email	String	Required, Unique	Candidate's email
HrApproval	String	Default: 'Pending'	HR approval status
interview	String	Default: 'Not Scheduled'	Interview status
interviewDate	String	-	Scheduled interview date

5.4.2.4 progress table

- **Score Table**

Field Name	Data Type	Constraint	Description
Email	String	Required	Candidate's email
Score	Number	Required	Test score

5.4.2.5 score table

- **Gtest Table**

Field Name	Data Type	Constraint	Description
Email	String	Required	Candidate's email
Score	Number	Required	General test score

5.4.2.6 Gtest table

- **User Table**

Field Name	Data Type	Constraint	Description
FullName	String	Required	User's full name
Email	String	Unique	User's email address
Phone	String	-	User's phone number
password	String	Required	User's encrypted password
resetToken	String	-	Token for password reset
tokenExpiry	Date	-	Expiry date for reset token

5.4.2.7 user table

CHAPTER 6: IMPLEMENTATION

6.1 IMPLEMENTATION PLATFORM / ENVIRONMENT

The implementation platform and environment for the recruitment system will depend on the specific technology stack selected for the project. The system could be developed using a combination of front-end web development technologies such as HTML, CSS, and JavaScript, along with back-end server-side technologies such as PHP, Ruby on Rails, or Node.js. The database could be MySQL, PostgreSQL, MongoDB or another database management system.

6.2 PROCESS/PROGRAM/TECHNOLOGY/MODULES SPECIFICATION(S)

The recruitment system will be developed using the agile software development methodology. The software development process will involve several stages, including planning, requirements gathering, design, implementation, testing, and deployment. The project will use a variety of technologies and programming languages, such as HTML, CSS, JavaScript, PHP, MongoDB and MySQL, to develop the system's modules. The main modules of the recruitment system will include:

- Job Posting Module - Allows the employer to create job postings and manage applications for those postings.
- Application Tracking Module - Allows the employer to track the status of job applications and manage candidate information.
- Candidate Portal Module - Allows candidates to create profiles, search for job postings, and apply to jobs.
- Interview Scheduling Module - Allows employers to schedule and manage interviews with candidates.
- Reporting Module - Provides employers with reports on job postings, applications, and candidate data.

6.3 FINDING / RESULTS / OUTCOMES

The recruitment system aims to streamline the recruitment process by automating various tasks such as job posting, application tracking, and candidate management. By using an online system, the recruitment process will be more efficient and cost-effective, reducing the time and resources needed to recruit candidates.

The outcome of the recruitment system is expected to be a more streamlined and efficient recruitment process, with improved candidate experience and a reduced time-to-hire. The system should also enable better data management and reporting, allowing employers to make more informed recruitment decisions.

6.4 RESULT ANALYSIS / COMPARISON / DELIBERATIONS

The effectiveness of the recruitment system will be evaluated through various metrics such as the time-to-hire, cost per hire, and candidate experience. The system will be compared to the existing recruitment process to determine its effectiveness in streamlining the process and improving outcomes.

The implementation of the recruitment system may require changes in the recruitment process and the roles of employees involved. Deliberations will need to be made regarding how to implement the system without disrupting the current process and how to train employees to use the new system effectively. Additionally, security and privacy concerns must be addressed, such as ensuring that candidate data is protected and secure,

6.5 UI SCREENSHOTS

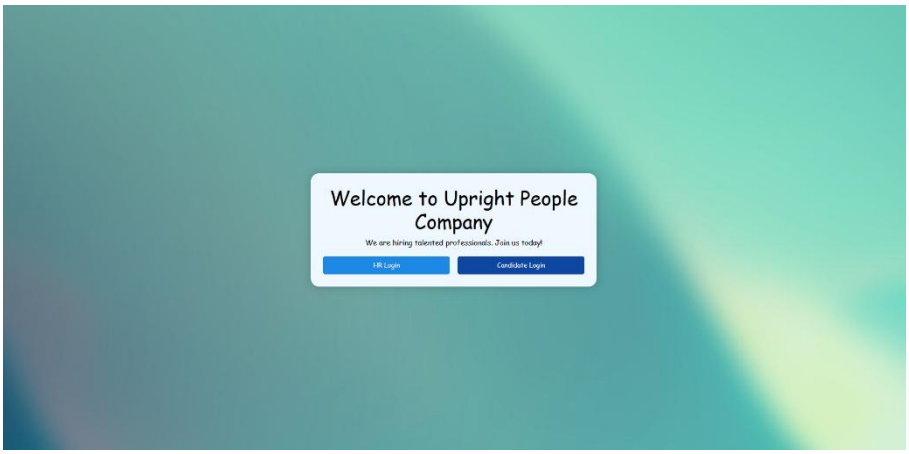


Fig. 6.5.1 Welcome Page

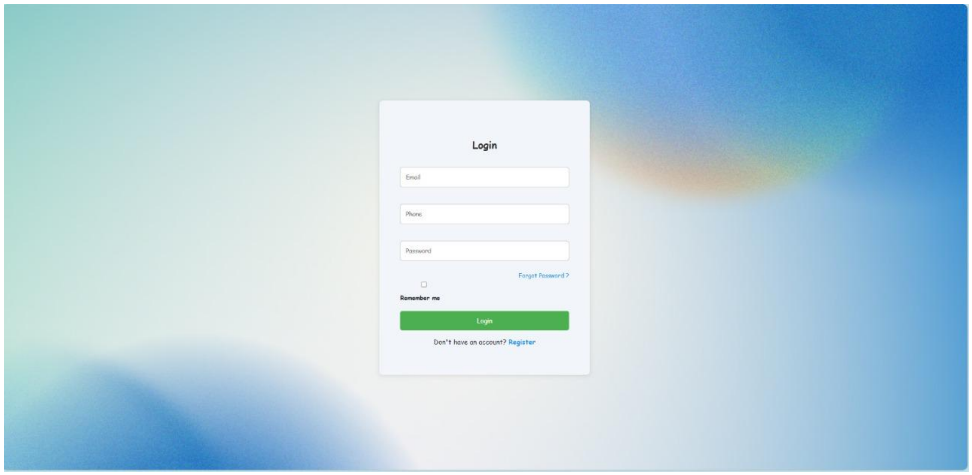


Fig. 6.5.2 Candidate/HR Login page

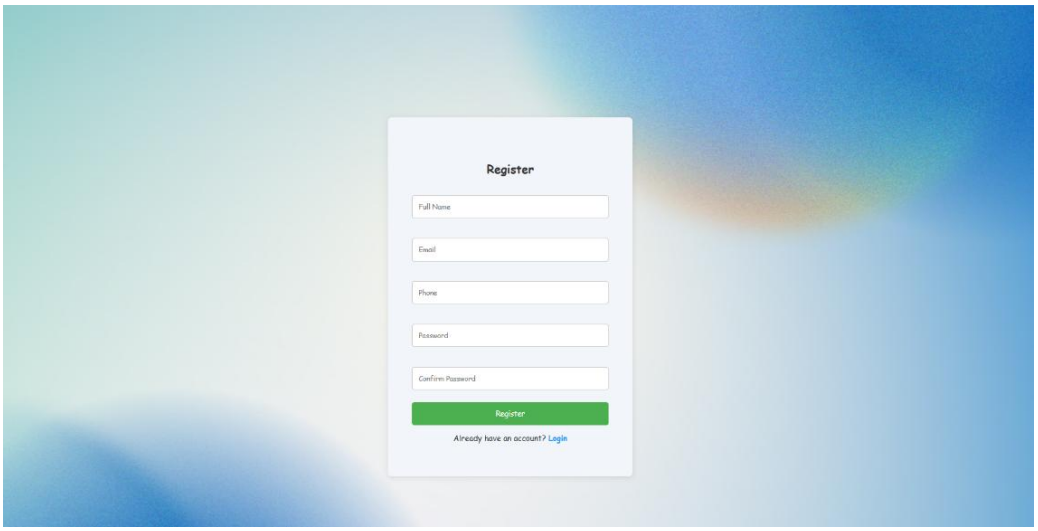


Fig.6.5.3 Candidate / HR Register Page

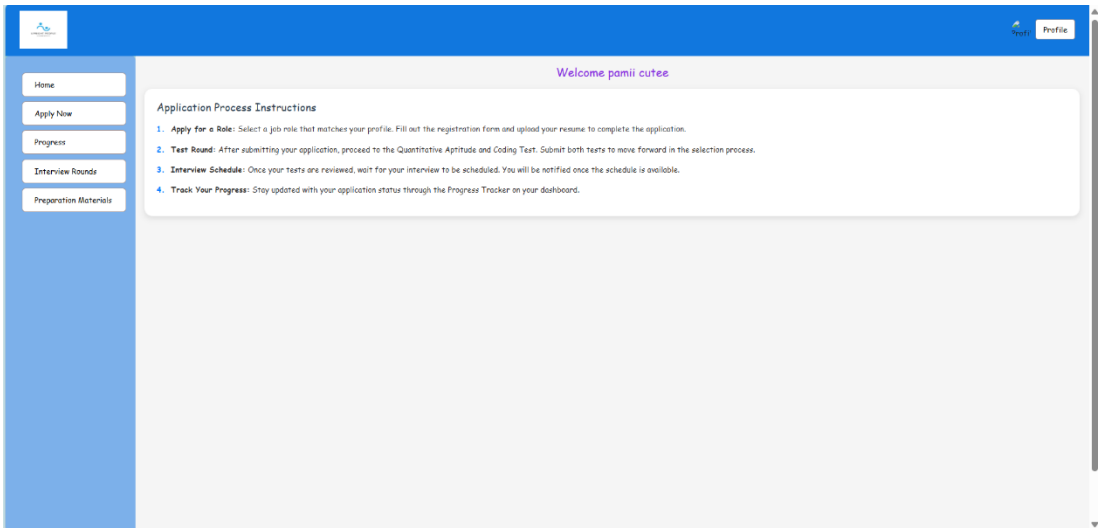


Fig. 6.5.4 Candidate side Dashboard

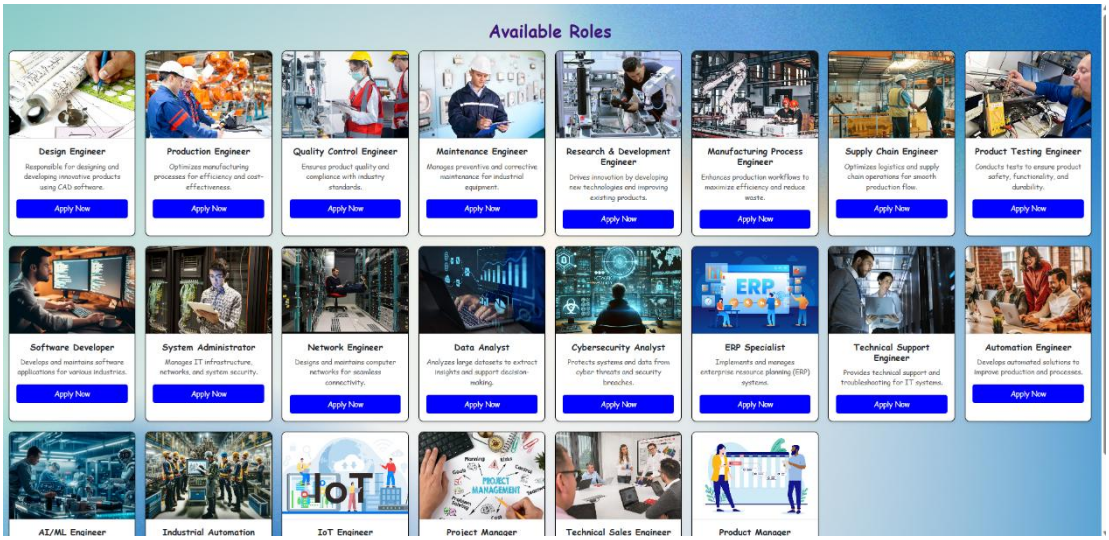


Fig. 6.5.5 Job Listing

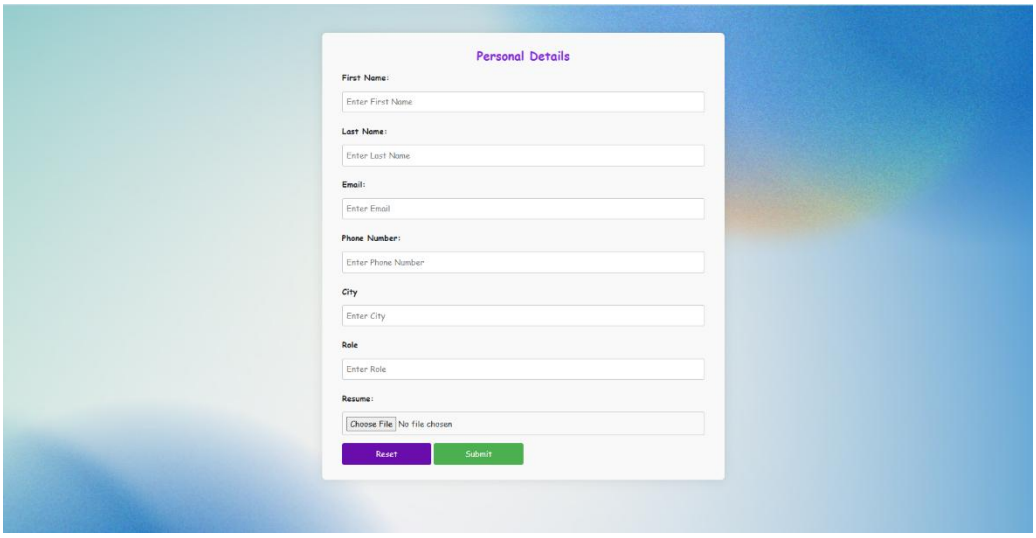


Fig. 6.5.6 Application Form

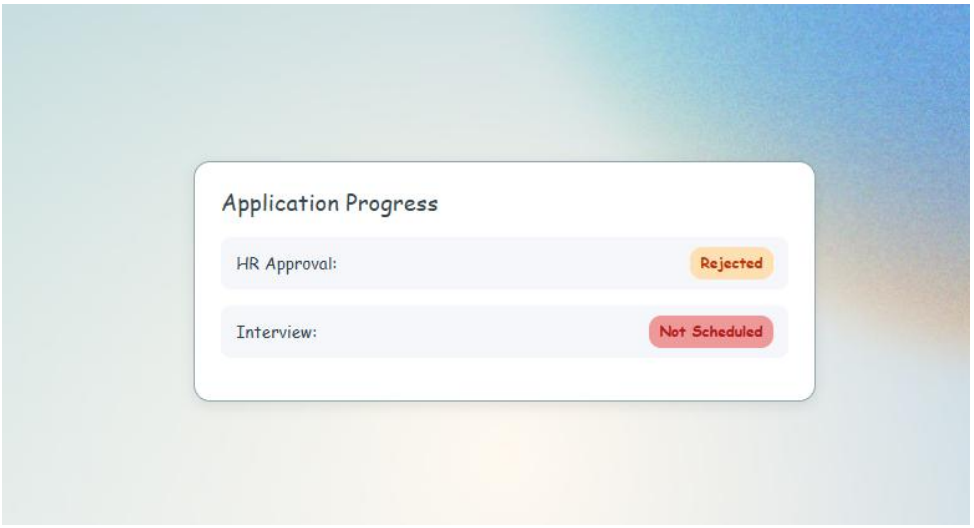


Fig. 6.5.7 Progress

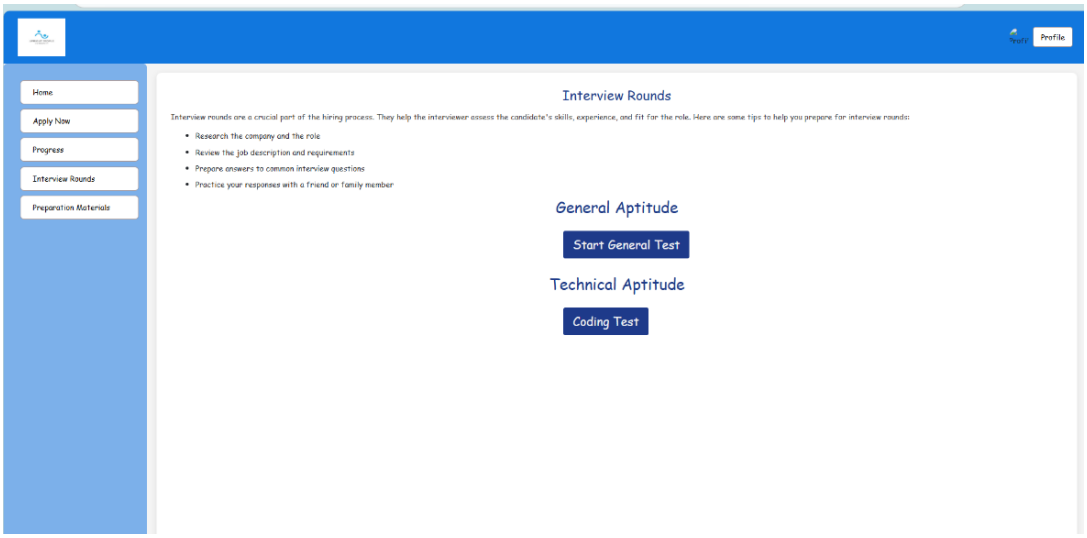


Fig. 6.5.8 Interview Round

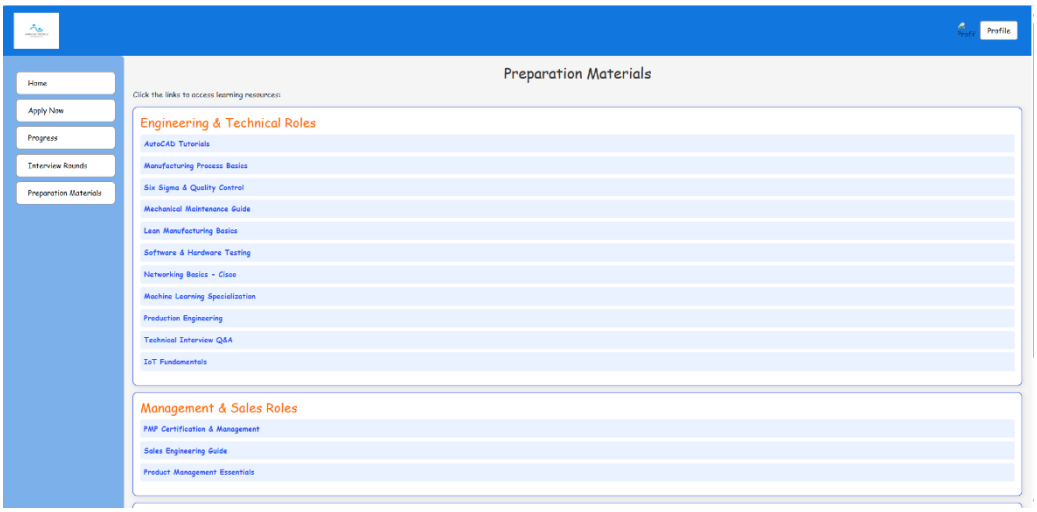


Fig. 6.5.9 Material

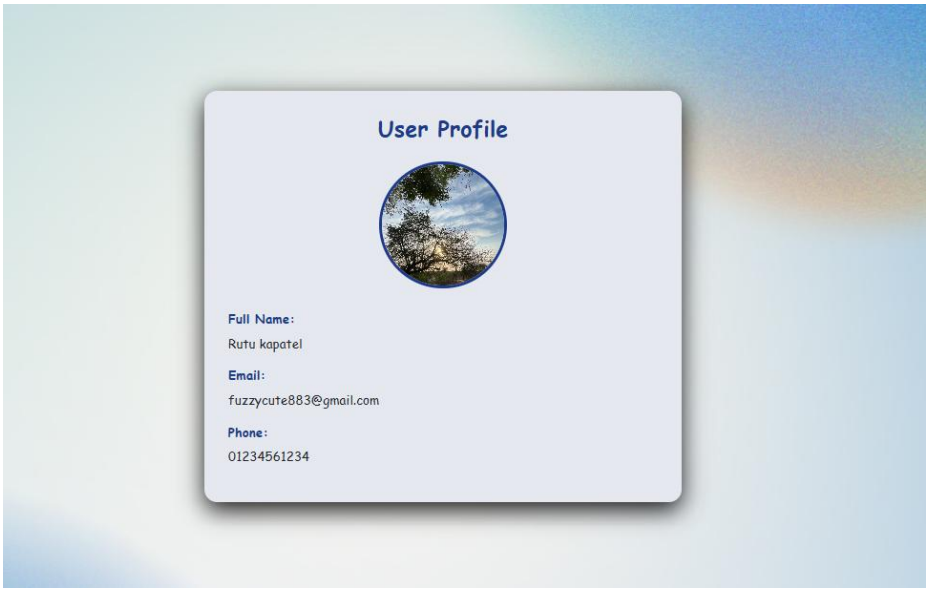


Fig.6.5.10 Profile

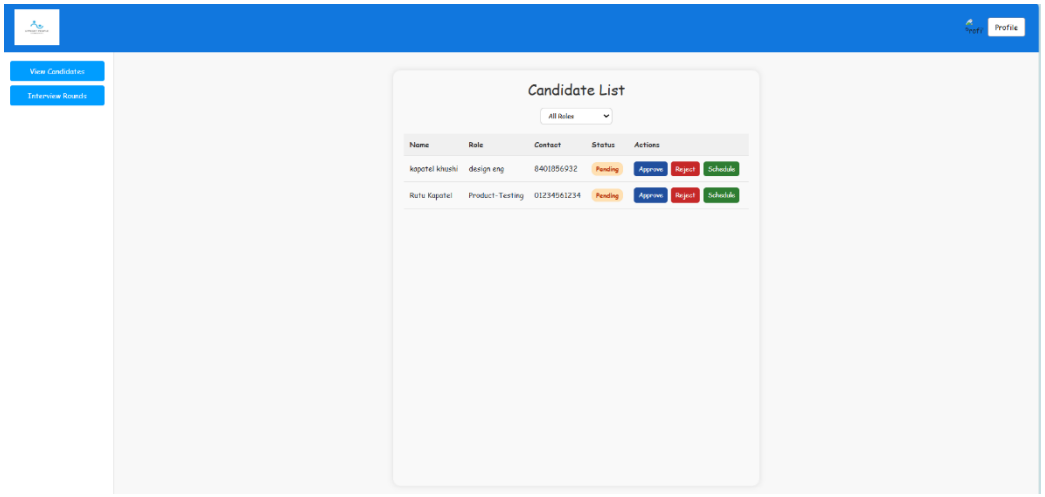


Fig.6.5.11 HR-side Dashboard

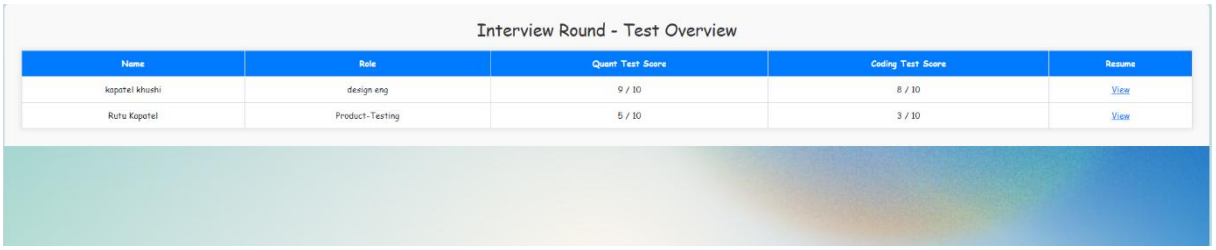


Fig.6.5.12 Test Score

6.6 Backend Details

- **Database Design**

  - Schema Design: Define MongoDB collections using Mongoose schemas for storing and validating structured data.
  - Model Creation: Create models based on the schemas to interact with collections.
  - Relationships: Handle one-to-one, one-to-many, and many-to-many relationships using schema references (ref) or embedded documents as required.

- **Business Logic**

  - Implement core backend logic using Express middleware and Mongoose methods.
  - Handle validation, authorization, and data manipulation before or after database interactions.
  - Use **Mongoose middleware (pre/post hooks)** for side-effects (e.g., hashing passwords before saving).

- **API Generation**
  - Create RESTful API endpoints using Express.js to expose functionalities to the frontend.
  - For this project, we used **Node.js with Express.js** as the web framework and **Mongoose** for MongoDB interactions.

- **Defining API Endpoints**

  Define endpoints for core operations like:
  - User Registration (POST /api/register)
  - User Login (POST /api/login)
  - Job Posting (POST /api/jobs)
  - Job Application (POST /api/apply)

- **Mapping API Endpoints to Controllers**

  - Create **route files** (e.g., authRoutes.js, jobRoutes.js) and map them to appropriate **controller functions**.
  - Each route handles one type of operation and forwards the request to a controller for processing.
  - Fetching Data (GET /api/jobs, GET /api/candidates/:id)

CHAPTER 7: Testing

7.1 TESTING PLAN / STRATEGY

Before implementing the Recruitment system, it is important to have a testing plan in place. The testing plan should outline the different types of testing that will be done, such as unit testing, integration testing, system testing, and acceptance testing. It should also specify who will be responsible for each type of testing, as well as the tools and techniques that will be used.

7.2 TEST RESULT AND ANALYSIS

After the testing plan is established, testing can begin. The Recruitment system will undergo various tests to ensure that it meets the requirements and functions as expected. Test results will be recorded and analyzed to identify any issues or bugs that need to be fixed.

7.2.1 Test cases (test id, test condition, expected output, actual output, remark)

Test cases will be created for each feature of the Recruitment system to ensure that it works as expected. Each test case will have a unique ID, test condition, expected output, actual output, and remark. Here is an example of a test case for the E-recruitment system:

- Test ID: ER001
- Test Condition: Submitting an application form with all required fields filled out
- Expected Output: The application form is submitted successfully
- Actual Output: The application form is submitted successfully
- Remark: Test passed

Each test case will be executed, and the actual output will be compared to the expected output. If there are any discrepancies, the issue will be noted and addressed by the development team. The testing process will continue until all test cases have been executed and passed, ensuring the Recruitment system is functioning correctly.

CHAPTER 8: CONCLUSION AND DISCUSSION

8.1 OVERALL ANALYSIS OF INTERNSHIP / PROJECT VIABILITIES

During the internship at Tech Elecon Pvt Ltd, I worked on the development of a Recruitment system, which aimed to streamline the hiring process and make it more efficient for the company. The project was designed to address the limitations of the current offline system, which is time-consuming and less efficient. The Recruitment system is an online recruitment platform that enables all senior managers and HR personnel to view and process applications in a smooth and efficient manner.

Throughout the internship, I learned about various technologies such as React JS, Node Js, Java Script, HTML/CSS, ASP.NET, Python, and Flutter. I also gained knowledge about the project development life cycle and worked in a professional environment, learning how to communicate effectively with team members and superiors.

8.2 PROBLEM ENCOUNTERED AND POSSIBLE SOLUTIONS

During the course of the project, some problems were encountered such as difficulty in integrating the system with existing systems, and some bugs in the system during the testing phase. These issues were resolved by seeking guidance from the project supervisor and making appropriate changes in the code.

8.3 SUMMARY OF INTERNSHIP / PROJECT WORK

The Recruitment system was designed to streamline the hiring process and make it more efficient for the company. The project was divided into several pages, including the Login page, HR Manager side, Senior Manager side, and Unit Head side. Each page had specific features designed to make the hiring process smoother and more effective.

The project was developed using various technologies such as React JS, Node Js, Java Script, HTML/CSS, ASP.NET, Python, and Flutter. The development process followed a project development life cycle, which included client requirement understanding, planning, development, review and QA, release or deployment, and maintenance.

Overall, the internship was a valuable learning experience that provided me with the opportunity to develop my skills and knowledge in a professional environment. The Recruitment system was a challenging project that enabled me to work with different technologies and learn about the project development life cycle.

8.4 LIMITATION AND FUTURE ENHANCEMENTS

The above system could benefit from several future enhancements that could improve its overall functionality, efficiency, and user experience. Firstly, the incorporation of artificial intelligence and machine learning technologies could enable the system to more accurately and efficiently identify and shortlist suitable candidates for job positions. This could also allow for more personalized recommendations for candidates based on their skills and experience. Secondly, integrating social media platforms like LinkedIn and Facebook into the system could improve recruitment efforts by allowing for targeted advertising and outreach to candidates who may not have otherwise come across job openings.

Additionally, optimizing the system for mobile devices could improve accessibility and convenience for employers and candidates alike. Enhancing the system's analytics and reporting capabilities could also provide recruiters and hiring managers with better insights into the recruitment process, enabling them to identify areas for improvement. Finally, incorporating collaboration and communication tools into the system could improve the coordination and efficiency of the recruitment process, facilitating scheduling and coordination among recruiters and hiring managers. These future enhancements could ultimately help streamline the recruitment process and make it more effective for all parties involved.

8.5 CONCLUSION

In conclusion, the above system is a comprehensive e-recruitment platform that can greatly benefit organizations seeking to streamline their recruitment process, reduce recruitment costs, and improve the overall recruitment experience for both employers and candidates. The system's web-based interface, applicant tracking systems, job portals, and video interviewing tools, among other features, make it a robust and efficient solution for modern recruitment needs. While there is always room for improvement, particularly in terms of incorporating emerging technologies and enhancing the system's analytics and reporting capabilities, the above system provides a solid foundation for efficient and effective recruitment practices. Ultimately, the above system has the potential to greatly benefit organizations seeking to optimize their recruitment efforts and identify the best candidates for their job openings.

REFRENCES

1. e-recruitment (e-recruiting) (author: Patrick Thibodeau, Senior News Writer) https://www.techtarget.com/searchhrsoftware/definition/e-recruiting

2. A Study On Online Recruitment (E-Recruitment) Portals Adoption (Usage): Role Of Demographics In Kolkata City http://journal.iujharkhand.edu.in/A-Study-On-Online-Recruitment.html

3. E-Recruitment System: The Effectiveness of the internet as a Recruitment Source (author: Erica R. Marr , Queensland University of Technology)

4. E-Recruitment: Practices, Opportunities and Challenges (author: Ugo Chuks Okolie and Ikechukwu Emmanuel Irabor