Hamdard University

Department of Computing

Final Year Project

HR System for Hiring

FYP-018/FL24

Software Design Specifications

Submitted by
Muhammad Hassan (1669-2021)
Ramiz Shahnawaz (1678-2021)
Shayan Yar Khan (1889-2021)

Supervisor(s)
Aamir Hussain
Maaz Ahmed

Fall 2021

Document Sign off Sheet

Document Information

Project Title	HR System for Hiring
Project Code	FYP-018/FL24
Document Name	Software Design Specifications
Document Version	<1.0>
Document Identifier	FYP-018/FL24-SDS
Document Status	Draft
Author(s)	Muhammad Hassan, Ramiz Shahnawaz, Shayan Yar Khan
Approver(s)	Aamir Hussain, Maaz Ahmed
Issue Date	16-01-2025

Name	Role	Signature	Date
Muhammad Hassan	Team Lead		16-01-2025
Ramiz Shahnawaz	Team Member 2		16-01-2025
Shayan Yar Khan	Team Member 3		16-01-2025
Aamir Hussain	Supervisor		16-01-2025
Maaz Ahmed	Co-Supervisor		16-01-2025
	Project Coordinator		

Revision History

Date	Version	Description	Author
16-01-2025	1.0	First Draft	Ramiz Shahnawaz, Shayan Yar Khan

Definition of Terms, Acronyms, and Abbreviations

Term	Description
HR	Human Resources
CV	Curriculum Vitae
SRS	Software Requirement Specification
API	Application Programming Interface

Table of Contents

3. Introduction

3.1 Purpose of Document

3.2 Intended Audience

3.3 Document Convention

3.4 Project Overview

3.3 Scope

4. Design Considerations

4.1 Assumptions and Dependencies

4.2 Risk and Volatile Areas

5. System Architecture

5.1 Sytem Level Architecture

5.2 Software Architecture

6. Design Stratey

7. Detail System Design

7.1 Class Diagram

7.2 Database Design

7.2.1 ER Diagram

7.2.2 Data Dictionary

7.3 Application Design

7.3.1 Sequence Diagram

7.3.2 State Diagram

3. Introduction

The HR System will serve as a platform that simplifies the hiring process providing a seamless experience for candidates, HR personnel, and companies, ensuring the right fit for each position. Our goal is to minimize the gap between organizations, HR professionals and job applicants by developing an easy-to-use virtual platform with advanced features that help organizations, HR personnels in receiving and assessing resumes and applications, scheduling interviews, conducting tests, and shortlisting applicants based on job requirements and for Organization by finding the right fit for their open position without spending vast amount of cost and manpower.

3.1 Purpose of Document

This Software Design Specification (SDS) document details the architectural design and component details of the proposed HR System for Hiring. It helps the team to meet SRS compliance and contains technical descriptions that define how the development team will operate.

3.2 Intended Audience

The hiring practices followed today requires a vast amount of manual labor and time for gathering resumes, shortlisting candidates, and scheduling interviews, leading to inefficiencies, higher expenses, and longer hiring periods. Organizations struggle to find top talents, HRs are stressed out, and candidates aren't given enough opportunity during the hiring process.

- Project Team
- Supervisors and Evaluators
- End-users (Companies, HRs, Candidates

3.3 Document Convention

This document is prepared in Times New Roman 12pt font for the text and Arial 14pt bold for section headers and 16 for main heading.

3.4 Project Overview

The HR System will serve as a platform that simplifies the hiring process, providing a seamless experience for candidates, HR personnel, and companies, ensuring the right fit for each position. Our goal is to minimize the gap between organizations, HR professionals, and job applicants by developing an easy-to-use virtual platform with advanced features that help organizations and HR personnel in receiving and assessing resumes and applications, scheduling interviews, conducting tests, and shortlisting applicants based on job requirements, and for organizations to find the right fit for their open positions without spending vast amounts of cost and manpower.

3.5 Scope

The following significant elements will be a part of the project.

1. Improving the overall efficiency of HR processes and procedures.
2. Simplifying and optimizing hiring processes.
3. Provide organization to manage job openings, hire HR professionals, and automate shortlisting.
4. Allow HR professionals and Organizations to conduct assessments and schedule interviews.
5. Allow candidates to apply for jobs, give assessment, and attend interviews.

Not In Scope

1. Salary negotiations between HR and companies.
2. Candidate evaluation based on non-quantifiable criteria (e.g., cultural fit).

4. Design Considerations

ensuring a modular, scalable, and effective system while managing potential risks and dependencies is the main goal of HR System design considerations.

4.1 Assumptions and Dependencies

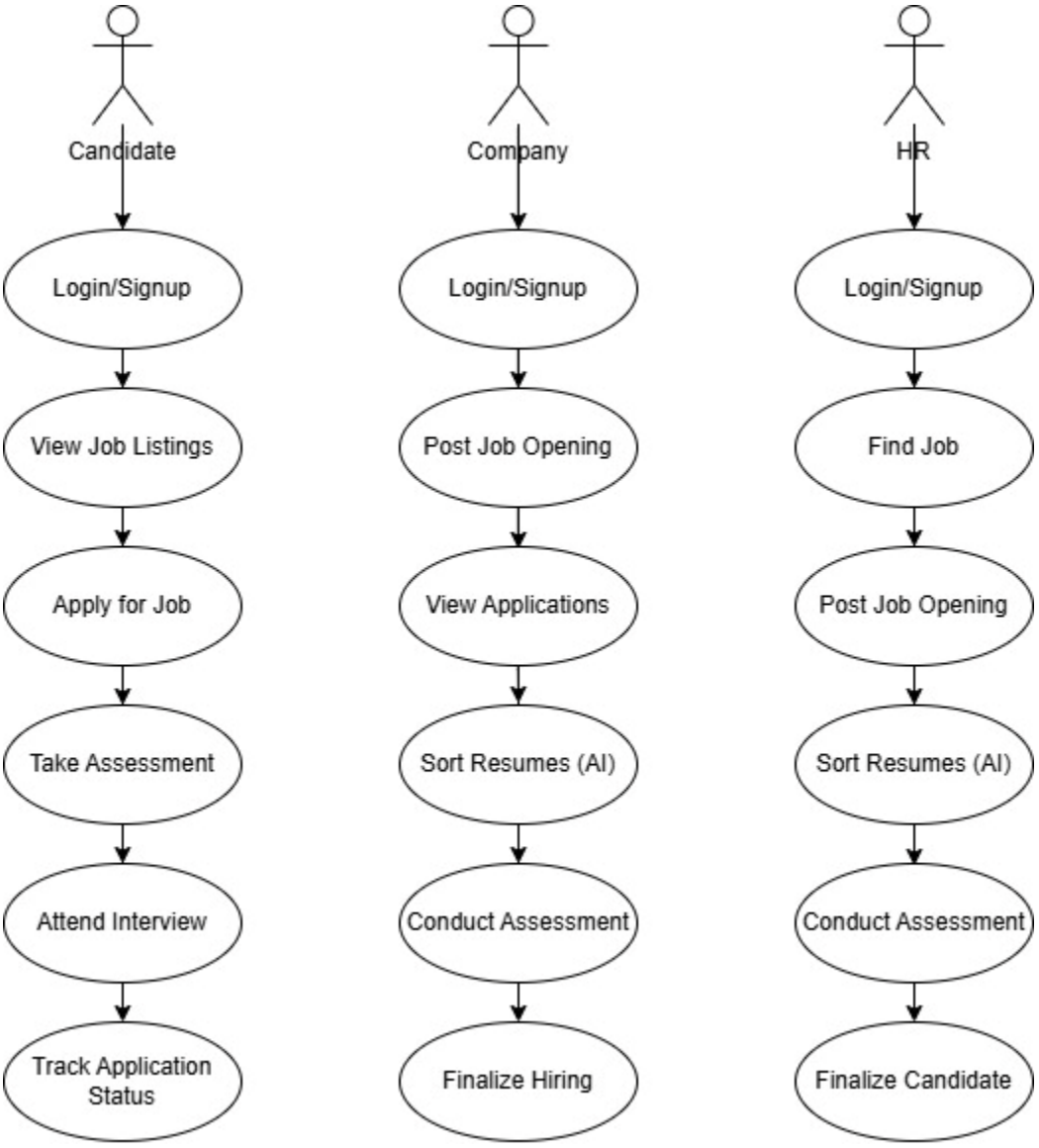
- The system makes assumptions that users—companies, human resources staff, and applicants—will have access to modern web browsers and stable internet connections.
- The system mostly relies on third-party APIs to provide necessary functions like real-time communication and email notifications.
- Scalability must be supported by the database infrastructure as the number of jobs and users grows over time.
- HR professionals who use the system are expected to be familiar with the basic understanding of online hiring procedures.

4.2 Risks and Volatile Areas

- Technology Risks: Relying on third-party APIs raises the possibility of problems if those services stop working or modify their privacy policies.
- User Adoption: Slower adoption rates or the need for more training may arise because of users limited technical knowledge.
- Scalability: During periods of high hiring demand, the system may have trouble managing an unexpected increase in users.
- Data privacy: To prevent legal problems, it is essential to make sure that data protection laws, such as the GDPR, are followed.
- Contingency Plans: Develop the system so that new features may be added and upgrades can be made in phases without affecting existing functionality.
- Setup backup plans for third-party services, including local storage for crucial tasks or alternative APIs.
- Test the system frequently under high-load situations to spot and fix scalability problems early.

5 System Architecture

5.1 System Level Architecture



5.2 Software Architecture

The software architecture follows a layered approach with separation of concerns and ease in maintenance.

User Interface Layer:

- Built with React.js to create responsive and dynamic interfaces.
- User-friendly portals for each role.

Middle Tier (Business Logic):

- Developed in Node.js using the Express.js framework.
- Core functionalities of job creation, candidate shortlisting, and interview scheduling.

Data Access Layer:

- Utilizes MongoDB to provide flexible and scalable data storage.
- There is an abstraction layer to ensure safe and efficient interaction with the database.

6 Design Strategy

The system design approach follows best practices for web application development while aiming for modularity, scalability, and reusability.

Future System Extension: The modular design makes it possible to add new capabilities without interfering with current operation, including advanced analytics or integration with new APIs.

System Reuse: Elements like the assessment tools and CV parser are made to be used across different modules.

User Interface Paradigms: To improve the user experience on all devices, a responsive, user-friendly design is used.

Data Administration: MongoDB is used to store data, providing high scalability and flexibility.

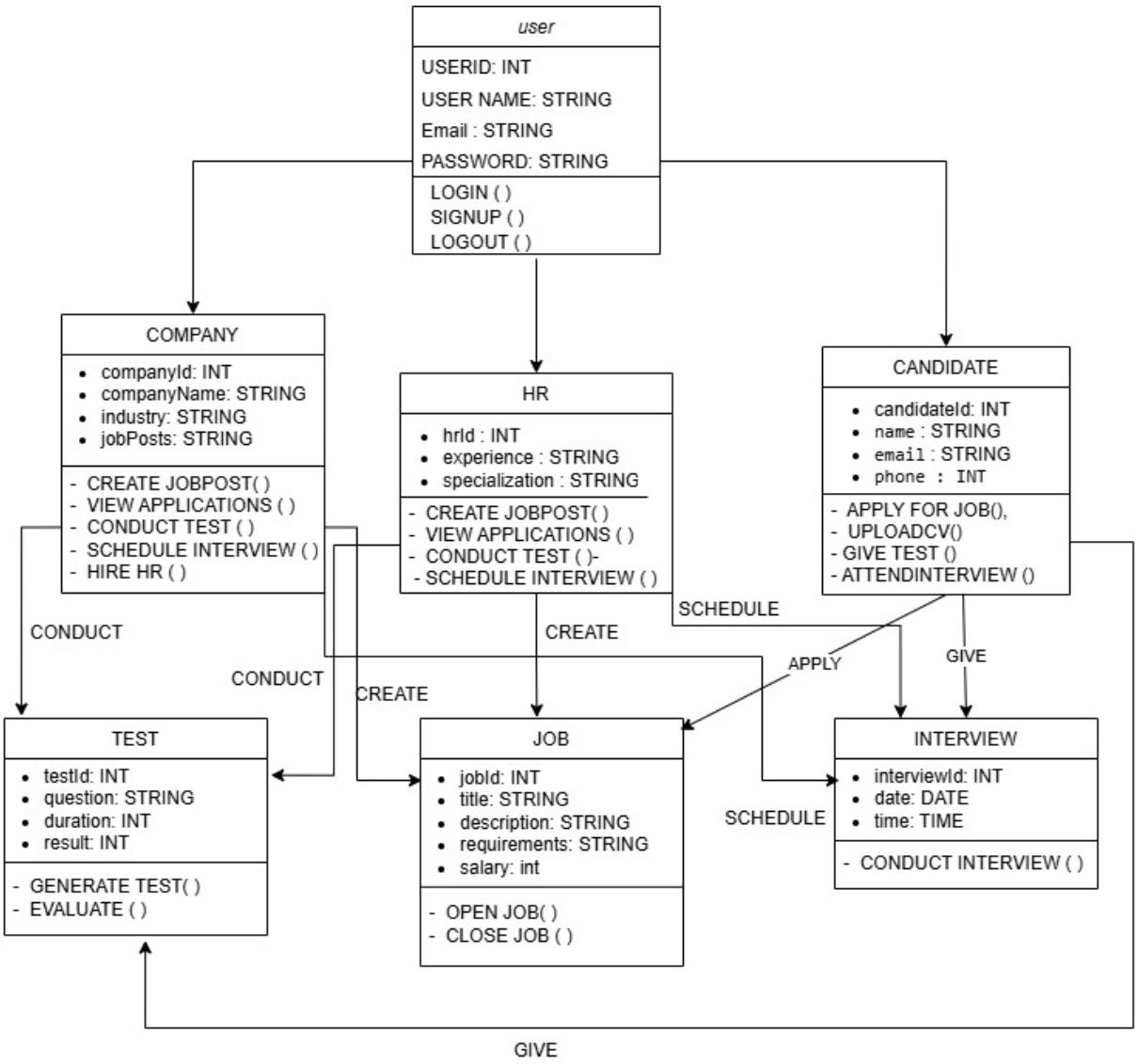
Synchronization and Concurrency:

- APIs are designed to manage several requests at once without experiencing any performance issues.

This approach ensures that the system will continue to be reliable, easy to use, and flexible enough to meet changing requirements.

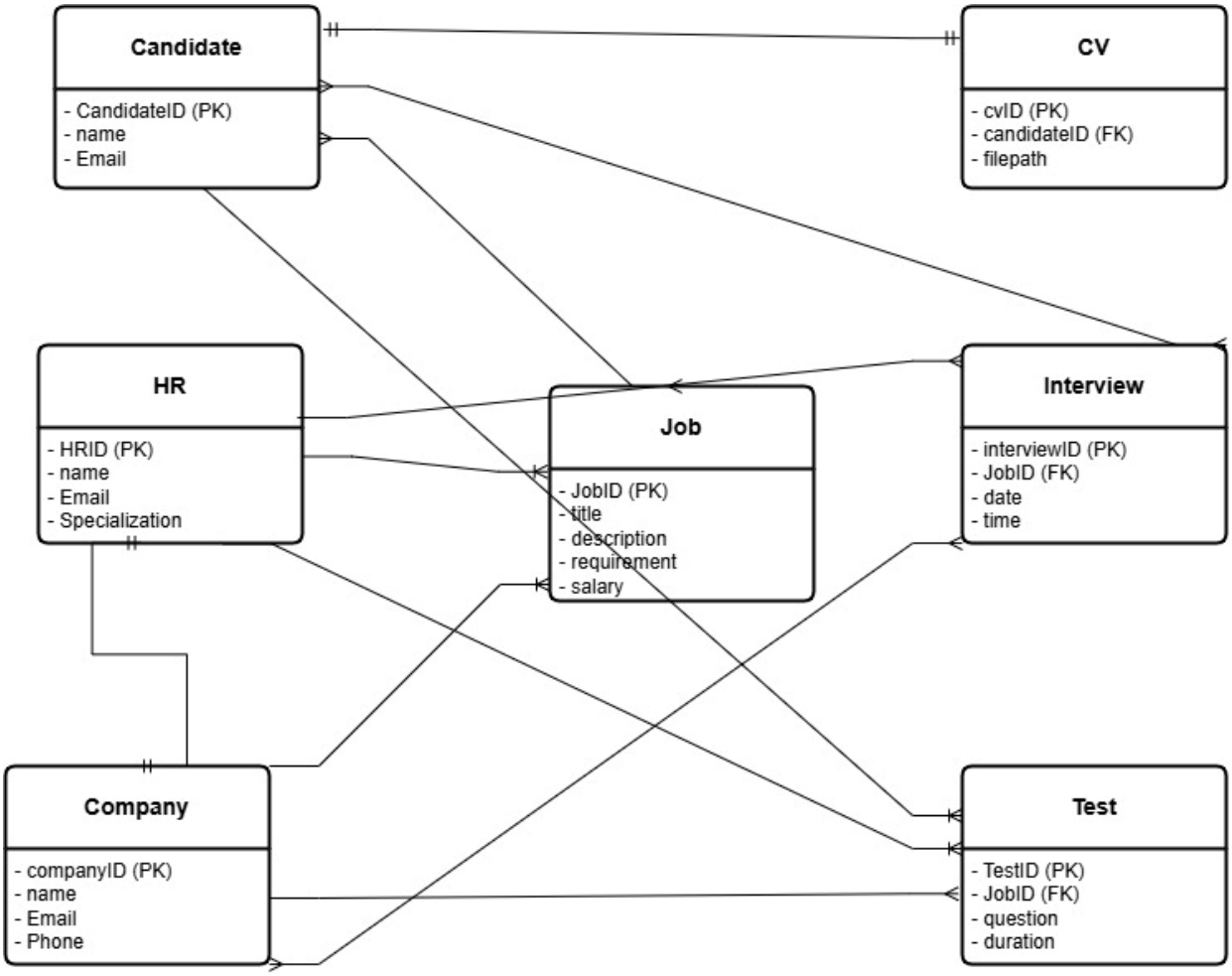
7 Detailed System Design

7.1 Design Class Diagram



7.2 Database Design

7.2.1 ER Diagram



7.2.2 Data Dictionary

Data 1: Company

Name	Company
Alias	Organization
Where-used/how-used	Used to store information about companies creating job postings and managing recruitment.
Content description	Stores details like company name, contact information, and location.

Column Name	Description	Type	Length	Nullable	Default Value	Key Type
companyID	Unique identifier for the company	INT	11	NO	NULL	PK
name	Name of the company	VARCHAR	255	NO	NULL	
email	Contact email of the company	VARCHAR	255	NO	NULL	
phone	Contact number of the company	VARCHAR	15	YES	NULL	

Data 2: HR

Name	HR
Alias	Human Resource Personnel
Where-used/how-used	Stores data for HR managing job posts, shortlisting candidates, and conducting tests.
Content description	Contains HR details, their specialization, and payment rates.

Column Name	Description	Type	Length	Nullable	Default Value	Key Type
hrID	Unique identifier for HR	INT	11	NO	NULL	PK
name	Name of the HR personnel	VARCHAR	255	NO	NULL	
email	Email of HR	VARCHAR	255	NO	NULL	
specialization	Area of expertise	VARCHAR	255	YES	NULL	

Data 3: Candidate

Name	Candidate
Alias	Job Seeker
Where-used/how-used	Used for storing candidate details such as applications and CVs for various jobs.
Content description	Holds information like candidate name, email, phone number, and CV file path.

Column Name	Description	Type	Length	Nullable	Default Value	Key Type
candidateID	Unique identifier for the candidate	INT	11	NO	NULL	PK
name	Name of the candidate	VARCHAR	255	NO	NULL	
email	Email address of the candidate	VARCHAR	255	NO	NULL	

Data 4: Job

Name	Job
Alias	Job Posting
Where-used/how-used	Represents open positions posted by companies and their related information.
Content description	Contains job details such as title, description, requirements, and salary information.

Column Name	Description	Type	Length	Nullable	Default Value	Key Type
jobID	Unique identifier for the job	INT	11	NO	NULL	PK
title	Job title	VARCHAR	255	NO	NULL	
description	Description of the job	TEXT	-	YES	NULL	
requirements	Requirements for the job	TEXT	-	YES	NULL	
salary	Salary offered for the job	FLOAT	8,2	YES	NULL	

Data 5: CV

Name	**CV**
Alias	Resume
Where-used/how-used	Stores information related to candidate resumes uploaded for job applications.
Content description	Contains the file path to the candidate's resume, linked to their profile.

Column Name	**Description**	**Type**	**Length**	**Nullable**	**Default Value**	**Key Type**
cvID	Unique identifier for the CV	INT	11	NO	NULL	PK
candidateID	Candidate associated with the CV	INT	11	NO	NULL	FK
filePath	Path to the uploaded CV file	VARCHAR	255	NO	NULL	

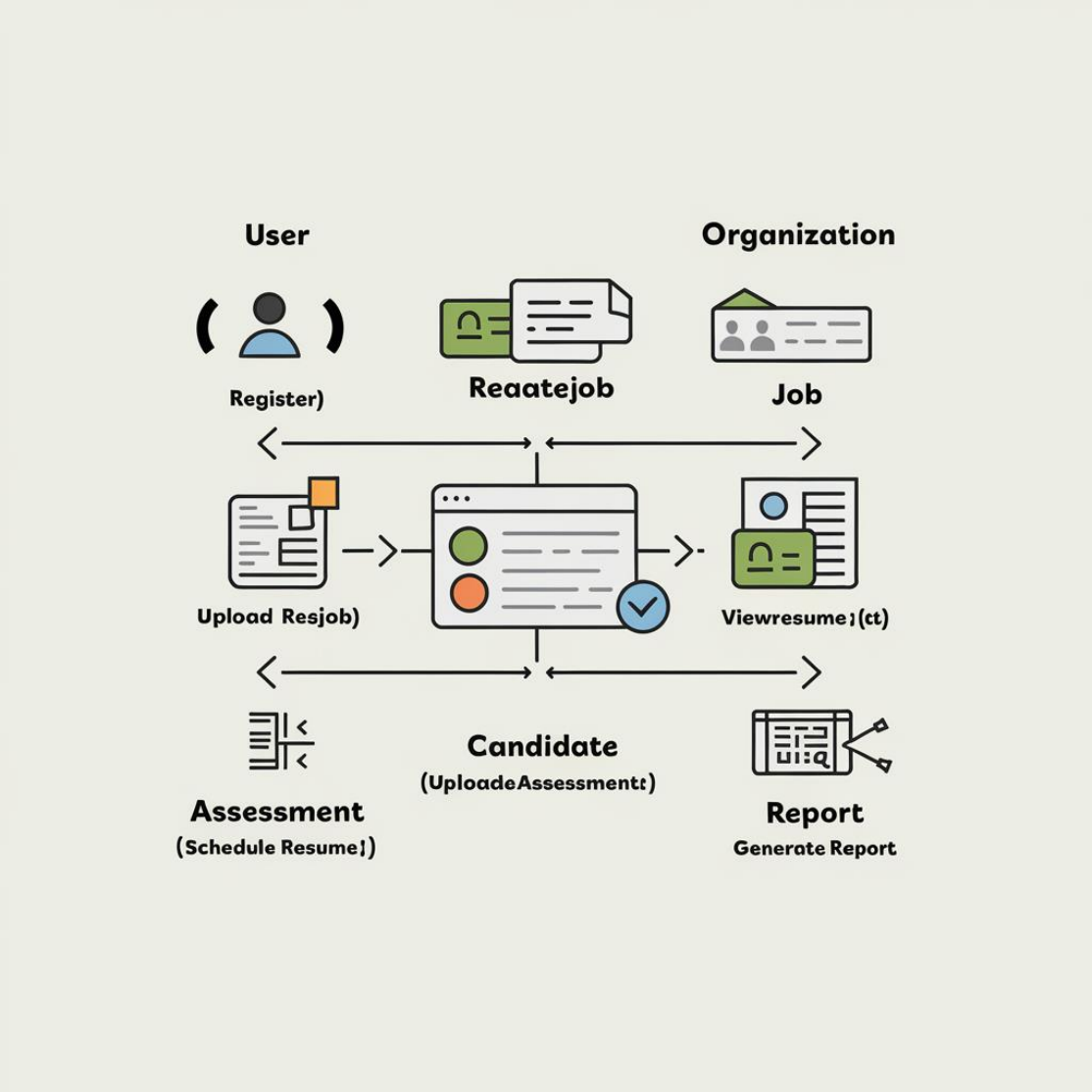
Data 6: Interview

Name	**Interview**
Alias	Meeting
Where-used/how-used	Represents the scheduled interviews for candidates for specific job positions.
Content description	Holds details about the interview date, time, location, and associated job and HR.

Column Name	**Description**	**Type**	**Length**	**Nullable**	**Default Value**	**Key Type**
interviewID	Unique identifier for the interview	INT	11	NO	NULL	PK
jobID	Job associated with the interview	INT	11	NO	NULL	FK
candidateID	Candidate attending the interview	INT	11	NO	NULL	FK
hrID	HR conducting the interview	INT	11	YES	NULL	FK
date	Scheduled date of the interview	DATE	-	NO	NULL	
time	Scheduled time of the interview	TIME	-	NO	NULL	

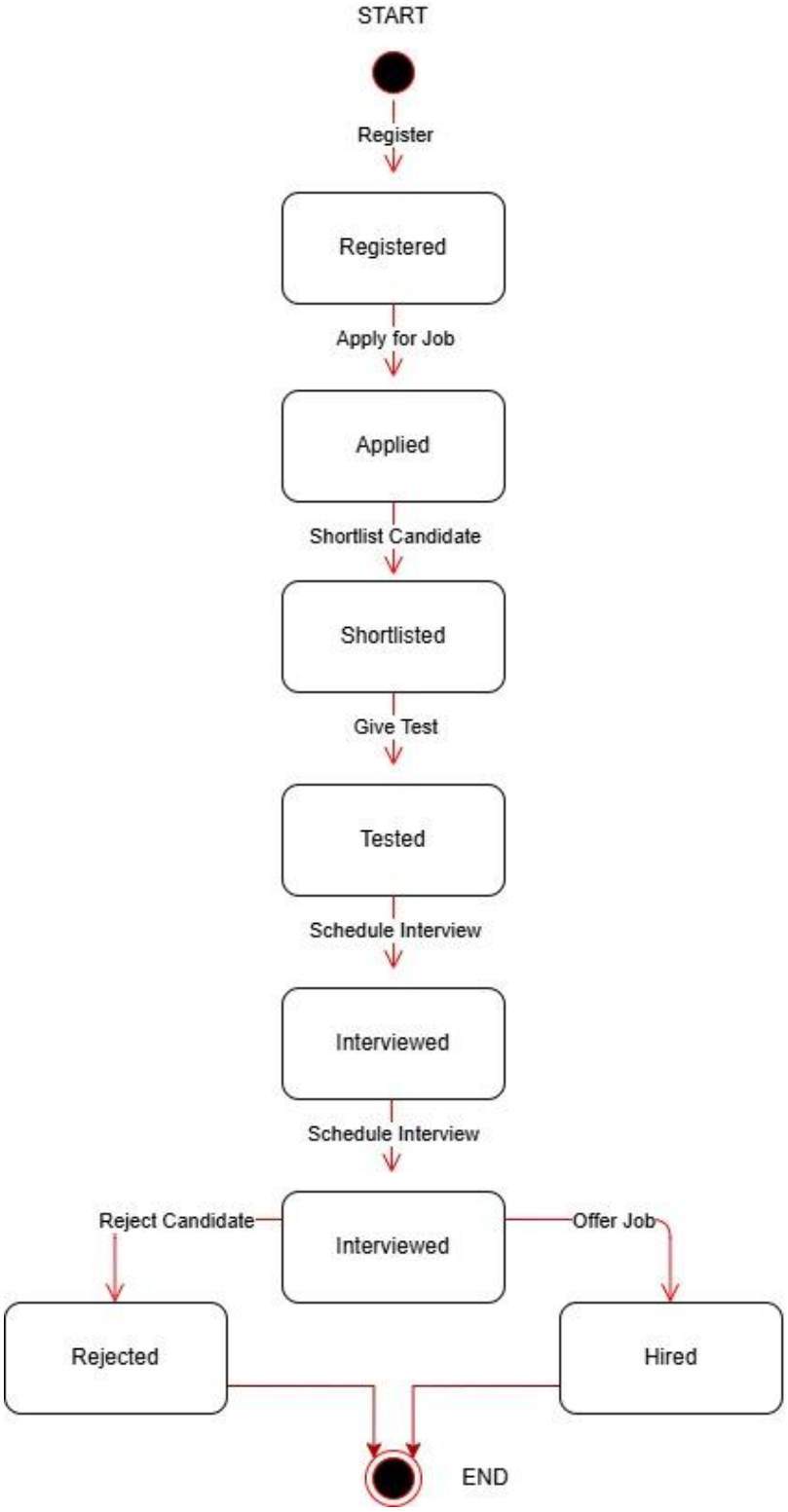
7.3 Application Design

7.3.1 Sequence Diagram

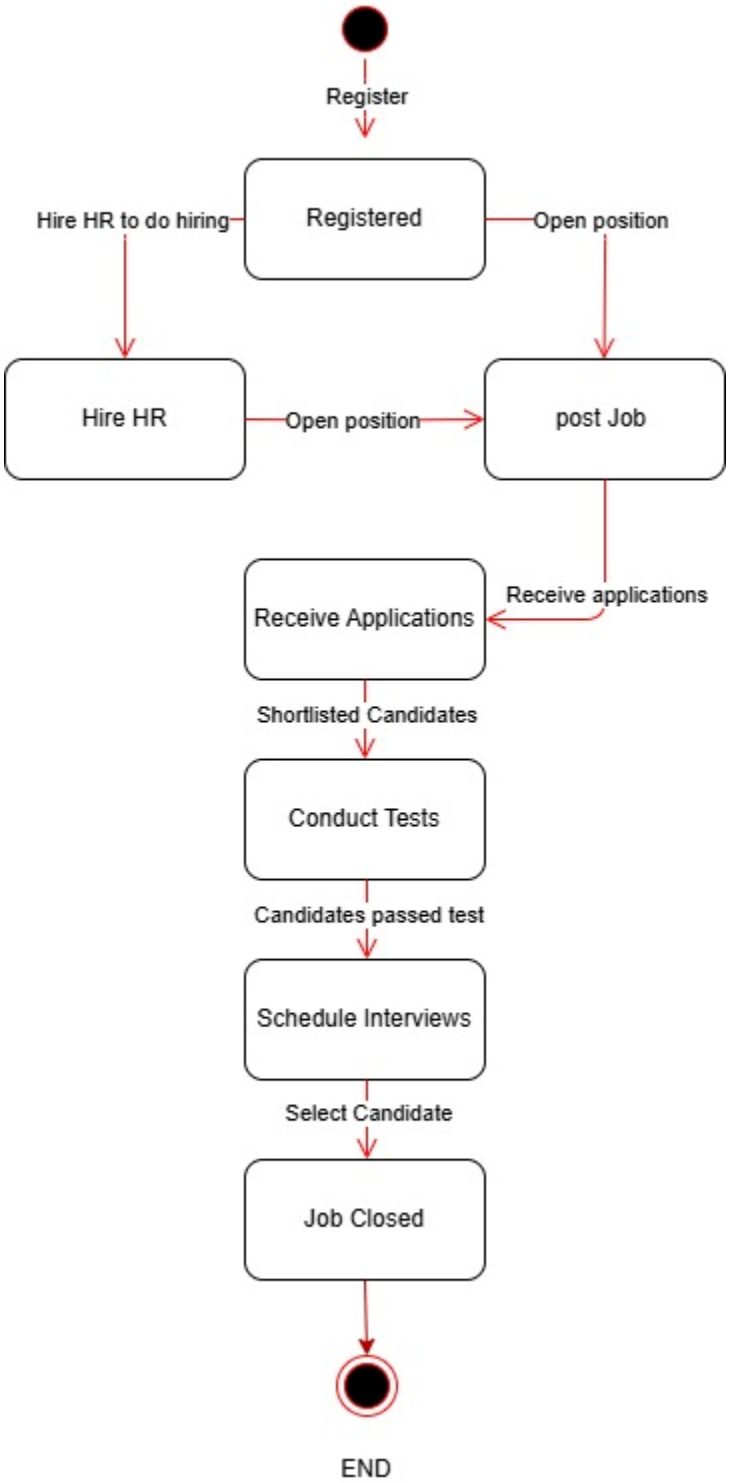


7.3.2 State Diagram

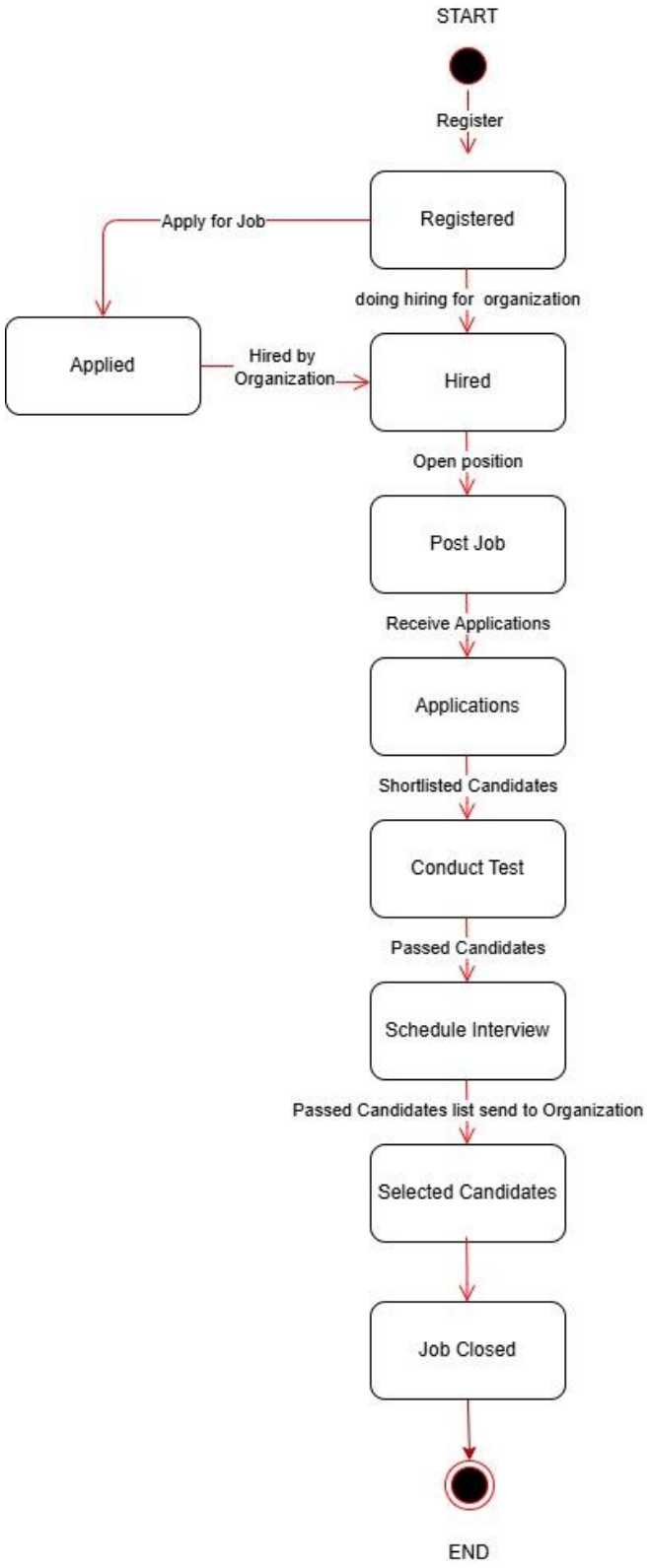
7.3.2.1 Candidate



7.3.2.2 Organization



7.3.2.3 HR


START
Register
Registered
Apply for Job
doing hiring for organization
Applied
Hired by Organization
Hired
Open position
Post Job
Receive Applications
Applications
Shortlisted Candidates
Conduct Test
Passed Candidates
Schedule Interview
Passed Candidates list send to Organization
Selected Candidates
Job Closed
END