Hamdard University

Department of Computing

Final Year Project

Recruit Right: Precision Hiring with AI Insight

FYP-029/FL24

Software Design Specifications

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Document Sign off Sheet

1.1.1 Document Information

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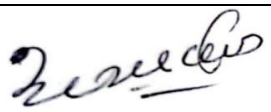
Muhammad Abdullah	*Team Member 2*		*17-01-25*
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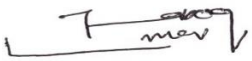
Dr. Umer Farooq	*Supervisor*		*17-01-25*
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Revision History

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Definition of Terms, Acronyms, and Abbreviations

Term	*Description*
NLP	*Natural Language Processing*
AI	*Artificial Intelligence*
HTML	*Hyper Text Markup Language*
CSS	*Cascading Style Sheet*
MongoDB	*Mongo Database*
SSL	*Secure Sockets Layers*
TLS	*Transport Layers Security*
HTTP	*Hyper Text Transfer Protocol*
API	*Application Programming Interface*
RESTful	*Representational State Transfer*
GDPR	*General Data Protection Regulation*
GUI	*Graphical User Interface*
DFD	*Data Flow Diagram*
SDK	*Software Development Kit*

2 Table of Contents

1 Introduction

This document outlines the comprehensive design, development, and deployment process for a technical interview outsourcing platform aimed at revolutionizing the hiring process for organizations. By automating key aspects of technical interviews, the platform offers a streamlined and scalable solution for conducting personality assessments, live coding sessions, and asynchronous video interviews, providing standardized evaluations and structured feedback from experts.

1.1 Purpose of Document

The purpose of this document is to provide a detailed overview of the project, including its objectives, scope, methodology, and design considerations. This document serves as a guide for the development team, stakeholders, and other personnel involved in the project to understand the structure and functionality of the proposed system.

*The intended design methodology for this project is **Object-Oriented Design (OOD)**, ensuring modularity, scalability, and ease of maintenance.*

1.2 Intended Audience

This document is intended for the following groups:

- ***Development Team:** Developers working on the front-end, back-end, and database systems.*
- ***Project Stakeholders:** Business decision-makers, recruiters, and delivery managers interested in streamlining their technical hiring processes.*
- ***Testing and QA Team:** Personnel responsible for ensuring the system meets functional and non-functional requirements.*
- ***System Administrators:** Professionals managing the deployment, scalability, and maintenance of the platform.*

1.3 Document Convention

The document follows these conventions for consistency and readability:

- ***Font:** Calibri*
- ***Font Size:** 12 for body text, 14 for headings, and 16 for section titles.*
- ***Formatting:***
    - *Bold for section headers and key terms.*
    - *Italics for emphasis.*
    - *Numbered lists for sequential information.*
    - *Bulleted lists for non-sequential details.*

1.4 Project Overview

The technical interview outsourcing platform automates and standardizes hiring processes by enabling organizations to:

- *Conduct personality assessments, live coding sessions, and video interviews remotely.*
- *Use NLP-powered resume screening for job-relevant keyword detection.*
- *Provide candidates with real-time, collaborative tools for coding and interview preparation.*
- *Deliver structured feedback and generate detailed reports to help organizations make informed decisions.*

*The system leverages a **micro services architecture** for scalability and **Object-Oriented Programming principles** to ensure robust modular design. The project includes an intuitive user interface connected to a reliable back-end system, integrating third party APIs such as Google Calendar and Google Forms for seamless operations.*

1.5 Scope

The scope of the project includes:

- ***Features:***
  - *Customizable interview plans created in collaboration with expert Interview Engineers.*
  - *A scalable network of skilled Interview Engineers for efficient candidate evaluations.*
  - *Reliable assessment processes using advanced algorithms and standardized evaluation rubrics.*
- ***Inclusions:***
  - *Development of a user-friendly front-end.*
  - *Integration with a back-end system to handle user data and job-specific workflows.*
  - *Testing the system with dummy data to ensure functionality and usability.*
  - *Deployment on Firebase for hosting and scalability.*
- ***Exclusions:***
  - *Integration with existing HR systems or proprietary algorithms outside the scope of public APIs.*
  - *Deep exploration of communication media beyond integrating Google Calender.*

By focusing on these defined objectives, the project aims to deliver a functional and impactful solution that simplifies hiring for organizations while maintaining clarity and feasibility.

2 Design Considerations

This section lays the foundation for the system design by addressing critical issues, assumptions, dependencies, risks, and strategies to mitigate potential challenges during the development process.

2.1 Assumptions and Dependencies

The project operates under the following assumptions and dependencies:

- ***Assumptions:***
    - *Users will have access to stable internet connections to conduct video interviews and use real-time coding features.*
    - *The platform will be accessed via modern web browsers that support HTML, CSS, and JavaScript.*
    - *The backend services, including databases and third-party APIs, will be reliable and available throughout the project.*
    - *The platform's functionality will be tested on dummy data before actual deployment, assuming the availability of necessary test cases and datasets.*
    - *The core technologies (HTML, CSS, JavaScript, Node.js, Firebase, and Python) will be compatible with the system requirements and will meet the scalability needs for initial deployment.*
- ***Dependencies:***
    - *The project relies on third-party APIs for certain functionalities, including resume analysis and interview evaluation, which may impact the development timeline based on availability and integration complexity.*
    - *The project's success is dependent on the availability of expert interviewers to validate the candidate evaluations and provide feedback.*
    - *The deployment of the platform on Firebase is dependent on the chosen hosting plan's scalability and support for the required infrastructure.*

Timely feedback and approval from the project supervisor and stakeholders are essential to ensure the project stays on track and meets its deadlines.

2.2 Risks and Volatile Areas

The following risks and potential sources of volatility could impact the design and development process:

1. ***Technology Changes:***
    - ***Risk:*** *Dependency on third-party APIs like Google Calender or Google Forms could lead to disruptions if API updates or service outages occur.*
    - ***Mitigation:*** *Use API versioning to maintain compatibility and have backup services integrated to minimize impact.*
2. ***Performance Bottlenecks:***
    - ***Risk:*** *Handling high user traffic, especially during peak hiring seasons, could result in performance degradation.*
    - ***Mitigation:*** *Employ a micro services architecture with load balancers and scalable Firebase functions to manage traffic efficiently.*
3. ***Data Privacy and Security:***
    - ***Risk:*** *Storing sensitive candidate and organization data exposes the platform to potential breaches.*
    - ***Mitigation:*** *Implement robust encryption mechanisms (SSL/TLS) and adhere to GDPR or other relevant data protection standards.*
4. ***User Adoption:***
    - ***Risk:*** *Poor user experience or lack of trust in automation tools may hinder adoption by key stakeholders.*
    - ***Mitigation:*** *Conduct usability testing and maintain clear documentation to enhance user confidence in the platform.*
5. ***Evolving Requirements:***
    - ***Risk:*** *Late-stage changes in feature requests or design specifications could disrupt timelines.*
    - ***Mitigation:*** *Use agile development practices to accommodate incremental changes without compromising project deadlines.*
6. ***Cheating Detection Mechanisms:***
    - ***Risk:*** *The accuracy and reliability of algorithms for detecting cheating during coding sessions are crucial and may need refinement.*
    - ***Mitigation:*** *Regularly update the cheating detection module with new patterns and test extensively on diverse datasets.*

By proactively addressing these considerations, the design will remain flexible, robust, and responsive to anticipated challenges, ensuring the platform's long-term success.

3 System Architecture

This section outlines the high-level organization of the system, focusing on the functional decomposition of its components, their interactions, and the underlying architectural strategies. The system is designed to streamline technical interviews by automating key processes and integrating with third-party tools for enhanced efficiency and scalability.

3.1 System Level Architecture

The system is decomposed into several key subsystems and components:

1. ***Subsystems and Components:***
    - ***User Management Subsystem:*** *Handles sign-ups, logins, and profile setups for all actors (Organizations, Candidates, Interview Engineers).*
    - ***Job Management Subsystem:*** *Manages job postings, resume uploads, and NER-based resume filtering.*
    - ***Interview Scheduling Subsystem:*** *Coordinates available slots for candidates and interviewers and generates meeting links.*
    - ***Assessment and Report Generation Subsystem:*** *Integrates with Google Forms for assessments and generates structured reports.*
    - ***Third-Party Integration Subsystem:*** *Interfaces with external systems like Google Calender and Google Forms.*
2. ***Relationships Between Elements:***
    - *Data flows from User Management to other subsystems for personalized experiences.*
    - *Job postings and resumes feed into the Interview Scheduling and Assessment Subsystems.*
    - *Reports are generated and shared with Organizations and Candidates after processing.*
3. ***Interfaces to External Systems:***
    - *Google Calender for interview coordination.*
    - *Google Forms API for assessments and rubric evaluations.*
4. ***Global Design Strategies:***
    - ***Error Handling:*** *Implement centralized logging and retry mechanisms for third-party API calls.*
    - ***Scalability:*** *Use cloud services (Firebase) for dynamic scaling based on load.*

3.2 Software Architecture

The software architecture is based on a layered design to separate concerns and enhance maintainability. Key layers include:

1. ***User Interface Layer:***
   - *Provides a web-based interface for all actors to perform their roles.*
   - *Facilitates real-time interactions, such as scheduling and joining interviews.*
2. ***Middle Tier:***
   - *Contains business logic, including resume filtering, interview scheduling, and report generation.*
   - *Acts as an intermediary between the User Interface Layer and the Data Access Layer.*
3. ***Data Access Layer:***
   - *Manages data storage and retrieval for user profiles, job details, resumes, interview schedules, and reports.*
   - *Utilizes Firebase as the primary database, ensuring scalability and real-time updates.*
4. ***Integration Layer:***
   - *Handles API calls to third-party services for scheduling and reporting.*

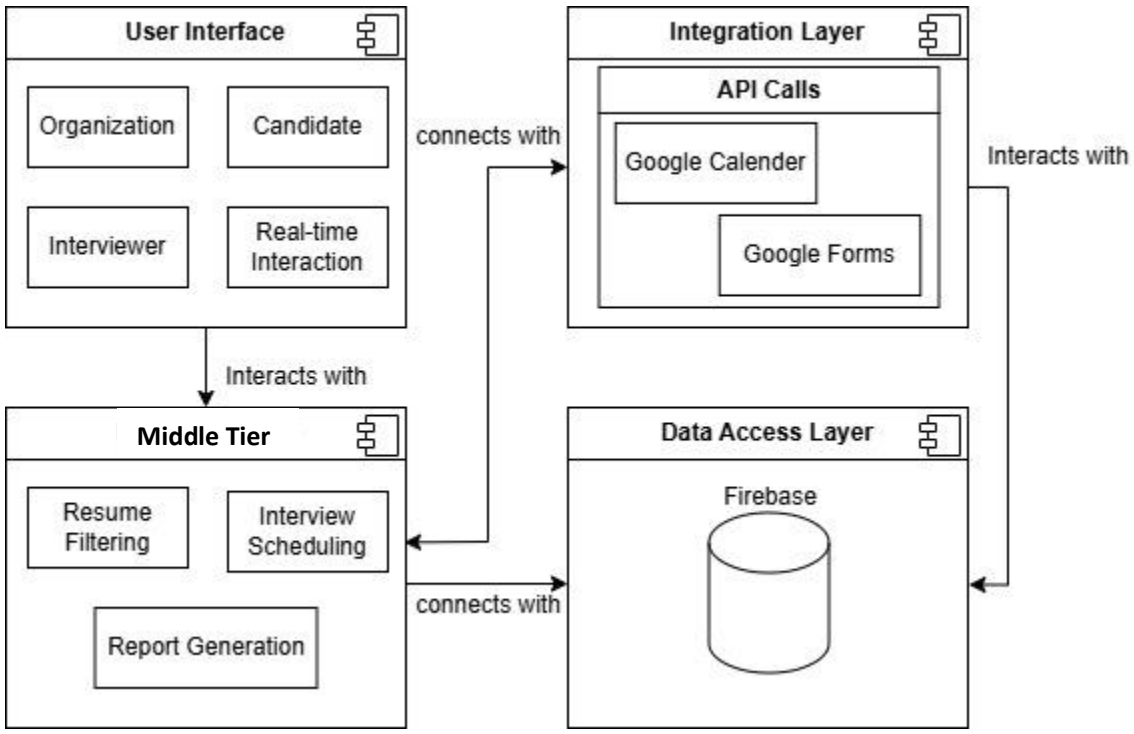


Figure 1: Tentative Software Architecture for Proposed System

4 Design Strategy

The design strategies for the system focus on achieving scalability, modularity, and maintainability while ensuring seamless integration with third-party tools. Below are the critical considerations and decisions impacting the overall organization of the system:

Future System Extension or Enhancement

- ***Strategy**: The system will adopt a modular architecture using micro services to isolate functionality into discrete components (e.g., resume parsing, interview scheduling, and report generation).*
    - ***Reasoning**: This ensures that individual modules can be updated or replaced without affecting the entire system.*
    - ***Trade-off**: Initial development may take longer due to the overhead of designing modular services, but the long-term benefit of scalability outweighs this drawback.*

System Reuse

- ***Strategy**: Common functionalities, such as authentication, notification services, and reporting, will be implemented as reusable components or libraries.*
    - ***Reasoning**: This reduces redundant code and ensures consistency across different system features.*
    - ***Trade-off**: Some upfront effort is required to design generic, reusable components.*

User Interface Paradigms

- ***Strategy**: A responsive, intuitive UI will be built using **Material Design principles** to ensure cross-platform compatibility and ease of use.*
    - ***Reasoning**: A clean, user-friendly interface reduces onboarding time for users and improves the overall experience.*
    - ***Trade-off**: Emphasis on responsiveness may increase complexity in frontend development, requiring additional testing.*

Data Management (Storage, Distribution, Persistence)

- ***Strategy**: A NoSQL database (e.g., Firebase) will be used to store semi-structured data such as resumes, user profiles, and reports. Real-time database capabilities will handle interview scheduling and progress tracking.*
    - ***Reasoning**: NoSQL databases offer flexibility in handling varied data formats and support horizontal scaling to manage growing data volumes.*
    - ***Trade-off**: Complex querying may require additional effort to optimize, as NoSQL systems are not as query-efficient as traditional relational databases.*

5 Detailed System Design

5.1 Design Class Diagram

This is the initial design of the class diagram, representing the key entities and their relationships in the system. It serves as a foundational structure and can be modified or extended as per evolving requirements.

5.1.1 Organization

- ***Attributes:***
  - *org_id: Unique identifier for the organization.*
  - *org_name: Name of the organization.*
  - *email: Contact email of the organization.*
  - *password: Encrypted password for secure access.*
  - *job_postings: A list of job postings created by the organization.*
- ***Methods:***
  - *signUp(): Registers the organization in the system, storing relevant details.*
  - *addJobDetails(): Allows the organization to create and manage job postings, which are stored in the job_postings attribute.*
- ***Interactions:***
  - *An Organization can create multiple JobPostings.*
  - *It receives reports for completed interviews through the Report class.*

5.1.2 JobPosting

- ***Attributes:***
  - *job_id: Unique identifier for the job posting.*
  - *job_title: Title of the job being offered.*
  - *job_description: Detailed description of the job role.*
  - *keywords: A list of keywords extracted from the job description, used for resume filtering.*
  - *resumes: A list of resumes submitted for the job posting.*
  - *status: Status of the job posting (e.g., "Open," "Closed").*
- ***Methods:***
  - *addJobPosting(): Adds a new job posting under an organization.*
  - *scanResumes(): Uses NER to filter resumes based on the keywords.*
- ***Interactions:***
  - *A JobPosting belongs to one Organization.*
  - *It contains multiple Resumes, which are scanned to find suitable candidates.*
  - *It is linked to InterviewSessions, which involve candidates applying for the job.*

5.1.3 Resume

- ***Attributes:***
  - *candidate_id: Identifier of the candidate who submitted the resume.*
  - *content: The actual content of the resume.*
  - *ner_score: A score derived from the NER tool based on how well the resume matches the job posting.*
- ***Methods:***
  - *evaluateKeywords(): Analyzes the resume content for matching keywords and assigns a score.*
- ***Interactions:***
  - *Each Resume is associated with one Candidate.*
  - *It is part of a JobPosting's list of submitted resumes.*

5.1.4 Candidate

- ***Attributes:***
  - *candidate_id: Unique identifier for the candidate.*
  - *name: Name of the candidate.*
  - *email: Candidate's email address.*
  - *password: Encrypted password for secure access.*
  - *profile: A detailed profile of the candidate (e.g., experience, skills).*
  - *available_slots: A list of time slots when the candidate is available for an interview.*
- ***Methods:***
  - *signUp(): Registers the candidate in the system.*
  - *createProfile(): Enables the candidate to add details like experience and skills.*
  - *selectSlots(): Allows the candidate to choose their availability for interviews.*
- ***Interactions:***
  - *Each Candidate has one Profile.*
  - *Candidates submit resumes to JobPostings and are matched based on the NER score.*
  - *Candidates are involved in InterviewSessions and receive reports post-interview.*

5.1.5 Profile

- ***Attributes:***
  - *experience: Candidate's work experience.*
  - *skills: A list of the candidate's skills.*
- ***Interactions:***
  - *The Profile belongs to a Candidate and is used during resume filtering and interview processes.*

5.1.6 Interviewer

- ***Attributes:***
  - *interviewer_id: Unique identifier for the interviewer.*
  - *name: Name of the interviewer.*
  - *email: Contact email for the interviewer.*
  - *password: Encrypted password for secure access.*
  - *specialty: The interviewer's area of expertise.*
  - *assigned_interviews: A list of interviews the interviewer is scheduled to conduct.*
- ***Methods:***
  - *signUp(): Registers the interviewer in the system.*
  - *selectCandidate(): Enables the interviewer to pick a candidate for an interview.*
- ***Interactions:***
  - *Interviewers conduct multiple InterviewSessions, which are linked to Candidates and JobPostings.*

5.1.7 InterviewSession

- ***Attributes:***
  - *session_id: Unique identifier for the interview session.*
  - *candidate: Reference to the Candidate being interviewed.*
  - *interviewer: Reference to the Interviewer conducting the session.*
  - *job_posting: Reference to the JobPosting the candidate applied for.*
  - *meeting_link: Link to the Google Meet/Zoom interview session.*
  - *scheduled_at: Scheduled date and time of the interview.*
  - *assessment_form_link: Link to the Google Form for assessment.*
  - *report: The report generated after the interview.*
- ***Methods:***
  - *schedule(): Schedules an interview session for a Candidate and Interviewer.*
  - *conductInterview(): Tracks the interview process.*
  - *generateReport(): Generates a detailed report based on the interviewer's assessment.*
- ***Interactions:***
  - *Links Candidates, Interviewers, and JobPostings for interviews.*
  - *Generates a Report that is shared with the Organization and Candidate.*

5.1.8 Report

- ***Attributes:***
  - *report_id: Unique identifier for the report.*
  - *content: Detailed assessment of the interview.*
  - *organization: Reference to the Organization that posted the job.*
  - *candidate: Reference to the Candidate who was interviewed.*

- ***Methods:***
  - *generate(): Creates the report based on the Google Form assessment.*
  - *send(): Shares the report with the Organization and Candidate.*
- ***Interactions:***
  - *Each Report is associated with one InterviewSession.*
  - *It is sent to the Organization and Candidate for further evaluation.*

5.1.9 Key Interactions Between Classes

1. ***Organization and JobPosting:***
   - *Organizations create multiple JobPostings.*
   - *JobPostings contain Resumes submitted by Candidates.*
2. ***Candidate and Profile:***
   - *Each Candidate has one Profile, which stores their skills and experience.*
3. ***JobPosting and Resume:***
   - *JobPostings contain a list of Resumes.*
   - *Resumes are filtered using NER to match job requirements.*
4. ***Candidate, Interviewer, and InterviewSession:***
   - *Interviewers select available Candidates for InterviewSessions.*
   - *Each InterviewSession involves one Candidate, one Interviewer, and a JobPosting.*
5. ***InterviewSession and Report:***
   - *Each InterviewSession generates a Report, which is shared with the Organization and Candidate.*

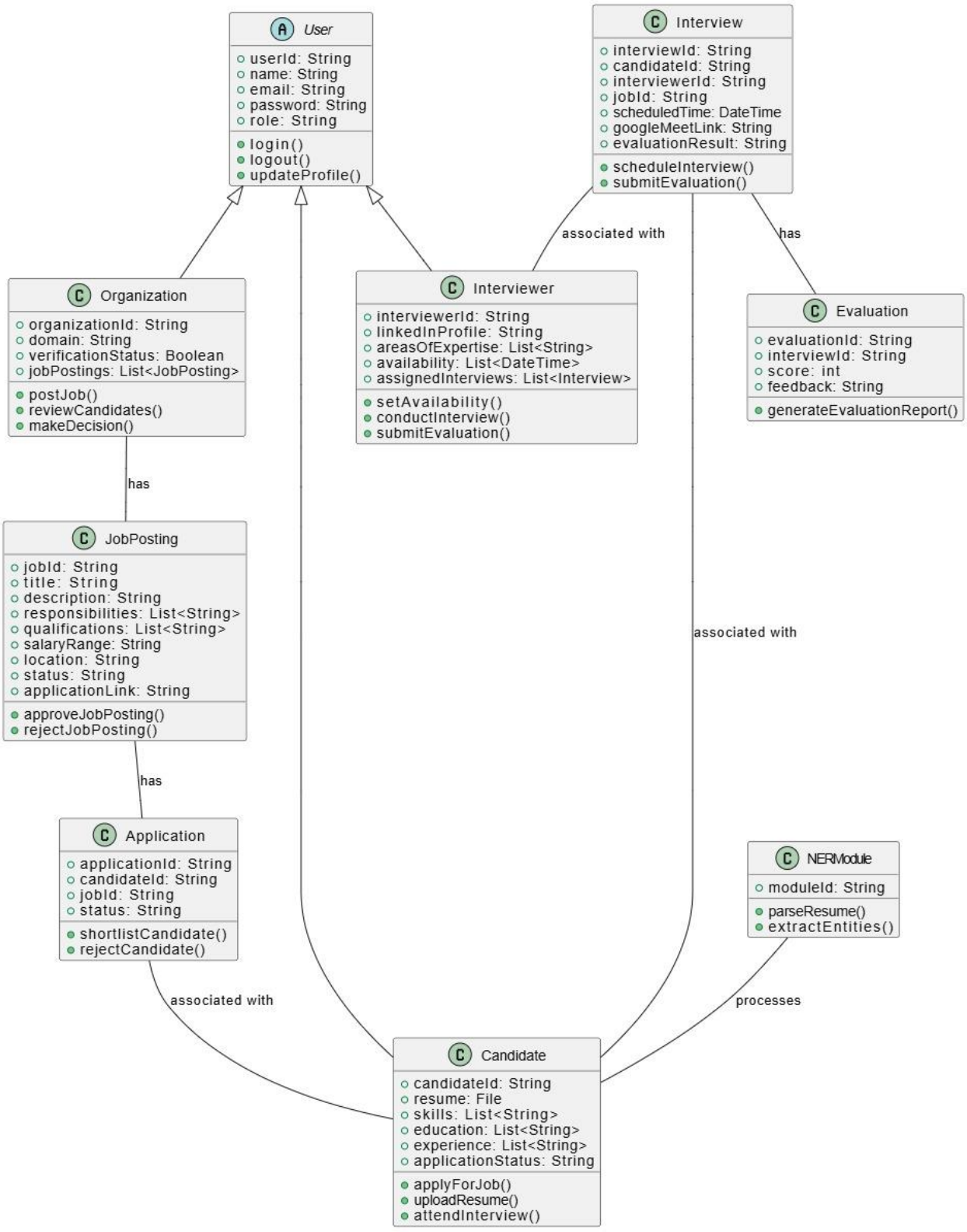


Figure 2: Tentative Class Diagram for Recruit Right

5.2 Database Design

This is the initial design of the database, outlining the core entities and their attributes. It serves as a foundational structure and can be modified or extended as needed to accommodate additional requirements or system enhancements.

5.2.1 ER Diagram

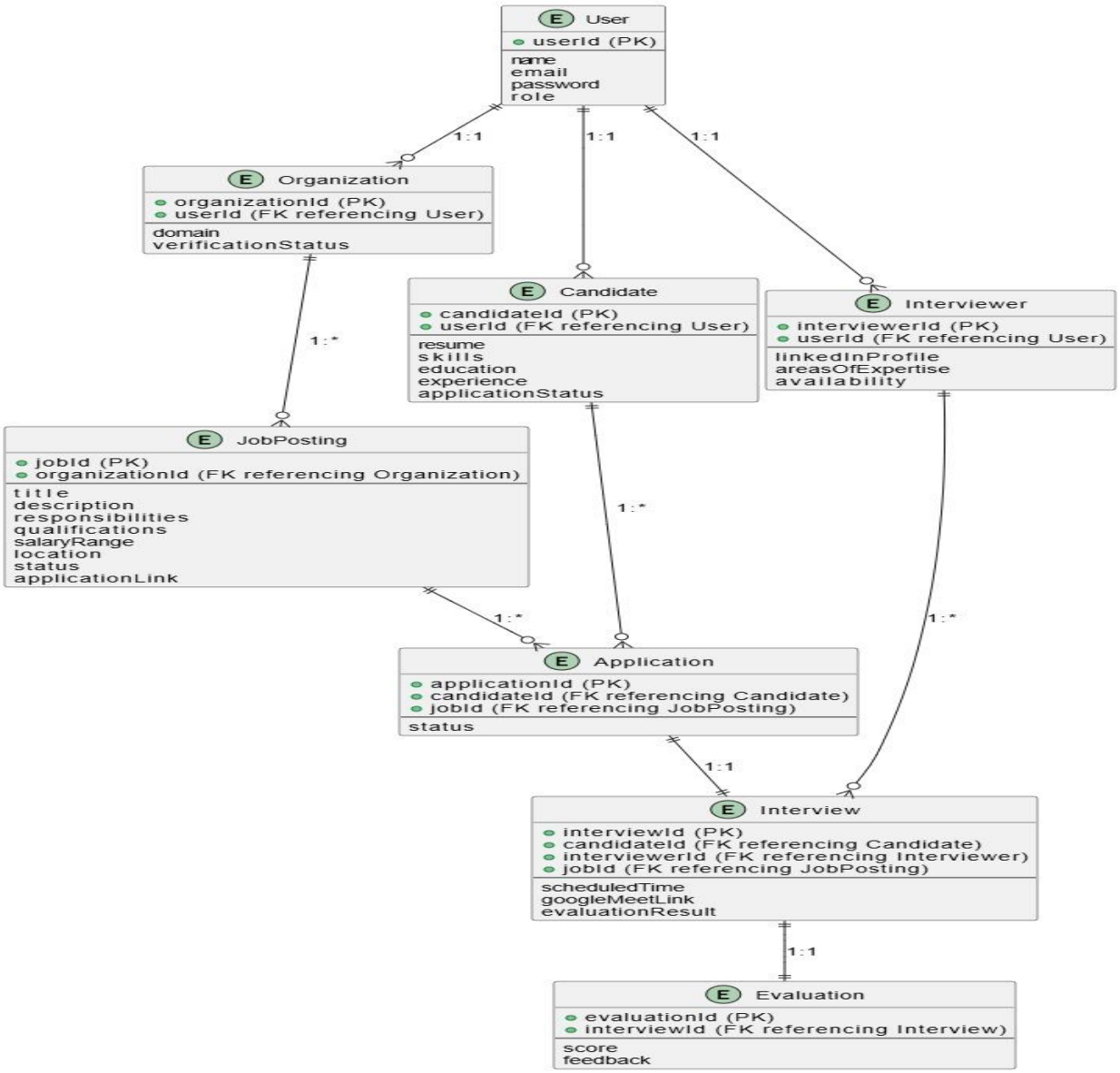


Figure 3: Tentative ER Diagram for Proposed System

5.2.2 Data Dictionary: Organization

5.2.2.1 Data 1: Organization

Name	***Organization***
Alias	*Company, Employer*
Where-used/how-used	*Used in job postings as the creator (input). Used in authentication and for organization-level data retrieval (store).*
Content description	*org_id = org_name + email + password + job_postings {created_at}*

5.2.2.2 Column Details

Column Name	***Description***	***Type***	***Length***	***Nullable***	***Default Value***	***Key Type***
org_id	*Unique identifier for the organization*	*Integer*	*10*	*No*	*Auto-Increment*	*PK*
org_name	*Name of the organization*	*String*	*255*	*No*	*NULL*	
email	*Contact email address*	*String*	*255*	*No*	*NULL*	
password	*Encrypted password*	*String*	*255*	*No*	*NULL*	
job_postings	*Array of job postings associated with the organization*	*JSON Array*	*N/A*	*Yes*	*NULL*	
created_at	*Timestamp of when the organization signed up*	*Timestamp*	*N/A*	*No*	*CURRENT_TIMESTAMP*	

5.2.3 Data Dictionary: Job Posting

5.2.3.1 Data 2: Job Posting

Name	***Job Posting***
Alias	*Listing, Vacancy*
Where-used/how-used	*Used as input for resume submission (input). Used to filter candidates via NER and pass results (store).*
Content description	*job_id = job_title + job_description + keywords + submitted_resumes + passing_candidates + {created_at, status}*

5.2.3.2 Column Details

Column Name	***Description***	***Type***	***Length***	***Nullable***	***Default Value***	***Key Type***
job_id	*Unique identifier for the job posting*	*Integer*	*10*	*No*	*Auto-Increment*	*PK*
job_title	*Title of the job*	*String*	*255*	*No*	*NULL*	
job_description	*Detailed description of the job*	*String*	*1000*	*No*	*NULL*	
keywords	*Extracted keywords for NER matching*	*JSON Array*	*N/A*	*Yes*	*NULL*	
submitted_resumes	*Array of candidate resumes submitted*	*JSON Array*	*N/A*	*Yes*	*NULL*	
passing_candidates	*Array of candidate IDs that passed NER filtering*	*JSON Array*	*N/A*	*Yes*	*NULL*	
created_at	*Timestamp of job creation*	*Timestamp*	*N/A*	*No*	*CURRENT_TIMESTAMP*	

status	*Current status (e.g., "Open," "Closed")*	*Enum*	*N/A*	*No*	*"Open"*	

5.2.4 Data Dictionary: Candidate

5.2.4.1 Data 3: Candidate

Name	***Candidate***
Alias	*Applicant, Job Seeker*
Where-used/how-used	*Used as input for resume submission (input). Used to track interview status (store).*
Content description	*candidate_id = name + email + password + profile + available_slots + {resume, ner_score, created_at}*

5.2.4.2 Column Details

Column Name	***Description***	***Type***	***Length***	***Nullable***	***Default Value***	***Key Type***
candidate_id	*Unique identifier for the candidate*	*Integer*	*10*	*No*	*Auto-Increment*	*PK*
name	*Candidate's name*	*String*	*255*	*No*	*NULL*	
email	*Candidate's email address*	*String*	*255*	*No*	*NULL*	
password	*Encrypted password*	*String*	*255*	*No*	*NULL*	
profile	*Detailed profile of the candidate (experience, skills)*	*JSON Object*	*N/A*	*Yes*	*NULL*	
available_slots	*Array of available time slots*	*JSON Array*	*N/A*	*Yes*	*NULL*	

resume	*Uploaded resume*	*File (PDF)*	*N/A*	*Yes*	*NULL*	
ner_score	*Derived score from NER matching*	*Float*	*N/A*	*Yes*	*NULL*	
created_at	*Timestamp of sign-up*	*Timestamp*	*N/A*	*No*	*CURRENT_TIMESTAMP*	

5.3 Application Design

This section provides a detailed overview of the application's design, focusing on the flow of interactions and state transitions within the system. The following diagrams and accompanying explanations outline the key processes and states that drive the application's functionality.

5.3.1 Activity Diagram

1. ***Actors**:*
    - *Organization*
    - *Candidate*
    - *Interviewer Engineer*
2. ***Modules/Components**:*
    - ***User Interface (UI)**: For user interaction.*
    - ***Authentication Module**: To verify credentials and grant access.*
    - ***Scheduling Module**: For booking interview slots and notifying users.*
    - ***Integration Module**: To connect with external tools like Google Meet/Zoom.*
    - ***Report Generation Module**: For creating and sharing interview reports.*
    - ***System**: Backend logic and session handling.*

Main Processes (from left to right):

1. ***Organization**:*
    - *Sign-up/login and dashboard display.*
    - *Job post creation and resume upload.*
    - *Invite shortlisted candidates (notification system triggered).*
    - *View interview reports.*
    - *Logout and confirmation.*
2. ***Candidate**:*
    - *Sign-up/login and dashboard display.*
    - *Profile setup and interview slot selection.*
    - *Wait for interview invitation (notification system triggers).*
    - *Join interview (via integration with Google Meet/Zoom).*
    - *View final report.*

- *Logout and confirmation.*

3. ***Interviewer Engineer****:*
    - *Sign-up/login and dashboard display.*
    - *Preference setup and candidate selection.*
    - *Schedule interview and conduct it via integrator (Google Meet/Zoom).*
    - *Complete the assessment (Google Form).*
    - *Generate a report (triggered via system).*
    - *Logout and confirmation.*

Flow of Communication:

- *Each action triggers operations in respective modules:*
    - *Authentication Module verifies credentials for sign-in.*
    - *Scheduling Module handles interview slot booking and notifications.*
    - *Integration Module connects to external platforms like Google Meet/Zoom.*
    - *Report Generation Module retrieves/generates reports.*
- *The system also handles session management during logouts.*

General Purpose:

This activity diagram details how users (organization, candidate, and interviewer) interact with the platform across different modules and how the system coordinates various functionalities like authentication, scheduling, integration, and reporting.

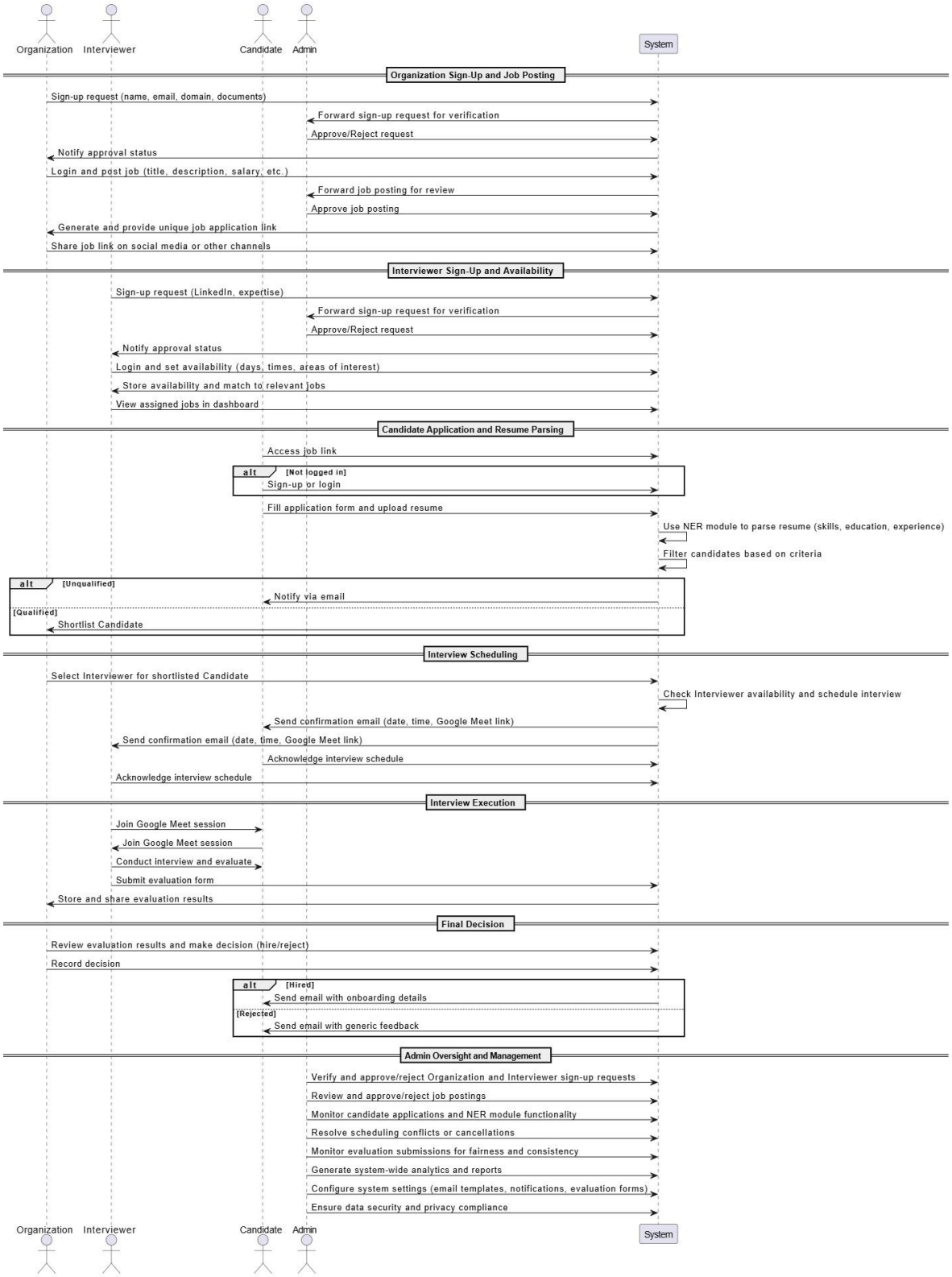


Figure 4: Tentative Sequence Diagram for Proposed System

5.3.2 State Diagram

5.3.2.1 Individual Actor Workflows:

1. Organization Workflow (fig 5.1):

- ***Not Signed Up:*** *The organization has not yet registered on the platform.*
- ***Signed Up:*** *The organization creates an account on the platform.*
- ***Submit Job Details:*** *The organization provides details about the job opening, including job description, requirements, and desired skills.*
- ***Job Posted:*** *The job posting is made live on the platform, visible to potential candidates.*
- ***Await Candidate Assessment:*** *The organization waits for the interview process to be completed and for the interviewer's assessment of the candidates.*
- ***Received Reports:*** *The organization receives the final interview reports, including candidate evaluations and feedback.*

2. ***Candidate Workflow (fig 5.2):***

- ***Not Registered:*** *The candidate has not yet created an account on the platform.*
- ***Signed Up:*** *The candidate creates an account and sets up their profile, including details like experience, skills, and preferred job types.*
- ***Profile Created:*** *The candidate's profile is complete and visible to potential employers.*
- ***Choose Slot:*** *The candidate selects available interview time slots that align with their availability.*
- ***Awaiting Interview:*** *The candidate waits for the scheduled interview time.*
- ***Interview Done:*** *The candidate completes the interview.*

3. Interviewer Engineer Workflow (fig 5.3):

- ***Not Signed Up:*** *The interviewer has not yet registered on the platform.*
- ***Signed Up:*** *The interviewer creates an account on the platform.*
- ***Add Specialty:*** *The interviewer specifies their areas of expertise and the types of roles they are qualified to assess.*
- ***View Candidates:*** *The interviewer views the list of available candidates for the specific job opening.*

- ***Schedule Interview:*** *The interviewer schedules an interview with a selected candidate, taking into account both their and the candidate's availability.*
- ***Conduct Interview:*** *The interviewer conducts the interview with the candidate using the platform's integrated communication tools (e.g., video conferencing).*
- ***Submit Assessment:*** *The interviewer submits their assessment of the candidate's performance and suitability for the role.*

4. System Workflow (fig 5.4):

- ***System Idle:*** *The platform is in an inactive state, awaiting user actions.*
- ***Job Posted:*** *The organization submits a new job posting.*
- ***Resume Evaluation:*** *The system automatically evaluates candidate resumes against the job requirements using Natural Language Processing (NLP) techniques.*
- ***Candidates Notified:*** *The system notifies shortlisted candidates about the job opening and invites them to apply.*
- ***Awaiting Interview:*** *The system waits for the interviewer to schedule interviews with selected candidates.*
- ***Interview Scheduled:*** *The system schedules interviews based on the availability of both the interviewer and the candidate.*
- ***Interview Conduct:*** *The platform facilitates the interview process, providing tools for communication and recording.*
- ***Report Generation:*** *The system generates a comprehensive interview report based on the interviewer's assessment and the candidate's performance.*
- ***Report Sent:*** *The system delivers the final interview report to the organization.*

5. ***Combined Workflow:***

The combined workflow demonstrates a seamless recruitment process where the organization, candidates, and interviewers interact through the platform. The system automates key tasks, including job posting, resume evaluation, scheduling, and report generation, streamlining the recruitment process for all stakeholders.

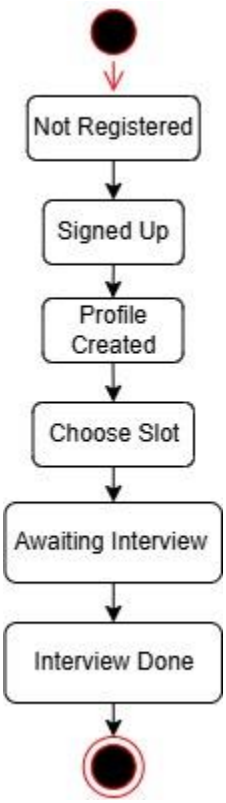


Figure 5.1

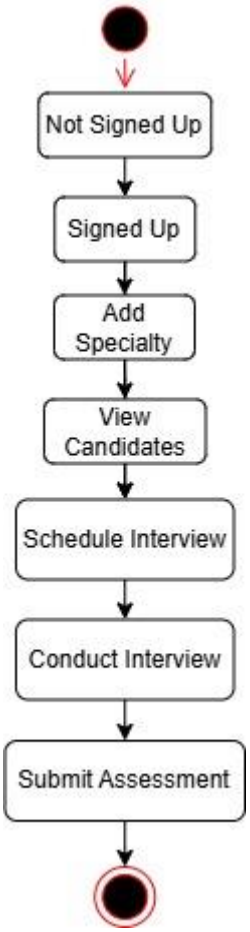


Figure 5.2

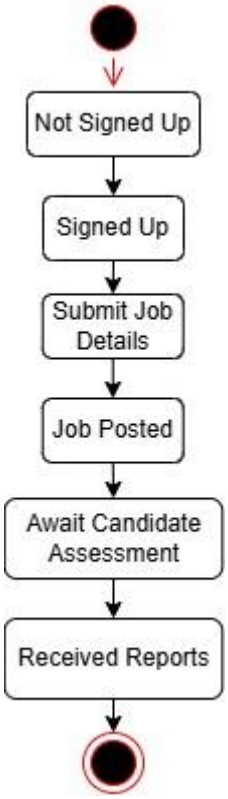


Figure 5.3

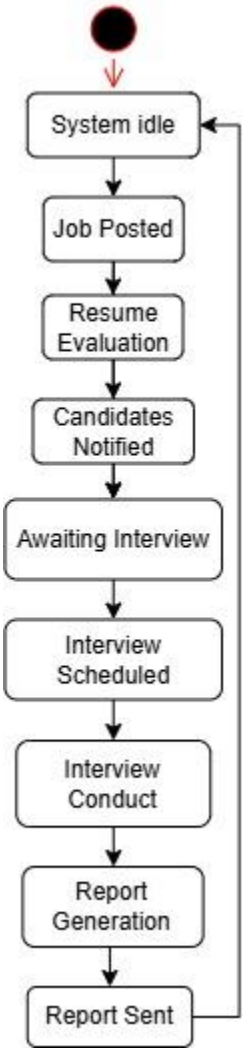


Figure 5.4

5.3.3 Data Flow:

5.3.3.1 Level 0 Data Flow Diagram (DFD)

The Level 0 DFD provides a high-level overview of the recruitment platform, showcasing the primary entities interacting with the system and the flow of data between them.

5.3.3.1.1 Entities and Processes:

1. ***Organization**:*
    - *The organization interacts with the recruitment platform to post job details, upload candidate resumes, and receive reports on the interview process.*
    - *Data Flow: The organization sends job postings and candidate resumes to the recruitment platform and receives reports on shortlisted candidates and interview results.*
2. ***Candidate**:*
    - *Candidates interact with the recruitment platform to submit their profiles and availability and to participate in scheduled interviews.*
    - *Data Flow: The recruitment platform processes candidate profiles and schedules interviews based on availability, returning interview details or notifications to the candidate.*
3. ***Recruitment Platform**:*
    - *The recruitment platform acts as the central system, processing data from organizations, candidates, and interview engineers. It handles job postings, resume evaluation, interview scheduling, and report generation.*
    - *Data Flow: The platform facilitates data exchange between all other entities, ensuring smooth processing and communication.*
4. ***Interview Engineer**:*
    - *Interviewers interact with the recruitment platform to view assigned candidates, conduct interviews, and submit assessment results.*
    - *Data Flow: The interview engineer receives scheduled candidate details and submits interview results back to the recruitment platform.*

5.3.3.1.2 Connections:

- *The recruitment platform serves as the intermediary, enabling bidirectional communication between:*
    - *Organization and platform (job details and reports).*
    - *Candidate and platform (profiles and interview scheduling).*
    - *Interview engineer and platform (candidate assignment and assessment results).*

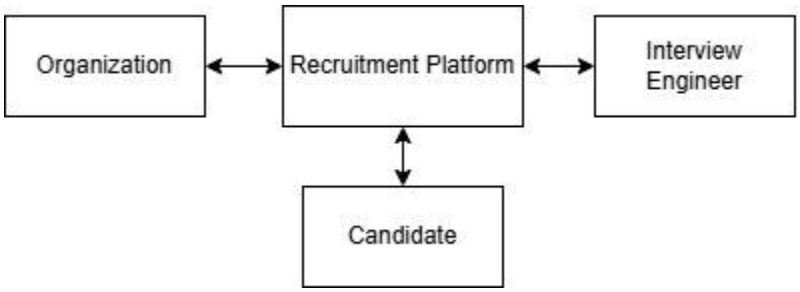


Figure 6: Initial Level 0 DFD for Proposed System

5.3.3.2 Level 1 Data Flow Diagram (DFD)

The Level 1 DFD provides a detailed breakdown of the recruitment platform, showing the internal processes, data stores, and interactions with external entities.

5.3.3.2.1 Processes and Data Flow:

1. ***Job Management**:*
    - *Handles job details and resumes submitted by the organization.*
    - *Stores job postings and filtered results in the **Job Database**.*
    - ***Input**: Job details and resumes from the organization.*
    - ***Output**: Filtered resumes and job posting data stored in the Job Database.*
2. ***Candidate Management**:*
    - *Manages candidate profiles and availability details.*
    - *Stores candidate data in the **Candidate Database**.*
    - ***Input**: Profiles and availability slots provided by candidates.*
    - ***Output**: Candidate data stored for further processing.*
3. ***Interview Scheduling**:*
    - *Schedules interviews between candidates and interview engineers.*
    - *Updates session details in the **Interview Session Database**.*
    - ***Input**: Candidate availability and interview engineer details.*
    - ***Output**: Invitation details sent to candidates and interview engineers; session data stored.*
4. ***Report Generation**:*
    - *Generates final reports based on interview assessments.*
    - *Stores generated reports in the **Report Database**.*
    - ***Input**: Assessment results submitted by interview engineers.*
    - ***Output**: Final reports sent to organizations and candidates; data saved.*

5.3.3.2.2 Data Stores:

1. ***Job Database**:*
    - *Stores job details, resumes, and filtering results.*

- *Acts as a repository for job-related information.*

2. ***Candidate Database**:*
   - *Maintains candidate profiles, resumes, and availability slots.*
   - *Ensures data persistence for candidate information.*
3. ***Interview Session Database**:*
   - *Records details of scheduled interviews, including participants and timing.*
   - *Enables efficient session management.*
4. ***Report Database**:*
   - *Archives interview assessment reports.*
   - *Facilitates access to finalized reports for organizations and candidates.*

5.3.3.2.3 Entities:

1. ***Organization**:*
   - *Submits job details and resumes.*
   - *Receives final reports after the interview process.*
2. ***Candidate**:*
   - *Provides profiles and availability slots.*
   - *Receives interview invitations and reports.*
3. ***Interview Engineer**:*
   - *Reviews assigned candidate details.*
   - *Submits interview assessments for report generation.*

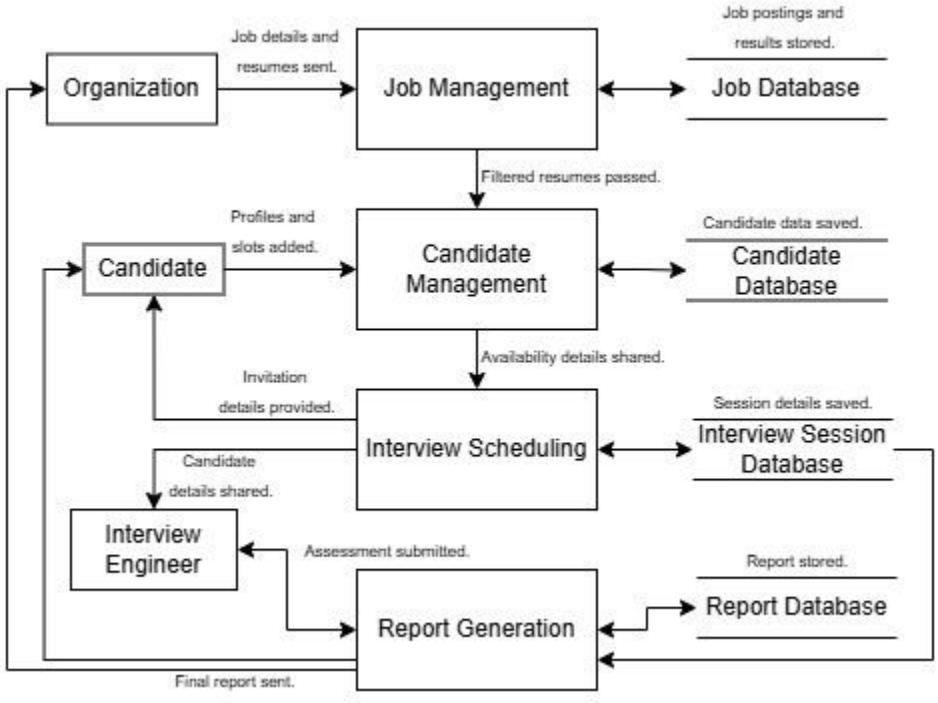


Figure 7: Tentative Level 1 DFD for Proposed System

5.4 GUI Design

The initial design of this GUI serves as a foundation for further development. It represents our current understanding of the user's needs and the system's functionality. We recognize that this design may evolve as we gather more user feedback and iterate on the system. Continuous improvement is crucial to ensure the GUI remains user-friendly, efficient, and effective in supporting the desired workflows.

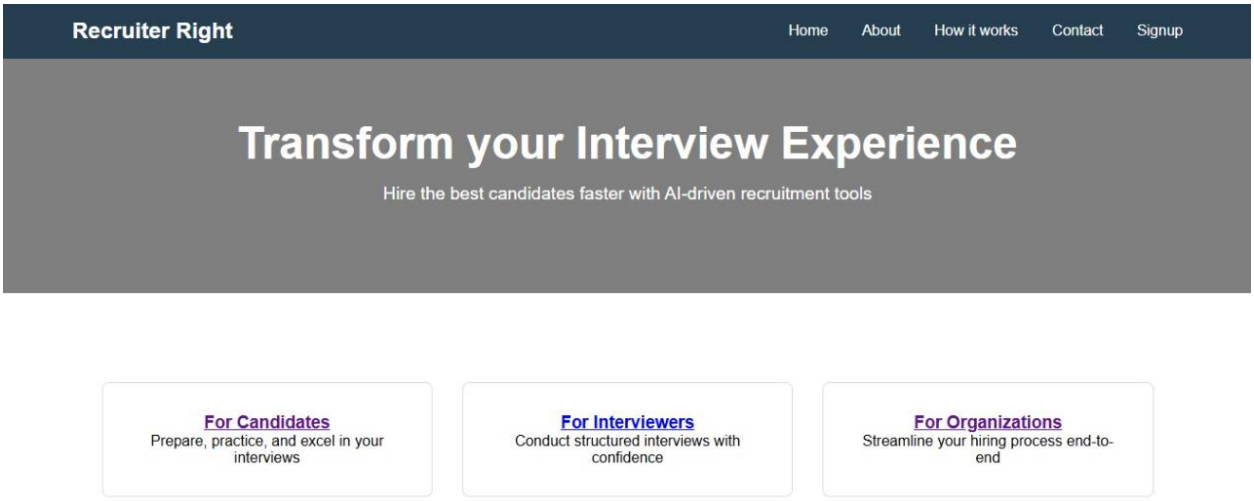
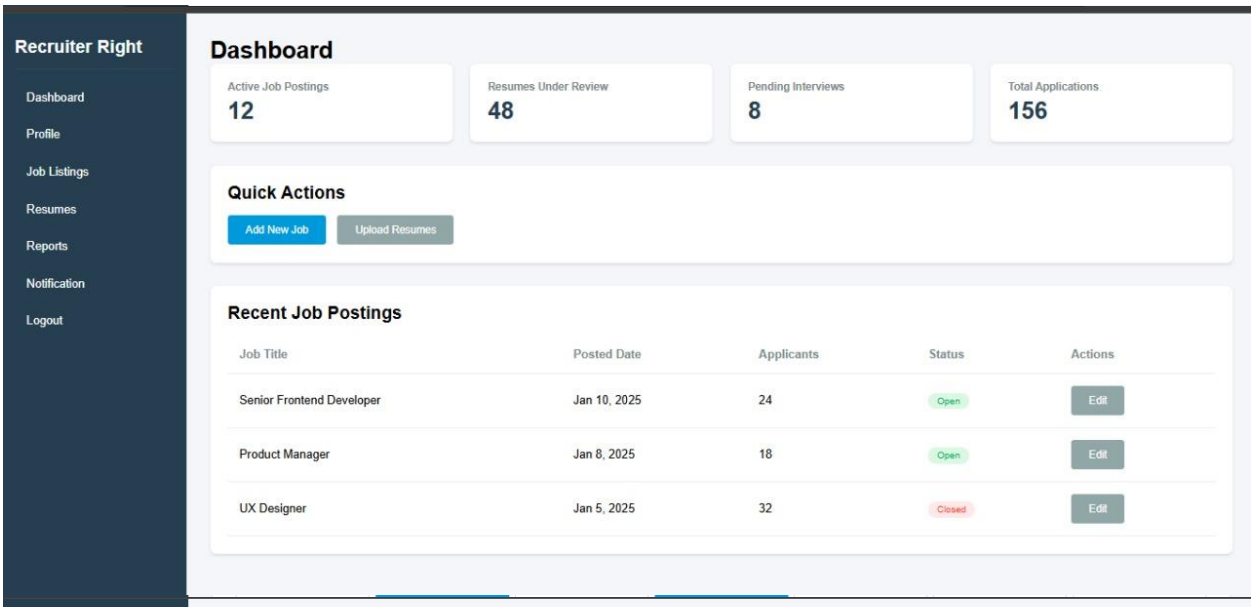


Figure 8: Landing Page


Recruiter Right
Dashboard
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Job Listings
Resumes
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Dashboard
Active Job Postings
12
Resumes Under Review
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Pending Interviews
8
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156
Quick Actions
Add New Job
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Recent Job Postings
Job Title
Posted Date
Applicants
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Senior Frontend Developer
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UX Designer
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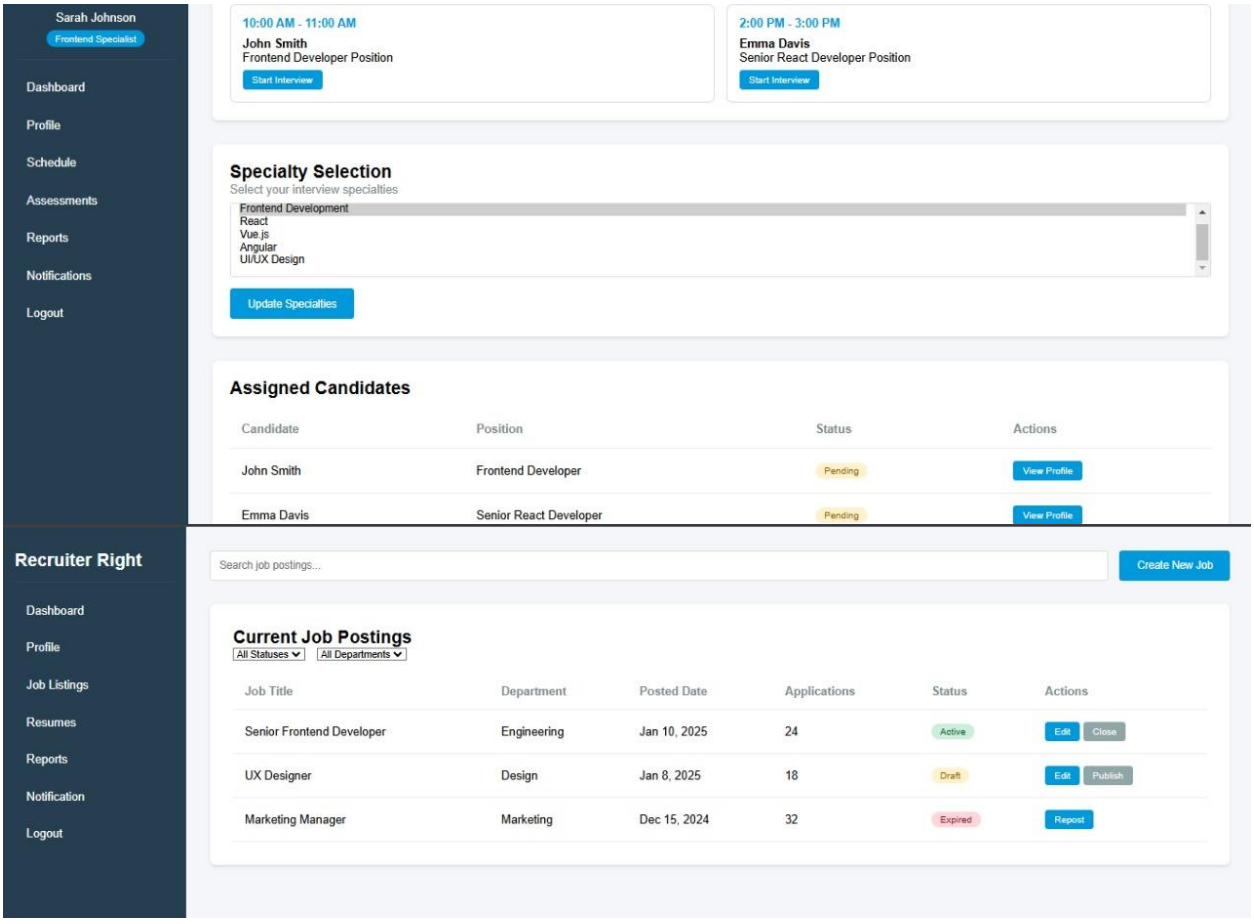
Sarah Johnson
Frontend Specialist
Dashboard
Profile
Schedule
Assessments
Reports
Notifications
Logout
10:00 AM - 11:00 AM
John Smith
Frontend Developer Position
Start Interview
2:00 PM - 3:00 PM
Emma Davis
Senior React Developer Position
Start Interview
Specialty Selection
Select your interview specialties
Frontend Development
React
Vue.js
Angular
UI/UX Design
Update Specialties
Assigned Candidates
Candidate
Position
Status
Actions
John Smith
Frontend Developer
Pending
View Profile
Emma Davis
Senior React Developer
Pending
View Profile
Recruiter Right
Dashboard
Profile
Job Listings
Resumes
Reports
Notification
Logout
Search job postings...
Create New Job
Current Job Postings
All Statuses
All Departments
Job Title
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Posted Date
Applications
Status
Actions
Senior Frontend Developer
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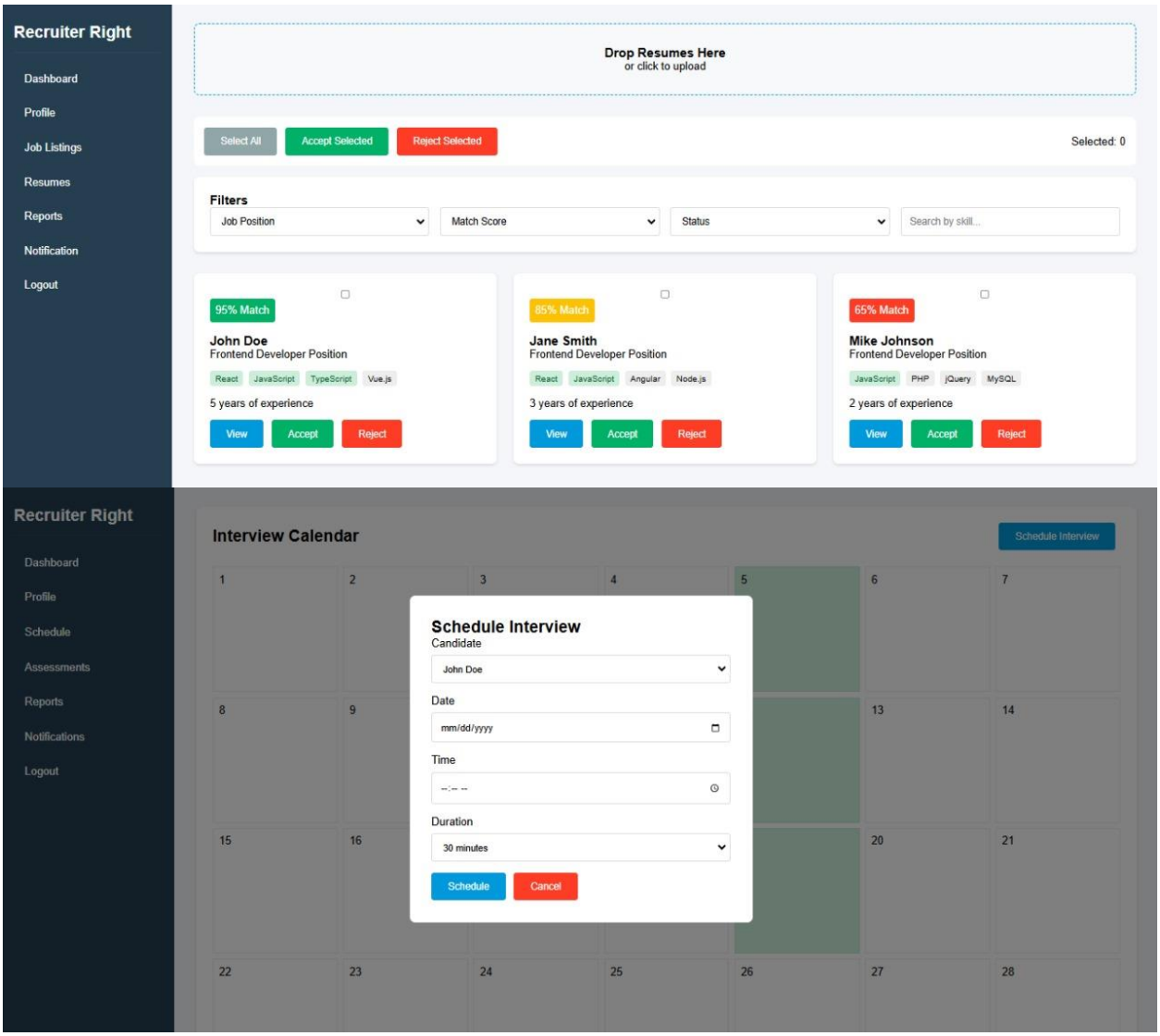
Recruiter Right
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Resumes
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Logout
Drop Resumes Here
or click to upload
Select All
Accept Selected
Reject Selected
Selected: 0
Filters
Job Position
Match Score
Status
Search by skill...
95% Match
John Doe
Frontend Developer Position
React
JavaScript
TypeScript
Vue.js
5 years of experience
View
Accept
Reject
85% Match
Jane Smith
Frontend Developer Position
React
JavaScript
Angular
Node.js
3 years of experience
View
Accept
Reject
65% Match
Mike Johnson
Frontend Developer Position
JavaScript
PHP
jQuery
MySQL
2 years of experience
View
Accept
Reject
Recruiter Right
Dashboard
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Assessments
Reports
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Candidate
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Date
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Duration
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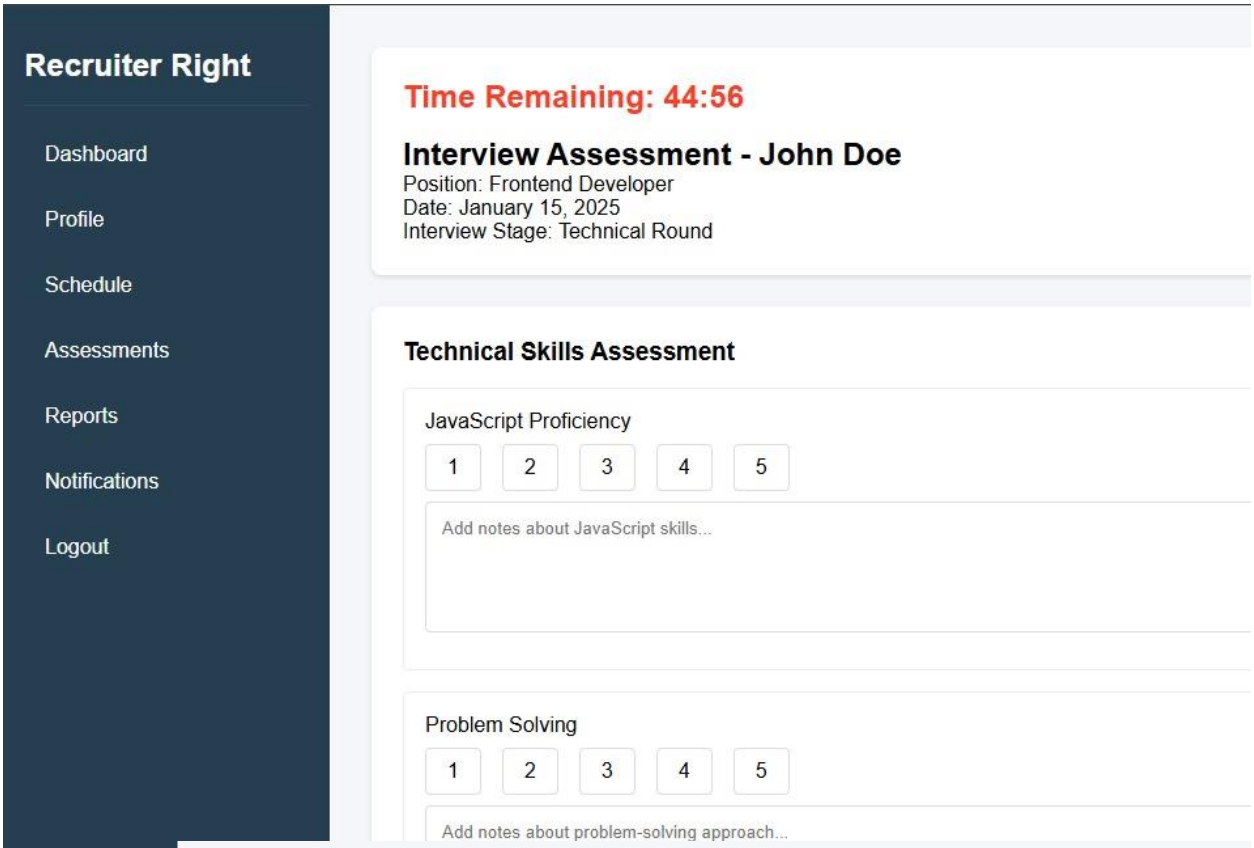
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Schedule
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Logout
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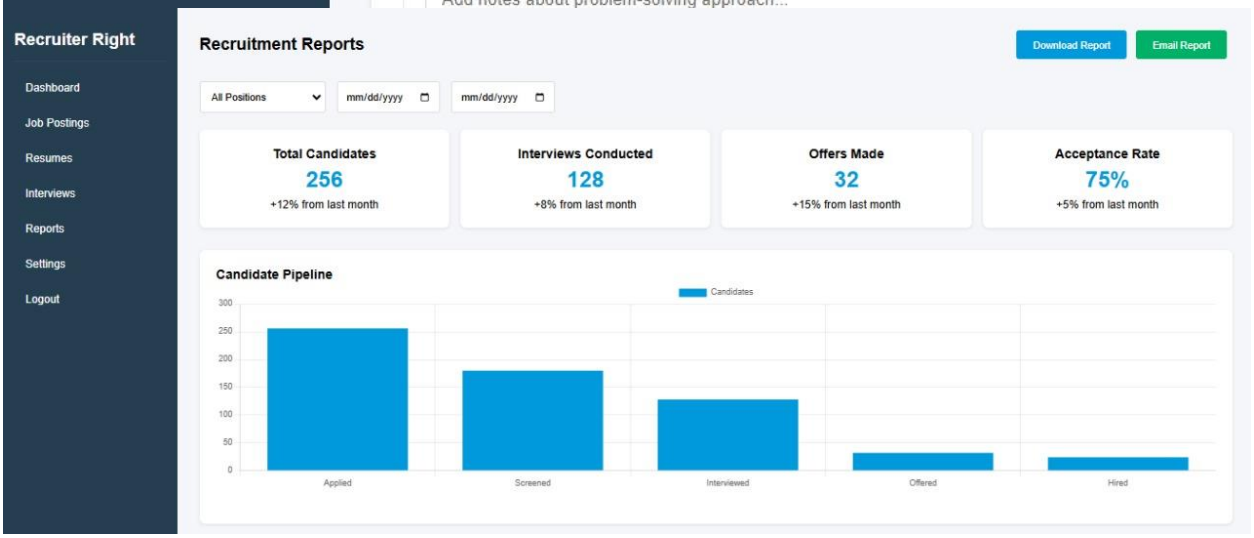
Interview Assessment - John Doe
Position: Frontend Developer
Date: January 15, 2025
Interview Stage: Technical Round
Technical Skills Assessment
JavaScript Proficiency
1
2
3
4
5
Add notes about JavaScript skills...
Problem Solving
1
2
3
4
5
Add notes about problem-solving approach...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Total Candidates
256
+12% from last month
Interviews Conducted
128
+8% from last month
Offers Made
32
+15% from last month
Acceptance Rate
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+5% from last month
Candidate Pipeline
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250
200
150
100
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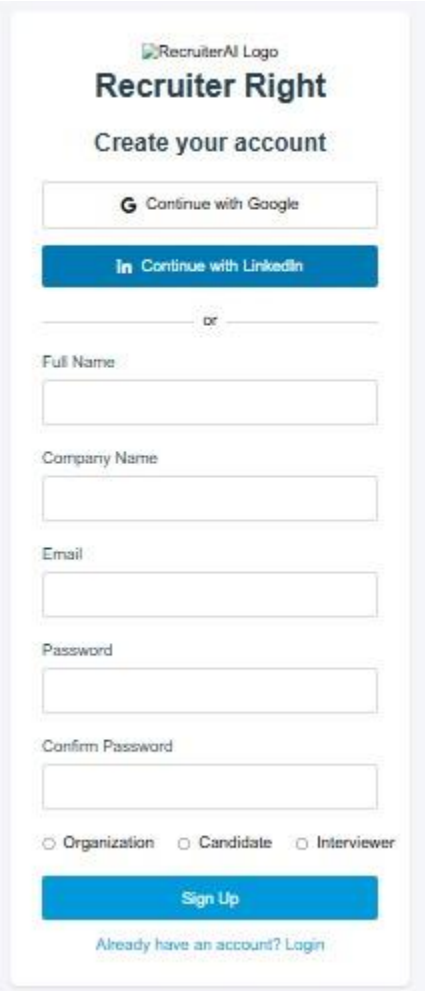
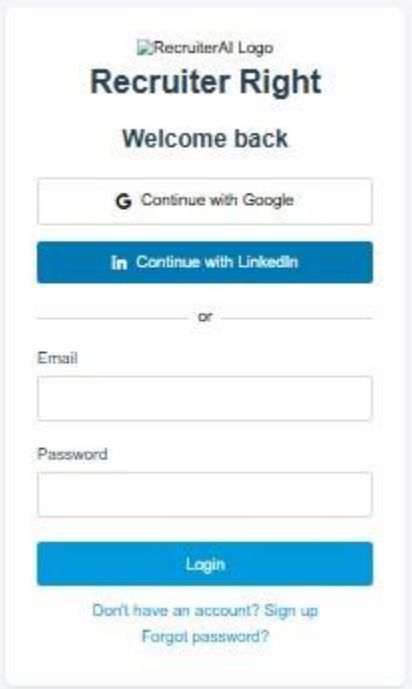
0
Applied
Screened
Interviewed
Offered
Hired


RecruiterAI Logo
Recruiter Right
Create your account
Continue with Google
Continue with LinkedIn
or
Full Name
Company Name
Email
Password
Confirm Password
Organization
Candidate
Interviewer
Sign Up
Already have an account? Login


RecruiterAI Logo
Recruiter Right
Welcome back
Continue with Google
Continue with LinkedIn
or
Email
Password
Login
Don't have an account? Sign up
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6 References

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[4] G O, Narendra & S., Hashwanth. (2022). Named Entity Recognition based Resume Parser and Summarizer. 2581-9429. 10.48175/IJARSCT-3029.

7 Appendices

[Include supporting detail that would be too distracting to include in the main body of the document.]