

EMPLOYEE RECRUITMENT AND MANAGEMENT SYSTEM

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INTRODUCTION

Employee Recruitment and Management System:

- Automates and digitizes the hiring process.
- Streamlines job posting, applicant tracking, and communication.
- Simplifies evaluation of tests, interviews, and shortlisting.
- Designed for small to medium-sized tech enterprises.

Key Actors:

- Applicant
- Recruiters,
- HR Managers ,Admin

ARCHITECTURE STYLE

- Modular Architecture:
 - System split into independent modules (Applicant/Recruiter/HR).
 - Each module follows Single Responsibility Principle for easier maintenance.
- Client-Server Architecture:
 - Frontend (React) and Backend (Express.js + PostgreSQL) separated.
 - Communication via HTTP APIs (client requests, server responds with data).

ARCHITECTURE STYLE

System Architecture Overview

Modular Architecture

Applicant Module

Applicant UI
(HTML/CSS)

Applicant JS
(Logic)

Recruiter Module

Recruiter UI
(HTML/CSS)

Recruiter JS
(Logic)

HR Module

HR UI
(HTML/CSS)

HR JS
(Logic)

Admin Module

Admin UI
(HTML/CSS)

Admin JS
(Logic)

MODULAR MODEL:
Each module follows separation of concerns, with dedicated UI (.css), logic (.js), communicating directly with backend.

Client-Server Architecture

Frontend
React Application

CLIENT-SERVER MODEL:
Frontend (Client) interacts with Backend (Server) using HTTP REST APIs

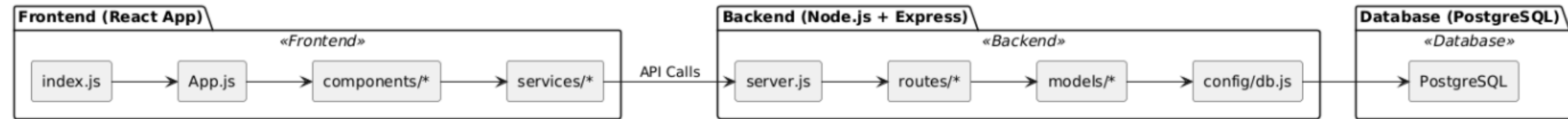
Backend
Express.js API

SQL Queries

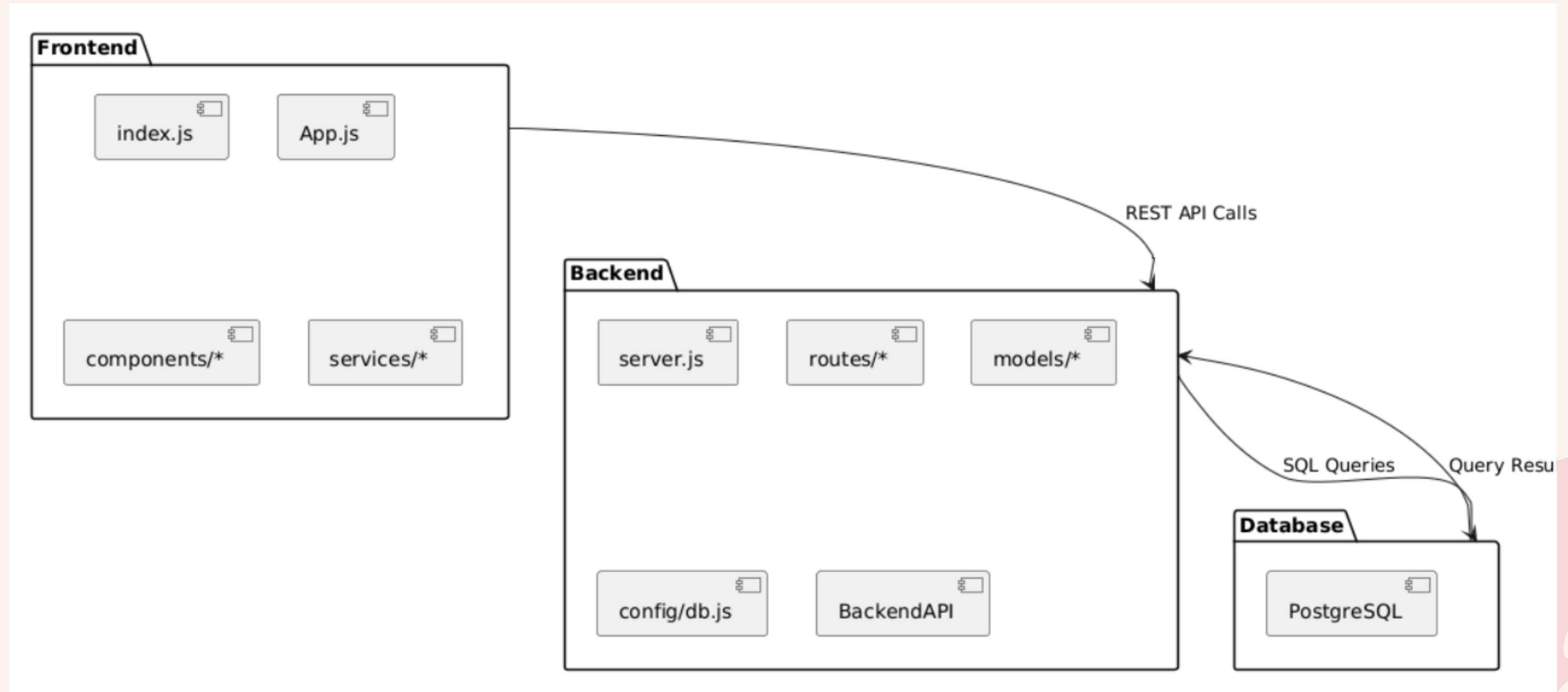
PostgreSQL

HTTP REST API
(JSON)

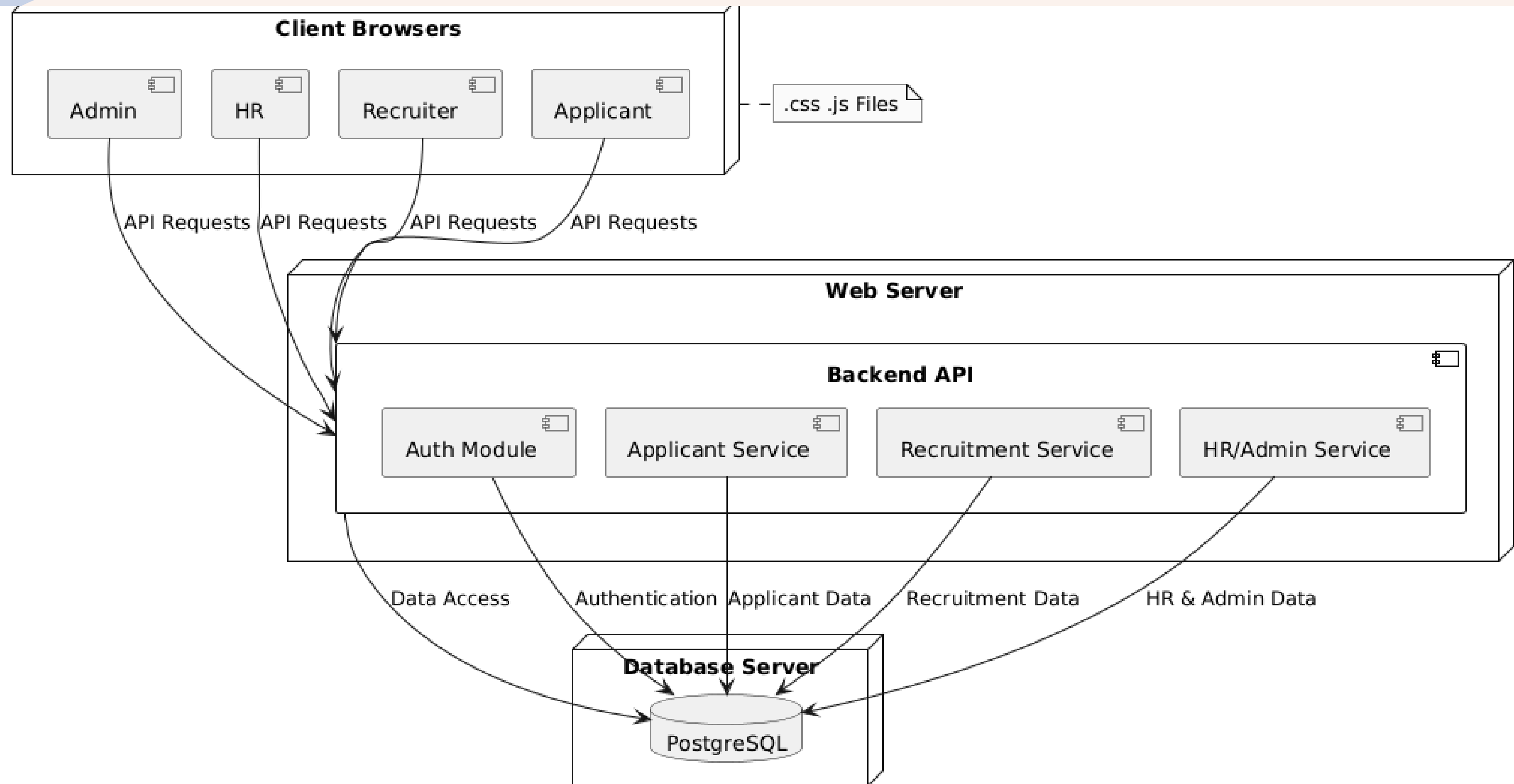
COMPONENT DIAGRAM



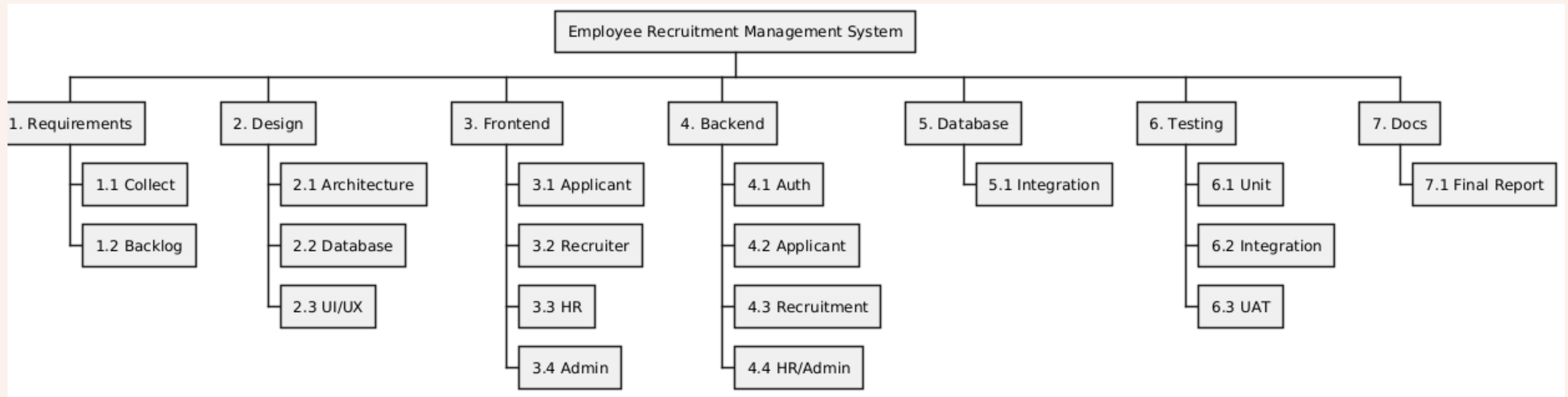
PACKAGE DIAGRAM



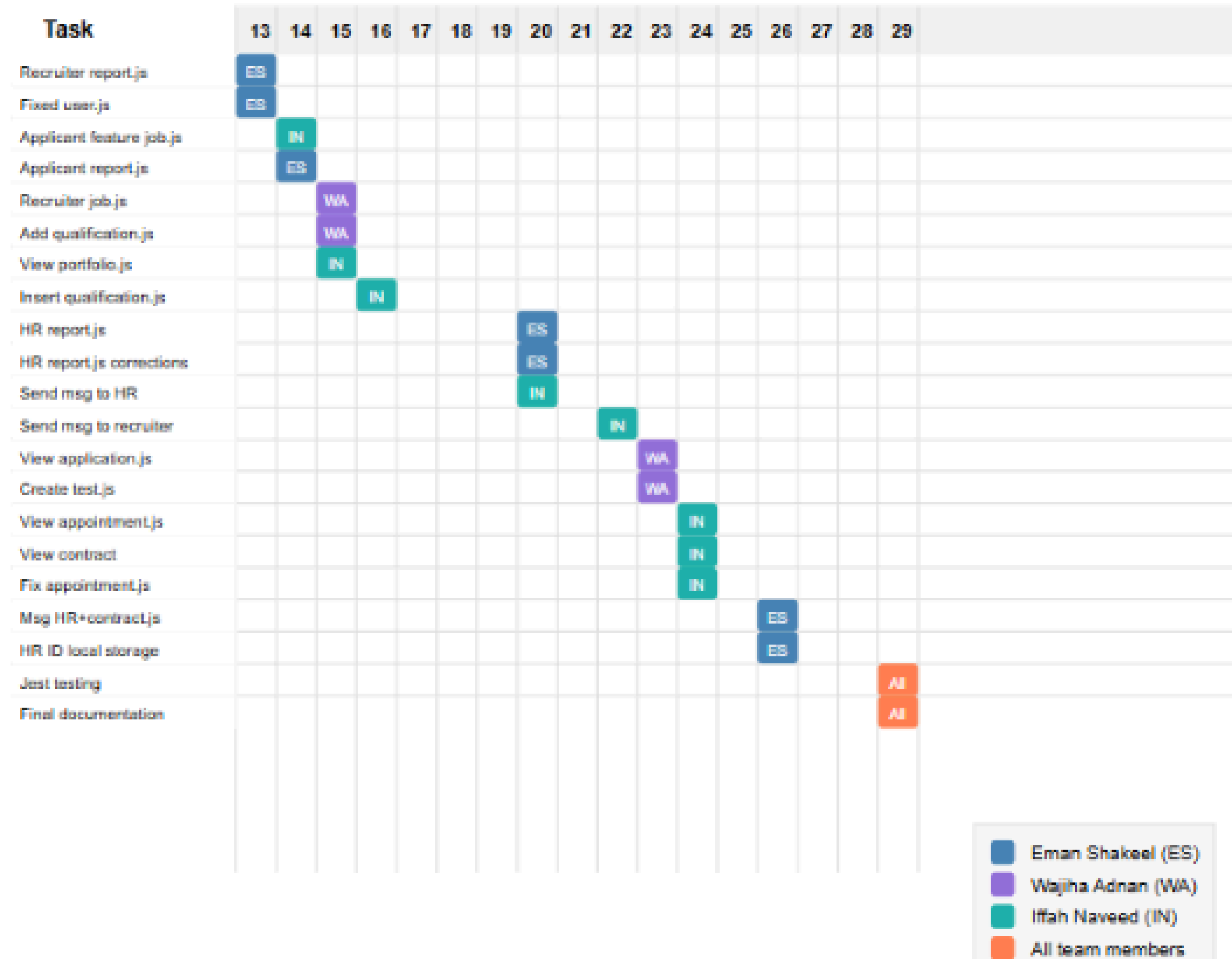
DEPLOYMENT DIAGRAM



WORK BREAK DOWN STRUCTURE



GANTT CHART



SPRINT PLANNING

Date	Task	file/module	Change	done by
13/4/2025	front end +backend	recruiter report.js	N/A	Eman Shakeel
13/4/2025	fixed user.js	recruiter report.js	corrected queries for retrieving the data	Eman Shakeel
14/4/2025	applicant feature	job.js	retrieved the available jobs for applicant	iffah naveed
14/04/2025	backend	applicant report.js	corrected errors of missing fields	Eman Shakeel
15/04/2025	front end +backend	recruiter job.js	implemented the logic of adding a job	wajiha adnan
15/04/2025	front end +backend	recruiter add_qualification.js	implemented the logic of adding a qualification and linking it to contains table	wajiha adnan
15/04/2025	frontend+backend	viewportfolio.js	implemented logic for viewing portfolio for applicant	iffah naveed
16/04/2025	backend	insertqualification.js	implemented qualification insertion for applicant	iffah naveed
19/04/2025	front end +backend	hrreport.js	implemented logic for displaying details of hr	Eman Shakeel

SPRINT PLANNING

19/04/2025	frontend+backend	sendmsgshr	implemented insertion for applicant	iffah naved
21/04/2025	frontend+backend	sendmsgrec.js + recmsgrec.js	implemented logic for it	iffah naved
22/04/2025	frontend+backend	view_application.js	implemented the insertion logic for it	wajiha adnan
22/04/2025	frontend+backend	create_test.js	implmented the insertion logic for it	wajiha adnan
23/04/2025	frontend+backend	viewappointment.js	implementation	iffah naved
23/04/2025	frontend+backend	viewcontract	implementation	iffah naved
23/04/2025	backend	viewappointment.js	fixed the fetch logic	iffah naved
25/04/2025	frontend+backend	msg_hr_appl.js +contract.js	implementation	Eman Shakeel
25/04/2025	frontend+backend	msg_hr_appl.js +contract.js	fetching hrid from local storage	Eman Shakeel
28/04/2025	testing	jest	implementing whitebox testing	all group members
28/04/2025	documentation	final report	working on documentation	

USER STORIES(3-5)

- Post and Manage Job Openings
- View and Apply for Available Job Postings
- Manage Applicant Shortlisting
- Generate Employment Contracts

PRODUCT BACKLOG

4. Product Backlog

1. Applicant Features

1.2 View and Apply for Available Job Postings

Priority: High

User Story: As an applicant, I want to browse and apply for jobs so that I can secure employment.

1.4 Review Employment Contract Details

Priority: High

User Story: As an applicant, I want to review my employment contract so that I can understand my employment terms.

1.4 View Appointments and Contracts

Priority: High

User Story: As an applicant, I want to view my scheduled appointments and employment contracts, so that I can stay informed about upcoming meetings, interviews, and contract details.

1.5 View Portfolio

Priority: Medium

User Story: As an applicant, I want to view my portfolio so that I can showcase my work to recruiters.

1.6 Track Application Progress

Priority: High

User Story: As an applicant, I want to track my job application status so that I can stay updated on my recruitment process.

1.7 Communicate with Recruiters and HR

Priority: High

User Story: As an applicant, I want to chat with recruiters and HR so that I can get updates and clarifications.

2. Recruiter Features

2.1 Post and Manage Job Openings

Priority: High

User Story: As a recruiter, I want to post and manage job listings so that I can find suitable candidates.

2.2 Manage Applicant Shortlisting

Priority: High

User Story: As a recruiter, I want to shortlist candidates so that I can proceed with hiring the best talent.

2.3 Schedule and Conduct Assessments (Written Tests & Interviews)

Priority: High

User Story: As a recruiter, I want to schedule and manage assessments so that I can evaluate candidates.

2.4 Approve or Reject Job Applications

Priority: High

User Story: As a recruiter, I want to approve or reject applications so that I can finalize candidate selection.

2.5 Communicate with applicants

Priority: High

User Story: As a recruiter, I want to approve or reject applications so that I can finalize candidate selection.

2.6 Book, Reschedule, and Manage Appointments

Priority: Medium

User Story: As a recruiter, I want to book and manage appointments so that I can coordinate interviews effectively.

3. HR Features

3.1 Generate Employment Contracts

Priority: High

User Story: As an HR manager, I want to create employment contracts so that I can formalize job offers.

3.2 Provide recommendations to applicants

Priority: High

User Story: As an HR, I want to provide recommendations for applicants so that recruiters can make better hiring decisions.

3.3 Communicate with applicants

Priority: High

User Story: As an HR, I want to communicate with applicants so that we can keep them informed and engaged throughout the hiring process.

4. Admin Features

4.1 Generate Detailed Recruitment Reports for All Actors

Priority: High

User Story: As an admin, I want to generate recruitment reports so that I can analyze hiring trends.

BLACKBOX TESTING

TestCase ID	Description	Input	Expected Output	Actual Output	Pass/Fail
TC01	Signup with valid details (ECP)	Valid username, email, password, age=22, gender=Male	User created successfully	User created successfully	Pass
TC02	Signup with existing email (ECP)	Existing email, new username and password	"Email already exists" error	"Email already exists" error	Pass
TC03	Signup with invalid email format (ECP)	username, "invalidemail", password	Validation error: Invalid email	Validation error: Invalid email	Pass
TC04	Signup with minimum boundary age (BVA)	age = 18	User created successfully	User created successfully	Pass
TC05	Signup with below minimum age (BVA)	age = 17	Validation error: Age must be ≥18	Validation error: Age must be ≥18	Pass
TC06	Login with correct email and password (ECP)	Correct email and password	Login successful with user ID	Login successful with user ID	Pass

TC07	Login with wrong password (ECP)	Correct email, wrong password	"Invalid password" error	"Invalid password" error	Pass
TC08	View applicant profile after login (Functionality)	Logged-in applicant ID	Applicant profile displayed	Applicant profile displayed	Pass
TC09	Apply for a job with eligible CGPA (ECP)	Applicant ID, Job ID (CGPA met)	Application submitted successfully	Application submitted successfully	Pass
TC10	Apply for a job with below-required CGPA (ECP)	Applicant ID, Job ID (CGPA not met)	"Not eligible to apply" error	"Not eligible to apply" error	Pass

WHITEBOX TESTING (JEST)

```
✓ 201 adds qualification (7 ms)
GET /api/auth/recruiter/:recruiterId
✓ 200 returns recruiter & quals (15 ms)
GET /api/auth/recruiter/:id/jobs
✓ 200 returns jobs (11 ms)
GET /api/auth/recruiter/:id/job-ids
✓ 200 returns ids (9 ms)
GET /api/auth/jobs/:jobId/applications
✓ 200 returns applications (3 ms)
POST /api/auth/tests
✓ 201 creates test (4 ms)
GET /api/auth/job/:jobId/applicants
✓ 200 returns applicants (5 ms)
POST /api/auth/testEvaluation/submit-score
✓ 201 & shortlist (5 ms)
✓ 400 if below minimum (3 ms)
POST /api/auth/appointments
✓ 201 books appointment (4 ms)
POST /api/auth/messages
✓ 200 sends message (6 ms)
✓ 400 bad query params (5 ms)
✓ 200 fetches merged (3 ms)
POST /api/auth/shortlist/:applicationId
✓ 201 shortlists (4 ms)
✓ 404 if not found (5 ms)

Test Suites: 1 passed, 1 total
Tests:       22 passed, 22 total
Snapshots:   0 total
Time:        2.217 s
Ran all test suites matching /recruiter.test.js/i.

D:\github_se\se_project_recruiter\SErestored\se_project_recruiter\my-app\server\routes>
```

FURTHER IMPROVEMENTS

- AI-Powered Resume Screening
- Multi-Language Support
- Add Feature for providing internships
- Mobile Application
- Employee Referral System

LESSON LEARNT

- Effective team collaboration with tools (Trello, sprint planning) enhances progress tracking and issue resolution.
- Focus on HR, recruiter, and applicant needs for a user-friendly system.
- Early performance testing ensures system scalability.
- Use tools like Trello, GitHub and sprint planning.
- Use WBS, Gantt charts, and structured planning to meet deadlines.

CONCLUSION

- The system digitizes and streamlines the hiring process, enhancing efficiency and collaboration.
- It caters to the specific needs of small to mid-sized tech enterprises with modular scalability.
- Future enhancements like AI screening and analytics will make it a powerful, all-in-one solution.

The background features a light cream color with abstract, organic shapes in soft blue and pink. A thin white line forms a loop in the top left, and several curved lines are visible on the left side. The bottom right corner contains a pink shape with small white oval patterns.

**THANK
YOU**