UNIVERSITY OF BARISHAL

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

DATABASE PROJECT REPORT

JOB PORTAL SYSTEM

A Report Submitted in Partial Fulfillment of the Requirements for the Course: CSE-2102: Database Management System Lab

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1. Overview of the project

The Job Portal System is a database-driven platform designed to streamline the job recruitment process by connecting Job Seekers with Employers in an efficient and structured manner. This system enables Job Seekers to create profiles, upload resumes, search for job opportunities, and apply for positions, while Employers can post job listings, manage applications, and hire suitable candidates.

The platform also includes an Admin module that ensures smooth operations by managing users, job postings, and applications. A Job Alert system notifies Job Seekers about relevant job openings based on their skills and preferences, enhancing user engagement.

This relational database system ensures data integrity, security, and scalability, providing a robust foundation for an organized and efficient job search and hiring process. The system is designed to meet industry standards, ensuring seamless recruitment management for both job seekers and employers.

2. Objective of the Project

The primary objective of this project is to design and develop a Job Portal System that efficiently connects Job Seekers and Employers, streamlining the recruitment process while ensuring data integrity and user engagement.

Key goals include:

- Store and manage details of Job Seekers, Employers, and Job Postings.
- Allow Job Seekers to apply for multiple job openings, track their applications, and receive job alerts based on their skills.
- Enable Employers to post job openings, review applications, and hire candidates.
- Facilitate Admin management for overseeing the entire system, including user management and job application reviews.
- Provide a Job Alert system to notify Job Seekers about relevant job postings according to their preferences.
- Ensure smooth and efficient data retrieval and accessibility for Job Seekers, Employers, and Admins, promoting a seamless job search experience.

3. Motivation of the project

The motivation behind the Job Portal System is to address the inefficiencies in the traditional job search and recruitment processes. With the increasing need for digital solutions, this system aims to provide Job Seekers with an easy-to-use platform to apply for jobs, track

applications, and receive relevant job alerts. At the same time, Employers benefit from a streamlined process to post jobs, manage applications, and hire candidates efficiently.

By creating a centralized platform, the system improves recruitment efficiency, enhances the user experience for both job seekers and employers, and ensures data integrity and scalability for future growth.

4. Requirements of the project

- **Functional Requirements**
  1. **User Registration & Authentication:**
     - ✓ Job Seekers and Employers must be able to register with personal details (name, email, password).
     - ✓ Secure login functionality for all users (Job Seekers, Employers, Admin) with password authentication
  2. **Job Seeker Profile Management:**
     - ✓ Job Seekers can create and manage their profiles, including uploading resumes, adding skills, experience, and education.
     - ✓ Job Seekers can search, view, and apply for available job postings.
  3. **Employer Profile Management:**
     - ✓ Employers can create and manage their company profiles, including adding company details (name, industry, location).
     - ✓ Employers can post job openings with details such as job title, description, requirements, and location.
  4. **Job Posting & Application Management:**
     - ✓ Employers can view and manage job resumes for each job posting.
  5. **Job Alerts:**
     - ✓ Job Seekers can set preferences to receive job alerts based on skills, location, and job type.
     - ✓ Alerts are sent automatically to Job Seekers when new job postings match their criteria.
  6. **Application Status Management:**
     - ✓ Employers can review and manage job resumes, update application statuses (Pending, Reviewed, Accepted, Rejected), and hire candidates.
     - ✓ Job Seekers can track the status of their applications and receive notifications when the status changes.
  7. **Admin Management:**
     - ✓ Admin can manage users (Job Seekers, Employers) by activating, deactivating, or deleting accounts.
     - ✓ Admin can check job postings to ensure smooth platform operations.
  8. **Search & Filter Functionality:**
     - ✓ Job Seekers can search for job postings using filters such as job title, location, salary, and skills.

- **Non-Functional Requirements**
  1. **Performance:**
     - ✓ Fast response times, handling multiple users efficiently.
  2. **Scalability:**
     - ✓ Supports future growth in users and job postings.
  3. **Availability:**
     - ✓ 99.9% uptime with real-time updates.
  4. **Usability:**
     - ✓ User-friendly interface with minimal learning curve.
  5. **Maintainability:**
     - ✓ Easily updatable and well-documented code.
  6. **Internationalization:**
     - ✓ Supports multiple languages.

5. Scope of the project

This project focuses on improving the hiring process within a job portal by streamlining job posting, application tracking, and recruitment management. Employers can post jobs and manage resumes, while Job Seekers can register, apply, and receive job alerts based on skills and preferences. Admins oversee users and job postings.

The system ensures secure authentication, job matching, structured resumes, and real-time alerts while maintaining data security and usability. It does not include AI-based recommendations, video interviews, or third-party integrations, focusing solely on efficient hiring and recruitment management.

6. Designing (Entity Relationship)ER Diagram

Steps of Drawing ERD:

1. Identify the Entities Required
2. Identify the Attributes and Primary key for each Entity
3. Identify the Relationship needed
4. Identify the Cardinality Ratio and Participation
5. Draw the Diagram

Scenario of Hiring Process of Job Portal System:

The hiring process of a Job Portal will allow various Employers to post job openings. Job Seekers can register on the platform, create profiles, and apply for any job posting based on

their skills and qualifications. Each Job Posting will specify required skills, job descriptions, salary, and location.

Users can be either Job Seekers, Employers, or Admins. Job Seekers can apply for jobs, upload resumes, and receive Job Alerts based on job matches. Employers will post job listings, manage applications, and track recruitment progress.

Admins will manage the platform by overseeing user registrations, check job postings, whether it's real or scam. The platform will also send Job Alerts to notify Job Seekers of relevant opportunities.

Step-1: Identify the Entities Required

The hiring process of a Job Portal will allow various **Employers** to post job openings. **Job Seekers** can register on the platform, create profiles, and apply for any job posting based on their **skills** and qualifications. Each **Job Posting** will specify required **skills**, job descriptions, salary, and location.

Users can be either Job Seekers, Employers. Job Seekers can apply for jobs, upload resumes, and receive **Job Alerts** based on job matches. Employers will post job listings, manage **resumes**, and track recruitment progress.

Admins will manage the platform by overseeing user registrations, check job postings, whether it's real or scam. The platform will also send Job Alerts to notify Job Seekers of relevant opportunities.

Step-2: Identify the Attributes and Primary key for each Entity

1. **Admin (admin_id,** username, password**)**
2. **User (user_id,** name, email, password, user_type**)**
3. **Employer (employer_id,** company_name, industry, location**)**
4. **JobSeeker (jobseeker_id,** first_name, last_name, address, contact, email, dob, CV, experience, education**)**
5. **JobPosting (job_id,** title, description, salary, location, post_date, deadline, type**)**
6. **Resume (resume_id,** status, submission_date**)**
7. **Skill (skill_id,** skill_name**)**
8. **JobAlert (jobalert_id,** alert_date**)**

Step-3: Identify the Relationship needed

1. Admin manages User
2. User registers_as Employer
3. Employer posts JobPosting
4. JobPosting receives Resume
5. User registers_as JobSeeker
6. JobSeeker submits Resume
7. Employer manages Resume

8. JobSeeker has Skill
9. JobPosting requires Skill
10. JobSeeker gets JobAlert.
11. Admin checks JobPosting

Step-4: Identify the Cardinality Ratio and Participation

1. Admin manages User (**1:N**)

2. User registers_as Employer (**1:1)**

3. Employer posts JobPosting (**1:N**)

4. JobPosting receives Resume (**1:N)**

5. User registers_as JobSeeker (**1:1)**

6. JobSeeker submits Resume (**1:N)**

7. Employer manages Resume (**1:N)**

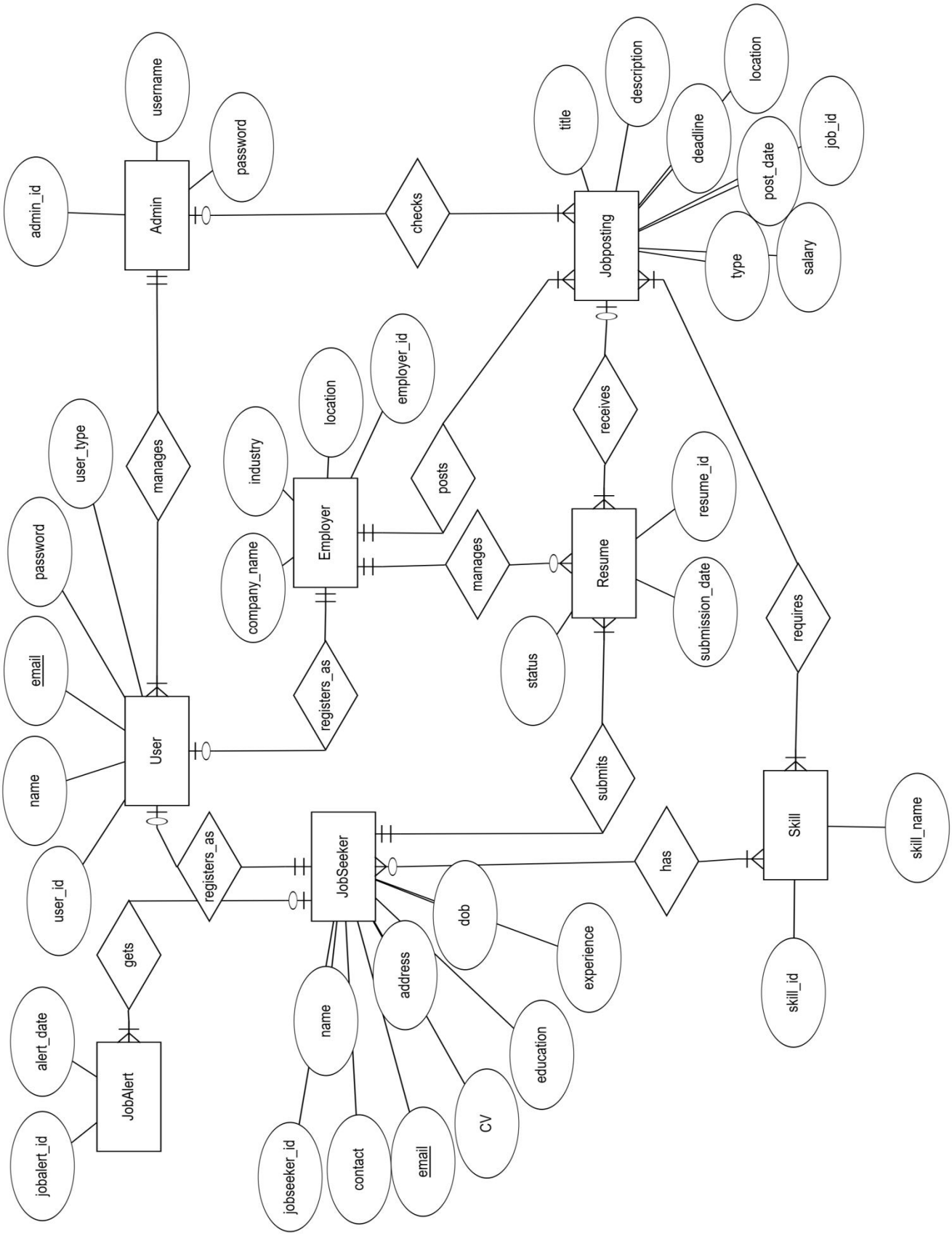
8. JobSeeker has Skill (**M:N)**

9. JobPosting requires Skill (**M:N)**

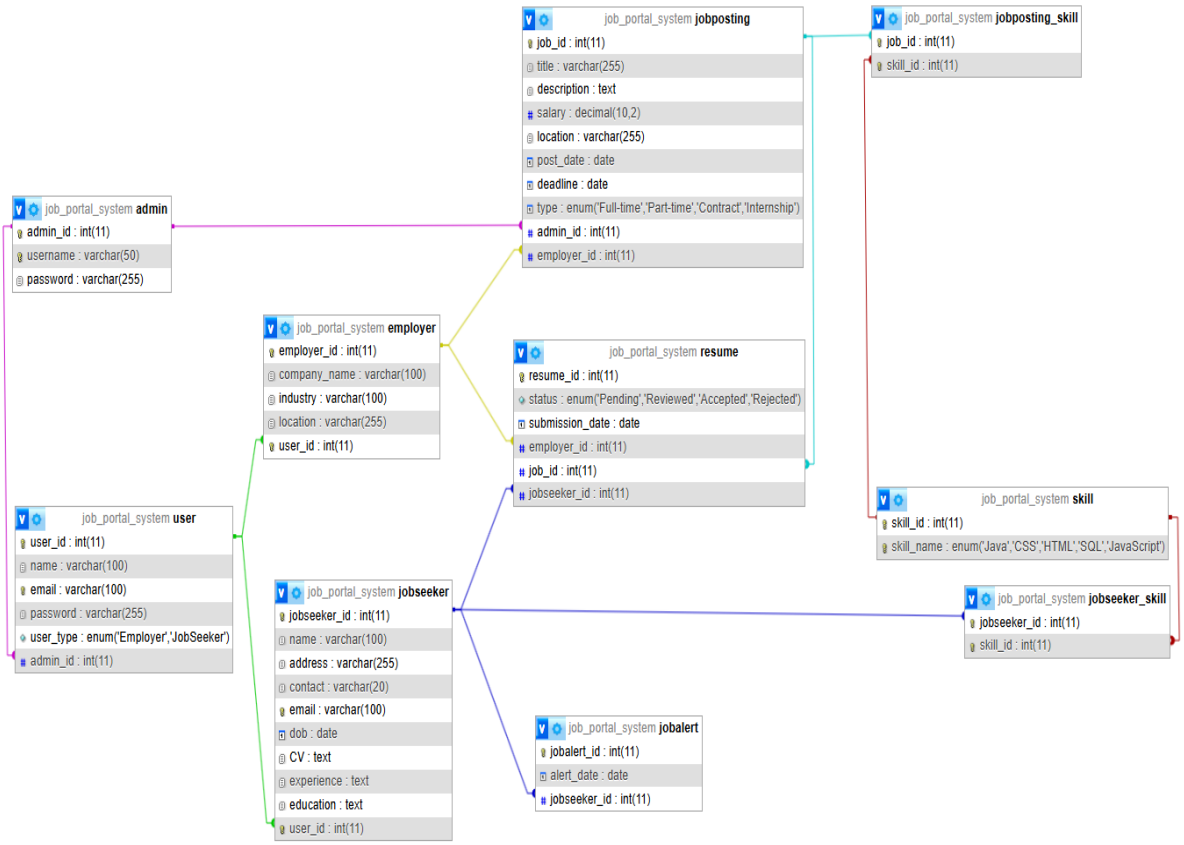
10. JobSeeker gets JobAlert (**1:N)**

11. Admin checks JobPosting (**1:N**)

Step-5: Draw the Diagram



Step-6: Schema Diagram



7. Reduction to database schema

1. **admin** (admin_id (PK), username, password)
2. **user** (user_id (PK), name, email, password, user_type (ENUM: 'Employer', 'JobSeeker'), admin_id (FK from admin))
3. **employer** (employer_id (PK), company_name, industry, location, user_id (FK from user))
4. **jobseeker** (jobseeker_id (PK), first_name, last_name, address, contact, email, dob, CV, experience, education, user_id (FK from user))
5. **jobposting** (job_id (PK), title, description, salary, location, post_date, deadline, type (ENUM: 'Full-time', 'Part-time', 'Contract', 'Internship'), employer_id (FK from employer))
6. **resume** (resume_id (PK), status (ENUM: 'Pending', 'Reviewed', 'Accepted', 'Rejected'), submission_date, job_id (FK from jobposting), jobseeker_id (FK from jobseeker))
7. **skill** (skill_id (PK), skill_name (VARCHAR))
8. **jobAlert** (jobalert_id (PK), alert_date, jobseeker_id (FK from jobseeker))
9. **jobseeker_skill** (jobseeker_id (FK from jobseeker), skill_id (FK from skill))
10. **jobposting_skill** (job_id (FK from jobposting), skill_id (FK from skill))

8. Implementing the database in MySQL

1. **admin** (admin_id (PK), username, password)

admin_id	username	password
1	admin1	pass123
2	admin2	pass456
3	admin3	pass789
4	admin4	passabc
5	admin5	passxyz

2. **user** (user_id (PK), name, email, password, user_type (ENUM: 'Employer', 'JobSeeker'), admin_id (FK from admin))

user_id	name	email	password	user_type	admin_id
1	Brain Station01	brainstation01@gmail.com	pass1	Employer	1
2	Md. Saiful Islam	saiful.islam@gmail.com	pass2	JobSeeker	2
3	Ostad	ostad.bd@gmail.com	pass3	Employer	3
4	Nasima Akter	nasima.akter@gmail.com	pass4	JobSeeker	4
5	Programming Hero	programminghero@gmail.com	pass5	Employer	5
6	Jamal Uddin	jamal.uddin@gmail.com	pass6	JobSeeker	1
7	IT Solution	itsolution@gmail.com	pass7	Employer	2
8	Mim Rahman	mim.rahman@gmail.com	pass8	JobSeeker	3
9	HerosAI	herosai@gmail.com	pass9	Employer	4
10	Hasan Mahmud	hasan.mahmud@gmail.com	pass10	JobSeeker	5

3. **employer** (employer_id (PK), company_name, industry, location, user_id (FK from user))

employer_id	company_name	industry	location	user_id
1	Brain Station01	Software	Dhaka	1
2	Ostad	Education Technology	Chittagong	3
3	Programming Hero	E-Learning	Sylhet	5
4	IT Solution	IT Services	Khulna	7
5	HerosAI	Artificial Intelligence	Rajshahi	9

4. **jobseeker** (jobseeker_id (PK), first_name, last_name, address, contact, email, dob, CV, experience, education, user_id (FK from user))

jobseeker_id	name	address	contact	email	dob	CV	experience	education	user_id
1	Md. Saiful Islam	Mirpur, Dhaka	01711112222	saiful.islam@gmail.com	1995-04-15	saiful_cv.pdf	2 years in Software Development	B.Sc. in CSE, BUET	2
2	Nasima Akter	Agrabad, Chittagong	01822223333	nasima.akter@gmail.com	1998-07-22	nasima_cv.pdf	1 year in Data Analysis	B.Sc. in CSE, CUET	4
3	Jamal Uddin	Sylhet Sadar, Sylhet	01633334444	jamal.uddin@gmail.com	1997-02-10	jamal_cv.pdf	3 years in Networking	Diploma in Networking, BTEB	6
4	Mim Rahman	Jessore, Khulna	01944445555	mim.rahman@gmail.com	1996-09-18	mim_cv.pdf	2 years in Web Development	B.Sc. in IT, RUET	8
5	Hasan Mahmud	Boalia, Rajshahi	01555556666	hasan.mahmud@gmail.com	1994-12-30	hasan_cv.pdf	4 years in Cyber Security	M.Sc. in Cyber Security, DU	10

5. **jobposting** (job_id (PK), title, description, salary, location, post_date, deadline, type (ENUM: 'Full-time', 'Part-time', 'Contract', 'Internship'), employer_id (FK from employer))

job_id	title	description	salary	location	post_date	deadline	type	admin_id	employer_id
1	Software Engineer	Develop and maintain web applications using Java a...	80000.00	Dhaka	2025-02-20	2025-03-20	Full-time	1	1
2	Data Analyst	Analyze large datasets and generate insights using...	65000.00	Chittagong	2025-02-18	2025-03-18	Full-time	2	2
3	Frontend Developer	Build user-friendly web interfaces using React.js ...	70000.00	Sylhet	2025-02-22	2025-03-22	Full-time	3	3
4	IT Support Specialist	Provide technical support and maintain system infr...	50000.00	Khulna	2025-02-19	2025-03-19	Contract	4	4
5	Machine Learning Engineer	Develop AI models using TensorFlow and deep learni...	90000.00	Rajshahi	2025-02-21	2025-03-21	Full-time	5	5

6. **resume** (resume_id (PK), status (ENUM: 'Pending', 'Reviewed', 'Accepted', 'Rejected'), submission_date, job_id (FK from jobposting), jobseeker_id (FK from jobseeker))

resume_id	status	submission_date	employer_id	job_id	jobseeker_id
1	Pending	2025-02-21	1	1	1
2	Reviewed	2025-02-19	2	2	2
3	Accepted	2025-02-22	3	3	3
4	Rejected	2025-02-20	4	4	4
5	Pending	2025-02-23	5	5	5

7. **skill** (skill_id (PK), skill_name (VARCHAR))

skill_id	skill_name
1	Java
2	CSS
3	HTML
4	SQL
5	JavaScript

8. **jobAlert** (jobalert_id (PK), alert_date, jobseeker_id (FK from jobseeker))

jobalert_id	alert_date	jobseeker_id
1	2025-02-21	1
2	2025-02-22	2
3	2025-02-23	3
4	2025-02-24	4
5	2025-02-25	5

9. **jobseeker_skill** (jobseeker_id (FK from jobseeker), skill_id (FK from skill))

jobseeker_id	skill_id
1	1
1	4
2	2
2	3
3	1
3	4
4	5
5	1
5	5

10. **jobposting_skill** (job_id (FK from jobposting), skill_id (FK from skill))

job_id	skill_id
1	1
1	4
2	2
2	4
3	5
4	1
5	1
5	5

9. Future Work

In the future, the Job Portal System can be enhanced with advanced features such as AI-based job recommendations, automated resume screening, and real-time interview scheduling. Additionally, chatbot support for job seekers and employers, data analytics for hiring trends, and integration with third-party job platforms can be implemented to improve efficiency. Expanding the system to support multiple languages and global job postings will further enhance its usability and accessibility.

10. Conclusion

The Job Portal System aims to streamline the hiring process by providing a structured platform for job seekers, employers, and administrators. It ensures an efficient recruitment workflow by managing job postings, applications, and alerts while maintaining data integrity. With a robust database design, this system enhances job matching, reduces hiring time, and improves user experience. Future enhancements will make it more intelligent, scalable, and adaptive to evolving recruitment needs.