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# **CAREER ENGINE**

By

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B.Tech., Jawaharlal Nehru Technological University, 2019

GRADUATE CAPSTONE SEMINAR PROJECT

Submitted in partial fulfillment of the requirements

For the Degree of Master of Science,

With a Major in Computer Science



Governors State University  
University Park, IL 60484

2022

## **ABSTRACT**

Career Engine is a website where people can search for jobs, apply for one or multiple positions, or review a company as a current or past employee. A recruiter, who represents a company, can post openings on the website, contact applicants, or conduct interviews. Job postings on this website are free to be searched or browsed by anyone visiting the site. However, if one needs to apply for a job, this user needs to register with or log in to the website. All recruiters also need accounts to post job openings.

By using this website, companies or recruiters can also find a good and well-profiled resume. This website allows job providers to establish one-on-one relationships with candidates. This website concentrates on the posting and management of job vacancies. Users will be able to search for jobs on this portal. It helps to review and manage the resulting applications efficiently through the web. Employers can also find the resume according to key skills more efficiently.

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## 1. Project Description

It is difficult to find work in skilled fields in today's world. This website is developed for a simple and effective way to search for jobs. This Web portal is very helpful for all users, whether experienced or new. By using this website, job seekers can upload his resumes and get plenty of opportunities matching their profiles. Every user has a unique ID and can apply for multiple jobs at a time. Most of the job portals are there to serve this purpose. Career Engine is another job portal where job seekers and recruiters can communicate on the same platform so that the right job seeker is placed in the right organization.

### 1.1. Competitive Information

There are multiple websites available in the market that provide information about various jobs; some of them are Times Jobs, Naukri, Monster, and so on. They just display job vacancies; there is no provision to search for suitable jobs. In our application, a job seeker can perform a search operations based on location, job title, and company name. We have implemented a better search system than the existing one so that job seekers can get exact results.

### 1.2. Relationship to Other Applications/Projects

There are so many applications related to our project, which helps job seekers to search for jobs. But we developed our application using open-source software like HTML, CSS, and JavaScript. PHP is used as a programming language and MySQL database as a backend. To compile and run applications we use XAMPP software.

### 1.3. Assumptions and Dependencies

Only registered users can access this website. Only recruiters and job seekers can post job details after successfully logging in. For unregistered users, separate mechanisms are there for recruiters and job seekers. The admin has complete control over the system; he or she can view job details posted by the recruiter, delete job details, and monitor how many job seekers are registered for a specific job.

### 1.4. Future Enhancements

We try to use video interaction between the recruiter and the job seeker so that the recruiter can finish his work and the job seeker does not have to go to the interview. We also include an email or mobile notification module, so that whenever a new job is posted on the site, job seekers are notified, and they are also notified when a specific job is approved or rejected.

### 1.5. Definitions and Acronyms

**Admin:** Admin is the one who controls entire project. He/she can approve or reject recruiter requests

**Recruiter:** He/she is the one who uploads job details of a particular company.

**Job seeker:** He/she is the one who applies for the job.

**Applied Job:** The jobs applied by the job seeker.

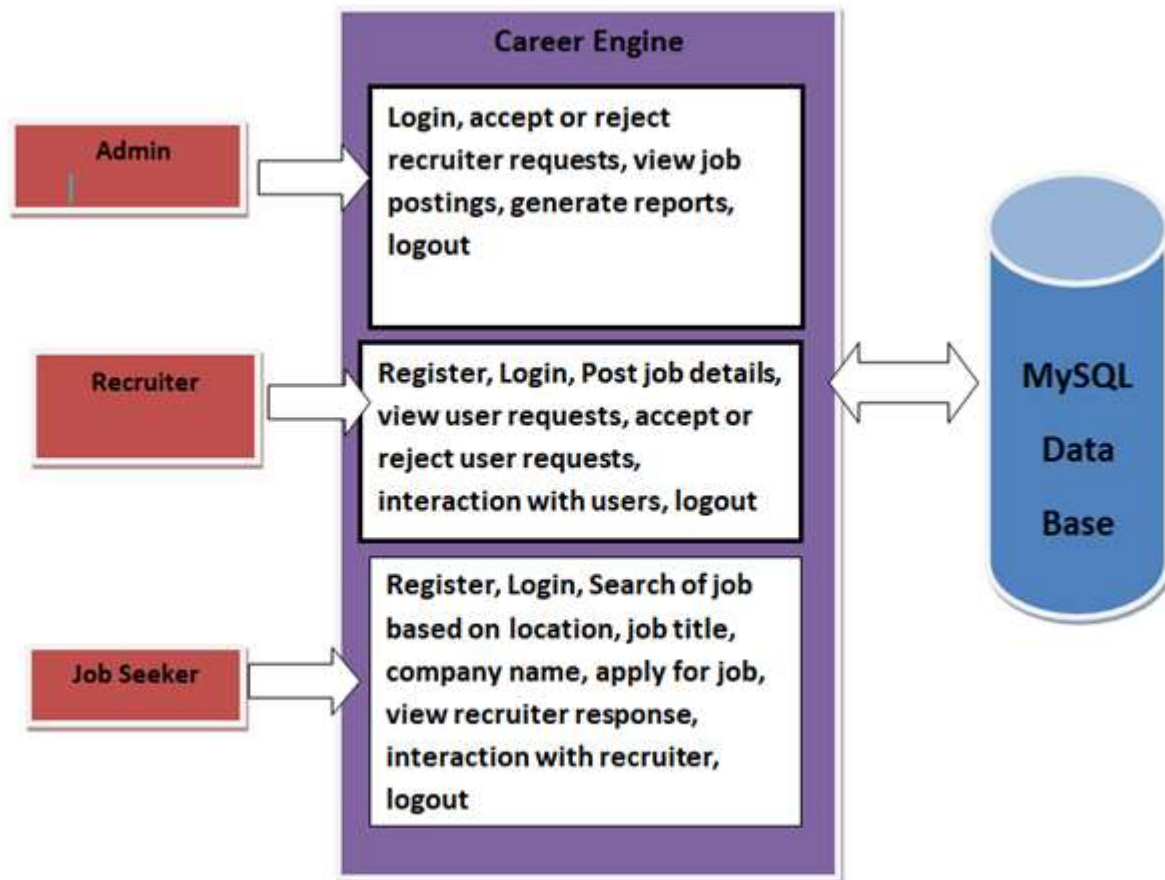
**Posted Job:** The list of jobs uploaded by the recruiter.

## 2. Project Technical Description

This project has three actors namely Admin, Recruiter and Job Seeker. Every actor performs specific operation to meet client requirements. The system architecture, technical architecture and UML diagrams are discussed in following sections.

### 2.1. Application Architecture

Specifically, in our web application we have three stakeholders Admin, job seeker and recruiter. In other words, application architecture can be described as the flow of application which is represented below in the pictorial format.



*Figure 1: Application architecture of Career Engine*

### 2.2 Technical Architecture

The system is developed as a three-tier application. Three parts are categorized as front-end, middleware, and back-end. The front end is designed with HTML, CSS, and JavaScript. For middleware, we have used Java, JSP, and JDBC. MySQL acts as a database. Figure 2 represents the technical architecture of our web site.

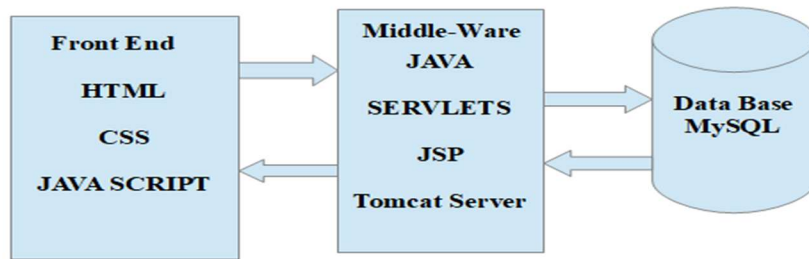


Figure 2: Technical Architecture

## UML Diagram:

### Use case diagram

1. Admin, Recruiter and Job seeker are the Actors.
2. Login, register, update job details, view job details, apply for job, view response, and view users, logout are the use cases.
3. Association relationship between Actors and their corresponding Use Cases.



Figure 3: Use case diagram

## Class Diagram:

1. Admin, Job seeker, and Recruiter are the classes.
2. The Attributes and Operations of the respective classes are placed in the class.
3. There is an association relationship between Admin, job seeker, and recruiter

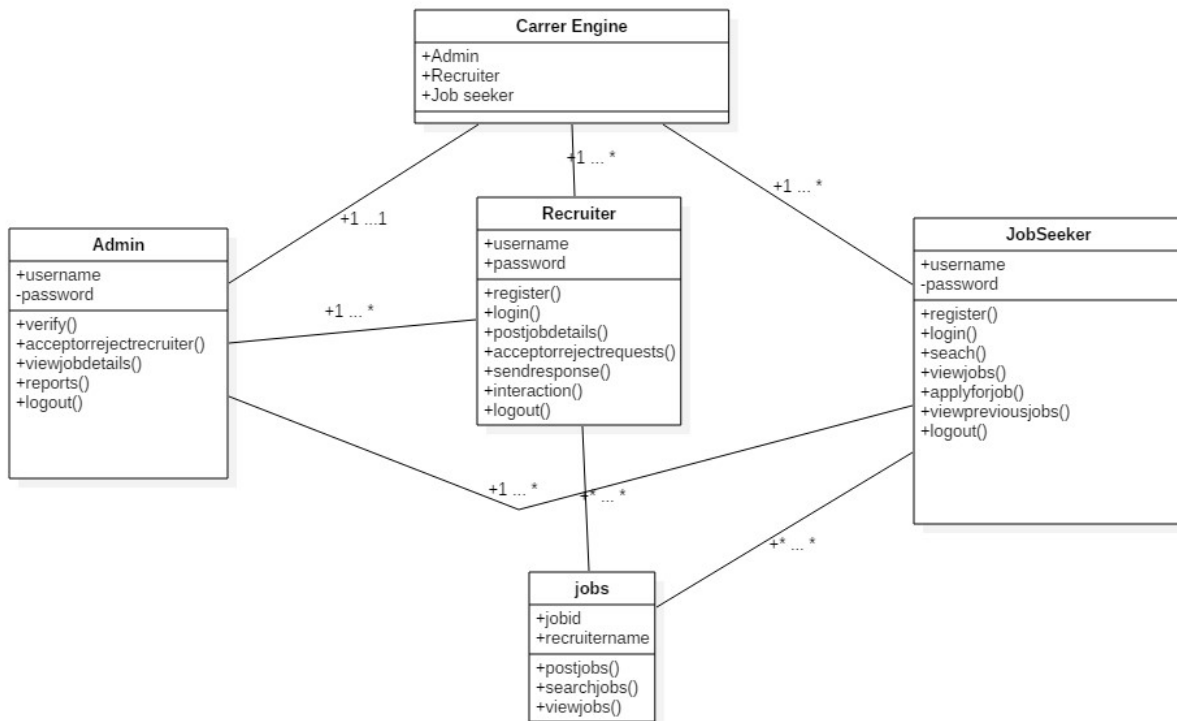


Figure 4: Class Diagram

## ER-Diagram:

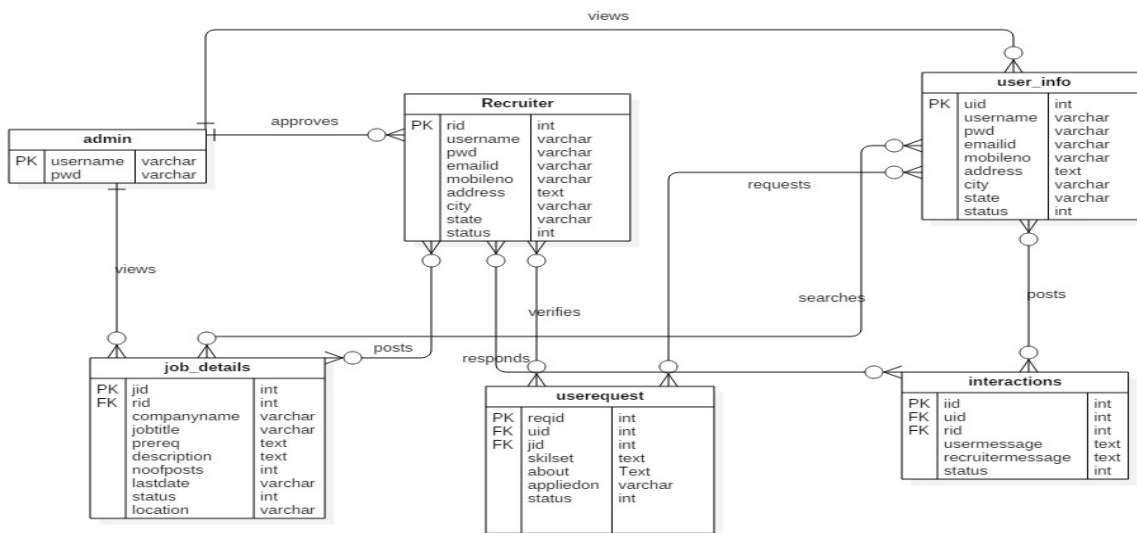


Figure 5: ER-Diagram

## 2.5 Interactions with Other Applications



Our website is designed to interact with other job portals like Naukri and Times Jobs, this system is designed to obtain job details from different websites. Job seekers can conduct mock interviews on other websites using our system.

## **2.6. Capabilities**

The project is designed using different technologies. MySQL database is used as backend and Java is used as a middleware. System has the capability to perform insert, update, delete and select operations on data base dynamically. When a user registers, we perform an insert operation to store details, and a select operation to display job details to job seekers. This system is designed to interact with different data bases and operating systems. System is developed using java therefore it is independent of database and operating system.

## **2.7. Risk Assessment and Management**

Risk assessment is the identification of risks that impact the performance of an entire system. Risk assessment assists in reducing risks and taking the necessary steps to minimize the system's impact.. A separate team is assigned to perform this operation. They will maintain a risk management log for future purposes. In our projects, risks are categorized into three types: low, high, and medium. Risks are handled with the "highest priority first" principle

# **3. Project Requirements**

## **3.1 Identification of Requirements**

In today's world It is difficult to find work in skilled fields. This web site is designed to be a clear and effective way to search for jobs. This Web portal is very helpful for all users, whether experienced or new. By using this website, job seekers can upload their resumes and get plenty of opportunities matching their profiles. Every user has a unique ID and can apply for multiple jobs at a time. Companies or recruiters can also use this website to find a good and well-profiled resume. This website will allow job providers to establish one-on-one relationships with candidates. This website mainly concentrates on the posting and management of job vacancies. Users will be able to search for jobs on this portal. It helps to review and manage the resulting applications efficiently through the web. Employers can also find the resume according to key skills in a very short amount of time.

The majority of job portals aim to serve this purpose. Career Engine is another job portal where job seekers and recruiters can communicate on the same platform so that the right job seeker is placed in the right organization. To achieve this goal, we have conducted research on various job portals and noted the advantages and disadvantages of each. and also interacted with different job seekers and recruiters and listed their requirements. After all our research, we discussed with the professor and finally set the detailed requirements that I expected to see in my application. I gathered requirements to satisfy the following three important factors:

**1) User Capability:** Every user has a unique username, and all the information must be stored and retrieved securely. To perform this operation, we have used the MySQL database.

**2) User-Friendly:** We have opted for HTML, CSS, and JavaScript for implementing the user interface to achieve and enhance the usability of the application. Bootstrap is used for look-and-feel design. The application is developed using HTML, so you need to train any user how to use it.

**3) User Experience:** This application is designed to maintain heavy traffic. The application is running inside the server, and a database is maintained to store all the user data. To increase the user experience of the application, we have used the best technology to render the server-side, which is called a JSP (Java Server Page). This application is quite fast and performs search operations very quickly.

### **3.2 Operations, Administration, Maintenance, and Provisioning (OAM&P):**

Administration, recruiting, and job seekers are the three main actors in our system.

**Admin** is the one who maintains the entire system. The following are the operations performed by the administrator:

1. He/she can approve the recruiter.
2. He/she has access to job postings.
3. He/she can delete job postings.
4. He/she can observe interactions between recruiters and job seekers.
5. He/she can view user feedback.

**The Recruiter** is one who plays a major role in Career Engine; he is responsible for uploading job details and can view and select job seekers. The following are the operations performed by the recruiter:

1. He/she can register with the system.
2. He/she can upload job details.
3. He/she has access to job seeker requests.
4. He/she has the authority to accept or reject a job seeker's request.
5. He/she can interact with job seekers.

**A Job seeker** is one who searches for jobs, can apply for multiple jobs, and can view previous job details. The job seeker is the most important role in our project because the main aim is to provide job details to the job seeker. Following are the operations performed by the job seeker:

1. He/she can register with the system.
2. He/she can search for a job.
3. He/she can view job details.
4. He/she can apply for jobs.
5. He/she has access to the recruiter's response and interacts with the recruiter.

### **3.3 Security and Fraud Detection**

During a job application, the job seeker uploads his personal and professional details, which could be exploited to steal the applicant's identity or commit financial fraud. So, for fraud prevention, we have implemented the following two methods:

- It is recommended to avoid job postings done through pop-up windows, which do not offer company information such as a job profile or contact number. Even if you want to apply for the job, visit the company's official website and contact the customer service department for more information.
- All major companies are registered with MCA. Before applying for any job, it is recommended that you go through the MCA website and view the company profile.

### **3.4 Release and Transition Plan**

The project is developed as a client-server model, so it needs to be deployed on a client organization server. All necessary software is installed in the client organization, and sufficient space is purchased to store and run the application on the server. Future release dates are communicated to the client, and advanced features are frequently upgraded based on client preferences.

## **4. Project Design Description:**

There are separate UIs designed for each module. Administrative UI is for maintaining all the operations and the database, and we can also perform insert, delete, and update operations on the database. Recruiter UI is designed to perform job postings, view requests, and send or view job seeker messages. Job seeker UI is designed to perform search operations, view job details, and have interactions with recruiters. Our system consists of three modules.

1. Admin
2. Recruiter
3. Work Seeker

The admin module will perform the following operations:

1. Login.
2. Approve Recruiters.
3. View job details.
4. Delete job details.
5. Look at job seekers.
6. View recruiters.
7. View feedback.
8. View interactions between recruiters and job seekers.

The recruiter module will perform the following operations:

1. Register.
2. Login.
3. Upload job details.
4. Examine job seeker requests.
5. Accept or reject job seeker applications.
6. Interaction with job seekers.
7. Logout.

The Job Seeker module will perform the following operations:

1. Register.
2. Login.
3. Search for jobs based on job titles.
4. Look the city or jobs based on the name of the company.
5. Search for jobs based on city
6. View job details
7. Job application
8. View job status
9. Interaction with the recruiter

### 5. Internal/External Impacts and Specification:

We designed interfaces utilizing various technologies that contribute to establishing user-friendly interfaces, which include HTML, CSS, JavaScript, JSP, JDBC, and MySQL.

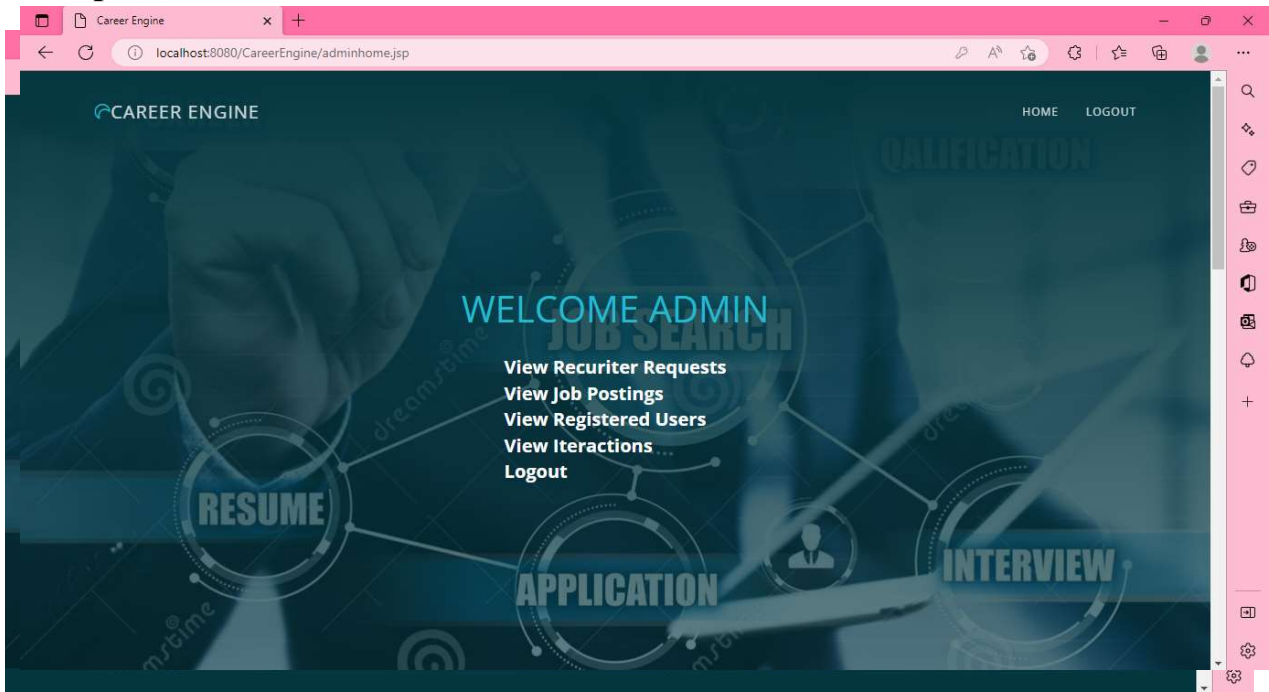
For UI development, we use HTML; for applying styles, we use CSS; to perform client-side validations, we use Java script; and for realistic design, we use Bootstrap. MySQL is used as a back-end database. MySQL is simple, open-source software; Java Server Pages (JSP) and Java Data Base Connectivity (JDBC) act as middleware. These are responsible for receiving requests from the front end and performing operations on the database. Tomcat, an open-source web server designed to run Java-based web applications, is used for deployment.

An agile development model is used to develop this application. In the Agile model, the entire project is divided into small incremental builds. Figure 3 depicts the Agile model.

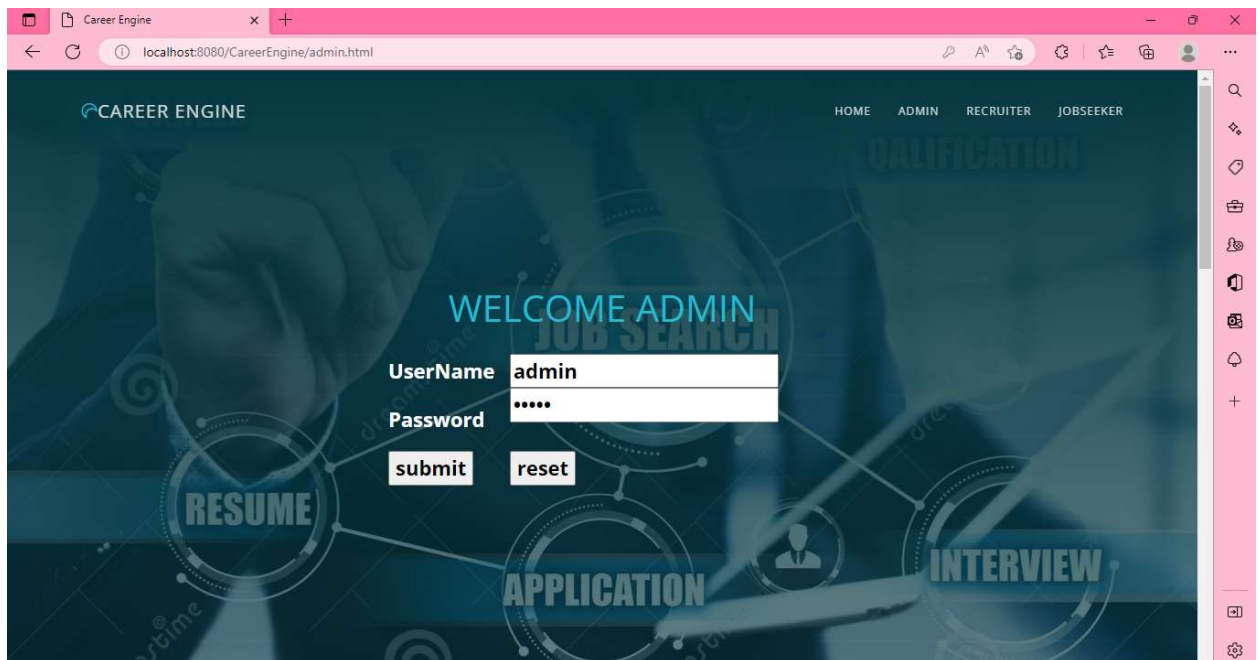


Figure 6: Agile model [5]

## Project Output Screen shots:



*Figure 7:Home Page*



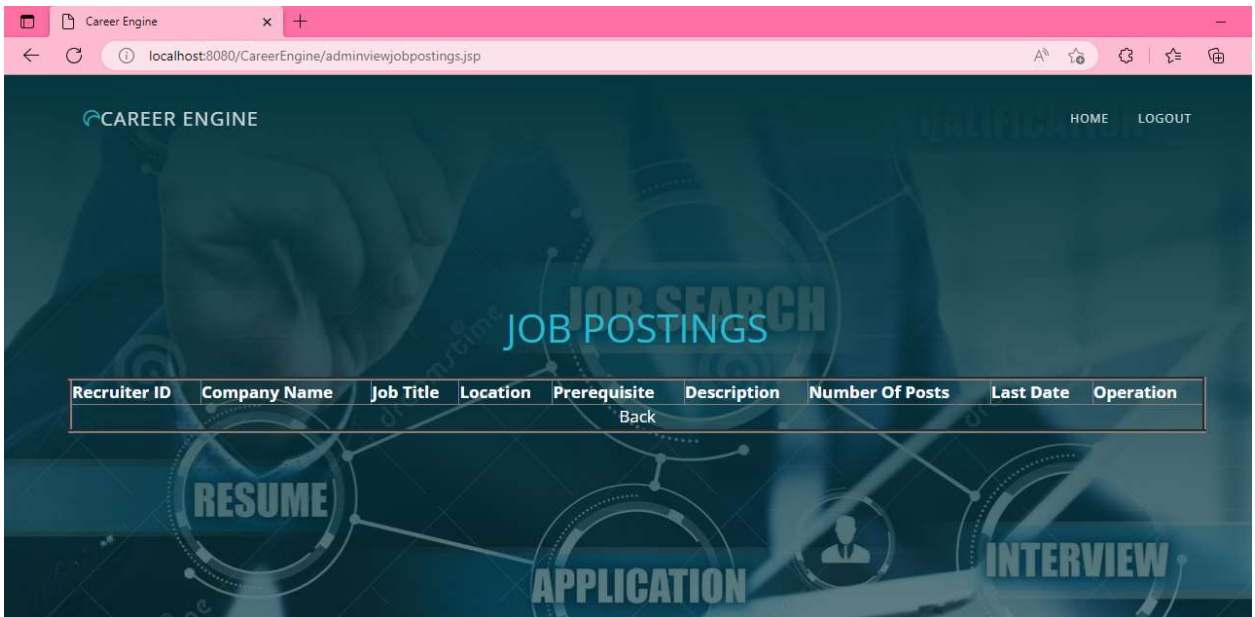
*Figure 8:Admin Login Page*

*Figure 9:Admin Home Page*

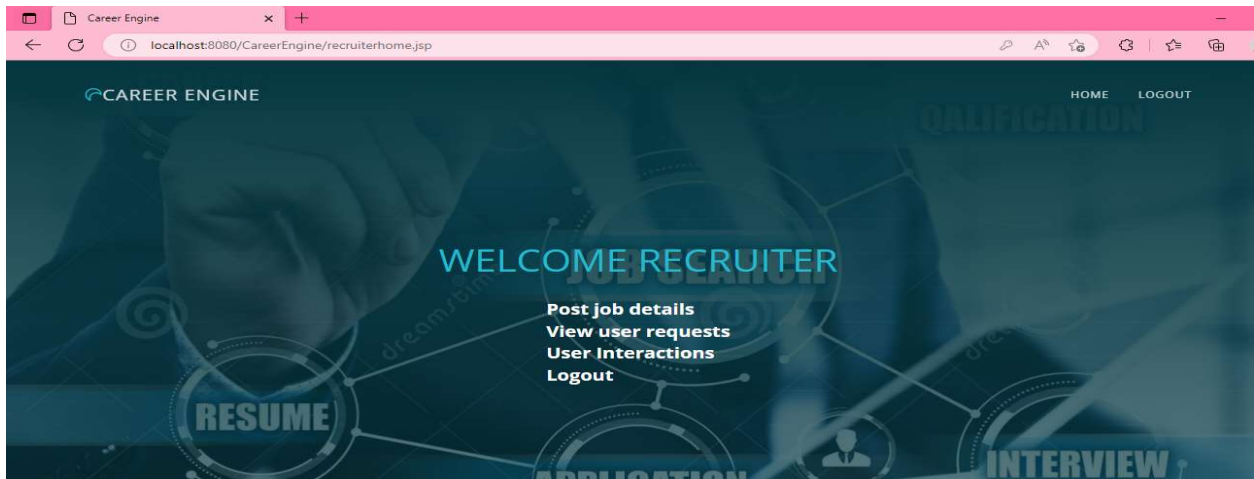
Figure 10: Pending Recruiter Requests

The screenshot shows a web browser window with the title 'Career Engine' and the URL 'localhost:8080/CareerEngine/viewrecruiterrequests.jsp'. The page features a dark blue background with a network diagram and the text 'PENDING RECRUITER REQUESTS'. A table with the following columns is displayed: Recruiter ID, Recruiter Name, EmailID, Mobile Number, Address, City, State, and Operation. Below the table is a 'Back' button. The browser's address bar and navigation icons are visible at the top. The page also includes a 'HOME' and 'LOGOUT' link in the top right corner. The background image contains the words 'RESUME', 'APPLICATION', and 'INTERVIEW' in large, semi-transparent letters.

Recruiter ID	Recruiter Name	EmailID	Mobile Number	Address	City	State	Operation
Back							



*Figure 11:View Job Postings*



*Figure 12:Recruiter Home Page*

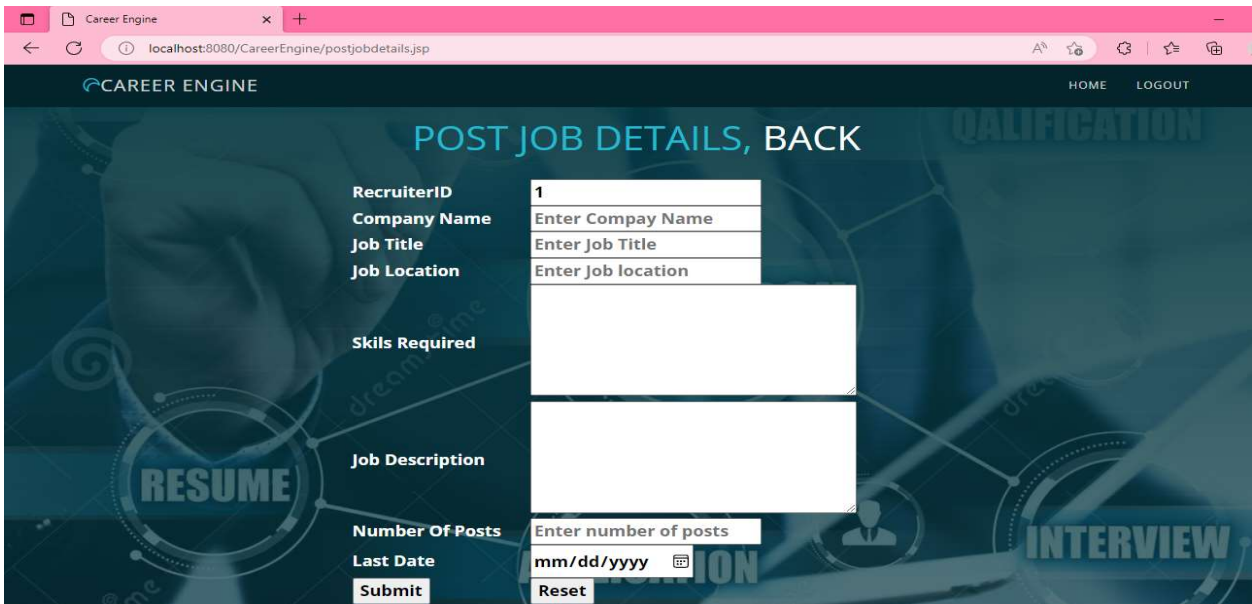


Figure 13: Post Job Details

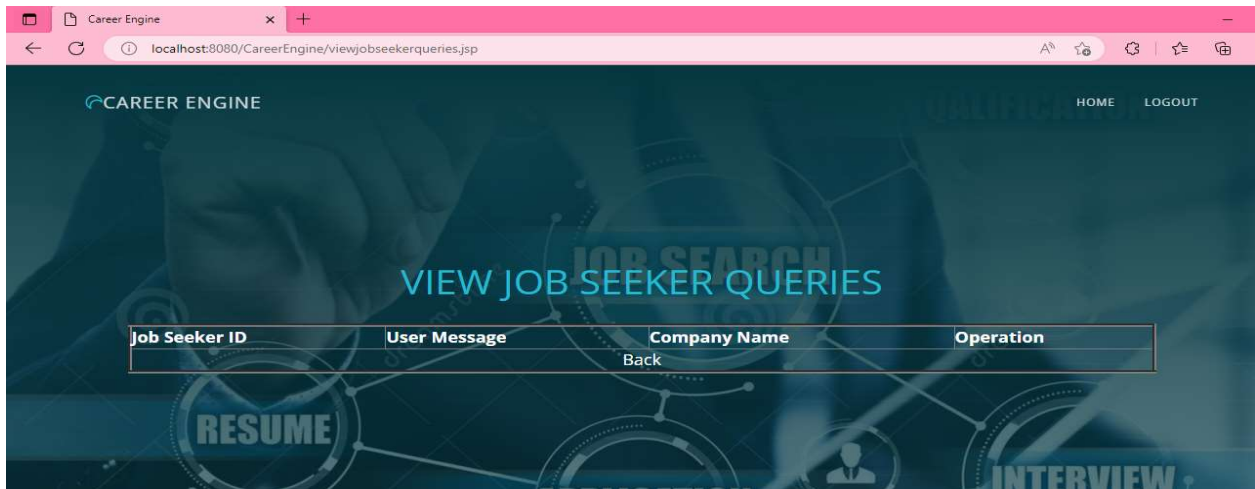


Figure 14: View Job Seeker queries



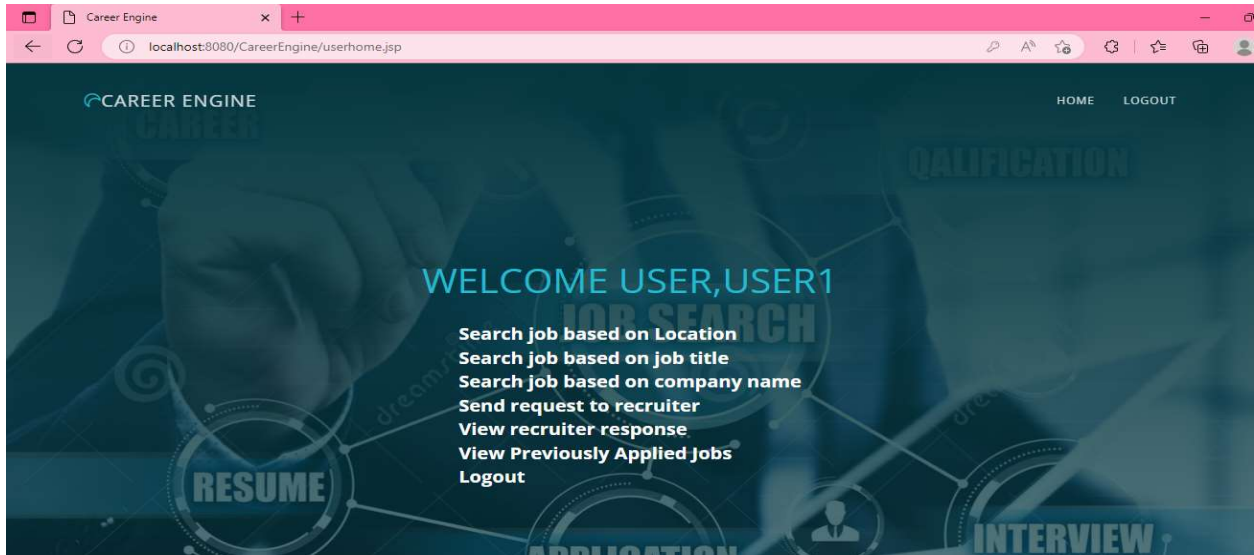


Figure 17: Job seeker Home Page

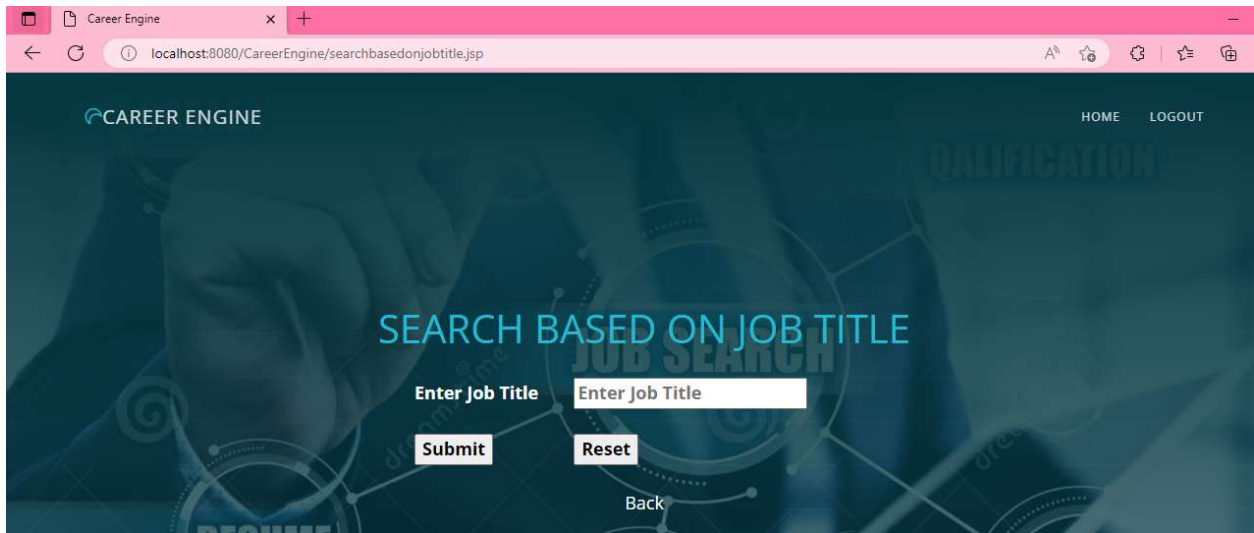


Figure 16: Search based on job title



Figure 15: Search Result



*Figure 18: View previously applied jobs*

## 6. Project Design Unit Impacts

Company employees can register as a recruiter and regular people can register and login as Job seeker and search for positions that match their skill set. The following are the design unit impacts

1. Registered job seekers can apply for multiple jobs directly
2. Only approved recruiters can post job details and can view job seeker profiles.
3. Multiple company recruiters can register and post their jobs
4. Only registered users can search for and view job postings and check the status of their application from recruiters

### 6.1. Functional Area

#### 6.1.1 Functional Overview

Following are the software technologies used in this application

#### Software Requirements:

1. UI Design: HTML, CSS and Bootstrap
2. Client-side Scripting: JavaScript
3. Web-based Technologies: JSP
4. Database: MySQL
5. Operating Systems: Windows
6. Server: Tomcat Web Server
7. IDE: Eclipse IDE
8. UML design: Star UML

#### Deployment Requirements

1. **Server:** Apache Tomcat
2. **Data Base:** MySQL Database

#### 6.1.2. Impacts

The database must be maintained to store a huge amount of information related to job seekers' details, job details, and recruiter details, and a proper network connection must be maintained between the server and the database.

## 7. Open Issues

Career Engine is a web application, it can be accessed by multiple job seekers and recruiters at the same time. The main risk is finding fraudulent recruiters, and job seekers may post incorrect details. So, a proper risk management team must be maintained to reduce the impact of the risk.

## 8. Acknowledgements

I'd like to thank my professor, Dr. Dae Wook Kim for his valuable guidance and cooperation throughout the course of my project. I sincerely appreciate your valuable time spent assisting me when I needed extra assistance with this project. Also, I'd like to thank my mentors for their encouragement and for doing everything they could do to keep me motivated which allowed me to develop my critical thinking and how to approach the project strategically

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