**OOADI FINAL EXAM PROJECT SPRING 2024**

**FOR JOB BOARD WEBITE**

**SCRUM TEAM FOR THE JOB BOARD WEBSITE PROJECT**

|  |  |  |
| --- | --- | --- |
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GITHUB REPOSITORY: <https://github.com/Favourez/JoBbOARD>

# Chapter One: Introduction

## General Introduction

In today’s competitive job market, the need for an efficient, comprehensive, and user-friendly job board platform has become paramount. The job search process can be daunting for job seekers who must navigate through numerous job postings on multiple platforms. Similarly, employers face challenges in efficiently finding and attracting the right talent. This project proposes the development of a robust job board website aimed at bridging the gap between job seekers and employers, providing a seamless and intuitive platform for both parties to connect.

## Aim and Objectives

### Aim

The primary aim of this project is to develop an interactive and efficient job board website that simplifies the job search and recruitment process, thereby enhancing the overall user experience for both job seekers and employers.

### Objectives

1. **User-Friendly Interface**: To design an intuitive and accessible user interface that caters to the needs of both job seekers and employers.
2. **Efficient Job Search**: To implement a powerful search engine with filters such as keywords, location, job category, and salary range to help job seekers find relevant job opportunities quickly.
3. **Seamless Application Process**: To enable job seekers to apply for jobs easily by providing features such as resume uploads and application tracking.
4. **Employer Tools**: To offer employers a suite of tools for posting jobs, managing applications, and communicating with candidates.
5. **Job Alerts**: To allow job seekers to set up job alerts for specific criteria to receive notifications about new job postings.
6. **Review and Rating System**: To provide a platform for job seekers to rate and review employers, and for employers to rate job seekers.
7. **Analytics and Reporting**: To provide dashboards and reports for employers and administrators to monitor job postings, applications, and site performance.

## Problem Statement

The current landscape of job search and recruitment is fragmented and inefficient. Job seekers often struggle with the following issues:

1. **Multiple Platforms**: Job seekers must search across various job portals, leading to redundancy and time inefficiency.
2. **Poor Search Functionality**: Many job boards lack advanced search filters, making it difficult for job seekers to find jobs that match their specific criteria.
3. **Cumbersome Application Process**: The application process on many job boards is cumbersome, requiring job seekers to fill out repetitive forms and upload their resumes multiple times.
4. **Lack of Feedback**: Job seekers rarely receive feedback on their applications, leaving them in the dark about their application status.

Employers face their own set of challenges, including:

1. **High Volume of Applicants**: Employers receive numerous applications, many of which are not relevant, making it time-consuming to sift through and find suitable candidates.
2. **Inefficient Communication**: Communicating with candidates is often inefficient, with no centralized system to manage correspondence.
3. **Limited Tools for Managing Applications**: Employers often lack comprehensive tools for tracking and managing applications, leading to disorganization and potential loss of valuable candidates.

This project seeks to address these issues by creating a job board website that offers a unified, efficient, and user-friendly platform for job seekers and employers alike. By improving the job search and application process for job seekers and providing powerful tools for employers, this job board aims to streamline the recruitment process and enhance the overall user experience.

# Chapter Two: Literature Review

## Software Development Methodologies

### Waterfall Model

The Waterfall Model is a linear and sequential approach to software development. It consists of distinct phases such as requirements gathering, system design, implementation, testing, deployment, and maintenance. Each phase must be completed before the next one begins, and there is little room for changes once a phase is finished.

### Agile Methodology

Agile methodology is an iterative and incremental approach to software development. It emphasizes flexibility, collaboration, and customer feedback. Development is carried out in small, manageable units called sprints, typically lasting two to four weeks. Agile encourages adaptive planning, evolutionary development, and continuous improvement.

### Scrum

Scrum is a subset of Agile methodology, focusing on delivering the highest value in the shortest amount of time. It involves roles such as Product Owner, Scrum Master, and Development Team. Key components include sprints, sprint planning, daily stand-ups, sprint reviews, and retrospectives. Scrum is designed to provide a framework for continuous improvement and to facilitate rapid delivery of high-quality software.

### Kanban

Kanban is another Agile methodology that emphasizes visualizing work, limiting work in progress, and enhancing workflow. It uses a Kanban board to visualize tasks and their status, helping teams manage and improve their processes incrementally.

## Comparison between Different Software Development Methodologies

### Waterfall vs. Agile

* **Waterfall**: Rigid, sequential process; limited flexibility; changes are difficult to implement once a phase is completed; suitable for projects with well-defined requirements.
* **Agile**: Flexible, iterative process; encourages changes and customer feedback; continuous delivery of small increments; suitable for projects with evolving requirements.

### Scrum vs. Kanban

* **Scrum**: Structured framework with specific roles, ceremonies, and artifacts; focuses on time-boxed sprints and iterative delivery; suitable for teams needing structure and defined roles.
* **Kanban**: Flexible framework without predefined roles or time-boxes; focuses on visualizing work and managing flow; suitable for teams looking for continuous delivery and process improvement.

## Reason for the Choice of Scrum Methodology

### Flexibility and Adaptability

The job board website project requires a methodology that allows for continuous feedback and adaptation. Scrum’s iterative approach ensures that we can adapt to changes in requirements and priorities quickly, delivering valuable features incrementally.

### Clear Structure and Roles

Scrum provides a well-defined structure with clear roles and responsibilities. This clarity helps ensure that all team members understand their roles and the overall process, leading to better coordination and communication.

### Continuous Improvement

Scrum’s focus on retrospectives at the end of each sprint allows the team to continuously reflect on their performance and make improvements. This continuous improvement cycle is crucial for maintaining high quality and efficiency throughout the project.

### Stakeholder Involvement

Scrum encourages regular stakeholder involvement through sprint reviews and product demonstrations. This involvement ensures that the project remains aligned with stakeholder expectations and requirements.

## General Review of Related Concepts with Respect to the Chosen Project

### Job Boards

Job boards are online platforms that connect job seekers with employers. They typically feature job listings, search functionalities, application processes, and user profiles. Advanced job boards may include additional features such as job alerts, company reviews, and analytics.

### User Experience (UX) Design

UX design focuses on creating a seamless and intuitive experience for users. For a job board website, this involves designing an easy-to-navigate interface, efficient search functionalities, and a straightforward application process.

### Search Engine Optimization (SEO)

SEO involves optimizing a website to rank higher in search engine results, increasing visibility and traffic. For a job board website, effective SEO ensures that job postings and the platform itself are easily discoverable by users.

### Data Security and Privacy

Data security and privacy are critical for job board websites, which handle sensitive user information such as resumes and personal details. Implementing robust security measures and ensuring compliance with data protection regulations (e.g., GDPR, CCPA) is essential.

## Review of Related Literature with Respect to the Chosen Project

### User-Centric Design in Job Boards

Smith (2019) emphasizes the importance of user-centric design in job boards, highlighting that a user-friendly interface significantly enhances user satisfaction and engagement. The study suggests incorporating intuitive navigation, personalized recommendations, and responsive design to improve user experience.

### Enhancing Job Search Algorithms

Jones and Brown (2020) discuss the role of advanced algorithms in enhancing job search functionalities. The research explores various techniques such as machine learning and natural language processing to improve the accuracy and relevance of job search results.

### Employer Perspectives on Job Boards

A study by Williams (2018) investigates employers’ needs and preferences regarding job boards. Key findings include the importance of efficient application management tools, the ability to track applicant progress, and the value of detailed analytics and reporting.

### Data Security in Online Recruitment Platforms

Johnson et al. (2021) highlight the critical importance of data security in online recruitment platforms. The paper discusses various security measures such as encryption, secure authentication methods, and regular security audits to protect user data.

### Agile Methodologies in Web Development

The application of Agile methodologies in web development is explored by Lee (2017), who demonstrates that iterative development and continuous feedback significantly enhance project outcomes. The study supports the use of Scrum for web-based projects due to its flexibility and emphasis on stakeholder involvement.

# CHAPTER 3

**Define Clearly the Requirements of Your System**

1. **Identify Stakeholders**:

* **Job Seekers**: People looking for jobs.
* **Employers**: Companies or individuals looking to hire.
* **Administrators**: People managing the platform.
* **Developers**: Team responsible for building and maintaining the site.

1. **Requirements Documentation**:
   * **Functional Requirements**:
     + **User Registration and Authentication**:
       - Job seekers can create profiles, upload resumes, and apply for jobs.
       - Employers can create company profiles, post job listings, and review applications.
       - Administrators can manage user accounts, job listings, and site content.
     + **Job Search and Filters**:
       - Job seekers can search for jobs by keywords, location, category, salary range, etc.
     + **Job Alerts**:
       - Job seekers can set up job alerts for specific criteria.
     + **Application Management**:
       - Employers can track applications, communicate with applicants, and schedule interviews.
       - Job seekers can track their application status.
     + **Reviews and Ratings**:
       - Job seekers can rate and review companies.
       - Employers can rate and review job seekers.
     + **Dashboard and Analytics**:
       - Employers and administrators can access dashboards to view statistics and reports.
   * **Non-Functional Requirements**:
     + **Performance**: The website should load within 3 seconds.
     + **Scalability**: The system should handle up to 10,000 concurrent users.
     + **Security**: Implement robust security measures to protect user data.
     + **Usability**: The website should have an intuitive and user-friendly interface.
   * **Constraints**:
     + Budget: Insufficient budget required for initial development and launching.
     + Timeline: 6 months for MVP (Minimum Viable Product).
     + Technology Stack: Use modern web technologies like Firebase, Maps\_Google, MongoDB, HTML, CSS.

**Analyse the Feasibility of the Various Requirements**

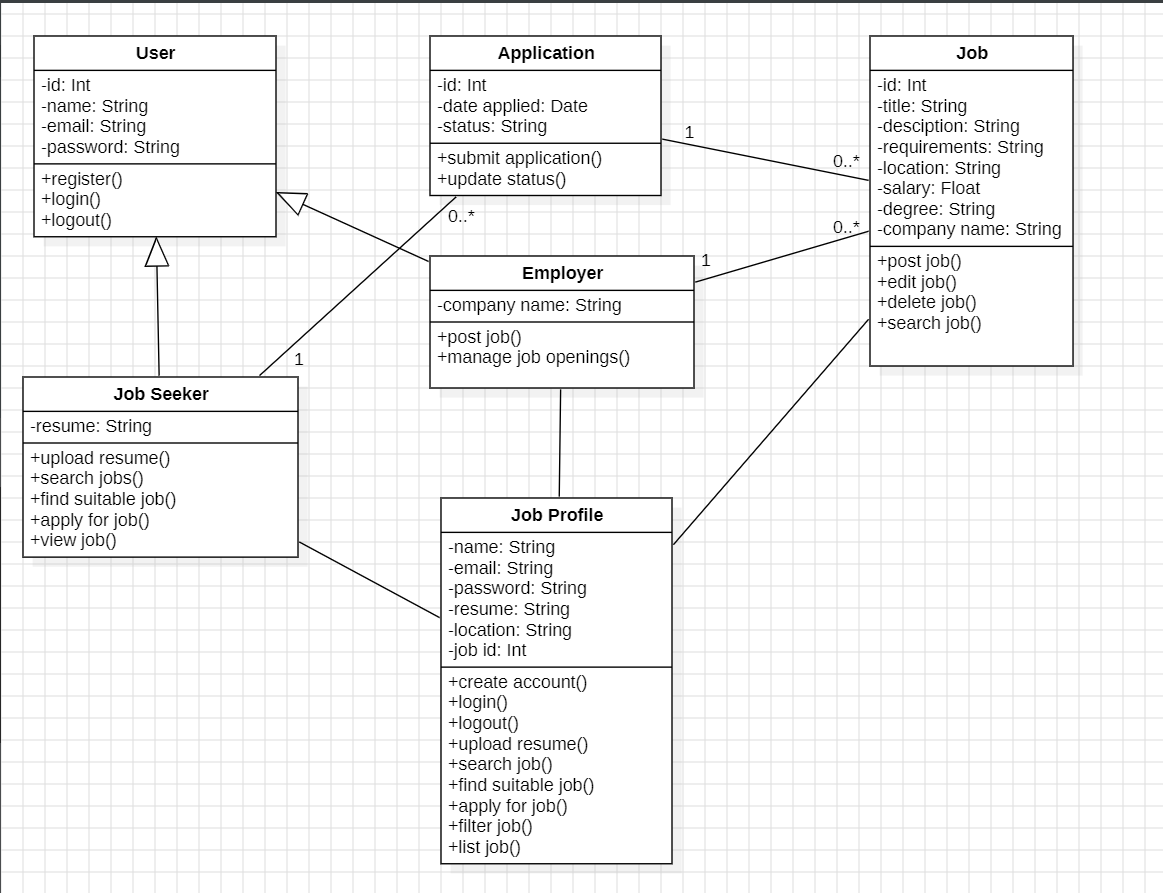
1. **Technical Feasibility**:
   * **Technology Stack**: Using HTML, CSS, JavaScript, Firebase, is feasible and suitable for building a scalable job board website.
   * **Team Expertise**: Ensure the development team has experience with the chosen technology stack.
   * Organise little workshops and training sessions to familiarize developers with the chosen coding languages.
2. **Economic Feasibility**:
   * **Cost Estimation**: Initial development is estimated at 50,000 cfa. Include costs for hosting, domain registration, and maintenance.
   * **Revenue Streams**: Consider monetization options like premium listings, featured ads, and subscription plans for employers.
   * Percentage cuts from successful payment of completed jobs on the website.
3. **Legal Feasibility**:
   * **Compliance**: Ensure compliance with data protection laws like GDPR and CCPA.
   * **Terms of Service and Privacy Policy**: Draft clear and comprehensive terms of service and privacy policy documents.
4. **Operational Feasibility**:
   * **Support and Maintenance**: Plan for ongoing support and maintenance, including user support and regular updates.
   * **Impact on Existing Processes**: If integrating with existing systems, ensure seamless data transfer and compatibility.
5. **Schedule Feasibility**:
   * **Timeline**: A 6-month timeline for MVP (minimum viable product) is ambitious but achievable with a dedicated team. Break down the project into sprints for better management.

**Example of Deliverables**

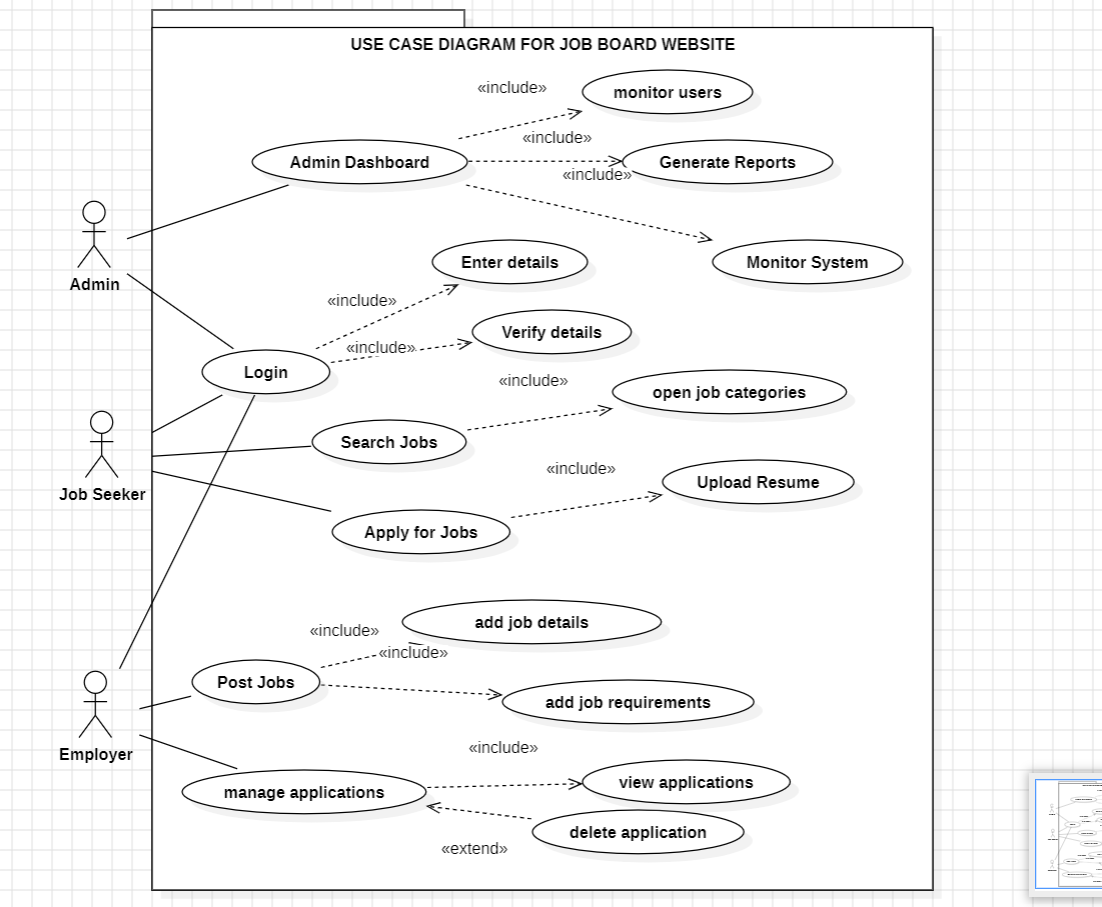
1. **Requirements Specification Document**: A detailed document outlining functional and non-functional requirements, constraints, and prioritization.
2. **Feasibility Analysis Report**: A report covering technical, economic, legal, operational, and schedule feasibility.
3. **Product Backlog**: A prioritized list of user stories with estimated effort and acceptance criteria, regularly updated based on project progress.

**UML DIAGRAMS**

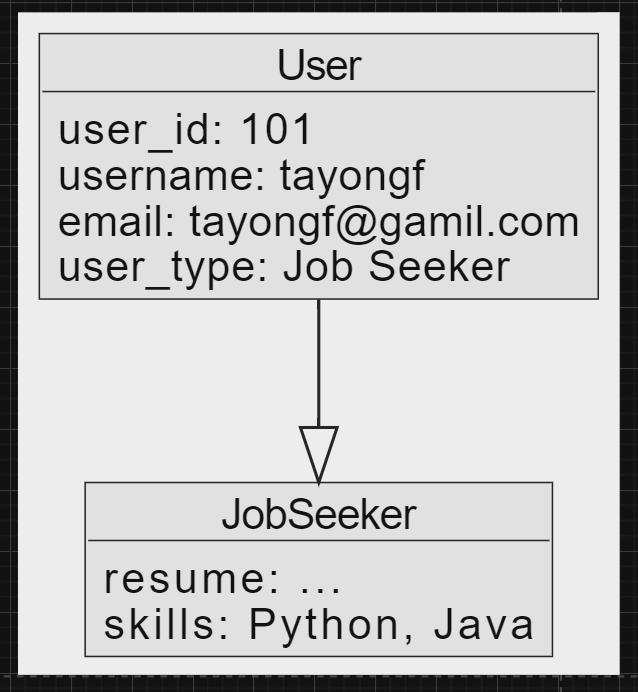
**CLASS DIAGRAM FOR THE JOB BOARD WEBSITE**



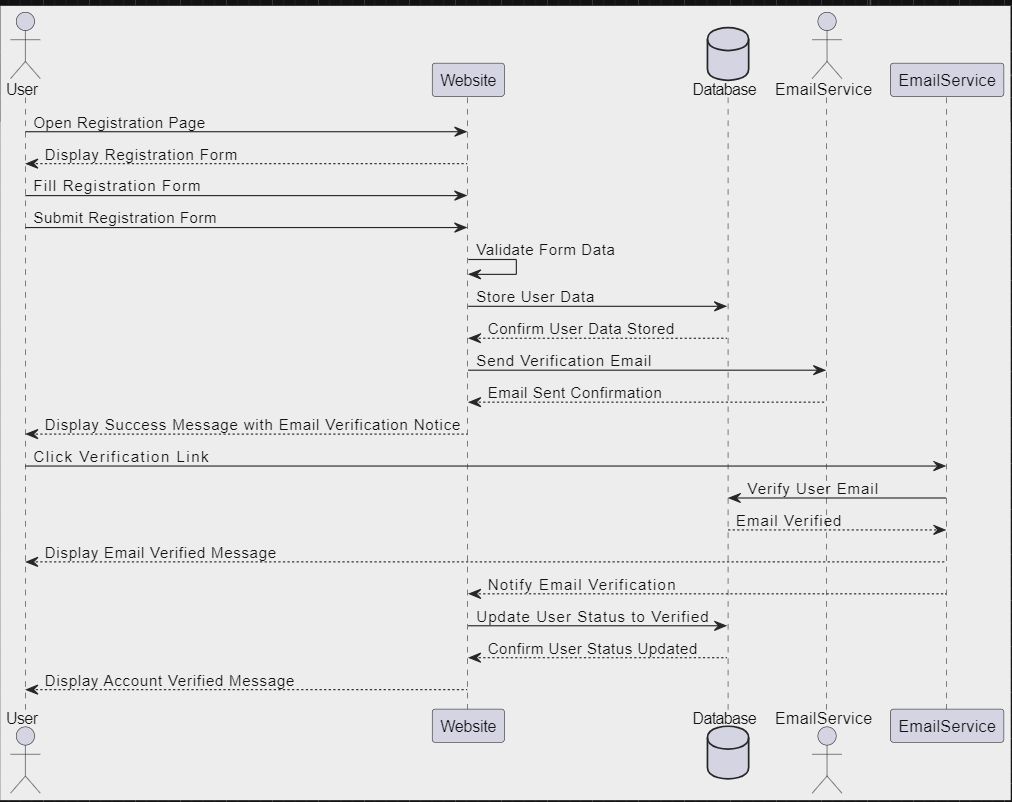
**USE CASE DIAGRAM FOR JOB BOARD WEBSITE**

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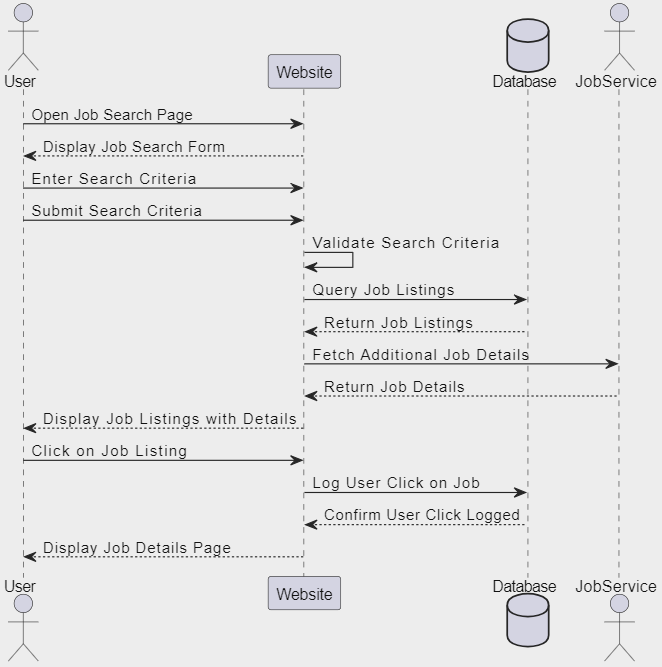
**OBJECT DIAGRAM**

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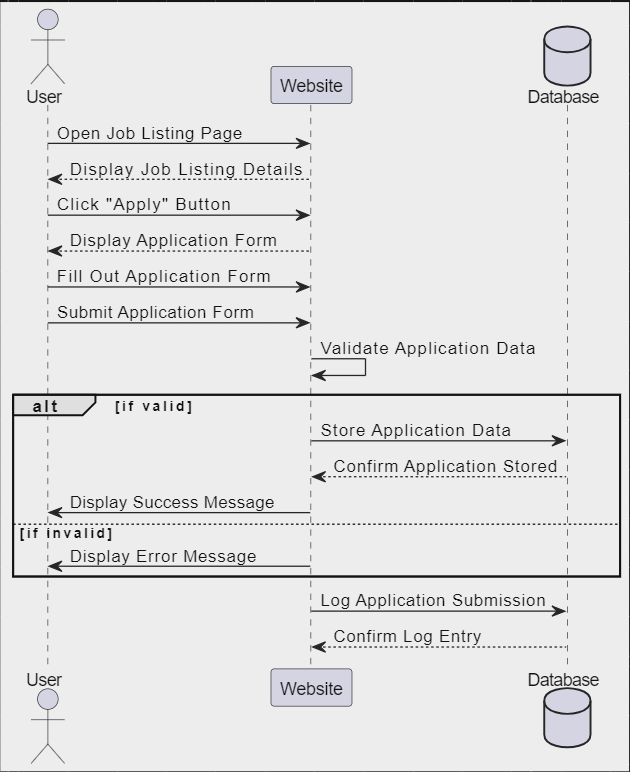
**SEQUENCE DIAGRAM FOR THE LOGIN PROCESS**

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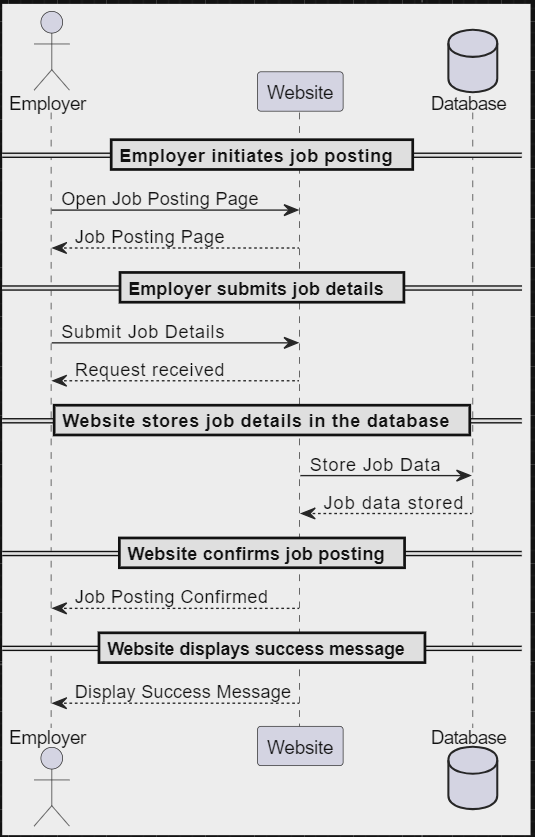
**SEQUENCE DIAGRAM FOR JOB SEARCH**

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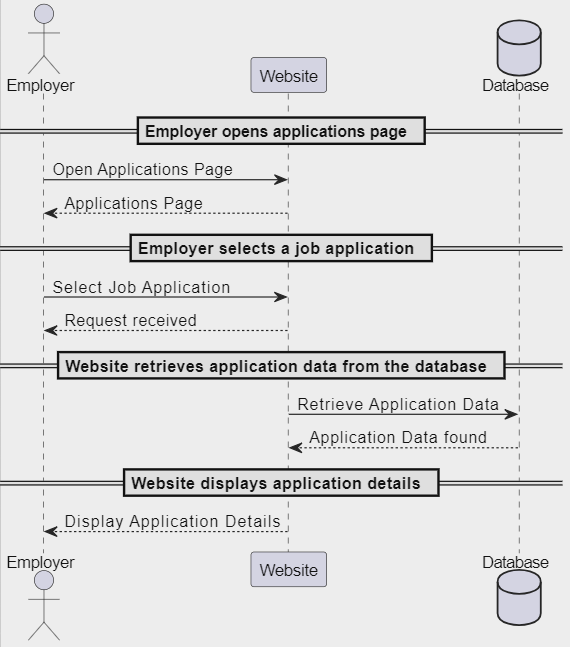
**SEQUENCE DIGRAM FOR JOB APPLICATION**

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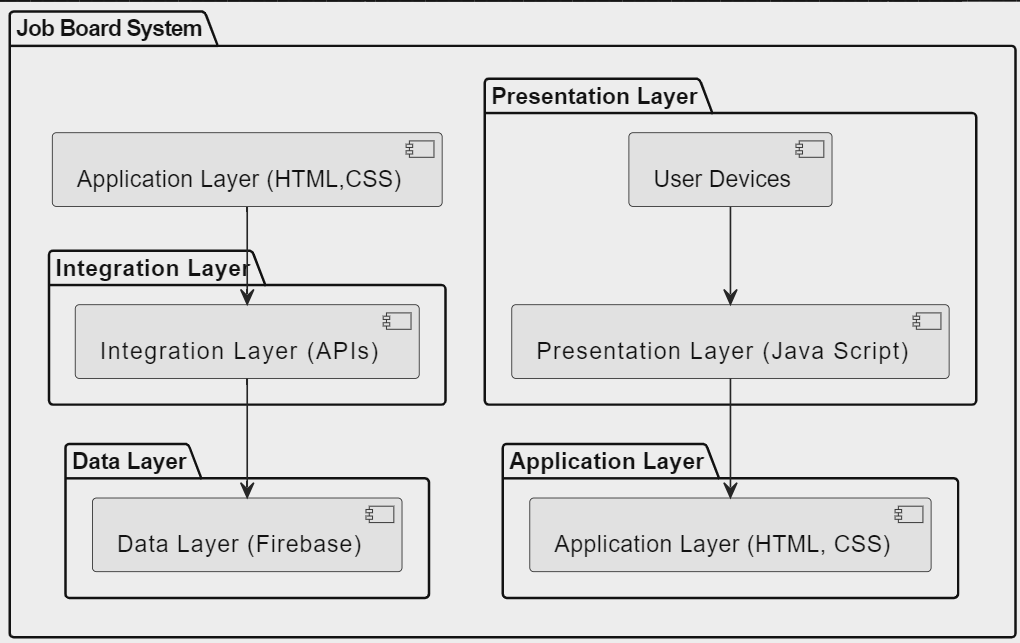
**SEQUENCE DIAGRAM FOR POSTING A JOB**

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**SEQUENCE DIAGRAM TO REVIEW JOB APPLICATIONS**

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**SYSTEM ARCHITECTURE**

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**SPRINT AND PRODUCT BACKLOGS FOR THE “Job Board” WEBSITE**

**Product Backlog for a Job Board Website**

The product backlog is a list of all the features, functions, requirements, enhancements, and fixes that need to be developed for the website. These are prioritized by the product owner. Here's an example:

1. **User Authentication**
   * User registration
   * User login
   * Password reset functionality
2. **User Profiles**
   * Create/edit profile for job seekers
   * Upload profile picture
   * Add resume/CV
   * Add skills and experience
3. **Job Listings**
   * Create/edit job postings for employers
   * Search and filter job listings by location, industry, salary, etc.
   * View job details
   * Apply to job postings
4. **Employer Profiles**
   * Create/edit profile for employers
   * Upload company logo
   * Add company description and details
5. **Job Application Management**
   * Track application status
   * Employers can review applications
   * Job seekers can view their application history
6. **Notifications**
   * Email notifications for job applications
   * Job alerts for seekers
   * Application status updates
7. **Search Functionality**
   * Keyword search for jobs
   * Advanced search filters
   * Search by company
8. **Dashboard**
   * Job seekers dashboard (applied jobs, saved jobs)
   * Employer dashboard (posted jobs, applications received)
9. **Admin Panel**
   * Manage users
   * Approve/reject job postings
   * Site statistics
10. **SEO and Analytics**
    * SEO optimization for job listings
    * Integrate with Google Analytics
11. **Responsive Design**
    * Mobile and tablet optimization
12. **Payment Integration**
    * Subscription plans for employers
    * Payment gateway integration
13. **Security Enhancements**
    * Data encryption
    * Regular security audits
14. **Feedback System**
    * Allow users to provide feedback on jobs and employers
    * Display ratings and reviews
15. **Customer Support**
    * Integrated support chat
    * Help center with FAQs

**PRODUCT BACKLOG**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Feature** | **Description** | **Priority** |
| 1 | User Authentication | User registration, login, password reset functionality | High |
| 2 | User Profiles | Create/edit profile for job seekers, upload profile picture, add resume/CV | High |
| 3 | Job Listings | Create/edit job postings for employers, search and filter job listings | High |
| 4 | Employer Profiles | Create/edit profile for employers, upload company logo, add company description | Medium |
| 5 | Job Application Management | Track application status, review applications, view application history | High |
| 6 | Notifications | Email notifications for applications, job alerts, application status updates | Medium |
| 7 | Search Functionality | Keyword search for jobs, advanced search filters, search by company | High |
| 8 | Dashboard | Dashboards for job seekers and employers | Medium |
| 9 | Admin Panel | Manage users, approve/reject job postings, site statistics | Low |
| 10 | SEO and Analytics | SEO optimization for job listings, integrate with Google Analytics | Medium |
| 11 | Responsive Design | Mobile and tablet optimization | High |
| 12 | Payment Integration | Subscription plans for employers, payment gateway integration | Medium |
| 13 | Security Enhancements | Data encryption, regular security audits | High |
| 14 | Feedback System | User feedback on jobs and employers, display ratings and reviews | Low |
| 15 | Customer Support | Integrated support chat, help center with FAQs | Low |

**Sprint Backlog for Sprint 1**

The sprint backlog consists of the highest-priority tasks from the product backlog that the team plans to complete during the sprint. Let's assume a 2-week sprint:

1. **User Authentication**
   * User registration (4 story points)
   * User login (3 story points)
   * Password reset functionality (3 story points)
2. **User Profiles**
   * Create/edit profile for job seekers (5 story points)
   * Upload profile picture (2 story points)
   * Add resume/CV upload functionality (4 story points)
3. **Job Listings**
   * Create/edit job postings for employers (5 story points)
4. **Search Functionality**
   * Keyword search for jobs (4 story points)

**Detailed Tasks for Sprint 1**

1. **User Authentication**
   * Design registration form (1 story point)
   * Implement backend for user registration (2 story points)
   * Design login form (1 story point)
   * Implement backend for user login (2 story points)
   * Design password reset form (1 story point)
   * Implement backend for password reset (2 story points)
2. **User Profiles**
   * Design profile creation/edit form (2 story points)
   * Implement backend for profile creation/edit (3 story points)
   * Implement profile picture upload (2 story points)
   * Design resume upload interface (2 story points)
   * Implement backend for resume upload (2 story points)
3. **Job Listings**
   * Design job posting form (2 story points)
   * Implement backend for job posting creation/edit (3 story points)
4. **Search Functionality**
   * Implement basic keyword search (4 story points)

**SPRINT BACKLOG 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Task** | **Description** | **Story Points** |
| 1 | User Registration | Design and implement registration form and backend | 4 |
| 2 | User Login | Design and implement login form and backend | 3 |
| 3 | Password Reset | Design and implement password reset form and backend | 3 |
| 4 | Create/Edit Profile | Design and implement profile creation/edit form and backend | 5 |
| 5 | Upload Profile Picture | Implement profile picture upload | 2 |
| 6 | Upload Resume/CV | Design and implement resume upload functionality | 4 |
| 7 | Create/Edit Job Postings | Design and implement job posting form and backend | 5 |
| 8 | Keyword Search | Implement basic keyword search functionality | 4 |

**Sprint Planning**

**Day 1-2:**

* Kick-off meeting and sprint planning
* Assign tasks to team members
* Set up development environment

**Day 3-5:**

* Complete user registration, login, and password reset forms and backend
* Start working on profile creation/edit form and backend

**Day 6-8:**

* Complete profile picture upload and resume upload functionality
* Start designing and implementing job posting form and backend

**Day 9-11:**

* Complete job posting creation/edit functionality
* Implement basic keyword search for jobs

**Day 12-14:**

* Buffer for any incomplete tasks
* Sprint review and retrospective

This sprint backlog should be adjusted based on the team's velocity and capacity, and the tasks might need to be split further depending on the complexity and the team's workflow.

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Task** | **Description** | **Story Points** |
| 1.1 | Design Registration Form | Design the registration form | 1 |
| 1.2 | Implement Registration Backend | Implement the backend for user registration | 2 |
| 2.1 | Design Login Form | Design the login form | 1 |
| 2.2 | Implement Login Backend | Implement the backend for user login | 2 |
| 3.1 | Design Password Reset Form | Design the password reset form | 1 |
| 3.2 | Implement Password Reset Backend | Implement the backend for password reset | 2 |
| 4.1 | Design Profile Form | Design the profile creation/edit form | 2 |
| 4.2 | Implement Profile Backend | Implement the backend for profile creation/edit | 3 |
| 5 | Implement Profile Picture Upload | Implement profile picture upload functionality | 2 |
| 6.1 | Design Resume Upload Interface | Design the resume upload interface | 2 |
| 6.2 | Implement Resume Upload Backend | Implement the backend for resume upload | 2 |
| 7.1 | Design Job Posting Form | Design the job posting form | 2 |
| 7.2 | Implement Job Posting Backend | Implement the backend for job posting creation/edit | 3 |

**USER STORIES**

### User Authentication

1. As a user, I want to register an account so that I can access job postings.
2. As a user, I want to log in to my account so that I can manage my profile and applications.
3. As a user, I want to reset my password if I forget it so that I can regain access to my account.
4. As a user, I want to receive a confirmation email after registration so that I know my account is successfully created.

### User Profiles

1. As a job seeker, I want to create a profile so that employers can learn about my background and skills.
2. As a job seeker, I want to upload a profile picture so that my profile looks more professional.
3. As a job seeker, I want to upload my resume/CV so that employers can review my qualifications.
4. As a job seeker, I want to add my skills and experience to my profile so that I can highlight my expertise.
5. As a job seeker, I want to update my profile information whenever needed so that it remains current.

### Job Listings

1. As an employer, I want to create job postings so that I can find suitable candidates for open positions.
2. As an employer, I want to edit my job postings so that I can update the details if necessary.
3. As an employer, I want to delete job postings so that I can remove outdated positions.
4. As a job seeker, I want to search for jobs by keyword so that I can find relevant job listings.
5. As a job seeker, I want to filter job listings by location so that I can find jobs near me.
6. As a job seeker, I want to filter job listings by industry so that I can find jobs in my field.
7. As a job seeker, I want to filter job listings by salary range so that I can find jobs that meet my financial expectations.
8. As a job seeker, I want to view detailed job descriptions so that I can understand the job requirements.

### Employer Profiles

1. As an employer, I want to create a company profile so that job seekers can learn about my company.
2. As an employer, I want to upload a company logo so that my company profile looks professional.
3. As an employer, I want to add a company description so that job seekers can understand our mission and values.
4. As an employer, I want to edit my company profile so that I can keep it up-to-date.

### Job Application Management

1. As a job seeker, I want to apply for a job so that I can express my interest in the position.
2. As a job seeker, I want to track my application status so that I can see which stage my application is in.
3. As an employer, I want to review job applications so that I can assess the candidates.
4. As an employer, I want to update the application status so that job seekers are informed about their progress.
5. As a job seeker, I want to withdraw my application if I change my mind so that I can manage my job applications.

### Notifications

1. As a job seeker, I want to receive email notifications when I apply for a job so that I know my application was submitted.
2. As a job seeker, I want to receive job alerts based on my preferences so that I can be notified of relevant job openings.
3. As a job seeker, I want to receive notifications about application status updates so that I am aware of my application progress.
4. As an employer, I want to receive notifications when a new application is submitted so that I can review it promptly.

### Search Functionality

1. As a job seeker, I want to perform an advanced search using multiple filters so that I can find the most relevant jobs.
2. As a job seeker, I want to search for jobs by company name so that I can find opportunities at specific companies.
3. As an employer, I want to search for job seekers by skills so that I can find candidates that match my job requirements.

### Dashboard

1. As a job seeker, I want a dashboard where I can see my applied jobs so that I can manage my applications.
2. As a job seeker, I want to see my saved jobs in my dashboard so that I can apply to them later.
3. As an employer, I want a dashboard where I can see my posted jobs so that I can manage my job listings.
4. As an employer, I want to see the applications received for each job posting in my dashboard so that I can review them.

### Admin Panel

1. As an admin, I want to manage users so that I can ensure the platform remains secure and user-friendly.
2. As an admin, I want to approve or reject job postings so that only relevant and legitimate jobs are listed.
3. As an admin, I want to view site statistics so that I can monitor the platform's performance.

### SEO and Analytics

1. As an admin, I want to optimize job listings for search engines so that they are easily discoverable by job seekers.
2. As an admin, I want to integrate with Google Analytics so that I can track user behavior and site performance.

### Responsive Design

1. As a job seeker, I want the website to be mobile-friendly so that I can search and apply for jobs on my phone.
2. As an employer, I want to manage job postings on my tablet so that I can make updates on the go.

### Payment Integration

1. As an employer, I want to choose a subscription plan so that I can post jobs according to my budget.
2. As an employer, I want to make payments securely through the website so that I can activate my job postings.

### Security Enhancements

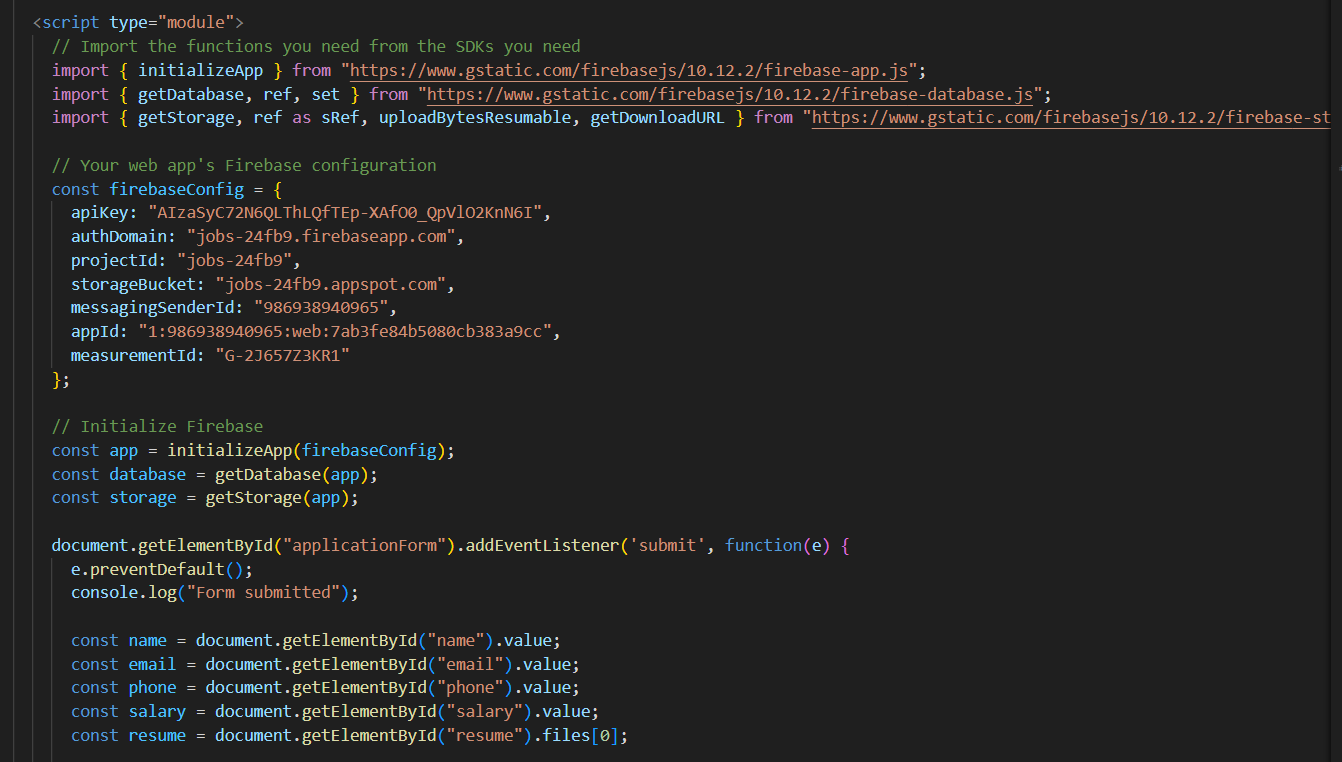
1. As a user, I want my data to be encrypted so that my personal information is secure.
2. As an admin, I want to conduct regular security audits so that I can identify and fix vulnerabilities.

### Feedback System

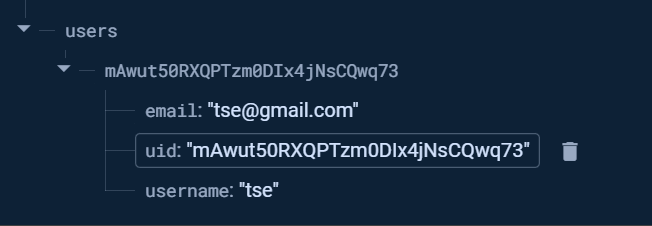
1. As a job seeker, I want to provide feedback on job postings and employers so that I can share my experience.
2. As an admin, I want to display ratings and reviews so that users can make informed decisions about jobs and employers.

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | |  | **User Story Description** | | --- | --- | |
| 1 | |  |  | | --- | --- | |  | As a user, I want to register an account so that I can access job postings. | |
| 2 | |  |  | | --- | --- | |  | As a user, I want to log in to my account so that I can manage my profile and applications. | |
| 3 | |  |  | | --- | --- | |  | As a user, I want to reset my password if I forget it so that I can regain access to my account. | |
| 4 | |  |  | | --- | --- | |  | As a user, I want to receive a confirmation email after registration so that I know my account is successfully created. | |
| 5 | |  |  | | --- | --- | |  | As a job seeker, I want to create a profile so that employers can learn about my background and skills. | |
| 6 | |  |  | | --- | --- | |  | As a job seeker, I want to upload a profile picture so that my profile looks more professional. | |
| 7 | |  |  | | --- | --- | |  | As a job seeker, I want to upload my resume/CV so that employers can review my qualifications. | |
| 8 | |  |  | | --- | --- | |  | As a job seeker, I want to add my skills and experience to my profile so that I can highlight my expertise. | |
| 9 | |  |  | | --- | --- | |  | As a job seeker, I want to update my profile information whenever needed so that it remains current. | |
| 10 | |  |  | | --- | --- | |  | As an employer, I want to create job postings so that I can find suitable candidates for open positions. | |
| 11 | |  |  | | --- | --- | |  | As an employer, I want to edit my job postings so that I can update the details if necessary. | |
| 12 | |  |  | | --- | --- | |  | As an employer, I want to delete job postings so that I can remove outdated positions. | |
| 13 | |  |  | | --- | --- | |  | As a job seeker, I want to search for jobs by keyword so that I can find relevant job listings. | |
| 14 | |  |  | | --- | --- | |  | As a job seeker, I want to filter job listings by location so that I can find jobs near me. | |
| 15 | |  |  | | --- | --- | |  | As a job seeker, I want to filter job listings by industry so that I can find jobs in my field. | |
| 16 | |  |  | | --- | --- | |  | As a job seeker, I want to filter job listings by salary range so that I can find jobs that meet my financial expectations. | |
| 17 | |  |  | | --- | --- | |  | As a job seeker, I want to view detailed job descriptions so that I can understand the job requirements. | |
| 18 | |  |  | | --- | --- | |  | As an employer, I want to create a company profile so that job seekers can learn about my company. | |
| 19 | |  |  | | --- | --- | |  | As an employer, I want to upload a company logo so that my company profile looks professional. | |
| 20 | |  |  | | --- | --- | |  | As an employer, I want to add a company description so that job seekers can understand our mission and values. | |
| 21 | |  |  | | --- | --- | |  | As an employer, I want to edit my company profile so that I can keep it up-to-date. | |
| 22 | |  |  | | --- | --- | |  | As a job seeker, I want to apply for a job so that I can express my interest in the position. | |
| 23 | |  |  | | --- | --- | |  | As a job seeker, I want to track my application status so that I can see which stage my application is in. | |
| 24 | |  |  | | --- | --- | |  | As an employer, I want to review job applications so that I can assess the candidates. | |
| 25 | |  |  | | --- | --- | |  | As an employer, I want to update the application status so that job seekers are informed about their progress. | |
| 26 | |  |  | | --- | --- | |  | As a job seeker, I want to withdraw my application if I change my mind so that I can manage my job applications. | |
| 27 | |  |  | | --- | --- | |  | As a job seeker, I want to receive email notifications when I apply for a job so that I know my application was submitted. | |
| 28 | |  |  | | --- | --- | |  | As a job seeker, I want to receive job alerts based on my preferences so that I can be notified of relevant job openings. | |
| 29 | |  |  | | --- | --- | |  | As a job seeker, I want to receive notifications about application status updates so that I am aware of my application progress. | |
| 30 | |  |  | | --- | --- | |  | As an employer, I want to receive notifications when a new application is submitted so that I can review it promptly. | |
| 31 | |  |  | | --- | --- | |  | As a job seeker, I want to perform an advanced search using multiple filters so that I can find the most relevant jobs. | |
| 32 | |  |  | | --- | --- | |  | As a job seeker, I want to search for jobs by company name so that I can find opportunities at specific companies. | |
| 33 | |  |  | | --- | --- | |  | As an employer, I want to search for job seekers by skills so that I can find candidates that match my job requirements. | |
| 34 | |  |  | | --- | --- | |  | As a job seeker, I want a dashboard where I can see my applied jobs so that I can manage my applications. | |
| 35 | |  |  | | --- | --- | |  | As a job seeker, I want to see my saved jobs in my dashboard so that I can apply to them later. | |
| 36 | |  |  | | --- | --- | |  | As an employer, I want a dashboard where I can see my posted jobs so that I can manage my job listings. | |
| 37 | |  |  | | --- | --- | |  | As an employer, I want to see the applications received for each job posting in my dashboard so that I can review them. | |
| 38 | |  |  | | --- | --- | |  | As an admin, I want to manage users so that I can ensure the platform remains secure and user-friendly. | |
| 39 | |  |  | | --- | --- | |  | As an admin, I want to approve or reject job postings so that only relevant and legitimate jobs are listed. | |
| 40 | |  |  | | --- | --- | |  | As an admin, I want to view site statistics so that I can monitor the platform's performance. | |
| 41 | |  |  | | --- | --- | |  | As an admin, I want to optimize job listings for search engines so that they are easily discoverable by job seekers. | |
| 42 | |  |  | | --- | --- | |  | As an admin, I want to integrate with Google Analytics so that I can track user behavior and site performance. | |
| 43 | |  |  | | --- | --- | |  | As a job seeker, I want the website to be mobile-friendly so that I can search and apply for jobs on my phone. | |
| 44 | |  |  | | --- | --- | |  | As an employer, I want to manage job postings on my tablet so that I can make updates on the go. | |
| 45 | |  |  | | --- | --- | |  | As an employer, I want to choose a subscription plan so that I can post jobs according to my budget. | |
| 46 | |  |  | | --- | --- | |  | As an employer, I want to make payments securely through the website so that I can activate my job postings. | |
| 47 | |  |  | | --- | --- | |  | As a user, I want my data to be encrypted so that my personal information is secure. | |
| 48 | |  |  | | --- | --- | |  | As an admin, I want to conduct regular security audits so that I can identify and fix vulnerabilities. | |
| 49 | |  |  | | --- | --- | |  | As a job seeker, I want to provide feedback on job postings and employers so that I can share my experience. | |
| 50 | |  |  | | --- | --- | |  | As an admin, I want to display ratings and reviews so that users can make informed decisions about jobs and employers. | |

**API INITILIAZATION**

****

**API RESPONSE**

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### Application of Scrum in the Job Board Website Project

#### Team Organization

In implementing Scrum for the development of the job board website, the team was organized into defined roles that facilitated efficient collaboration and accountability:

* **Product Owner**: Responsible for defining the vision and priorities of the project, including managing the product backlog and ensuring alignment with stakeholder needs.
* **Scrum Master**: Facilitated the Scrum process, coached the team on Scrum practices, and ensured that impediments were resolved promptly to maintain productivity.
* **Development Team**: Comprised developers, designers, and testers who were responsible for implementing features, conducting testing, and delivering increments of functionality during each sprint.

#### Workflow Management

The project workflow was managed using Scrum practices, which included:

* **Sprint Planning**: Conducted at the beginning of each sprint to prioritize and select user stories from the product backlog. Tasks were estimated and committed to for the sprint.
* **Daily Stand-ups**: Short daily meetings where team members shared progress, discussed any obstacles, and planned the day's work.
* **Sprint Reviews**: Held at the end of each sprint to demonstrate completed work to stakeholders and gather feedback.
* **Sprint Retrospectives**: Conducted to reflect on the sprint process, identify areas for improvement, and implement changes for subsequent sprints.

#### Conflict Resolution

During the project, conflicts occasionally arose, particularly around differing opinions on implementation approaches or prioritization of features. To resolve conflicts effectively within the Scrum framework:

* **Open Communication**: Encouraged team members to express concerns openly during daily stand-ups or retrospectives.
* **Collaborative Decision-Making**: Utilized group discussions to reach consensus on solutions that aligned with project goals and user requirements.
* **Scrum Master Intervention**: When necessary, the Scrum Master intervened to facilitate discussions, mediate conflicts, and ensure that team dynamics remained positive and focused on achieving sprint goals.

#### Challenges Encountered and Overcoming Them

Several challenges were encountered during the project, including:

* **Scope Creep**: Managing stakeholder expectations and ensuring that changes were evaluated against project priorities to minimize disruption to sprint goals.
* **Resource Constraints**: Addressed by prioritizing tasks based on their impact and ensuring that team capacity was optimized for maximum efficiency.
* **Technical Complexity**: Overcame through collaborative problem-solving, leveraging expertise within the team, and seeking external resources or training where necessary.
* **Adapting to Changes**: Embraced the iterative nature of Scrum, allowing flexibility in responding to changing requirements and market conditions while maintaining project momentum.

### 1. Introduction

#### Project Overview

The job board website is designed to connect job seekers with employers by providing a platform where job seekers can search for job openings, and employers can post job listings and find suitable candidates. The platform will support various features such as user authentication, profile management, job listing management, and application tracking to ensure a seamless job searching and recruitment experience.

#### Scope

* **Included**: User authentication, user profile management, job postings, job search and filtering, application tracking, notifications, employer profiles, dashboards for job seekers and employers, admin panel for managing users and postings, SEO and analytics integration, responsive design, payment integration for premium services, security measures, and feedback system.
* **Excluded**: External job board integrations, video interview capabilities, third-party background checks, and social media integration.

#### Components

* **Front-end**: Developed using HTML, CSS, JavaScript, and frameworks like React or Angular.
* **Back-end**: Developed using a server-side language like Node.js, Python, or Java.
* **Database**: Using relational databases like MySQL or Firebase.
* **External Services**: Integrations with email services for notifications, payment gateways for transactions, and analytics services for tracking user interactions.

### 3. Functional Requirements

#### User Roles and Permissions

* **Job Seeker**: Register, log in, create/edit profile, search for jobs, apply for jobs, track applications.
* **Employer**: Register, log in, create/edit company profile, post/edit/delete job listings, review applications.
* **Admin**: Manage users, approve/reject job postings, view site statistics, perform security audits.

#### Detailed Functional Requirements

* **User Authentication**: Secure user registration, login, and password reset.
* **User Profiles**: Profile creation, editing, and resume upload for job seekers.
* **Job Listings**: Posting, editing, deleting, and searching job listings.
* **Application Management**: Applying for jobs, tracking application status, and reviewing applications.
* **Notifications**: Email notifications for job applications, job alerts, and status updates.
* **Search Functionality**: Advanced search with filters for keyword, location, industry, and salary.
* **Dashboard**: Personalized dashboards for job seekers and employers to manage their activities.
* **Admin Panel**: User and job posting management, site statistics, and security controls.
* **SEO and Analytics**: Optimization for search engines and integration with Google Analytics.
* **Responsive Design**: Mobile and tablet optimization.
* **Payment Integration**: Subscription plans and secure payment processing.
* **Security Enhancements**: Data encryption and regular security audits.
* **Feedback System**: User feedback and ratings for jobs and employers.

### 4. Non-Functional Requirements

#### Performance

* The system should handle up to 10,000 concurrent users.
* Page load time should be less than 2 seconds.

#### Security

* All data should be encrypted in transit and at rest.
* Use multi-factor authentication for enhanced security.

#### Usability

* The interface should be intuitive and user-friendly.
* Follow accessibility guidelines (WCAG 2.1) to ensure the site is usable by people with disabilities.

#### Reliability

* The system should have an uptime of 99.9%.
* Implement error handling to gracefully manage system failures.

#### Scalability

* The system should be able to scale horizontally to handle increased traffic and data.

#### Database Schema

Detail the database schema including:

* **Users**: ID, Name, Email, Password, Role
* **Profiles**: UserID, ProfilePicture, Resume, Skills, Experience
* **JobListings**: ID, EmployerID, Title, Description, Location, Salary, DatePosted
* **Applications**: ID, JobListingID, JobSeekerID, Status, DateApplied

### 7. API Documentation

#### API Endpoints

* **POST /api/register**: Register a new user.
* **POST /api/login**: Login a user.
* **GET /api/jobs**: Retrieve job listings.
* **POST /api/jobs**: Create a job listing.
* **PUT /api/jobs/{id}**: Edit a job listing.
* **DELETE /api/jobs/{id}**: Delete a job listing.

#### Request and Response Formats

* **Request**: JSON format for sending data.
* **Response**: JSON format for receiving data.

#### Authentication

* Use JWT (JSON Web Tokens) for securing API endpoints.

### 8. User Interface Design

#### Wireframes

Include wireframes for:

* Home Page
* Job Seeker Dashboard
* Employer Dashboard
* Job Listing Page
* Profile Page

#### UI Components

* **Navigation-bar**: Navigation menu with links to different sections.
* **Job Card**: Component displaying job information in a compact format.
* **Profile Form**: Form for job seekers to enter their profile details.
* **Application Tracker**: Component showing the status of job applications.

### 9. Testing

#### Test Plan

Outline the testing strategy:

* **Unit Testing**: Test individual components.
* **Integration Testing**: Test interactions between components.
* **System Testing**: Test the complete system.
* **User Acceptance Testing (UAT)**: Validate the system with end-users.

#### Test Cases

Provide detailed test cases for each feature:

* **Login**: Test valid and invalid login attempts.
* **Job Posting**: Test creating, editing, and deleting job listings.
* **Application Tracking**: Test applying for jobs and tracking application status.

#### Test Tools

List the tools used for testing:

* **Selenium**: For automated UI testing.
* **J-Unit**: For unit testing in Java.
* **Postman**: For API testing.

### 10. Deployment

#### Deployment Architecture

Describe the deployment environment:

* **Cloud Services**: Use GitHub Pages for hosting

#### Deployment Steps

* **Setup Environment**: Configure servers and databases.
* **Deploy Code**: Push the code to the server.
* **Run Tests**: Execute automated tests.
* **Go Live**: Make the application accessible to users.

### 11. Maintenance

#### Maintenance Plan

* **Routine Updates**: Regular updates for bug fixes and improvements.
* **Scheduled Downtime**: Notify users about planned maintenance windows.
* **Support**: Provide support channels for users to report issues.

#### Monitoring

* **Monitoring Tools**: Use tools like New Relic or Datadog to monitor system performance and health.
* **Alerts**: Set up alerts for critical issues.

### 12. Project Management

#### Resource Allocation

Outline resources needed:

* **Team Members**: Developers, testers, designers, project manager.
* **Tools**: Development tools, testing tools, project management tools.
* **Budget**: Estimated budget for the project.

#### Risk Management

Identify potential risks and mitigation strategies:

* **Risk**: Data breaches.
  + **Mitigation**: Implement strong security measures.
* **Risk**: Project delays.
  + **Mitigation**: Regular progress reviews and adjustments.

# Chapter Four: Recommendations and Conclusion

## Summary of Achievements

Throughout this project, our team successfully developed a comprehensive and user-friendly job board website. Key features include a robust search engine with advanced filtering options, a seamless job application process, employer tools for managing job postings and applications, and a user rating and review system. We also implemented secure authentication mechanisms and data encryption to ensure the privacy and security of user information. The platform's responsive design ensures accessibility across various devices, providing a consistent and intuitive user experience.

## Difficulties Encountered

Despite our achievements, we encountered several challenges during the development process. Integrating advanced search functionalities and machine learning algorithms for job recommendations proved to be complex and time-consuming. Ensuring data security and compliance with regulations such as GDPR required rigorous testing and adjustments. Additionally, balancing the diverse needs of job seekers and employers while maintaining a streamlined user interface was challenging. These difficulties required iterative development and continuous feedback to address effectively.

## Recommendations for Further Studies

For future enhancements, we recommend exploring the integration of artificial intelligence to further personalize job recommendations and improve matching accuracy. Conducting user experience research to gather more in-depth feedback from both job seekers and employers will help refine the platform's features and usability. Additionally, expanding the platform's analytics capabilities will provide valuable insights to employers and administrators, enabling data-driven decisions. Further studies should also focus on enhancing mobile user experience and exploring potential partnerships with educational institutions for internship and job placement opportunities.

### 13. Appendices

#### Glossary

### Applicant Tracking System (ATS): A software application that helps employers manage and streamline the hiring process by organizing and tracking job applications.

### Application Programming Interface (API): A set of protocols and tools for building software and applications, enabling different software systems to communicate with each other.

### Agile Methodology: An iterative approach to software development that emphasizes flexibility, collaboration, and customer feedback.

### Backlog: A prioritized list of features, enhancements, and bug fixes that need to be addressed in a software project.

### Candidate: A job seeker who has applied for a job opening.

### Cloud Computing: The delivery of computing services, including storage, processing, and software, over the internet (the cloud).

### Dashboard: A user interface that provides a visual overview of key metrics and data, often used by employers to track job postings and applications.

### Data Encryption: The process of converting data into a code to prevent unauthorized access.

### Employer: An individual or organization that posts job openings and seeks to hire candidates.

### Front-End Development: The practice of creating the user interface and experience of a website or application using technologies like HTML, CSS, and JavaScript.

### General Data Protection Regulation (GDPR): A regulation in EU law on data protection and privacy for individuals within the European Union.

### Job Alert: A notification sent to job seekers when new job listings that match their specified criteria are posted.

### Job Board: An online platform that connects job seekers with employers by listing job vacancies and allowing applications.

### Job Posting: An advertisement created by an employer to inform potential candidates about a job opening.

### Job Seeker: An individual actively looking for employment opportunities.

### Kanban: An Agile methodology that focuses on visualizing work, limiting work in progress, and improving workflow efficiency.

### Machine Learning: A field of artificial intelligence that uses statistical techniques to enable computers to learn from and make predictions based on data.

### Natural Language Processing (NLP): A field of artificial intelligence that enables computers to understand and interpret human language.

### Product Owner: A role in Scrum methodology responsible for defining project goals and managing the product backlog.

### Responsive Design: A web design approach that ensures websites work well on a variety of devices, including desktops, tablets, and smartphones.

### Retrospective: A meeting held at the end of a Scrum sprint where the team reflects on their performance and identifies areas for improvement.

### Scrum: An Agile framework for managing and completing complex projects, characterized by iterative development and regular feedback loops.

### Search Engine Optimization (SEO): The practice of optimizing a website to improve its ranking in search engine results, increasing visibility and traffic.

### Sprint: A time-boxed period, typically 2-4 weeks, during which a Scrum team works to complete a set of tasks from the product backlog.

### Stakeholder: An individual or group with an interest in the success and outcomes of a project.

### User Experience (UX) Design: The process of designing products that provide meaningful and relevant experiences to users.

### User Interface (UI) Design: The process of designing the visual elements and interactive components of a software application.

### Wireframe: A basic visual guide used in web design to suggest the structure and layout of a website or application.

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