

EUROPEAN UNIVERSITY OF LEFKE

FACULTY OF ENGINEERING

Graduation Project I

Online Recruitment System

Dias Mukash

194072

An online recruitment system is a platform that allows organizations to efficiently manage their hiring process by posting job openings, receiving and reviewing job applications, and communicating with candidates entirely online. The main idea behind an online recruitment system is to streamline and automate the recruitment process, making it easier for organizations to find and hire the best candidates for their open positions. This type of system can be used by businesses of all sizes, in any industry, to manage their recruitment needs. The goals of an online recruitment system might include improving the efficiency and speed of the recruitment process, increasing the number of qualified candidates that apply for open positions, and reducing the workload of HR staff. It can also provide a more convenient and user-friendly experience for job seekers, allowing them to easily apply for and track the status of their applications.

Supervisor

Zafer Erenel

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1. Introduction

1.1 Problem definition

The problem that my project aims to solve is the inefficiency and difficulty of the current recruitment process for companies. Online recruitment systems have been developed in the past, but they often lack certain features or are difficult to use. My project aims to create an online recruitment system web application which is efficient and user-friendly and that is easy to use for both companies and job seekers, and includes all necessary features to streamline the recruitment process. My project is designed to reduce the cost of finding employees, because in real life, costs can be very high [1]. By leveraging modern technology and design principles, I hope to make the recruitment process more efficient and effective for all parties involved.

1.2 Goals

The aims of this project are:

- To create an online platform for companies to post job openings and for job seekers to apply.
- To streamline the application process for both companies and job seekers by allowing the submission and review of applications and resumes online.
- To provide a user-friendly interface for both companies and job seekers.
- Ensure equal access to all populations, races, nationalities, ages and orientations [2].
- To allow for the tracking of applicants and the status of their application.
- Develop a web application using the right architecture and principles and methodologies.

Also, one of the main priorities of my project is to clearly follow the correct methods of application development, taking into account the architecture and principles, software development methodologies in order to make it easier to maintain the project in the future.

Overall, my project aims to create a comprehensive online recruitment system that addresses the current shortcomings of existing solutions and helps companies and job seekers connect more effectively.

2. Literature Survey

There are several online recruitment systems that have been developed in the past, such as LinkedIn and Indeed. These systems allow companies to post job openings and for job seekers to search and apply for them. However, there are some limitations to these systems. LinkedIn, for example, has a focus on networking and job search rather than the actual application process, and may not have all the necessary features for a comprehensive recruitment system. But still recruiters cannot perform effective recruitment process without using LinkedIn [3]. Indeed, allows for the posting and searching of job openings, but the application process may not be as streamlined as desired.

There have also been other online recruitment systems developed, such as Monster and Glassdoor. These systems have similar features to LinkedIn and Indeed, but may not have the same level of popularity or user base.

My project aims to improve upon these existing online recruitment systems by including all necessary features for a comprehensive recruitment process and providing a user-friendly interface for both companies and job seekers. I also plan to differentiate this project by potentially including additional features, such as resume and job recommendation algorithms, to enhance the user experience.

Comparing with LinkedIn: LinkedIn is known as a professional platform for networking that allows its users to connect with other professionals, search for jobs, and apply for positions. It also offers employer branding and recruitment advertising services. LinkedIn differentiates itself from other job search platforms by focusing on professional networking and career development. My online recruitment system comparing to LinkedIn will be narrow focused on the job postings and all the necessary instruments for applying for jobs and tracking applications.

Comparing with Indeed: Indeed is a job search engine that aggregates job postings from various sources, including company websites, job boards, and recruitment agencies. It allows users to search for jobs by location, job title, and company, and to filter results by job type, experience level, and other criteria. Indeed also offers employer branding and recruitment advertising services. Comparing to Indeed my online recruitment system will have the same features like search by location, job titles and company, including results by job type, but also will have a user-friendly interface, which is going to make the process easy and smooth.

Comparing with Glassdoor: Glassdoor is a job search platform that offers company reviews, salary information, and job listings. It allows users to search for jobs by location, job title, and company, and to filter results by job type, industry, and other criteria. Glassdoor also offers employer branding and recruitment advertising services. My online recruitment system in comparison with Glassdoor may offer more comprehensive and tailored recruitment solution for organization.

While LinkedIn, Indeed and Glassdoor primarily focus on job search and employer branding, an online recruitment system can provide a more integrated and streamlined recruitment process, including the ability to manage and track candidates throughout the hiring process.

3. Background Information

My online recruitment system will be developed using a combination of modern technologies and programming languages. On the front-end, I'm going to use HTML, CSS, and JavaScript to create a responsive and user-friendly interface with the help of modern and robust framework like React.js to enhance the functionality and performance of the platform. On the back-end, I'm going to use a server-side technology such Node.js and to power the platform's core functionality. I will also be using a database management system such as MongoDB to store and retrieve data related to job postings, applications, and other relevant information. In terms of hardware, I will be hosting the platform on a cloud-based server to ensure scalability and reliability. Also, I will also be using Git for version control.

If I summarize the information about technologies that I'm going to use in this project, they will form a MERN stack.

3.1 Required Software

React Js. React is a widely used JavaScript library for creating UI (user interfaces), and it offers several benefits for developers. One benefit is its ability to efficiently update and render components, which can improve the performance of applications. Another benefit is its flexibility and reusability, which can save time and resources in the development process.

Node Js. Node.js is a runtime environment for building server-side applications, and it offers several benefits for developers. One benefit is its ability to handle a large number of concurrent connections with high performance, making it well-suited for real-time applications. Another benefit is its extensive ecosystem of libraries and tools, which can reduce the time and effort required to build and deploy applications.

MongoDB. MongoDB is an open-source DBMS (database management) system that uses a document-oriented model to store data. It offers several benefits for developers. One benefit is its scalability, which allows it to easily handle large amounts of data and support the growth of applications. Another benefit is its flexibility, as it allows developers to store and manipulate data in a variety of formats, including JSON and BSON.

Express Js. Express.js is a popular web application framework for Node.js, and one of its main benefits is its simplicity and flexibility, which allows developers to quickly build and deploy web applications.

Visual Studio Code. Good choice for web development projects.

3.2 Other Software

Figma. Figma is a cloud-based design and prototyping tool that offers several benefits, including real-time collaboration, a wide range of design features, and the ability to easily share and collaborate with team members and stakeholders.

Git. Git is a version control system that allows developers to track and manage changes to their code, and one of its main benefits is its ability to allow multiple developers to work on the same project concurrently while keeping track of all changes.

4. Modules

4.1 Front-End Module

The front-end module will be responsible for the user interface of the platform, which will be accessible to both companies and job seekers. It will be developed using HTML, CSS, and JavaScript, and will use a modern and robust framework such as React to enhance its functionality and performance.

4.1.1. A customizable job posting form that allows companies to easily advertise their open positions and specify the required qualifications and skills. This form will include various fields such as job title, location, industry, job description, required qualifications, and application deadline.

4.1.2. A powerful search engine and filter system that allows job seekers to easily find and apply for relevant jobs based on various criteria such as location, industry, and job title. The search engine will use advanced algorithms to match job seekers with suitable job openings based on their skills, experience, and preferences.

4.1.3. Job application: This submodule would allow job seekers to view job details and submit their applications, including their resume and cover letter.

4.1.4. Candidate profile: This submodule would allow job seekers to create and manage their candidate profile, including their personal and professional information and their job preferences.

4.1.5. Job alert notifications: This submodule would allow job seekers to sign up for notifications when new job openings are posted that match their criteria.

4.1.6. Career resources: This submodule could provide job seekers with access to resources such as resume templates, job search tips, and career advice.

4.1.7. Company profiles: This submodule would allow job seekers to browse and learn more about the companies that have posted job openings.

4.1.8. Employer dashboard: This submodule would allow companies to post and manage job openings, review and evaluate job applications, and communicate with candidates.

4.2 Back-End Module

The back-end module will be responsible for the core functionality of the platform and will be developed using server-side technology such as Node.js. It will also utilize a database management system such as MongoDB to store and retrieve data related to job postings, applications, and other relevant information.

4.2.1. User management: Handling user registration, login, and authentication for both job seekers and companies.

4.2.2. A robust job posting and application management system that allows companies to easily create, edit, and delete job postings, and track the status of applications. This system will enable companies to view and manage all of their job postings in one place, and view the status of each application (e.g., received, reviewed, rejected, etc.).

4.2.3. A powerful search engine and filter system that enables job seekers to easily find and apply for relevant jobs based on various criteria. The search engine will be integrated with the front-end module to provide a seamless experience for job seekers.

4.2.4. Candidate evaluation: This submodule would allow companies to review and evaluate job applications and provide feedback to candidates.

4.2.5. Advanced analytics and reporting tools to help companies track the success of their recruitment efforts and make data-driven decisions: These tools will enable companies to track the number of views and applications for each job posting, and analyze the data to identify trends and areas for improvement.

4.2.6. Secure user authentication and authorization to ensure the privacy and security of user data: The platform will use secure protocols and authentication methods to protect user data from unauthorized access.

5. Risk Analysis

The development and deployment of an online recruitment system involves a number of risks that must be carefully managed in order to ensure the success of the project. Some of the key risks associated with this project include:

Risks related with technology:

One of the main risks associated with this project is the potential for technological issues to arise during development or deployment. This could include issues such as compatibility problems with different devices or browsers, or issues with the scalability of the platform. To mitigate this risk, I will conduct thorough testing and quality assurance throughout the development process, and ensure that the platform is built using proven technologies and architectures.

Data security (privacy) risk:

Another important risk to consider is the potential for data breaches or unauthorized access to user data. To protect against this risk, I will implement robust security measures such as secure authentication and data encryption, and ensure that the platform complies with all relevant data protection regulations. Also, I will research about OWASP-10 (The top 10 main problems related to the security of web applications) and try to take the necessary measures to protect my web application from each of these risks. It is also worth considering methods of assessing the cybersecurity of an application [4].

Legal risk:

There are also potential legal risks associated with this project, such as the possibility of infringing on the intellectual property rights of others, or of facing legal action from users or third parties. To mitigate this risk, I will ensure that I have the necessary permissions and licenses for all third-party software and content that I use, and that I adhere to all relevant laws and regulations.

Budget and schedule risk:

Another key risk to consider is the possibility of encountering delays or cost overruns during the development and deployment of the platform. To mitigate this risk, I will carefully plan and manage the project schedule and budget, and implement robust project management processes to ensure that the project stays on track and within budget.

User adoption risk:

Finally, there is a risk that users may not adopt or use the platform as intended due to a lack of interest or because of issues with the user experience. To mitigate this risk, I will gather information from users through research and testing to make sure that the platform satisfies the needs and preferences of my target users, and will continually improve and optimize the user experience based on this feedback.

6. Ethics

The development and deployment of an online recruitment system has a number of ethical implications that must be precisely considered to guarantee that the project is performed in a responsible and ethical manner.

One of the key ethical considerations is the potential impact of the platform on the employment opportunities and job market. The platform will have the ability to connect companies with job seekers, and could potentially have a significant impact on the hiring process and the availability of jobs. It is important to make sure that the platform is designed and operated in a way that is fair and unbiased, and that it does not discriminate against any particular groups of job seekers. The problem is that women and ethnic minorities often experience worse labor market outcomes compared to men and the majority group in many countries [5].

Another ethical consideration is the handling of user data. Nowadays keeping customer information safe is a must for building a reliable communication and relation with customers. The platform will collect and store a large amount of personal information about both companies and job seekers, and it is crucial to validate that this data is handled responsibly and in conformity with relevant data protection regulations. This includes ensuring that user data is kept secure and confidential, and that it is only used for the purposes for which it was collected.

A third ethical consideration is the potential impact of the platform on the environment. The platform will be hosted on a cloud-based server, and it is important to ensure that the server infrastructure is energy efficient and has a minimal impact on the environment. Also, these days it is important to reduce a carbon footprint [6]. I will also consider other environmental impacts of the platform, such as the use of paper and other resources, and work to minimize these impacts wherever possible.

Overall, it is necessary to confirm that the online recruitment system is developed and operated in a responsible and ethical manner, taking into account the potential impacts of the platform on the job market, user data, and the environment.

7. Conclusion

7.1 Benefits

a. Benefits to users :

- 1. Convenience:** The system can provide a more convenient and user-friendly experience for both companies and job seekers, allowing them to easily post and search for job openings, apply for positions, and track the status of their applications.
- 2. Efficiency:** The system can streamline and automate the recruitment process, saving time and resources for both companies and job seekers.
- 3. Improved job matching:** The system may include algorithms or other tools to match job seekers with relevant job openings based on their skills and experience, improving the chances of finding a good fit.
- 4. Enhanced communication:** The system can facilitate communication between companies and candidates, allowing them to easily exchange messages and documents.
- 5. Data and analytics:** The system can provide companies with data and insights on their recruitment efforts, such as the number of applications received and the success rate of hired candidates.
- 6. Career resources:** The system may include access to resources such as resume templates, job search tips, and career advice for job seekers.
- 7. Improved accessibility:** The system can provide access to job opportunities and career resources for individuals who may have difficulty accessing them through traditional methods, such as those living in rural areas or with disabilities.
- 8. Enhanced security:** The system can provide security measures to protect the privacy and personal information of both companies and job seekers.

b. Benefits to me:

- 1. Professional experience:** Building and launching an online recruitment system can provide valuable professional experience in software development, project management, and other related skills.
- 2. Career advancement:** The project can serve as a showcase of the creator's skills and abilities, potentially leading to new job opportunities or career advancement.

3. Professional networking: The project can provide opportunities for the creator to network and connect with other professionals in the field, such as potential clients or collaborators.

4. Educational benefits: Building an online recruitment system can provide a learning opportunity for the creator, as they may have the opportunity to learn and apply new technologies and techniques.

5. Improved resume: The project can serve as a notable accomplishment to include on the creator's resume and may increase their chances of being considered for job opportunities.

6. Reputation and credibility: The project can enhance the creator's reputation and credibility as a software developer or technology professional.

7. Opportunity for growth: Building an online recruitment system can provide an opportunity for the creator to grow and expand their skills and knowledge.

Why did I choose this project?

I chose "Online Recruitment System" because this idea is very interesting. Recruitment products are in demand on the market, because nowadays more and more people are using online job search platforms, and companies are also looking for employees, and this web application will help bring employees and employers together.

I want to contribute solutions that can improve the process of finding and hiring top talent. Also, this project will help me develop my development skills such as web development and I want to use the right methodologies and development principles so that the project structure is properly aligned to easily support the application in the future.

7.2 Future Works

After graduation, I plan to develop this project, as I believe it will be in demand in the job search and recruitment solutions market. I want to make the system scalable so that it is ready for more workloads. I also want to improve the algorithms and make them more personalized for the user and make the system as secure as possible. If the online platform is successful, I want to hire programmers to maintain and develop the project, implement a help desk and concentrate on marketing to increase the number of clients.

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