

A
Mini Project Report
on
Resume Radar-NLP based Streamlined Recruitment Process
Submitted in partial fulfillment of the requirements for the degree.
Third Year Engineering – Computer Science and Engineering Data Science

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CERTIFICATE

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ABSTRACT

The integration of Radar-NLP (Natural Language Processing) into recruitment processes represents a transformative step in how organizations approach candidate selection and hiring. Traditional recruitment often requires extensive manual effort, with recruiters having to sift through a large volume of resumes to identify candidates with the right qualifications and experience. This method is not only time-consuming but also susceptible to human error, unconscious bias, and inconsistent evaluations. Radar-NLP automates these key tasks by utilizing sophisticated algorithms to parse resumes, extract relevant skills, and compare them to job requirements, thereby streamlining the entire recruitment process.

Radar-NLP employs advanced machine learning and NLP technologies to analyze resumes and identify key data points such as education, professional experience, specific skills, and certifications. By comparing these attributes to predefined job descriptions, the system can quickly identify the most qualified candidates from a vast pool of applicants. This reduces the need for manual resume screening and allows recruitment teams to focus on more strategic tasks, such as candidate interviews and assessing cultural fit. The automation not only improves efficiency but also speeds up the overall hiring timeline, ensuring that companies can make quicker and more informed hiring decisions.

One of the primary benefits of Radar-NLP is its ability to minimize human bias and error, creating a more objective and transparent hiring process. In traditional recruitment, personal biases can influence decisions, often resulting in less diverse candidate pools or unfair evaluations. Radar-NLP eliminates this subjectivity by relying on data-driven criteria to assess candidates, ensuring that each applicant is evaluated fairly based on relevant qualifications alone. Additionally, the system provides real-time analysis of large candidate pools, enabling faster decision-making and a more efficient recruitment pipeline.

In conclusion, the adoption of Radar-NLP-based recruitment systems offers numerous benefits, including reduced manual effort, increased objectivity, and faster decision-making. By promoting a more inclusive hiring process and focusing on data-driven assessments, companies can build more diverse and capable teams while ensuring fairness and transparency. As technology continues to evolve, the role of NLP in recruitment is likely to expand further, offering even more advanced capabilities to improve how talent is sourced, evaluated, and hired, ultimately benefiting both employers and candidates.

Chapter 1

Introduction

In today's highly competitive job market, organizations face significant challenges in managing the overwhelming volume of resumes they receive for open positions. Traditional recruitment methods, which rely on manual review and screening, are often slow, labor-intensive, and prone to errors. Recruiters must sift through hundreds or even thousands of resumes to identify qualified candidates, a process that can lead to delays in hiring and, at times, suboptimal decisions due to human bias or inconsistencies. As companies struggle to keep up with the growing number of applicants, the risk of missing out on top talent increases, which can negatively impact organizational performance and competitiveness. Moreover, the manual approach can be inefficient, leading to frustration among both recruiters and candidates, as prolonged hiring processes can affect candidate engagement and experience.

Resume Radar provides a solution to these challenges by leveraging advanced Natural Language Processing (NLP) technology to automate and streamline the resume screening process. By utilizing sophisticated algorithms, Resume Radar can quickly parse large volumes of resumes, accurately extracting and analyzing key data points such as skills, qualifications, and relevant experience. This automation not only reduces the time spent on resume screening but also improves accuracy by minimizing human errors and bias. With the ability to match candidate profiles to job descriptions in real time, Resume Radar enables faster, data-driven hiring decisions, leading to more effective recruitment outcomes. Ultimately, this technology enhances hiring efficiency, increases the chances of identifying top candidates, and ensures a fairer and more objective selection process, contributing to overall hiring effectiveness in today's dynamic job market.

1.1 Purpose:

The purpose of implementing the "Resume Radar" system using NLP (Natural Language Processing) in recruitment processes serves multiple goals aimed at improving both efficiency and fairness in hiring. These purposes include:

- **Enhancing Candidate Experience:** By automating the initial resume screening process, Resume Radar ensures that candidates are evaluated more quickly and fairly. This leads to a smoother, more transparent experience, with reduced waiting times and more consistent feedback, ultimately improving candidate satisfaction.
- **Promoting Objectivity in Hiring:** Resume Radar minimizes human biases in the screening phase by focusing on qualifications and skills, rather than subjective factors. This fosters a more professional, data-driven approach to recruitment, ensuring candidates are assessed purely on merit.

- **Improving Recruitment Efficiency:** The system accelerates the recruitment process by automatically extracting key information from resumes, such as qualifications and experience, allowing HR teams to focus on interviews and final evaluations. This can lead to faster hiring decisions and higher-quality hires, improving the overall effectiveness of recruitment efforts.
- **Reducing Bias and Enhancing Diversity:** By eliminating subjective bias during the resume screening process, Resume Radar promotes a fairer recruitment system. This helps to reduce negative perceptions surrounding the hiring process, making it more inclusive and attractive to a wider, more diverse pool of candidates.

1.2 Problem Statement:

In the current recruitment landscape, organizations face significant challenges in efficiently managing and evaluating a large volume of resumes. Traditional methods of resume screening are often labor-intensive, time-consuming, and prone to human biases and errors. Recruiters spend excessive amounts of time manually reviewing resumes, leading to delays in the hiring process and a potential loss of top talent. Additionally, the subjective nature of manual evaluations can result in inconsistent candidate assessments, perpetuating biases and hindering diversity in hiring.

Resume Radar seeks to address these issues by leveraging advanced Natural Language Processing (NLP) technology to automate the resume screening process. The primary goal is to enhance recruitment efficiency, accuracy, and fairness by automatically extracting and analyzing key information from resumes. By implementing this automated system, organizations can streamline the screening process, minimize human biases, and ensure that candidates are evaluated objectively based on relevant qualifications. This will ultimately lead to faster hiring decisions, improved candidate experiences, and the establishment of a more diverse and capable workforce.

1.3 Objectives:

- **Implement a streamlined candidate resume assessment system:** Develop a system where candidate resumes are systematically reviewed by qualified staff and a dedicated committee. This ensures that the initial screening process is fast, efficient, and reduces manual workload, allowing recruiters to focus on top candidates.
- **Utilize resume screening and matching technology:** Integrate advanced resume screening technologies to automatically match resumes with specific job criteria. This allows for quicker identification of candidates who meet the necessary qualifications, improving the overall recruitment efficiency.
- **Establish a thorough qualifying and approval process:** Create a well-structured process for qualifying and approving candidates before scheduling interviews. This ensures that only the most qualified applicants move forward, saving time and resources for the hiring team.
- **Involve a dedicated committee for diverse evaluations:** Engage a panel of experts to offer diverse perspectives and conduct comprehensive evaluations. This approach promotes a more balanced and fair assessment of candidates, ensuring that a variety of factors are considered during the selection process.
- **Enhance accuracy with Natural Language Processing (NLP):** Implement NLP algorithms to automatically extract relevant information from resumes, such as skills, qualifications, and experience. This improves the accuracy of the matching process and reduces errors in candidate evaluation.
- **Promote fairness by minimizing human biases:** Leverage automated resume screening to minimize human biases that can occur in manual evaluations. This ensures that candidates are assessed based on objective qualifications rather than subjective factors, supporting a more equitable hiring process.
- **Improve decision-making with data-driven insights:** Use data analytics to track recruitment trends and performance metrics. This helps the recruitment team make informed decisions, continuously improve the process, and ensure that hiring decisions are aligned with organizational goals.

1.4 Scope:

The scope of the **Resume Radar** project encompasses several key areas of application within the recruitment process, making it highly adaptable for a range of industries and organizational needs. Below are some specific areas where the system can have a significant impact:

- **Corporate Hiring:** Large organizations with high recruitment volumes can benefit from automating the initial resume screening process. The system can help HR teams filter out unqualified candidates early on, allowing recruiters to focus on the most promising applicants.
- **Recruitment Agencies:** Staffing and recruitment firms can utilize the Resume Radar system to manage diverse candidate pools more efficiently, ensuring faster placements and better matching between candidates and job openings.
- **Academic Institutions:** Universities and educational institutions can employ this system during student placement processes. By automatically matching students' resumes with potential internships or job opportunities, it reduces the administrative burden on career services departments.
- **Tech Startups:** For fast-growing startups, Resume Radar provides a scalable solution to quickly screen resumes as they expand, ensuring that only the best candidates move forward in the hiring process, saving valuable time.
- **Diversity and Inclusion Initiatives:** The system can be adapted to eliminate biases in resume screening by ensuring objective, data-driven decisions that align with diversity and inclusion goals.
- **Global Companies:** Multi-national corporations can use the system across various locations to maintain consistent hiring standards and reduce the complexity involved in managing recruitment on a global scale.

CHAPTER 2

LITERATURE REVIEW

The recruitment process has seen remarkable transformation due to the rising need for efficiency and inclusivity in candidate selection. Traditional manual resume screening often leads to biases, inefficiencies, and missed opportunities to identify top talent, prompting a shift towards automated solutions. Recent studies explore how Natural Language Processing (NLP) and machine learning (ML) are shaping the future of resume screening, focusing on efficiency, accuracy, and unbiased hiring practices.

In their research, Dr. Ambareesh S. et al. (2024) propose a resume shortlisting system utilizing NLP techniques to automate the initial stages of recruitment. The study addresses the challenges posed by unstructured data in resumes, which often result in subjective evaluations. By implementing NLP algorithms, the authors demonstrate how relevant information, such as qualifications and skills, can be automatically extracted, significantly reducing the manual effort involved in the screening process. The system enables HR professionals to focus more on strategic tasks like interviews while maintaining consistency in evaluating candidates. Their findings underscore the efficiency gains and improved candidate-job matching, ultimately leading to higher-quality hires (Dr. Ambareesh S. et al., 2024) [1].

Building on the momentum of machine learning in recruitment, Kowalski et al. (2022) present a framework that utilizes machine learning algorithms to improve the hiring process. Their research focuses on analyzing historical hiring data to develop predictive models that assess candidate fit based on qualifications and potential success within the organization. The study highlights the ability of machine learning to reduce human bias in hiring decisions and promote diversity. It also emphasizes the importance of transparency in algorithmic decision-making, ensuring that hiring managers understand and trust the outcomes. The study provides insights into the ethical implications of automated hiring and underscores the potential of machine learning to transform recruitment into an equitable and objective process, ultimately fostering a more diverse workforce (Kowalski et al., 2022) [2].

Further enhancing recruitment processes through technology, Amin et al. (2019) developed a web application specifically for screening resumes, providing a user-friendly interface for HR professionals to streamline resume management. This application automates routine tasks such as categorizing and sorting resumes based on predefined criteria, significantly improving the recruitment workflow. The backend of the system is designed to ensure accurate filtering of resumes, reducing the risk of overlooking qualified

candidates. Additionally, the application provides HR professionals with valuable insights into candidate demographics and qualifications, facilitating more informed decision-making. This study highlights the importance of leveraging technology to improve the efficiency and effectiveness of modern hiring practices (Amin et al., 2019) [3].

CHAPTER 3

PROPOSED SYSTEM

The **Resume Radar** system aims to revolutionize the recruitment process by automating the resume screening and matching phases, ultimately enhancing efficiency, accuracy, and fairness in hiring. By leveraging advanced Natural Language Processing (NLP) techniques, the system will streamline the evaluation of candidates, enabling recruiters to quickly identify top talent based on specific job criteria. This innovative solution seeks to eliminate biases inherent in traditional manual methods, providing a data-driven approach that enhances the overall quality of hiring decisions.

3.1 Features and Functionality

- **User Registration and Authentication:** Candidates and recruiters can securely register and log in to the system, ensuring that sensitive information is protected and accessible only to authorized users.
- **Resume Upload and Parsing:** Users can upload resumes in various formats (PDF, Word), which the system will then parse to extract key information such as skills, experience, and education using advanced NLP algorithms.
- **Automated Resume Matching:** The system employs Named Entity Recognition (NER) and Stochastic Gradient Descent (SGD) to automatically score and rank candidates based on their qualifications, matching them against specific job requirements.
- **Admin Dashboard:** Admin users have access to a comprehensive dashboard for managing user roles, viewing system activities, and tracking recruitment metrics, providing insights into the recruitment process's efficiency.
- **Shortlisting and Feedback:** Recruiters can create and manage candidate shortlists based on automated scoring, while also providing feedback to candidates regarding their application status, enhancing the overall candidate experience.

CHAPTER 4

REQUIREMENTS ANALYSIS

The requirement analysis for the Resume Radar project is essential to ensure that the system meets both functional and non-functional expectations, providing a seamless experience for users while optimizing the recruitment process. Below is an outline of the key requirements:

Functional Requirements:

1. **User Registration and Authentication:** The system should allow users (HR staff, recruiters, and committee members) to register, log in, and securely access the platform. User roles must be defined to manage permissions.
2. **Resume Upload and Parsing:** Candidates or HR staff should be able to upload resumes in various formats (PDF, Word). The system must parse the resumes using NLP techniques to extract relevant data such as skills, experience, and qualifications.
3. **Resume Matching:** Implement algorithms like Named Entity Recognition (NER) and Stochastic Gradient Descent (SGD) to match resumes against predefined job criteria, helping recruiters identify the most suitable candidates.
4. **Admin Dashboard:** The platform should feature an intuitive dashboard for administrators to manage user roles, view system activity, and track recruitment statistics.
5. **Search and Filtering:** Users must be able to search for specific candidates based on qualifications, experience, or skills, and filter results to narrow down the most relevant candidates.
6. **Candidate Shortlisting:** The system should allow recruiters to shortlist candidates based on the automatic scoring and ranking of resumes, providing a list of top candidates for further review.
7. **Reporting and Analytics:** The platform should generate reports on candidate matches, system performance, and recruiter activity. Analytics on recruitment trends, such as common skill sets, should also be provided.

Non-Functional Requirements:

1. **Performance:** The system should handle a large volume of resumes without delays, processing resumes and generating results in a timely manner.

2. **Security:** Ensure secure handling of candidate data, including encryption of sensitive information and multi-factor authentication for users.
3. **Scalability:** The platform must be scalable to support growing numbers of resumes, users, and additional functionalities in the future.
4. **Usability:** The user interface should be intuitive, making it easy for recruiters to navigate the system, upload resumes, and extract meaningful insights without extensive training.
5. **Compatibility:** The system should be compatible with various file formats (PDF, Word) for resume uploads and should function across multiple devices, including desktops and mobile devices.
6. **Data Privacy:** Ensure compliance with data privacy regulations such as GDPR, by anonymizing personal data where necessary and providing users with control over their information.
7. **Reliability:** The system must be reliable, with minimal downtime, and should offer data backup and recovery features in case of system failures.

By addressing these functional and non-functional requirements, the Resume Radar system will be able to streamline the resume screening process, ensuring accuracy, speed, and fairness in recruitment.

CHAPTER 5

PROJECT DESIGN

5.1 Use Case Diagram

The Use Case Diagram shown below in figure: 5.1 is a visual representation of the interactions between users (actors) and a system. It outlines how different users interact with the system to achieve specific goals or use cases. In the diagram, actors are usually represented by stick figures, while use cases are depicted as ovals. Lines between actors and use cases show the relationships or interactions. This type of diagram helps to capture the functional requirements of a system, clarify user roles, and highlight system behavior from an end-user perspective. It is commonly used in system design and analysis, particularly in software engineering.

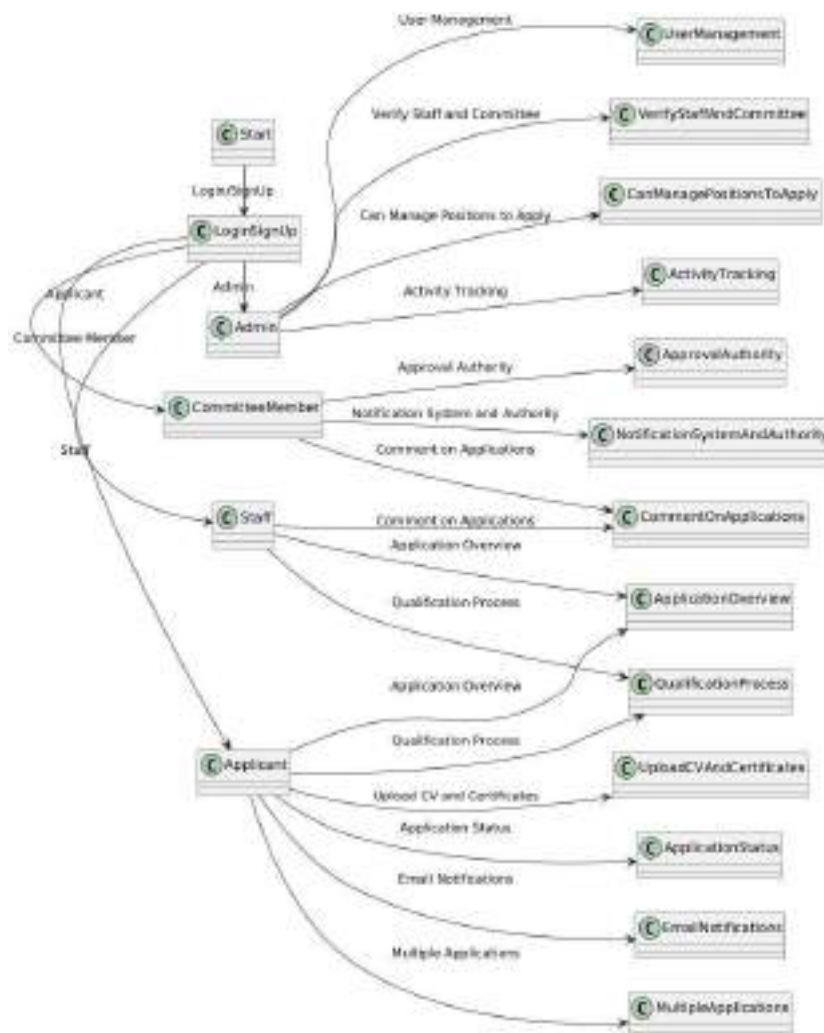


Figure 5.1: Use Case Diagram

In Figure 5.1, In this diagram there is detailing the interactions between various user roles and the functionalities of a system.

Each role is connected to different system functions, which describe the actions the user can perform.

1. **Applicant:** The primary user who interacts with the system to apply for positions.
2. **Staff:** A role that assists in reviewing and managing applications.
3. **Committee Member:** Likely responsible for reviewing and providing feedback on applications.
4. **Admin:** The system administrator who manages users and has broader authority over system functions.

5.2 DFD (Data Flow Diagram)

A Data Flow Diagram (DFD) visually represents the flow of data through a system, showing how information moves between processes, data stores, and external entities. It consists of processes that manipulate data, data stores that hold information, and external entities that interact with the system. Arrows indicate the flow of data between these components. DFDs help in understanding how data is processed within a system, making them useful for analyzing system functionality and designing clear, efficient workflows during the development process.

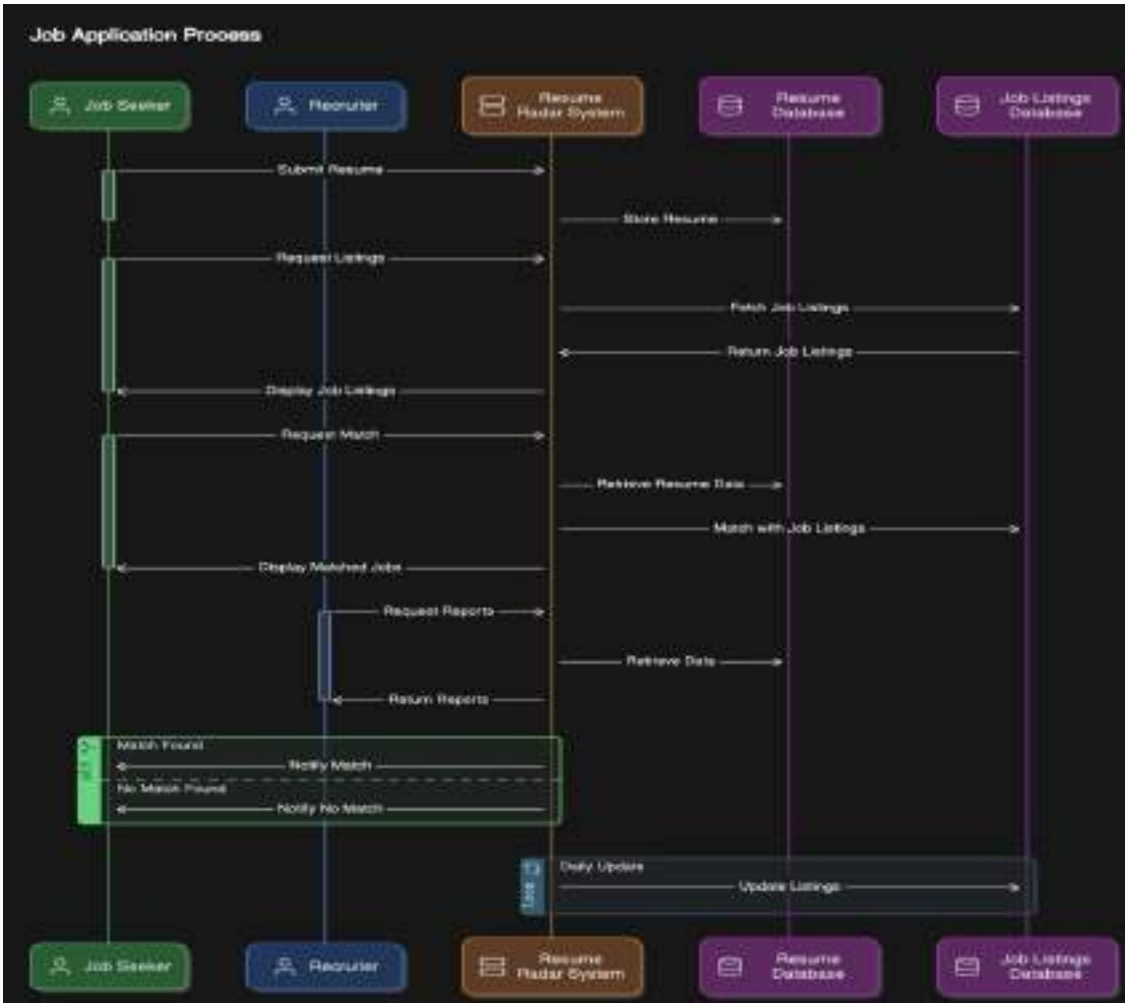


Figure 5.2: Data Flow Diagram

In the figure 5.2, This diagram illustrates the entire job application process, showcasing how different entities—Job Seeker, Recruiter, Resume Radar System, and associated databases—interact seamlessly. The process begins when the Job Seeker submits their resume, which is stored in the Resume Database for future processing.

The Recruiter, looking for candidates, can request available job listings from the system, which are fetched from the Job Listings Database and presented to the Job Seeker. The Job Seeker can then request to match their resume with relevant job listings, and this request is handled by the Resume Radar System. The system retrieves the resume data and compares it with the job listings to find potential matches. If any matches are found, the Job Seeker is notified; otherwise, the system informs them that no suitable matches are available. At the same time, the Recruiter can request reports from the Resume Radar System, which retrieves and returns data related to job matches or the recruitment process. In the background, the system performs daily updates to ensure that the job listings database remains current and accurate, allowing both job seekers and recruiters to interact with up-to-date information. This flow ensures a smooth, automated process for matching candidates with job opportunities and keeping the database refreshed.

5.3 System Architecture

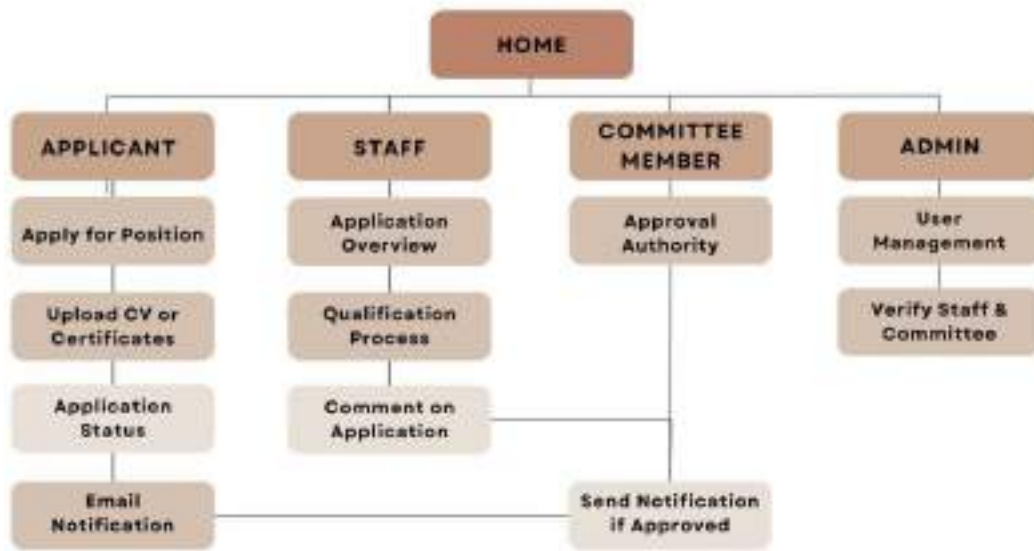


Figure 5.3: System Architecture

In the figure 5.3, The platform follows a modular design, dividing functionalities based on user roles to ensure a smooth and streamlined experience. The core of the application is built around Login/SignUp, which directs users to role-specific dashboards: Applicants are provided with tools to manage their applications, upload documents, and track status, while Staff and Committee Members gain access to application reviews and approval mechanisms. The Admin module focuses on user and system management, enabling the addition,

verification, and role assignment of users, as well as job posting and activity tracking. Each module interacts with a centralized database, ensuring secure and efficient data retrieval, storage, and processing. This modular architecture enhances scalability, allowing for future feature expansions.

5.4 Implementation

In the figure 5.4.1, Applicant will login/Sign in into the web application and select the open positions for which he wants to apply for the job

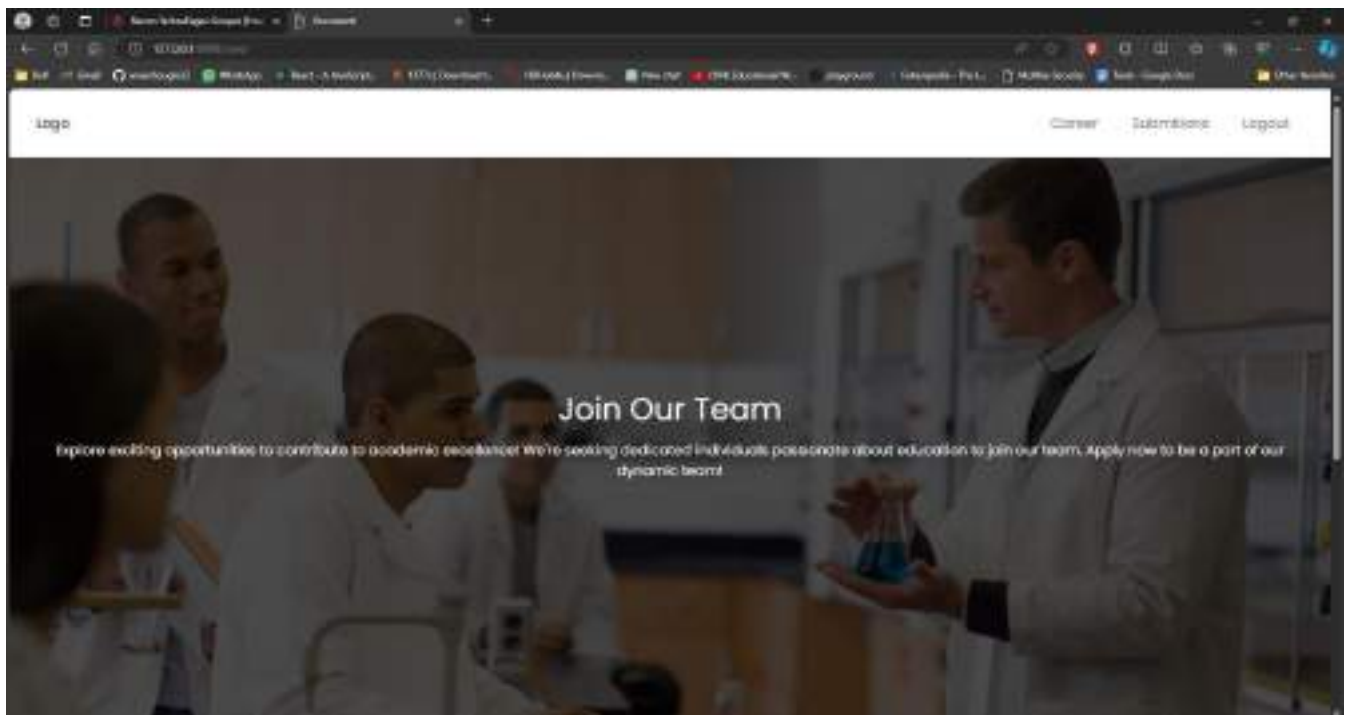


Figure 5.4.1 Front page

In the figure 5.4.2, Applicant will login/Sign in into the web application and select the open positions for which he wants to apply for the job

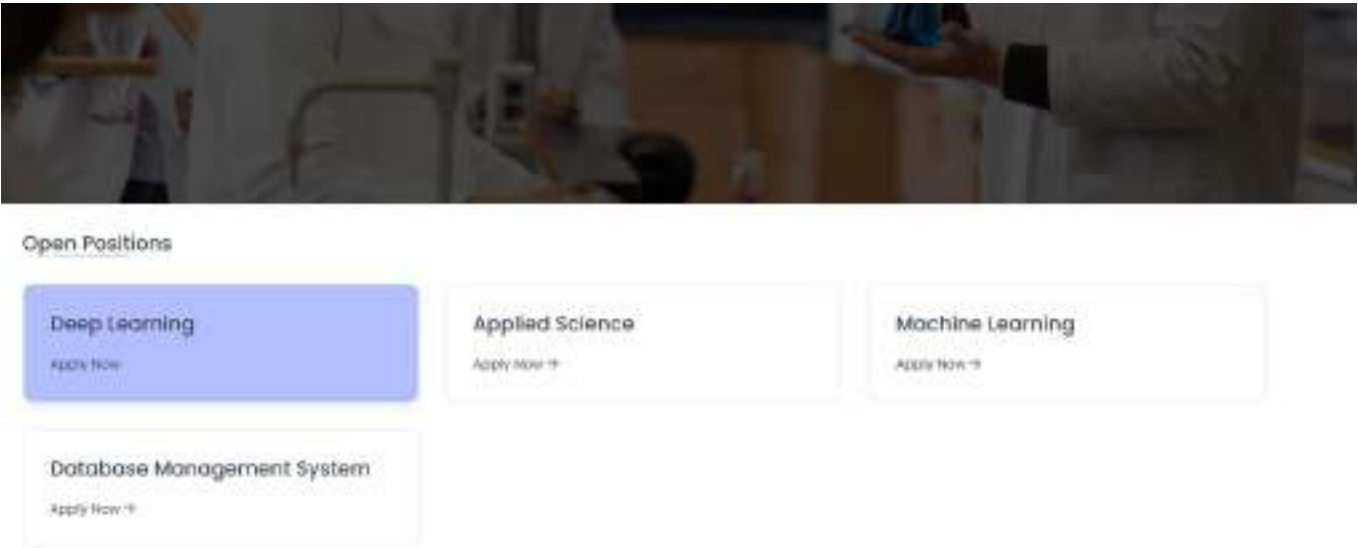


Figure 5.4.2 Dashboard

In the figure 5.4.3, Description About the job and applicants can upload their cv here. This page shows the requirements for this job. Also they can add certificates.

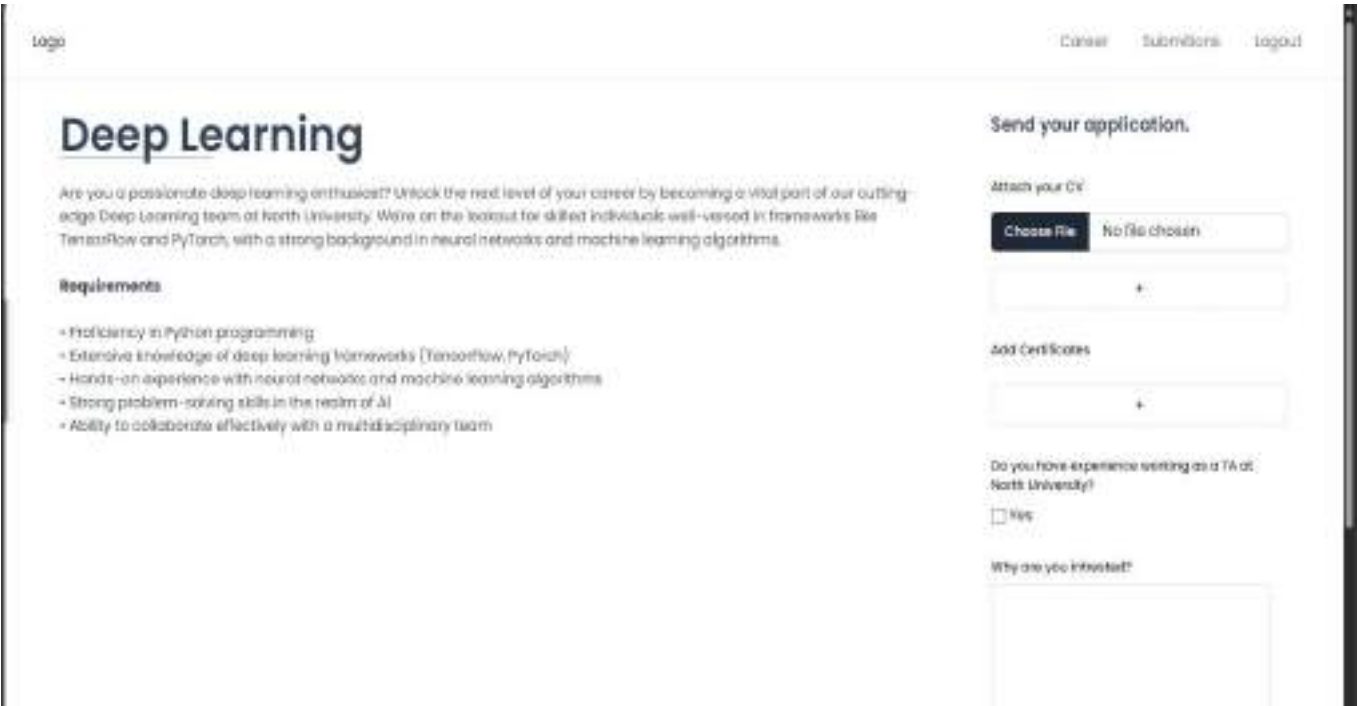
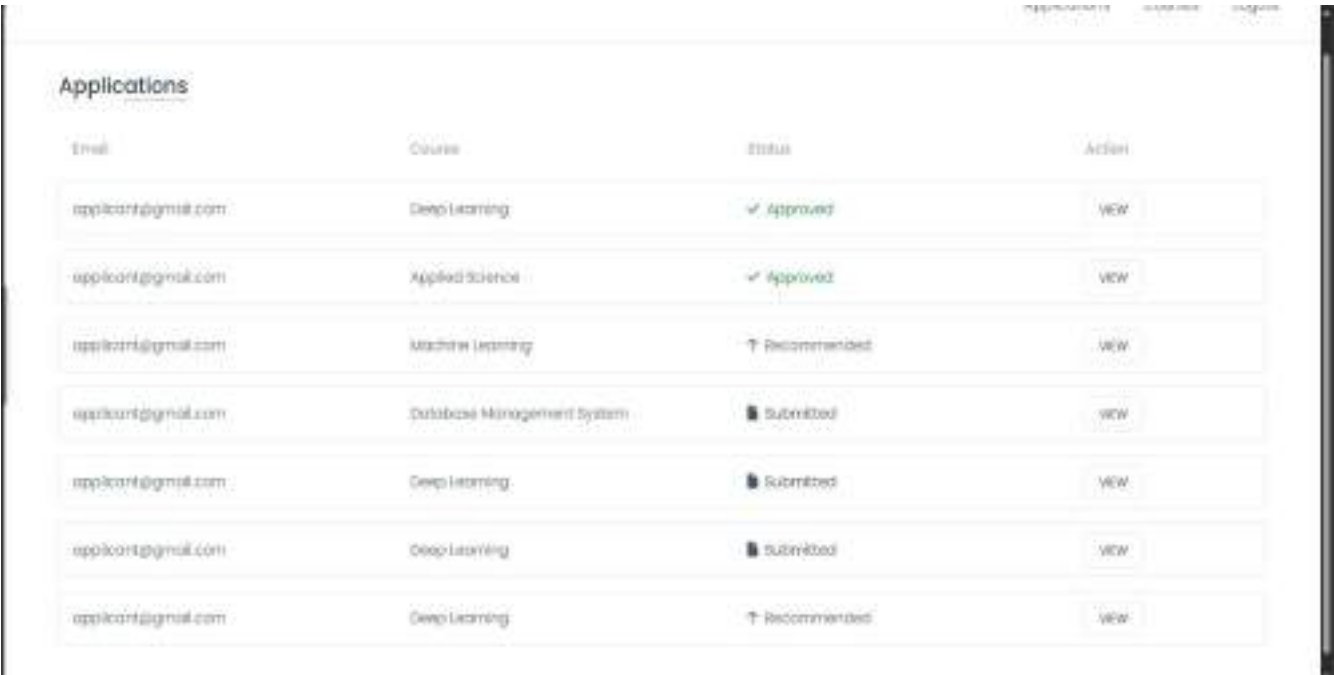


Figure 5.4.3 Job Description

In the figure 5.4.4, The status of Applicant is shown here. Whether it has been Approved, Recommended or submitted.

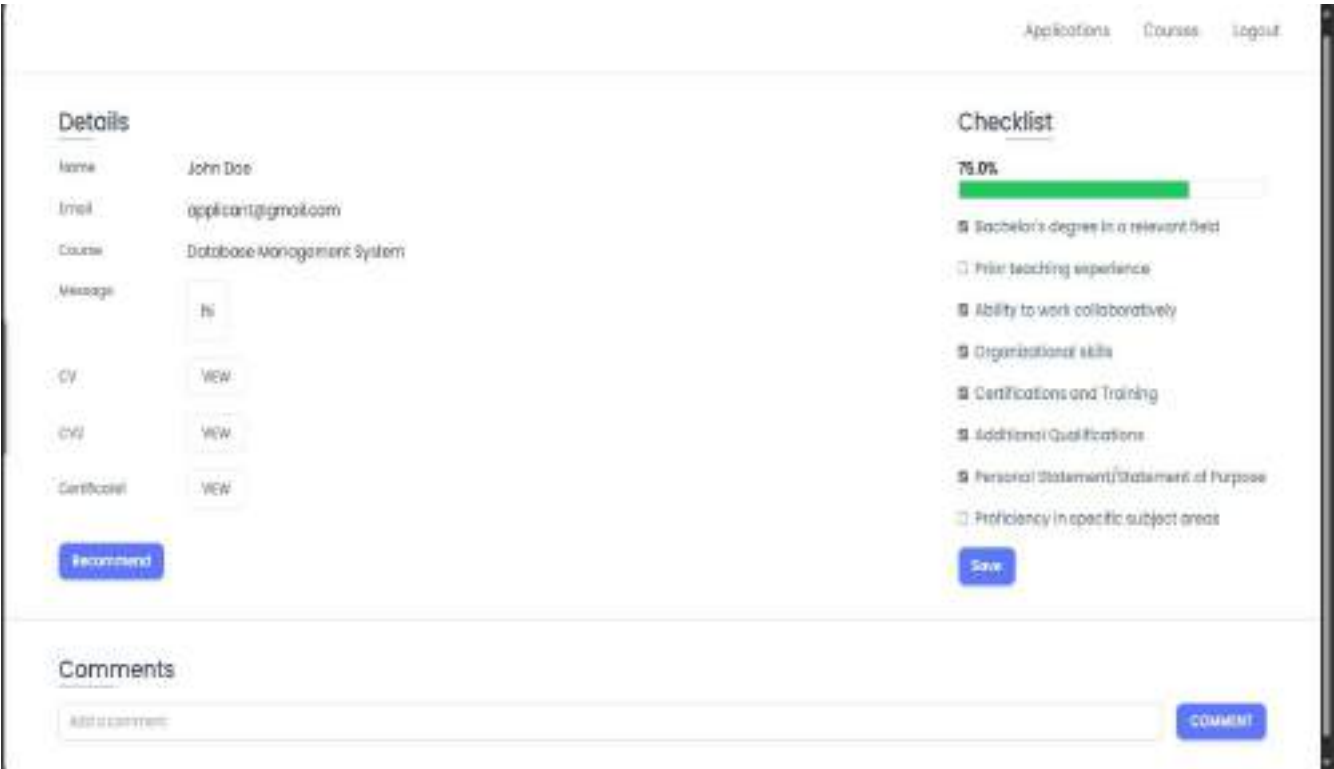


The screenshot shows a web application interface with a top navigation bar containing 'Applications', 'Courses', and 'Logout'. The main content area is titled 'Applications' and displays a table with the following columns: Email, Course, Status, and Action. The table contains seven rows of data, each with a 'VIEW' button in the Action column.

Email	Course	Status	Action
applicant@gmail.com	Deep Learning	✓ Approved	VIEW
applicant@gmail.com	Applied Science	✓ Approved	VIEW
applicant@gmail.com	Machine Learning	↑ Recommended	VIEW
applicant@gmail.com	Database Management System	📁 Submitted	VIEW
applicant@gmail.com	Deep Learning	📁 Submitted	VIEW
applicant@gmail.com	Deep Learning	📁 Submitted	VIEW
applicant@gmail.com	Deep Learning	↑ Recommended	VIEW

Figure 5.4.4 Application Status

In the figure 5.4.5, Admin has access to all the data provided by the users.



The screenshot shows the 'Admin Page' with a top navigation bar containing 'Applications', 'Courses', and 'Logout'. The page is divided into three main sections: 'Details', 'Checklist', and 'Comments'.

Details: This section displays the following information for an applicant:

- Name: John Doe
- Email: applicant@gmail.com
- Course: Database Management System
- Message: No
- CV: VIEW
- CV2: VIEW
- Certificate: VIEW

Below the details is a blue 'Recommend' button.

Checklist: This section shows a progress bar at 75.0% and a list of seven items, each with a checkbox:

- ☒ Bachelor's degree in a relevant field
- ☐ Prior teaching experience
- ☒ Ability to work collaboratively
- ☒ Organizational skills
- ☒ Certifications and Training
- ☒ Additional Qualifications
- ☒ Personal Statement/Statement of Purpose
- ☐ Proficiency in specific subject areas

Below the checklist is a blue 'Save' button.

Comments: This section has a text input field labeled 'Add a comment' and a blue 'COMMENT' button.

Figure 5.4.5 Admin Page

In the figure 5.4.6, There are multiple job openings where applicants can apply.

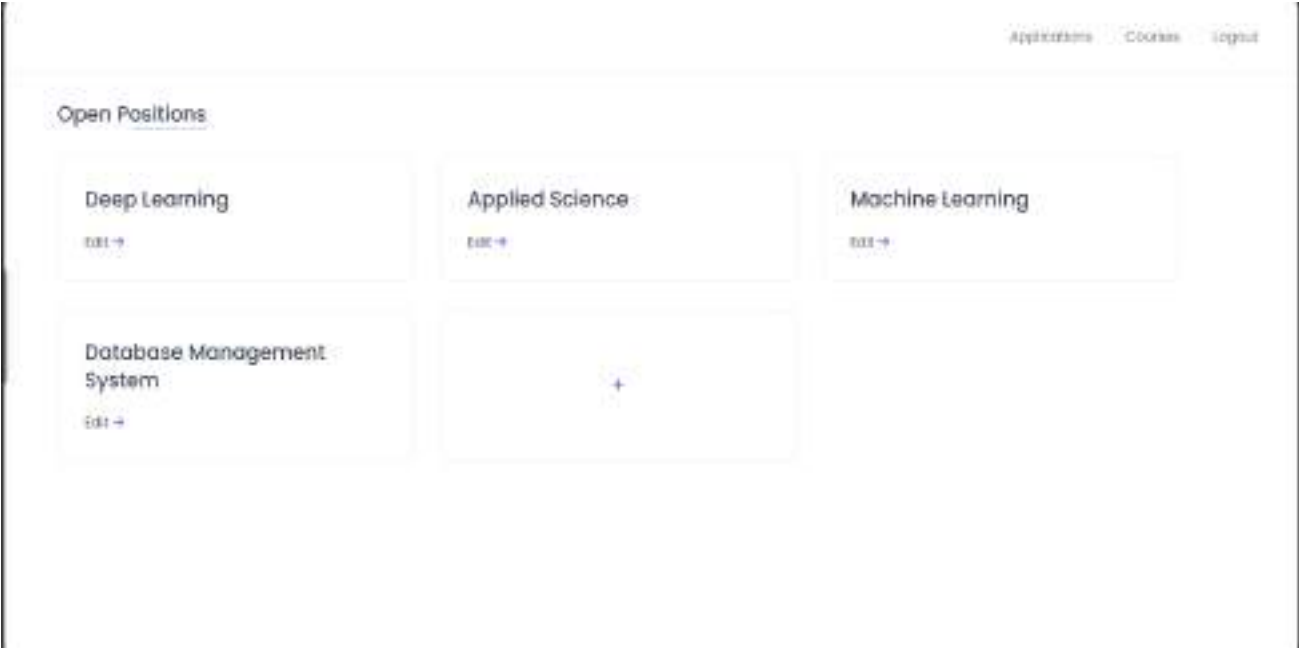


Figure 5.4.6 Job Opening

In the figure 5.4.7, Staff is checking the CV here and recommending to the committee members who will send the notification if they are approved.

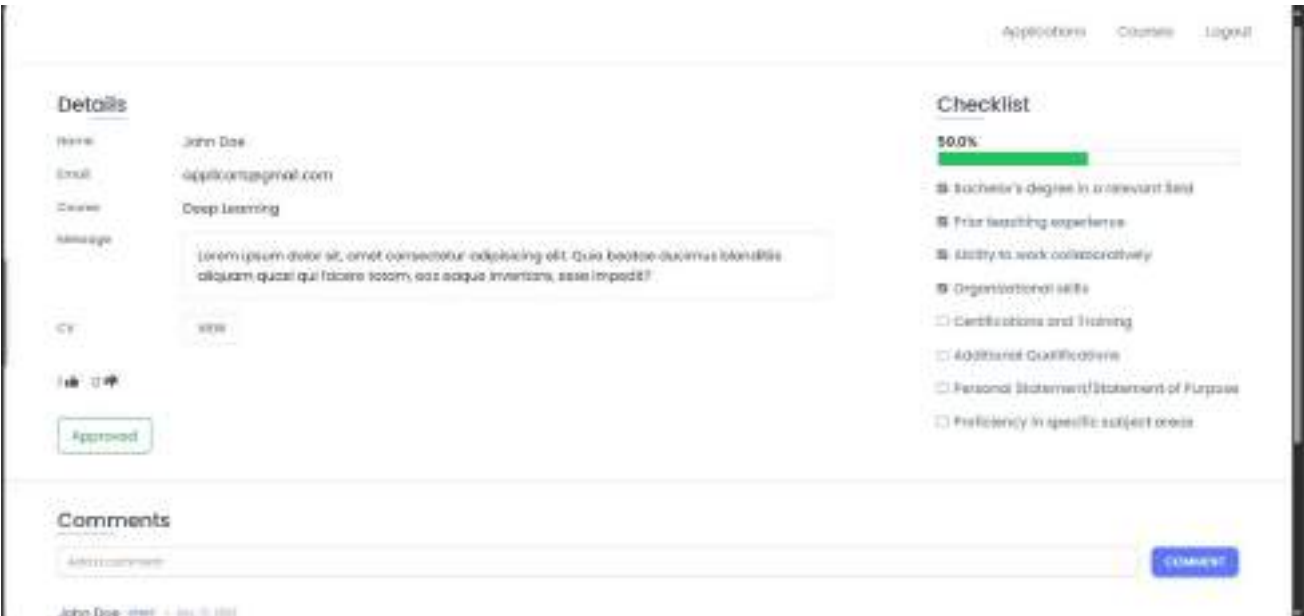


Figure 5.4.7 CV Check

In the figure 5.4.8, The resume data is summarized and has been displayed here through AI. The matching percentage is also done through AI.

Details

Name

Mohammed Anas

Email

applicant@gmail.com

Course

Deep learning

Language

Python

CV

CV

Download

AI Summary

Name

Mohammed Anas Cheugale

Designation

AI / Machine Learning

Location

Mumbai

Email Address

cheugaleanas2@gmail.com

Degree

Diploma in Computer Engineering

College Name

S. H. Jadhav Polytechnic

Skills

Python, IT Programming, TensorFlow, PyTorch, Soft Skills, Java

Checklist

82.5%

☐ Bachelor's degree in a relevant field

☒ Prior working experience

☐ Ability to work collaboratively

☐ Organizational skills

☒ Certifications and Training

☒ Additional Qualifications

☒ Personal Statement/Statement of Purpose

☒ Proficiency in specific subject areas

Save

Comments

0/1000 characters

Comment

Figure 5.4.8 Resume Summary

CHAPTER 6

TECHNICAL SPECIFICATIONS

The Technical Specifications for the Resume Radar system highlight the various technologies and methodologies that contribute to its overall functionality and efficiency.

Front-end:

- **Development Framework:** HTML5, CSS3
- HTML is employed to structure the web application, ensuring a semantic layout for content, while CSS is utilized for styling the interface. This combination creates a visually appealing and responsive user experience, enabling users to navigate the application seamlessly and efficiently

Back-end:

- **Development Framework:** Python, Django
- Python serves as the core programming language for implementing the system's logic, renowned for its readability and efficiency. The robust Django framework is employed for rapid development, facilitating the seamless integration of various components within the application.

Additionally, the system uses an SQLite database, a lightweight solution that effectively stores and manages resumes, user interactions, and other critical data, ensuring smooth functionality and quick access to necessary information.

The Resume Radar system relies on two primary datasets: the Resume Dataset from Kaggle, which features a diverse collection of resumes across various industries and job roles, serves as the foundation for training the system's algorithms. This dataset enables the system to learn and adapt to different formatting styles and content types. Additionally, the Updated Resume Dataset from Kaggle includes recent resumes reflecting current industry trends and required skills. By incorporating this enhanced dataset, the system improves its matching accuracy and relevance, aligning closely with contemporary employer requirements. The algorithms used in the system include Named Entity Recognition (NER) with SpaCy, which identifies and categorizes key entities in resumes, and Stochastic Gradient Descent (SGD), an optimization algorithm that iteratively adjusts model parameters to minimize errors, thereby enhancing the overall performance of the resume matching process and leading to more informed hiring decisions.

CHAPTER 7

PROJECT SCHEDULING

In our project, the Gantt chart will outline key activities where each task will be represented by a bar on the chart, indicating its start and end dates, duration, and dependencies, allowing project stakeholders to track progress, identify potential delays, and timely completion of project objectives.



Fig 7.2: Gantt chart

In the figure 7.2, The Gantt chart for the "Resume Radar System" project serves as an essential tool to manage the timeline and track the progress of various tasks. It visually outlines the workflow, helping ensure that tasks are completed on schedule and dependencies are managed efficiently.

Key Features:

1. **Project Overview:** The chart provides a structured approach, listing the project title, team members, and key details to ensure clear communication of responsibilities.
2. **Timeline:** The horizontal axis shows a week-by-week breakdown, from Week 1 to Week 16, indicating when each task begins and ends, ensuring proper resource planning.
3. **Progress Tracking:** Tasks are color-coded based on status—completed, ongoing, or pending—with percentage completion shown for easy tracking of project milestones.
4. **Week Breakdown:** Each task is mapped to its specific duration, allowing clear visualization of when different phases will occur.
5. **Task Dependencies:** The chart highlights task dependencies, ensuring critical tasks are completed before others.

In summary, the Gantt chart effectively tracks timelines and progress, making it easy to monitor project stages and ensure timely completion of the Resume Radar System.

CHAPTER 8

RESULTS

The implementation of the Resume Radar system has yielded transformative results in the recruitment landscape, enhancing both the efficiency and effectiveness of the hiring process. By harnessing the power of advanced Natural Language Processing (NLP) techniques, the system has not only automated the resume screening process but also optimized candidate matching by accurately interpreting and analyzing resumes. This data-driven approach has led to significant reductions in the time and effort required for recruitment, ensuring that hiring managers have access to the most qualified candidates promptly. Furthermore, the Resume Radar system fosters a more strategic approach to recruitment, enabling organizations to make informed hiring decisions that align closely with their talent needs, ultimately driving organizational success.

System Overview: This application provides a specialized platform to manage and streamline job application processes, tailored to the unique needs of various user roles, including Applicants, Staff, Committee Members, and Admins. The system enables applicants to easily upload their resumes, track the status of their applications, and apply for multiple positions, while staff and committee members are provided with a structured interface to review, comment, and approve applications. The Admin panel supports managing users and job postings, creating a fully integrated solution for recruitment management. Through automated notifications and status updates, all users are kept informed throughout the process, ensuring a smooth and transparent flow of information. This system reduces administrative workload and improves coordination across different roles involved in the hiring process.

System Architecture: The platform follows a modular design, dividing functionalities based on user roles to ensure a smooth and streamlined experience. The core of the application is built around **Login/SignUp**, which directs users to role-specific dashboards: Applicants are provided with tools to manage their applications, upload documents, and track status, while Staff and Committee Members gain access to application reviews and approval mechanisms. The Admin module focuses on user and system management, enabling the addition, verification, and role assignment of users, as well as job posting and activity tracking. Each module interacts with a centralized database, ensuring secure and efficient data retrieval, storage, and processing. This modular architecture enhances scalability, allowing for future feature expansions.

Resume Matching Module: This core module processes submitted resumes using advanced machine learning techniques. Leveraging Named Entity Recognition (NER) with SpaCy, the system identifies key

entities within resumes, such as education, experience, and skills. Stochastic Gradient Descent (SGD), an optimization algorithm, helps fine-tune the matching process by analyzing the relationship between resume content and job listings. The integration of the Resume Dataset and Updated Resume Dataset from Kaggle enables the system to learn from diverse and recent resume formats, ensuring accuracy in matching applicants to relevant positions. This results in a more effective and informed hiring decision-making process.

Job Recommendation Module: The Job Recommendation Module is another vital component of the system, responsible for identifying and recommending suitable job listings to applicants based on their resume data and profile. This module uses machine learning algorithms to analyze the uploaded resumes, including factors such as work experience, education, skills, and industry preferences, and matches them with relevant job postings stored in the system's job listings database.

- **System Scalability:** With multiple user types and functions, the architecture needed to remain scalable. Modular design ensured easy integration of additional features without disruption.

CHAPTER 9

CONCLUSION

The incorporation of Natural Language Processing (NLP) into Resume Radar signifies a transformative advancement in recruitment technology, fundamentally changing how organizations approach talent acquisition. By leveraging sophisticated NLP algorithms, Resume Radar can efficiently analyze and interpret the vast array of language patterns found in resumes, extracting relevant skills, qualifications, and experiences. This capability enables the system to match candidates with job requirements more accurately, which not only accelerates the screening process but also enhances the overall quality of candidate selection. As a result, recruiters can navigate through large volumes of applications with ease, allowing them to focus on strategic decision-making and candidate engagement rather than tedious manual filtering.

Moreover, the adoption of a data-driven methodology through NLP contributes significantly to improved hiring outcomes. The insights derived from analyzing candidate profiles empower organizations to make informed choices that align with their specific job needs and cultural fit. This leads to higher satisfaction rates among candidates and a more efficient hiring process, ultimately reducing turnover rates and fostering a more productive workforce. In essence, Resume Radar's NLP capabilities not only streamline the recruitment process but also position organizations for long-term success by ensuring they attract and retain the best talent available in a competitive job market.

CHAPTER 10

FUTURE SCOPE

The future scope of the Resume Ranking System is expansive and promising, with potential for integrating cutting-edge technologies, improving user experience, and driving more effective recruitment strategies. Below are seven detailed future directions for the system:

- 1. Integration with Advanced Artificial Intelligence and Machine Learning:** AI and machine learning could help predict potential issues, analyze driver behavior, and flag complaints before they occur. This allows for proactive intervention and more efficient resolution.
- 2. Real-time Monitoring and Response:** Future updates could enable real-time complaint submission and instant response, improving passenger safety and satisfaction. Quick issue resolution would enhance the overall customer experience.
- 3. Expanded Data Analytics:** Big data could be used to identify complaint trends, helping improve driver training and service standards. Insights from analytics can drive operational efficiencies and strategic improvements.
- 4. Enhanced User Experience:** Future enhancements could improve the system's accessibility through mobile apps and voice activated interfaces. This would make submitting complaints easier and more convenient for users.
- 5. Global Standards and Benchmarking:** The system could help establish global benchmarks for service quality and complaint resolution. This would set new industry standards for taxi services worldwide.
- 6. Collaboration with Regulatory Bodies:** Working with regulatory authorities can ensure the system aligns with legal and safety standards. This would promote compliance and improve industry-wide practices

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