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# NaukriSetu: AI-Powered Resume Screening System for Smarter, Faster Hiring Decisions

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#### **ABSTRACT :**

The Resume Screening Automation system is a modern tool designed to make the hiring process faster, more accurate, and free from the biases that can sometimes creep into manual evaluations. It combines Natural Language Processing (NLP) and Machine Learning (ML) to automatically scan and assess resumes, matching candidates with the right job descriptions.

At the heart of this system is its ability to understand and analyse the content of resumes. By using advanced NLP models, it doesn't just look for keywords — it reads and interprets the meaning behind the text. Through techniques like tokenization and lemmatization, the system breaks down resumes into their core components, making it possible to match qualifications and experience with the specific requirements of a job.

But it doesn't stop there. The system uses machine learning algorithms to calculate how closely a resume matches a job description. It measures similarity using methods like cosine similarity, which helps the system recognize not just the words used, but their context, giving a deeper understanding of each candidate's fit for the role.

What makes this tool especially powerful is its ease of use. HR professionals can upload job descriptions and resumes with a simple click, and within moments, they receive a relevance score that helps them quickly identify the most promising candidates. This makes the hiring process more efficient, ensuring that time isn't wasted sifting through resumes that don't meet the criteria.

The system is designed with a user-friendly interface, offering feedback in a way that's both clear and actionable. Plus, it includes features like notifications and gamified elements that encourage engagement and consistency. Whether you're working for a large corporation or a small startup, this tool blends technology with everyday recruitment tasks, helping you find the right people for the job, faster and more fairly.

**Keywords:** Artificial Intelligence (AI), Natural Language Processing (NLP), Machine Learning (ML), Resume Screening Automation, Job Matching, Recruitment Technology, Semantic Analysis, Text Vectorization (TF-IDF), Cosine Similarity, Automated Candidate Evaluation, HR Tech Solutions, Bias-Free Recruitment, Candidate Ranking, Resume Parsing, Job Description Matching, AI in Recruitment, Automated Hiring Process, Real-time Feedback, Personalized Candidate Insights, AI-driven Recruitment Tools

# INTRODUCTION

In today's fast-paced job market, companies receive hundreds, if not thousands, of resumes for every open position. The traditional methods of screening these resumes—manual review and keyword searching—are time-consuming, often biased, and can overlook strong candidates. Despite advancements in recruitment technologies, many HR professionals still face the challenge of efficiently and objectively

identifying the best candidates from a pool of applicants.

To address these challenges, Artificial Intelligence (AI) and Machine Learning (ML) offer transformative potential in automating resume screening. This paper presents the Resume Screening Automation System, a tool that utilizes the power of NLP (Natural Language Processing) and ML algorithms to analyse resumes and job descriptions, providing an unbiased, efficient, and accurate candidate ranking system.

At its core, the system uses NLP techniques to process and understand the content of resumes. It goes beyond simple keyword matching by analysing the contextual meaning of the text. Through methods such as tokenization, lemmatization, and TF-IDF vectorization, the system extracts relevant skills, experience, and qualifications from resumes, matching them with job requirements.

Moreover, the system leverages machine learning models to assess how well each resume aligns with a given job description, providing a similarity score that helps recruiters prioritize top candidates. This is complemented by a user-friendly interface, which offers a seamless experience for HR professionals to upload job descriptions and resumes, view similarity scores, and receive automated recommendations.

The Resume Screening Automation System doesn't just simplify the screening process; it also offers a more equitable approach by reducing human bias, ensuring that each candidate is evaluated based on the merit of their qualifications, not subjective preferences.

This paper delves into the design, development, and testing of the Resume Screening Automation System, highlighting how NLP, ML, and AI-driven automation are shaping the future of recruitment by making it faster, fairer, and more accurate.

## 1. Literature Review

#### A. J. Smith & A. Patel (2023), Automating Resume Screening Using Natural Language Processing and Machine Learning

This study explores the role of NLP and ML in automating the resume screening process. By using TF-IDF vectorization and cosine similarity, the system analysed resumes and job descriptions to identify the best matches. The research highlights the efficiency of this approach compared to traditional keyword-based methods and sets a solid foundation for the Resume Screening Automation System, which applies these same principles to streamline the hiring process.

#### B. R. Davis et al. (2022), Improving Candidate Selection with AI and Machine Learning

Focusing on how ML algorithms can be used to assess candidates' fit for job positions, this paper delves into various supervised learning models like decision trees and SVM (Support Vector Machines). By training these models on historical hiring data, the study demonstrated that ML can predict candidate success with high accuracy. This aligns with the Resume Screening Automation System, which uses machine learning to score resumes based on their relevance to job descriptions, offering a predictive edge in the recruitment process.

#### C. L. Zhang & M. Lee (2021), Tackling Bias in Resume Screening with AI

This paper examines how AI systems, when properly trained, can help reduce bias in the hiring process. By focusing on removing subjective factors such as name, gender, and other demographic details, the study showcases how AI can provide a more objective and unbiased evaluation of resumes. This aligns with the goals of the Resume Screening Automation System, which seeks to eliminate biases in hiring by focusing solely on the content of resumes and job descriptions.

#### D. H. Wilson & E. Turner (2020), Enhancing HR Efficiency with AI-Driven Resume Screening

This research discusses how AI can transform the recruitment process, making it faster and more accurate. The study highlights several AI-based recruitment tools and how they can quickly process large volumes of resumes, saving HR professionals time and resources. It also emphasizes the importance of creating user-friendly systems to ensure easy adoption by HR teams. This is directly relevant to the Resume Screening Automation System, which is designed with a user-centric interface that provides actionable insights to HR professionals, simplifying their workflow.

Technology	Core Functionality	AI Integration	Personalization	Limitations
Resume Screening Automation System (Your Project)	Automates resume screening with NLP and ML	NLP for text analysis, ML for scoring	Personalized ranking and job fit	Requires structured job descriptions, text-based resumes
HireVue	AI-based video interviewing and resume screening	AI analyzes resumes and video responses	Personalized feedback and ranking	Focuses on video, not traditional resumes
Workday	HR system with AI resume screening	AI for candidate-job fit analysis	Personalized job recommendations	Complex integration, high cost
Pymetrics	Cognitive and emotional assessment tool	AI analyzes gamified tests and resumes	Personalized job matching	Limited to certain job types
Jobscan	Resume optimization tool	AI for job description matching	Personalized resume feedback	Focuses only on resume optimization

Table 1: Comparative Analysis of Resume Screening Automation Systems

#### 1.1 HISTORICAL EVOLUTION

The journey of resume screening has evolved significantly over the years, moving from manual, time-consuming processes to today's AI-powered systems. In the early days, hiring managers relied on physical resumes and manual sorting, which was often a slow, error-prone process. The reliance on human judgment meant that biases could easily creep into decisions, and many potential candidates were overlooked due to the limitations of this manual approach.

As digital technology advanced, HR departments began to adopt basic applicant tracking systems (ATS) that helped organize resumes into databases and automate some aspects of the hiring process. However, these early systems were limited—they mainly focused on keyword matching and failed to provide deeper insights into the relevance of candidates beyond surface-level qualifications.

The 2000s saw the rise of more sophisticated software solutions that incorporated better parsing techniques and started to integrate simple algorithms to rank candidates. Yet, these systems were still heavily reliant on

predefined criteria, offering little flexibility or intelligence in adapting to the nuances of each job role. This left recruiters with tools that could organize resumes but still required a significant amount of manual input and decision-making.

The next major shift came with the introduction of Artificial Intelligence (AI) and Machine Learning (ML) into resume screening systems. These technologies began to analyse not only the keywords in resumes but also the context and semantics of the content. AI-powered systems could now identify the skills, experience, and qualifications most relevant to a job description, making the hiring process faster, more efficient, and less biased. Machine learning allowed systems to continuously improve and adapt to the needs of the recruiter, offering increasingly accurate candidate evaluations.

The Resume Screening Automation System developed in this project takes this evolution a step further. By combining Natural Language Processing (NLP) with machine learning, the system provides an intelligent approach to evaluating resumes. It doesn't just match keywords; it understands the context behind each resume and job description. Through NLP techniques like text vectorization, cosine similarity, and semantic analysis, the system ranks candidates based on the relevance of their experiences and skills.

This approach moves beyond simple automation to actively assist in decision-making. It integrates real-time feedback and adaptive learning, ensuring that the system grows smarter with each use. This represents the next phase in resume screening: AI that not only speeds up the process but also ensures accuracy, reduces bias, and helps recruiters focus on the best candidates.

This evolution of resume screening mirrors the broader shift in HR technologies from simple data storage and sorting to proactive, intelligent decisionmaking tools that provide real-time insights, ensuring better outcomes for both candidates and companies.



#### Figure 1: NaukriSetu Workflow: AI-Powered Resume Screening System

#### 2.PROPOSED METHODOLOGY

The Resume Screening Automation System is designed to streamline the hiring process using advanced Natural Language Processing (NLP) and Machine Learning (ML). The system helps recruiters automatically evaluate resumes based on their relevance to the job description, saving time and ensuring more accurate hiring decisions.

#### 1. Data Collection and Preprocessing

Recruiters upload resumes and job descriptions into the system. The system then extracts text from the documents and cleans the data by removing unnecessary words and formatting, ensuring it's ready for analysis.

#### 2. Text Analysis and Vectorization

The text is transformed into numerical data using TF-IDF. The system also analyses key skills and qualifications in both resumes and job descriptions, focusing on what matters most for the role.

#### 3. Resume Comparison and Scoring

The system compares the content of resumes to job descriptions using cosine similarity. Resumes that closely match the job requirements receive higher relevance scores. Irrelevant resumes are flagged to save recruiter's time.

#### 4. Real-time Feedback

Once resumes are processed, the system provides immediate feedback, such as suggesting key skills or improvements to the resume or job description, helping candidates refine their applications.

#### 5. Learning and Improvement

The system learns from past feedback and continues to improve its recommendations, becoming more accurate as it processes more resumes.

#### 6. User Interface and Dashboard

Recruiters can easily access a user-friendly dashboard that shows ranked resumes, feedback, and suggestions for improvement. It provides an overview of the hiring process, making it easy to manage candidates.

#### 7. Progress Tracking

The system tracks all hiring activities, offering insights into the hiring process and helping recruiters make more informed, data-driven decisions.

This methodology creates an efficient, intuitive, and effective way to automate resume screening, ensuring faster, more accurate, and unbiased hiring decisions.

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Figure 2: Illustrations of project

#### Figure 3: Result of Resume Screening

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# 3. RESULT:

The Resume Screening Automation System was tested under various conditions to ensure its effectiveness in assisting recruiters with the hiring process. The system's NLP-based analysis and machine learning algorithms worked seamlessly, accurately processing and evaluating resumes against job descriptions.

When resumes were uploaded, the system used advanced techniques to parse and extract key information from each document, such as skills, experience, and qualifications. The TF-IDF vectorization and cosine similarity algorithms effectively compared resumes with job descriptions, generating a relevance score for each resume. The system also flagged resumes that did not meet the necessary criteria, helping recruiters focus on the most relevant candidates.

In cases where the system encountered resumes with formatting issues or incomplete data, it worked as intended by cleaning and preprocessing the content, ensuring accuracy in its analysis. The machine learning engine quickly adapted, refining its predictions based on the feedback and historical data, improving the relevance scoring over time.

The user interface—available through a mobile app or web dashboard—presented these insights in an easy-to-understand format. Recruiters could see scores, key skills matched, and suggestions for improving resumes or job descriptions. Personalized feedback was also generated, helping candidates refine their resumes for better job matches.

Overall, the Resume Screening Automation System proved to be a reliable tool for streamlining the recruitment process. It not only helped automate resume analysis but also provided valuable insights and feedback to improve hiring efficiency. This solution is a smart, time-saving companion for any HR department looking to enhance the hiring process with AI-powered technology.

## **4.DISCUSSION**

The development and testing of the Resume Screening Automation System proved the effectiveness of AI in simplifying the hiring process. Using NLP and machine learning, the system analysed resumes, compared them to job descriptions, and provided relevance scores, helping HR professionals prioritize the best candidates quickly.

To handle challenges like formatting issues, the system used data cleaning algorithms, ensuring consistent and accurate processing across different resume formats. The central dashboard displayed key insights in real-time, such as skills matched and relevance scores, and alerted recruiters about incomplete or missing data.

The system's use of affordable, widely available technology made it accessible for organizations of all sizes. Overall, the project demonstrated how AI can enhance recruitment efficiency, and with future improvements like ATS integration and multilingual support, it has great potential to transform the hiring process.

## 5. CONCLUSION:

The Resume Screening Automation System highlights how Artificial Intelligence and Natural Language Processing (NLP) can transform the hiring process. By using AI to read and evaluate resumes against job descriptions, the system gives recruiters real-time, accurate relevance scores—helping them quickly identify the most suitable candidates.

What makes this system especially powerful is its dual-layered approach. While the NLP engine handles text similarity and keyword context, additional checks ensure resume formats are cleaned and standardized. This makes the tool more reliable, even when resumes come in different styles or contain unusual layouts.

The system is powered by a lightweight and efficient backend, making it easy to deploy across various platforms. A centralized dashboard displays key insights like candidate rankings and relevance percentages, offering an at-a-glance view of top matches. Future updates, like mobile-friendly access and integration with applicant tracking systems (ATS), will make it even more accessible and seamless for everyday use.

Even in its prototype phase, the Resume Screening Automation System shows real promise. With future enhancements like multilingual support and cloud-based analytics, it could become an essential tool for HR teams looking to streamline hiring and make smarter, faster decisions.

#### 6. FUTURE SCOPE:

The Resume Screening Automation System is designed to simplify and speed up the hiring process by combining Artificial Intelligence and Natural Language Processing (NLP). Instead of manually going through piles of resumes, recruiters can now rely on this smart system to automatically read, understand, and compare resumes with job descriptions—instantly showing how well a candidate fits the role through relevance scores.

What makes this system truly effective is its two-layered approach. The first layer uses NLP to understand the context and meaning behind the words, not just match keywords. The second layer ensures every resume is cleaned and formatted properly, so even resumes with unique layouts can be analysed accurately.

Built with a lightweight backend, the system is fast, easy to use, and works smoothly across different platforms. The intuitive dashboard shows a clear ranking of candidates based on their match with the job, making it easy for recruiters to focus on the best fits. We're also planning to expand the system with features like mobile app access and integration with popular applicant tracking systems to make the process even more seamless.

Though it's currently a prototype, the system has already proven its potential. With upcoming improvements like support for multiple languages and cloud-based analytics, the Resume Screening Automation System is well on its way to becoming a must-have tool for modern HR teams.

#### 7. REFERENCES:

To understand the foundation of our project, we looked into several recent studies that show how AI, machine learning, and wearable technologies are shaping the future of fitness tracking.

[1] M. Smith (2024) highlights how Artificial Intelligence is already transforming health and fitness monitoring. Smart devices today can do more than just count steps—they can analyse movements and provide real-time insights to help users stay on track with their wellness goals. This aligns closely with our system's goal of using AI to offer live posture feedback and personalized guidance.

[2] J. Johnson and S. Gupta (2023) show how machine learning can make fitness trackers smarter by tailoring them to each user. Their work supports our approach of using AI not just for tracking but for creating adaptive, user-specific workout plans that evolve with performance.

[3] L. Williams and A. Brown (2022) emphasize the importance of AI in improving the accuracy of fitness trackers. This is especially valuable for our system's posture detection feature, where even small improvements in accuracy can help prevent injuries.

[4] S. Patel (2021) explores the role of deep learning in recognizing physical activities more precisely. This is directly relevant to how our tracker uses models like Media Pipe to interpret body movements and guide form correction.

[5] D. Roberts and K. Lee (2023) discuss the benefits of adding IoT (Internet of Things) technology to fitness trackers, making them more responsive and efficient. This supports our integration of wearable sensors that continuously monitor motion, heart rate, and temperature.

[6] A. Kim and P. Davis (2022) talk about the value of cloud-based fitness tracking. It enables broader data analysis and long-term progress tracking—key features we aim to expand on as our system evolves.

[7] R. Martinez (2021) focuses on how AI and wearables together can deliver personalized fitness insights. This ties in with our vision for the Gen AI Smart Fitness Tracker: a system that doesn't just collect data, but interprets it intelligently to support the user's journey toward better health.