

AI Resume Builder and Analyzer

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Abstract— The artificial intelligence (AI) has developed so fast that it has transformed the contemporary career development and recruitment services significantly. The success of a candidate in the subsequent stage of the recruiting process is very much dependent on the quality of the resume that the person has prepared. Nevertheless, most job hunters are unable to create refined resumes that satisfy hiring officers and technological requirements of the Applicant Tracking Systems (ATS). According to the job demands, the proposed AI-based Resume Builder and Analyzer is a system that would generate refined, personalized, and ATS-optimized resumes automatically. The system analyzes job descriptions to derive relevant skills and keywords using the application of Natural Language Processing (NLP) techniques. It then gives smart suggestions to improve the organization, phrasing and content of the resumes. The application is developed with Next.js, Node.js, TailwindCSS, MongoDB, and the Gemini API and is a web-based platform that provides a preview of the resume in real time and AI-driven guidance. The system was tested to determine the relevance of the key-words in the system and compatibility with ATS using sample resumes and job descriptions. As experimental findings reveal, the proposed system enhances the likelihood of shortlisting applicants, resume optimization, and accuracy of the key-word matching. The proposed solution can be a helpful resource to job seekers in the modern recruitment environment since it simplifies the resume building process and provides responsive personalization and ATS capabilities.

Index Terms— Artificial Intelligence, Resume Builder, Career Services, Applicant Tracking System, Personalization, Job Matching.

I. INTRODUCTION

The employment industry has become very competitive and, in most cases, when an employer publishes the job advertisement, he/she might receive hundreds of applications. In this instance, a resume is a critical determining factor of whether a candidate is to go ahead with the recruitment. A lot more than a good resume must be able to excite the interest of the recruiters; it must be able to meet the technical specifications of Applicant Tracking systems (ATS). However, applicants generally experience resume adjustment in the targeted job, applicable key word application, and professional formatting, which would tend to shorten their short-listing chances when they possess the appropriate qualifications.

The traditional method of writing a resume, which is primarily founded on the predetermined template, or general principles, does not always allow revealing the personal advantages of an applicant, and may not fit the needs of industry. This weakness, as well as the ignorance of the optimization of ATS, suggests that new solutions can be offered that will enable the applicants to be more tactical in offering their skills and experiences. An example of a current trend that can be applied in helping address these problems is the increasing use of artificial intelligence (AI) in career services.

The paper will suggest a resume builder created using AI that will make the resume building process more efficient and, therefore, automated. The system analyses the job specifications, identifies the skills and keywords required and provides suggestions on how to improve phrasing, structure and layout. The tool bridges job seekers and employers by producing ATS compatible and customized resumes in response to a dynamic career profile of a user. Through this it can streamline the resume writing process, make it more adaptive and efficient and raise the profiles of the candidate and improve the outcomes of a job application.

The overall aims of this research work are to come up with a program founded on AI to produce a resume that renders the resume generation process intuitive and automated to job-seekers. In addition, the analysis of job descriptions will be performed in the study with the assistance of the natural language processing (NLP) methods to determine the keywords and particular skills that are needed in particular jobs. The other goal is to utilize intelligent keyword optimization to improve quality of the resume and the Applicant Tracking System (ATS) operations. The system will also generate job-specific resumes in that the system will give personalized advice to the consumer on the position of employment desired. Lastly, the program will aim at developing an engaging and convenient interface in which resumes are made in a short time and with minimal effort.

II. LITERATURE SURVEY

One of the biggest developments is the application of NLP to screen and assess applicants. To demonstrate the ease of hiring a lot of people, Henry [1] demonstrates how AIs make hiring a multitude of individuals easier by reviewing both structured and unstructured data. This aids in eliminating the shortcomings of manual screening. Predictive analytics can also enable an organization to predict trends in their workforce and enhance employee retention models, making the hiring process much easier to achieve the long-term business objectives.

Another key topic is ethical issues, particularly with regard to algorithmic bias. Since gender, race, and age are among the aspects that can lead to discrimination and, as Gada [2] points out, there is a need to develop fair algorithms, it is also possible that, in the future, sensitive data could be anonymized and result in unbiased decisions. Transparency and confidentiality are also appreciated in this study, which helps to explain AI models and improve AI algorithms with a sense of transparency and build trust with stakeholders.

Incorporating Applicant Tracking Systems (ATS) is essential to the contemporary hiring process. According to D'Souza and Paiithannkar [3], the implementation of AI into ATS systems allows reducing the time spent on candidates by up to forty percent. It also enables real-time evaluation of suitability of applicants. This system is simpler to integrate profiles, has better efficiency in the recruiter, and facilitates making decisions with more information.

These developments have not prevented a significant challenge related to regional adoption and compliance with regulations. According to Tsiskaridze, Reinhold, and Jarvis [4], in Europe, GDPR restrictions are an obstacle to adoption. They further state that Asia and Africa have been at the forefront regarding research and application. Fears of rendering HR professionals jobless and ambiguity in the algorithms decision must be carefully adjusted, striking a balance between automation and human control. The transformative nature of AI in Human Resource Management (HRM), also highlighted by Henry [1] is outlined. Machine learning resume analyzers powered by AI can discern finer details in the data of applicants, matching them with the needs of the organization. Efficiency and inclusivity is the overall outcome of AI on recruiting, and there is the potential to improve such multitasking.

Further down the line, there is a surge in new artificial intelligence (AI) technologies including Explainable AI (XAI) and adaptive learning. According to Kaygin [5], XAI plays a critical role in accountability as it aids the recruiters to understand how the rankings of the candidates were made and the weighting factors involved. As Gada [2] notes, this is an encouraging solution, with adaptive learning allowing AI systems to optimise algorithms, based on recruiter feedback and changing labour market demands.

Machine learning remains essential towards improving recruitment systems. Kumar and Gowrigari [6] propose a rank scheme that integrates deep learning with an NLP model to increase the accuracy of candidate matching. On this note, Priyanka and Parveen [7] present hybrid algorithms, being compositions of classical NLP and an advanced machine learning algorithm to produce greater degree of accuracy in resume parsing and ranking. These studies have shown that the recruitment tools in these algorithms must be continuously optimized to meet the requirements of the company which are dynamic. Briefly, the current body of literature on AI-based recruitment illustrates how technology and human resources needs are converging. The invention of NLP, bias reduction, and ATS mixed with machine learning enabled hiring behavior to become more effective and non-discriminatory. Meanwhile the virtue of explainable and flexible models is called to account by regional

differences, legal constraints and morals. This renders the recruitment systems powerful, transparent and trustworthy in future.

Tyagi et al. [8] has coined an android application called resume builder, the application allows the user to generate professionally styled resume on a customizable template. The program has a user-friendly interface and focuses on the list of formats to be exported. This system is limited in some ways due to the availability of the internet and due to the platformness of the Android operating system which is universal. In spite of those limitations, the application is very time saving and content based as the users can focus on the information of the content and not the formatting issues.

In the template-based models, Kungwani et al. [9] and others proposed Analytical Resume Builder, a web-based tool which uses comparative analytics and industry knowledge. The user of this system can get statistical analysis of graduate resumes, compare his profile with industry ranks, and view his industry colleagues. It is also a complete system of career development which also includes job notification. The specified feature of an analysis is suitable to the requirements of fresh graduates and professionals who are either too young or too busy to obtain a sufficient exposure to industry-specific resume requirements or can afford professionally-written resumes.

The professionals, whose work Kumar et al. [10] devoted to the aesthetics and networking of resume building, and created the web application, in which considerable emphasis is put on the visual image and photos in the various templates and the selection of typography. It also offers professionals a networking prospect, linking the user with online accounts like LinkedIn. The interface of the apps is extremely basic and the app itself is free, but lacks more advanced functions like AIs recommending what to learn, or commenting on what one can read (optimization). Marapaka and Ramteke [11] researched resume building as it relates to large systems of training and placement systems. They are dedicated to their efforts concerning the role of internet-based technologies in changing nature of knowledge management and information distribution in learning and working environments. The general solution removes the manual error, time management, real-time notification software using SMS notifications. This big picture view reflects how resume builders are being reduced (even though not eliminated) into the blocks of larger career management systems.

III. METHODOLOGY

The proposed AI-based Resume Builder and Analyser was engineered based on a careful approach of system design made up of four primary phases namely requirement analysis, system design, implementation, and evaluation. The goal of this methodology is to build a system that would be able to auto-create professional resumes, streamline those resumes to fit Applicant Tracking Systems (ATS), as well as make smart suggestions based on the job requirements.

A. Requirement Analysis

The first step was finding out the shortcomings of the traditional resume making methods and getting to know the demands of the new recruitment systems. The analysis of the current resume-building systems and Applicant Tracking System (ATS) triggered hiring processes indicated that the job seekers encounter a number of challenges. These barriers are difficulties in finding appropriate keywords, failure to customize the resumes to certain job opportunities, and poor formatting that makes it less compatible with the ATS-based screening systems.

According to the analysis, the functional requirements of the proposed system were identified. This system must offer secure user authentication and profile management as well as the ability to automatically create a resume as per the user inputs. It must also examine job descriptions with the view of identifying potential keywords and skills required.

Moreover, AI-based recommendations should be offered by the system to enhance the quality and efficiency of the resume. Moreover, the system should enable the users to preview and edit resumes in real time without compromising the formatting with the ATS standards. When the users change their information, the update in the resume information should also be dynamic. The needs are the basis of creating the AI-based resume generation system.

B. System Design

The project has been built using a modular structure and a framework. It was noted to be composed of three large modules:

- Job Requirement Analyzer - a job that involves the disaggregation of the job description and establishes the skills and qualification.
- Resume Generator and Optimizer -is an AI based resume generator, which generates resume offers with proposal algorithms, therefore, being transparent, professionally written, and passing through ATS.
- Dynamic Updater- allows customers to edit and revise resumes to reflect new experience or more new job opportunities.

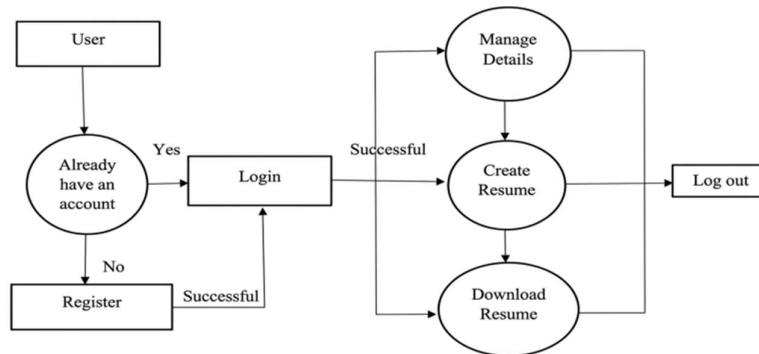


Figure 1. User Workflow and System Interaction Diagram

The design was crafted using Next.js 14 and TailwindCSS to ensure that it has a responsive user interface such that it can be utilized in the various devices. It was authenticated with the assistance of Clerk, and the information about user was stored in MongoDB, and the resumes records were stored in it. Gemini API was applied to combine AI capabilities.

C. Implementation

The given system was introduced as a web-based application with the help of modern full-stack technologies. Next.js 14 and TailwindCSS were used to create the front-end interface to ensure that it is responsive and user-friendly on various devices. The back-end system was created based on the use of Node.js that handles application logic, AI integration, and database interactions. Clerk was deployed to provide secure user authentication which made user profiles and resume data accessed safely. The mongoDB stores all information of users and their resumes and enables the easy storage and retrieval of structured information. The Gemini AI API was incorporated into the system to offer intelligent resume proposals, content rewriting as well as optimization. This stack technology facilitates real-time preview of the resume, automatic resume creation and content suggestions.

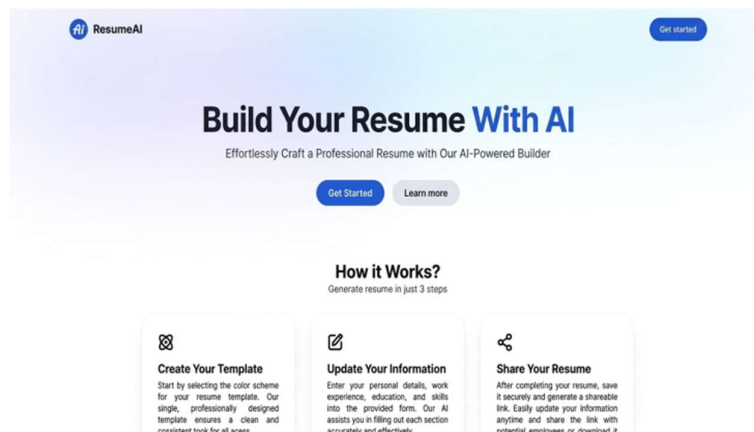


Figure 2. ResumeAI "EDIT YOUR RESUME" Interface

The ResumeAI platform has the homepage as the main entry point. It allows the users to authenticate safely, create new resumes and retrieve the resume templates stored in the past. Modern development technologies have been used to implement the interface to ensure that it has a responsive aspect that works with various devices.

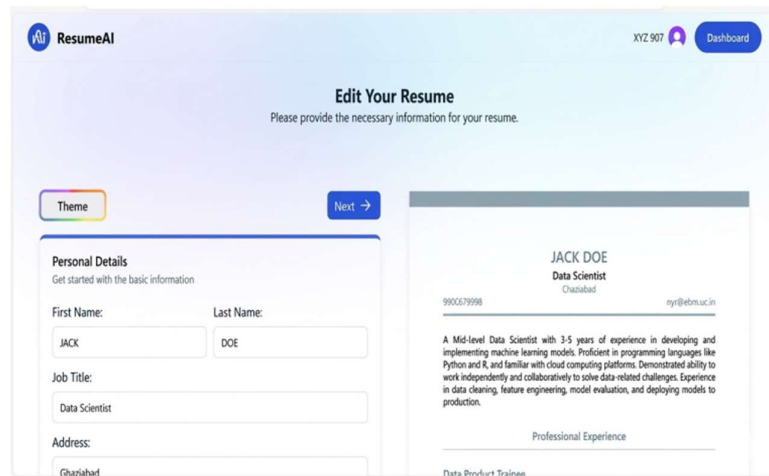


Figure 3. Interactive Resume Editing and Real Time Preview

The interface is a platform where he or she can also provide information, competencies ,educational qualifications as well as experience. The system automatically updates the preview of a resume in real time and provides AI-generated recommendations to reduce the quality of the content.

D. ATS Score Evaluation System

The test of the suggested system was performed under a set of sample job descriptions and user resume inputs. The evaluation was meant to evaluate how well the system is able to achieve the objectives mentioned above. The following performance criteria were evaluated: the extraction of the keywords in the job descriptions is correct; the resume recommendations by the AI is effective; the resumes generated should be compatible with the applicant tracking system (ATS); the system is responsive and generally user-friendly. The findings revealed significant enhancements in the quality of the resume, relevancy in the keywords, and the matching with automated recruiting systems, which results in the use of an AI-based approach.

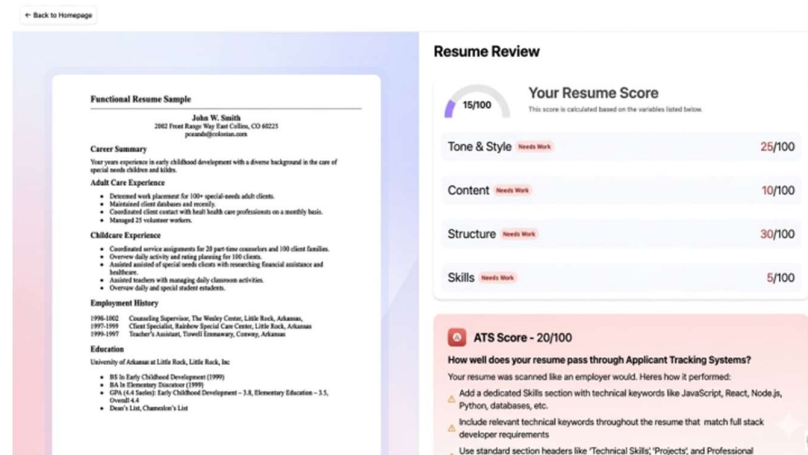


Figure 4. AI Powered Resume Scoring Interface

IV. RESULTS

As a more specific point, ResumeAI application was considered in terms of functionality, performance, and the impact on the resume quality, i.e. on automation, customization and access to Applicant Tracking Systems (ATS). The usefulness of AI-assisted recommendations and system responsiveness were measured by assessing a set of inputs that may be found within the samples and that which is measured through artificial job descriptions.

A. System Performance

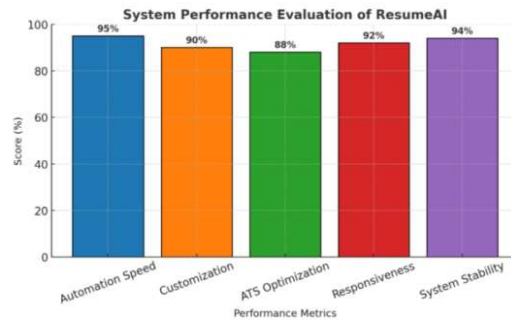


Figure 5. System Evaluation Graph

The platform proved to be efficient because under 1 minute the user can create a resume in its full format. The live preview feature assumed that irrespective of the alterations that had been done to the experience, education, and skills, they would be prerecorded in real-time and in various regions. Next.js system and Node.js ensured stability and scalability and the system was authenticated by Clerk to ensure that unsafe access by users could only happen. Other than this, the responsive design provided easy functionality to all the devices that confirmed the flexibility of the system to different user environments.

B. Resume Quality Enhancement

The engine of the recommendations was anchored in AI and was very useful in as far as the content and format of resumes is concerned. Computer generated suggestions were used to optimize the text with the hope of reducing the best achievement and matched the resumes to skills and industry requirements of the job. It further emerged that the artificial ATS parsing were more accommodating and controlled and strategic arrangement and positioning of the keywords minimised the likelihood of the automated screening system dispensing them. The NS was a highly convenient compilation machine of the new factors or skills which were added to the system by the Dynamic Updater module which caused the resumes to always be relevant irrespective of the time which had elapsed.

C. Experimental Evaluation

In order to evaluate the functioning of the proposed system, a sample set of 50 resumes along with 20 job descriptions obtained off the online job portals was used. Each job description was searched through the AI system, and relevant keywords and required skills were found. Thereafter, the applied keywords were compared against applicant resume content to measure the accuracy of the key word matching. The results showed that resumes that are optimized through the AI recommendation system scored about 3035 percent higher on the keyword relevance score as compared to the resumes that have been written manually. Moreover, the Applicant Tracking System (ATS) compatibility scores were also improved, which is due to a better formatting and the positioning of keywords in a systematic manner. The evaluation also showed that the program was capable of producing a complete resume within one minute which reduced significantly the time needed to create a resume and maintained professionalism.

V. CONCLUSION AND FUTURE WORK

The proposed work presents a Resume Builder and Analyzer application to facilitate the process of creating professional resumes and improving its overall quality and suitability to Applicant Tracking Systems (ATS). The suggested framework uses the methods of artificial intelligence and natural language processing (NLP) to analyze job advertisements, extract meaningful keywords, and provide intelligent recommendations to perfect resume information. The solution was implemented in the form of the web based platform on the basis of modern technologies. A rigorous version of an evaluation showed that the system significantly increases the relevance of keywords, enhances ATS compatibility, and reduces the amount of time spent on creating refined resumes. The given system has personalization that is dynamic, associated with recommendations powered by data and immediate resume edits in comparison with the traditional template-based resume building interfaces. The abilities give job seekers the powers to develop more effective resumes, which are appealing to the current

trends in recruitment. Altogether, the system is one of the crucial moves towards integrating artificial intelligence in career development tools.

Although the proposed system will successfully automatize the sale of resumes and optimize them, there are still a number of improvements that can be implemented to increase the overall activity of the proposed system. Creating a specific mobile application would enhance the level of access since it will allow users to create, edit, and update resumes immediately via mobile devices, even in the case of low-connectivity through offline storage. Future releases may add support of connection with online job services as a way of enabling automatic submission of resumes and real-time job matching based on user profiles. In addition, more sophisticated artificial intelligence solutions may be utilized to track the trends within the industry, recognize the skills demanded, and provide information individuals with various recommendations on how to improve their resumes and their structure. Lastly, the adoption of a resume analytics dashboard might provide worthy information like the relevance of the key words, the quality of formatting, and compatibility with the automatic screening tools that may assist users to further optimize their resumes to achieve better recruitment rates.

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