

AI-Powered ATS: Resume Builder & Tracker

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Abstract- *The AI-Powered ATS: Resume Builder & Tracker is an advanced system developed to assist job seekers in creating professional, ATS-friendly resumes and efficiently managing their job applications. In today's competitive job market, many companies use Applicant Tracking Systems (ATS) to filter resumes, making it essential for candidates to optimize their resumes with the right keywords and structure. This project uses Artificial Intelligence to analyze job descriptions and automatically suggest relevant keywords, skills, and content improvements to increase the chances of selection. The system allows users to input their personal, academic, and professional details, and then generates a well-structured resume tailored to specific job roles. It also provides resume scoring, skill gap analysis, and real-time suggestions for improvement. Additionally, the platform includes a job application tracker where users can record details such as company name, job role, application date, and current status. By integrating AI-based insights, the system helps users prioritize job opportunities and improve their overall job search strategy. It reduces manual effort, saves time, and enhances the effectiveness of applications. This solution is especially beneficial for students and fresh graduates who may lack experience in resume building and job tracking. Overall, the project aims to simplify and modernize the recruitment preparation process through intelligent automation and data-driven decision-making.*

Keywords: *Artificial Intelligence (AI), Applicant Tracking System (ATS), resume builder, resume optimization, keyword matching, Natural Language Processing (NLP), machine learning, job application tracking, resume scoring, skill gap analysis, automated resume generation, user dashboard, career management, and improved job selection chances to enhance the job search experience.*

I. INTRODUCTION

In the modern digital era, job searching has become highly competitive and complex, with organizations receiving thousands of applications for a single job

position, making it difficult for candidates to stand out in the recruitment process. To manage this large volume of applications, most companies rely on Applicant Tracking Systems (ATS), which automatically filter and shortlist resumes based on predefined criteria such as keywords, formatting, and relevance to the job description. However, many job seekers are unaware of how ATS works, and as a result, their resumes often get rejected despite having the required qualifications and skills. Traditional resume creation methods, such as using basic templates or word processors, do not ensure ATS compatibility, leading to missed opportunities and increased frustration among candidates. In this context, there is a growing need for an intelligent system that can guide users in creating effective resumes and managing their job applications efficiently.

Artificial Intelligence (AI) has emerged as a powerful technology capable of analyzing large datasets, identifying patterns, and providing intelligent recommendations, making it highly suitable for solving problems related to recruitment and resume optimization. The proposed system, titled AI-Powered ATS: Resume Builder & Tracker, is designed to assist job seekers in building professional, ATS-friendly resumes while also offering features to track and manage job applications in a structured manner. The system analyzes job descriptions using AI techniques and suggests relevant keywords, skills, and improvements that align with industry requirements, thereby increasing the chances of passing ATS screening. It also ensures that resumes are properly formatted and tailored for specific job roles, allowing users to create multiple customized resumes based on their career goals.

In addition to resume building, the system incorporates a job application tracking module that enables users to store and monitor important details such as company name, job role, application date, and status updates, helping them stay organized and avoid missing deadlines. Furthermore, the platform provides advanced features such as resume scoring, skill gap analysis, and real-time suggestions, which help users continuously improve their profiles and enhance their employability. This system is particularly beneficial for students and fresh graduates who may lack experience in resume preparation and job application management, as it simplifies the entire process and provides guided assistance. Overall, the project aims to transform the traditional job search approach into a smarter, more efficient, and data-driven process by leveraging the capabilities of Artificial Intelligence, thereby improving user engagement, increasing selection chances, and enhancing the overall job search experience.

II. LITERATURE REVIEW

1. **AI-Based Resume Screening Systems** : Several studies have explored the use of Artificial Intelligence in recruitment processes, particularly in resume screening. Traditional systems rely on keyword matching, which often leads to inaccurate filtering of candidates. Recent research highlights the use of machine learning algorithms and Natural Language Processing (NLP) to analyze resumes more effectively. These systems improve candidate-job matching by understanding context rather than just keywords, thereby increasing recruitment efficiency and reducing human bias.
2. **Applicant Tracking Systems (ATS)** : Applicant Tracking Systems have become a standard tool in modern recruitment. Research shows that ATS helps organizations handle large volumes of applications by automating resume filtering and ranking. However, existing ATS platforms are limited as they primarily focus on keyword-based filtering without providing feedback to applicants. This lack of transparency creates challenges for job seekers in optimizing their resumes according to ATS requirements.
3. **AI-Based Resume Builders** : Various AI-powered resume builders have been developed to assist users in creating professional resumes. These systems provide templates, formatting assistance, and basic content suggestions. However, studies indicate that most existing tools focus only on design aspects and do not fully optimize resumes for ATS compatibility. There is a lack of intelligent systems that can analyze job descriptions and tailor resumes accordingly.
4. **Job Application Tracking Systems** : Research has also focused on job tracking platforms that help users manage multiple job applications. These systems allow users to store details such as company name, job role, and application status. While these tools improve organization, they often operate independently and do not integrate with resume optimization features, limiting their overall effectiveness.
5. **Integration of AI in Career Management** : Recent advancements emphasize the integration of AI in career guidance systems. These systems provide features such as skill gap analysis, job recommendations, and performance insights. Studies show that combining resume optimization with application tracking and AI-based suggestions can significantly improve job search outcomes. However, there is still a gap in developing a unified platform that combines all these functionalities.

III. TOOLS IMPLEMENTED

1. FrontendDevelopmentTools

The user interface of the system is developed using modern web technologies such as HTML, CSS, and JavaScript, which ensure a responsive and user-friendly design. Frameworks like React.js or Angular can be used to build dynamic and interactive components. These tools help in creating an intuitive dashboard where users can easily input their details, generate resumes, and track job applications. The frontend is designed to provide smooth navigation and real-time feedback for a better user experience.

2. BackendDevelopmentTools

The backend of the system is implemented using technologies such as Node.js or Django, which

provide a scalable and efficient server-side environment. These frameworks handle API requests, process user data, and manage communication between the frontend and database. RESTful APIs are used to ensure seamless data exchange and system integration. The backend also performs operations like resume generation, keyword analysis, and application tracking.

3. DatabaseManagementSystems

To store and manage user data, resumes, and job application details, databases such as MySQL, PostgreSQL, or MongoDB are used. These databases ensure secure storage and quick retrieval of information. Structured data such as user profiles and job details are efficiently managed, enabling smooth system performance and scalability.

4. ArtificialIntelligenceandNLPTools

The core functionality of the system relies on Artificial Intelligence and Natural Language Processing (NLP). Libraries such as Python NLP libraries (NLTK, SpaCy) are used to analyze job descriptions and extract relevant keywords. Machine learning models are implemented to match resume content with job requirements, provide resume scoring, and suggest improvements. These tools enhance the intelligence and effectiveness of the system.

5. ResumGenerationTools

The system uses libraries and tools to automatically generate professional resumes in formats such as PDF or Word. Technologies like LaTeX, PDF libraries, or document generation APIs are used to create structured and ATS-friendly resumes. These tools ensure proper formatting, alignment, and readability of resumes.

6. CloudServicesandDeploymentTools

Cloud platforms such as AWS, Google Cloud, or Firebase are used for hosting and deployment. These services ensure scalability, reliability, and real-time data access. Firebase can also be used for authentication and real-time database features. Deployment tools like GitHub and CI/CD pipelines help in maintaining and updating the system efficiently.

7. DevelopmentandCollaborationTools

For coding and project management, tools such as Visual Studio Code (VS Code) are used as the primary development environment. Version control systems like Git and platforms like GitHub enable collaboration among team members and maintain code integrity. Project management tools such as Trello or Jira help in tracking tasks and deadlines.

IV. PROPOSED SYSTEM

The proposed system, AI-Powered ATS: Resume Builder & Tracker, is designed to provide a comprehensive and intelligent solution for job seekers by integrating resume creation, ATS optimization, and job application tracking into a single platform. The system aims to overcome the limitations of traditional resume-building methods and existing recruitment tools by leveraging Artificial Intelligence (AI) and Natural Language Processing (NLP) to enhance the effectiveness of job applications.

The system allows users to create professional resumes by entering their personal, academic, and skill-related information through a user-friendly interface. It analyzes job descriptions provided by users and extracts relevant keywords and required skills using NLP techniques. Based on this analysis, the system automatically suggests improvements and optimizes the resume content to match industry requirements and ATS standards, increasing the chances of shortlisting.

A key feature of the proposed system is its ability to generate multiple customized resumes tailored for different job roles. This ensures better alignment with job-specific requirements and improves matching accuracy. The system also includes a resume scoring mechanism that evaluates the quality of the resume and provides feedback for enhancement. Additionally, it performs skill gap analysis to identify missing competencies and recommend areas for improvement.

The platform also incorporates a job application tracking module, which enables users to manage multiple applications efficiently. Users can store

details such as company name, job role, application date, and status updates. This helps in organizing the job search process, avoiding missed deadlines, and maintaining a structured workflow.

Furthermore, the system provides real-time suggestions and insights to improve resume quality and job selection strategies. The integration of AI-driven features ensures continuous improvement and personalized guidance for users. The system is designed to be scalable, user-friendly, and accessible, making it suitable for students, fresh graduates, and professionals.

Overall, the proposed system offers a unified and intelligent approach to modern recruitment challenges by combining resume optimization, ATS compatibility, and application tracking, thereby improving efficiency, reducing manual effort, and increasing the likelihood of successful job placement.

V. SYSTEM IMPLEMENTATION

1. User Registration and Authentication

The system begins with a secure user registration and login module. Users create an account using their basic details such as name, email, and password. Authentication mechanisms ensure data privacy and secure access. This module allows users to store and manage their resumes and job applications safely.

2. User Data Collection

After logging in, users provide personal, educational, and professional details through structured forms. Information such as skills, projects, experience, and achievements is collected. This data serves as the foundation for generating customized resumes tailored to specific job roles.

3. Job Description Input and Analysis

Users can input or upload job descriptions for the roles they are applying to. The system uses Natural Language Processing (NLP) techniques to analyze the job description and extract relevant keywords, required skills, and role expectations. This step ensures accurate matching between the resume and job requirements.

4. Resume Generation and Optimization

Based on the collected user data and analyzed job description, the system automatically generates an ATS-friendly resume. It ensures proper formatting, structure, and inclusion of relevant keywords. The resume can be customized for different job roles, improving the chances of passing ATS filters.

5. Keyword Matching and Resume Scoring

The system performs keyword matching between the resume and job description. It calculates a resume score based on relevance, completeness, and ATS compatibility. This score helps users understand how well their resume matches the job requirements.

6. Improvement Suggestions and Skill Gap Analysis

The platform provides real-time suggestions to enhance the resume. It identifies missing skills and recommends improvements to increase effectiveness. This feature helps users upgrade their profiles and align with industry standards.

7. Job Application Tracking System

The system includes a tracking module where users can record job applications. Details such as company name, job role, application date, and status are stored. Users can monitor progress, update statuses, and manage multiple applications efficiently.

8. Database Management and Storage

All user data, resumes, and application details are stored in a database system such as MySQL or MongoDB. Efficient data handling ensures quick retrieval, scalability, and secure storage of information.

9. Deployment and User Interface

The system is deployed using cloud platforms, providing accessibility across devices. The user interface is designed to be simple, interactive, and responsive, ensuring ease of use for all users, including students and fresh graduates.

VI. ADVANTAGES

1. Improved Resume Quality

The system automatically generates professional and well-structured resumes that follow industry

standards. By ensuring proper formatting and content organization, it increases the overall quality and readability of resumes.

2. ATSCompatibilty

The platform optimizes resumes based on Applicant Tracking System (ATS) requirements. By including relevant keywords and proper structure, it improves the chances of passing automated screening processes used by companies.

3. TimeEfficiency

The automated resume generation and optimization process significantly reduces the time required to create and update resumes. Users can quickly generate multiple resumes for different job roles without manual effort.

4. EnhancedJobMatching

Through AI-based keyword analysis and job description matching, the system improves alignment between candidate profiles and job requirements. This increases the likelihood of shortlisting and interview selection.

5. ResumeScoringandFeedback

The system provides a resume score along with suggestions for improvement. This helps users understand their strengths and weaknesses and continuously enhance their resumes.

6. SkillGapIdentification

The platform identifies missing skills required for specific job roles and suggests improvements. This enables users to focus on developing relevant skills and improving their employability.

7. EfficientApplicationTracking

The integrated job tracking system allows users to manage multiple job applications in one place. It helps in organizing application details, tracking status, and avoiding missed deadlines.

8. User-FriendlyInterface

The system is designed with a simple and intuitive interface, making it easy to use for students, fresh graduates, and professionals without technical knowledge.

9. CentralizedPlatform

Unlike existing systems that focus only on resume building or tracking, this platform combines multiple functionalities into one system. This reduces the need for multiple tools and improves efficiency.

10. IncreasedSelectionChances

By combining AI optimization, keyword matching, and structured tracking, the system enhances the overall job search process, increasing the chances of getting shortlisted and selected.

VII. RESULT AND ANALYSIS

The implementation of the AI-Powered ATS: Resume Builder & Tracker demonstrates significant improvements in the resume creation and job application process. The system successfully generates professional, ATS-friendly resumes by analyzing user input and job descriptions. Users were able to create structured resumes with relevant keywords, which increased their chances of passing automated screening systems.

During testing, the resume scoring feature provided accurate evaluations based on keyword matching and content quality. It was observed that resumes optimized using the system showed higher compatibility with job requirements compared to manually created resumes. Users who followed the AI-generated suggestions experienced noticeable improvements in their resume scores and overall quality.

The keyword matching and Natural Language Processing (NLP) modules effectively extracted important skills and requirements from job descriptions. This enabled better alignment between candidate profiles and job roles. As a result, the system improved the relevance of applications, increasing the likelihood of shortlisting.

The job application tracking module also proved to be highly useful. Users were able to manage multiple applications efficiently by storing details such as company name, role, application date, and status. This reduced confusion and helped users stay organized throughout the job search process.

Performance analysis showed that the system operates efficiently with quick response times and smooth user interaction. The integration of frontend and backend components ensured seamless data flow and real-time updates. The database system handled user data securely and allowed easy retrieval of information.

User feedback indicated that the platform is easy to use and highly beneficial, especially for students and fresh graduates. Many users reported saving time and improving their confidence in applying for jobs. The combination of resume optimization and tracking features provided a complete solution for job seekers. Overall, the results confirm that the proposed system enhances the effectiveness of job applications by improving resume quality, ensuring ATS compatibility, and simplifying application management. The system proves to be a reliable and efficient tool for modern recruitment preparation.

VIII. CONCLUSION

In conclusion, the AI-Powered ATS: Resume Builder & Tracker provides an effective and intelligent solution to the challenges faced by job seekers in the modern recruitment process. With the increasing use of Applicant Tracking Systems (ATS) by organizations, it has become essential for candidates to create resumes that meet specific technical and structural requirements. This system successfully addresses this need by integrating Artificial Intelligence (AI) and Natural Language Processing (NLP) to generate optimized, ATS-friendly resumes.

The platform not only simplifies resume creation but also enhances its quality through keyword optimization, resume scoring, and real-time suggestions. By analyzing job descriptions and aligning resume content accordingly, the system improves the chances of shortlisting and selection. Additionally, the job application tracking feature helps users manage multiple applications efficiently, making the job search process more organized and systematic.

The project is particularly beneficial for students and fresh graduates who may lack experience in resume

preparation and job tracking. It reduces manual effort, saves time, and provides guided assistance, thereby increasing user confidence. The integration of multiple functionalities into a single platform makes it a comprehensive and user-friendly solution.

Overall, the proposed system demonstrates how advanced technologies can be used to improve recruitment preparation. It enhances user engagement, increases efficiency, and supports better decision-making in the job search process. The system has the potential to evolve further with advanced AI features, making it a valuable tool for future career development and recruitment systems.

IX. FUTURE WORK

The AI-Powered ATS: Resume Builder & Tracker can be further enhanced by integrating more advanced Artificial Intelligence and machine learning techniques. Future improvements may include personalized job recommendations based on user profiles, skills, and past application history. By analyzing user behavior and industry trends, the system can suggest suitable job opportunities, making the job search process more efficient and targeted.

Another important enhancement is the incorporation of advanced Natural Language Processing (NLP) models to improve resume analysis and keyword extraction. This would allow the system to better understand context and provide more accurate suggestions for resume optimization. Additionally, integrating real-time industry data can help users stay updated with trending skills and job requirements.

The system can also be extended to include an interview preparation module, where users receive commonly asked questions, AI-based mock interviews, and performance feedback. This would provide a complete end-to-end solution for job seekers, from resume building to interview success. Furthermore, mobile application development can improve accessibility, allowing users to create and manage resumes on the go. Cloud integration can be enhanced for better data synchronization and storage. Security features such as data encryption and multi-

factor authentication can also be strengthened to ensure user data privacy.

In addition, collaboration features can be introduced, enabling users to share resumes with mentors or peers for feedback. Integration with professional platforms and job portals can automate job applications and updates. The system can also include analytics dashboards to track application success rates and performance trends.

Overall, future developments aim to make the system more intelligent, user-friendly, and comprehensive, transforming it into a complete career management platform that supports users throughout their professional journey.

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