Volume 11, Issue 5, May – 2026 International Journal of Innovative Science and Research Technology
ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26may253

AI Resume Builder System

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Publication Date: 2026/05/18

Abstract: The AI Resume Builder is a smart web-based application designed to help users create professional resumes quickly and efficiently using Artificial Intelligence. In today's competitive job market, a well-structured and attractive resume is essential for getting shortlisted in recruitment processes. Many job seekers, especially freshers and students, face difficulties in preparing a proper resume due to lack of formatting knowledge, content writing skills, and awareness of industry standards. This system is developed to solve these issues by providing an automated and user-friendly platform for resume creation. The system uses AI to generate professional resume content, improve wording, suggest stronger descriptions, and format the resume according to modern industry standards. Users can choose from multiple templates, preview the resume, edit sections, and download the final resume in PDF format. The project is developed using React.js, Node.js, Express.js, and MongoDB with AI content generation powered by the Gemini API.

Keywords: *AI Resume Builder, Artificial Intelligence, Web Application, React.js, Node.js, MongoDB, Gemini API, ATS Optimization, PDF Generation.*

How to Cite: Dr. K. Srinivasan; P. Logeswari (2026) AI Resume Builder System. *International Journal of Innovative Science and Research Technology*, 11(5), 445-450. https://doi.org/10.38124/ijisrt/26may253

I. INTRODUCTION

Resume writing is a critical skill for job seekers in the modern competitive job market. A well-crafted resume increases the chances of getting shortlisted by recruiters and Applicant Tracking Systems (ATS). However, most students, freshers, and even experienced professionals struggle with preparing a professional resume due to limited knowledge of formatting standards, industry-specific keywords, and content presentation.

Traditional resume-building approaches rely on manual editing in tools like MS Word or Google Docs, which requires time, formatting expertise, and knowledge of professional resume conventions. Existing online resume builders provide only basic templates with limited AI assistance. This paper presents an AI-powered Resume Builder System that automates the resume creation process by leveraging AI-based content generation, multiple template options, ATS-friendly keyword optimization, and PDF export capabilities.

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II. EXISTING SYSTEM

In the existing system, most users prepare resumes manually using word processing tools such as MS Word, Google Docs, or by downloading traditional templates from the internet. Users must format sections manually, write content on their own, and arrange the resume structure without guidance. This is time-consuming and requires technical knowledge and awareness of professional resume standards [1].

Some online resume builders are available, but most provide only basic templates with limited customization. Advanced features such as content suggestions, AI-based improvements, keyword optimization, and smart resume recommendations are often restricted or available only in paid versions. Common problems include watermark limitations, paid downloads, and lack of flexibility in editing.

➢ *Drawbacks of the Existing System*

- Manual resume creation — time-consuming and error-prone.
- Lack of intelligent content suggestions.
- Limited template customization options.
- No ATS-friendly keyword optimization.
- Beginners lack guidance for professional resume writing.

III. PROPOSED SYSTEM

The proposed system introduces an AI-powered Resume Builder that overcomes the limitations of the existing system through automation, intelligent suggestions, and modern resume generation features. The system provides a smart platform where users can create, edit, and download professional resumes easily.

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Users can register and log in, enter profile details, educational background, skills, projects, certifications, and work experience. Based on the provided information, the AI engine — powered by the Google Gemini API — generates professional resume content, improves wording, suggests better descriptions, and helps users create impactful resumes. The system offers multiple resume templates that users can select according to their preferences.

➢ *Advantages of the Proposed System*

- Automated resume generation using AI.
- AI-powered content suggestions via Gemini API.
- Professional template selection (18+ templates).
- ATS-friendly keyword optimization.
- Easy editing, customization, and preview.
- Faster resume preparation.
- Secure user data management with JWT authentication.
- Downloadable resume in PDF format.
- Resume scoring system with section-wise feedback.
- AI Career Suggestion Engine for job role recommendations.

IV. MODULE DESCRIPTION

➢ *User Module*

Handles user registration, login, profile creation, and update. Provides secure authentication using email and password with JWT tokens. Users can update skills, experience, and contact details via a personalized dashboard.

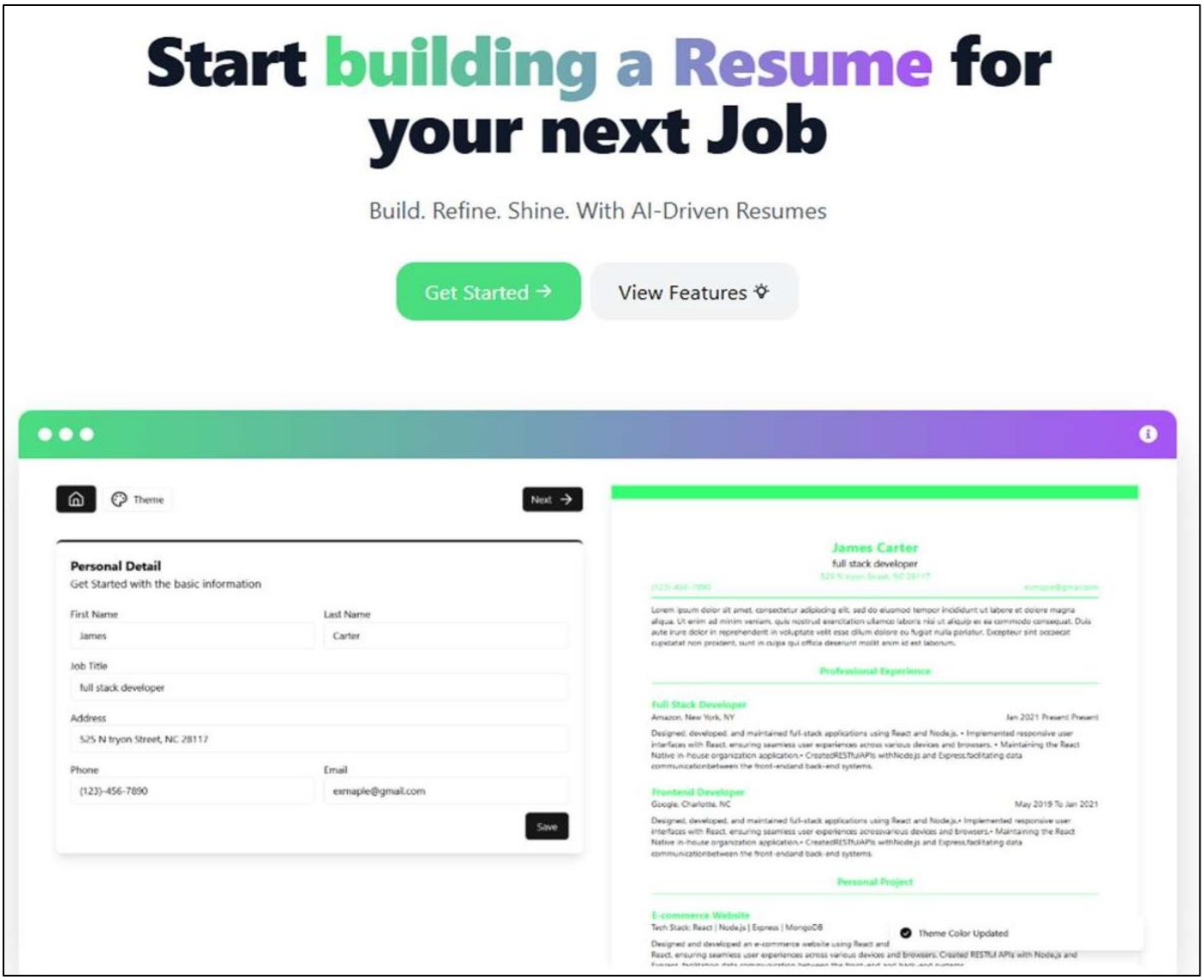

Fig 1 User Home Screen

➢ *Resume Preview Module*

Allows users to preview the resume before final output. Users can check formatting and alignment, edit and update content before downloading, identify errors or missing details, and verify the final resume layout. This module significantly improves the accuracy of the generated resume.

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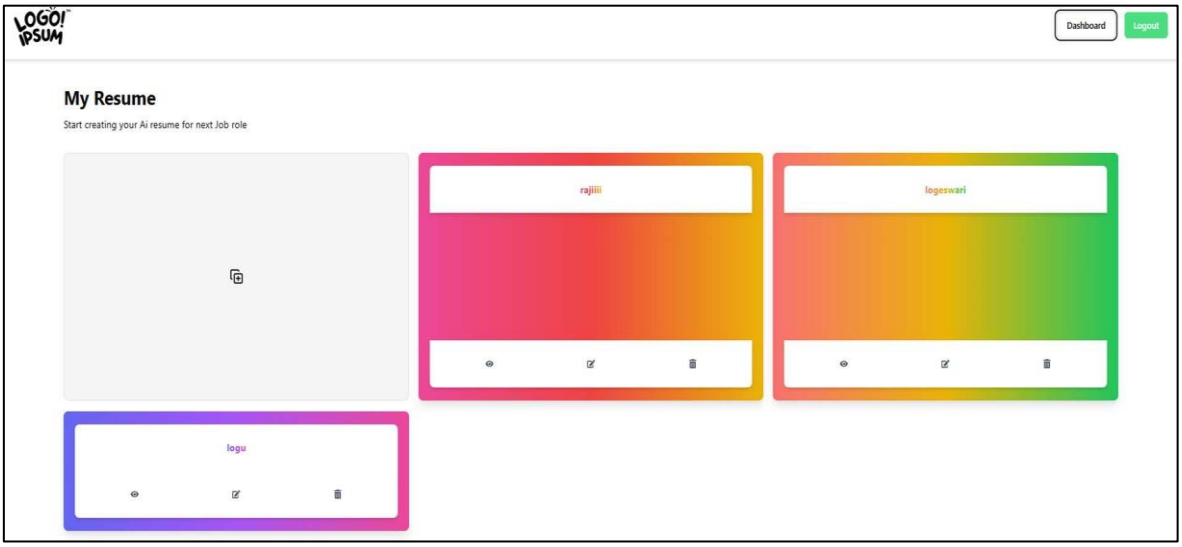

Fig 2 Resume Preview Module

➢ *AI Suggestion Module*

Provides AI-generated content suggestions using the Google Gemini API. This module improves summary and objective statements, suggests better skill descriptions, enhances project and experience content, and creates ATS-friendly resume content tailored to modern industry standards.

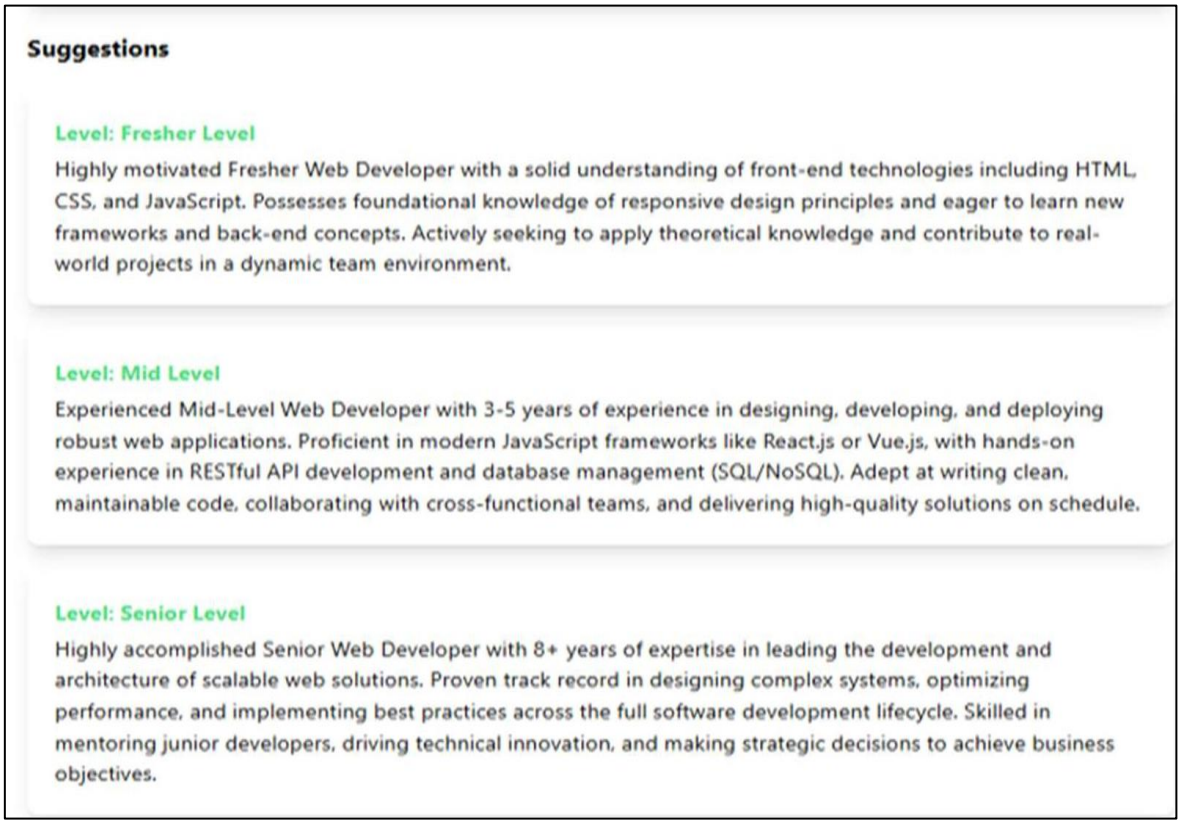

Fig 3 AI Suggestion

➢ *Template Selection Module*

Offers 18 professional resume templates including Classic, Modern, Minimal, Professional, Chronological, Functional, Combination, Executive, Creative, Portfolio, Photo Header, Two Column Photo, Academic, Compact, Bold Accent, Clean Sidebar Word Style, and Canvas Style.

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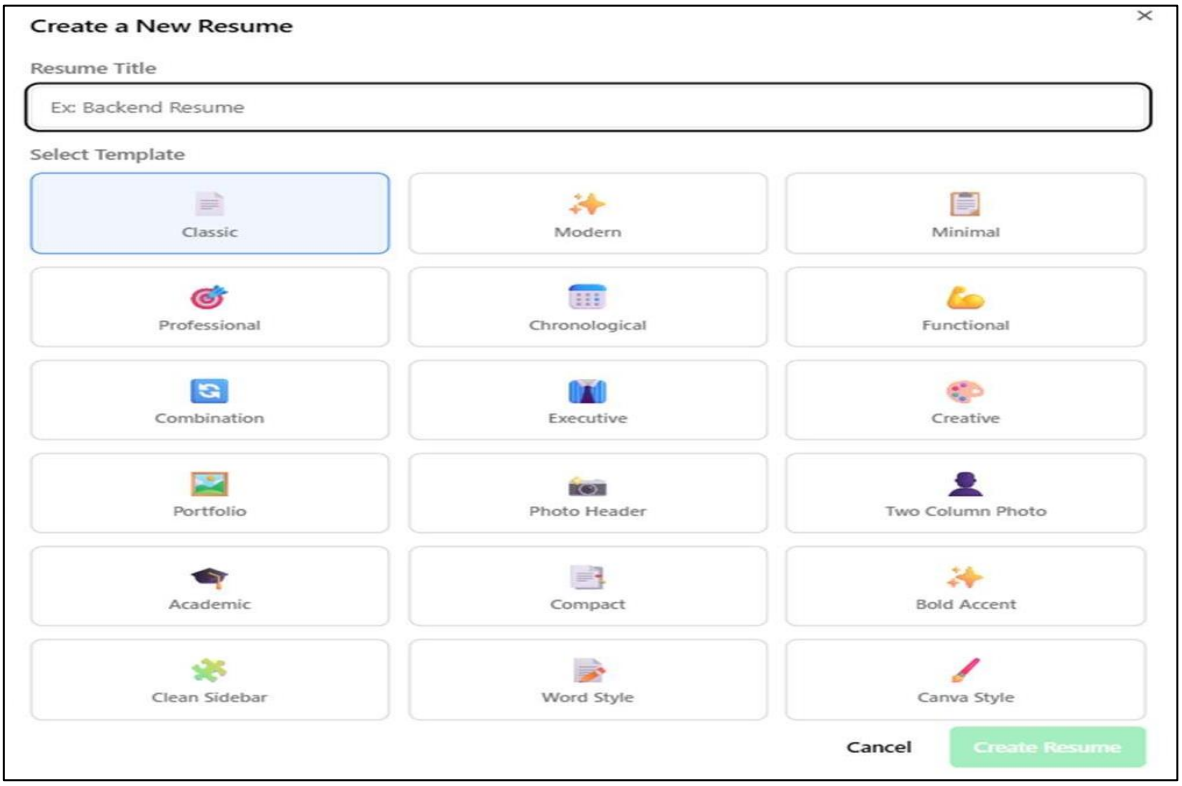

Fig 4 Template Selection

➢ *PDF Download Module*

Allows users to preview the resume before final output, check formatting and alignment, edit content before download, and convert the final resume to PDF format using html2canvas and js PDF for easy sharing and submission.

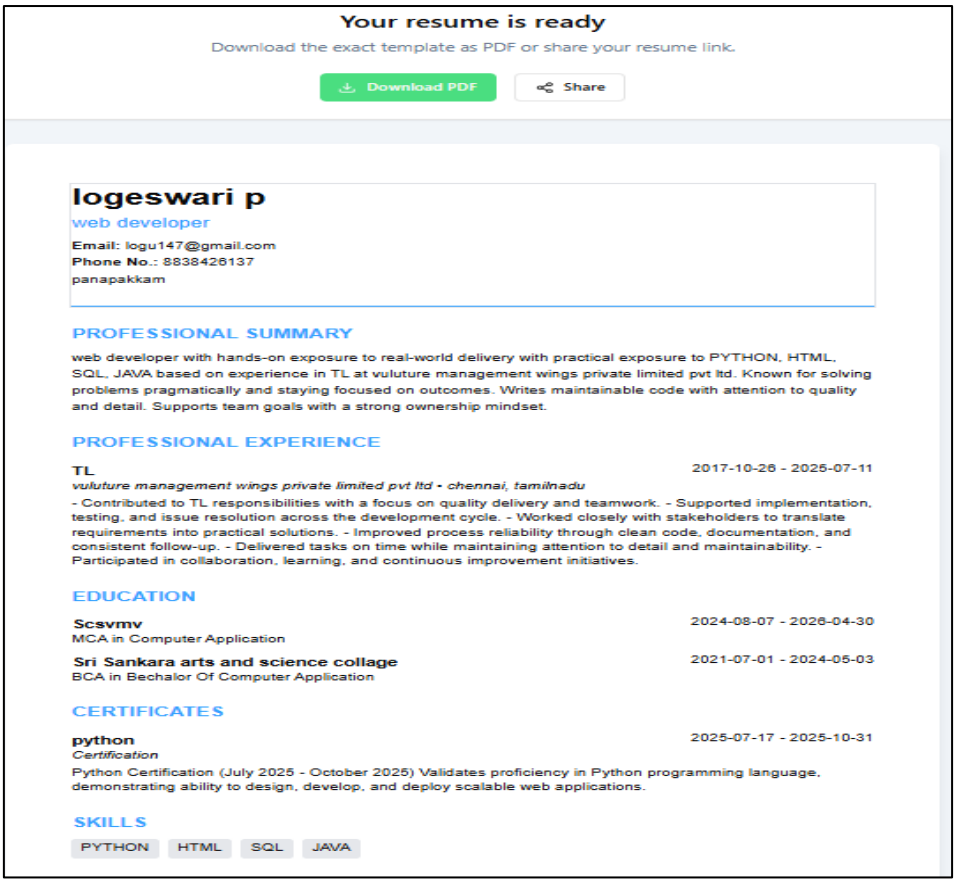

Fig 5 PDF Download

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V. SYSTEM REQUIREMENTS

➢ *Software Requirements*

Table 1 Software Requirements

Component	Technology / Tool
Front-End	HTML, CSS, JavaScript, React.js
Back-End	Node.js, Express.js
Database	MongoDB
AI API	Google Gemini 1.5 Flash
Editor	VS Code, Notepad++
Operating System	Windows 10 or above

➢ *Hardware Requirements*

Table 2 Hardware Requirements

Component	Specification
Processor	Intel Core i3 or above
RAM	4 GB or above
Hard Disk	500 GB or above
Monitor	15" Color Monitor

VI. SYSTEM DESIGN

➢ *Database Design*

The system uses MongoDB as the primary database. Key collections include Users, Resumes (with sub-documents for experience, education, skills, projects, certificates, and languages), and Templates. The schema is designed to support flexible, nested resume data with timestamps.

Table 3 Users Collection

Field Name	Data Type
User_Id	ObjectId
First_Name	String (50)
Last_Name	String (50)
Job_Title	String (250)
Email	String (150)
Phone	String (15)
Password	String (hashed)
Profile_Photo	String

Table 4 Resume Collection

Field Name	Data Type
Resume_Id	ObjectId
User_Id	ObjectId (ref)
Title	String
Summary	String
Template	String (enum)
Theme_Color	String
Experience	Array
Education	Array
Skills	Array
Certificates	Array
Languages	Array
Projects	Array

➢ *Overall System Architecture*

The system follows a three-tier architecture: React.js frontend for the user interface, Node.js/Express.js backend for business logic and REST API, and MongoDB for data persistence. JWT-based authentication secures all API endpoints. The AI layer (Gemini API) is integrated at the resume service level to provide intelligent content generation.

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➢ *Sequence Diagram*

The user opens the application and registers or logs in. The backend validates credentials and returns a JWT token. The user enters resume information through step-by-step form sections. Data is submitted to the backend and saved to MongoDB. The user previews the resume and requests PDF generation. The system generates and returns the PDF file for download.

VII. SYSTEM IMPLEMENTATION

➢ *Frontend Implementation*

The frontend is developed using React.js with Redux for state management. It provides a step-by-step multi-section form covering 10 steps: Template, Personal Details, Summary, Experience, Projects, Education, Certificates, Skills, Languages, and AI Tools. CSS utility classes (Tailwind) and shadcn/ui components are used for styling.

➢ *Backend Implementation*

The backend is built with Node.js and Express.js. Key controllers handle user authentication (JWT-based), resume CRUD operations, and AI content generation requests. Mongoose ODM is used for MongoDB interaction. bcryptjs is used for password hashing, and cookie-based token sessions ensure security.

➢ *AI Integration*

The Google Gemini 1.5 Flash API is integrated to provide AI-generated professional summaries, experience descriptions, project summaries, and certificate descriptions. A resume scoring system evaluates ATS compatibility (40 pts), Readability (100 pts), Impact (100 pts), and Completeness (100 pts) to give users actionable feedback.

VIII. TESTING

➢ *Testing Methodology*

The system underwent five levels of testing to ensure reliability and performance:

- Unit Testing: Individual modules (login, resume creation, PDF download).
- Integration Testing: Frontend-Backend-Database interaction.
- System Testing: End-to-end functional verification.
- User Acceptance Testing: Real user feedback collection.
- Performance Testing: Response time and system efficiency.

IX. CONCLUSION

The AI Resume Builder System successfully demonstrates how artificial intelligence can simplify and enhance the resume creation process. The system provides an efficient, reliable, and intelligent solution for creating professional resumes. It overcomes the limitations of traditional resume-building methods by providing automated content generation, ATS-friendly optimization, multiple professional templates, and a resume scoring system.

The system is beneficial for students, freshers, and professionals alike. Future enhancements could include job matching integration, interview preparation modules, cloud storage, LinkedIn profile import, and advanced AI recommendations. The project demonstrates the practical application of modern web technologies and AI in career development tools.

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