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Career Compass AI: Resume Analysis and Job Role Alignment System

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Abstract: *In the modern job market, students and early professionals often face challenges in evaluating the quality of their resumes and aligning them with suitable job roles. Traditional methods of resume evaluation are either manual or based on static rules, which do not provide consistent and structured feedback [12]. This paper presents Career Compass AI, a full-stack web-based platform designed to analyse resumes and provide actionable insights.*

The system accepts resume documents in PDF format, extracts textual information, and evaluates the profile based on a selected job role. It generates a structured report including overall score, job-match score, strengths, weaknesses, and suggestions for improvement. The system incorporates secure authentication using OTP verification and reliable deployment mechanisms [5], [10].

The proposed system demonstrates a reliable and scalable solution for automated resume evaluation and career guidance support.

Keywords: Resume Analysis, Artificial Intelligence, Job Matching, Web Application, AI Analysis

I. INTRODUCTION

Choosing an appropriate career path and preparing an effective resume are critical challenges for students and fresh graduates. Many individuals lack access to personalized feedback and rely on generic advice or inconsistent manual evaluations.

Traditional resume evaluation approaches often depend on manual review or rule-based systems. These methods lack consistency and fail to provide detailed insights into strengths and improvements required for a specific job role [14].

To address these challenges, this paper introduces Career Compass AI, a web-based system that provides structured and automated resume analysis. The system evaluates resumes based on job-role alignment and generates detailed reports to help users improve their profiles.

The system is designed as a practical solution that integrates artificial intelligence with modern web technologies such as Node.js and Express [1], [2].

II. LITERATURE SURVEY

Several approaches have been developed in the field of resume analysis and career recommendation systems.

1. Resume Evaluation Systems

Many systems use rule-based techniques and keyword matching to evaluate resumes. These systems provide basic filtering but lack contextual understanding [14].

2. Career Recommendation Systems

Machine learning-based systems are used to recommend job roles based on user profiles. These systems improve job-role matching but lack detailed resume feedback [13].

3. AI-Based Analysis Systems

Artificial intelligence-based systems enhance textual analysis and generate better suggestions, but many lack reliability in deployment environments [12].

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4. Research Gap

The analysis of existing systems reveals several limitations:
Lack of structured and consistent feedback
Limited integration of full system workflows
Lack of deployment reliability
The proposed system addresses these issues through a complete system design and implementation.

III. PROPOSED SYSTEM

The proposed system, **Career Compass AI**, is a web-based application designed to analyse resumes and provide structured feedback.

System Features

- User registration and login with OTP verification
- Resume upload in PDF format
- Text extraction from resume documents
- AI-based resume analysis
- Structured report generation
- User history tracking

System Architecture

The system follows a layered architecture:

1. **Presentation Layer** – User interface
2. **API Layer** – Request handling and validation
3. **Application Layer** – Business logic and processing
4. **Database Layer** – Data storage using PostgreSQL and SQLite [3], [4]
5. **Integration Layer** – External services for analysis and email [6], [7]

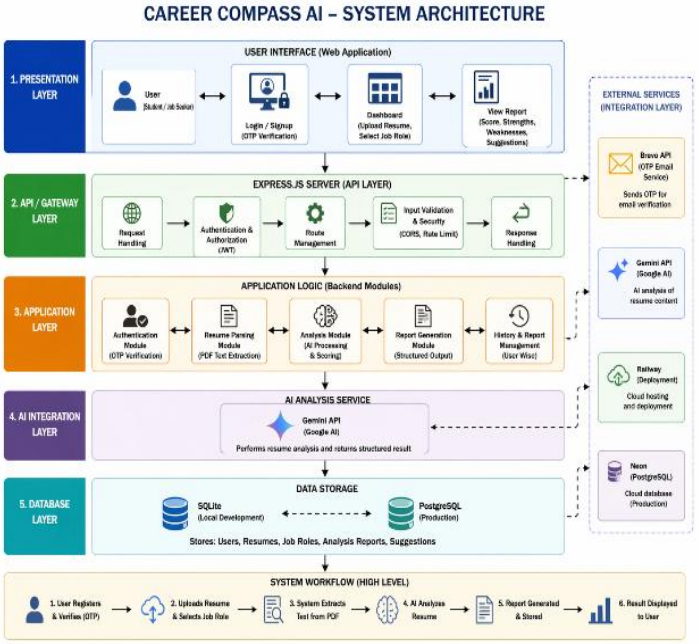

Fig. 1: System Architecture

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System Workflow

1. User registers and verifies account
2. User uploads resume and select job role
3. System extracts text from PDF
4. AI module performs analysis
5. Structured report is generated and stored
6. Results are displayed to the user

IV. METHODOLOGY

Resume Analysis Method

The system processes resume by extracting text and analysing it through an AI module. The output is structured into score, job match, strengths, weaknesses, and suggestions.

To ensure reliability, the system includes fallback mechanisms when analysis fails.

Authentication Method

Authentication is implemented using OTP verification and JSON Web Tokens for secure access [5].

Database Management

The system uses SQLite for development and PostgreSQL for production environments [3], [4].

Error Handling and Reliability

The system ensures stability using:

- Input validation
- API error handling
- Retry mechanisms
- Fallback analysis

Security practices are considered based on standard guidelines [10].

Algorithm: Resume Analysis Pipeline

1. Receive request
2. Validate input
3. Extract text
4. Process analysis
5. Normalize output
6. Apply fallback if needed
7. Store report
8. Return result

V. RESULTS

The system generates structured outputs including:

- Overall Score
- Job Match Score
- Strengths
- Weaknesses
- Suggestions

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Observations

- Consistent structured output
- Reliable performance with fallback support
- User history tracking enables iterative improvement

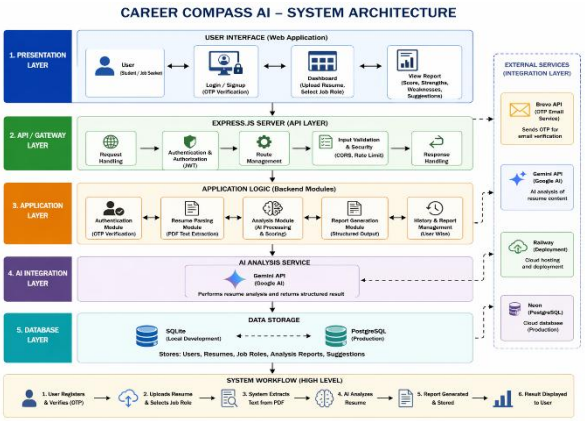

Fig. 3: Expected Results

VI. ANALYSIS

The system is evaluated based on:

- **Functionality:** Successfully performs all operations
- **Reliability:** Stable due to fallback mechanisms
- **Security:** Ensured through authentication and best practices [10]
- **Performance:** Efficient for normal usage

VII. CONCLUSION

The paper presented Career Compass AI, a system for automated resume analysis and job-role alignment. The system provides structured feedback and improves resume quality through iterative analysis.

It offers a practical solution to the limitations of traditional resume evaluation methods.

VIII. FUTURE WORK

Support for multiple formats
Improved document handling
Expanded job-role coverage
Enhanced analysis capabilities successfully perform all operations

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