



# AI-Powered Interview Application Tracking System (ATS): An AI-Powered Resume Analysis and Job Matching System

*A Research Paper on Intelligent Career Support Systems*

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## Abstract

AI-Powered Interview Application Tracking System (ATS) is an AI-powered web application designed to bridge the gap between job seekers and the competitive modern hiring landscape. The system leverages large language models (LLMs) — specifically Claude AI — to provide Applicant Tracking System (ATS) compatibility scoring, targeted improvement feedback, and intelligent job role matching based solely on a candidate's resume content. Users can upload their resume in PDF format, optionally supply a job description, and receive a detailed analytical report highlighting strengths, weaknesses, and actionable recommendations. A complementary Job Role Matcher feature identifies the top five most suitable career roles for a candidate without requiring any job description input. This paper presents the motivation, system architecture, key features, technical implementation, potential applications, and future scope of the AI-Powered Interview Application Tracking System (ATS) platform.

**Keywords:** *Resume Analysis, ATS Score, Large Language Models, Job Matching, Claude AI, NLP, Career Intelligence, Web Application.*

## 1. Introduction

The modern job market has grown increasingly competitive, with recruiters spending an average of six to seven seconds reviewing a single resume before deciding whether to proceed with a candidate. Compounding this challenge is the widespread adoption of Applicant Tracking Systems (ATS) by organizations of all sizes. ATS platforms automatically scan, parse, and rank submitted resumes based on keyword relevance, formatting compliance, and other heuristic criteria — often filtering out qualified candidates before a human reviewer ever examines their application.

This creates a significant disadvantage for job seekers who may possess the relevant skills and experience but lack awareness of how ATS systems evaluate their documents. Career counseling services and professional resume writers exist to fill this gap, but they are often expensive and inaccessible to a large segment of the workforce — particularly students, early-career professionals, and individuals in developing economies.



AI-Powered Interview Application Tracking System (ATS) addresses these challenges by offering an intelligent, automated, and accessible alternative. By utilizing Claude AI as its analytical backbone, the platform provides users with a structured resume evaluation experience that simulates the scrutiny of both an ATS engine and an experienced hiring manager. The application is deployed as a web platform, making it accessible from any device with an internet connection and a browser.

## 2. Problem Statement

The following core problems motivate the development of AI-Powered Interview Application Tracking System (ATS):

1. **Resume Rejection by ATS:** Many resumes are automatically rejected before human review due to poor keyword alignment, non-parseable formatting, or lack of role-specific terminology.
2. **Lack of Targeted Feedback:** Generic resume templates and feedback do not account for specific job roles or industry nuances. Candidates rarely understand why their resume underperforms.
3. **Career Path Uncertainty:** Many candidates, particularly fresh graduates, are uncertain about which job roles best match their skillset and background.
4. **Cost and Accessibility:** Professional resume review services are expensive and geographically limited, excluding large portions of the global workforce.

## 3. Objectives

The primary objectives of the AI-Powered Interview Application Tracking System (ATS) project are:

- To provide an automated ATS compatibility score for uploaded resumes.
- To deliver targeted, actionable improvement recommendations tailored to a specific job description.
- To identify the top five best-fit job roles for a candidate based purely on their resume content.
- To create a user-friendly, accessible, and privacy-respecting platform deployable on the web.
- To enable tracking of multiple resume submissions and their ratings over time.

## 4. System Overview

AI-Powered Interview Application Tracking System (ATS) is structured around two primary functional modules and a centralized dashboard for tracking resume history.

### 4.1 Resume Analyzer Module

The Resume Analyzer is the core feature of the platform. A user uploads their resume as a PDF document (up to 20 MB) and optionally provides the target company name, job title, and a full job description. The system processes this input and generates:

- An ATS compatibility score (percentage-based) reflecting how well the resume aligns with the supplied job description.
- A strengths analysis, identifying which aspects of the resume are well-suited to the target role.
- A gaps analysis, highlighting missing keywords, skills, or experience that a recruiter or ATS would expect.
- Actionable improvement suggestions structured as concrete, prioritized recommendations.

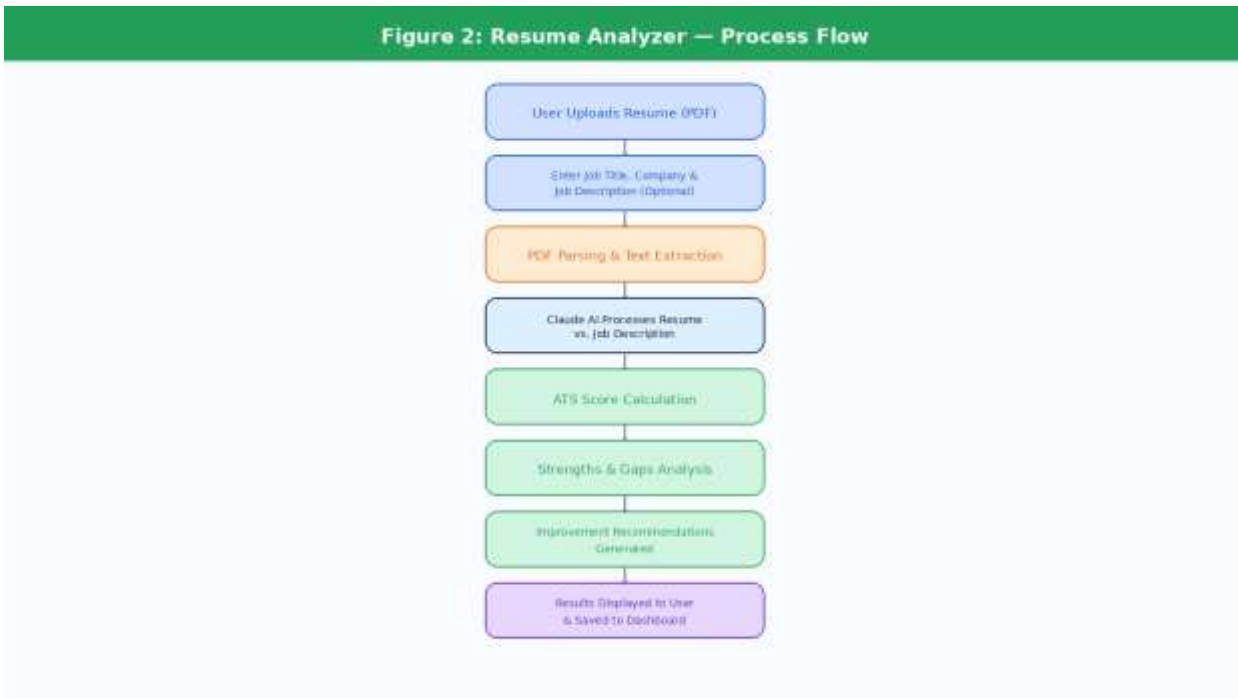


Figure 2: Resume Analyzer Process Flow

#### 4.2 Job Role Matcher Module

The Job Role Matcher operates independently of any job description. A user uploads their resume, and the system analyzes skills, educational background, work experience, and project descriptions to recommend the top five job roles for which the candidate is best suited. This module is particularly useful for career changers, fresh graduates, and individuals exploring new opportunities. Resume data is analyzed privately using Claude AI and is explicitly stated to not be stored permanently.



Figure 3: Job Role Matcher Process Flow

### 4.3 Application Tracking Dashboard

The platform includes a centralized dashboard that tracks application submissions alongside their corresponding resume ratings. Users can review the history of their analyzed resumes, compare scores across different job targets, and monitor improvement over time. This feature supports longitudinal resume development — a systematic approach to improving one's job application materials through iterative refinement.

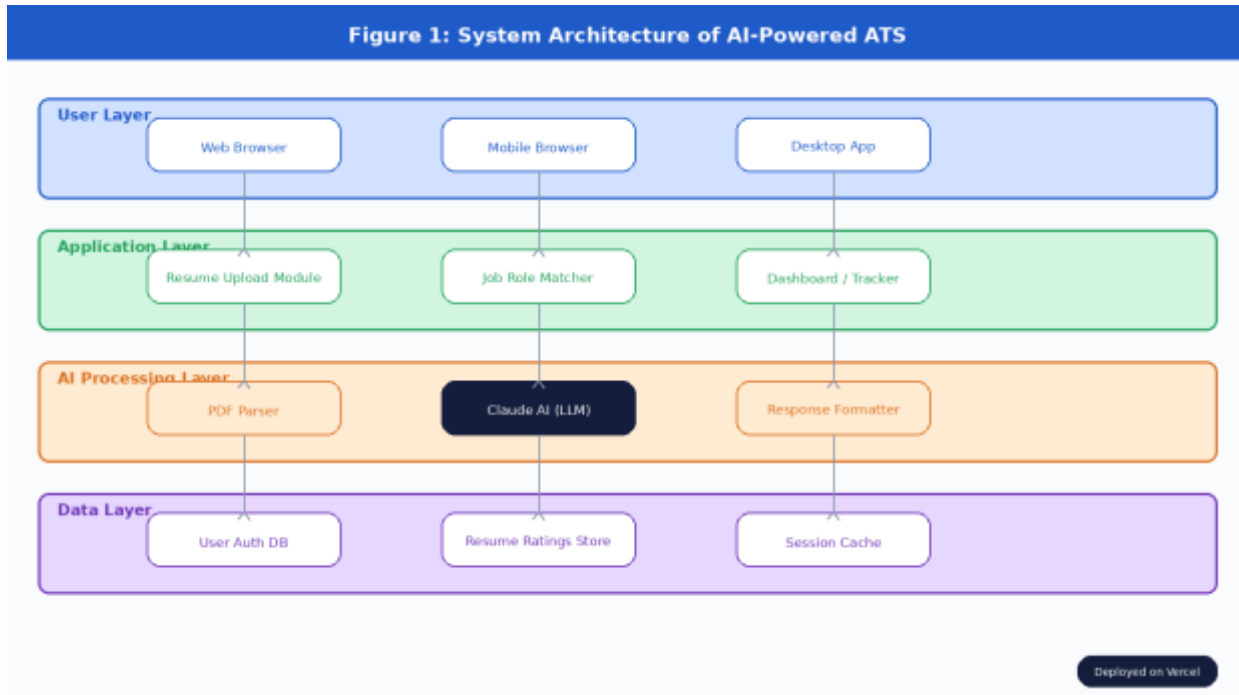


Figure 1: System Architecture of the AI-Powered ATS Platform

## 5. Technical Architecture

### 5.1 Frontend

The frontend is built as a modern single-page application (SPA) deployed on Vercel, a cloud platform optimized for frontend frameworks. The interface offers a clean, minimal user experience with drag-and-drop resume upload functionality, intuitive form inputs, and responsive design compatible with both desktop and mobile devices.

### 5.2 AI Backend — Claude AI Integration

The intelligence layer of AI-Powered Interview Application Tracking System (ATS) is powered by Claude AI, developed by Anthropic. Claude is a large language model (LLM) capable of deep contextual understanding, natural language analysis, and structured output generation. The system sends parsed resume text and optional job description content to Claude via API, where the model applies nuanced reasoning to evaluate ATS alignment, identify skill gaps, and generate role recommendations.

Claude's strength as an analytical engine lies in its ability to understand context beyond simple keyword matching. Unlike traditional ATS systems that rely on rigid pattern recognition, Claude interprets the semantic content of a resume — understanding synonyms, equivalent skill expressions, and contextual relevance in a manner closer to how an experienced human recruiter would evaluate a document.



### 5.3 Document Processing

Resumes are accepted exclusively in PDF format, with a maximum file size of 20 MB. PDF processing pipelines extract text content from the document before submitting it to the AI model. This approach ensures format consistency and protects against encoding issues commonly encountered when handling documents in proprietary word processor formats.

### 5.4 Authentication and Privacy

The platform incorporates user authentication to associate resume uploads and ratings with individual accounts. A critical privacy-oriented design decision is stated explicitly in the system: resume data is analyzed privately and is not stored permanently. This commitment to minimal data retention addresses growing concerns around personal data handling in cloud-based services.

## 6. Key Features and Differentiators

5. AI-Driven ATS Scoring: Unlike static checklists or rule-based tools, AI-Powered Interview Application Tracking System (ATS) uses a generative AI model to produce contextually aware compatibility scores.
6. Job Description Awareness: The analyzer can incorporate specific job descriptions, enabling highly targeted feedback for individual applications.
7. Description-Free Role Matching: The Job Role Matcher requires no external job description — the AI infers suitable roles from the resume alone.
8. Application History Tracking: The dashboard enables longitudinal tracking of resume quality, encouraging an iterative improvement cycle.
9. Privacy-First Architecture: No permanent storage of resume data ensures user trust and regulatory compliance.
10. Accessibility: Deployed as a web application, the platform is available across devices and geographic regions without software installation requirements.



Figure 4: Use Case Overview of the AI-Powered ATS System



## 7. Use Cases and Applications

- **Students and Fresh Graduates:** Individuals entering the workforce can receive guidance on how to structure and target their resumes for specific roles or industries.
- **Career Changers:** Professionals transitioning to a new field can identify which existing skills are transferable and which gaps need to be addressed.
- **Active Job Seekers:** Candidates applying to multiple positions can tailor their resumes for each application and track which versions score highest.
- **Educational Institutions:** Universities and placement cells can integrate the platform into career development programs.
- **HR Trainers and Career Coaches:** Professionals who assist job seekers can use the platform as a diagnostic tool to structure their coaching sessions.

## 8. Limitations

11. **PDF-Only Input:** The system currently accepts resumes exclusively in PDF format, excluding users who maintain resumes in DOCX, TXT, or other formats.
12. **Dependency on External API:** The platform relies on Claude AI via Anthropic's API, introducing a dependency on third-party service availability and potential latency.
13. **No Offline Mode:** The application requires an internet connection and cannot function offline.
14. **Subjective AI Outputs:** While Claude AI provides highly capable analysis, LLM outputs can vary in tone and detail between runs, and may not perfectly replicate the evaluation criteria of any specific organization's ATS.
15. **Limited Industry Customization:** The current implementation does not appear to include industry-specific scoring rubrics, which may limit precision for highly specialized fields.

## 9. Future Scope

Several enhancements could significantly extend the capability and reach of AI-Powered Interview Application Tracking System (ATS):

- **Multi-Format Support:** Extending document support to DOCX, ODT, and TXT formats to accommodate a broader range of users.
- **Real-Time Job Board Integration:** Connecting with job listing APIs (e.g., LinkedIn, Indeed, Naukri) to retrieve live job descriptions and benchmark resumes against current market requirements.
- **Industry-Specific Scoring Profiles:** Developing customized evaluation rubrics for domains such as software engineering, healthcare, finance, and creative fields.
- **Cover Letter Generation:** AI-assisted cover letter drafting based on the resume and job description provided by the user.
- **Multi-Language Support:** Enabling analysis and feedback in multiple languages to serve non-English-speaking job markets.
- **Batch Processing:** Allowing recruiters or placement officers to upload multiple resumes for bulk analysis and comparative ranking.



## 10. Conclusion

AI-Powered Interview Application Tracking System (ATS) represents a meaningful application of large language model technology to a real-world, high-stakes problem that affects millions of job seekers globally. By automating the resume review process and delivering intelligent, contextualized feedback, the platform democratizes access to career development resources that were previously available only to those who could afford professional services.

The system's dual-module architecture — a targeted Resume Analyzer and a description-free Job Role Matcher — offers complementary pathways for candidates at different stages of their job search journey. The privacy-first approach to data handling further positions AI-Powered Interview Application Tracking System (ATS) as a trustworthy tool in an era of heightened concern over personal data usage.

As AI capabilities continue to advance and the job market grows increasingly competitive, tools like AI-Powered Interview Application Tracking System (ATS) will play an important role in equipping candidates with the knowledge and confidence needed to navigate complex hiring processes. With targeted future enhancements, the platform has the potential to evolve into a comprehensive career intelligence ecosystem.

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