Smart Resume Parser – Project Report

I. Introduction

The Smart Resume Parser is a modern AI-driven solution designed to automate the process of resume screening and candidate evaluation. Traditional resume screening requires recruiters to manually extract key details such as contact information, skills, education, and experience, which is both time-consuming and error-prone.

This project leverages Artificial Intelligence (AI), Natural Language Processing (NLP), and cloud deployment to develop a scalable application that can parse resumes in multiple formats (PDF/DOCX) and generate structured outputs. The system also provides exportable data (JSON/CSV) for easy integration with Applicant Tracking Systems (ATS) and HR workflows.

II. Abstract

The Smart Resume Parser provides a two-tier architecture:

- **Backend**: Built with FastAPI, the backend extracts raw text, cleans it, and integrates with an AI model (gpt-oss-120b via OpenRouter) for parsing. It then structures the extracted information into categories like contact details, skills, education, projects, and professional experience.

- **Frontend**: A user-friendly Streamlit interface allows recruiters to upload resumes, visualize extracted information in a dashboard, and download structured reports. The UI is enhanced with custom CSS to deliver a professional dashboard experience.

The application is deployed on Render Cloud, ensuring accessibility, scalability, and real-time performance for HR teams.

III. Tools & Technologies Used.

- **Backend Framework**: FastAPI (with Uvicorn ASGI server)

- **Frontend Framework**: Streamlit (with custom CSS for professional UI)

- **AI Model**: gpt-oss-120b (via OpenRouter API)

- **Libraries**:
  - **Text Extraction**: PyPDF2, python-docx
  - **Data Processing**: Pandas, Regex, JSON
  - **Environment Management**: dotenv

- **Deployment**: Render Cloud (separate backend & frontend services)

- **Version Control**: Git & GitHub

IV. Development Workflow

1. **Requirement Gathering & Planning** – Defined core features like AI-based parsing, export options, and professional UI.

2. **Backend Development** – Created APIs for resume upload, text extraction, AI parsing, and data export in JSON/CSV.

3. **AI Integration** – Integrated OpenRouter API (Mistral-7B) for parsing resumes into structured JSON.

4. **Frontend Development** – Designed an interactive dashboard in Streamlit with sections for contact details, skills, education, projects, experience, links, and summary.

5. **Testing & Debugging** – Validated with diverse resume samples; used Postman to test backend APIs.

6. **Deployment** – Deployed backend and frontend on Render Cloud, enabling seamless online access.

V. Key Features

- Upload resumes in PDF/DOCX format.

- AI-powered parsing of resumes into structured data.

- Professional Dashboard UI with sections for skills, education, projects, and experience.

- Data Export in JSON & CSV formats for ATS/HR system integration.

- Fully cloud-deployed and accessible online.

VI. Conclusion

The Smart Resume Parser demonstrates how AI can transform traditional HR workflows by automating resume parsing. Recruiters benefit from faster decision-making, improved accuracy, and reduced manual effort. The project successfully integrates AI, NLP, backend APIs, frontend UI, and cloud deployment into a single cohesive system.

Future enhancements may include:

- Support for multilingual resumes.

- Integration with job descriptions for candidate-job matching.

- Role-specific scoring models.

- Integration with enterprise-grade ATS platforms.

By combining cutting-edge AI with user-friendly design and deployment scalability, the Smart Resume Parser provides a professional, practical, and impactful solution for modern recruitment.