MEDHAVI COLLEGE

(Affiliated with Pokhara University)

Report of Project (2025)

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DECLARATION

I hereby declare that the project entitled **"AI-Based Resume Analyzer & Skill Gap Detector"** has been prepared and submitted to the **Faculty of Management, Pokhara University**, as a partial fulfillment of the requirements for the degree of **Bachelor of Computer Information System (BCSIT)**.

This project is our original work and has been carried out under the supervision of **Mr.Sandeep Oli.** The work presented in this report has not been submitted to any other university or institution for the award of any degree or diploma.

The project has been developed solely for academic purposes during the fourth semester of the BCSIT program. Any sources of information or assistance used in this project have been duly acknowledged. I further declare that this project has not been developed for any commercial or personal gain.

INTRODUCTION

The rapid growth of information technology has transformed modern recruitment and career development processes. Organizations often receive a large number of resumes for a single job opening, making manual resume screening inefficient, time-consuming, and prone to human bias. At the same time, job seekers face difficulty understanding whether their skills match job requirements. To address these challenges, intelligent, AI-driven recruitment systems have become increasingly important.

The **AI-Based Resume Analyzer & Skill Gap Detector** is a web-based application designed to automate resume analysis and skill evaluation using artificial intelligence techniques. The main objective of this project is to develop a user-friendly and efficient system that extracts key information from resumes, compares candidate skills with job requirements, and identifies missing or weak skills. The system provides meaningful insights to job seekers and assists recruiters in making informed hiring decisions.

The project is developed using **React.js** for the front-end to provide an interactive and responsive user interface, **Node.js with Express.js** for backend processing and API handling, and **MySQL** for secure and structured data storage. By utilizing **Natural Language Processing (NLP)** techniques, the system can analyze unstructured resume data more accurately than traditional keyword-based methods.

In today's digital era, AI-powered recruitment tools play a vital role in improving efficiency, transparency, and skill-based hiring. This project aims to contribute to that transformation by providing a reliable and scalable resume analysis and skill gap detection platform.

Objectives

The main objectives of the AI-Based Resume Analyzer & Skill Gap Detector project are:

- To develop a user-friendly web-based system that analyzes resumes and matches candidate skills with job requirements using artificial intelligence.
- To provide an efficient and secure platform that identifies skill gaps and offers actionable insights to support informed recruitment and career development decisions.

Scope

The scope of the AI-Based Resume Analyzer & Skill Gap Detector project is focused on developing a web-based system that supports automated resume analysis and skill evaluation for recruitment and career development purposes. The system allows users to upload resumes, extract relevant information using artificial intelligence techniques, and compare candidate skills with predefined job roles or job descriptions.

The project includes functionalities such as secure user authentication, resume parsing, skill identification, job-role matching, skill gap detection, and visualization of analysis results through dashboards and reports. The system is designed to support job seekers by providing insights into missing or weak skills and offering recommendations for improvement, while also assisting recruiters in evaluating candidate suitability efficiently.

The application is implemented using modern web technologies, including React.js for the user interface, Node.js with Express.js for backend services, and MySQL for structured data storage. The scope of this project is limited to skill-based analysis and resumes evaluation and does not include final hiring decisions, interview scheduling, or payroll management. The system is intended for academic and learning purposes, demonstrating the application of AI and web technologies in recruitment systems.

Tools and Technology

The project is developed using modern web and AI technologies to ensure efficiency, scalability, and usability. The main tools and technologies used include:

1. **Frontend: React.js**
    - To build an interactive, responsive, and user-friendly interface

2. **Backend: Node.js with Express.js**
    - To handle server-side logic, API routing, and processing

3. **Database: MySQL**
    - To store user data, resumes, job roles, and analysis results securely

4. **NLP/ AI: spaCy, Transformer-based APIs**
    - To parse resumes, extract skills, and perform semantic analysis

5. **Version Control: Git**
    - For source code management and project version tracking

6. **PDF Generation: PDFKit / jsPDF**
    - To generate downloadable PDF reports of resume analysis and skill gap results

Problem Statement

High Volume of Resumes:

Recruiters receive hundreds or thousands of resumes per job posting, making manual screening time-consuming and inefficient.

Limited Screening Time:

Recruiters spend only 6–10 seconds per resume on average, increasing the risk of overlooking qualified candidates.

Ineffective Keyword Filtering:

Existing systems rely on keyword matching, which fails to capture semantic meaning, context, or transferable skills.

Difficulty Identifying Skill Gaps:

Job seekers often cannot determine which skills are missing or underdeveloped relative to job requirements, making it hard to improve employability and match target roles effectively.