

CERTIFICATE

This is to certify that the Project Report submitted by **JITENDRA CHAUDHARY (22SE02ML095)** to the **P P SAVANI UNIVERSITY** for the partial fulfilment of the subject credit requirements is a bonafied work carried out by the student.

This is to further certify that I have been supervising the Major/Minor Project of **JITENDRA CHAUDHARY (22SE02ML095)**.

The contents of this report, in full or in parts, have not been submitted to any other Institute or University for award of any degree, diploma or titles.

Sign of Faculty Mentor :

Name of Faculty Mentor:

Date:

ACKNOWLEDGEMENT

This report would not have been possible without my teachers who were always there when I needed them the most. I take this chance to acknowledge them and extend my sincere gratitude for helping me make this Report a possible.

I wish to thank my faculty mentor **Ms. Shruti Mishra, Assistant Professor**, School of Engineering. It has been an honor to learn under their mentorship.

As my mentor, she has constantly motivated me to remain focused on achieving my goal. Their observations and guidance helped me to establish the overall direction of the report and to move forward with learning in depth. Their vital support at each juncture, which culminated in successful completion of my project work. I express my sincere gratitude to them for constant support during the project work.

I am also thankful to faculty members of the department for constant support and guidance.

I am thankful to Dean, School of Engineering for his initiative of imparting Project during tenure of your study making us learn new things and to help us in expanding our horizons.

Name of Student : **JITENDRA CHAUDHARY**

Enrollment No : **22SE02ML095**

ABSTRACT

The project “Personalised Career Recommendation and Skills Growth Tracker using AI” aims to assist individuals in identifying the most suitable career paths and skill development opportunities based on their personal interests, skills, experience, and salary expectations. The system leverages Artificial Intelligence (AI) and Natural Language Processing (NLP) to analyse both user input and real-world job data. Using the Sentence Transformer model (all-MiniLM-L6-v2), the system generates embeddings for job descriptions and user profiles to measure similarity through cosine similarity. A Random Forest Classifier is then used to predict job suitability and recommend the most relevant roles.

The model evaluates various parameters such as job titles, industries, experience levels, required skills, and salary ranges. Users interact with the system through a simple web interface, and the backend processes their input to generate personalized recommendations. This AI-driven approach bridges the gap between users’ current skills and career goals, helping them make informed decisions while promoting continuous professional growth.

CONTENTS

1. Table of Contents/Index with page numbering
2. Introduction/Objectives
3. System Analysis
 - a. Identification of Need
 - b. Preliminary Investigation
 - c. Feasibility Study
 - d. Project Planning
 - e. Project Scheduling (PERT Chart and Gantt Chart both)
 - f. Software requirement specifications (SRS)
 - g. Software Engineering Paradigm applied
 - h. Data models (like DFD), Control Flow diagrams, State Diagrams/Sequence diagrams, Entity Relationship Model, Class Diagrams/CRC Models/Collaboration Diagrams/Use-case Diagrams/Activity Diagrams depending upon your project requirements
4. System Design
 - a. Modularisation details
 - b. Data integrity and constraints
 - c. Database design, Procedural Design/Object Oriented Design
 - d. User Interface Design
 - e. Test Cases (Unit Test Cases and System Test Cases)
5. Coding
 - a. SQL commands for (i) database creation (along with constraints), (ii) data insertion in tables and (iii) access rights for different users.
 - b. Complete Project Coding

- c. Comments and Description of Coding segments
- 6. Standardization of the coding
 - a. Code EfficiencyError handling
 - b. Parameters calling/passing
 - c. Validation checks
- 7. Testing
 - a. Testing techniques and Testing strategies used
 - b. Testing Plan used
 - c. Test reports for Unit Test Cases and System Test Cases
 - d. Debugging and Code improvement
- 8. System Security measures (Implementation of security for the project developed)
 - a. Database/data security
 - b. Creation of User profiles and access rights
- 9. Cost Estimation of the Project along with Cost Estimation Model
- 10. Reports (sample layouts should be placed)
- 11. Future scope and further enhancement of the Project
- 12. Bibliography
- 13. Appendices (if any)
- 14. Glossary.

1. Introduction/Objective

1.1 Introduction

Choosing the right career has become difficult due to the growing number of job roles and fast-changing industry demands. Many students and professionals struggle to match their skills and interests with suitable job opportunities. Traditional counselling or keyword-based systems cannot provide accurate, personalized guidance.

This project, “Personalized Career Recommendation and Skills Growth Tracker using AIML,” aims to solve this problem by using Artificial Intelligence and Machine Learning. The system analyzes the user’s interests, skills, experience, profession preference, and salary expectations. It then compares this information with a job dataset using Sentence Transformer embeddings, cosine similarity, and Random Forest classification to recommend the most suitable career paths. The system also highlights required skills for each recommended role, helping users understand their strengths and areas of improvement.

1.2 Objective

- To design an AI-based system that provides personalized career recommendations.
- To preprocess job data and generate meaningful embeddings for similarity matching.
- To use Machine Learning (Random Forest) to classify suitable job roles based on user profiles.
- To combine similarity scores and ML predictions for accurate recommendations.
- To build a simple, user-friendly web interface for user input and results.
- To guide users by identifying missing skills and suggesting improvement areas.

2. System Analysis

2.1 Identification of Need

Students and professionals often struggle to select the right career path because of limited guidance and the vast number of available job roles. Manual counselling is time-consuming and subjective, while traditional job portals provide generic suggestions.

Therefore, a system is needed that can analyze user skills, interests, and experience and match them with real job data using AI for accurate, personalized career recommendations.

2.2 Preliminary Investigation

During the initial research stage, it was found that no reliable or practical career recommendation system existed for students or freshers. Most available tools online were either too generic or only suggested jobs based on simple keyword matching.

Further investigation showed that some students had created similar projects, but:

- They were developed only for academic purposes.
- The systems were poorly trained with very small datasets.
- Recommendations were not accurate or personalized.
- Many models failed to consider skills, experience, or salary expectations.
- A few projects were incomplete and did not work properly when tested.

This highlighted the need for a more advanced, usable, and intelligent system that uses real datasets, proper NLP embeddings, and machine learning for accurate predictions.

2.3 Feasibility Study

I. Technical Feasibility

- Python and libraries like Sentence Transformer, Scikit-learn, Flask are easily available and suitable.
- Dataset is structured and ready for preprocessing.
- Model can run on normal systems without GPU.

II. 2. Operational Feasibility

- System is easy to use through a simple web interface.
- Users only need to input interests, skills, profession, salary, and experience.

III. 3. Economic Feasibility

- Uses open-source tools → no extra cost.
- Low operational expense as system can run locally or on low-cost servers.

2.4 Project Planning

2.5 Project Scheduling

2.6 Software requirement specifications (SRS)

2.7 Software Engineering Paradigm applied

2.8 Data models