

Intelligent Career Path Guidance for Student Based on Skills and Performance

S. Lesa, V. Ishwariya, B. Marushini, D. Ramya, P. Usha

Department of Computer Science and Technology

Vivekanandha College of Engineering for Women (Autonomous), Tiruchengode, Namakkal, Tamil Nadu, India

lesa@vcew.ac.in, ishwariyavenkatesan8@gmail.com,

marushinibabu2203@gmail.com, ramyad131104@gmail.com, usha17092004@gmail.com

Abstract: *Choosing the right career and education path is difficult for many students due to lack of proper guidance and personalized support. The One Stop Personalized Career & Education Advisor is designed to help students make better career decisions based on their interests, skills, academic performance, and personal goals. This system collects user details through simple questions and provides customized career suggestions, suitable courses for college students, and Suitable skill development recommendations for students. It acts as a single platform where students can explore different career options, understand education pathways, and plan their future effectively. By using basic data analysis and recommendation techniques, the system reduces confusion, saves time, and improves decision-making. Hence to support students in choosing the right career direction with confidence and clarity.*

Keywords: Intelligent Career Guidance, Skill-Based Recommendation, Student Performance Analysis, Python-Based System, Career Prediction

I. INTRODUCTION

Choosing the right career is difficult for many students due to lack of proper guidance. This project proposes an intelligent system that analyze students' skills and academic performance to suggest suitable career paths. It helps students make better decisions by providing personalized recommendations based on their strengths and interests.

II. EXISTING SYSTEM

The existing career guidance system mainly relies on traditional methods such as counselling, teacher suggestions, and basic academic performance analysis. These methods do not fully consider a student's individual skills, interests, and real abilities. As a result, guidance provided is often general and not personalized. Many students face confusion in choosing the right career path due to lack of accurate information and proper evaluation tools. Additionally, existing systems do not use advanced technologies like data analysis or intelligent algorithms. This leads to less effective decision-making, where students may choose careers that do not match their strengths, ultimately affecting their future growth and satisfaction.

III. PROPOSED SYSTEM

The proposed system introduces an intelligent career guidance platform that analyzes students' skills, academic performance, and interests to provide personalized career recommendations. It uses data-driven techniques and algorithms to evaluate individual strengths and match them with suitable career paths. Unlike traditional methods, this system ensures accurate and customized guidance for each student. It helps reduce confusion and supports better decision-making by suggesting careers that align with the student's abilities. The system is user-friendly and efficient, making it easier for students to explore various career options. Overall, it improves career planning and helps students build a successful future based on their true potential



IV. METHODOLOGY

4.1 Data Collection Module:

The Data Collection Module is responsible for gathering student information required for career guidance. Its main functions include collecting academic performance, skills, and interests through forms or questionnaires. This module ensures that accurate and relevant data is obtained from the user for further processing.

4.2 Data Preprocessing Module:

The Data Preprocessing Module is responsible for cleaning and organizing the collected data. Its main functions include handling missing values, normalizing scores, and converting inputs into a structured format. This helps improve the quality and consistency of data before analysis.

4.3 Skill and Performance Analysis Module:

The Skill and Performance Analysis Module evaluates student abilities based on input data. Its main functions include analyzing academic scores, identifying strengths and weaknesses, and categorizing skill levels. This module forms the base for accurate career prediction.

4.4 Career Recommendation Module:

The Career Recommendation Module is responsible for suggesting suitable career paths. Its main functions include applying intelligent algorithms, matching student profiles with predefined career datasets, and generating personalized recommendations based on skills and performance.

4.5 User Interface and Result Module:

The User Interface and Result Module is responsible for displaying the output to users. Its main functions include presenting career suggestions in a simple format, allowing user interaction, and ensuring easy understanding. This module helps students make informed career decisions.

V. SYSTEM ARCHITECTURE

5.1 Student Data Collection Module:

This module handles all user input data and converts it into a usable format. Its main functions include:

- Data Input & Validation: Collect academic marks, skills, and interests from students and ensure proper format.
- Questionnaire Handling: Gather responses through structured forms or surveys.
- Data Verification: Check completeness and correctness of input data.
- Output: Structured student data ready for processing.

5.2 Data Preprocessing & Feature Extraction Module:

This module processes raw student data and extracts meaningful features. Its main functions include:

- Data Cleaning: Handle missing or incorrect values.
- Normalization: Standardize marks and skill levels for uniform analysis.
- Feature Extraction: Identify key attributes such as strengths, weaknesses, and interest areas.
- Output: Processed data with extracted features for analysis.

5.3 Skill Analysis & Evaluation Module:

This module evaluates student abilities and performance. Its main functions include:

- Performance Analysis: Analyze academic scores across subjects.
- Skill Mapping: Categorize skills into different domains (technical, analytical, creative, etc.).
- Strength Identification: Detect strong and weak areas of the student.
- Output: Evaluated student profile with skill insights.



5.4 Career Recommendation Engine Module:

This module generates suitable career suggestions based on analysis. Its main functions include:

- Profile Matching: Compare student profile with predefined career datasets.
- Algorithm Application: Use intelligent algorithms to find best-fit careers.
- Personalized Suggestions: Generate customized career options for each student.
- Decision Layer: Rank and prioritize career paths based on suitability.

5.5 User Interface & Result Module:

This module ensures interaction between the user and the system and displays the final output. Its main functions include:

- User Interface: Provide a simple and user-friendly interface for data input.
- Interaction Handling: Allow users to enter details and navigate the system easily.
- Result Display: Show personalized career recommendations clearly.
- Report Generation: Generate simple reports based on student profile and suggestions.
- User Support: Help users understand results for better decision-making.

Result Display & Report Generation:

The Result Display and Report Generation Module is responsible for presenting career recommendations in a clear and understandable format. It displays personalized career options based on the student's skills, performance, and interests. The module also provides explanations for each suggestion to help users understand the reasoning behind the recommendations. Additionally, it generates detailed reports that summarize student profiles, strengths, and suitable career paths. These reports can be stored for future reference and analysis. The module ensures that results are user-friendly, visually organized, and easy to interpret, helping students make informed decisions about their career path.

5.6 Flowchart

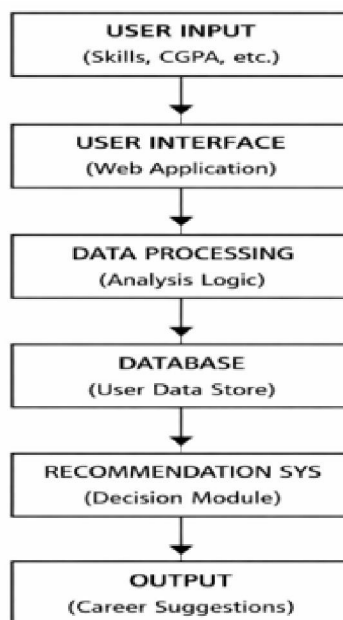


Fig 6.1.1 Image Understanding



6.1 OUTPUT

Student Career Predictor

Name

Department

Interest

Skills

Predict Career

Predicted Career: Data analytics

Possible Roles: ['Data Analyst', 'Business Analyst', 'BI Developer']

Required Skills: ['Python', 'SQL', 'Power BI', 'Excel']

Salary Range: ₹5 LPA – ₹12 LPA

Roadmap:

- Learn Python & SQL
- Learn BI tools
- Do projects
- Apply jobs

Fig Understanding

VII. CONCLUSION

The proposed intelligent career guidance system helps students choose suitable career paths based on their skills, academic performance, and interests. Unlike traditional methods, it provides personalized and accurate recommendations using data-driven analysis. The system reduces confusion and supports better decision-making by identifying individual strengths and matching them with appropriate careers. It is user-friendly, efficient, and reliable for students seeking guidance. Additionally, the system can be further improved by integrating advanced technologies like machine learning and real-time data analysis. Overall, this project contributes to better career planning and helps students build a successful future aligned with their potential.

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