

EDUNAVI - AI Powered Career Counselling System

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Abstract: EDUNAVI is an AI-powered career counselling system designed to guide students in making the right career decisions. Many students face confusion and stress when selecting a career path because of limited awareness, lack of guidance, and uncertainty about their own strengths. EDUNAVI addresses this issue by collecting information such as academic performance, skills, interests, and personality traits, which are then analysed to understand the student's profile. Using intelligent recommendation techniques, EDUNAVI matches the student's profile with suitable career options and generates a ranked list of the best paths. It also provides details about required qualifications, entrance exams, courses, and future opportunities. This system saves time, reduces confusion, and gives students clear, personalized, and data driven suggestions. By doing so, EDUNAVI helps learners make informed and confident decisions, enabling them to plan their future careers effectively.

Keywords: AI, Career counselling, Machine Learning, Natural Language Processing, Recommendation System, Personalized guidance.

INTRODUCTION

Career counselling plays a vital role in guiding students toward making informed academic and professional choices. However, traditional counselling methods often face challenges such as limited availability of experts. As a result, many learners struggle with confusion, lack of direction, and mismatched career paths.

To address these challenges, the AI Powered Career Counselling System leverages artificial intelligence to deliver personalized, data-driven guidance. By analysing user profiles, academic performance, skills, and interests, the system generates tailored career recommendations and suggests suitable courses, skill development opportunities. The integration of machine learning and natural language processing ensures adaptability to user needs and responsiveness to evolving industry trends.

This system not only enhances accessibility by providing 24/7 virtual counselling but also reduces dependency on manual processes, making career guidance more efficient, scalable, and impactful. Ultimately, it empowers individuals to make better career decisions while enabling educational institutions to adopt a modern, technology driven approach to student support.

Career guidance systems have evolved over time to support students and job seekers in making informed decisions about their educational and professional paths. Traditionally, career guidance began as a manual, counsellor-driven process where trained professionals provided advice based on interviews, academic records, and basic aptitude assessments. These early systems relied heavily on human judgment and limited tools such as paper-based questionnaires, psychological tests, and one-to-one counselling sessions. While effective to some extent, these methods were constrained by time, availability of experts, and subjective interpretation.

1. LITERATURE REVIEW

The study of previous research helps in understanding how career counselling systems have improved with the use of modern technologies. Many researchers have focused on developing intelligent systems that can guide students in choosing suitable career paths. Artificial Intelligence (AI) and Machine Learning (ML) are commonly used in these systems to analyse factors such as students' interests, skills, and academic performance. Several studies such as [1], [2], and [4] proposed career recommendation systems using machine learning algorithms like K-Nearest Neighbour, clustering methods, decision trees, and random forest models to analyse student data and suggest appropriate courses or career fields. Other research works like [3] and [5] discussed the development of web-based career counselling platforms and frameworks that include aptitude tests, interest analysis, and career information databases to help students explore different career opportunities more easily.

Recent research has also focused on improving interaction and accessibility in career guidance systems. Studies such as [7] and [10] introduced AI-based systems and chatbots that use technologies like natural language processing to provide real-time career guidance and personalized suggestions to students. Additional studies including [8], [9], [11], and [12] worked on improving the accuracy of career predictions by analysing student profiles with machine learning models. Other research papers [13]-[18] highlighted the importance of scalable AI-based platforms that combine intelligent algorithms and expert knowledge to provide better career recommendations. Although these studies have contributed significantly to the development of career counselling systems, many existing platforms still face challenges such as limited personalization and lack of real-time guidance. Therefore, there is a need to design a more intelligent and user-friendly career counselling system that can provide accurate recommendations and help students make informed decisions about their future.

2. PROPOSED SYSTEM

The proposed system, AI-Powered Career Counselling, aims to provide a centralized digital platform that delivers personalized career guidance to students. Currently, career counselling is largely manual, relying on limited counsellor availability and generic advice, which can lead to poor career decisions and missed opportunities. By automating the process, the system allows users to create profiles, take assessments, and receive tailored career recommendations based on their academic performance, skills, and interests. Role based access ensures that administrators, counsellors, and students have clearly defined responsibilities within the system.

The system is designed to enhance the career planning experience by providing data-driven guidance, identifying skill gaps, and suggesting suitable career paths, courses, and professional opportunities. Interactive counselling features keep users engaged, while counsellors and administrators can monitor progress and provide support through a unified platform. The ultimate goal is to empower users to make informed career decisions and provide educational institutions with a modern, scalable approach to career guidance.

3. METHODOLOGY

The methodology describes the systematic approach adopted to design, develop, and evaluate the AI Based Career Counselling system. It outlines how data is collected, processed, and transformed into meaningful inputs for the AI/ML models. A well-defined methodology ensures the reliability, accuracy, and effectiveness of the career recommendation process.

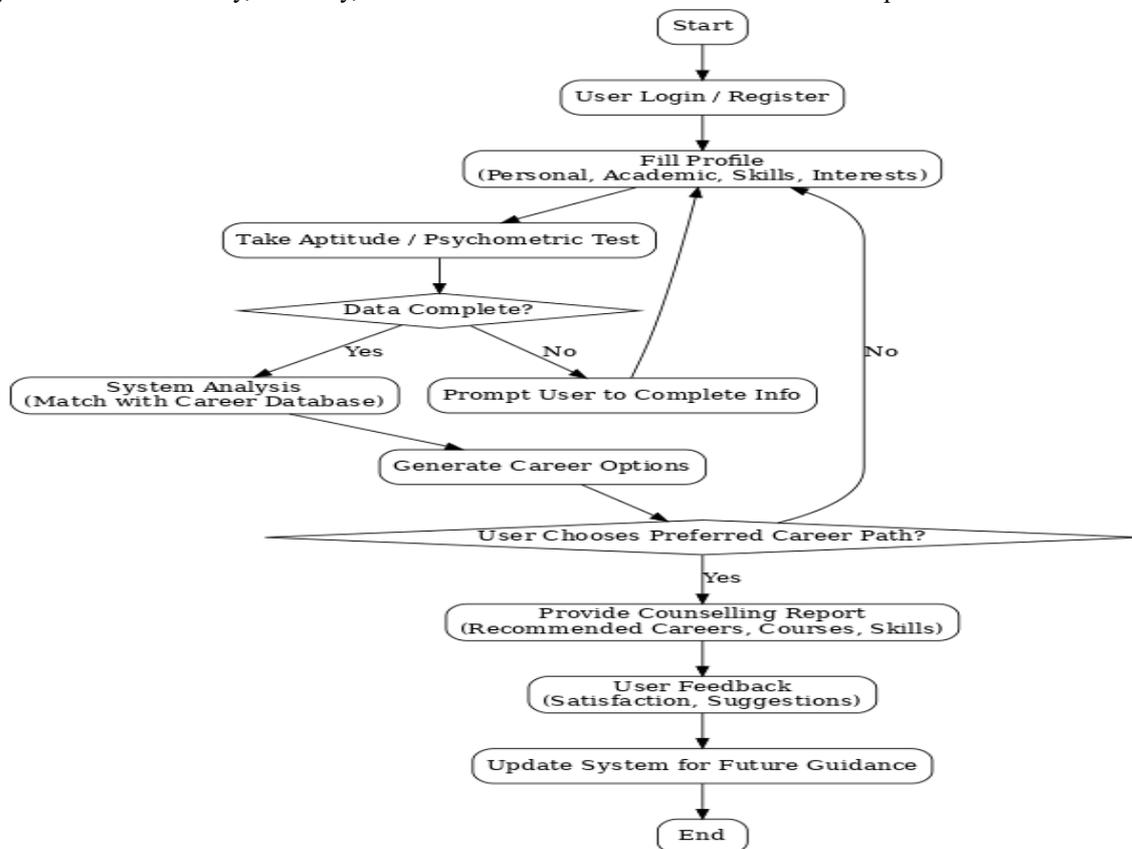


Fig.3.1 Work Flow Diagram

1) User Login / Register:

Process starts when the user logs in or registers into the system and creates an account.

2) Fill Profile Information:

The user enters personal details such as personal information, academic background, skills, and interests.

3) Aptitude / Psychometric Test:

The user takes an aptitude or psychometric test to evaluate abilities, personality traits, and strengths.

4) Data Completion Check:

The system checks whether all required information is complete. If data is incomplete, the system asks the user to fill the missing details.

5) System Analysis and Career Option Generation:

The system analyses the user's profile and test results and matches them with the career database to generate suitable career options.

6) Career Selection and Counselling Report:

The user selects the preferred career path. The system then provides a counselling report with recommended careers, courses, and skills, collects user feedback, updates the system, and ends the process.

4. RESULT AND DISCUSSION

This chapter presents the outcomes of implementing the AI Based Career Counselling system and discusses the effectiveness of the developed solution. The results focus on the system's functional outputs, quality of career recommendations, and overall performance observed during testing and evaluation. The discussion highlights how well the system meets the project objectives and addresses the identified problem statements.

System output screenshots are used to visually demonstrate the functionality and user experience of the AI Based Career Counselling platform. These screenshots provide concrete evidence of successful implementation and illustrate the workflow of the system from user interaction to recommendation delivery. The captured outputs represent key system interfaces and functional milestones.

The screenshots typically include the **user registration and login interface**, showing the ease of onboarding and secure access mechanisms. This demonstrates that users can create accounts and access personalized services. The **profile management screen** displays how users input and update academic background, skills, and interests, validating that the system captures comprehensive profile data required for accurate recommendations.

The **assessment interface screenshots** showcase the aptitude and interest tests, illustrating the interactive and user-friendly design of the questionnaire module. Progress indicators and validation messages visible in the screenshots confirm that the assessment workflow is intuitive and responsive. The **assessment result screen** demonstrates how scores and insights are presented to users, helping them understand their strengths and areas for improvement.

The most critical screenshots include the **career recommendation dashboard**, which displays personalized, ranked career suggestions along with compatibility scores and explanatory insights. These screenshots visually confirm the successful integration of the AI recommendation engine and the frontend dashboard. Additional screenshots of the **career details view** show how users can explore individual career options, required skills, learning pathways, and growth prospects. Screenshots of the **admin panel** demonstrate content management and system monitoring functionalities, validating the completeness of the implementation.

The discussion of screenshots highlights that the system outputs align with functional requirements and provide a coherent, user-friendly experience. The visual evidence confirms that the platform supports end-to-end career counselling workflows, from data input to actionable guidance delivery.

5. CONCLUSION

This project presented the design and development of an AI Based Career Counselling system aimed at supporting students in making informed and personalized career decisions. The work began with a detailed analysis of challenges in traditional career counselling, such as limited personalization, restricted access to professional counsellors, and difficulties in navigating a rapidly

evolving career landscape. Based on these challenges, the project proposed an intelligent, automated platform that leverages artificial intelligence and machine learning to deliver scalable and data-driven career guidance.

The system was designed using a modular architecture consisting of a user interface layer, application logic layer, AI/ML processing layer, and database layer. Functional modules such as user registration, profile management, aptitude and interest assessments, career recommendation engine, guidance dashboard, admin management panel, and counsellor module were implemented. The methodology covered data collection, preprocessing, feature selection, model training, recommendation logic, and system implementation workflow. Comprehensive testing and validation ensured that the system functions reliably and meets functional and non-functional requirements. Overall, the work demonstrates a complete end-to-end implementation of an AI-driven career counselling platform.

6. ACKNOWLEDGMENT

It gives us immense pleasure to express our gratitude to **Prof. Monika Shirbhate**, our guide who provided us constructive criticism and positive feedback during the preparation of this project. We are indebted to **Dr. Priti Khodke**, Head of Department, Information Technology and other teaching and non-teaching staff who were always there whenever we needed any help. Without them and their co-operation, completion of this project work would have been difficult. Most importantly, we are thankful to our parents, who constantly motivated us during this work.

7. FUTURE SCOPE

The development of the AI Based Career Counselling system provided valuable learning experiences across technical, analytical, and project management domains. The project involved hands-on experience with data preprocessing, feature engineering, machine learning model selection and training, system architecture design, backend and frontend integration, and comprehensive testing and validation. These experiences strengthened understanding of how AI models can be integrated into real-world applications and the importance of balancing technical accuracy with user-centric design.

The project also highlighted practical challenges such as data quality management, model interpretability, system scalability, and security considerations. Addressing these challenges provided insights into real world constraints of deploying AI-driven systems and emphasized the importance of continuous monitoring and improvement.

In terms of future scope, the project provides a strong foundation for further enhancements. Potential extensions include AI-based resume analysis, personalized career roadmap generation, chatbot-based guidance, mobile application development, integration with job portals and educational institutions, and bias reduction mechanisms to enhance fairness. Incorporating real-time labour market data and expanding training datasets can further improve recommendation accuracy and relevance. These future enhancements can transform the platform into a comprehensive career planning and development ecosystem, supporting users throughout their academic and early professional journeys.

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