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Making Career Choices and Ai Based Career Counselling Model

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ABSTRACT

Many advanced secondary students struggle to secure suitable employment during or after completing their education, which is a critical factor for long-term career satisfaction and personal fulfilment. This mismatch between students' capabilities and their eventual career paths often leads to disengagement, lack of motivation, and unproductive professional lives. One of the core reasons behind this issue is the absence of structured and effective career guidance within educational systems. Career development services are either inadequate or inaccessible to many, leaving students to make uninformed decisions based on limited exposure or social pressure. In this context, Artificial Intelligence (AI) offers a transformative solution. With its ability to simulate expert-level interactions and deliver tailored guidance, AI can bridge the gap left by the shortage of qualified career counsellors. By analyzing a student's interests, strengths, preferences, and even behavioral patterns, AI-powered systems can offer personalized career recommendations and learning pathways. This technology is especially beneficial in resource-constrained settings where human guidance is limited or unavailable

Keywords: *AI-based guidance, individualized career planning, aptitude evaluation and informed. .*

1. INTRODUCTION

As students begin to contemplate their future careers, secondary school becomes a defining period that shapes their academic and professional trajectories. This phase is not just about academic growth but also about forming aspirations, setting goals, and identifying pathways to achieve them. Ideally, it should be one of the most empowering and enlightening stages of a student's educational journey. However, for many students, it turns out to be a period of confusion, indecision, and missed opportunities due to the lack of personalized and structured career guidance [1].

In many education systems, especially in developing regions, career counselling services are either non-existent or extremely limited. The few interventions that do exist are often generic and fail to address the unique strengths, interests, and aspirations of individual students. As a result, students make arbitrary decisions based on peer influence, parental pressure, or incomplete information. This not only affects their academic motivation but also leads to long-term dissatisfaction in their professional lives. The absence of timely and informed career guidance is not just an educational issue, it has larger implications on societal well-being, economic development, and mental health [2].

Recognizing this critical gap, the problem statement highlights the urgent need to incorporate AI-based solutions to democratize career guidance. Artificial Intelligence has the potential to transform the landscape by offering accessible, scalable, and personalized counselling to every secondary school student, regardless of geographical or socio-economic barriers. AI tools can analyze multiple parameters such as student interests, aptitudes, academic performance, and personality traits to generate customized career pathways. More importantly, they can adapt over time, providing ongoing support and updates as students grow and evolve in their educational journey.

Moreover, AI-based career counselling can integrate with existing educational technologies, provide multilingual support, and offer engaging tools such as gamified assessments and interactive learning modules. This ensures that students are not only informed but also motivated and empowered to explore various career options confidently. Hence, implementing AI in career counselling is not just a technological upgrade, it is a critical reform in the education system that addresses long-standing issues of guidance inequality and prepares students for a rapidly evolving job market [3]

2. LITERATURE SURVEY

S.no	Title	Author	Methodology	Achievement	Limitations
1	Al Powered Career Counselling	Madhuri - Ghuge	Take the K-Nearest Neighbor (KNN) algorithm and use it to classify students' skills by looking at their academic performance and extracurricular activities. Next, use K-Means Clustering to sort students into different career paths or academic departments based on their unique profiles and skill sets.	The system is designed in a modular way, making it simple to add new features like psychometric assessments and insights from the in dustry.	The current system does not fully integrate psychometric testing personalities, interests, and emotional essential for career guidanc e
2	Artificial Intelligence based Career Guidance and Counselling Systems: an Appraisal	Tehseen Mehraj	The computing systems created with these techniques tend to be quite intricate and challenging to manage, including methods like ANN, KNN, genetic algorithms, and fuzzy logic.	To manage, including methods like ANN, KNN, genetic algorithms, and fuzzy logic.	Unfortunately, these systems often fall short of providing a one-size-fits-all solution for a broader audience.
3	Barriers and effectiveness to counselling careers with Artificial Intelligence	Rifqi Muhamm ad	ANN, KNN, and Genetic algorithms. Machine Learning is set to tackle computational intelligence tasks in a smart way (Yang et al., 2020).	This study offers an evaluation of a limited set of empirical data that specifically investigates the obstacles and effectiveness of applying artificial intelligence in career counselling. The data collection process has been completed	This study takes a close look at a limited set of real-world data, focusing on the challenges and effectiveness of incorporating artificial intelligence into career counselling.

4	A Customized Artificial Intelligence Based Career Choice Recommender System for a Rural University	Nosipho Carol Mavuso	One of the main aims of utilizing ICT based career guidance resources and services, like personalized career recommender systems	It is to assist both young people and adults in their career journeys.	When considering to decision making process, it is crucial to have a look at it from learner's viewpoint.

3. PROPOSED METHODOLOGY

1. Data Collection and Signing Up

Users' sign-up and data collection are the initial steps towards creating an AI-powered career guidance model. Prior to our offering personalized career recommendations to each user, we must collect data on each user that is needed. Utilizing libraries like React, Flutter, or even standard HTML, we build a plain, user-friendly registration form that communicates with secure backend APIs developed using Node.js or Python. When a user registers, they provide their name, age, gender (if chosen), educational level, interests, hobbies, location, preferred language, and previous career ambitions. You can be sure that all this data is safely stored to be processed later in the future in a database system like PostgreSQL or MongoDB.

2. Aptitude and Personality Test Design

The aptitude and personality test design are the second most critical step after registration.

To identify the aptitudes, abilities, and personality of the user, these tests are designed with great care as per standard psychometric practice. Logical reasoning, numerical ability, verbal ability, spatial ability, scientific aptitude, problem-solving skill, creativity, and technical ability are some of the areas covered under the aptitude tests. We utilize severed psychology models such as Holland's RIASEC Model and Big Five Personality Test (OCEAN). Besides situational judgement test, these instruments include multiple-choice questions (MCQs) and other kinds of adaptive tests, in which difficulty level changes according to input from the user. This method provides rigorous assessment of everyone.

3. ALGORITHM

1. **Gather Past Cases:** Build a rich database consisting of student profiles along with corresponding academic record, interest, aptitude test scores, professions pursued, and results.

2. Add a New Case: A new student submits their educational information, interest profiles, and aptitude test scores.

3. Case Similarity Search: Fetch the most similar case to the most recently entered in the system using a similarity algorithm.

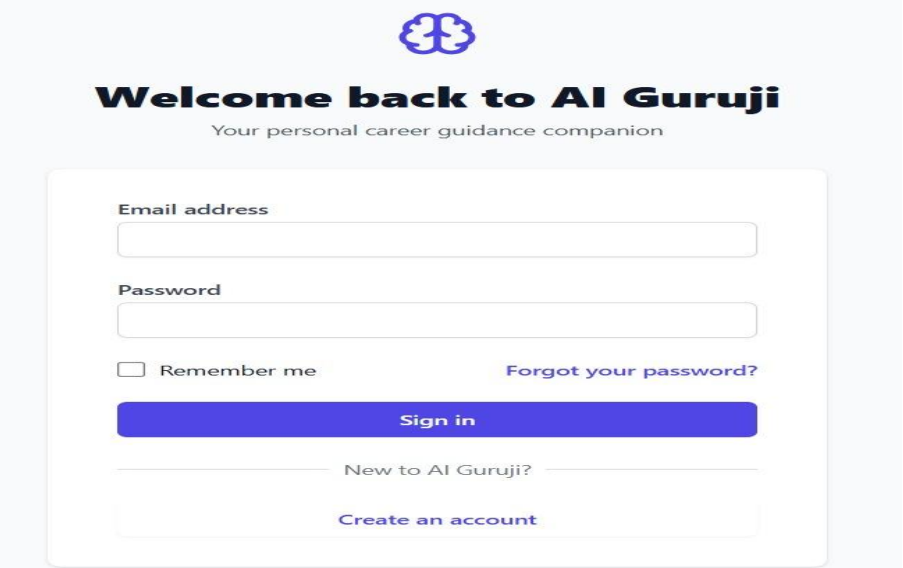
4. Use Successful Set Solutions: Provide career guidance based on the student profile which has been successful for similar students and based on the students' interests.

5. Redesign Recommendations as Needed: If the student has mentioned constraints or preferences, redesign the recommendation accordingly.

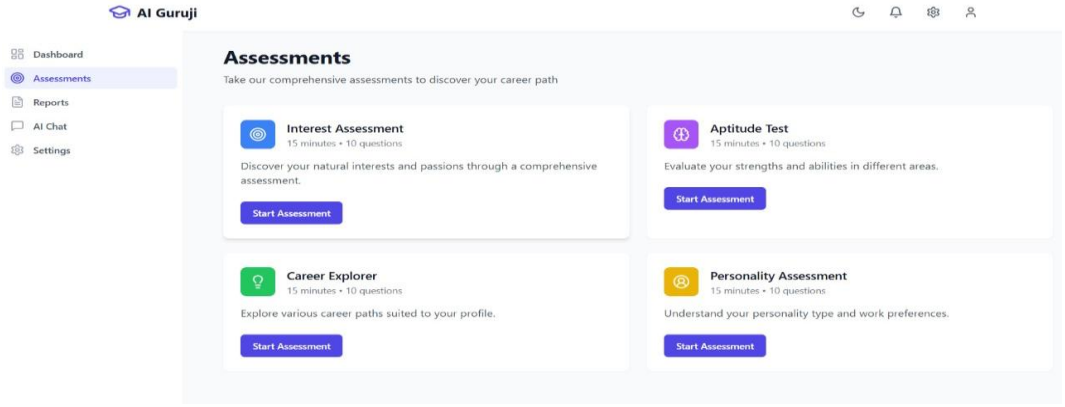
6. Save More Case Data: Edit and review the in-depth student profile and case results

4. RESULTS

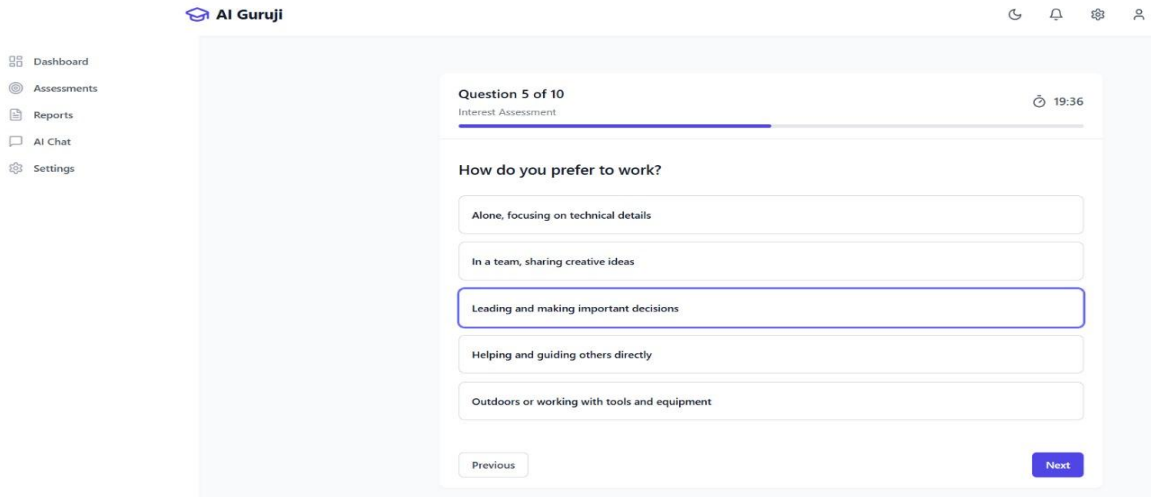
User Interface:

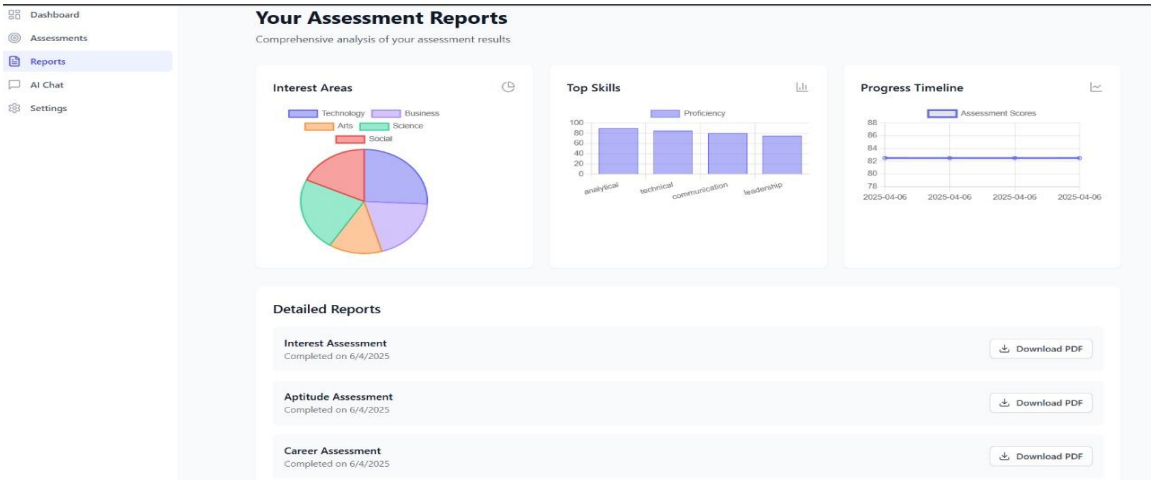


The login page encourages the user to sign in or sign up for career guidance.



The four tests include Interest, Aptitude, Career Explorer, and Personality. All of these allow users to identify the best choices and loopholes with in their abilities.





The report of assessment shows interest areas, best skills, and trends over time. Reports of Interest, Aptitude, and Career assessments are downloadable in detailed forms.

5. COMPARATIVE ANALYSIS

S.NO	MODEL	VALUES
1.	Envisioning Tomorrow: AI Powered Career Counselling	Accuracy: 83.64% Precision: 83.75% F1 Score: 83.62%
2.	Scrutinising Artificial intelligence based on career guidance and counselling systems: an Appraisal	Accuracy: 74% Precision: 0.96 F1 Score: 0.94
3.	Barriers and effectiveness to counselling careers with Artificial Intelligence: A systematic literature review	Accuracy: 92% Precision: 92% F1 Score: 92%
4.	A Customized Artificial Intelligence Based on Career Choice Recommender System for a Rural University	Accuracy: 95.46% Precision: 95.46% F1 Score: 95.46%

6. CONCLUSION

The use of an AI-based career counselling system for high school students holds much potential in overcoming the challenges that come with career counselling and making decisions. By going through a comprehensive process involving data cleaning, exploratory data analysis, model selection, training, and evaluation, we have clearly established that applying machine learning methodologies to make personalized and insightful career suggestions is not just feasible but also viable. We learned some valuable patterns and trends by carefully analyzing the data, which helped us develop our AI model. In addition, we made sure that our model was both tested on new samples and trained on a heterogeneous set of data by splitting the dataset into training and testing sets, which enhanced its ability to generalize considerably.

7. FUTURE SCOPE:

Advanced AI capabilities such as Natural Language Processing (NLP) can significantly enhance conversational interactions

by delivering context-aware and meaningful responses. More customizations can be achieved through micro-recommendations, allowing the system to suggest personalized internships, certifications, and job opportunities. Enhanced psychometric tools, incorporating gamification elements, can make assessments more engaging and enjoyable for users. Additionally, implementing a continuous upgradation strategy with an effective feedback mechanism will help refine the system based on user input, ensuring its relevance and effectiveness over time

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