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AI-Powered Psychometric Based Career Counseling: A Novel Approach to Personalized Career Guidance

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Abstract
The "Psychometric-Based Career Counselling System" is an intelligent platform designed to deliver personalized career recommendations by deeply analyzing individual traits through psychometric assessments. The system evaluates two primary dimensions PASSION (Probing, Acting, Scoping, Setting, Innovating, Owning, Nurturing) and PRUTL (Peace, Respect, Unity, Truth, Love) to create a holistic profile of the user's aptitudes and emotional attributes. Data is gathered through a carefully structured 30-question multiple-choice questionnaire, which captures essential insights into users' personalities and career inclinations. Utilizing a dynamic architecture, this application integrates an intuitive front-end interface, where users can seamlessly navigate and respond to the questionnaire. The system's core, built on a robust Node.js backend, processes each response securely, while a MongoDB database handles data storage with an emphasis on user privacy and protection. Additionally, advanced AI-driven analysis is powered by the OpenRouter API, which translates user responses into actionable career guidance tailored to their unique profiles. With a strong focus on data security and privacy compliance, this system aspires to empower users in their career paths by delivering insightful, personalized guidance based on their distinctive psychological frameworks.

Keywords: *MongoDB; Node.js; OpenRouterAPI; PASSION; PRUTL*

1. Introduction
Choosing a career is one of the most significant decisions a person makes, especially during their academic journey. Yet, for many students and young professionals, this process is filled with uncertainty. With hundreds of career options available and limited personalized guidance, it's easy to feel lost or unsure about what direction to take. Traditional career counselling systems often rely on standardized aptitude tests or predefined personality types. While these approaches can offer general direction, they usually fail to consider an individual's emotional values, motivations, and personality traits in depth. In today's world, where emotional intelligence and personal fulfillment play a huge role in long-term success, career guidance needs to be more than just skill-matching. It needs to understand who a person truly is — how they think, feel, and interact with the world around them. This is where our Psychometric-Based Career Counselling System comes into play. The system is designed to offer customized career suggestions by analyzing both behavioral traits and emotional tendencies, using modern psychometric frameworks and artificial intelligence. Our platform combines psychological assessment with technology to provide career guidance that's not only data-driven but also deeply personalized. By helping users gain better self-awareness, the system aims to reduce confusion, boost confidence, and support better career decisions [1].

1.1. Background and Motivation
Traditional career counselling methods often offer a one-size-fits-all approach, relying heavily on aptitude scores or general personality tests. While these can be useful, they usually fail to capture what truly defines

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a person — their emotional intelligence, values, and behavior. Many students end up following paths that look good on paper but don't reflect who they are inside. This mismatch can lead to dissatisfaction, poor performance, or even complete career changes later in life. We saw the need for a system that could go beyond the surface and understand individuals on a deeper level. The goal was to create a smarter career guidance solution — one that considers both the mind and the heart. By focusing on emotional traits and behavioral patterns, our system aims to provide guidance that feels not just accurate, but also personally meaningful. 1.

1.2. Objective and Scope of Study

The objective of this project is to design a career counselling system that delivers recommendations tailored to each user's unique personality and emotional traits. To achieve this, we developed a structured 30-question psychometric questionnaire based on two models: PASSION, which evaluates behavioral traits, and PRUTL, which reflects emotional values. The system is accessible through a web interface and uses technologies like React, Node.js, MongoDB, and AI integration via OpenRouter API. It aims to keep the process smooth, secure, and insightful. While the focus remains strictly on career guidance, the system ensures privacy and data security at every level. This project does not cover academic or personal counselling — it is dedicated entirely to helping users make informed and confident career choices based on who they truly are [2].

2. Method

Each question in the psychometric test is designed to reflect a specific trait from the PASSION and PRUTL models. This allows the system to assess not just skills, but also values and behavioral tendencies. Traits like "Probing" or "Unity" help capture how users think and what they prioritize in life. User responses are scored using a weighted algorithm, generating a psychometric profile that is then analyzed by the AI module. Based on this, the system suggests career paths that align with the user's personality and emotional makeup. This approach ensures that the guidance provided feels both accurate and personally meaningful [3].

Table 1 Sample Questions Mapped to Psychometric Traits

Sr. no	Sample question	Mapped trait
1.	I enjoy exploring problems from different angles before deciding.	Probing (PASSION)
2.	I value creating harmony in group discussions.	Unity (PRUTL)
3.	I often take the lead when working in a team.	Acting (PASSION)
4.	I strongly believe in being honest, even in difficult situations.	Truth (PRUTL)
5.	I enjoy planning detailed steps to reach long-term goals.	Setting (PASSION)

2.1. Tables

Table 1 showcases a sample of the psychometric questions used in the system, along with the traits they are designed to assess. Each question is linked to either a behavioral trait from the PASSION model or an emotional value from the PRUTL model. For instance, questions focusing on leadership or goal-setting reflect behavioral tendencies, while questions about honesty or harmony highlight emotional strengths. This structured mapping ensures that user responses contribute meaningfully to building a well-rounded psychological profile, which is later used for career recommendations.

2.2. Methodology

The system is structured using a modular architecture that ensures seamless interaction between the user interface, backend processing, AI analysis, and data storage. The process starts when a user accesses the web-based front-end, built with React.js, and completes the psychometric questionnaire. Upon submission, the frontend communicates with a Node.js-powered backend, which handles both request routing and validation. The backend performs two critical tasks. First, it securely stores the user's responses in a MongoDB database for future reference and analysis. Second, it sends the collected data to the AI module via the OpenRouter API. This module is responsible for interpreting the

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psychometric data using natural language processing and trait-matching logic based on the PASSION and PRUTL frameworks. Once the analysis is complete, the AI returns a personalized set of career recommendations, including match percentages and brief descriptions. These processed results are then stored in the database and made available to the frontend for display. Users can view their results through a dedicated dashboard that offers insights into their dominant traits and most compatible career paths. This architecture enables secure data flow, real-time analysis, and a user-friendly interface, ensuring an effective and responsive counselling experience, shown in Figure 1.

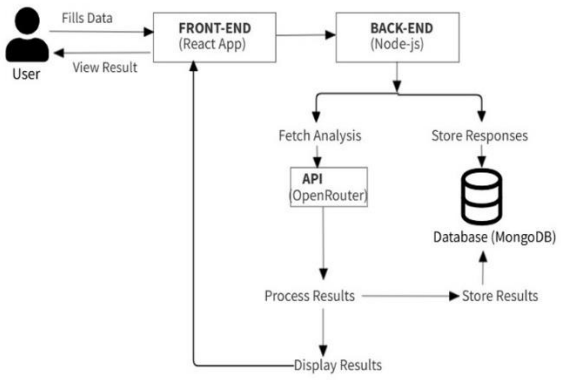

Figure 1 System Architecture

This architecture was intentionally designed to be scalable, maintainable, and efficient. By separating the concerns of front-end interaction, backend logic, and AI processing, the system ensures that each component can function independently while still contributing to a cohesive workflow. The use of RESTful APIs enables smooth communication between the modules, while asynchronous data handling allows the system to process multiple user requests simultaneously without performance degradation. Moreover, by incorporating MongoDB as the database, the system benefits from flexibility in handling structured and semi-structured data, which is essential for storing diverse user profiles and recommendation results. Overall, this architecture supports both real-time interaction and future enhancements, such as multilingual support or adaptive questioning based on user responses.

3. Results and Discussion

3.1. Results

The primary goal of the system was to provide accurate, insightful, and personalized career recommendations based on users' psychometric traits. To evaluate the effectiveness of the system, we conducted multiple test runs using mock and real user inputs to validate the accuracy and reliability of the AI-generated recommendations. The psychometric questionnaire, designed using the PASSION and PRUTL models, successfully captured a range of behavioral and emotional attributes. Once users submitted their responses, the system mapped these inputs to specific personality traits and values using a weighted algorithm. These mappings were then analyzed via the OpenRouter-powered AI module, which returned tailored career options for each user, along with a match percentage that indicated how well each career aligned with the user's profile. The test cases demonstrated consistent behavior across multiple user profiles. For instance, users who scored high in traits such as "Innovating" and "Owning" were frequently recommended roles in entrepreneurship or product design, while those with strong "Unity" and "Respect" scores were more likely to receive suggestions related to human resources, teaching, or social work. The system accurately processed and reflected variations in responses, validating the relevance of its underlying psychometric mapping and AI logic. Results were displayed to users through a dedicated dashboard, where each career suggestion was accompanied by a confidence percentage and a brief description, shown in Figure 2.

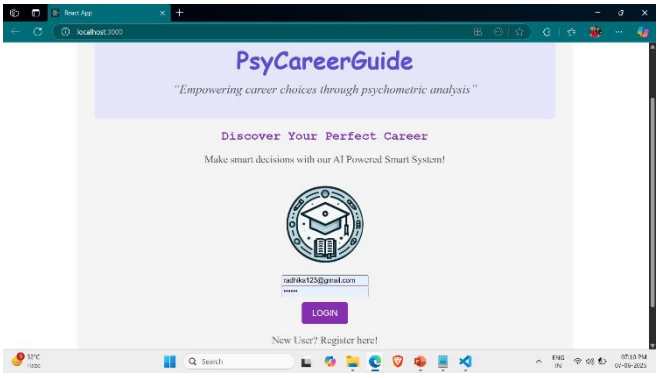

Figure 2 Landing Page

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Page No: 2524 - 2529

The system also maintained a history of test attempts, allowing users to revisit past results and track changes in their profile over time. These outcomes confirm that the system delivers consistent, interpretable, and valuable insights, enabling users to make more informed career decisions. The landing page serves as the user's entry point into the system. It provides options to log in or register and explains the purpose of the platform. The design is clean, user-friendly, and focused on guiding users into the psychometric test flow, shown in Figure 3.

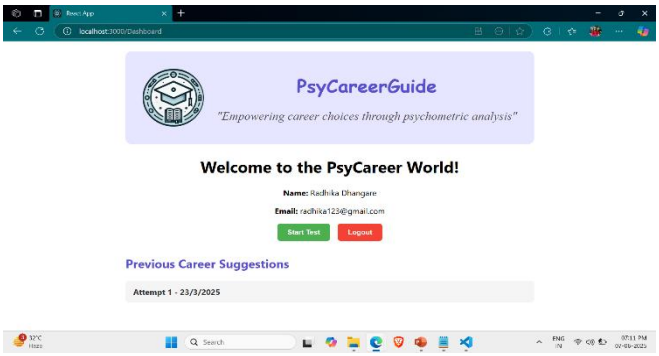

Figure 3 User Profile

The user profile page presents the user's basic information along with a detailed history of their completed assessments. It enables users to revisit previous test attempts and review the corresponding career recommendations, including match percentages and brief role descriptions. This functionality encourages self-reflection, helps users track their progress over time, and supports a more informed and personalized career planning experience, shown in Figure 4.

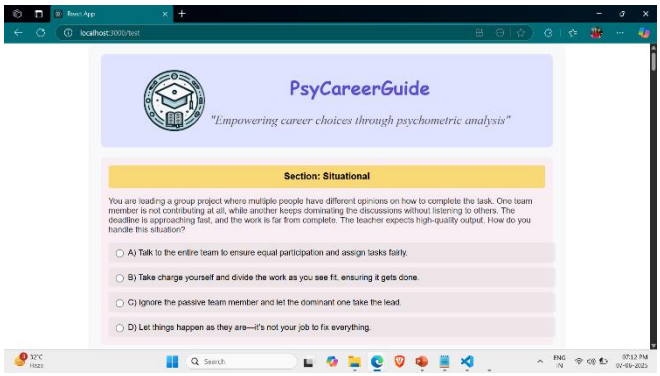

Figure 4 Questionnaire Page

This page allows users to complete a psychometric test consisting of 30 carefully framed questions. Each question is linked to specific behavioral or emotional traits using the PASSION and PRUTL models. The layout is kept clean and easy to navigate, ensuring users can focus while responding. The data gathered here is later analyzed to generate career suggestions that reflect the user's personal qualities and preferences, shown in Figure 5.

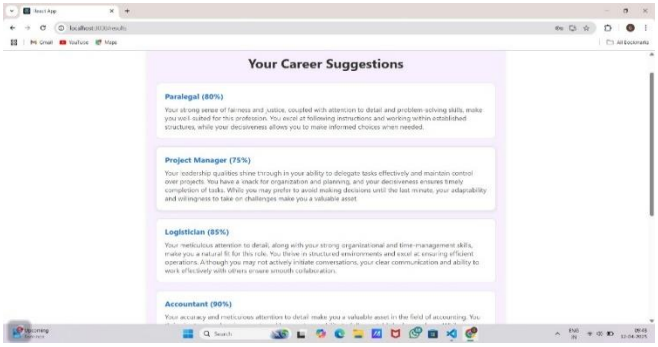

Figure 5 Career Suggestions

The career suggestions page displays personalized recommendations generated through psychometric and AI-driven analysis. Each recommendation is presented with a match percentage, offering users a sense of how closely their traits align with a given career path. Alongside the career titles, concise descriptions are provided to help users understand the nature and responsibilities of each role. This page is designed not only to inform but also to encourage reflection, helping users explore professions that genuinely fit their personality and values, shown in Figure 6.

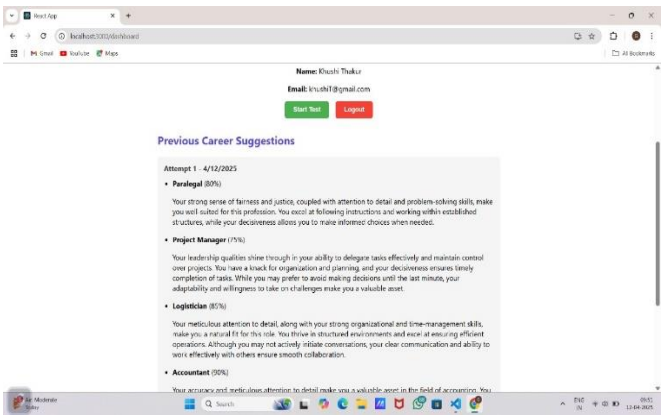

Figure 6 Historical Data

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Page No: 2524 - 2529

The historical data section provides users with access to their previous test attempts, allowing them to track changes in their career preferences over time. Each entry is timestamped and linked to the corresponding career recommendations, enabling users to revisit their psychometric insights whenever needed. This feature supports long-term reflection and self-awareness, making it easier for individuals to identify patterns, shifts in traits, or growing clarity in their career choices. By offering a chronological view of progress, the system adds depth to the counselling experience beyond a single assessment.

3.2. Discussion

The implementation and results of the system reveal a promising shift in how career guidance can be delivered using a psychometric and AI-driven approach. By interpreting users' behavioral and emotional traits through structured models, the system provides recommendations that go beyond surface-level interests. This leads to suggestions that are more aligned with the user's core personality, increasing the relevance and acceptance of the guidance offered. Additionally, incorporating emotional values through the PRUTL model added a deeper dimension to the decision-making process, showing that career alignment is not just about skills, but also about personal values and motivation. The system's ability to produce consistent, interpretable, and meaningful outcomes highlights its potential as a practical alternative to conventional counselling. The inclusion of features like test history and match percentages encourages self-reflection, enabling users to better understand their own growth and preferences over time. These insights support the idea that AI-powered, psychometric-based counselling platforms could play a key role in shaping the future of personalized career support.

Conclusion

This research addresses the limitations of traditional career counselling methods, which often fail to consider the psychological and emotional factors that influence long-term career satisfaction. The Psychometric-Based Career Counselling System offers a structured, personalized approach by analyzing users' behavioral and emotional traits using the PASSION and PRUTL frameworks. By integrating AI through the OpenRouter API, the system interprets psychometric data to generate relevant and user-aligned career suggestions. These recommendations are not only data-driven but also emotionally and behaviorally appropriate, making them more meaningful and easier for users to connect with. The system demonstrated consistent performance across various test cases, delivering accurate suggestions based on diverse user profiles. Additionally, features such as test history and result tracking help users reflect on their development over time, promoting self-awareness and informed decision-making. The platform is designed with a user-friendly interface, ensuring smooth navigation and accessibility for all users. In conclusion, the system effectively bridges the gap between traditional counselling and modern, AI-enhanced career guidance. Future improvements may include expanding the user base, refining the recommendation model, supporting multiple languages, and integrating real-time feedback to further enhance accuracy and user experience.

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