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AI POWERED CAREER GUIDANCE PLATFORM

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Abstract: Career guidance is an integral yet underrepresented part of education that helps students decide on what course they want to pursue post-secondary. In India, career guidance for students is either not available or available to only some extent because students do not have structured guidance. Moreover, the traditional career guidance is generic, sporadic, and does not cater to personal preferences of the students. This paper proposes the design and development of an Artificial Intelligence-powered Career Guidance Platform known as AI Guruji. This platform uses various features like AI, psychometric assessment, and conversation-based recommendation engines to offer personalized career recommendations to the users based on their profile and preferences. Some of the technical aspects of this platform include React18 as a frontend, Nodejs Backend, Supabase Database, and Gemini AI-powered recommendation engine. The users go through multidimensional psychometric assessments of interest, aptitude, and unconventional careers along with chatbot-powered career guidance. The user validation test revealed that most of the time students receive no career guidance at school. Moreover, all the respondents expressed an immense desire for AI Career Guidance.

Keywords – AI Career Guidance, Psychometric Assessment, Gemini API, NLP, Personalized Recommendation, Conversational Chatbot.

I. INTRODUCTION

Career decisions are some of the most crucial choices students make, but the guidance mechanisms provided to help make these decisions are inadequate within Indian schools. Students face immense pressure when transitioning from secondary school to college because of the commitment and limited information that goes into the process with insufficient self-awareness. Conventional career counseling involves one-size-fits-all methods using periodic counseling sessions from inadequately trained counselors who do not possess appropriate methods to give personalized guidance [1]. According to an IIT Kanpur study (2022), less than 10% of Indian students receive structured career counseling in school. In addition, a survey by Mindler (2021) indicates that over 75% of Indian students seek counsel from parents and peers rather than professionals, and almost 90% of students know fewer than ten careers, while over 250 career options exist in India. According to India Skills Report (2023), 47 percent of India's graduates are not employable because of incorrect career choice. Only 7 percent of rural students are provided with career guidance as against 26 percent of urban students (ASER Centre, 2023). Innovations in AI technology such as LLMs and NLP have revealed significant potential for personalized career advising. Chatbot-based counseling resulted in a 25% reduction in average wait times compared to conventional FAQ-based models [1]. MBTI-integrated profiling techniques achieved 28% higher precision levels in career recommendations [2]. On the other hand, an AI-driven advisory system achieved 32% improvements in user engagements [3]. Therefore, there is need to create an innovative AI-based solution to cater to the challenges experienced by current methods.

II. LITERATURE SURVEY

The career guidance chatbot system designed by Ohm and Bhavani [1] using Dialogflow text and voice processing capabilities showed that an Intent-Entity-Context framework can efficiently replicate the effects of career counseling in terms of both engagement and query handling. This system was not personalized and relied only on the knowledge base without considering users' profiles. Gowda et al. [3] proposed a career chatbot with the use of MBTI and OCEAN personality classifications powered by GPT-3.5 Turbo, resulting in a 32% increase in the efficiency of interaction in comparison with traditional counseling methods. Authors noted that unclear queries could be problematic but advised performing a systematic update of the chatbot's library of intents regularly. Career Compass developed by Bebale et al. [2] combined the MBTI and RIASEC frameworks to classify users and used decision trees, support vector machines, and neural networks for career prediction, showing a 28% increase in the accuracy of predictions. Lokam et al. [4] built their system with React.js, Flask, and MongoDB to achieve 85% accuracy and 82% recall, with the Marathi language support being highly beneficial for rural population comprehension. Jyotshna and Kumari [5] combined career chatbots with resume generation software, reaching 85% accuracy in career prediction and 90% ATS compatibility. Thus, the major advantages in these systems were personality profiling (MBTI, OCEAN, RIASEC), conversation-oriented AI, multi-language

options, and context consideration. At the same time, no parental involvement, lack of emphasis on rural students, and failure to track the progress over time are the problems left unsolved. They are solved by AI Guruji..

III. PROBLEM STATEMENT AND OBJECTIVES

A. Problem Statement

The students studying in secondary schools in India face a lot of problems concerning receiving customized and reliable career guidance. The types of career guidance methods that are traditionally employed do not take into consideration the individual abilities and skills of the students. Such situations lead to bad career choices by the students, hence creating an unfitting match between the abilities of the students and their chosen professions.

B. Objectives

i. To build an AI-powered system that provides personalized and adaptive career recommendations based on psychometric and aptitude assessments.
ii. To integrate skill development pathways and real-time progress tracking for holistic student growth.
iii. To provide access for students from rural and underprivileged backgrounds, ensuring equitable career guidance.
iv. To support parents and educators with transparent insights and collaborative guidance tools.
v. To guide students toward future-ready careers aligned with NEP 2020 and emerging industry trends.

IV. USER VALIDATION AND MOTIVATION

In order to verify the problem and design the system accordingly, a questionnaire was carried out among secondary level students. These results are highlighted in Table I and Figure 1.

TABLE I

User Validation Survey Results

Survey Question	Key Finding
Primary source of career advice	36.3% rely on parents/family
Confidence in choosing career path	Most rated 3/5 (mid-level)
Experience with psychometric tests	Majority have not taken any
Interest in AI-powered guidance	Vast majority said Yes
Frequency of career counseling at school	Most reported Never

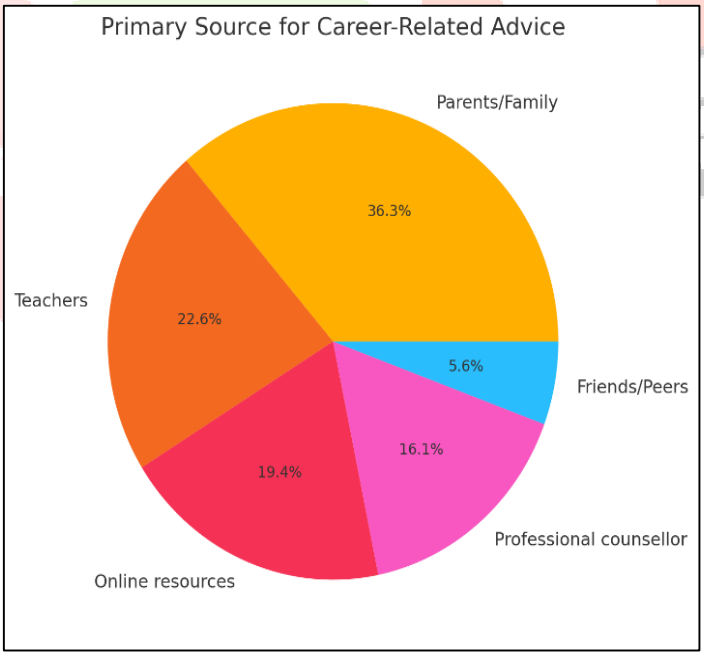

Fig. 1: User Validation Survey Results

V. SYSTEM ARCHITECTURE

The AI Guruji platform is designed as a modern three-tier system comprising a Client Frontend, an AI Recommendation Engine, and a Backend Database layer, supported by a secure Authentication Layer. The system architecture is shown in Fig. 2.

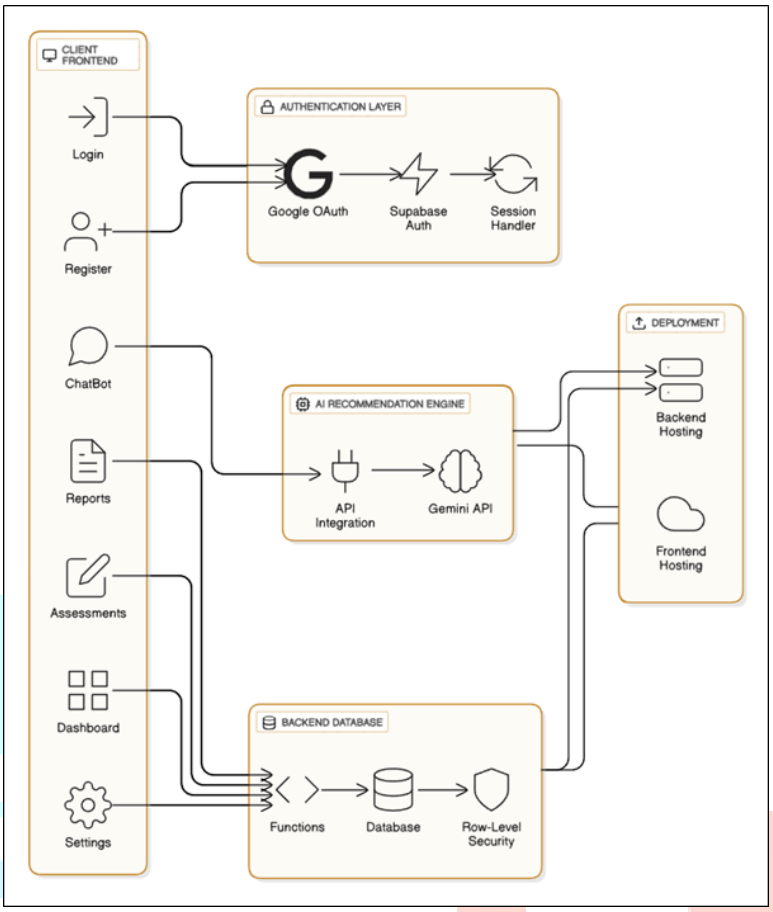

Fig. 2: AI Guruji System Architecture

A. Client Frontend

The frontend was developed using React 18, Typescript, and Vite. The frontend design and animations were achieved using Tailwind CSS and Framer Motion. This will be the primary system that the students, parents, and teachers will use to explore the different modules available such as the Login/Registration module, Assessment module, Dashboard, AI chatbot, Reporting, and Settings module.

B. Authentication Layer

The Security feature is managed through Google OAuth to provide One-Click Social Login and Supabase Auth for any other authentication besides Google. The Session Handler will handle active sessions of users and access control in all modules.

C. AI Recommendation Engine

The Gemini API analyzes information from the users' profile, their psychometrics data, the assessments they have taken, and their career interest details to provide a list of recommended careers based on ranking. The career suitability score S is calculated using the formula:

$$S = \Sigma\, w_i\, F_i \quad (i = 1 \text{ to } n) \qquad \ldots (1)$$

where w_i indicates feature weights and F_i are feature scores that are based on the assessments performed by the users. The input of the users is standardized using the formula:

$$X_{no}{}^{r}{}_{m} = (X - \mu) / \sigma$$

D. Backend Database

The database MongoDB contains information about users, their assessments, recommendations, and career libraries. Supabase is used to provide PostgreSQL with RLS (Row Level Security) for sensitive multi-user data like parental, educator, and student data.

VI. DATA FLOW

The process of transferring data within the platform is described through DFDs at two stages of decomposition. The Level 0 DFD (see Figure 3) offers a general overview of the input and output processes within the system. The Level 1 DFD (see Figure 4) demonstrates processes such as login, chat, AI recommendation, and reporting.

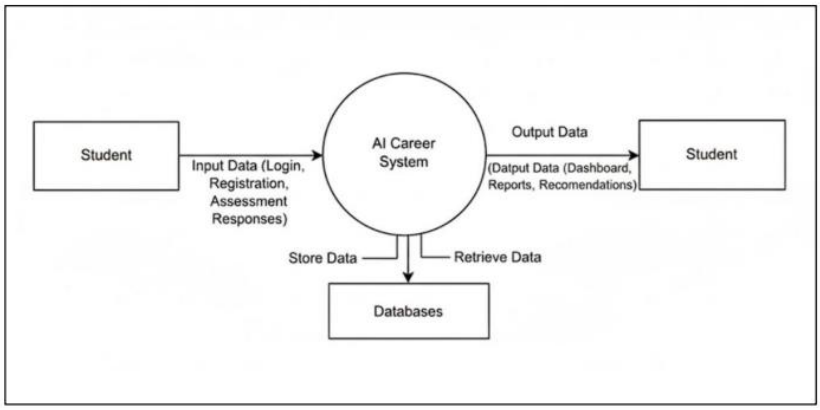

Fig. 3: Data Flow Diagram Level 0

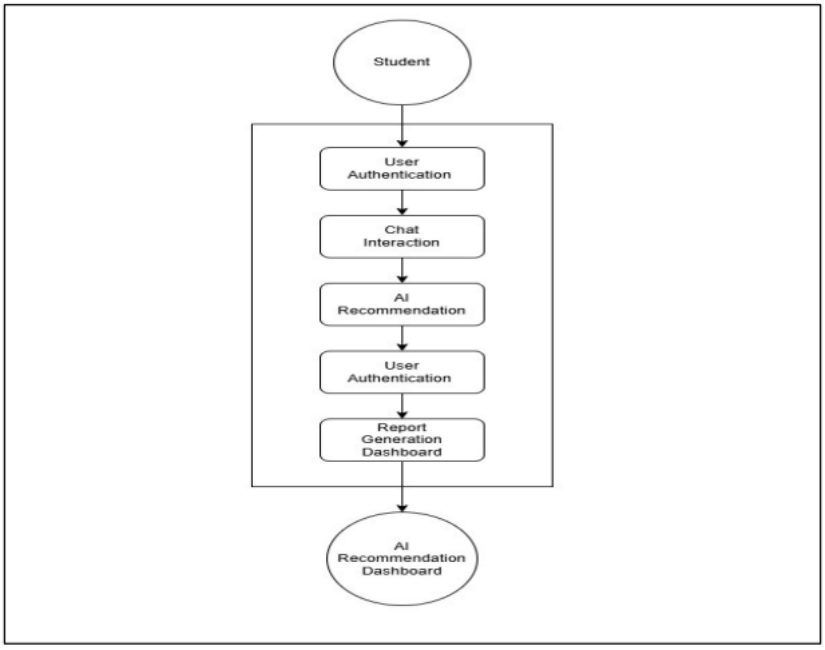

Fig. 4: Data Flow Diagram Level 1

The end-to-end user journey is as follows: User Registration → Profile Creation → Assessment using NEP → AI Model Analysis → Career Suggestion → Report Generation → Career Counselor Chatbot → Expert (optional).

VII. IMPLEMENTATION DETAILS

A. Technology Stack

The full technology stack is presented in Table II.

TABLE II

Technology

Layer	Technologies
Frontend	React 18, TypeScript, Vite, Tailwind CSS, Framer Motion, Chart.js
Backend	Node.js
Database	Supabase (PostgreSQL)
AI Engine	Gemini API (Google)
Authentication	Google OAuth, Supabase Auth
Deployment	Netlify (Frontend), Supabase (Backend)
Dev Tools	VS Code, Postman, MongoDB Compass, Git, GitHub

B. Assessment Module

The following tests are included in the evaluation system: (1) Interest Assessment test consisting of 40 questions taking 20 minutes to be answered, belonging to RIASEC categories; (2) an aptitude test comprising 50 questions needing 30 minutes to be answered that measures mental abilities; (3) Assessment for Non-Conventional Career Test consisting of 105 questions taking 25 minutes to be answered.

C. AI Chatbot

The chatbot for career guidance conversations uses the Gemini API and retains conversation context for consistency throughout different conversations. The chatbot can perform several career-related tasks like career exploration, identifying skill gaps, and inquiries about educational paths.

VIII. DISCUSSION

A. Comparison with Related Works

Table III compares the proposed platform against key related systems across critical dimensions. AI Guruji uniquely combines all key features identified as important across reviewed literature.

TABLE III

Comparison with Related Works

Feature	Ohm [1]	Bebale [2]	Gowda [3]	Lokam [4]	Proposed
AI Chatbot	Yes	No	Yes	No	Yes
Personality Profile	No	MBTI	OCEAN	No	Multi
Multilingual	No	No	No	Yes	Yes
Parent Portal	No	No	No	No	Yes
Progress Tracking	No	No	No	No	Yes
LLM Integration	No	No	GPT-3.5	No	Gemini
Rural Focus	No	No	No	Partial	Yes

B. Performance Metrics

Table IV summarizes the expected performance benchmarks aligned with related literature. The platform targets 85%+ recommendation accuracy and 90%+ user satisfaction, consistent with findings by Lokam et al. [4] and Jyotshna and Kumari [5].

TABLE IV

Performance Metrics and Benchmarks

Metric	Value / Target
Recommendation Accuracy	85%+ (aligned with [4], [5])
User Satisfaction Rate	90%+ (target, based on [4])
Average Response Time	Under 1.5 seconds
Student Interest in Platform	87%+ (from survey)
Assessment Completion Rate	Tracked via dashboard

IX. CONCLUSION AND FUTURE WORK

AI Guruji was introduced in this essay, which is an AI-based career counseling platform tailored to provide solutions to the problem of lack of career counseling among secondary-level students in India. By incorporating multi-dimensional psychometric assessment, Gemini API-based recommendation engine, AI-based chatbot, real-time monitoring system, and collaboration module for parents and teachers, this application has been developed into a scalable and inclusive career counseling platform.The idea of this application is motivated based on thorough user validation indicating that most students do not get any kind of career counseling in schools, and there is a considerable need for AI-based personalized career counseling. This platform is developed to overcome the limitation of previous researches that have been conducted in the same domain such as lack of multilingual support, parental involvement, and rural accessibility.

Future scope of improvement can be done by adding real-time labor market integration using LinkedIn/Indeed APIs, hybrid collaborative recommendation engine, automated AI-based ATS-compatible CV generation system, multilingual support for Marathi, Hindi, Tamil, Telugu languages, analytics portal for institutions, and voice-based interface.

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