SavvyAI : AI Enhanced Personalized Career Guidance System

Vishruth Ramesh
Department of CSE,
SVCE, Vidyanagar,
Bangalore, India
vishruth03ramesh@gmail.com

Vamshik Shetty R
Department of CSE,
SVCE, Vidyanagar,
Bangalore, India
vamshikshetty9472@gmail.com

Rahul M
Department of CSE,
SVCE, Vidyanagar,
Bangalore, India
rahulmdhl1625@gmail.com

Sankalp S
Department of CSE,
SVCE, Vidyanagar,
Bangalore, India
sankalps.chintu@gmail.com

Dr Hema M S
Department of CSE,
SVCE, Vidyanagar,
Bangalore, India
hema.ms_ds@svengg.in

Abstract— **One of the most important components of professional and educational development is career counseling. Conventional counseling techniques frequently fall short in offering individualized, practical advice based on each person's particular circumstances. In order to provide students and professionals with dynamic, customized career trajectories, this paper introduces SavvyAI, an AI-powered career advising system. It uses industry trends and predictive analytics to suggest customized job possibilities by combining aptitude tests, user goals, abilities, and experiences. In order to engage users at different phases of their career journey, the system integrates an intuitive, user-friendly interface that provides them with clear development prospects and actionable insights.**

Keywords— ***Personalized Guidance, Chatbot, Artificial Intelligence, Skill Development, Data.***

I. INTRODUCTION

Although career planning has long been a key component of both professional and personal growth, conventional career counselling techniques frequently fail to meet the varied and changing needs of people. Standardized aptitude tests, generic guidance, and inflexible frameworks are usually the mainstays of conventional approaches, which ignore individual backgrounds, distinct goals, and the dynamically shifting nature of contemporary industries. People frequently lack specific, useful insights into their possible professional prospects as a result of this lack of individualized assistance.

The shortcomings of these conventional methods have been made clear in recent years by developments in technology and a more complicated labour market. Many still use a one-size-fits-all approach, providing general advice without completely adjusting to the unique requirements of each industry and the complex objectives of individuals, even though some more recent solutions make use of digital resources. This demonstrates the pressing need for a change to more dynamic, individualized career counselling techniques that match individual goals with the changing demands of the business.

By launching an AI-powered career guidance system that transforms career planning through increased efficacy and customization, our solution closes this gap. With its dynamic aptitude tests, real-time industry trend analysis, and tailored recommendations, this system goes above and beyond conventional methods. It provides users with information about their areas of strength, pinpoints skill gaps, and creates career trajectories that support their objectives. Our solution empowers people to make educated decisions and confidently navigate their professional paths by combining cutting-edge technology with an intuitive interface to provide clear and useful recommendations.

The AI-powered solution accepts the needs of a quickly changing labour market while simultaneously addressing the drawbacks of conventional career advising. To ensure that customers receive current advice that is in line with new prospects, it regularly adjusts to changes in the industry by utilizing machine learning algorithms. Our solution gives users a thorough picture of in-demand skills, expected industry changes, and growth trajectories by combining data from multiple industries, empowering them to make informed career decisions. In a time when the rate of technological development and industry change may make or break career decisions, this adaptability is essential. Additionally, the user-friendly interface is made to appeal to a wide range of users, from seasoned professionals looking for new paths to students investigating possible occupations. This wide accessibility guarantees that everyone attempting to negotiate the intricacies of the contemporary workplace will have easy access to individualized career counselling, making it no longer a privilege.

II. LITERATURE REVIEW

Westman et al. explore the potential benefits of artificial intelligence for career counselling and support, with a focus on its application in professional and educational growth. Artificial intelligence has the potential to bridge the skills gap between education and employment by promoting lifelong learning, helping individuals identify their abilities, and aligning them with shifting labour market demands. Using models such as the VAK learning styles and the Big Five personality traits, the system provides personalized employment recommendations and connects users with career pathways that match their learning preferences and skill set. To ensure a successful and well-rounded approach to career guidance, however, ethical concerns such as data protection and the need to maintain a "human touch" in counselling emphasize that AI should supplement human advice rather than replace it.[1]

Le Hoanh Su et al. examine an AI chatbot that may be used around-the-clock to provide consistent and efficient

answers to frequently asked questions, streamlining admissions and career counselling. The chatbot uses machine learning and natural language processing (NLP) to understand user inquiries and deliver pertinent answers based on a structured dataset. By matching each student's profile with the chatbot's recommendations, personality-based career matching principles are successfully incorporated to provide personalized counsel. The relevancy and efficacy of the system are increased when machine learning algorithms validate the chatbot's responses.[2]

Bagai, Mane et al. propose an AI-powered mentorship platform aimed at promoting career advancement, skill development, and work-life balance. Using user profiles, learning preferences, and previous interactions, this platform customizes its recommendations. NLP and machine learning enable the platform to adapt dynamically to the requirements and preferences of users. Data privacy and algorithmic bias are two ethical and implementation issues that emphasize the necessity of fair and transparent AI systems in order to gain user confidence. All of these studies show how AI-based systems can improve career counselling by offering personalized recommendations, increasing productivity, and helping professionals and students find career options that fit their unique interests and abilities.[3]

Monreal, Palaoag et al. explore how AI may improve job counselling for Philippine K–12 students. using evaluating student data, AI can increase the effectiveness of coaching, facilitating better academic and professional decisions, as demonstrated using a mixed-methods approach. Logistical problems in remote places and a lack of qualified counsellors were identified as challenges. The study emphasizes how AI could enhance conventional counselling by offering more precise and tailored job advice.[4]

Mehraj, Baba et al. examine several AI-powered career counselling programs, highlighting how they might automate and expedite the process of choosing a career. Unlike conventional techniques, AI tools like machine learning and neural networks provide reliable, rapid, and scalable instruction. Developing solutions that cater to the many demands of students is still difficult, though. The study emphasizes how, in order to take a more comprehensive approach, AI frameworks must take personality features into account.[5]

Muhammad et al. provides a comprehensive review of AI in career counselling, identifying major obstacles like the replication of human intuition and technical dependence. AI works well for giving real-time, tailored advice and expanding access to disadvantaged areas in spite of these obstacles. This paper emphasizes how AI might increase career counselling's effectiveness and accessibility, but careful application is required to ensure dependability.[6]

Dalvi et al. present a chatbot-based career advising system that predicts appropriate career routes using deep neural networks (DNNs) and natural language processing (NLP) is presented. Data from extracurricular activities, family history, and academic records are combined to create a comprehensive perspective. The chatbot evaluates user responses to a web-based questionnaire to determine their personality, interests, and abilities, then matches the results with job fields. Using dynamic, data-driven methodologies, the system provides accurate and easily accessible real-time suggestions, validated by comparisons with experienced counsellors.[7]

Jawhar et al. develop an AI system to provide high school students with individualized career and college advice. An AI module evaluates information gathered from a questionnaire on personality traits, hobbies, academic achievement, and financial concerns to suggest appropriate college programs and job pathways. While taking employment market trends into consideration, the system produces customized recommendations, such as recommended majors and skill gap evaluations. By matching possibilities with students' interests and strengths, machine learning algorithms increase decision-making satisfaction and confidence.[8]

Potnuru et al. introduce the Career Compass system, which directs users toward appropriate jobs using sophisticated algorithms and tests such as the Big Five qualities. It uses machine learning to increase accuracy by customizing recommendations according to preferences, salary, and skill levels. A work role catalog and recommendations for skill improvement are features that enhance career exploration. It enables users to effectively make well-informed professional decisions by combining AI and feedback.[9]

Prathibha et al. discuss CareEx, a system that helps students choose jobs and estimate their eligibility for college by using machine learning techniques like decision trees, random forests, and KNN algorithms. In order to recommend linked pathways and forecast university entrance probability based on academic achievement, it assesses strengths, capabilities, and gaps. The system emphasizes both career alignment and academic opportunity projection, and it comes with tools like a career dendrogram for exploring choices and structured coaching based on user preferences.[10]

Shilaskar et al. present a system for individualized career counselling that blends conversational AI and machine learning. A K-Nearest Neighbours (KNN) algorithm uses students' academic backgrounds, interests, and talents to predict jobs with 97% accuracy. The system has a chatbot that uses RASA NLU to respond to questions about careers and offer personalized advise. Through the integration of data analysis and natural language understanding, the platform guarantees accessibility and engagement while assisting students in making well-informed decisions.[11]

Ghuge et al. describe a career counselling system that uses machine learning algorithms including KNN, SVM, and AdaBoost to assess students' extracurricular and academic accomplishments. It offers tailored career advice, such as creative occupations for students who thrive in the arts or leadership positions for kids who have excellent cooperation abilities. To reduce the possibility of misalignment and enhance decision-making, the system uses hybrid techniques such as content-based filtering. The tool helps students match their strengths with job possibilities and cultivates self-awareness.[12]

Pallavi et al. use advanced machine learning algorithms like Cat Boost, AdaBoost, and XGBoost to develop a system that classifies jobs into industries such as IT, education, and business. With the highest accuracy of 94.7%, Cat Boost was the model of choice. To provide accurate employment recommendations, the system evaluates technical talents, communication abilities, and academic performance. It helps students make informed career decisions that are in line with their skills by finding important traits through correlation analysis and thorough validation.[13]

Dolhopolov et al. present a neural network model for career advising that employs a multi-label classification strategy. To forecast appropriate job pathways, the Fully Connected Feed-Forward Neural Network (FNN) examines 29 input characteristics, such as personality qualities and age. By connecting user attributes with expert choices, the AI system provides tailored recommendations that have been verified by a wealth of empirical data. The method seeks to assist students in finding professions that complement their interests and abilities.[14]

José-García et al. develop C3-IoC which is an AI-based tool designed for IT career counselling that uses text analysis and machine learning to connect student talents with professional responsibilities. Through CV processing and self-assessments, it creates a skill profile by combining information from job advertisements and the O*NET database. The approach helps students understand how their skills correspond with the job market by visualizing their fit. Feedback emphasizes how well it works to give students individualized career guidance and raise their understanding of the demands of the labour market.[15]

Gedrimiene et al. examine an AI-enhanced learning analytics tool designed to aid in professional decision-making. The program supports self-reflection and decision-making by offering tailored job recommendations based on user preferences and prior schooling. Although consumers pointed up a need for more customisation, it provides advantages including broadening job opportunities and assisting in well-informed decision-making. By providing customized, data-driven insights, the tool shows promise in assisting with job changes.[16]

AI-powered career counselling systems have advanced, but there are still a number of issues that prevent them from providing genuinely tailored and useful advice. Current systems usually don't fully integrate user data, and they typically overlook important aspects like goals, aptitude, prior experiences, and special skills. Because of this data profile gap, general employment recommendations are made that could not perfectly suit each person's demands. Furthermore, the lack of sophisticated evaluations may result in simplistic career recommendations that ignore the complexity of each person's professional objectives.

Furthermore, because of their limited ability to dynamically adapt to changing market trends and work requirements, many of these systems find it difficult to keep up with changes in the industry. Career recommendations may become more relevant with the use of a predictive analytics framework that foresees future possibilities and skills that will be required. The lack of emphasis on skill development is another significant drawback; although existing systems might recommend possible career routes, they hardly ever offer tools or practical advice to help users fill skill gaps and progress in their careers.

Because interactive features like real-time feedback or gamified aptitude testing are rarely used, the static structure of many user interfaces further reduces engagement. More dynamic interfaces that are suited to a variety of audiences are necessary to improve accessibility and user interaction. Finally, the system's ability to improve iteratively is limited by the absence of a strong feedback mechanism. Over time, allowing users to provide input or identify errors can greatly improve the precision and flexibility of job recommendations.

III. Methodology

The AI-powered career assistance system was built using a methodical approach, beginning with user registration and data collection. Users enter important details such basic profiles, educational background, career goals, and preferences through an intuitive interface. This phase, which is shown in *Fig. 1*, collects a lot of information to support aptitude and competency testing. The system ensures accessibility by lowering complexity, encouraging engagement, and helping users in a straightforward process.
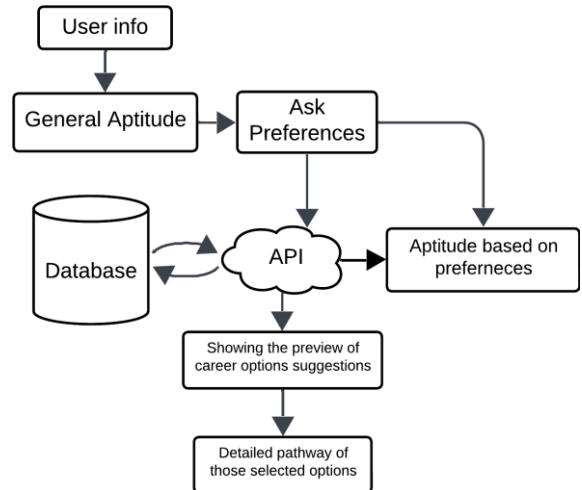

Fig. 1. SavvyAI's Architecture.

After gathering user data, the system assesses the individual's innate skills and talents using an AI-Driven Aptitude Assessment. The aptitude test uses sophisticated models driven by OpenAI's ChatGPT API to dynamically create customized questions that focus on verbal, logical, and mathematical reasoning abilities. A customized insight of the user's potential is produced by analysing this data in conjunction with their preferences. As seen in *Fig. 1*, the results are safely kept in a centralized database, guaranteeing effective administration and retrieval.

The solution incorporates Real-Time Career Mapping and Recommendation Generation after the aptitude test, using data analytics to develop customized career pathways. By matching user input with current industry trends and skill needs, career recommendations are produced. This is accomplished by making API calls that get pertinent information, guaranteeing that recommendations stay up to date. As shown in *Fig. 1* and *2*, users can sample career alternatives, including work duties, necessary skills, and growth potential, and they can also get advice on how to fill up identified skill gaps using specific resources.

The technology finds skill shortages and suggests resources like NPTEL courses and other upskilling alternatives in the following step, the Personalized Learning Journey. By offering users practical ways to improve their skills, this tool helps them reach their career goals. Continuous checkpoints are used to track progress, allowing users to adjust their objectives in response to feedback and new information, guaranteeing alignment with both personal ambitions and changing market demands as shown in *Fig. 2*. In addition to offering continuous direction, these checkpoints enable prompt modifications, guaranteeing that the learning route stays interesting and pertinent as users work toward their professional goals.
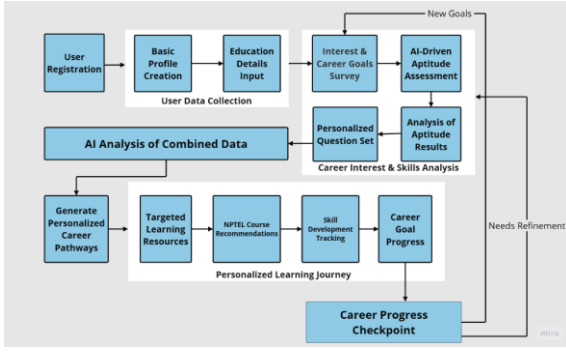
Fig. 2. SavvyAI's Guidance Framework.

Lastly, a feedback and iterative refinement mechanism is incorporated into the system, which gradually increases the precision and applicability of career recommendations. The system can improve its predictive models and suggestions by getting input from users on the recommendations. As seen by the intricate flow diagrams, this iterative loop guarantees that the system adjusts dynamically, staying efficient and sensitive to shifting user profiles and labour market demands.

In this project, we propose an AI-enhanced career guidance system by utilizing the OpenAI GPT-4o model. With its multimodal capabilities, which allow it to process and produce text, audio, and visual input, GPT-4o represents a significant development in artificial intelligence. This enables the system to comprehend a variety of user inputs and provide more accurate and individualized career advice. By employing specialized "experts" for various tasks, the model optimizes processing efficiency through the use of a Transformer architecture in conjunction with a Mixture of Experts (MoE) method. GPT-4o's estimated 1.8 trillion parameters enable it to learn intricate patterns across a variety of modalities, which makes it ideal for the multimodal interactions in our project. The model's enormous processing power and capacity to handle complex data are attributed to its eight models, each of which has 220 billion parameters.
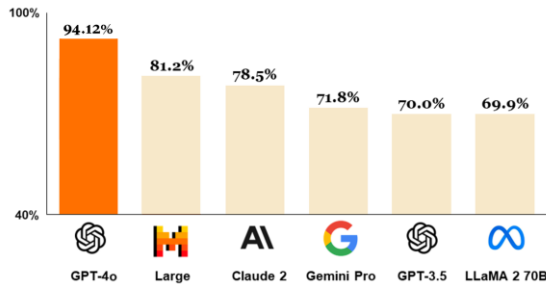

Fig. 3. Accuracy of GPT-4o vs. Other AI Models.

When compared to previous models, the GPT-4o model exhibits notable gains in accuracy and performance. In Optical Character Recognition (OCR) workloads, it outperforms its predecessor, GPT-4V, by 10.8%, with an average accuracy of 94.12%, is shown in *Fig. 3*. Furthermore, the model creates content with a coherence score of 89.3% and a relevance score of 92.5%, demonstrating that it generates responses that are highly contextually appropriate and aligned. With an average reaction time of 320 milliseconds, the increased processing speed considerably improves the model's efficacy and efficiency in producing precise, timely career advice. The Table I below illustrates how GPT-4o performs better than a

number of top AI models on a variety of benchmarks when compared to other models available on the market:

TABLE I. COMPARATIVE PERFORMANCE OF AI MODELS ON VARIOUS BENCHMARKS

Model	MMLU	GPQA	HumanEval	MGSM
OpenAI GPT-4o	88.7	53.6	90.2	90.5
OpenAI GPT-4 Turbo	86.5	49.1	87.6	86.6
Google PaLM 2	84.5	45.7	85.3	87.5
Anthropic Claude 2	82.6	43.5	84.0	85.9
BERT-Large	70.3	40.2	78.5	74.0
LLaMA 2	79.4	44.1	82.6	83.2
Meta OPT	72.6	41.0	78.2	76.3

These improvements in multimodal processing, accuracy, and speed confirm how well GPT-4o supports the customized career counselling system. The methodology guarantees that consumers obtain customized job recommendations based on a variety of inputs by combining text, voice, and visual data. With its wide range of parameters and unified model architecture, GPT-4o's sophisticated machine learning algorithms enhance the system's capacity to produce logical and trustworthy results, making it the perfect tool for assisting users in navigating their individual career paths.

IV. RESULT

The results describe the AI-enhanced implementation in a dynamic platform and the career recommendation process.
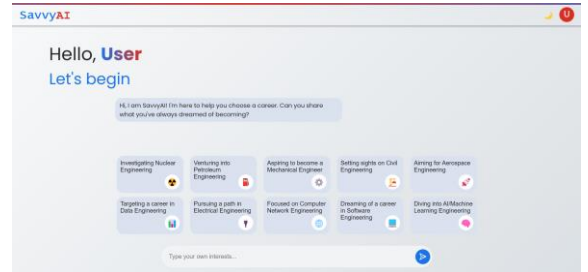

Fig. 4. Chatbot Interface.

The main tool for user engagement, the chatbot interface, is shown in *Fig. 4*. In addition to exploring possible career routes and answering questions about their aptitude results or interests, users can also ask questions about career assistance. The chatbot makes difficult material easier for customers to understand while guaranteeing an enjoyable and user-friendly experience.
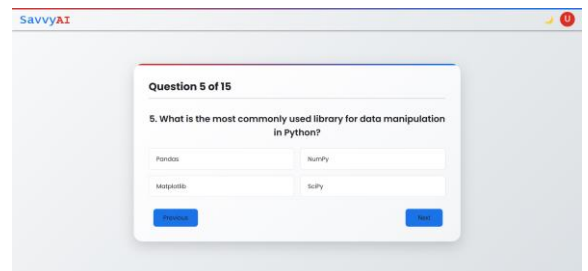

Fig. 5. Aptitude Assessment.

An aptitude test measuring the user's verbal, logical, and numeric reasoning abilities is shown in *Fig. 5*. According to the user's profile, these questions are dynamically generated. AI is then used to match the user's talents with appropriate career options. Furthermore, the system offers instant feedback, which assists users in determining their areas of strength and growth.
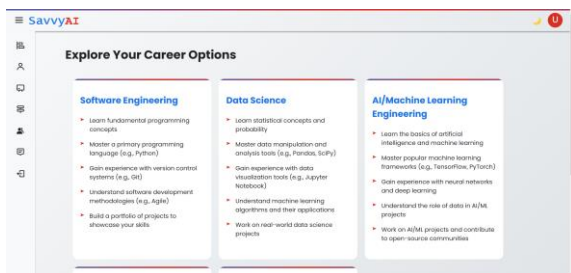

Fig. 6.   Career Options.

The job alternatives that are recommended to users based on their aptitude, preferences, and interest questionnaires are displayed in *Fig. 6*. In order to give consumers a thorough perspective on their options, each proposal contains a thorough summary of the career, including necessary skills, employment role, earning potential, and growth chances.
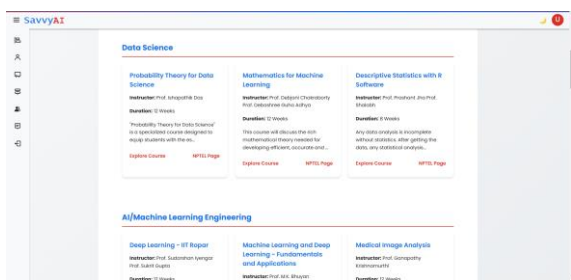

Fig. 7.   Learning Resources.

The learning materials incorporated into the platform to fill up the skill gaps found throughout the study are highlighted in *Fig. 7*. To ensure ongoing learning and advancement, the platform suggests skill development resources and specific courses, such NPTEL modules Coursera, Udemy and YouTube courses, based on the user's chosen career.
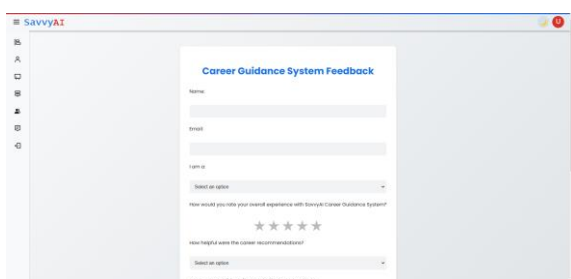

Fig. 8.   Feedback Form.

The feedback form, which gathers user opinions on the applicability and correctness of the offered career recommendations, is shown in *Fig. 8*. For the AI algorithms to be improved and the system's recommendations to get better over time, this feedback is essential. Additionally, it enables the system to improve tailored recommendations, guaranteeing that they continue to be in line with the changing demands of each user and the changing current job market.

V. FUTURE WORK

Provide resources for career development, such as skill certification courses, networking advice, interview techniques, and resume-building tools.

AI-powered professional coaching and mentorship services should be made available to offer individualized advice and methods for career progression.

Real-Time Career Simulation: Use a virtual reality (VR) or gamified simulation tool to provide users a better knowledge of employment tasks and responsibilities by allowing them to experience a "day-in-the-life" of different jobs.

AI Career Models with LinkedIn Integration: Use LinkedIn's API to evaluate user profiles, connections, and job advertisements in order to deliver real-time career insights.

Incorporate more AI-powered career models to increase the precision of recommendations and link users to pertinent professional networks and employment openings.

VI. CONCLUSION

In conclusion, by using AI to generate personalized suggestions based on a user's education, career objectives, and existing skill sets, SavvyAI transforms career counselling. The platform offers targeted upskilling possibilities, such pertinent courses and certificates, to assist users overcome skill gaps and progress toward their chosen professions, going beyond simple advising. Career recommendations are kept current and useful by SavvyAI's continuous adaption to user progress and industry changes. Finally, the system gives people the ability to improve their skill sets, make well-informed career decisions, and have more job satisfaction.

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