World Journal of Advanced Engineering Technology and Sciences

eISSN: 2582-8266

Cross Ref DOI: 10.30574/wjaets

Journal homepage: https://wjaets.com/

(RESEARCH ARTICLE)

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Develop effective career counselling and guidance online platform to enhance student career choices

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World Journal of Advanced Engineering Technology and Sciences, 2025, 15(01), 720-728

Publication history: Received on 28 February 2025; revised on 07 April 2025; accepted on 10 April 2025

Article DOI: https://doi.org/10.30574/wjaets.2025.15.1.0278

Abstract

The adoption of Artificial Intelligence (AI) and Machine Learning (ML) technologies has actually transformed an entire face of education and career counselling. It involves the design and impact on an AI-enabled online career content, guidance, and consultation system for academic and non-academic career aspirations. Most conventional counselling services provide emphasis on academic routes, whereas the above-mentioned one completely focuses on vocations unconventional as creative arts, entrepreneurship, or skilled trades, still endorsing academic aspirations. This is a highly sophisticated AI system for personalizing recommendations, career plans, and real-time feedback to user goals, skills, and interests. It makes a fully inclusive and adaptable system that enables users to make informed decisions about their futures. The study included in this paper will investigate platform design and research integration implementation challenges, user engagement metrics, and the effect of the system on users' improved career readiness. Preliminary findings indicate that the users experience better decision making, more satisfaction, and increased awareness of career alternatives. The platform not only improves access to career guidance but also democratizes it through bridging gaps in the traditional services. By addressing a larger audience-including non-traditional route aspirants-this AI-powered solution highlights the potential of technology to change the way people perceive career prospects in the future. In broad terms, the research points out the need for equity, personalization, and outreach in developing career support systems for diverse goals and backgrounds.

Keywords: Career Counselling application; Guidance platform; Emerging Career; Creative career choices; Career path; Future Opportunities; Personalized Career Advice

1. Introduction

Career counselling has always been very significant in guiding individuals in their work life. It encompasses dealing in the fundamental aspects of job markets and matches people's interests and skills with available work possibilities. But the old methods viewed the school based and regular employment as engineering, medicine or law-based jobs. They did not consider many other such job types. As the job market is evolving considerably, the gap has begun to be more enticing especially at a time when the job market is more skill driven and patience and flexibility is required. New researches indicate that we require web-based systems for career consulting, which can conform to this alteration.

To resolve this problem, we propose an AI-based online tool that provides career guidance for new professions. This platform will employ state-of-the-art technologies, such as NLP and ML, to suggest intelligent, fact-based career recommendations to its users based on their skills, interests, goals, and background. It is this combination of user-cantered design and intelligent decision-making tools that led to its effective development in line with best modern-day practices in career advice and recommendations with a view intermediate of traditional counselling techniques and contemporary work practices.

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Featuring a properly optimized registration system whereby XXX will be able to administer and customized assessments to the users and one way this will be done is by recommending more suitable tests to the user.. These areas do not only cover the educational pathways but also include career options in arts, crafts, entrepreneurship, which most common advice fails to include. This comprehensive strategy attempts to consolidate as many resources on career assistance in one place that serves the interests of all the users. Furthermore, the platform is going to employ predictive analytics with counsellor help to make predictions about future employment opportunities and prospects. This enables users to prepare in advance so that they do not make arbitrary decisions at a time. Plus, including chatbots and NLP technology, the platform will enable boring and traditional career counselling to be turned in real-time interaction for making decisions instead of a passive read only gaining practice. This platform utilizes the most advanced trends in AI and ML. These will determine and shape the ways users will be receiving career counselling. The platform's digital strategy will not only enhance user's interactions and satisfaction but also improve the quality of the decision-making processes. In the end, the platform aims to change the landscape of career counselling in the context of the digital age. It hopes to achieve this by making a plethora of career resources available to workplaces and addressing the issues of obsolete system.

2. Literature Survey

Career guidance is an important tool that helps people find their way to academic and non-academic fields. The development of new technologies has made it possible the creation of online platforms that provide career counselling services. These platforms are intended to meet the needs of the users by applying the data analysis, artificial intelligence and the interface that is simple to use. This survey examines previous research on career counselling systems with emphasis on their utilization in academic as well as non-academic fields.

2.1. Web-Based Career Counselling Systems

Atay et al. (2024) suggested a web-based career counselling information system for the case of Türkiye [1]. This system incorporates the user's information and offers the best fit career suggestions to the user. While focusing on the structural aspects and the ease of use to make it suitable for almost everyone, it is based on a well-defined process. Though mainly intended for academic career directions, the flexibility of the platform also enables non-academic guidance. The web-based design emphasises the flexibility and the ability to use the system on any platform including android, which may be used to shape the architecture of the system.

2.2. Career Counselling with AI and Chatbots.

Deshpande et al. (2024) studied the use of NLP based chatbots and machine learning in career counselling in their paper titled "Integrating Artificial Intelligence in Career Counselling: The Chatbot Way"[2, 5]. The system incorporates AI to make the interactions between the system and the user as realistic as possible and offer the client real time help on career choices. The chatbot improves the interactivity of the website and gives specific recommendations for career progress in both academic and non-academic fields. The integration of machine learning ensures that the counselling process is also improving with each process making it relevant in the ever-changing world of work.

2.3. Addressing Context-Specific Needs

Keshf and Khanum (2021) stressed the need to contextualize career counselling for developing countries [3]. In such circumstances, users in these regions struggle for limited access to information, which contributes to socio-economic challenges as highlighted in their study. This not only opens up access to actionable results across various professions, especially non-academic, including trades and entrepreneurship but also addresses the degradation of skill futures over time. These qualitative findings reinforce the importance of culturally and linguistically appropriate platforms, which can be achieved through an Android-based application.

2.4. Implications for Android Career Counselling Applications

Reviewed literature discusses topics necessary for an Android career counselling platform to be successful:

Scalability and Accessibility: From web-based system [1], an Android application has to be designed in such way that they should be accessible to different end users [certain groups] not just the students as such but also for those with academic and non-academic interests.

- AI enabled Interactivities: e.g., Deshpande et al. [2, 5] suggests that integration of NLP chatbots will only help to increase user interaction and engagement.

Systematic optimization of personalized career guidance using techniques from machine learning.

Contextual Relevance — The platform from Keshf and Khanum [3] research will meet the regional needs with some high-potential non-academic jobs available in area, like arts, crafts etc alongside academic jobs.

2.5. Problem Statement

Key components in society today are career guidance and counselling as they assist people in their decision as to what career path to pursue. Career choice, especially at the turning points of high school, college, young adulthood, and so forth, has great implications on individual development, job contentment and achievement. Though this is so, a worrying trend still exists within the career counselling field: the over-emphasis on career education of professional workers such as lawyers, doctors, engineers and business professionals. There is no denying that these professions provide opportunities, but there are more career opportunities that one can tap into in this global economy.

Seems to be most of these career counselling portals tend to focus on the academic professionalism leaving behind the nonrequired academic careers, for instance, business ventures, creative economy (design, painting, writing, etc), skilled workers (plumbers, electricians, builders, etc), and skilled labour (chef, and carpenter, etc.). These fields often require different skill sets and qualifications usually not met by the "standard" academic requirements. As a result, there are discrepancies in the career development that one is exposed to, which in the case applicants who are interested in taking non-academic routes is. Thus, many people, especially those who don't have much concentration in academic pathways, may tend to be apathetic disillusioned aimless or even feel a sense of bewilderment in case they are presented with the possibility of career options.

This burning issue of a non-academic career guide is only going to continue intensifying with many more people starting to dispel the forces of empathy and logic and seek avenues that are more in line with their Interests and skills. These non-academic occupations are many and occupy satisfying careers yet are often neglected in relation to normal business direction. For example, there is still not a lot of focus on the need for skilled tradespeople, an ever-expanding entrepreneurial landscape, and more attention on the creative industries for majority of the career guidance systems. With these professions not occupying much focus attention, a gap is created for people who could excel at these professions but don't have the means or guidance to pursue them. Without concrete understanding and mentorship, they will either constantly visit a conventional academic route without really being interested or will be left to explore the employment market while lacking in proper mentorship.

It's important to mention that many people, particularly in their early youth, do not have the opportunity to receive adequate career counselling that develops in terms of comprehensiveness and individual tailoring in the academic as well as in non-academic professions. As a point of concern, this perpetuates the trend since much of the guidance on careers is stereotypical in approach and ignores the personal goals, interests, and capabilities of the individuals. In the absence of such customized and specific instructions, it is very likely that a number of individuals will find it difficult to consider and work in different occupations. They tend to fit into one of the two extremes: those who tightly scrape by doing work that they are not interested in or are capable of, quenched with routine differential depression, and those who do not pursue jobs that are compatible with their potential, settled in mediocrity, or worse, the stage of an almost nurtured 'unmotivated' individual.

In addition, a properly designed and effective career counselling system that covers academic and non-academic careers simultaneously does not allow a person to make an informed choice in their career. The vast majority of students start their careers on various platforms offering educational courses since they depend on the academic route. They ignore countless ways of work with a degree. For this reason, they do not have sufficient information regarding the professional paths that they can follow. Moreover, the efforts are made purely to comply with statutory requirements aimed at gaining real-world experience, and requirements are minimum.

3. Proposed Statement

This platform is a cutting-edge artificial intelligence engine that has been set up to provide digital career counselling, merging academic and career guidance into a single integrated and aesthetically pleasing experience. This platform places equal emphasis on academic and non-academic development and welcomes a range of user needs, from those desiring traditional careers to non-conventional career modes, which is in contrast to traditional career-guidance platforms.

The platform is driven by an AI chatbot, thus beginning the journey of career exploration. The virtual assistant seeks to analyse a student's interests, passions, and preferences through structured interactive dialogue and psychometric-style inputs. Rather than achieving an in-depth counselling session, the chatbot's aim remains primarily to offer personalized suggestions on courses or professions based on inputs from the student. That is to say, by matching users' interests with relevant academic disciplines and alternative career paths, the chatbot helps students attempting to gain initial clarity and direction in the process of career planning.

Following the presentation of relevant options by the chatbot—be they academic programs, creative careers, vocational tracks, or emerging digital professions—the application will put forth a list of duly vetted professional career counsellors who specialize in those suggested areas. These counsellors can be filtered according to expertise, ratings from users, and availability so that students may pick their best fit according to the guidance they need. From there, a session can be booked very conveniently and with flexibility for a live chat or a video call at a given time slot that is suitable for the student. Post-session, students will assess their counsellors, thus improving transparency of the platform and quality assurance.

This AI platform is set up to assist students from all different areas—for technology, for business, for healthcare, for art, for trade areas, and so on. It also supports conventional academic careers like those in medicine, law, engineering, and then modern or alternative careers, such as digital content creation, ethical hacking, and entrepreneurship. The students can set their goals in a very user-friendly dashboard and monitor their journey with updates, recommendations, and alerts powered by AI analytics.

Key principles underpinning accessibility and inclusivity. The interface is simple and responsive, adopting multilingual support to engage students from different socio-economic and regional backgrounds. Professionally available for mobile and web usage, enhancing the reach of career guidance.

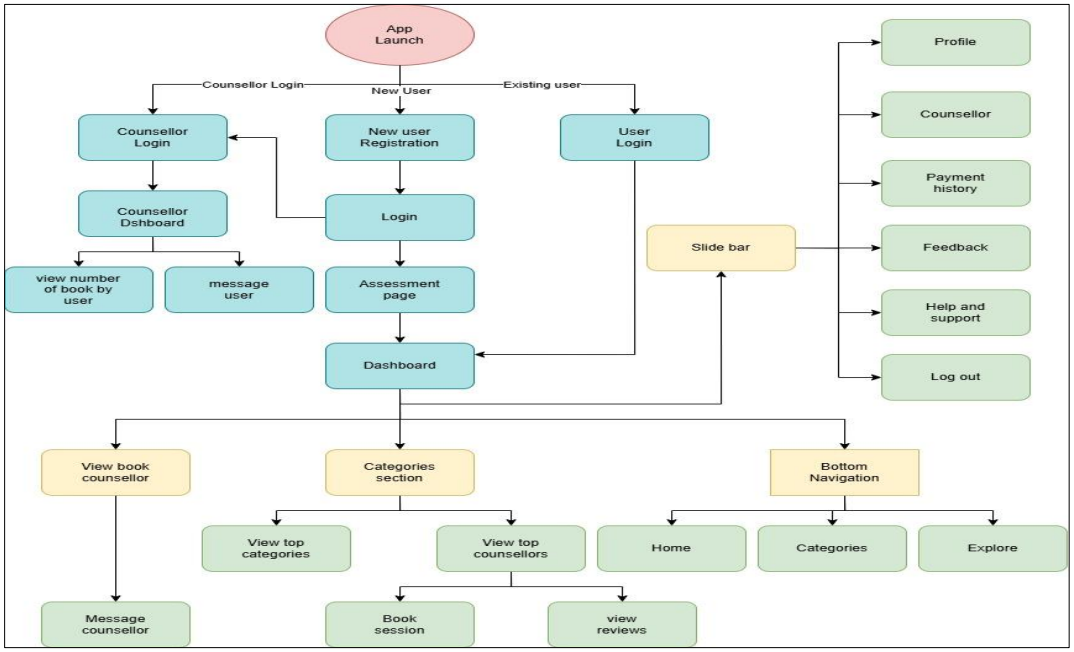

Figure 1 Data flow diagram

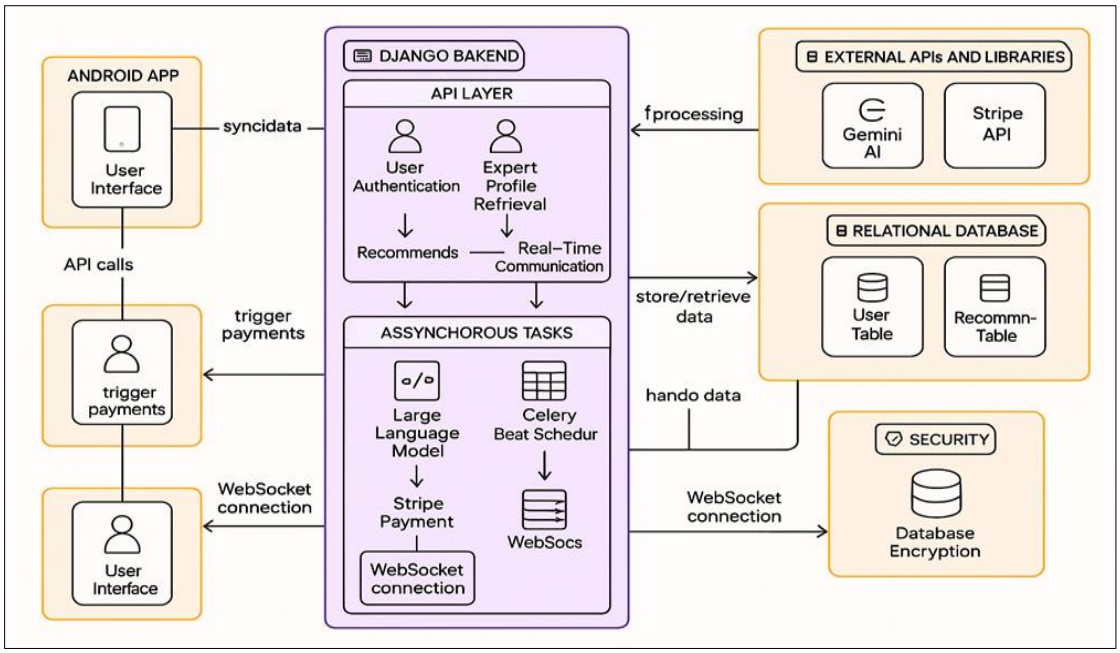

Figure 2 Architecture diagram

4. Methodology

Frontend and backend, mobile application development, payment integration, chatbots, and real-time communication, are all part of a complete system that facilitates a better user experience. Every technology has its own specific purpose, which it serves in the developmental process.

4.1. Frontend Development (Webpage).

4.1.1. HTML (HyperText Markup Language)

HTML means HyperText Markup Language and it is the basic building block to create web pages. It defines the structure and content of a website using different elements in a document, such as headings, paragraphs, images and tables. HTML is the foundation to design a layout for any webpage. So, the whole skeleton for that website is built in HTML. It helps in organizing content into a proper formatting that any web browser can show properly to a user.

4.1.2. CSS (Cascading Style Sheets).

CSS is a great styling language by which web pages made by HTML will get better visibility and design. It controls every visual aspect such as colour, fonts, spacing, and the positioning of elements on the webpage. CSS would also provide very responsive designs for desktops, tablets, and other smart devices. Most importantly, it is also responsible for the creation of extremely attractive animations and transitions among the different design effects made for user interaction.

4.1.3. JavaScript

JavaScript is a client-side scripting language that allows an interactive dynamic website to be generated. It can add features like image sliders, form validation, live updating of content, or animations without refreshing the page. Both HTML and CSS are used with it to perform dynamic manipulation of elements of the webpage. The way that it enhances user experience with websites is by making them responsive and allowing user interaction via events such as clicks, scrolls, and forms being filled out.

4.2. Android Application Development

4.2.1. XML (Extensible Markup Language)

XML in android is mainly used to design the User Interface (UI) of an application. It describes the layout of different elements like buttons, text fields, images, and menus in a well-structured way. XML separates the design part and from

the functional codes so that maintaining of the whole application becomes easy. It creates a better interface because now there is a better-looking layout to improve user interaction and experience on mobile devices.

4.2.2. Java

Java is that one major programming language which is used for the development of Android applications. It does all the core performing task along with backend logic of the application. It is just straightforward and lets the developer manage and handle user inputs along with processing data, handling API communication, and performing database operations as well, thus providing a really secure and stable environment for developing mobile applications that can work fabulously across Android devices.

4.3. Backend Development

4.3.1. Django (Python Web Framework)

Django is a high-level back-end web framework that is written in Python and oriented toward the Model-View-Template (MVT) architecture for use in project creation. It assists in the development of secure and scalable web applications. Django is responsible for database creation and management, user-authentication mechanisms, URL routing, and server-side business logic processing. This framework also allows developers to build simple, maintainable, and efficient back-end code, thereby being the chosen path for modern web application generation.

4.3.2. Integration of Payments via Stripe

Stripe is an online payment processing platform for managing secure cash transactions through websites and applications. It allows payment through various means, including credit and debit cards and online wallets. Stripe creates a secure environment in which payments can be processed and has found widespread acceptance for e-commerce sites handling purchases, subscriptions, and invoicing in a trusted manner.

4.3.3. Celery

Celery is an asynchronous task queue for working efficiently with background tasks in Django applications. The time-consuming processes that are executed by the Celery task queue include sending emails, file uploads, and report generation, all of which are not required to interfere with the running of the application. Such a setup of Celery will help enhance the user's experience, as the aforementioned heavy tasks will be taken off the main server processes and executed independently as background jobs.

4.3.4. Celery Beat

Celery Beat is another extension featuring periodic task scheduling. Whereas, it will be used to perform tasks such as sending daily reports, cleaning the database, or generating notifications in given intervals of time. Celery Beat will comply with Celery workers through which the scheduled tasks are performed in the background, thus efficiently handling repetitive processes without manual intervention.

4.4. AI Chatbot Integration

4.4.1. AI Chatbot using Gemini (Google AI)

The AI chatbot works via Gemini: an advanced AI model from Google. This chatbot provides support and answers users' questions in real-time with the help of NLP. The chatbot prevents human interference and increases user engagement through the automation of customer service. The chatbot understands human language and can give smart and accurate answers according to the input of a user.

4.5. Real-Time Communication

4.5.1. WebSocket

WebSocket is a protocol for the bi-directional communication established in real-time between the client (web browser or mobile application) and some server over a persistent single connection. Unlike the usual HTTP request-response pair, the WebSocket protocol offers instant transfer of data without any page refreshes to a client. This makes it possible to have a much faster, more responsive user experience in applications such as live chat systems, online gaming, real-time notifications, and live-streaming.

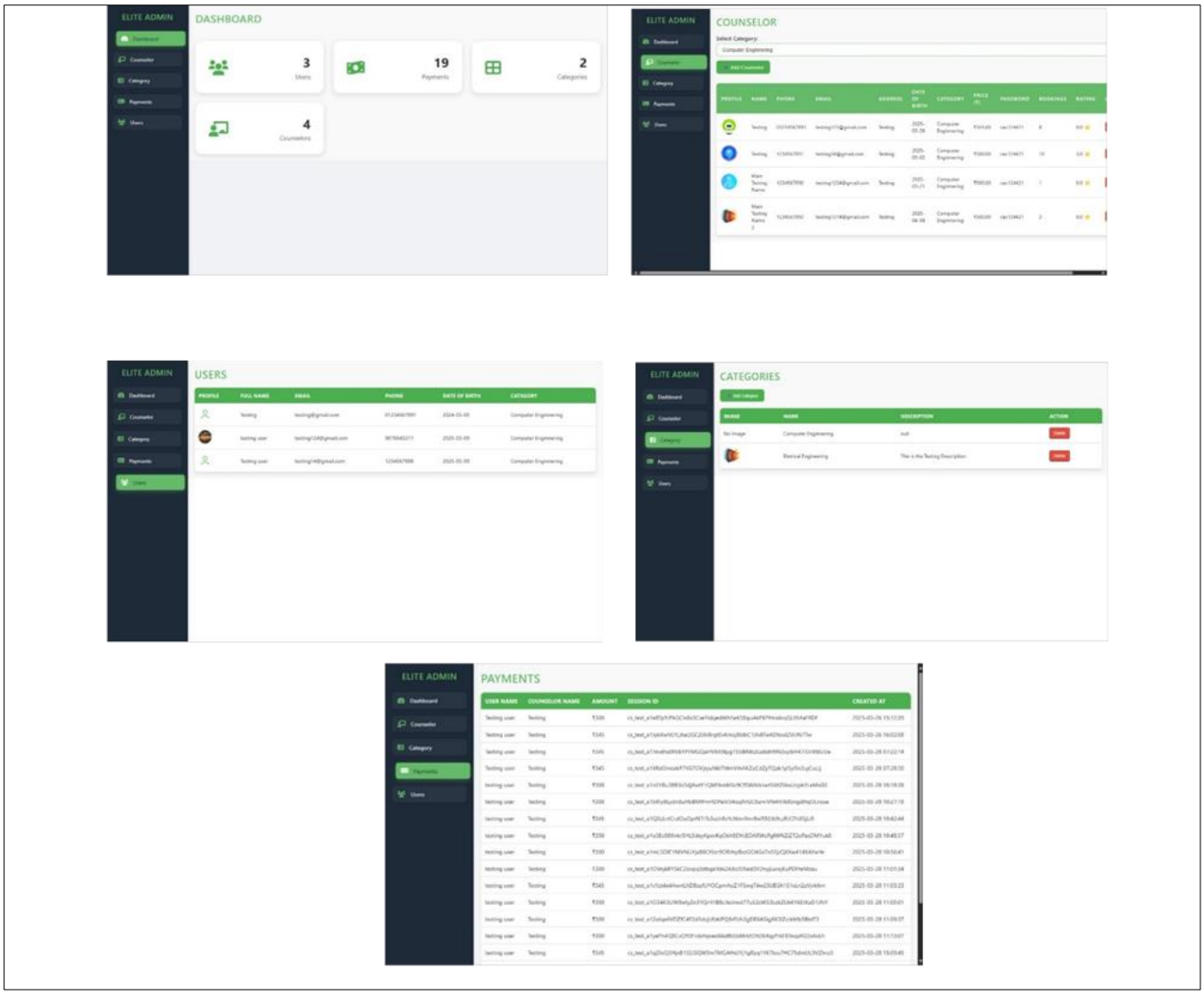

Figure 3 Admin Panel

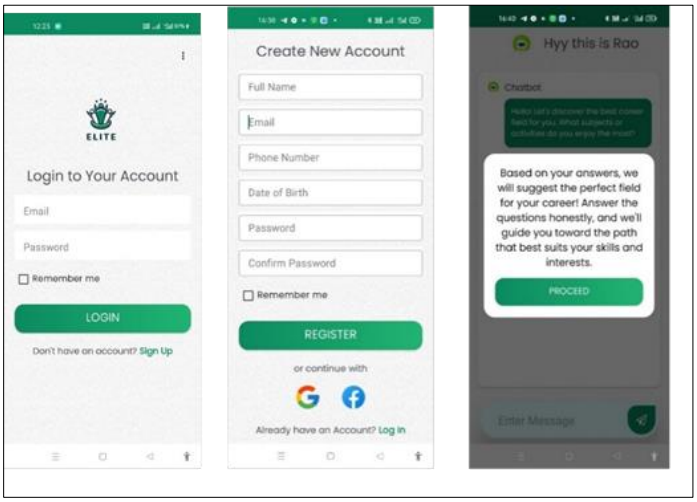

Figure 4 Login Page

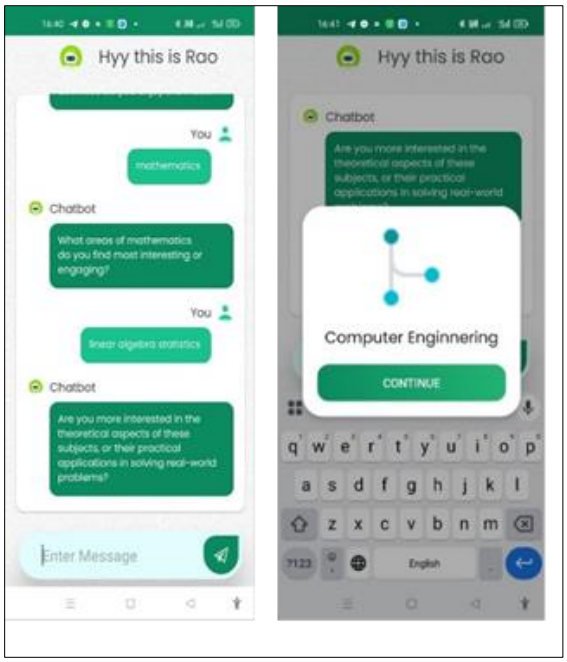

Figure 5 AI Chatbot Page

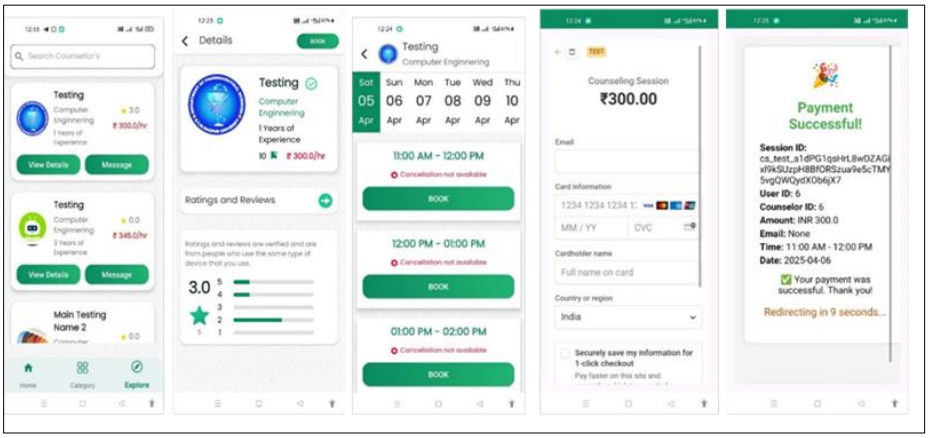

Figure 6 Slot Booking Page

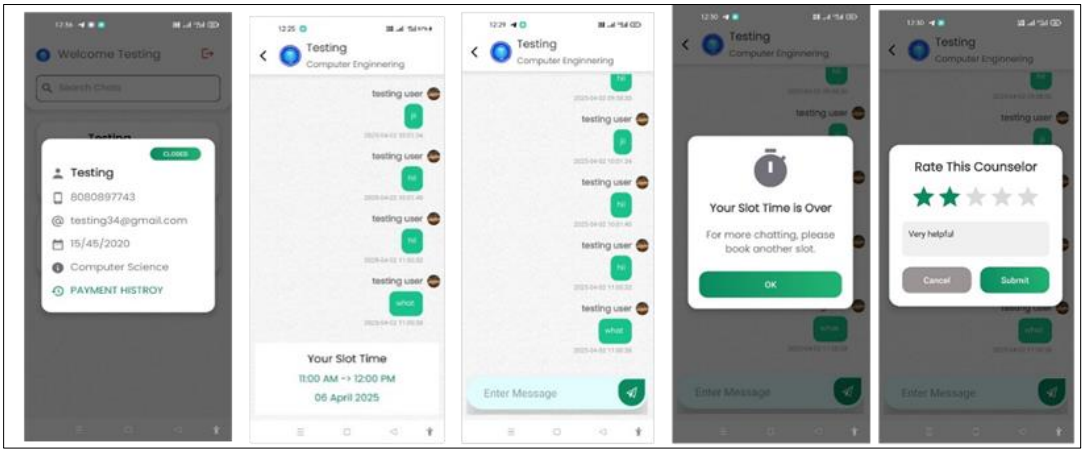

Figure 7 Chating and Rating Pages

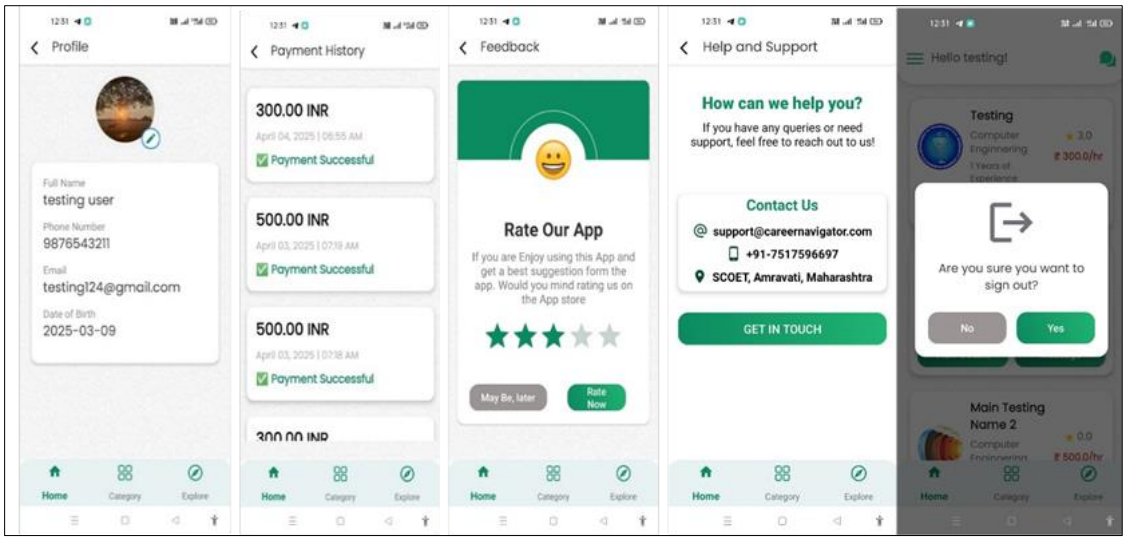

Figure 8 User Profile Page

5. Conclusion

Therefore, it would really help the students to take informed decisions over their careers through an integrated online platform for effective career counselling and guidance in schools. Such programs are of great importance in today's working the marketplace, as one should be acquainted with various, even the most unconventional professions. Integrate career counselling in school curricula and utilize technology to improve not only the availability of resources but also make it all "fit their own everyday life" and assist students with personal guidance and exposure, enabling them to explore little-known career opportunities.

Appropriate in-school programs, if added to an online structure, would allow for a holistic approach toward career development much needed to promote more awareness, inclusiveness and active openness regarding wide professional development. In fact, such empowerment would result in students making confident career decisions and, in effect, would help bridge the requirements of education and working toward a diverse and adaptable workforce in the future. It is, in fact, investing in the future—a student with knowledge and skills, encouraged to indulge in fulfilling careers appropriate for society at large

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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