

Career Crafter: An Intelligent Career Guidance and Skill Development Platform

Prachee Chikane¹, Atharva Sapa², Tushar Baghdane³, Prachi Hile⁴, Ganesh Pujari⁵, Mr.A.H.Raheja*
(Department of Engineering Science), AISSMS Institute of Information Technology, Near RTO, Pune,
Maharashtra, India-411001, *Guided

Abstract - Selecting an appropriate career is probably one of the most crucial decisions that can be made during one's studies. Unfortunately, many students pick up their careers without any advice or guidance from experts, not having assessed their skills or knowledge of the available options. Career Crafter is a web-based career guidance solution intended to assist students and job hunters to make the right decision regarding their future career. In addition to recommending suitable careers for the user depending on his/her interests, aptitude, skills, and background, the platform will include such additional features as analysis of one's skills, recommendation of training courses, generation of a roadmap for achieving success in a certain career, among others.

Keywords: Career Guidance, Recommendation System, Skill Analysis, Web Application, Career roadmaps.

I. INTRODUCTION

Amongst other things, one of the issues that most students face today when making decisions regarding their career path is that sometimes they may be influenced by peer pressure, ignorance, or the lack of adequate guidance when making those important decisions. In most cases, the students end up being ignorant of the career choice that best suits their talents, personalities, and educational achievements. Lack of adequate counseling facilities, and availability of convenient electronic facilities to help students make better career choices are some of the reasons that have motivated me.

Career Crafter is an electronic career decision-making tool that will assist individuals make their career-related decisions by use of the career decision assistance facilities of the software. Individuals will be able to get informed of their careers, talents, and the necessary steps required to achieve this career choice. Career Crafter will assist a student from self-evaluation to career development.

The potential market for this product will include secondary and college students, and young professionals.

II. LITERATURE REVIEW

Some researchers have explored digital career guidance systems, recommendation engines, and skill-based learning platforms.

Researchers created online career guidance tools, which analyzed student interest using questionnaires and suggested careers. The system aided users in identifying suitable careers; however, it did not have personalized skill tracking (Kumar and Singh, 2020)

Recommendation systems were created based on aptitude test results and academic performance to enhance career matches. These systems gave accurate suggestions but failed to include learning resources or detailed career pathways (Lahoud et al., 2023).

Some learning platforms concentrated on skill gap analysis and learning recommendations to help users identify missing skills needed for the desired career. However, the platforms were complex for novice users to operate (Shabeen Taj et al., 2024).

Researchers created artificial intelligence-based career counseling applications that made personalized suggestions by analyzing user profiles and data. Although these were advanced systems, most were too complex for students who lacked technical knowledge (Nayak and Vora, 2024).

Based on the above studies, it is evident that there is a need for a simple, smart and user-friendly career system that provides career suggestions and planning. Career Crafter is designed to erase this gap.

III. OBJECTIVE

The objectives of the Career Crafter project include analyzing and evaluating existing career guidance systems and identifying their flaws, designing and implementing an intelligent career guidance

framework, assisting learners and potential job applicants in selecting appropriate careers based on their personal interests, competencies, and educational background, providing them with tailored career advice, highlighting any skill deficiencies and recommending relevant learning materials, and resolving any career-related ambiguity.

Based on an assessment of user preferences, aptitudes, and aspirations, the application enables users to determine the most fitting occupations and plan their future careers in a more effective manner. Another goal of the project entails bridging the gap between educational institutions and industries by assisting users in identifying the skills required to pursue specific occupations. The other aim of the project involves designing a straightforward and efficient career guidance website, which users can utilize for career planning purposes.

IV. SOFTWARE (SYSTEM / TECHNICAL WORKFLOW)

The Career Crafter system includes mostly software components designed for career guidance and recommendation purposes.

The software implementation of the project will be based on contemporary web development. Frontend will be built with the help of HTML, CSS, and JavaScript languages that will enable creating an appealing user interface. Backend will involve technologies like Node.js. Also, the application will need a database that will store user profile, career data, and educational materials.

The software algorithm starts with user registration and user profile creation. The user provides his/her interests, education, and skills to the system. After analyzing the data, the system compares it with available career profiles and recommends relevant ones according to the comparison results. Upon selecting a specific career profile, the system offers necessary skills and educational directions.

It consists of several modules:

4.1 User Interface Module

This module enables users to register, login, enter their profile information, and receive career recommendations through a user-friendly interface.

4.2 Profile and Testing Module

This module obtains user details including educational qualifications, interests, skills, abilities,

and objectives. It can also contain aptitude tests or questionnaires about preferences.

4.3 Recommendation Engine

This module analyzes the received information and generates career recommendations according to pre-established criteria.

4.4 Skill Gap Analysis Module

This module determines the skill gaps between the user's existing skills and those needed by the selected career.

4.5 Learning Resources Module

This module provides recommendations on how the user can develop in the desired career area.

4.6 Backend and Database Module

This module stores the user's profile information, test results, recommendations, and progress history.

V. METHODOLOGY

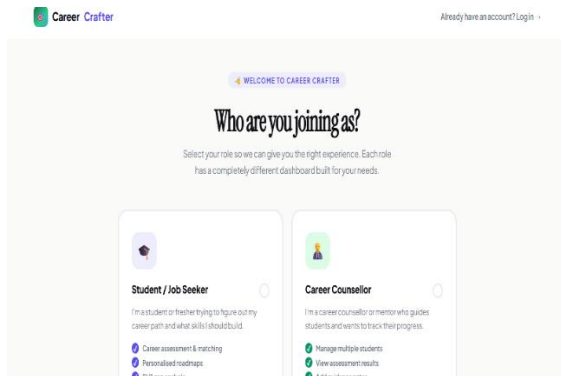
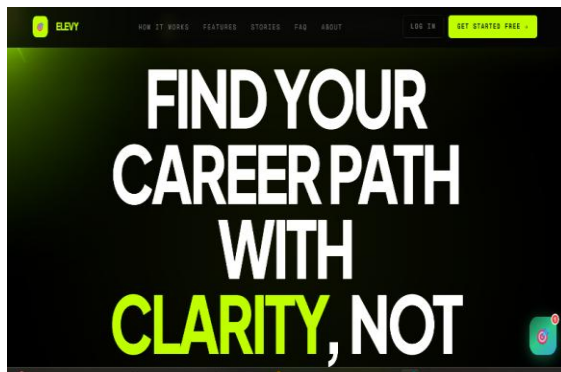
The methodology of the Career Crafter project relies on user profile evaluation and intelligent career recommendation. As for the main components of the system, there are a user interface, a profile management module, a recommendation engine, a skill gap analysis module, and a learning resource module.

The user registers an account and inputs personal data about the individual, including his/her education level, interests, strengths, skills, and career preferences. The recommendation logic works in the background, gathering data and generating career proposals. As a result, the platform evaluates the individual's profile and matches it to pre-established careers.

The recommendation engine constantly evaluates the data and makes career proposals accordingly. Once the user picks a certain career path, the system makes a skill gap analysis of the user's existing skills compared to those he/she needs in order to pursue this career. The platform offers personalized learning solutions and career roadmaps.

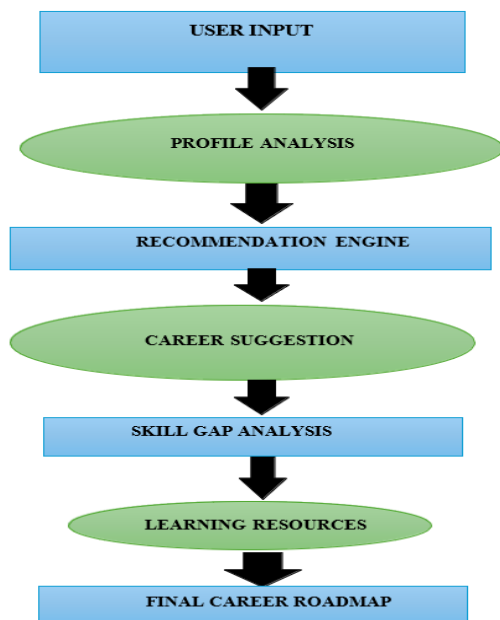
Overall, constant evaluation of the data helps make the process of career planning easier and more effective. Besides, the methodology offers a cost-effective, efficient way of using technology to benefit students and job seekers.

5.1 Home Page of the Website



5.2

VI. BLOCK DIAGRAM



VII. EXPERIMENTAL RESULTS

The testing of the Career Crafter system involved carrying out tests through the system by recruiting different users with varied academic inclinations and interests. The results from the testing proved that the system was capable of generating personalized career suggestions using inputs from the users.

Students enrolled in engineering courses got career suggestions in fields such as software development, data science, and careers in engineering. Students who were inclined to work in creative industries were presented with career suggestions in fields such as graphic designing, digital marketing, and content creation. Besides, the system was able to detect skill shortages in certain careers and offer learning suggestions.

From the findings obtained through the testing, the users felt that the system was quite effective in helping them choose the best career path suited for them. The process of suggesting careers eliminated any doubts regarding their future careers and increased their awareness on the same.

VIII. CONCLUSION

Career Crafter project has succeeded in proving the effectiveness of using a computer-based platform in career counseling and planning. Career Crafter is based on profile analysis, recommendation logic, and skills analysis to give tailored career choices. The use of the platform to analyze user interests, skills, and educational aspects allows the users to identify appropriate careers for themselves and learn how to pursue them.

According to experimental data obtained in the course of development of Career Crafter, this platform is efficient in recommending career paths and increasing users' career knowledge. It can also be regarded as simple and reliable enough for actual application. Career Crafter can be applied effectively by students and job seekers.

IX. FUTURE SCOPE

Scope of improvement of the Career Crafter project includes several improvements in terms of advancing the efficiency of the project. The system could benefit from the use of artificial intelligence algorithms for recommendation in order to increase its accuracy in making recommendations related to careers. Additionally, the system might include the use of tests as well as personality assessments for the purpose of improving its performance.

Moreover, the Career Crafter system can be integrated with different online course vendors to make recommendations regarding the certification

and education courses of users. Another feature that can be added in the future includes the use of chatbots for giving career advice. This system might also include resume preparation, internships, job offers, and mentorship.

Lastly, machine learning-based recommendation techniques can be used to improve the accuracy of recommendations made by this system.

REFERENCES

- [1] J. Holland, "Making Vocational Choices: A Theory of Careers," Prentice Hall, 1997.
- [2] M. Osborn and C. Zunker, "Career Counseling: A Holistic Approach," Cengage Learning, 2015.
- [3] S. Kumar and R. Singh, "Web Based Career Guidance System for Students," International Journal of Computer Applications, vol. 176, no. 12, pp. 15–19, 2020.
- [4] A. Sharma and P. Gupta, "Career Recommendation System Using Machine Learning," IEEE International Conference on Computing and Communication, 2022.
- [5] T. Brown, "Online Career Guidance Platforms and Their Impact on Student Decision Making," Journal of Educational Technology, vol. 14, no. 3, pp. 45–52, 2021.
- [6] R. Verma, "Skill Gap Analysis for Career Development Using AI," International Journal of Advanced Research in Computer Science, vol. 13, no. 2, pp. 88–94, 2023.
- [7] A. Patel and M. Shah, "Online Career Counseling Platform for Students," Proceedings of International Conference on Emerging Technologies, pp. 120–124, Dec. 2019.
- [8] P. Verma and S. Gupta, "AI-Based Recommendation System for Career Selection," IEEE International Conference on Smart Computing and Communication, pp. 210–214, Aug. 2021, DOI: 10.1109/ICSCC.2021.9488392
- [9] R. Mehta and K. Joshi, "Skill-Based Career Recommendation System Using Machine Learning," International Journal of Engineering Research and Technology, vol. 10, issue 5, pp. 340–345, May 2021. T. H. Cormen, C. E. Leiserson, R. L. Rivest and C. Stein, Introduction to Algorithms, 3rd edition, ch. 2–4, MIT Press, Cambridge, 2009.
- [10] T. H. Cormen, C. E. Leiserson, R. L. Rivest and C. Stein, Introduction to Algorithms, 3rd edition, ch. 2–4, MIT Press, Cambridge, 2009.
- [11] J. Duckett, HTML and CSS: Design and Build Websites, 1st edition, ch. 1–8, Wiley Publication, New Jersey, 2011.
- [12] D. Flanagan, JavaScript: The Definitive Guide, 7th edition, ch. 1–10, O'Reilly Media, California, 2020.