Career Bot for Career Prediction of Higher Secondary Students using Decision Tree

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Abstract: *Career guidance refers to a process that assists individuals, typically students in making informed decisions about their career paths. Career guidance can be delivered through various channels, including career counsellors, educational institutions, online platforms, and self-help resources. It plays a vital role in helping individuals make informed choices that align with their aspirations, values, and capabilities. Traditional career prediction models often lack transparency and fail to consider the diverse and dynamic factors that influence students' career choices. The existing systems may exhibit biases and limitations that hinder accurate and personalized career guidance. The project aims to tackle these problems by developing an Explainable ML (XML) model that provides transparent, personalized, and adaptable recommendations to higher secondary students. The proposed system incorporates Decision Tree algorithms within an Explainable ML framework to provide clear and comprehensible insights into the factors influencing career predictions. It takes into account a diverse set of input features, including academic performance, skills, interests, and extracurricular activities, to offer personalized career guidance to individual students. The project also addresses potential biases in the model to ensure fair and equitable career recommendations for students from varied backgrounds. By combining the power of Decision Tree algorithms with Explainable ML, the project aims to empower higher secondary students in making well-informed decisions about their future careers. The transparency provided by the Explainable ML model enhances user trust and understanding, fostering a more engaging and personalized career prediction system. The project's outcomes are expected to contribute significantly to the field of career guidance, providing a model that is not only accurate but also accessible and comprehensible for students navigating the critical phase of choosing their career paths.*

Keywords: Machine learning, Decision tree algorithm

I. INTRODUCTION

A career is an individual's 'journey' of lifelong learning, working, extensive training and learning new skills. It can be described as employment or a vocation that generally involves some specialized training or formal study. In simple terms, a career is what you do for a living.The word "guidance" originated back in the 1530s, and is defined as the process of directing conduct. Career guidance can be defined as a comprehensive, developmental program designed to assist individuals in making and implementing informed educational and occupational choices. In simple words, it is a journey on which people develop to make mature and informed decisions. It is the act of guiding or showing the way; it is the act of seeking advice. Career guidance is the guidance given to individuals to help them acquire the knowledge, information, skills, and experience necessary to identify career options, and narrow them down to make one career decision. This career decision then results in their social, financial and emotional well-being throughout.In an age where career queries are not uncommon, it's important to answer queries related to career guidance or career, in general. Clearing the higher secondary examination is one of the most significant milestones in a student's life. At this stage, they graduate from their student life to be transitioned into their professional life. The academic years do not end here, but the choice for the next course determines where a student is headed towards their career. This is why career guidance after 12th becomes almost imperative. The right career guidance after 12th can help you find the most suitable

career path.A whole new gamut of opportunities opens up at this phase, and often, a student feels overwhelmed by the options

II. LITERATURE SURVEY

KK Jena, SK Bhoi, TK Malik, KS Sahoo, NZ Jhanjhi, S Bhatia, et al., "E-Learning Course Recommender System Using Collaborative Filtering Models", Electronics, 2023.

The paper you're referring to, "E-Learning Course Recommender System Using Collaborative Filtering Models" by KK Jena, SK Bhoi, TK Malik, KS Sahoo, NZ Jhanjhi, S Bhatia, et al., was published in the journal Electronics in 2023. The authors explore the development of a recommender system tailored for e-learning platforms. They focus on collaborative filtering models, which analyze users' past behavior and preferences to recommend courses they might be interested in. This approach is commonly used in various recommendation systems, including those in e-commerce and streaming services. Collaborative filtering can be effective in suggesting relevant content by leveraging the collective intelligence of a user base. The paper likely includes a literature review discussing prior work in the field, methods used for building the recommender system, evaluation metrics, and results demonstrating the system's effectiveness. It's a valuable resource for anyone interested in the intersection of e-learning and recommendation systems.

Z. Ao, G. Horváth, C. Sheng, Y. Song and Y. Sun, "Skill requirements in job advertisements: A comparison of skill-categorization methods based on wage regressions", Information Processing & Management, vol. 60, no. 2, pp. 103185, 2023.

The paper you mentioned, "Skill requirements in job advertisements: A comparison of skill-categorization methods based on wage regressions" by Z. Ao, G. Horváth, C. Sheng, Y. Song, and Y. Sun, was published in Information Processing & Management in 2023. In this study, the authors explore different methods for categorizing skills mentioned in job advertisements. They specifically focus on comparing these methods using wage regressions to assess their effectiveness in predicting job salaries based on skill requirements. This research is crucial for understanding the relationship between skills demanded in the job market and corresponding wage levels. By analyzing job advertisements and employing statistical techniques like wage regressions, Their findings could inform policymakers, job seekers, and employers about skill trends in various industries, helping them make informed decisions related to workforce development, hiring strategies, and salary negotiations.

III. METHODOLOGY

This web app helps high school students choose a career path. It uses Explainable Machine Learning (XML) to recommend careers based on a student's academic performance, interests, and activities.

User Interface: Separate interfaces for students and administrators.

Students: See a personalized dashboard with recommendations and resources.

Administrators: Manage users, content, and system performance.

Machine Learning Model: Uses decision trees to make predictions. The model is transparent so students can understand why it recommends a particular career.

Features:

- Data Pre-processing: Cleans and prepares data for the model.
- Feature Selection: Identifies the most important data for predicting careers.
- Feature Extraction: Extracts patterns from the data to improve model accuracy.
- Career Prediction: Uses a student's information to recommend careers.
- Recommendation System: Recommends colleges and skill development opportunities.

Career Prediction

- User-friendly interface for inputting student data
- Model predicts suitable career paths based on the data

Recommendation System

- Recommends colleges for the chosen career path
- Suggests resources for skill development

Fig.1 Architecture
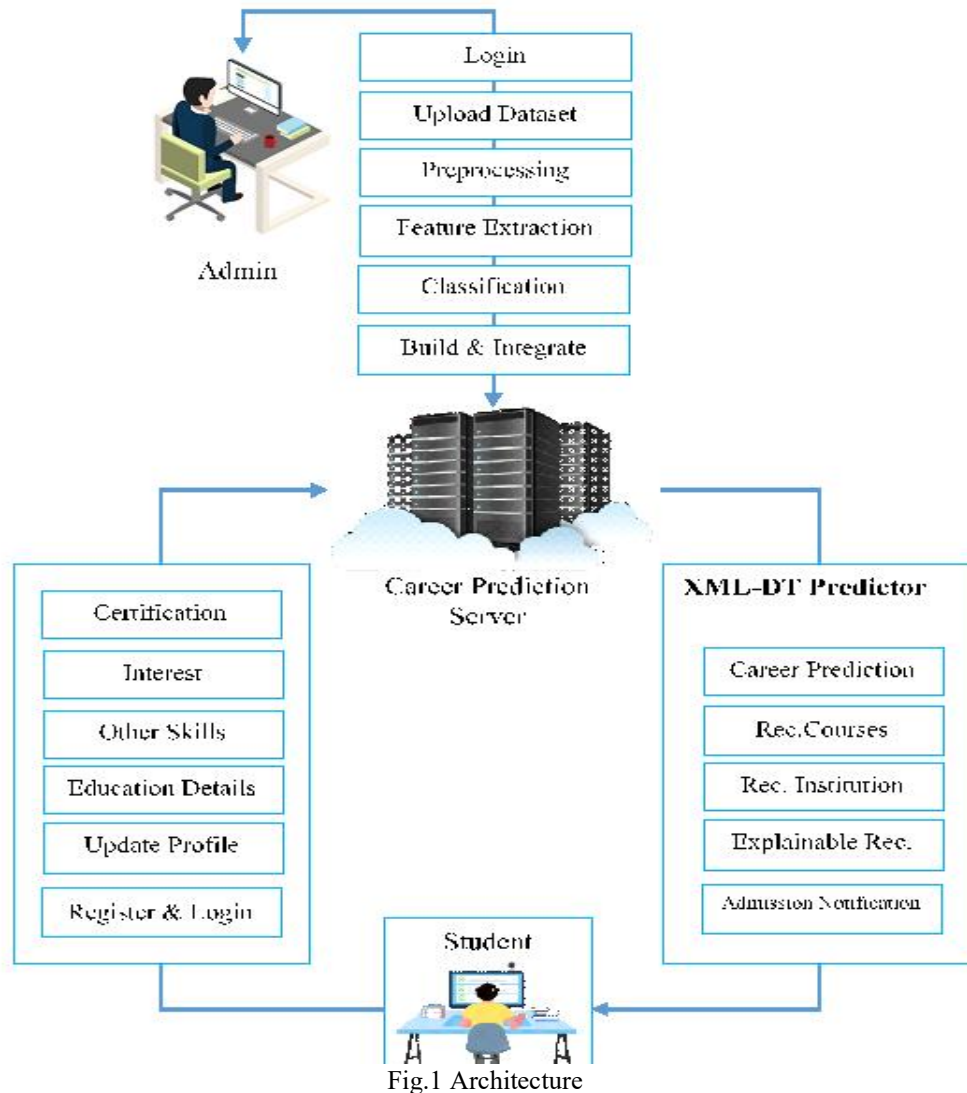
IV. EXPRIMENTAL RESULTS

The project stands as a pioneering initiative poised to redefine the realm of career guidance. By ingeniously incorporating Decision Tree algorithms into an Explainable AI framework, the model not only guarantees transparency and lucidity in decision-making but also delivers personalized and understandable career suggestions. With its intuitive interface, the platform enables effortless interaction, empowering high school students to access tailored guidance rooted in their academic performance, skills, and interests. By championing fairness and addressing biases, this project emerges as a trailblazing tool, arming students with the knowledge to make informed and equitable career choices, thereby establishing new benchmarks in the domain of career prediction.

Fig .2 Admin login page
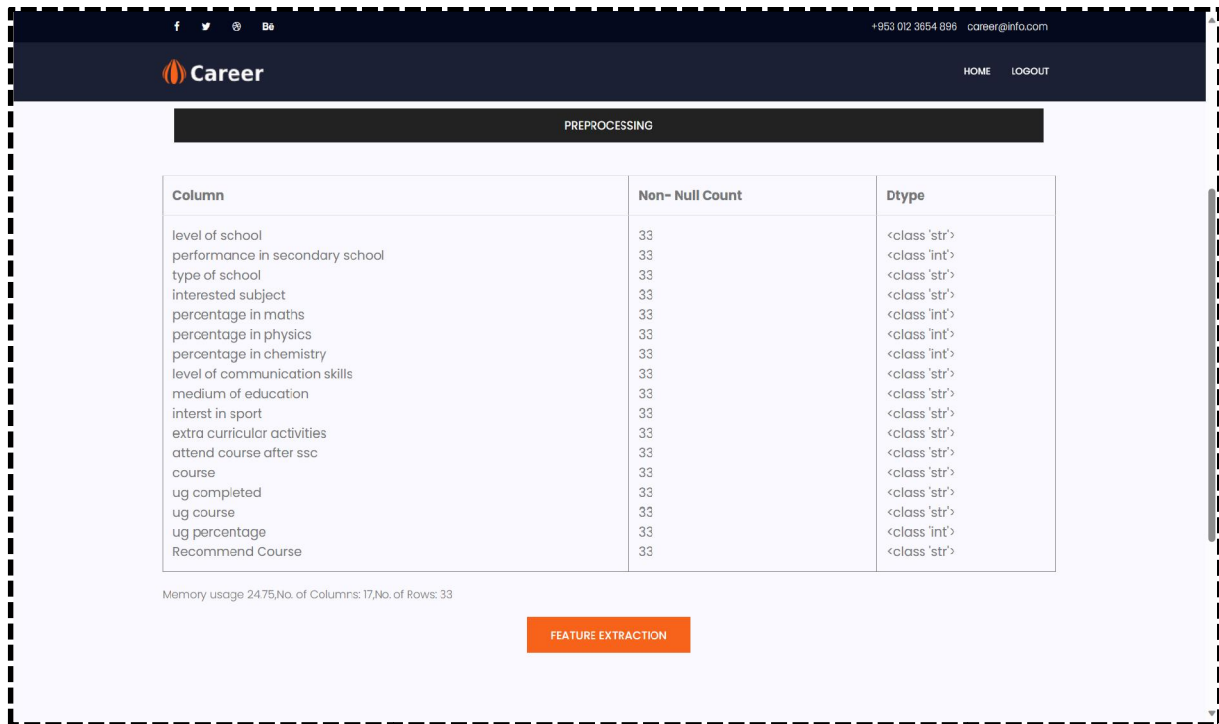

Fig.3 Data of the user
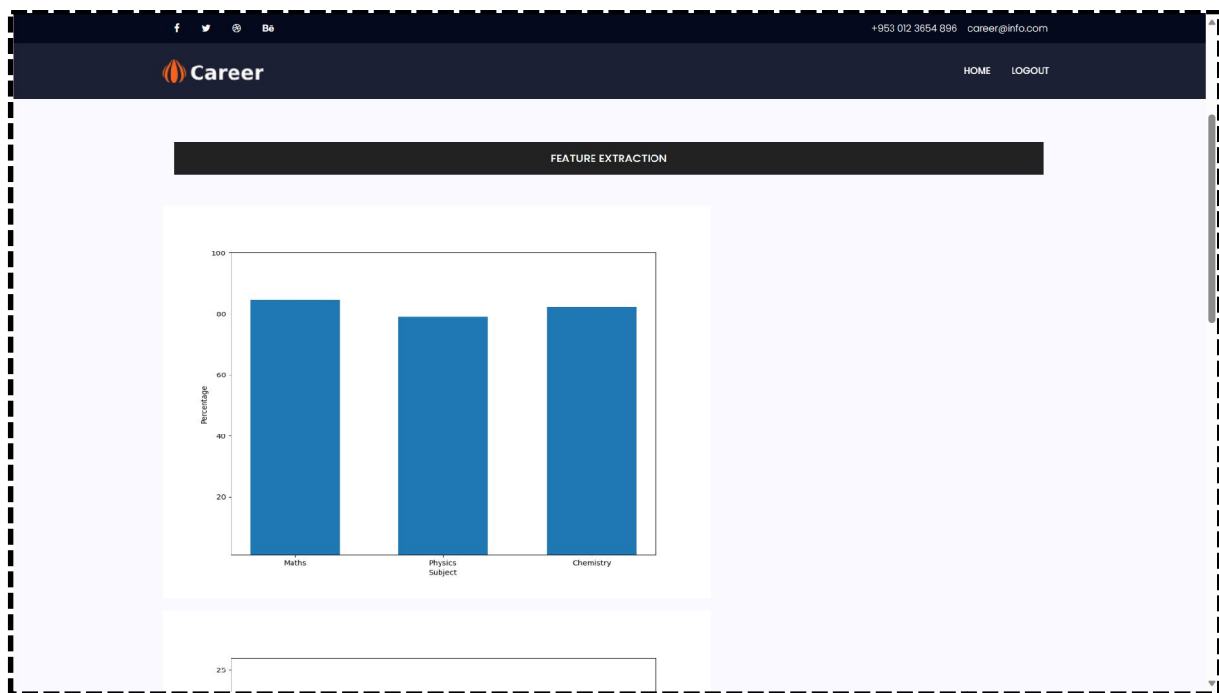
Fig.4 Single user data

Fig.5 Graph

V. CONCLUSION

In conclusion, the project represents a ground-breaking initiative in reshaping the landscape of career guidance. Through the strategic integration of Decision Tree algorithms within the Explainable AI framework, the model not only ensures transparency and clarity in the decision-making process but also provides personalized and comprehensible career recommendations. The user-friendly interface facilitates seamless interaction, allowing higher secondary

students to receive tailored guidance based on academic performance, skills, and interests. By prioritizing fairness and mitigating biases, the project stands as a pioneering tool that empowers students to make informed and equitable career decisions, setting new standards in the field of career prediction.

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