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ASSESSING THE NEED FOR NON-ACADEMIC CAREER GUIDANCE: A DATA-DRIVEN SURVEY USING INTEREST-MATCHING TECHNIQUES AND DATA ANALYSIS

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Abstract : Many students fail to choose proper careers simply because they do not receive adequate information about opportunities in their chosen fields. Students are unaware about the academic and non-academic career options. This work brings out the importance of adequate AI-driven career counseling systems in leading students in the light of different parameters, such as skill, academic performance, and other extra curricula activities. We derive the differentiated needs of career counseling and urgent requirements of meeting platforms suiting student's interests by bringing together diverse student groups through such surveys. More confident explorations by the students in varied fields could be enabled, and better assist universities to design target career service towards building employability through improved career guidance.

IndexTerms **- AI-driven Career Guidance Systems, Academic and Non-Academic Career Exploration.**

I. INTRODUCTION

The most important career decision is choosing the right profession, which has to correspond with your interests and capabilities. Realistic knowledge of what one is capable of doing is important for effective guidance in making a career. Though various people, such as parents, teachers, and education specialists, advise them about various opportunities, still most of them express regret over the choices made during their career life. To solve this, we propose an " Android OS Application " that uses various machine learning techniques to predict well-suited career paths considering the given individual skills and behaviors. This way our system may group people belonging to same characteristics and advise them to their needs individually, so that students can know their next future better.

The need for career counseling is gradually surfacing in the education system as it becomes difficult for students to choose the right university and profession. Effective career counseling provides professional guidance and understands the specific needs of a student and the labor market. Modern approaches focus on career construction or life design, which helps students develop their meaningful identities and improve self-reflection. It depends much on the information about professions and labor markets-this is more or less a conventional approach.

Surveys about professional guidance repeatedly state that there are great troubles in choosing a suitable and suitable career in the fields which are not directly related to studies. Such problems become more profound when there is no understanding about the many options existing for careers apart from following conventional choices some of students could not recognize what they should convey regarding paths that relate to personal interest or aptitude. Traditional career counseling lacks this assistance, which can be required to solve such challenges, as the emphasis is usually on academic performance rather than a holistic view of capabilities and aspirations.

Although career offices ought to be more prominent as far as career development is concerned, most higher learning institutions especially in Portugal remain underdeveloped. Besides highlighting the need for interest-maintenance platforms in identifying academic or other careers, contemporary career needs and the efficiency of online interventions are discussed. This would make the student confident of exploring different kinds of careers. More confidence increases more satisfaction and success in their respective careers. Data analysis algorithms along with interest-matching algorithms that can be connected with the career counseling procedure might well be the starting point, leading the student to reach even greater heights, by making suitable careers with the right education.

AI-based future options platforms are increasingly powerful equipment's to bridge this gap. Advanced data analysis and interest-matching algorithms by these platforms ensure them with highly personalized future recommendations. They analyze an expansive data set that encompasses academic record, psychometric assessments, extracurricular activity, and personal interest, identifying patterns and correlations that may not be apparent when such investigations are done conventionally. The counseling provides them with the opportunity to consider a wider range options greater confidence, allowing them to make better-informed choices and thus decreasing the chances of future dissatisfaction & accordingly, options change. We can, through AI power, create a more inclusive and supportive career counseling environment that will help the them to reach in the chosen fields.

II. LITERATURE SURVEY

2.1. Difficulties in Choosing Right Path

Career counseling surveys persistently indicate that children have impactful problems in determining a suitable career path, especially outside of an academic environment. The problem is worsened by the general lack of information on what is available outside the norm of academic pursuits [1]. Many learners do not know what choices match up with their interests and strength, thus becoming frustrated and uncertain. Traditional mentorship plans cannot, however, achieve that due to its rigid structure which focuses more on academic achievements instead of looking at the individual as a complete being in terms of capabilities and aspirations [2].

2.2. AI Driven Mentorship Plan Providing Platforms

These gaps are being filled with powerful AI-driven career counseling platforms advanced data analysis and interest-matching algorithms enable these platforms to offer recommendations of careers that best suit a student. This is done based on the analysis of a vast dataset that encompasses academic performance, psychometric assessments, extracurricular activities and personal interests, through this, patterns and correlations that might not have appeared through conventional methods can be identified [3]. This personalized advice helps scholars the two achieve more diversified future options with higher levels of confidence thus making the learners well-informed and reducing the possibility of their dissatisfaction with the career and subsequently career changers [4].

2.3. Career Services at Leading Universities

The top-ranked US universities like MIT, Stanford, and Harvard offer all-round career services ranging from individual to group counseling, internships, and even career events. These career services are in place for catering to various student needs and labor market requirements which change over time [5]. For example, at MIT, many full-time staff and peer career advisors work, but it is shown that only a small fraction of students finds these services 'very helpful.'.

Research indicates that though such services are available only a small percentage of students find them 'very helpful' and the need for continuous improvement is highlighting. While universities are making efforts to provide career guidance, there is room for enhancing the effectiveness and accessibility of these services continuous feedback from students and adapting to their evolving needs is crucial for improving career services [6].

2.4. Portugal's Universities Offer Career Advice

In Portugal the history of career services dating back to early 20th century with the establishment of a professional guidance institute in Lisbon dates back to the establishment of the Ministry of Career over the years these services have become a fundamental part of higher education institutions, focusing on assisting students' transitions providing psychoeducational support and supporting employment [7]. However, there is considerable variability between different institutions in the scope and quality of these services.

Recent studies have highlighted the need for better access to career guidance in Portuguese universities [7]. Currently the career services are offered through various entities such as Career Offices GIP (Gabinets de Inserto professional) and GAIVA (Gabinetes de Apoio Inserto na Vida Ativa). These services include group counselling and individual counseling together with internships career fairs and entrepreneurial activities geared towards young women and girls. Despite these efforts many institutions still primarily focus on job placement which points to the necessity for a more comprehensive approach to career development that includes comprehensive career counseling and support [8].

2.5. University Students Career Needs Assessment

In line with PWT, Blustein et al. 2019 have advanced the mentality of Working Framework, which emphasizes how sociocultural factors can play a role in the program of career choice and job satisfaction [9]. Most recently, research indicates the necessity to engage students during the planning and delivery of career guidance interventions to make these programs more relevant and pertinent to their needs [10]. Universities can develop better alignment programs of career guidance activities aligned with the needs and for some of learners by directly involving them in the whole program [11].

III. METHODOLOGY

ML, an implementation of AI, allows devices to learn or even grow without explicit development. It includes designing software that can discover and acquire knowledge without explicit development.

This section covers the supervised discovering technique.

Supervised learning is defined as the prediction of one value from other values in a dataset using predefined labels. Algorithms used for supervised discovering include K Nearest Neighbor (KNN), Naive Bayes, Decision Tree, ID3 algorithm, Random Forest

and Support Vector Machine. These algorithms are chosen based on specific requirements, labels, parameters and data available. In case ambiguity of data arises, the algorithms develop a model to predict based on the evidence provided.
For our career counselling project, we use Bayesian classifier and K Nearest Neighbor (KNN) algorithms. These algorithms are known to be effective and productivity in handling diverse parameters, hence giving accurate results.

IV. Attribute Selection

Bayesian classifier algorithm steps:

- **Data Extraction:** Preparing datasets are retrieved from the database (SQL Server) and processed with supervised learning algorithms. Parameter Probability Calculation: Calculate the probability for all parameters used in career predictions.
- **Application of Formula:** Apply the formula

$$P = \{n_C + (m \times p)\} / (n+m)$$

- **Multiplying Probabilities:** Multiply the probability values by p.
- **Outcome Comparison:** Compare all possible outcome probabilities predicting the highest probability as the final result.

This methodology ensures the enhancement of a robust and accurate career counselling system by leveraging the power of machine learning and effective feature selection techniques

V. Result and Discussion

5.1 Outcome of the Literature Review

The literature review points out the following drawbacks of the existing career counselling systems:

- **Accuracy Rate**: Most existing systems have a lower accuracy rate for suitable career recommendations.
- **Applicability to Different Branches**: The existing systems are rarely applicable across diverse branches of study.
- **Limited Parameters**: The parameters of these systems are limited that somehow hampers their effectiveness.

5.2 Results

This survey concludes that the methods applied so far for career counselling are not entirely appropriate for the real-time applications. These systems are usually not capable of giving instant, personalized suggestions, and thus the system takes more time and becomes less effective.

5.3 Discussion

Our proposed solution overcomes these limitations with a real-time "Android-based Web Enabled Application" project. This system is applicable across different branches of study, providing a more versatile and comprehensive career counselling experience. The proposed system, considering a whole range of parameters such as attendance status, extracurricular activity, grades, technical skill, performance in the preceding semester, grasping capacity, aptitude grades, and interaction with lecturers to provide accurate career recommendations in the entire process. A holistic approach will ensure these recommendations will be well-rounded and tailored specifically to unique profiles of all learners in improving their satisfaction in the area of their success.

Flow Diagram

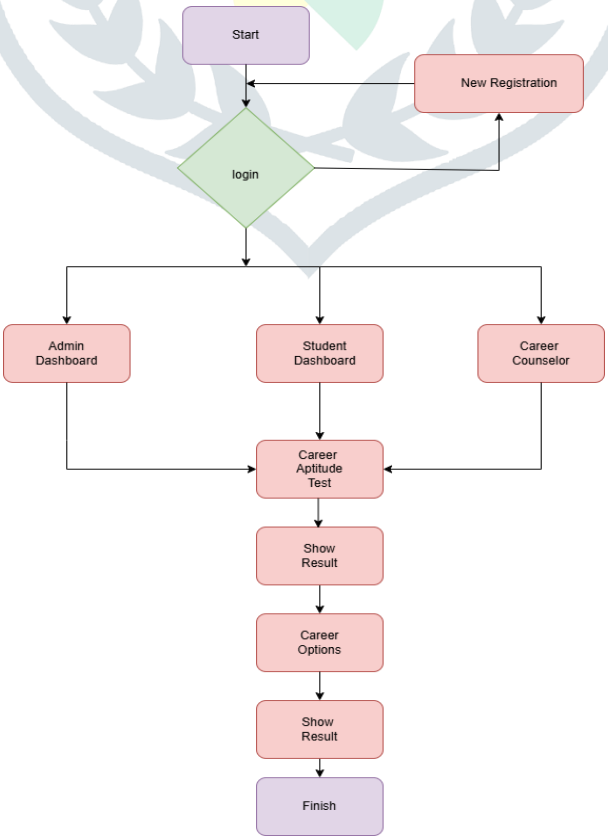

Fig. System Data Flow Documentation

VI. CONCLUSION

This survey paper draws special attention to the serious difficulty's students face in making suitable choices of careers, more specifically in non-academic areas. The conventional career counselling is usually found wanting in guiding an individual based on one's interests and strengths. An AI-based platform with algorithms related to data analysis and matching of interests ensuring. AI-based career counselling systems such as K-Nearest Neighbor KNN and K-means Clustering algorithms, have shown to be more accurate in career suggestion. Providing by identifying patterns and correlations that may not be apparent through traditional methods by analysing comprehensive datasets. This personalized guidance empowers learners to explore a broader range of career options with confidence, reducing the likelihood of career dissatisfaction and career changes. Combination of AI and data analysis in a career counselling program creates an environment that's more inclusive and supportive and allows learners to realize their potential in the chosen fields of work. Further enhancements of the systems will continue to fine-tune their accuracy

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