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Research Paper

Online Career Guidance System

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Abstract— A Career Guidance System where students can see various career opportunities, the system shows various fields available after 10th, 12th for graduation and after graduation fields are also available. It also lists various colleges available where students can search colleges by their courses. Next the system allows users to give a test. The tests have two levels. The first level has questions which help us to identify which field the student is interested in and based on this the second level will accordingly ask questions from their interested field. The first level has same questions for all the standards as it is not based on knowledge but on the interests. The second level questions will be from that field in which the student is interested the most, along with questions from other fields. After the successful completion of both the levels, the student will receive his result along with a detailed explanation and advice from us. The explanation will state the reason as to why we feel a certain career is better for him/her and why not the other.

Keywords— Career Guidance System, first level questions, second level questions, successful completion detailed explanation

I. INTRODUCTION

Choosing a career for has always been one of the most important tasks of our lives from a very early age. This issue always keeps tricking our minds as to what our interest lies in. This tension starts to mount as we grow up and realize that we have already reached a stage where we have to decide what has to be done next in life, but still are confused. Parents who have children studying in SSC are tensed about their future and end up passing their anxiety to their children. Children in turn have no idea as to which stream to choose, what job to take up and what life they want to lead. Our website is basically the ultimate relief for both, students and their parents. Our website will help to clear the confusion in the mind of the student. We aim to guide students by leading them into a series of tests which will give them an idea how to start and what to do further. A career aptitude test is a test designed to identify the careers or occupations that best suit you. Our website will guide students from the 8th, 9th and 10th standard in choosing the right career option that is which stream they must select after their SSC. We start conducting the aptitude tests from standard 8th itself, as it is better to start pruning their minds at an early stage. The students have to first register with our website. They will then have to select their standard, as the level of the tests for each standard is different. After the selection of the standard, the students can proceed for the tests. The tests have two levels. The first level has questions which help us to identify which field the student is interested in and based on this the second level will accordingly ask questions from their interested field. The first level has same questions for all the standards as it is not based on knowledge but on the interests. We have selected eight fields namely Health Science; Technology and Engineering; Business; Education and Training; Law and Public Safety; Liberal Arts, Humanities and Media; Social Science and lastly Culinary and Hotel Management. The questions from both the levels are from these eight fields. The first level has four options namely Very Interested, Interested, Slightly Interested and Not Interested. Clicking on the first two options for a question of a particular field will increment the counter in that field and the second level questions will be from that field in which the student is interested the most, along with questions from other fields. After the successful completion of both the levels, the student will receive his result along with a detailed explanation and advice from us. The explanation will state the reason as to why we feel a certain career is better for him/her and why not the other.

II. LITERATURE REVIEW

Review of literature based on the IEEE paper-"Choosing Career Paths: The Outputs of VTASI Teams", Young people in high schools and colleges make important decisions regarding what to study and which career path to pursue. For various reasons, most of them end up switching to other majors. Literature is full of references which outline the view of professional grownups (e.g., researchers, teachers, governmental personnel, engineers, doctors, pharmacist, bankers, and bachelor of mass media (BMM), lawyers, and others) regarding factors affecting such changes. It is not known how this career selection and switching problem is seen by the young generations these days. At university of Buffalo, USA, a research was done regarding this issue. The ways of discussion here were as follows: a modified Delphi brain-storming process, communicate with each other asynchronously via electronic means, apply a set of Deep Think idea generation strategies to think and act creatively, and conduct multiple rounds of structured interactions, under the guidance of a knowledgeable team leader to produce increasingly novel ideas. Choosing college majors and career paths after schooling is a critically important decision for young people to make. Because of the advancement in technologies

and rapid changes in marketplace conditions, as affected by globalization and ever increasing interdependence of national economies, making the right career choices has become increasingly more complex and difficult. Changing career decisions at a later stage is usually wasteful in time and resources for the individuals involved. It is desirable that career decisions are made as appropriate as possible the first time around. Young people select specific career directions to be successful and happy in life. Success is to be assured through technical and professional accomplishments, peer recognition, opportunities for self-actualization, and increased levels of self-confidence. Happiness is to be secured by personal health, financial security, admirable relationship in personal networks, and social standing, among others. Career tests are generally useful to objectively assess the individuals' capabilities, preferences, values and other personal characteristics, to arrive at valid results, career tests need to be taken carefully. It is also obvious that when making career decisions, they consult their trusted family members and friends, as well as other experienced people. Statistics have demonstrated that many young people change their career directions, sometime involuntarily and other times by free choice. For example, 40% of students(science, technology, engineering and mathematics) and 60% of pre-medical students end up switching to other subjects or failing to get any degree. Reasons for this unexpected outcome may include difficulty of the base subjects, competition within the academic environment, students being unwilling to work hard, and not sufficiently prepared for the basic courses such as sciences and mathematics. Some students pick easier majors despite of less pay. It will prove be useful to find out more exhaustively what factors influence young people's career decision, and how can they be better advised, so that the subsequent changes made to their career decisions can be substantially minimized. In the university at Buffalo, USA a brainstorming session was taken regarding choosing career paths by 52 graduate students who have recently given the "Selection of my career path test". These happened in two ways and the results were noted as to how to give this approach a better way or how to improve it. These were the assumptions made:

1. Selected students can be given allotment as to their convenience to save time and money.
2. Any given issue may be reviewed from a variety of viewpoints by the group, so that selections are done for the best.
3. Team participants remain anonymous to one other and do not interact face-to-face, in order to be free of any fear of saying something wrong.
4. The teams should go through several rounds of individual brainstorming sessions.
5. The team leader prunes and categorizes the team outputs at the end of each round, separating wheat from the chaff, so that participants are led to focus on an increasingly novel set of residual ideas. It is generally known that individuals formulate ideas based on their existing patterns of thinking, they normally think in ways they were taught to think. Their experience tends to confirm the ideas they generate, inhibiting new types of ideas from surfacing up. Excessive experience might, in fact, have a negative impact on the individual's capability of thinking out-of-the-box. Most people search for solutions in the nearer context of the problem as they are led by already fixed patterns of thinking structures. Students were also interviewed with few questions after the career guidance session was given to them. By and large, the participants of this team process, even though some of them find the Deep Think methodologies somewhat difficult to apply, at least initially. Several approaches were also suggested to further improve the operations of this team.To conclude the team engaged a group of graduate students who had just gone through their own processes of selecting college majors and career directions to brainstorm the key factors affecting such process and the ways to improve such selection process using the team approach. Their views turned out to be slightly different from those of professional adults known in the literature. Teams represent a flexible, low-cost and globally applicable organizational design to screen participants with respect to their relative creativity. For colleges, these teams could be readily utilized to enhance the training of student's creativity. They are capable of adding great value, provided that the team leader is capable of playing the active and proper role required to assure success. VTASI teams can also stand for "Venturing Together Achieves Superior Inventiveness."[1]

Review of literature based on the IEEE paper-"Multi-expert system design for educational and career guidance: An approach based on a multi-agent system and ontology", the main objective is to present the design of a multi- expert system for decision support in the career guidance field by using the multi-agent paradigm and the ontology approach. Ontology is a description of the concepts and relationships that can exist for an agent or a community of agents". The use of ontology allows us to identify guidance concepts and semantic links between them in order to establish a better representation of the existing while staying within the context of sharing and reusing of knowledge. We have distinguished ontology as ontology of individual, ontology of trades, ontology of trainings and ontology of actors. The problem that has to be dealt with in this article is that of educational and career guidance where different types of knowledge come from four sources: pedagogical expert (A person who studies theories of education), psychological, sociological expert (a person who studies the systematic study of human society, especially present-day societies.) and economic expert (an expert in the science of economics). In addition to the above four mentioned experts, other two experts are added which are a coaching expert and the system supervisor. Choosing career guidance is not always an easy task for students, especially since the choice The psychologist`s role is basically to determine the individual`s personality traits in order to know its vocational trends. He relies on a psychological model of vocational choice. The sociologist`s job is to break down the values of the user. He relies on an analytical model of personality. The intervention of these two experts (psychologist and sociologist) allows determining the vocational group of individual. The pedagogue`s responsible for determining the balance of skill of the user. He is interested in everything that is training, education, skills, abilities, etc. The economist is the expert of the labor market; he knows its trends, its requirements, the new occupations, trades in the process of disappearing, etc. The Coach is involved in monitoring the user. His role begins only after the determination of the professional project. The supervisor organizes the tasks between the different experts; he has his

own database of rules. Should be based on several criteria and at a relatively early age. It affects academic and professional life. A bad educational or professional guidance may be at the origin of several educational and social problems: school failure, school dropout, lack of skills, integration difficulties, unemployment, etc. Choosing an orientation is often based on several criteria or parameters whose weights (or coefficients) are of different natures. Several studies have examined demographic and personal factors that can influence the vocational and educational choice. It is extremely important that a country builds its policy in terms of education and training directly related to the needs of its labor market, for this, the country must give major importance to its guidance system. There is no question of allowing young people to make 'vacuum' educational and professional careers by following erroneous studies, because it will result in only increasing the rate of unemployment. . The proposed system as part of this work is supposed to make a triple works. The first one is to make a better pairing between an individual profile (profile acquired) and that of different trades (profile required) according to a set of criteria involved in the guidance process. The second is to generate adapted training paths in accordance with previously established pairing. The third is dedicated to monitoring the individual to the maturation and implementation of her/his career plan. This pairing is based on a set of factors (criterion) involved in the process of orientation among individual factors - Professional interests, personality traits and values are used to generate a profession capital corresponding to the profile of the individual. - Skills, training, socio-economic status, sex and health- appearance are used, rather, to apply some 'filtering', that is to say, eliminate the possible trades to adapt the best two possible profiles. In their turn, the trades are subject to a certain categorization according to the criteria, professional interests, personality, values, wages, safety and comfort. The system consists of several applications (modules) namely, a set of actors are solicited by this system; the system is accessed by multiple categories of actors (Students, job seekers, counselors, teachers...); the system is powered by data from external sources; the system is evolutionary in term of contents as well as of services and components; the system uses data coming from several different sources, physically isolated.

This system has some principles and concepts which are the use of multi-agent systems (MAS) to represent the different agents(members) of the system; integrating methodologies from Artificial Intelligence (AI) based on mathematical theories to render   intelligent agents; analysis of data, Genetic Algorithms, Networks bays, Neural Networks, Fuzzy logic, Petri nets, Case-based reasoning, Data mining; architecture to allow efficient use, based on Service Oriented Architecture (SOA); flexible distribution that is based on the principle of SAAS; the use of the principle of Big data. Here have we used the Agent technology in order to implement flexible and modular solutions. An agent is a physical or virtual entity that has the ability to act, perceive its environment (in a partial way) and communicate with others; it is autonomous and has skills to achieve its goals and tendencies. In a multi-agent system (MAS) an agent can communicate with other agents which behavior is the result of these observations, knowledge and interactions with others agents. The communication between agents is one of the key components of multi-agent system and is its primary property. In fact, agent needs to be able to communicate with users, with system resources, and with each other in order to cooperate, collaborate, and negotiate. The main agents (non exhaustive list) of our system are Interface Users Agent (IUA), Users Manager Agent (UMA), Professional Interests Agent (PIA), Trait Personality Agents (TPA), Economist agent (EA), Pedagogue agent (PA), Supervisor Agent (Manager) (SA), Inference Engine Agent (IEA), Generator Professional Project Agent (GPPA) and Agents Coach (AC). The system uses Protégé to edit the ontologies, JENA API, SPARQL to edit the OWL file; JADE to implement the SMA and JESS that is a rule engine environment and scripts written entirely in JAVA by Ernest Friedman-Hill au Sandia National Laboratories. In a multi-agent environment, JESS can be used as an element of decision of an agent. [2]

Review of literature based on the IEEE paper-"Design of an online expert system for career guidance." This paper is based on the construction of an online Expert System which guides the students for the selection of their undergraduate courses after the completion of their higher secondary school education. With today's increasing number of colleges and innumerable courses the details provided by a human expert may not be fully sufficient to judge whether a college /course is appropriate for a particular student. Artificial intelligence methods like Expert Systems (ES) can help and save time in this domain because an ES provides fast expert advice based on the knowledge from its knowledge base component. There are a total of five different modules in this proposed system. First module is to extract the information about various colleges. Now this information extracted may be in random form so the second module is to structure the extracted information in a particular order. In the third module the rules are framed, and these rules are framed on the basis of knowledge and the facts. The fourth module will get certain details from the user as input. And in the fifth module the system based on the user's requirements and the eligibility criteria for the colleges, the user will be provided with the needed information. The constructed expert system is queried with 5 types of queries related to the domain of career guidance from the user's perspective. The test queries are categorized on the college types, the branch present in the colleges, percentage of the students, past year statistics, comparison between colleges and the placements details and other facilities present. The proposed system generates assuring results and it reduces a great amount of human effort in the extraction of knowledge and providing the students correct and authentic information which inturn helps them in choosing the right path, updating the recent details frequently to provide the latest information. Therefore an expert system is a branch of artificial intelligence which attempts to replace the human experts. [3]

III.   PROBLEM ANALYSIS IN THE EXISTING SYSTEM

The problem in the existing system as mentioned in the IEEE paper Choosing Career Paths: The Outputs of VTASI Teams, is the use of the Deep Think strategies. The Deep Think strategies are difficult and confusing. Not all Deep Think methods are applicable to all issues. These strategies are restrictive. Also another problem is that the VTASI team will be

capable of adding great value only if the team leader is capable of playing the active and proper role. Problems in the existing system mentioned in the IEEE paper of the Multi-expert system design for educational and career guidance is that the approach based on a multi-agent system and ontology. The system requires the use of many agents. The use of many agents requires proper co-ordination between them. This may lead to a lot of confusion. Also this system needs to make use of several scientific methods coming from artificial intelligence. We also visited a Career Counsellor who conducts aptitude tests. The problem that students experienced is that to access his Career Counselling website, the student must take an appointment to receive the password and user id. That is, just to access the website for any details or clarifications we need to take an appointment and be willing to appear for the test at least once which means we have to pay fees and it is not free of cost. Whereas for our website, it can be accessed free of cost. Problems faced in the existing system for: Design of an online expert system for career guidance is that it usually only covers a narrow range of subject knowledge. A lot and effort and cost need to be spent for making a good expert system. Not as good as having human experts to hand. Most of the systems are menu driven which do not deal very well with ambiguous problems and it's unlikely to come up with creative solutions. Thus we have come up with this project to rule out most of these problems and issues present in other existing systems.

IV. PROPOSED WORK

Algorithm of our system:
Start
Step 1: If (student is registered) then
    Login
    Input student id, password
    else
    signup
    Input student details
    endif
Step 2: Select standard
Step 2.1: Level 1
Step 2.2: give test
Step 2.3: Input option
Step 2.4: if (option==very interested||interested) then
    increment session variable
    end if
Step 3: Logs out automatically
Step 4: Log in
Step 5: Level2
Step 5.1: set created according to the previous test given
Step 5.2: give test
Step 5.3: result displayed
Step 5.4: if (student wants to give test again) then
    go back to step 5.1
    else
    log out
    endif
Step 6: Get result and explanation
Step 7: end

V. CONCLUSIONS

Career Guidance System is an innovative idea. The opportunities provided by this e-medium are immense and many students can make use of this medium to choose a career more appropriate to their skills. In today's competitive and technology driven world, with innumerable options available, the student is generally confused on choosing the right or more suited career. The world these days is moving towards "information streams". The information is thrown to the user rather than the user learning about the information. Keeping the above in view, it is felt that the proposed system has the ability to connect to various students and help them connect to most suited career. To conclude, the objective of designing this system is to lend a helping hand to the students aiming for such a career. By using our system, one will be guided towards a career to pursue and how to work towards it.The proposed system currently deals with guiding students in a direction that is right for them i.e. to select a proper career path depending upon the present skill sets and mental abilities. But this is only for academic subjects. The plan for future is to expand this system by including vocational subjects as well. It may be reiterated that at this juncture our objective is entirely on academic subjects and not on vocational subjects as these arise from an individual's liking and would need further improvisation on the model proposed above.

ACKNOWLEDGMENT

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