



EXPERT CAREER ADVISOR

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ABSTRACT

Career guidance helps people choose a career path based on interests, qualifications and ambitions. It is important for the people to make decisions carefully about the career and educational choices as these choices determine their future. These decisions should be taken under the guidance of an expert. In this paper we discuss about an expert system which provides career related advices. The career related decisions are generated using the candidate's values, unique skills and experiences. The system uses different tools to analyze the candidates IQ, EQ, SQ and interests to determine the compatibility of the candidate to a particular profession and this is used in guiding the candidate appropriately. The system uses a unique mechanism to map candidate's skills to compatibility scores for a particular profession. The system then gives detailed report, action plans and SWOT analysis of the user to identify their strengths and abilities and according to it provides certain expert advices to choose a career for the edification of their future.

Keywords: *Expert System, Flex, Decision Support System*

I. INTRODUCTION

Choosing a career is one of the most important decisions that a person takes in his life. But most of the people make career choices without taking proper guidance. The parents play an important role in student's life as they help them to take career related decisions. But unfortunately most of the parents' guide them to choose a career which they think is suitable for the student, without knowing their actual ability and skills. This leads to a career where the student cannot perform to his full potential because of lack of interest or lack of skills. Thus interest and skills play an important role in choosing a career.

Career guidance is important in a person's life as it provides a pathway to a career according to one's interest and skills. This guidance must be provided by an expert so that the person chooses a career which is better for his future. Career guidance enables the individuals to manage and plan for their goals. Here we discuss about an expert system which provides expert advices which are for the betterment of one's future. This expert system determines the compatibility of the candidate by analyzing his intelligence quotient, emotional quotient and social quotient.

An intelligence quotient, or IQ, is a score derived from one of several standardized tests designed to assess intelligence. IQ scores are used as predictors of educational achievement, special needs, job performance and income. Emotional quotient or EQ is the ability to identify, assess, and control the emotions of oneself, of others, and of groups. Criticisms have centered on whether EQ is a real intelligence and whether it has



incremental validity over IQ. SQ is a score that measures the social attributes of the person.

II. PROBLEM STATEMENT

The important factors required to choose a particular career are interest and skills. Candidates can decide to choose a career according to their interest, but if they don't have the skills which are required for the particular career then it will cause less productivity cause of lack of self-motivation. On the other hand if the candidates choose a career in which they are not interested then it will lead to lack of satisfaction in the future. Parents play an important role in student's life to help them make important decisions regarding their future but sometimes parents are unable to analyze the actual skills of the students and hence they make wrong decisions while choosing the career for the students. Psychologists are the experts who can measure one's skills by their intelligence quotient, emotional quotient and social quotient but they are not aware of the career opportunities related to the skills. Career consultants are the experts who can help to find the right career for the candidate according to their interest. But in order to be successful in the future the candidates should be guided to choose a career according to their interest and skills. There are only few experts who can measure the skills of the candidate and are well aware of the career opportunities related to their interest but they are not available every time. Because of all these reasons a system is required to provide the career related advises which is affordable and easily available for every person who needs a proper guidance.

III. ARCHITECTURE

The System has 4 modules

- 1) Profession selector.
- 2) Compatibility analyzer.
- 3) Course selector.
- 4) College selector.

A. Profession Selector

Profession selector will suggest a list of professions for the candidate. It identifies the area of interest of the candidate and accordingly suggests the professions related to that area. The selected professions are forwarded to the compatibility analyzer.

B. Compatibility Analyzer

The compatibility analyzer module analyzes the candidate's Intelligence quotient, Emotional quotient, Social quotient and generates compatibility score for each selected profession generated by the profession selector module. The IQ score of a candidate is obtained by asking the candidate to take up specially designed IQ test. The candidate is analyzed for the following IQ components (Cattell-Horn-Carroll theory) [a1]

- a) Fluid intelligence (Gf): includes the broad ability to reason, form concepts, and solve problems using unfamiliar information or novel procedures.
- b) Crystallized intelligence (Gc): includes the breadth and depth of a person's acquired knowledge, the ability to communicate one's knowledge, and the ability to reason using previously learned experiences or procedures.
- c) Quantitative reasoning (Gq): is the ability to comprehend quantitative concepts and relationships and to manipulate numerical symbols.
- d) Reading and writing ability (Grw): includes basic reading and writing skills.
- e) Short-term memory (Gsm): is the ability to apprehend and hold information in immediate awareness, and then use it within a few seconds.
- f) Long-term storage and retrieval (Glr): is the ability to store information and fluently retrieve it later in the process of



thinking.

- g) Visual processing (Gv): is the ability to perceive, analyze, synthesize, and think with visual patterns, including the ability to store and recall visual representations.
- h) Auditory processing (Ga): is the ability to analyze, synthesize, and discriminate auditory stimuli, including the ability to process and discriminate speech sounds that may be presented under distorted conditions.
- i) Processing speed (Gs): is the ability to perform automatic cognitive tasks, particularly when measured under pressure to maintain focused attention.
- j) Decision/reaction time/speed (Gt): reflects the immediacy with which an individual can react to stimuli or a task (typically measured in seconds or fractions of seconds; it is not to be confused with Gs, which typically is measured in intervals of 2-3 minutes).

The EQ score of a candidate is obtained by asking the candidate to take up specially designed EQ test. The candidate is analyzed for the following EQ components (Daniel Goleman's five components of emotional intelligence)[a-2]

- a) Self-awareness (Esa): the ability to recognize and understand personal moods and emotions and drives, as well as their effect on others. Hallmarks* of self-awareness include self-confidence, realistic self-assessment, and a self-deprecating sense of humor. Self-awareness depend on one's ability to monitor one's own emotion state and to correctly identify and name one's emotions.
- b) Self-regulation (Esr): the ability to control or redirect disruptive impulses and moods, and the propensity to suspend judgment and to think before acting. Hallmarks include trustworthiness and integrity; comfort with ambiguity; and openness to change.
- c) Internal motivation (Eim): a passion to work for internal reasons that go beyond money and status -which are external rewards, - such as an inner vision of what is important in life, a joy in doing something, curiosity in learning, a flow that comes with being immersed in an activity. A propensity to pursue goals with energy and persistence. Hallmarks include a strong drive to achieve, optimism even in the face of failure, and organizational commitment.
- d) Empathy (Ee): the ability to understand the emotional makeup of other people. A skill in treating people according to their emotional reactions. Hallmarks include expertise in building and retaining talent, cross-cultural sensitivity, and service to clients and customers. (In an educational context, empathy is often thought to include, or lead to, sympathy, which implies concern, or care or a wish to soften negative emotions or experiences in others.). It is important to note that empathy does not necessarily imply compassion. Empathy can be 'used' for compassionate or cruel behavior. Serial killers who marry and kill many partners in a row tend to have great empathic skills!
- e) Social skills (Es): proficiency in managing relationships and building networks, and an ability to find common ground and build rapport. Hallmarks of social skills include effectiveness in leading change, persuasiveness, and expertise building and leading teams.

The SQ score of a candidate is obtained by asking the candidate to take up specially designed SQ test. The candidate is analyzed for the following SQ components One model consists of three components:

- a) Social Skills (Sss): the inferences a person makes while socializing and the role one plays within a group. Social skill improves the 5 basic skill situational awareness, presence, authenticity, clarity and empathy.
Situational Awareness (or social awareness) is your ability to observe and understand the context of a situation you may find yourself in, and to understand the ways in which the situation dominates or shapes the behavior of the people in it. Presence, also known simplistically as bearing is the impression, or total message you send to others with your behavior. People tend to make inferences about your character, your competence and your sense of yourself based on the behaviors they observe as part of your total presence dimension. Authenticity is the extent to which others perceive you as acting from honest, ethical motives, and the extent to which they sense that your behavior is congruent

with your personal values - i.e. "playing straight." Clarity is the ability to express ideas clearly, effectively and with impact. It involves a range of "communicating" skills such as listening, feedback, paraphrasing, semantic flexibility, skillful use of language, skill in using metaphors and figures of speech, and the ability to explain things clearly and concisely. Empathy is the skill of building connections with people - the capacity to get people to meet you on a personal level of respect and willingness to cooperate. Empathy, in this case, goes beyond the conventional definition of having a feeling toward another person; here, it means creating a mutual feeling between yourself and another person.

- b) Self insight (Ssi):self-insight indicates about how one is influencing others.
- c) Interaction Style (Sis), the underlying model of social interaction styles involves two primary dimensions: social energy and results focus. Social energy is the impulse to engage other people, to interact with them, to influence them and be influenced by them. Results focus is the preference for getting things done either through people or by one's own effort.

The questionnaire contains questions measuring the components of IQ,EQ,SQ described above. Now based on the responses from the user the system generates the IQ,EQ,SQ scores of the candidate and also keeps track of the score for each constituent component. Based on the net score IQ,EQ,SQ the system generates certain inferences. For example mapping the candidate to an occupational group based on Average IQ of various occupational groups[1] Similarly people with low SQ are more suited to work with low customer contact, because they may not have the required interpersonal communication and social skills for success on with customers. People with SQs over 120 are considered socially skilled, and may work well with jobs that involve direct contact and communication with other people The system also generates a compatibility score each selected profession, the knowledge base has a formula for every profession to evaluate the candidate's compatibility with a particular profession by using the components of IQ, EQ and SQ.

For example the compatibility formula for a doctor would be like

$$SQ \times 0.15 + Glr \times 0.30 + Gc \times .15 + Grw \times 0.10 + Gf \times 0.05 + Eim \times 0.15 + Ee \times 0.10$$

Similarly for an engineer the compatibility formula would be

$$SQ \times 0.05 + Gc \times 0.25 + Grw \times 0.10 + Gf \times 0.10 + Gv \times 0.10 + Gq \times 0.30 + Glr \times 0.10 + Es \times 0.15$$

C. Course Selector

The course selection module advises the candidate of what course one should pursue based on his/her interested profession. The module first identifies the profession the candidate is interested in and then it suggests the course which he/she can pursue so as to qualify for the particular profession.

D. College Selector

The college selection module helps the candidate in choosing a college where he/she can pursue the desired course. College selector module identifies the course the candidate is looking for, if the candidate is eligible pursue the course, the system identifies if the candidate has any interests based on location and provides a list of suitable colleges with their contact details ,how to apply and the selection criterion to the college.

IV. ALGORITHM

The Expert Career advisor has 4 modes of operation. These modes of operation are explained below.

- a) Profession Selection.
- b) Compatibility analysis for a profession.
- c) Course selection.
- d) College selection.

These modes of operation are explained below.

A. Profession Selection



- i) Identify the interest of the candidate to generate list of interested professions.
 - ii) Select the IQ, EQ, SQ components to be emphasized on during the analysis based on the interested professions.
 - iii) Perform IQ, EQ, and SQ analysis of the candidate.
 - iv) Generate the compatibility scores for the interested professions.
 - v) If compatibility scores are unsatisfactory perform general IQ, EQ, SQ analysis and Select professions with suitable compatibility scores.
 - vi) Display all options with compatibility scores, areas to improve if any (With respect to interested professions), brief description on each listed profession, SWOT report on all selected professions.
Compatibility analysis for a profession
 - i) Obtain the profession from the candidate.
 - ii) Analyze the candidates knowledge on the selected profession.
 - iii) Select the IQ, EQ, SQ components to be emphasized on during the analysis based on the input profession.
 - iv) Perform IQ, EQ, and SQ analysis of the candidate.
 - v) Generate the compatibility scores for the interested professions.
 - vi) If compatibility scores are unsatisfactory perform general IQ, EQ, SQ analysis and Select professions with suitable compatibility scores.
 - vii) Display all options with compatibility scores, areas to improve if any (With respect to input profession), brief description on each listed profession, SWOT report on all selected professions.
- B. Course selection
- i) Identify the profession of the candidate in which he/she is interested.
 - ii) Specify the course that is to be pursued, eligibility to pursue the course, Exams one should take.
- C. College selection
- i) Identify the country where the user wants to pursue his/her studies
 - ii) Obtain the last completed degree and the degree the user is planning to pursue
 - iii) Analyze if the candidate satisfies all eligibility criterion.
 - iv) Give you the list of colleges with their contact detail and selection criteria
 - v) Else show you the reason why you are not eligible

V. CONCLUSION AND FUTURE

ENHANCEMENT

The Expert career advisor was successfully implemented in flex. The system was successfully able to measure the different components of the candidates IQ, EQ, SQ and generate compatibility scores for interested professions. Certain components of IQ could not be measured like processing speed (Gs), Reaction time (Gt) due to certain limitations of the flex expert system shell.

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