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Career Guidance System

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Abstract: Guidance systems have widespread applications in both academics and industry. Traditionally performance of guidance system has been measured by the precision. The proposed system is focused on specializations that can be undertaken by engineers through reliable and flexible online tests that are adaptive in nature. The test will start with aptitude questions related to the field and then based on the inputs from the user and accuracy of the input, the user will be provided with the next set of questions and this adaptive nature continues throughout the test. On completion of the test, the users shall get a report of their performance based on which the system will provide a career path in which the user is more likely to succeed. The adaptive nature and the end result report using tableau are the two major components that will be the highlight of our project.

Keywords: Recommendation System, questions, tests, career, students, report generation, website.

I. INTRODUCTION

Nowadays, students are often facing a dilemma in deciding to choose a career in their life. There are several factors that influence the students when choosing their career path such as their personal aptitudes, educational achievements and their environment. Upon completing their first degree or undergraduate students at their university, students are normally starting to consider a career path which may suit their skill and potential the best. Development of computer and network technologies has brought in great advancement in the education system. Tests are generally the most common and effective way in evaluating an individual's knowledge or ability. Traditionally, teachers or examiners need to take days or weeks to compose a test which cannot always satisfy the need in discriminating the individual's knowledge. In modern edification, computer availed testing systems are promising in engendering tests efficiently for evaluating a person's adeptness. This project develops a testing system for students. Equipped with user friendly interfaces and administrative modules, the proposed system is self-adaptive in nature and flexible for generating parallel tests with identical test ability.

II. OTHER RELATED WORK

This paper [5] develops a novel keenly intellective testing system for students. Equipped with user friendly interfaces, the proposed system offers the following features and advantages: Self- Adaptive [6]- Item attributes in an item bank are adaptively updated to reflect students newest learning states. Tests with high assessment qualities are reliably generated. It is flexible for generating parallel tests with identical test ability. In this paper, the self-adaptation strategy and the Ant Colony Optimization based test composition (ACO-TC) method are firstly described. ACO, an advanced computational intelligence algorithm is used for searching high quality results. Another paper [7] proposes a career path recommendation framework which addresses shortcomings. Using text mining and collaborative filtering techniques [8], it first scans the user's profile and resume, identifies key skills of the person and recommends personalized job recommendations. and also additional skills for the related job openings. Text mining module fetches user's profile data and then outputs required data needed as input to recommendation engine. Depending on the engine, the output differs resulting in the two types of recommendation, namely job and skill [9]. Choosing the right option for their career is important and in the contemporary world, the awareness about this is increasing. The system proposes an improved approach using C4.5 [12] algorithm for generating rules and for applying statistical correlation on the results.

III. PROPOSED SYSTEM

The product of ours includes two major components, one for recommendation and the other for displaying the summarized results. The user will be able to interface with the system and give the test by entering their login id and password. The user will get a recommendation and a summary of the given test based on the test given. The first set in the test contains questions from all the domains of the preferred area of interest of the user. Once answered, they will be evaluated on the basis of which the domains will be narrowed and this process will be repeated a number of times till the final set of questions after which an appropriate recommendation can be given. There will be a total of three to four levels with each level being difficult than the other. For each level the user goes higher, the ratio of questions will

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change as per the performance of the user. The last level will consist of a case study that will be related to the subject which the user is most confident and potent in.

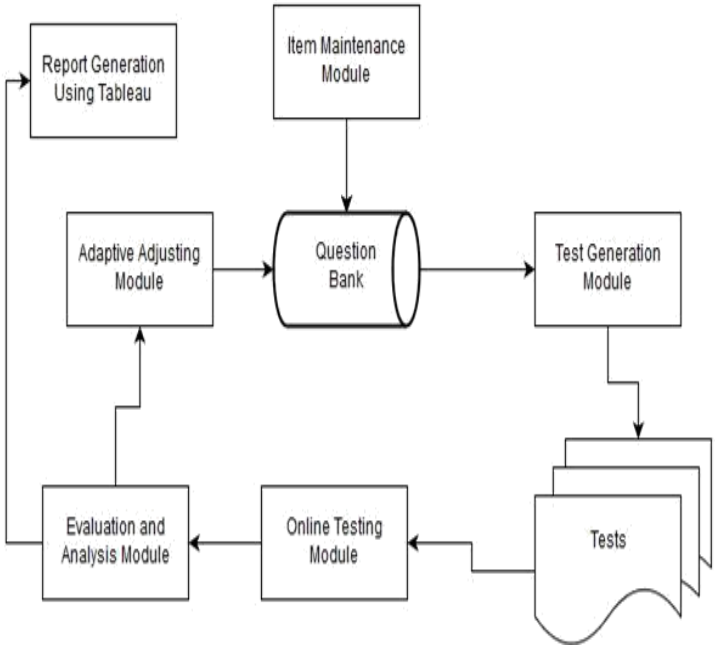

Fig.1 Block Diagram of Proposed System

The proposed intelligent testing system is composed of an item bank, an item maintenance module, an evaluation and analysis module, a test generation module and an online testing module. The *Question Bank Module* consists of the question sets of different levels of various domains.

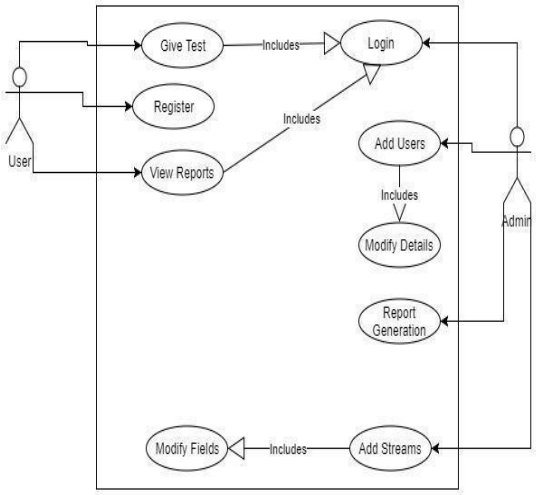

Fig. 2 Use Case Diagram

1. *Item Maintenance Module:* This module is maintained by the administrator and is used to maintain items in the item bank, such as item deletion, revision and addition of items.

2. *Item Evaluation and Analysis Module:* Once a student answers the question, this module is responsible for the evaluation of the questions answered by the user. It also helps in adaptively adjusting the item attribute values using the *Adaptive Adjusting Module.*

3. *Online Testing Module:* This module provides a platform for the students to take a test. It is also used to transfer the answers to the evaluation and analysis module for assessment.

4. *Test Generation Module:* The test generating module helps in implementing the proposed system to generate tests.
5. *Report Generation Using Tableau Module:* The report generation module will use the Tableau software [13] to summarize the results and display it as a graphical representation. This module will also contain the recommendation to

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the user based on the report. There will also be mentioned the additional courses and certifications that can be done by the user to make himself/herself gain even more knowledge and improve their set of skills in that particular domain.

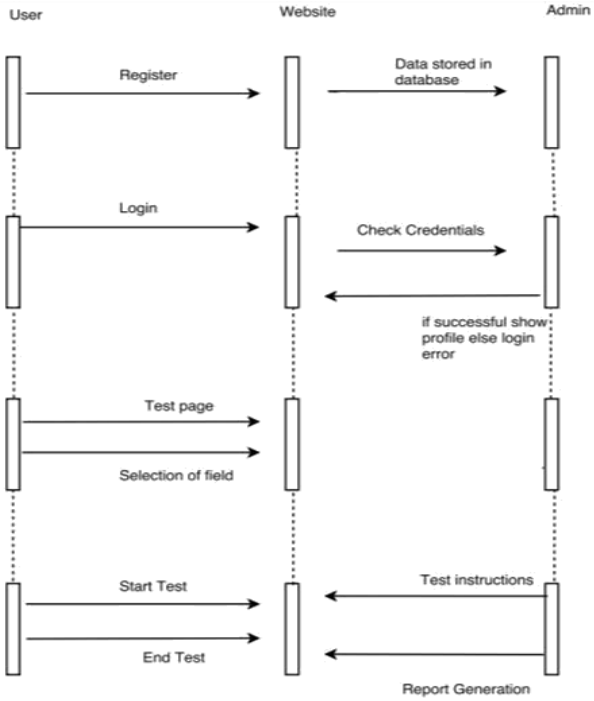

Fig . 3 Sequence Diagram

The process model used for the project is Prototype Model. Workable prototype is ready earlier and can be reworked as necessary until an acceptable prototype is finally achieved and improved software is obtained. Prototype model is a very desirable model when a lot of end user interfacing is required. Fig. 2 represents the use-case diagram of the proposed system. It consists of two actors, namely User and Admin. The user will have the use cases like Register, Give test, View reports. The admin will have the use cases like Login, Add Users, the report Generation, etc. Fig. 3 represents the sequential flow of the proposed system. It is the stepwise representation which will be followed during the process.

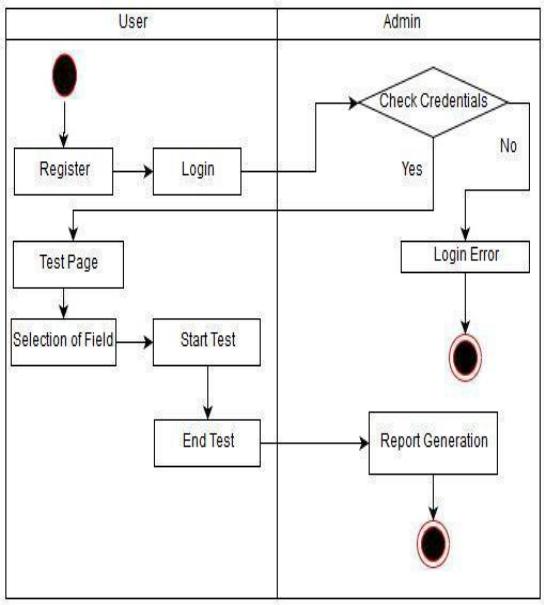

Fig. 4. Activity Diagram

Fig. 4 represents the activity diagram which is the graphical representations of workflows of stepwise and actions with support for choice, iteration and concurrency. The user will first register and after registering himself he will get one time Login id and password. Then after entering user id and password the admin will cross check the credentials of the

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user. If the credentials are correct then the login will be successful and the account can be accessed by the user where the user can view previous reports or if the user wants to take the test, then the test page will be generated for the user or else it will simply show login error.

Then after getting through the test page the test will get started. This proposed model of ACO will evaluate the best suited career for user based on their inputs by conducting an aptitude test.

Item Attributes: A test is composed of n (n>=1) items for students to answer. Each item has several attributes such as unique degree id number I, discrimination degree d_i. So the scoring proportion s_k can be calculated by,

$$s_k = \sum_{i=1}^{n}(v_{y_i} | y_i = k) / \sum_{i=1}^{n} v_{y_i} \quad \ldots\ldots\ldots\ldots(1)$$

Where y_i denotes the type of item i, $(v_{y_i} | y_i = k)$ denotes

the score of item I whose type is k. The difficulty ranges in [0.00, 1.00]. If no one has achieved the item correctly the degree is 0.00. If all students can answer the item correctly, the degree is 1.00.

The Average Difficulty Degree can be denoted as D, where *n*

$$D = \sum_{i=1}^{n} d_i / n \quad \ldots\ldots\ldots\ldots(2)$$

where d_i is the Difficulty degree. The value of discrimination degree ranges from [-1.00, 1.00]. The higher the discrimination degree, the better the item does in evaluating the student's knowledge. The average discrimination degree is denoted by E, where

$$E = \sum_{i=1}^{n} e_i / n \quad \ldots\ldots\ldots\ldots(3)$$

After the successful completion of test, the student will receive his result along with a detailed explanation [10] 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. The students will be the beneficiaries from the resultant information that our algorithm will provide them with. At the end of the process of taking the quizzes, the associate can take a definitive decision about the path which would fit him/her the best [11]. This will also be a commercially exploitative tool as several career counsellors can ask the aspiring and concerned/anxious candidates to take use of our website and this thereby would benefit both parties.

We will be designing our website with the intention of the algorithm covering as many as career groups as possible ranging from graduates to aspiring doctoral candidates.

IV. CONCLUSION

We hereby conclude that this software can be useful for students for finding a correct career path. The software/project will provide a detailed report which can help a user analyse his/her strengths and weaknesses and choose a profession accordingly.

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