International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 02 | Feb 2020 www.irjet.net p-ISSN: 2395-0072

INTELLIGENCE QUOTIENT TESTER

Dharanya S[1*], Akshya Rangarajan[2], Aadhithya A[3], Jaahnavee G[4]

[1,2,3,4]*UG Students, Department of Information Technology, SRM Valliammai Engineering College Tamilnadu, India*

Abstract - *The measure of intelligence level of people at every stage of their life will be very useful for them which will result in self-awareness of their capability. IQ is the measure of the problem-solving capability of people. There are many scales to measure IQ but they do not have variations in age group. Thus Wechsler Scale can be used which has three different age groups namely (i) Wechsler Preschool and Primary Scale of Intelligence (WPPSI) test for children below 10 years, (ii) Wechsler Intelligence Scale for Children (WISC) test for children between the ages 11 and 17, (iii) Wechsler Adult Intelligence Scale (WAIS) test for individuals of ages above 17. The database of this system stores a large set of questions for each age group. The registered users should give their age to take up the test and then view the results. The result of this test determines the mental age of the person. Then the IQ can be found using the mental age and the chronological age. This system generates a report based on the user's performance. The users can also view their history of previous performances. Many of the IQ testing systems have repeated questions which will not provide proper results. This system uses* ***Fisher-Yates Shuffling algorithm*** *to generate random questions from the set of questions stored in the database to reduce the repetition of questions as much as possible. The result can be generated appropriately. The administrator is responsible for loading the questions and updating the questions in future.*

Key Words*: *Intelligence Quotient (IQ), Wechsler scale, Random question generation, Shuffling algorithm, Report generation

1.INTRODUCTION

In this competitive world, it is necessary for a person to know their problem-solving capability. This can be measured using Intelligence Quotient (IQ). Intelligence Quotient is the measure of one's cognitive ability and problem-solving capability and it can be measured with the help of intelligence quotient tester. The average IQ level of a person is 100, if their IQ level is above 100, they come under a superior category. If their score is below 100, they come under a low score category (see Chart-1).

1.1 OBJECTIVE

To develop a system for testing Intelligence Quotient for three different age groups. Requires randomization to avoid repetition of questions. Based on the Wechsler Intelligence scale consisting of three variations which lacks in other IQ standards.

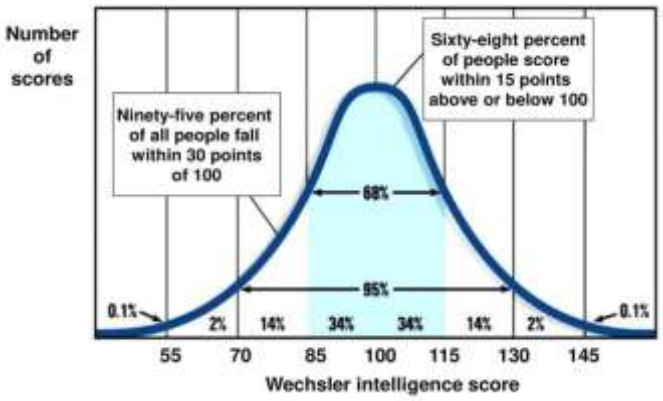

Chart -1: Wechsler Normal Curve

1.2 BENEFITS

IQ formula is incorporated within the code so there would be no error in calculating the score. Repetition of questions will be prevented due to randomization so that each time the user takes the test, a new set of questions are generated. This system is applicable for multiple forums (like school, colleges) as per the age variation in Wechsler scale.

1.3 CHALLENGES

Main challenge of the IQ test is **repetition of questions** which will affect the accuracy of the result. In most of the IQ tests, the user cannot view their previous IQ test result and the related details. Other IQ scales do not have variation in age groups.

2. LITERATURE SURVEY

The following works explain the system used in various educational fields for conducting exams and quizzes. Similar to this Intelligence Quotient System can also be used.

C.M. Mihăescu, et al. in [1] "Learning Analytics Solutions for Building Personalized Quiz Sessions", Proceeding of IEEE (2017) uses a collaborative filtering

algorithm based on the SVD method. The recommender system uses three filters to filter the questions.

M.Mojesh, et al. in [2] "Research on Online Examination System" Proceeding of the International Journal of Electrical Electronics and Computer Science Engineering - (2018) is designed using network application development model, a kind of client-server model connected using JSP.

Muna R. Hameed, et al. in [3] "Online Examination System" Proceeding of the International Advanced Research Journal in Science, Engineering and Technology (IARJSET), Vol. 4, Issue 3-(2017) is based on client-server architecture, Web browser and MySQL server using PHP. Uses two Subsystems, Student and Admin.

Dhotre Virendrakumar, et al. in [4] "Online examination system E-examination" Proceeding of the International journal of trends in Research and development, Volume 3(3) (2016) randomly selects questions from question paper. After completing the exam, the E-examination system displays the result of the exam instantly and saves the test details in the system database for future reference.

Deepankar Vishwas Kotwal, et al. in [5] "Online examination system", Proceeding of International Research Journal of Engineering and Technology (IRJET), Volume:03, Issue:01-(2016) is based on a customer server model, which generates questions for both practice and real test. It uses a random question generator.

Mohammed Issam Younis, et al. in [6] "Construction of Online Examination System using Resumption and Randomization", Proceeding of International Journal of Computing Academic Research (IJCAR), volume-4, number-2-(2016) is based on three tier architecture which uses JDBC to connect to the database and web server. It randomizes the questions, distribution and choices.

Wang Jing jing in [7] "Research on Intelligent Test Paper Of WEB-Based", Proceeding of International Conference on Computer Science and Information Processing (ICSIP)-(2012) follows a mathematical model to generate the questions based on degree of difficulty and time constraints. They use the Random algorithm. The teacher and students can select their own interesting course of their own.

3. MODULE DESCRIPTION

In registration module the new users register to take up the test. The user has to provide the following details like, Name, Age, Username, Password, and E-mail. In the login module, the already registered users should enter the following details to enter into the home page. E-mail, Password etc. After logging in successfully the user will be navigated to the home page, where they start the test. The test module consists of 10 questions. Questions will be generated based on the age of the user. Each question carries two marks each for the correct answer. The question pattern varies based on age. A report will be generated after the user completes the test. The report consists of a user's IQ score, IQ level, and some ways to improve their IQ level. The IQ score is calculated based on IQ formula in (1). The user can view the history like when they last took an IQ test and their previous scores. This will be useful for the user to compare their present performance with the previous performance.

$$IQ = \left(\frac{MENTAL\ AGE}{CHRONOLOGICAL\ AGE}\right)*100 \quad \ldots\ldots\ldots\ldots \quad (1)$$

In the (1), the mental age is the summation of score of each question and chronological age is the actual age of the user. This formula gives the IQ score of individual.

4. SYSTEM DESIGN

The front end is designed with HTML, CSS, and jQuery while the backend is built using PHP, MySQL (Apache server). The questions and choices of each question is stored in the database and accessed using apache server.

4.1 ARCHITECTURAL DESIGN

The admin module includes the login credentials of the administrator. Only after successful login, the administrator can add, update or remove questions from the database. The loading questions module adds the questions for three different age groups, WAIS, WISC and WPPSI. The user module prompts the user to register in the system. Only the registered users can take up the test. The random question generator module displays randomly generated sets of questions to the user (see Fig - 1).

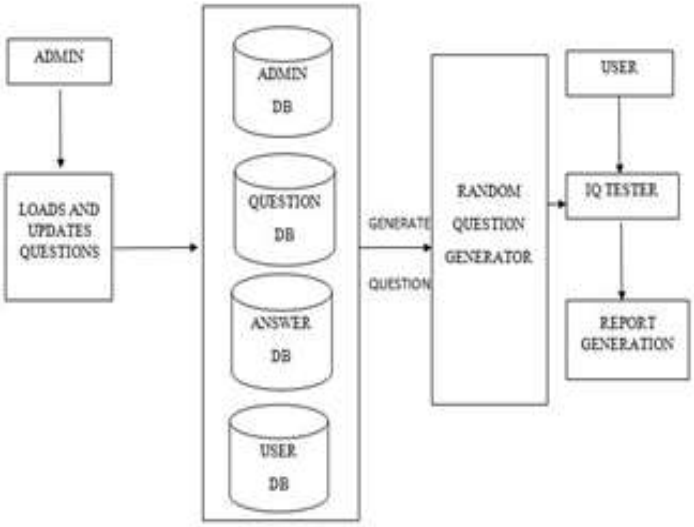

Fig -1: IQ Three Tier Architecture

4.2 SHUFFLING ALGORITHM

This system makes use of Fisher – Yates shuffling algorithm to avoid repetition of questions. This algorithm generates a random number which is used to build a permuted sequence from the given input. The algorithm to shuffle the n questions (0..n-1):

```
for i from 0 to n-2 do
    j-> random integer such that i ≤ j < n
    exchange a[i] and a[j]
```

5. CONCLUSION

The proposed system has the ability to measure the intelligence and cognitive skills of a person. The proposed system has the potential to improve the IQ of the person by conducting the tests. It has three different age group classifications so it is easy to analyze the particular child's IQ. The result will be generated immediately after the completion of the test; this reduces the time taken for evaluation. This system provides the report after the result to improvise the IQ. By using randomization techniques, the quality of test is improved. Because of its simple implementation it lessens the manual work of evaluating the IQ score and appropriate IQ level. The user can view their previous history and they can compare their growth easily through this system.

5.1 FUTURE WORK

In future, the application can be widened by using the adaptive method in the test. In an adaptive method if a user gives an incorrect answer then the next question will be easier else the next question will be more difficult than the previous one. This method provides more reliable results. Additionally, the generated report can be shared to the examinee's mail for more interactions. The report generated can be in a more detailed version. This system can be enhanced by indicating the correct answer with green and wrong answers with red immediately when the user selects the option for the question so that the examinee can know that they are performing well or not. Intelligence Quotient is one part of testing the ability of a person. Another one is Emotional Quotient, is the capability of individuals to recognize their own emotions and discern between different feelings and label them appropriately. By developing this EQ, the individual can easily mingle with their professional environment and colleagues.

REFERENCES

[1] C.M. Mihaescu, P.Ş. Popescu, O.M. Teodorescu, M.L. Mocanu, "Learning Analytics Solutions for Building Personalized Quiz Sessions", Proceeding of IEEE (2017).

[2] M. Mojesh, J. Aravind Reddy, N.Anudeep, - "Research on Online Examination System" Proceeding of the International Journal of Electrical Electronics and Computer Science Engineering - (2018)

[3] Muna R. Hameed, Firas. A. Abdullatif – "Online Examination System" Proceeding of the International Advanced Research Journal in Science, Engineering and Technology (IARJSET), Vol. 4, Issue 3-(2017)

[4] Bagwan Khajabhai B, Bhosale Yogesh H, Narute Anil D, and Dhotre Virendrakumar, "Online examination system E-examination" Proceeding of the International journal of trends in Research and development, Volume 3(3) (2016)

[5] Deepankar Vishwas Kotwal, Shubham Rajendra Bhadke, Aishwarya Sanjay Gunjal, Puspendu Biswas, "Online examination system", Proceeding of International Research Journal of Engineering and Technology (IRJET), Volume:03, Issue:01-(2016).

[6] Mohammed Issam Younis, Maysam Sameer Hussein, "Construction of Online Examination System using Resumption and Randomization", Proceeding of International Journal of Computing Academic Research (IJCAR), volume-4, number-2-(2016).

[7] Wang Jingjing, "Research on Intelligent Test Paper Of WEB-Based", Proceeding of International Conference on Computer Science and Information Processing (ICSIP)-(2012).

[8] Magdi Z. Rashad, Mahmoud S. Kandil, Ahmed E. Hassan, and Mahmoud A. Zaher," An Arabic Web-Based Exam Management System", proceeding of International Journal of Electrical & Computer Science (IJECS)-IJENS Vol: 10 No: 01-(2010).