

Online Adaptive Questionnaire

Ashibba sithara.N¹, Pratima², R.Aparna³, R.K.Kapilavani⁴

Department of Computer Science and Engineering

^{1,2} Student, Prince Shri Venkateshwara Padmavathy Engineering College.

^{3,4} Assistant Professor, Prince Shri Venkateshwara Padmavathy Engineering College.

Abstract- Paper deals with 3-Tier Architecture, of which the core mainly constitutes the Business logic .e. Efficient Algorithms and Data Structures. The idea behind the system came when it's been seen that many existing platform like Hacker-Earth, E-Litmus, etc. These platforms are not intelligent enough, they are just conducting the online test and most probably dumps the questions to screens on some standard Parameters, So why not create some intelligent System which will do the work for both Companies and candidates without human intervention, so that company will get the best resource and candidate will be able to get the opportunity which nowadays people are not getting due to lack of organized System. It's the need of time to create a Self Teaching Questionnaire which will judge the candidate on the basis of his/her response. In short it would be a program that would be as intelligent that it should behave like a human brain, when the human brain is playing the role of Interviewer. On the basis of user self-scaling, it will filter the candidates and conducts the interview; system will select the some topics per subject by using an algorithm like Random Choose (Proposed), Shake and serve (Proposed).Then per topic the system will generate sets of questions like basic and moderate sets, and from the given sets question will be taken out rank wise, and also topic wise for that some proposed algorithm for taking the question rank wise is, Sorting algorithms (Proposed), Knapsack[3] algorithms (Proposed). In stipulated time user may reply to the questions, and system will interprets user answer for being correct or wrong, Blind Answer, Last Moment Answer.

Keywords- 3-Tier Architecture, Algorithms, Interviewing system, Intelligent system, Machine learning[7].

I. INTRODUCTION

Online adaptive questionnaire is a 3-Tier Architecture Web Application consisting of Frontend, Business Logic and Backend, frontend will be used to create the User Interface so that the user will be able to use with ease, User Interface would be synchronized with business logic tier which would be Machine Learning[7] based Program to create an intelligent system. The system will be efficient enough to replicate the current ongoing scenario of human brain at a time of interview by considering many predefined cases and values. This all will be done in the

business logic tier as it will be the central processing power of this system constituting of many efficient and high performance algorithm.

The business logic tier would be simultaneously linked with the backend of the system, on any action by the user in the front end; backend tier will be affected and updated with middle tier communication linkage. Till now the intelligent kind of system is not available anywhere around, many interviewing system don't have intelligent traits, so this system will be one level ahead in this league. The System will use Efficient Algorithms and Data Structure in order to enhance the System performance, so that it is not compromised in any form. It will be more advanced than many existing platform which till now is not intelligent or some platform which is partially intelligent, have many flaws and issues which don't cater the industry need to its full potential like many competitive programming or interview generation platform which are not based on machine learning[7] and require maximum human intervention, so to avoid all these and update to new era of computing power by making system self-sufficient with every scenario, it is necessary to make it work on its full potential, the proposed system will cater our need with minimum human intervention and with minimum error and high performance.

II. LITERATURE SURVEY

There are some existing platforms which have done some awesome work regarding this field, there are many out there, of which the survey has been done like GeeksForGeeks[1] portal, founded by sandeepjain, which is treasure to computer geeks having vast amount of content and good interview preparation and practice platform, similarly HackerRank[6] founded by vivekravishankar and CodeChef[5] which is developed by the renowned firm Directi, all of them are in these line of process but they are having many flaws and issues, there are many issues like question sets are not being generated in efficient way, which is to be cater with good question mining algorithms, these system doesn't provide simultaneous appearing for similar firm or companies, which is a bane for these system as having these features would enhance the capacity of the system and would cater the much more needs of the resource as well as that of industry, the main issues which is been identified is

that, the user behavior is not recorded on the basis of user action, this all things are taken into consideration and been worked out to make the existing platforms more user friendly and intelligent.

III. PROPOSED WORK

Learning from existing platforms it's been found out that there are many issues, which will be taken care properly to make the system extremely robust and efficient so that in actual terms it can be called as intelligent system which can handle itself, reducing the human intervention. Some of the proposed modifications which can be done to existing system are:

At a Time User can opt for N Similar companies on the basis of Self Scaling, so that the user don't have to appear again and again for the same kind of test having same skill sets and for the same post, this would also give some freedom to industry as it also don't have to conduct same things again and again and the time consumed on these things can be saved by conducting the interviews only once.

Generation of Question Sets levels per topic on the basis of performance, Ranking and previous Track. This would require good mining algorithms and data buckets for significant results. Proposed work would be to create the different sets on the basis of different levels like easiness and hardness, and would be displayed to the user with each user of N users getting different sets blocks having minimum common question and having good results.

User Behavior is recorded like Blind Answer, Time Bracket Answer, and Last Moment Answer and on the basis of these traits next set is generated. These features will most probably give the intelligent traits to the system, these all traits will be recorded with each question and with each user creating good dense B Tree and simultaneous updating in backend as both tier would be synchronized. Also the system is called adaptive because it does not only produce intelligent result but also because it evolves itself with time. For example a given question has a rank higher than 5 but throughout the time we noticed that the student is easily solved by maximum number of people and hence we can say that the rank has to be changed, so that's what the logic works here, it checks these information and then update the rank of the questions. That means the more this system is use the more use cases it gets and hence it becomes more intelligent than the before one.

IV. ALGORITHMS

Algorithms play the biggest role in this system, it is the core part and all the logical things, ideas and intelligence is been coded here only in computer language.

The Proposed System Architecture will give the insight of all the tier and about the algorithms which will be used in the business part, user interacts with the frontend which would be synchronized with the backend which is the database, , first user have to go through the authentication mechanism i.e. login functions, on successful authentication of user with original credentials it will land on to the company selection area which was lagged in the pre-existing platforms and is been modified in these system.

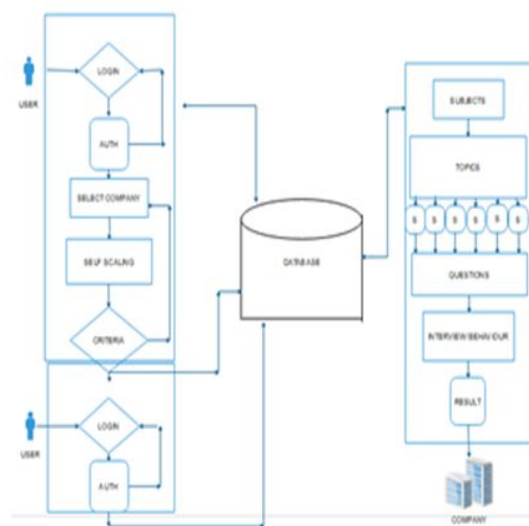


Fig. 1. System Architecture

Here user would be able to select one to many companies according to its needs and can simultaneously select N companies having same post and same skill set need, it will be boon for the user to get interviewed by many companies at one go. Next part would be to self-scale itself in various subjects required by the company and it is mandatory that on an average user should have scale rate which would be greater than threshold value fixed by the companies, fitted into criteria will lead user to Interview otherwise user will not be eligible for that firm and user could reapply for another firm, on passing the criteria the business logic criteria would come into action and will do its work.

The Interview part which is the core part i.e. algorithms and logic will come into existence, first of all of all the subjects or skills which has been selected by user will be pulled out from the data banks which is known as database and different topics would be squeezed out eliminating the

duplicates topic and then sets would be generated using some of the proposed algorithms that would be used:

Shake and Serve: Of t topics per subject, systemselects t1 topics by "Shake and Serve" algorithm. Shake and serve algorithm is basically a mining algorithm which will be basically an advanced version of random selection. Many parameters for serving purpose and will output the question according to the system needs. The algorithm will be highly useful while selecting question from the mined sets.

Knapsack Algorithm[3]: Virtually Acts as a Sack for the bunch of question, useful while doing topic mining for M common subjects. Knapsack[3] Algorithms is also one algorithm which is been proposed as it can best act as a mining algorithms where originally a sack will contain all the question and the mining will be done on the basis of many parameters which we denote as a weight in original knapsack[3]algorithms but here, on many parameter question will be mined out having maximum profit in terms of knapsack[3] algorithm. It would be a good proposed algorithm which could solve our problem of generating question sets of different levels like easy sets or moderate sets. Once the sets is been created the sets will be given to the appropriate bucket or data structure and would be displayed on the screens.

Prediction System: User Behavior analysis on thebasis of time bracket. Behavior tracking and analysis is one of the most important pillars of the system on which whole system will run because it will be acting as a processing and intelligence part of the system. The proposed system will take many cases to predict and analyze. On a single question system will run many cases like time bracket answer, blind answer, fast answer and will analyze and on the intelligent criteria only it will update the rank and marks of the question and user in the backend to give the best result, as it will not be error free, the efforts would be to minimize the error as much as possible for better results.

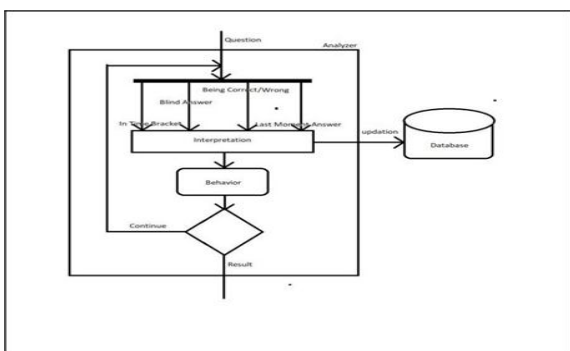


Fig. 2. Behavior tracker and analyzer Flowchart.

V. RESULTS

The Existing systems like GeeksForGeeks[2], HackerRank[6], CodeChef[5] works well, but with some issues which would be taken care properly. In present scenario many new cases could be implemented in these existing system which is stated in survey part and it is a must.

Taking into consideration these platforms the results is like these:

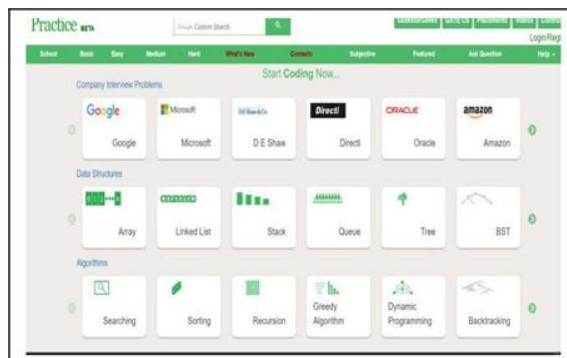


Fig. 3. GeeksForGeeks Practice Platform

The above snapshot from the famous online portal GeeksForGeeks[2] clearly shows the results that, it conducts multiple interview for numerous same post and question is been mined on the basis of just three parameters like Basic, Easy, Medium which is been taken care of in the intelligent interviewing system. Besides that many of the traits of the portal is been inherited with slight modifications and with many more new features is been added stated above in all the architectural part.

HackerRank[6] is also one of the platform which offer same feature just like GeeksForGeeks[2] but with more sophistication and efficient way, it is an competitive programming platform where live coding round is been done to judge the practical skills of coding, but it also lag intelligence and it can't track the behavior or analyze it on the basis of user types of answer.

The system has ranking feature which rank question according to the user rate of attempting which is been inherited and modified in intelligent system with more parameters.

ONE MORE PLATFORM WHICH IS ALSO TAKEN INTOCONSIDERATION IS CODECHEF[5], IT IS A VERY RENOWNED PLATFORM FOR ALL THE COMPANIES AND

PROFESSIONAL FOR ALL THE HIRING WORKS AND OPPURTUNITIES. THE INTERNAL SYSTEM OFCODECHEF[5] IS POWERFUL AS IT APPLIES

MANYALGORITHMS TO MAKE THE PLATFORMS ROBUST BUT STILL IT FOLLOWS THE SAME FATE AS BEEN FOLLOWED BY THE ABOVE TWO PLATFORMS I.E. NOT HAVING INTELLIGENT TRAITS AND SELF-LEARNING TRAITS.

These all system is very much helpful to the people but can be upgraded to next level with slight modification and learning capability.

VI. CONCLUSION

It will work as proposed and the system would intelligently interview the candidates like a human do with taking all the cases like tracking behavior, Interview test and evaluation and result calculation, by using efficient algorithms in consideration, that a human do while the interviewing is going on and will compare the candidate with the input scale that the user has given to the system and output the result that whether the candidate is eligible for this job or not and if not why, it will give you the reason.



Fig. 5. System Authentication

The System first Tier deals with all the authentication process which is been synchronized with backend database. Resource could only access the system with valid credential to apply for various interviews and the credential will be provided by the responsible authority.

INTERVIEWS				
SLECT	TITLE	DESCRIPTION	PAYMENT PACKAGE	COMPANY
1	Freelance C1	Freelance Required	5.00 per annum	C1
2	Senior S.E. C2	2-3 Years of Exp. Required	9.00 per annum	C2
3	DBA C2	2-3 Years of Exp. Required	8.00 per annum	C2

After successful authentication companies selection can be done in 1-N type and the issues in existing platform is overcome here. The system will be one of a kind and with taking many things under consideration will perform intelligently. Thus it can concluded that with advancement in the existing system will definitely benefit the industry as well as the students and the professional to show their intelligence and caliber to the industry and at the same time industry would be able to get the best resource which they deserve without investing much of their resources and money and industry can save much of their funds towards these process.

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