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Online Test Monitoring System

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Abstract— The increasing use of World Wide Web has given a new dimension to developments in almost every field including the use of technology and conducting online tests. Almost all renowned institutes and organizations rely on assessing candidate's performance through online tests. This promotes the "go green" environment thereby reducing paper work and manpower requirements. Among the various categories of online tests, multiple choice tests are extremely popular, since they can be corrected and assessed automatically. The online test which is being conducted today lack in identifying test quality through learners' behaviour. Thus to overcome these drawbacks we have designed a system that enables the test setters to record learners' behaviour change during online tests without making them aware of underlying experiment and thereby yielding more realistic result.
Keywords— Data Visualization, Knowledge discovery (KDD), Visual Data Mining.

I. INTRODUCTION

With the exponential increase in number of internet users there is a drastic shift of people doing paper pencil work to performing online transactions. Among these shift one important shift in field of education is shift from paper-pencil test to online tests. Almost all the entrance exams of government and non-government organization are nowadays conducted online. The advantage to conducting tests online is that the evaluation process becomes faster and accuracy of evaluation becomes higher. The environmental aspect on test being conducted online is that the wastage of paper reduces thus preserving more tress and ultimately reducing global warming. Among the various categories of online tests, multiple choice tests are extremely popular, since they can be corrected and assessed automatically. Monitoring the data obtained by the interaction of user with the system with the help of data exploration and knowledge discovery (KDD) strategies plays an important role to acknowledge test quality and identify scope for improvements in the tests. This requires the logging of important data related to learners interaction with the system during the execution of online tests and exploits data visualization techniques in such a way that enables test setters review and improve the whole assessment process. The data visualization charts are analysed by the system which is used to detect previously unknown test strategies used by the learners. It also detects the correlation among questions (if any) that may prove as a useful feedback to test setters for further improvements on the test quality. The system we have designed enables the test setters to analyse and improve the quality of their test. The purpose of is to analyse data obtained from learners interaction with the system and show results in graphical form. This detects the test quality by capturing the question browsing and answering events by the learners thereby using this data to visualize review of tests. The system thereby provides recommendations to the test setters by determining correlation among questions and also the level of the questions. The system includes a logging framework that can be integrated and used for any other online test conducting systems and a stand-alone application that analyses the logs in order to extract information from it. Accordingly results are displayed in graphical form. Thus system aims to implement, analyse, assess and improvise the online test conduction system, which thus, can be used by any organization. In second section we will discuss about existing system and its drawbacks. After that in third section, architecture of proposed system is discussed followed by working of proposed system and then finally concluding with conclusion and future scope.

II. EXISTING SYSTEM

There are various tests monitoring system in existence. Few of them are listed below:

A. Kryterion Testing Solutions

This system observes the test takers online using web-cams and microphones. Hence the analysis is difficult.

B. CEC TMS

Here online system has been adopted for monitoring all non-ERC database CES tests. This system does not find correlation among the questions.

C. Exam 9

This system automatically generates the score but does not include R2W (right to wrong), W2R (wrong to right) and W2W (wrong to wrong) analysis.

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III. ARCHITECTURE OF PROPOSED SYSTEM

In this section, we describe the architecture of the proposed system.

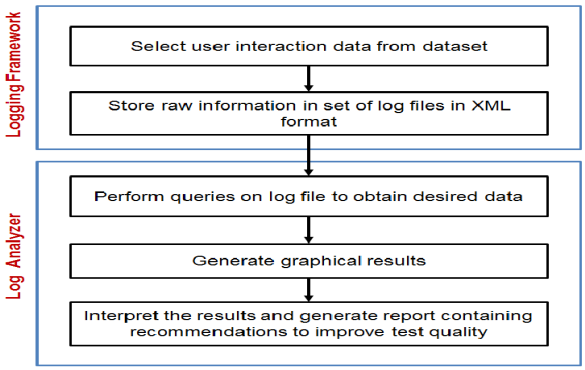


Fig -1: Architecture of proposed system

The proposed system consists of two parts:

Logging Framework
Log Analyzer

The first part i.e. the logging framework provides the basic functionality of the system. Logging framework performs mainly two important steps:
It collects the user actions while browsing the webpages. It does this by recording the mouse movements.
Then it stores the recorded information in XML format.

The second part i.e. the log analyzer does the processing on the data obtained from the logging framework. It performs following operations:
The log analyzer performs query operations on the XML file to obtain the desired results.
The results obtained from the queries are further processed to get the graphical representation of the data in the form of charts and graphs.
These graphs are then interpreted to generate report for the admin which contains recommendations regarding the quality of the test.

IV. WORKING OF PROPOSED SYSTEM

The Online Test Monitoring System is an approach to discover the knowledge related to the activities carried out by the user while giving the online tests. The proposed system enables to record the users, behavior change during the tests without making them aware of the underlying experiment and thereby yielding more realistic results. These results can then be used by the test setters to improve their tests using the recommendations provided by the system.

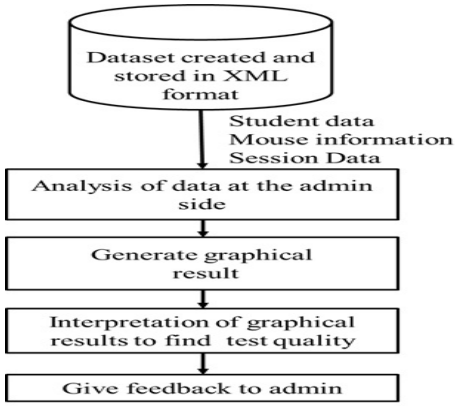


Fig -2: Working of Proposed System.

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The proposed system includes following aspects:
Question solving speed.
R2W (right to wrong) checking.
W2R (wrong to right) checking.
W2W (wrong to wrong) checking.
Test execution strategies.
Question skipping analysis.
The system monitors the user behavior change during the online tests such as the speed of solving each question, analysis on the basis of changes in the selection of options made: from right to wrong (R2W), wrong to right (W2R), wrong to wrong (W2W) or no changes, the test execution strategy used, analysis based on the questions skipped by the user.
The system consists of following modules:

A. Login Module

Each user will be provided with a username and password to log into the system. According to the user level the privileges will be provided to the users. The user login provides the functionality to select and appear for the test, whereas the admin login provides the functionality to create a new test or modify a test, add new questions or modify existing questions, view results of the tests taken by the users.

B. DESIGN TEST MODULE

Using this module the test setter or admin can design a test. This may include creating a new test, modifying an existing test or deleting a test. The test setter can also add new questions, modify existing questions or delete existing questions.

C. ANALYSIS MODULE

This module will do the analysis of the data recorded during the test conduction. This includes recording of the user interaction with the system during the test such as the mouse clicks and browsing events. The data recorded during the test is stored in the XML format which can then be accessed by performing queries on them. This data is further processed by the system to generate graphical results.

D. Recommendations Module

The graphical results generated by the analysis module are further interpreted by the system. The interpretations are done to find the quality of the test and provide recommendations to the test setter to improve the quality of the test.

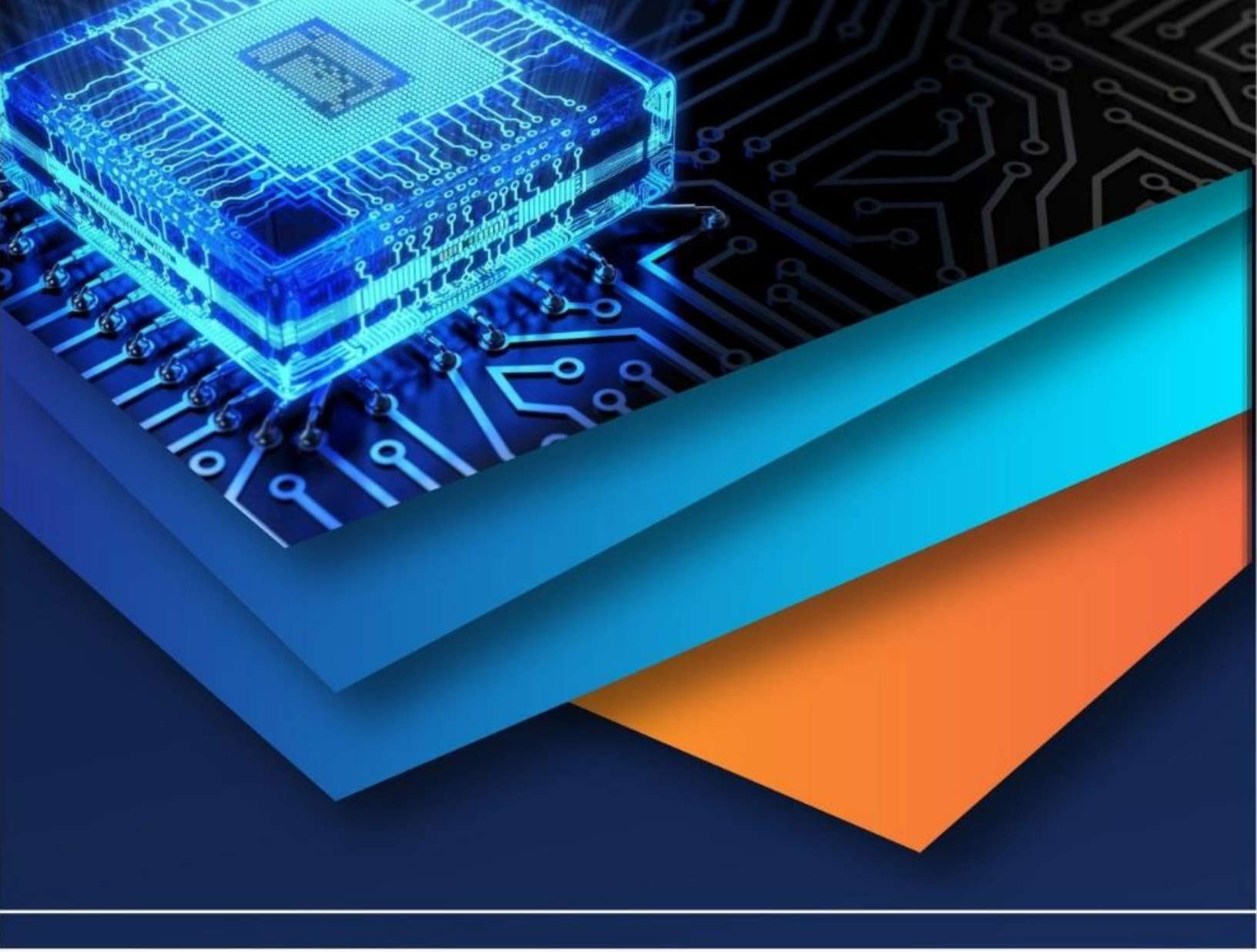
V. CONCLUSIONS

In this paper, we presented a system to analyze online test based on user's interaction with the system. The system monitors several important aspects related online test including test quality. Thus the system can also generate recommendations for test setter which will help him/her to improve test quality and improve the whole assessment process.

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