

5: CONCLUSIONS AND FUTURE DIRECTIONS

5.1 Conclusions in brief

The main contribution of this work is a proposed framework of an Examination Audit System that helps maintaining the rigor in examination and facilitating better quality selections. Worth of such systems is underlined by the growing recruitments and diverse demands for specialized skills in the job specifications. The concept of audit in principle is to bring the quality in the system and provide a constructive mechanism to the system for being adaptive to the dynamic changes in the professional environment and look forward for the expansion.

EAS reported in this work is a special purpose DSS that assists various levels of management and decision making by different stakeholders in the process of training and selection. It has advantage of computer aided information retrieval for managerial information purpose. The major components include (i) TestPaperAnalyzer, (ii) ItemRepository, (iii) ExamineesProfileManager, (iv) FeedbackGenerator and (v) TrendAnalyzer. The components are so stringed around the human arbitrator that the decisions would more and more realistic and practicable. For example, a suggestion for modification in selection criterion at MCA entrance examination for the inclusion of the students with mathematical ability [4.4,R6]. The computer aided data analysis makes it possible to conclude like, 'because 100% items in the test papers are poor discriminators, the test does not have any contribution to the selection process' [4.4,R5]. Other merits of the system include, item banking, generating training question sets, providing user friendly feedback etc. The intelligence is modeled in the system in terms of heuristics based conclusions and use of historical data for statistical data mining.

We believe that, institution of EAS reinforces a discipline of continuous evaluation of examination process and provides timely feedback to the concerned elements in the process. This approach smoothly drives the process of evolution in the system. The results of psychometric analysis produced in the examination audit are obvious in the EAS but those are otherwise almost not possible because of the scale of the examinations, complexities in handling the data and also due to

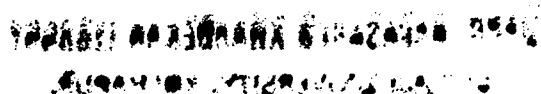
the human natural tendency. Institution of EAS makes the reports of psychometric analysis available on the regular basis. It educates the stakeholders to look at the process without any bias, prepares him / her to accept the facts, verify his / her roles and volunteer for the change.

5.2 Summary of the contribution of the present work

We have used classical method of item analysis as a basis of examination audit system. The scope of the system is extended. Unlike the contemporary systems that handle the examination as a discrete event and so provide the statistics on item difficulty, discrimination and reliability of the test with respect to the eventual data about the key and the examinees responses, the proposed system maintains the historical records of the examinees and also incorporates data from various allied sources, namely, annotated question paper, syllabus with the weights attached to the topics, selection objective document along with the data of the current event of the examination. It utilizes an association that exists between the data sources. A comprehensive view of the data for the application of heuristics is employed. The system follows a sequence of steps to come to the conclusion. Our suggestion of carrying out distracter analysis as a first step in data analysis and continuing with the further evaluation only after resolution of the discrepancies is an example. Improved reliability and more sensible feedback are the consequences.

5.3 Suggestions for future research

The objective of the present work was to attempt modeling human intelligence in selection process for its application in the automated system. Towards this goal goes our suggestion of employing the required heuristics in the automated process of enabling the decision making. The software modules developed during the course of this work are for the proof of concepts and so are not integrated in professional manner. The integration of these modules into a professional quality product is the work left behind. This integration includes developing DBMS support for item banking and stakeholders' profiles for trend analysis and for the multilevel analysis to evaluate the personality traits.



As stated in Section 4.4x, the highest number of examinees appeared for an examination in our observation was 1200. The performance of our system needs to be verified in the context of significantly large databases. A plan of rigorous testing with this intention may help evolution of the heuristics proposed in this work. Application of modern data-mining techniques namely artificial neural networks, genetic algorithms and fuzzy logic could be incorporated that would mimic the role of the human arbitrator while facilitating the data for decision making. A more mature and sophisticated AI based EAS would be the consequence.

The concepts developed in this work can be extended to the item analysis of descriptive type questions. This extension necessarily involves natural language processing and hence in itself is a potential area to explore for the further research.

The issue of selective assessment is discussed to some extent. A rigorous thought is necessary to come up with a reliable system of practical use. Similarly item banking attempted in this work is in its infancy stage. And there are not many attempts observed at commercial or academic world in this area. Developing an AI based system that facilitates an automatic generation of a question paper as per the specifications provided could be an extension of this work.

In summary, the present work has opened an avenue in a multidisciplinary field of research with the focus on developments of selection systems by using cognitive approach of education, psychology, human resource management and statistic. There are ample of opportunities for computer science researchers in general and AI researchers in particulars to work in this domain.