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A Review on Student Performance Analysis Based on Result Outcome

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ABSTRACT

In our daily academic life we see a lot of data gets accumulated as a result of processes like examinations, registration, event organisation etc in schools and colleges. This data can be used effectively for the beneficiary of the institution itself. As this data is only operational ,we can develop a system for a graduation or higher level institution which will help the administration gain information turned knowledge from accumulated data. The system can be developed to perform three main functions : student performance analysis, prediction of rank of a student & evaluating the teaching quality. The system will take input from the faculty in the form of marks into it's database, analyse the students marks using neural networks, training & optimize data. The knowledge is hidden among the educational data set and it is extractable through data mining techniques. Present paper is designed to justify the capabilities of data mining techniques in context of higher education by offering a data mining model for higher education system in the university. In this research, the classification task is used to evaluate student's performance and as there are many approaches that are used for data classification, the decision tree method is used here. By this task we extract knowledge that describes students' performance in end semester examination. It helps earlier in identifying the dropouts and students who need special attention and allow the teacher to provide appropriate advising/counselling.

Keywords : KDD, FES, CSL, E-Ectively, Data Mining

I. INTRODUCTION

EDUCATION acts as the foremost element for a country's development. Lack of insight in higher educational system could prevent system management to achieve quality in education. Data mining techniques can help linking this knowledge gaps in higher education system. A better student-faculty model outturns better instruction, which leads to improved learning. More accurate skill diagnosis leads to better prediction of what knowledge a student has, which provides better assessment. The rate of success for a student can be used as an indicator of college effectiveness by the accrediting agencies. Student Performance Analysis can assist the college in improving its performance and help the potential students arrive at a conclusion for a particular college.
The student success rate can be used as an signal of college effectiveness by the deciding agencies. Student Performance Analysis will help the college know about its performance and help the potential students judge a particular college. The performance of either the whole batch or an individual student can be predicted through the Student Performance Analysis. This research paper will support the following objectives:

1. To minimize the existing gap in prediction methods.
2. Verifying & identifying the variables which are used in performance analysis.
3. To study the existing methods of prediction for analysing performance.

These are practiced to visualise the most effective factors of performance during the curriculum. The evaluation of marks of students will help to improve the quality of teaching for making the system more effective.

II. METHODS AND MATERIAL

1. Defining A Problem

The most common methodology adopted is governed by a series of stages. The methodology starts from defining a problem, followed by collection of data from surveying & students database. Selection of appropriate attributes, their conversion as well as file manipulation. Comparative analysis of efficient classification algorithm is done by creating a systematic student schema.

2. Search Strategy

It is necessary that a well planned approach should be followed so that every relevant piece of work can be found in the search results. Therefore it was necessary to conduct a search for research papers to try finding the queries of proposed questions [1].

3. Data Mining

It is an interdisciplinary subfield of computer science. The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use [2].

Aside from the raw analysis step, it involves database and data management aspects, data pre-processing, model and inference considerations, interestingness metrics, complexity considerations, post-processing of discovered structures, visualization, and online updating [3].

Data mining is the analysis step of the "knowledge discovery in databases" process, or KDD [4].

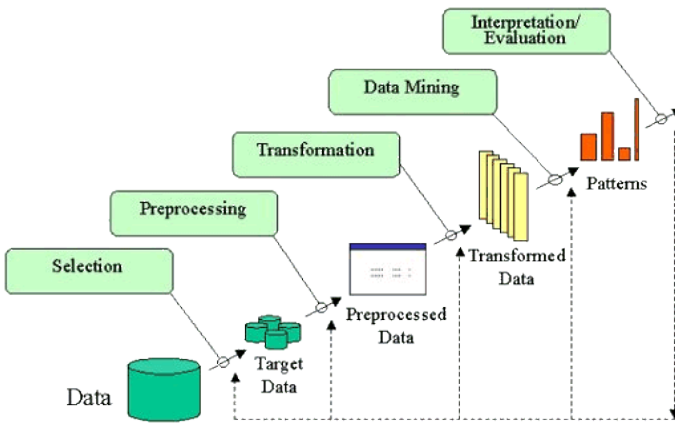

Figure 1.

The unifying goal of the KDD process is to extract knowledge from data in the context of large databases. It does this by using data mining methods (algorithms) to extract (identify) what is deemed knowledge, according to the specifications of measures and thresholds, using a database along with any required pre-processing, sub sampling, and transformations of that database.

4. Related Work

Piatetsky in 2009 suggested that Data Mining is an emerging methodology used in educational field to enhance the understanding of learning process. The application of Data mining is widely spread in Higher Education system. In Education domain many researchers and authors have explored and discussed various applications of data mining in higher education. The authors had gone through the survey of the literature to understand the importance of data mining applications. In the year 2001 Luan al. suggested a powerful decision support tool called data mining. Data Mining is a powerful tool for academic purposes Alumni, Institutional effectiveness, marketing and enrolment can benefit from the use of data mining Data Mining is the most suited technology that can be used by lecturer, student, alumnus, manager and other educational staff and is a useful tool for decision making on their educational activities.

A test was done with the marks of twenty students' marks obtained in Ist & IInd semester using the fuzzy expert system, for both the inputs gave the same triangular membership function. This system uses a fuzzy influence mechanism & other associated rule. Similarly FES was developed for evaluation of teachers' performance in teaching activity.

Juan and Changjun [6] reported that GA-base neural networks for assigning grades to teachers can overcome neural networks one-sidedness to some extent and fuzzy neural networks are not completely black-box operation, experts or teaching managers can adjust fuzzy computing rules according to actual experience, which can solve blindness problem of neural network to some extent.

In Thai-Nghe et al., (2011, 2011A), a recommender system is used to predict the performance of the student.

The information of the individual students is used to fore-casting his/her own performance. The class imbalance in the data is solved using both resampling and cost-sensitive learning (CSL) using support vector machines by which the misclassification is reduced and the classification accuracy is improved [7].

Bray [8], in his study on private tutoring and its implications, observed that the percentage of students receiving private tutoring in India was relatively higher than in Malaysia, Singapore, Japan, China and Sri Lanka. It was also observed that there was an enhancement of academic performance with the intensity of private tutoring and this variation of intensity of private tutoring depends on the collective factor namely socioeconomic conditions.

III. RESULTS AND DISCUSSION

1. Proposed System

The first step consists of analysing student data followed by finding the most appropriate parameter which includes several processes : The first step consists of analysing student data followed by finding the most appropriate parameter which is as followed:

The data for analysis takes into account quantifiable such as attendance, assessment marks, mid semester marks, end semester marks, seminar, project marks etc. Many researchers used statistics such as age, gender etc as they have a broad class of male & female students in their knowledge process[9].

Study done by Meit et al. found that most of female students have various positive learning styles and behaviours compared to male students. Female students are more discipline and dutiful in their studies, self - directed, always preserved and focused. In other side, female students have an e-ective learning strategies in their study. They have self - motivation, organization and rehearsal that were e-ectively used by them. Thus gender proves to be an important attribute influencing the performance of student.

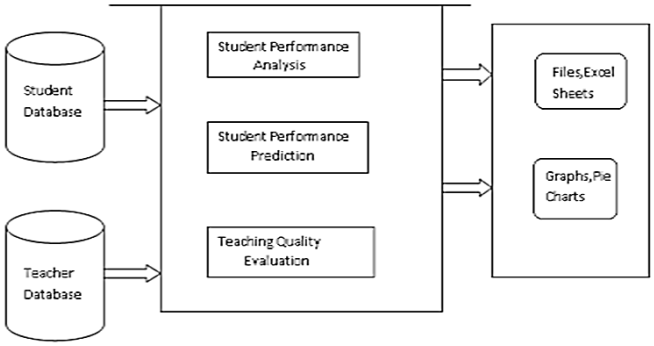

Figure 2

2. Merits

This system is advantageous in countless ways. If implemented rightly it can help the administrators & faculty reasons of students not graduating, help in taking rightful steps towards students progress. This will reduce human interference in the process. Genetic algorithm (if used) will further optimize the network performance.

IV.CONCLUSION & FUTURE WORK

The significant factors of classification, analysis & evaluation during the successive years of the course will provide a optimal solution towards the overall performance. This way of using real algorithm can serve as the most important factors to predict the performance effectively, plus working as a self-assessment tool for the students to get their overall rank so as to know where they stand & where they need to improve.

A further extension can be done through analysing of records of students for co-circular activities & provide a communication, technical skill development, expert faculty meet or talk to alumni to develop professionalism in students. The system can be semi-automated by the help of developing a chatbot where the faculty will just need to type in a query & the system will provide with the right information. This system will need the complex in depth understanding concepts of artificial intelligence along with a programming language in which it'll be implemented (such as Microsoft Bot Framework along with python/C#)

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