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Educational Data Mining for Prediction of Students Performance using Clustering Algorithms

Nikita Akhade[1], Harshada Tandure[2], Priyadarshani Deshmukh[3]

[1,2,3]*Dept. of Computer Engineering, Sinhgad Academy of Engineering, Pune, Maharashtra, India*

Abstract – *The main objective of this paper is to use data mining methodologies to study student's performance in end General appreciation. Data mining provides many tasks that could be used to study the student performance. 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. Dimensions categorize it and summarize the relationships which are identified during the mining process* The main functions of data mining are applying various methods and algorithms in order to discover and extract patterns of stored data.

Keyword: *Management Information System; Database Analysis*

1. INTRODUCTION

The advent of information technology in various fields has lead the large volumes of data storage in various formats like records, files, documents, images, sound, videos, scientific data and many new data formats. The data collected from different applications require proper method of extracting knowledge from large repositories for better decision making. Knowledge discovery in databases (KDD), often called data mining, aims at the discovery of useful information from large collections of data.

1.1 Motivation

The general motivation for Student performance system is monitoring the all activities of the college through website. Data mining technique is used for the student prediction system.

2 RELETED WORK

College Management System deals with all kind of student details, academic related reports, college details, course details, curriculum, batch details and other resource related details too. It tracks all the details of a student from the day one to the end of his course which can be used for all reporting purpose, tracking of attendance, progress in the course, completed semesters years, coming semester year curriculum details, exam details, project or any other assignment details, final exam result; and all these will be available for future references too. Our program will have the databases of Courses offered by the college under all levels of graduation or main streams, teacher or faculty's details, batch execution details, students' details in all aspects. This program can facilitate us explore all the activities happening in the college, even we can get to know which teacher / faculty is assigned to which batch, the current status of a batch, attendance percentage of a batch and upcoming requirements of a batch. Different reports and Queries can be generated based of vast options related to students, batch, course, teacher / faculty, exams, semesters, certification and even for the entire college.

2.1 LITERATURE SURVEY

1 **Data Mining: A prediction for Student's Performance Using Classification Method:** In this paper the classification method is used to grade the student performance. There are huge amount of data store in database. Database contain the information for predict the student performance. There are many approaches that are used for data classification. Decision tree is used here.

2 **Data Mining on Educational Domain:** educational data mining define as the area of scientific inquiry centered around the development of methods for making discoveries within the unique kinds of data that come from educational settings , and using those methods to better understand students and the settings which they learn in. We have also focused on classification of students into different categories such as good, average, poor depending on their marks scored by them by obtaining a decision tree which will predict the performance of the students and accordingly help the weaker section of students to improve in their academics. We have also found clusters of students for helping in analyzing student's performance and also improvising the subject teaching in that particular subject. Keywords –Data Mining, Education Domain, India, Association Rule Mining, Pearson Correlation Coefficient.

3 **Mining Educational Data to Improve Students' Performance:** the main objective of the higher institute is providing the quality of education of its student's. One way to achieve highest level of quality in higher education system is by discovering knowledge for prediction regarding enrolment of students in a particular course, alienation of traditional classroom teaching model, detection of unfair means used in online examination, detection of abnormal values in the result sheets of the students, prediction about students' performance and so on. The knowledge is hidden among the educational data set and it is extractable through data mining techniques.

4 **Mining Education Data to Predict Student's Retention:** The results show that some of the machines learning algorithms are able to establish effective predictive models from the existing student retention data.

Prediction models that include all personal, social, psychological and other environmental variables are necessitated for the effective prediction of the retention rate of the students. The retention of students with high accuracy is beneficial for identify the students with low academic achievements initially. It is required that the identified students can be assisted more by the teacher so that their performance is improved in future.

3 DESIGN MODULE

College management system is an integrated web application that handles various academic and nonacademic activities of a College/Academic Institute. The system can access by every students/ faculties/ employees of the institution through internet connected computers or internet enabled mobile devices with the aid of his user name and password.

Every user will have a customized home page with his/her profile management facilities. Through links that displays in the home page the user can access different options of the website assigned to him. Though the system allows access to every one there is a significant security risk involved in this project. To tackle this problem we suggest a modular structure in the proposed system and a complete isolation of the financial and administrative modules from the public portal. Only trusted IPs can access these modules. Web services will interact to the financial and administrative modules to fetch necessary information to display in the public portal. Although a standard password policy will be followed in the designing of the system to prevent the possibilities of malicious activities of itching users. A self-driven module in the proposed system will accomplish the automated tasks such as Email Alerts, SMS alerts, Notifications to the administrator etc.

3.1 FEATURES OF PROPOSED SYSTEM

Some of the features of the proposed system are:

1) Student Admission
2) Student Attendance management
3) Student Result Management
4) Staff Attendance Management
5) Staff Timetable Management
6) Function Management
7) User Management

4 PROPOSED METHODOLOGY

Module wise description:

Login module is used to check whether the user is an authorized person to use the system or not. For this the user should give the correct user name and password.

The different types of users are:

1) Student
2) Teacher
3) H.O.D.
4) Principal

This module consists of the following sub modules

I. Student Registration Form
II. Student Attendance sheet
III. Student Marks Form
IV. Student ID Form
V. Teacher Detail Form
VI. Teacher ID Form
VII. Timetable Form
VIII. Notice Form
IX. Department Detail Form

X. Other Form

Reports

All the above mentioned data are stored in the back end and can be retrieved as reports with filtering options. The Following are the reports can be taken from this system:

1. Student Report
2. Teacher Report
3. Department Detail Report
4. Attendance Detail Report
5. Marks Details Report
6. Feedback Detail Report
7. Timetable Details Report
8. Notice Detail Report
9. Other Report

5 SYSTEM ARCHITECTURE

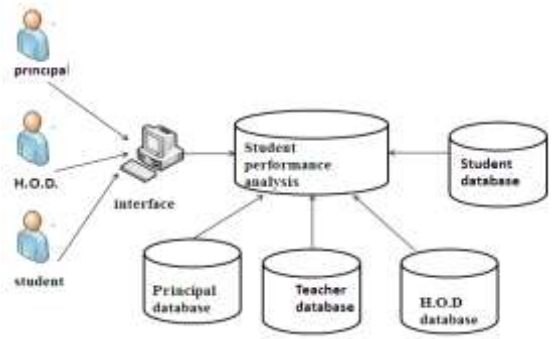

Fig -1: **System architecture**

6 SOFTWARE REQUIREMENTS

Operating System	: Windows 7/8
Technology	: Java (JDK 1.8/+)
Front End	: Website
Database	: MySQL

7 HARDWARE REQUIREMENTS

- Processor : At Least Pentium Processor
- Ram : 2 GB
- Hard Disk : 1 TB

8 ADVANTAGES

- Easily find the necessary information from the database.
- Easily create/update/delete the information.

9 CONCLUSION

Student performance system can be used by educational institute for the grade the student according to their performance. i.e. administrator can delete/update/edit the student records. Students can also check their progress through their login. Management System can be used by education institutes to maintain the records of students easily. The student information can be easily available.

10 REFERENCES

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