

DAMS-DYNAMIC ATTENDANCE MANAGEMENT SYSTEM

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Abstract

This paper describes a project which aims at the implementation of an online student teacher attendance management system which can act as an efficient means in maintaining proper correct and updated records. With the amalgamation of the various tools and techniques in data base, data mining and web technologies we can implement an online attendance management system. Attendance can be accessed anytime and personalized reports can be generated for each student or teacher. This project can also double as a student teacher portal to share assignments, results and other important notices. An educational institution needs to have an approximate prior knowledge of enrolled students to predict their performance in future academics. This helps them to identify promising students and also provides them an opportunity to pay attention to and improve those who would probably get lower grades. This system which can predict the performance of students from their previous performances using concepts of data mining techniques under Classification. 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. This can facilitate us 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.

Keywords: Attendance, Data Mining and Web

1. INTRODUCTION

People have always been concerned about attendance management in big organization. Since attendance plays a very important role in the working of the organization. People have used paper and pen to mark the attendance. This method is very tedious, time consuming and not interactive. For over decades people have been dreaming about a better way to manage and view attendance, which is easily accessible and usable. The goal of DAMS (Dynamic Attendance Management System) is to bring computer technologies into attendance management. This would make the organization's job for managing attendance more efficient and easier. DAMS is highly dynamic and easy to access in nature, any person can access it any time from the centralized database system and generate required report.

In this project database is used to keep a record of attendance and also use data mining to generate attendance management report for individual students. The ability of updating attendance live makes the system more robust to check ones attendance.

To provide interaction with a user, we can use a database server and web interface to mark the attendance of students for various lectures. This application would also help in updating the attendance dynamically right when the changes are made i.e. if attendance of a student is changed by the teacher, student can view the update right away from his/her account. With the help of a web site with an easy to use GUI and all necessary functions with an industrial standard

database system as the backbone to store and process all the required data for this system, we can achieve great results.

The object under consideration in the project is to identify areas in the Education System which can be compiled together with the help of data mining techniques to determine trends which can be used to improve student performance.

2. RELATED RESEARCH

Data mining is an exploratory data analysis [12].

[1] This paper gave us insights into how the process of data mining can be used to gain valuable insights in the educational sector. Predicting the performance of a student is a great concern to the higher education managements

[2] This paper helped us in judging the criteria which are useful and important to determine their usefulness in using them in our data collection process.

[3] The following paper gave us insights into the various techniques and algorithms which are effective in classifying and clustering our data into useful format for our use.

[4] This paper also helped us in gaining more knowledge and familiarity with the whole process of result prediction from data mining and generating results for our processing.

3. IMPLEMENTED SYSTEM

With help of good UI and proper database management we can make attendance management easier to view and manage. Our System maintains a centralized database for

the attendance of all students. As the data is readily available at any time, reports can be easily generated in an organized form using data mining techniques on the available data.

- **User Friendly:** The proposed system is going to be highly user friendly. The system follows a hierarchal flow of data hence the process seems more organized and easy to use
- **Better UI:** The User Interface of the proposed system is seamlessly simple and unique, shows the right info at the right time. With a better UI we can achieve better usability.
- **Notification System:** In the proposed system in case the student's overall attendance drops below a certain percentage an email will be sent to the student reporting his/her current attendance levels in each subject. Which helps in managing their attendance better. The system can also be used to send notification and upload assignments by the professors even if they aren't present in the college.
- **Computer Operated:** Since the whole process is managed by the computer there will be a minimal instance of error generation during attendance calculation and report creation.
- **Report Generation:** This system can be used to generate reports on different authorization levels to judge and evaluate the trends and performance in the different aspects.

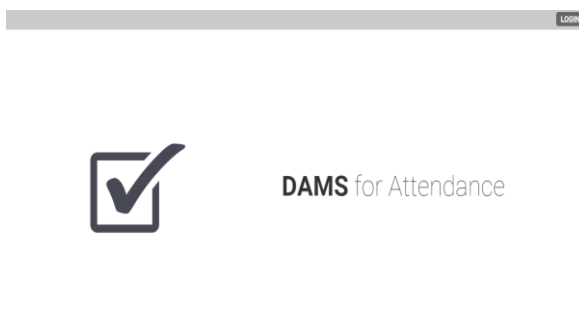


Fig -1: Home page of DAMS system

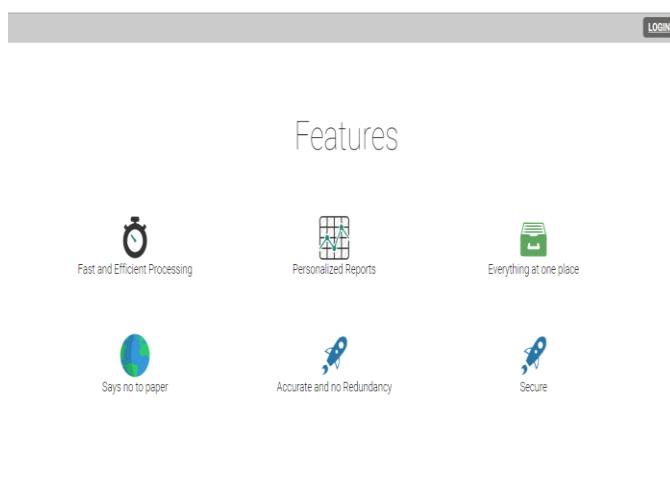


Fig -2: Features of DAMS system

4. DATA MINING APPLICATIONS IN THE PROJECT

Data Mining is used as an important tool to determine trends and helps in characterizing data into suitable format to be used in the application.

In this project the major applications of Data Mining will be:

- **Identifying student attendance trends:** By analyzing the data obtained from the attendance we can determine the number of students present for a particular lecture at a particular time of the day. This can help in generating better schedules so as to improve both student performance and attendance in the specified subject.
- **Predicting the possible result of the students in a particular subject:** Our database collects all the information of the student regarding the previous performance of the student and by comparing it against the present performance it can help us predict the possible outcome of the student and hence develop strategies to combat the outcome.
- **Constructing Student Profile:** This can be used by teachers in scheduling extra tutorials and extra guidance to be provided to students who are expected to show poor results. It can also be used to develop various assessment procedures too.

5. DATA MINING TECHNIQUES

Prediction of the outcome of the student in the academic scenario requires the analysis of various different parameters and criteria. The model which is to be created after the analysis requires the inclusion of a variety of variables involving the academic, social and psychological factors. Due to current project constraints we have decided to work only with the academic variables.

Through the extensive research and study of various literatures and discussions with academic professionals a few key factors were identified as the most important in the analysis process. Table I lists out the various attributes shortlisted for the study to be conducted.

These factors were categorized as input variables for the data set to be considered for the data mining model. On the other hand the output variables or the rank values represent the possible outcomes of the criteria after the classification algorithm (i.e. ID3 or C4.5) has been implemented on it.

For this experiment before the actual calculations could be finalized, data from our college was collected. The data set consisted of students from all branches from all the semesters over the span of two annual academic sessions.

In the actual project the data collection is done through the web interface itself in the form of Student Registration form Fig. 2b. The information to be processed was reviewed by the academic professionals assisting us with the project.

The secondary data which involved the variables such as Attendance and Mid-term marks were obtained by the teachers who are assigned the particular subject and the specified class of students under observation. The results obtained were tabulated in the data base and further processing was conducted on it.

The domain values of Table 1 of the various attributes are defined as follows:

- Student Attendance (ATT): This criteria is selected for the evaluation of student interest in the particular subject which will be directly proportional to the number of lectures attended by the student. This value will also allow us to substantiate weightage to the student interest and performance and help us in predicting the outcomes.

This value will be collected in our database against each student when the teacher takes the daily attendance for her subject. These values will then combined together for all the subjects for each student and hence evaluated.

- Midterm Marks (MT): This attribute refers to the assessment tests conducted by colleges on a regular basis. This criteria will help us determine the current progress of the student in the particular subject.

This value will be collected in the format of average of the test marks and then converted into percentages which will then be assigned rank values for further evaluation.

- Previous Semester Marks (PS): The value in this attribute will help us judge the temperament of the student in the current course of education and give us another aspect for the evaluation of the student.
- Senior Secondary Exam Marks (SSC): This criteria has been selected for the benefit of students who have been inducted into the program recently and don't have sufficient values in the other criteria.

This would also help in again predicting future result based on past performance.

- Higher Secondary Exam Marks (HSC): This criteria will help us determine the dedicated approach of the student on his particular interest by helping us evaluate the interest in the chosen stream of higher education.

Table 1

Sr . No.	Data Attributes to be used for mining		
	Criteria	Variab les	Grade
1.	StudentAttendance	ATT	{>90% -- 10 75% - 90% -- 8 60% - 75% -- 6 40% - 60% -- 4 <40% --1 }

Sr . No.	Data Attributes to be used for mining		
	Criteria	Variab les	Grade
2.	Midterm Marks	MT	{>90% -- 10 70% - 90% -- 8 55% - 70% -- 6 40% - 55% -- 4 <40% --1 }
3.	Previous Semester Marks	PS	{>80% -- 5 70% - 80% -- 4 60% - 70% -- 3 50% - 60% -- 2 <50% --1 }
4.	Senior Secondary Exam	SSC	{>90% -- 5 75% - 90% -- 4 60% - 75% -- 3 35% - 60% -- 2 <35% --1 }
5.	Higher Secondary Exam	HSC	{>90% -- 5 75% - 90% -- 4 55% - 75% -- 3 35% - 55% -- 2 <35% --1 }

Table 2

Sr. No.	Rank values of attributes to be used in the Mining Model	
	Criteria	Rank Values
1.	ATT	0.42
2.	MT	0.28
3.	PS	0.19
4.	SSC	0.05
5.	HSC	0.06

5.1 Implementation of the Mining Model

WEKA is an Open Source Software which is a collection of a variety of algorithms for use in Data Mining Applications. From the student data set various database files are created and from teacher data set different database files are created which were subsequently loaded into the WEKA explorer for analysis and generation of the required reports. A variety of algorithms which along with rank values Table II assigned to them were applied to the data sets to determine which algorithms worked best and provided the most suitable results.

6. CONCLUSION

Fig.3 shows the login page of the website wherein registered students and teachers can access their respective dashboards and retrieve information. They can also change update modify the values depending upon their fixed usage.

Fig.4 shows the parts of the student dashboard or homepage where the total aggregate of his attendance and the uploaded assignments can be viewed.

Fig.5 displays the chart which can be used to compare the values of attendance between selected numbers of students in various subjects.

Fig -3: Login Page of DAMS System

Dashboard

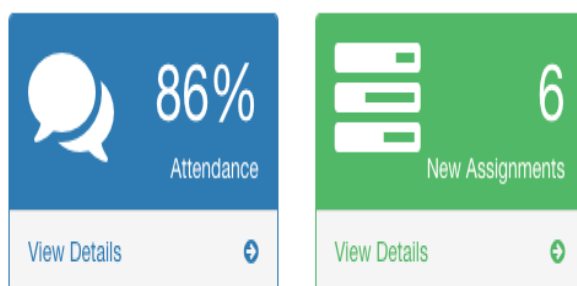


Fig -4: Dashboard of Student System

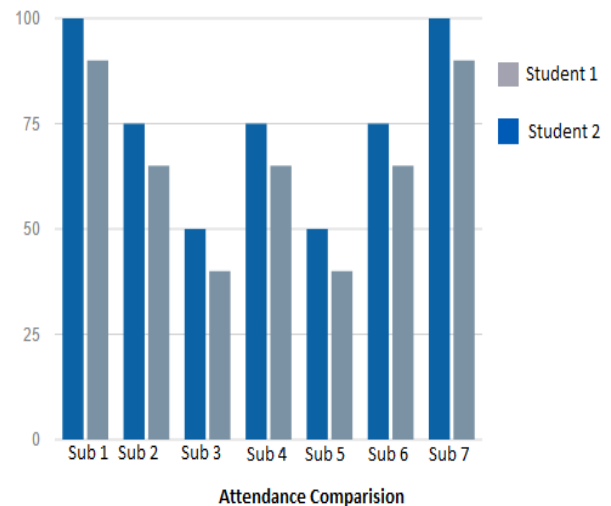


Fig -5: Comparison chart of Subject and attendance

7. FUTURE SCOPE

Our application has immense scope of development in the future. Some of the points that can be taken into account at that point of time are:

- This project can further be developed by using a camera based facial recognition technique for taking the attendance of the student. This would reduce manual work to a minimal level.
- We can add biometric scanner for taking the attendance. It would need additional hardware to be implemented.
- Voice recognition based attendance management. The system will mark the student's attendance when he/she gives the roll call.
- We can add a GPS tracker to the student mobile system to keep a check on his present location.

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