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Student Performance Prediction via Online Learning Analytics using Exam Metrics

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***Abstract*: Prediction of Student Performance will help the more understanding of the peer view model of the education system. It provides the supportive environment to the lectures to understand the student activities and the learning curves on the curriculum and non-curriculum activities. A Research conducted between 2012 and 2021 was the base research over the fundamental of the student prediction used the student outcomes on their curriculums. Now-a-days we are gone through various papers in the online mode with the college domain, So the main objective of this prediction is to apply the college level system prediction of the student using Microservices Architectural View of the Data Mining.**

***Keywords*: AWS, API, Prediction analysis, Machine Learning, Microservices, MangoDB.**

1. Featured Application

This Student Prediction Performance Analytics is the system of Predict analysis and improve the performance and the quality of the study system for the student and the faculty using Machine Learning based data mining with microservices. It has the various microservices which predicts the performance and the stability of the student curriculum and non-curriculum activities in the college or schools.

2. Introduction

Student Performance Prediction via Online Learning Analytics of the exam metrics over the year of the students or any exams which are all conducted over the year will be collected from the exam metrics this part is considered as the main model centralized of the system Architecture. It's also helps the students to monitor their cultural and study model also they can monitor and share their works with lectures for the review It's a Peer Review Model System.

Machine Learning with Data Mining is the main process which involves on every level of the data processing unit on the architecture which followed into the system mainly focusing on the outcome metrics of the student online exams which we can deliver in the exams and the cloud-based data model for online exam data model collection.

Student Performance Prediction supports the journal level research improvement of the massive impacts for the students to improve their level of study. This Systematic review applied for the various batches of the exam data metrics of the year 2021 which provides the higher percentage of positive metric analysis on the student performance this process involved the below symmetries into the systems.

- Understanding of the student performance with machine learning concept of prediction so deeply understood the student exam outcomes.
- Performed each level of process by splitting with microservices.
- Identify the higher and lower end of nodes of the result sets with different perspective of datamining.
- Higher rate of outcomes on various data sets with microservice architecture.
- Collecting the exam data with cloud on mango dB with involving various

The remaining of this paper speaks into various strategies which involves the study and improvement of following categories [2] Background of Education system improvement, [3] Existing student performance system, [4] Architecture [5] Microservice improvement model of Student performance prediction system and [6] Testing of the System with Karate Framework. The system which notifies the faculty to provide the review kind of feedback about the students to the faculties.

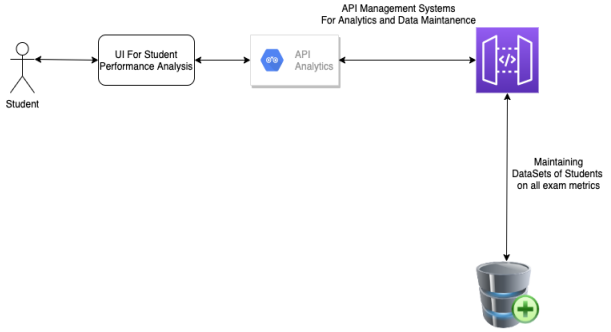

Fig. 1. Overview of the student performance prediction system

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3. Background Study of Education System Improvement

Background study of student performance prediction involves various study level of education system on prediction over the data mining projects which are available in the research area. We found some systems which are available for the students to predict their learning and career improvements, those systems are mainly focused on the collective student performance with the help of various datasets which are available on the college or any education systems. Most of the systems involves the propagations are developed with R Language and the system-oriented designs but in the proposed system we are planned and migrated the development with latest emerging technology like Java Microservices with Spring boot for UI we are proposing system with Data Sets.

A. Exam Outcomes

This part will discuss the main part of the system which is data with Student exam results outcomes. Maintains the drive-based system to collect all online exam outcomes of each students including their percentages and the performance review of the faculty. It will help the data prediction using data mining from the collected data we are representing collected data to be organized with K Means Clustering to classify the data with the possible predictions.

B. Peer to Peer Review Model

Student Performance prediction systems are not involved any systematic prediction status before, but now we are developed system with systematic tracking of exams and the outcomes of those with feedback system, this will provide the consistent system to bring student career growth of the various levels for the reviews.

Peer review will be the system which notifies the faculty to provide the review kind of feedback to the students for making the progress of education system via online exam metric improvement.

4. Existing Student Performance Prediction System

Student Prediction system has the improvement on every phase of research, but all the existing research are mostly preferred to use the existing data not real time data, So We are going learn about the existing system performance and the procedure they followed for the development

A. Working Model with Patch Data System

Appling the Prediction Mechanisms and Algorithm over the existing path of data for example at the year of 2021 if we need to predict the performance of the batch, we need to conclude solution with the pat student's history of percentage with the professor approached percentage like past performance of the student otherwise might can have the existing performance of the same student for the prediction. It will fall over the place of student current performance.

5. Architecture and Working Flow for Proposed system

A. Student Performance Analytics System

Student performance prediction has the various layers which includes the UI for the better user experience. This level will be constructed using vue js which supports the dynamic loading and lazy performance to the predictive system.

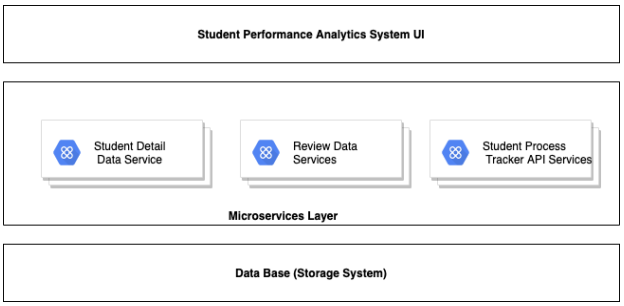

Fig. 2. Architecture

B. Student Detail Data Service

Student detail data service is the microservice which will return the data for the student and will support the prediction level of filtering to the student prediction system.

C. Review Data Service

Review Data Service is the microservice which will return the data for the student review metrics and will support the prediction level of filtering the review metrics which include students self-review and staff review details to the student prediction system.

D. Student Process Tracker API Services

Student Process Tracker API Service provides the tracking data services like combined prediction metrics of review and student historical data

6. Conclusion

This systematic survey applied the Student Performance research for various colleges for investigating the prediction of student outcomes, which is considering as proxy, we applied the PRISMA protocol and SLR guidelines to produce the review. The exhaustive search of seven bibliographic databases yielded a synthesis of 62 primary articles. These articles presented intelligent models to forecast student performance using learning outcomes. The predictive models were published in peer-reviewed venues, spanning from 2010 till November 2020. To the best of our knowledge, this was the first published work that summarized the outstanding efforts of other researchers who studied the attainment of student outcomes. The prominent challenges included the prediction of academic performance at the program level We call upon the research community to implement the recommendations concerning (1) the prediction of program-level outcomes and (2) validation of the predictive models using multiple datasets from different majors and disciplines.

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