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CALIFYN- LEARNING MANAGEMENT SYSTEM

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Abstract- *Califyn is a learning management system that mainly focuses on automated activity point calculation and to identify the students that require improvement in their academics with necessary remedies. So far, the calculation of activity points is performed manually by the faculties based on the certificates submitted by the students at each semester. Califyn is developed with the idea of automating the calculation process and thereby making it easier for faculties and students. It is relevant as it generates automated reports on all aspects of data-driven decision-making. The traditional way of entering activity points is by comparing the given details with the guidelines given by the university and then it is entered on an excel sheet. Another similar learning management system is a fully hosted cost-effective and innovative learning management system that provides centralized and automated administration but misses on features that we offer. An innovative idea in the project is to automate the activity points of the students and make the student profile updated with their current points and give them an alert if they are far behind to their destination. Along with that, Califyn provides better features for attendance monitoring, using a prediction model to make predictions on marks for upcoming internals using machine learning. Students and Staff under APJ Abdul Kalam Technological University will be benefited through this application. This system will also help faculties to monitor the student activities and to generate reports on them since these are necessary criteria for meeting students' eligibility to acquire B. Tech degree.*

***Key Words*: Learning management system, Activity point calculation, Attendance monitoring, Automated administration, Machine learning**

CHAPTER 1

INTRODUCTION

Learning management system, or LMS, is a software application used in the academic process. This method has revolutionized the education business and continues to evolve as technology advances. One of the technologies that drives demand for the LMS is advancement in the field of AI. Because many students and research scholars rely on online content as their classroom as a result of the Covid epidemic, the use of LMS by schools and colleges has surged. Without the costs of printing physical copies, the limitation on the number of students each class, and the absence of tracking tools, the learning management system virtually mimics what an indoor classroom can do. Students can learn from anywhere and at any time with the help of a learning management system (LMS). So LMS is being developed day by day to enhance the user experience and its demand is increasing daily.

1.1 General Background

We are focusing on binding the technology of AI into the LMS system through which a much better and efficient system could be generated. Features such as attendance monitoring, online examination, activity point calculator and performance prediction model are the highlights included. As AI has taken over many fields including the education sector, we believe that it could be very beneficial in this system. When an individual student is able to understand his current situation of education, he/she will be able to make up their mind and set a proper goal and will have that mentality to reach the destination. Along with that activity points which are mandatory for the completion of course is also integrated in the system to make it easier for the faculties and students regarding their activity point status.

1.2 Relevance

Califyn allows teachers and instructors to monitor student progress and assess performance using machine learning. From keeping track of records, grades, everything is included in the system. Coming to an industrial perspective, it can be used to predict sales and determine the worth of a product. The importance and demand of learning management systems are elevating day by day making the academic activity easier to interact.

1.3 Socio-Economic Importance

Every organization is still attempting to find out what, if anything, to do with social learning, especially with the new mainstream social media capabilities. There is no shortage of ideas or hype about how to use social learning to its full potential. Learning management systems have progressed to become excellent social learning platforms. Our LMS has features that make online learning and activity point calculation easier, making learning more enjoyable and social.

1.4 Applications

- Our System is flexible to the modifications made by universities regarding guidelines, so our system can be implemented to any college irrespective of any university.
- The Student Performance Prediction using machine learning can also be used to predict the performance of an employee in an organization.
- The various benefits of our system can be implemented in product-based industries that includes data organization, sale prediction etc.

1.5 Advantages

- Student Data can be organized on a single space
- Based on the documents uploaded, Activity Point Calculation is automated
- Flexible to make Modifications made by the university regarding activity points
- Data Manipulation can be avoided
- Evaluates student performance using ML

CHAPTER 2

LITERATURE SURVEY AND EXISTING SYSTEMS

In this chapter, the literature review and existing systems related to our project will be covered

2.1 LITERATURE SURVEY

Facebook group as a learning management system [1]. Qiyun Wang, Huay Lit Woo, Choon Lang Quek, Yuqin Yang, Mei Liu. A Facebook group was used as an LMS in two courses at a teacher education institute in Singapore for posting announcements, exchanging materials, organizing weekly tutorials, and conducting online conversations. Students were pleased with Facebook's features. The LMS could be readily integrated into Facebook group. Other file formats could not be directly uploaded. Students also did not feel safe or comfortable since their privacy might be compromised. Self-disclosure by teachers on Facebook can improve learning atmosphere, credibility, and student–teacher relationships.

Choosing the Right Learning Management System (LMS) for the Higher Education Institution Context: A Systematic Review [2]. N. N. M. Kasim, F. Khalid. Discusses a variety of prospective Learning Management Systems (LMS) that can be used in the context of Higher Education Institutions for teaching and learning activities. Each platform is exceptional in its own way. Institutions or lecturers that want to use an online learning management platform have the right to select the platform based on the specifications and demands of the users. Moodle, ATutor, Blackboard, and SuccessFactors are a few examples. The comparison is based on a review of the literature on the characteristics of the selected LMS providers. Flexibility, ease of use, accessibility, and user friendliness are among the characteristics taken in to consideration.

OLMS: Online learning management system for e-learning [3]. Vinay Kumar Ippakayala, Hosam El-Ocla. A learning management system that allows for the centralization of course content control. This application has a secure technique for recording lectures, which may be accessed through webcam or mobile recording. User administration, subject management, and a notice board are the main modules. Users such as students, teachers, and administrators can manage their schedules, lectures, assignments, employment, events, chats, and research. In addition, we connect a learning management system to a social activities platform, and student assessment analysis is developed.

Design and Development E-Learning System by Learning Management System (LMS) in Vocational Education [4]. Rabiman Rabiman, Muhammad Nurtanto, Nur Kholifah. To establish an LMS-based E-Learning system that has been tested on Microteaching in the Mechanical Engineering Education class, using the Hannafin and Peck approach model with particular stages (needs analysis, design, development and implementation).The findings of an LMS-based E-Learning development study are "extremely practical" for application.The evaluation is based on the LMS usability, LMS functions, visual communication, learning design, material contents, and language and communication skills.

Designs of web based LMS (Learning Management System) in SNAM1 Kampar Kiri Hilar [5]. Muhardi Muhardi, Sakroni Indra Gunawan, Yuda Irawan, Yuda Irawan. A web-based Learning Management System was built by using the PHP programming language and MySQL using the Waterfall Model Method. Level of interaction between teachers and students increases.

Learning Management System (LMS) Based on Moodle to Improve Students Learning Activity [6]. N H S Simanullang, J Rajagukguk. This research is to look at student learning activities that are learned in online using by LMS based Moodle applications. Moodle-based LMS can increase student learning activities though in even online. Student learning activity can be carried out well without any constraints on the limitations of face-to-face time in class.

2.2 EXISTING SYSTEMS

- **Manual entry in Microsoft Excel**

As of now Colleges, under the Kerala Technological University adopt Microsoft excel sheets enabling students to upload their activity points based on the events they have attended. The faculties need to calculate the points based on these events for every student and it is time consuming.

- **AMS Developed by Saintgits College**

It is an AMS developed by Er Tibin Thomas, a faculty of Saintgits College of Engineering that mainly focuses on attendance monitoring, Internal mark assessment (entering of series mark and assignment mark) report generation can be made and makes it easier for the faculties to assess the student performance.

- **Edmodo**

Edmodo is an open-source e-learning platform that offers numerous features such as facilitating learning goals, creating polls for students, online discussion forums and through the network it connects students, teachers, parents and administrators on a single platform.

- **Linways**

Linways is a complete management software for managing entire academic activities. It is incorporated with numerous features such as course material distribution, online admission management, attendance marking and report generation, time table management, online examination and mark analysis and many more. This module can be considered as a complete system which is still being updated.

CHAPTER 3

OBJECTIVES AND PROPOSED INNOVATION

In this chapter, objectives and proposed innovation of our project will be discussed.

3.1 OBJECTIVES

- Developing a LMS which makes the academic process simpler.
- Giving alerts to the students regarding their academic activities.
- To reduce the overhead of activity point calculation through automation
- Getting an overview of the student's performance based on their past performance.

3.2 PROPOSED INNOVATION

Our System is a LMS (Learning Management System). The modules which we are planning to develop consist of the following:

1. Activity Point Calculator
2. Attendance Monitoring
3. Student Performance Prediction using ML
4. Online Test Portal

1. Activity Point Calculator

An activity point Calculator is a module that calculates the activity point of a student who comes under a particular university. Currently, we are using an Excel Sheet to enter the details of activities that the students have participated in and it has been found that it is more difficult to fill the excel sheet since everyone has the permission to edit the sheet and it is also a unique feature of the system. Also, the faculties have to look upon every student's entry and calculate the activity points along with that they need to verify that it is not a duplicate entry. Therefore, bringing an automated system to perform the calculations would be a great benefit for both the students and faculties.

2. Attendance Monitoring

The Second module provides the feature of attendance monitoring to assess the participation of students in the classes. Here an overall attendance view is visible to faculties to analyze the attendance of a particular class during that year. Here the faculties will be able to mark the attendance on a day-to-day basis. Based on the attendance during that day a level is calculated from 0 to 5 and a graph is created.

3. Online Test Portal

In the fourth module, provision for Online assessment can be performed with a more secure method to avoid malpractices, etc. The importance of online tests is seen during the pandemic time when there was no option for an examination to be conducted in offline mode. So, this module plays an important role at all times. Making the test portal more secure is another important task. Making the students not visit another tab is an example of how to ensure that cheating is not done.

4. Student Performance Prediction

Then comes the last module. Using machine learning the student's performance is monitored based on his academic performance and thereby enabling the faculty to get an overview of the student. The linear regression technique is being used so that individual student performance can be

monitored. Mostly we see that a class contains almost 60 students, and a faculty might not be able to monitor every student. So, using this system it alerts the faculty to find which students need to be focused more.

CHAPTER 4

HYPOTHESIS, DESIGN AND METHODOLOGY

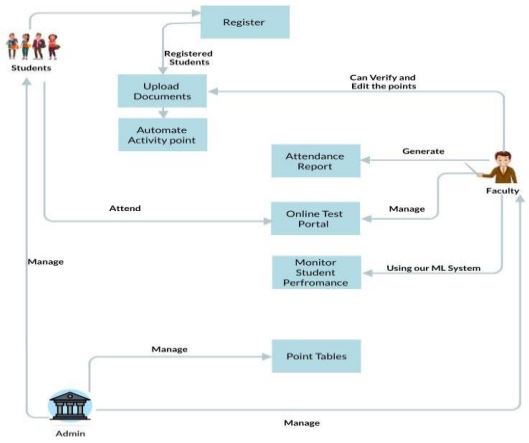
In this chapter the hypothesis, design and methodology about the project will be covered.

a. HYPOTHESIS

We found that our system can minimize the overheads of faculties, as our system manages the data by itself and also the faculty can predict the performance of a class he is going to approach, which will be helpful in selecting appropriate approaches. Students using LMS can study better and can implement new learning techniques. Along with using LMS obtains time management and becomes consistent with their academics.

b. DESIGN

Following diagram shows the design of our proposed system:



4.2 Design of the proposed system

In our system there are three types of users,

- **Students**

Students need to register their account in our web application. After registration, they need to add their mentor using the mentor code and after that they can upload their documents in order to automate their activity points. Along with that, Students can take up Assessment Tests created by Faculty and can know their activity points status anytime.

- **Faculty**

Once students upload their documents, the faculty can verify the documents and can apply modifications if any. They can also manage Online Test Portal System and conduct tests to assess the knowledge and skills of Students and they can analyze the performance of a student based on their previous performance using our Student Prediction ML System.

- **Admin**

Next user is the admin, who can manage all the faculties and students in our system and also modify the point tables according to the regulations made by the University.

4.3 METHODOLOGY

Our system provides a set of actions like login, register and forgot password for the users. Once the user is logged in, they will be directed to their dashboard page. If the user is a student, they will be provided with many features as mentioned below and if the user is a faculty, they will be provided with another set of features including online test portal, attendance monitoring system, student performance prediction system based on their previous academics such as their mark sheet, class average which will be the input dataset for training. They can also verify the documents of corresponding students. If the user is admin, they will be given the control to manage all members and our web application.

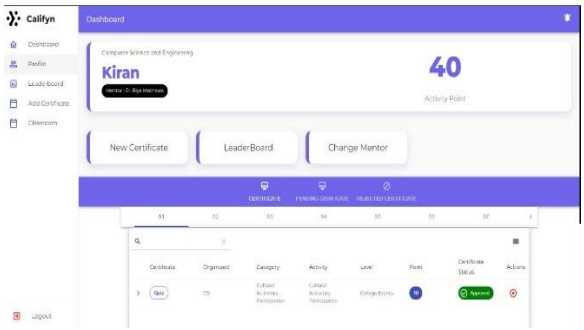


Fig 4.3(a) Student Dashboard

In the Students Portal Fig 4.3(a), at first, they need to register their account in our web application. After successful login, they will be directed to the dashboard page. In dashboard page, student have the provision to access classroom, manage their certificates and select their mentor. Along with that they will be notified regarding the placements, activity points etc. At first, they need to select their mentor, for that they have to access their profile page and paste the mentor code, which is the shared by the faculty to their corresponding students.

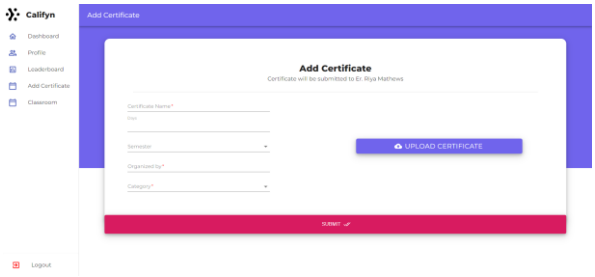


Fig 4.3(b) Student Add Certificate

In the new certificate page as shown in Fig 4.3(b), they can upload the documents by filling out the necessary fields which is provided by the University. After successful submit, they can see the update of their submitted document in dashboard. When the certificate is approved by the faculty, it will be listed in certificate tab and their total activity point will be updated. The rejected Certificate will be updated in the rejected Certificate tab along with the reason to reject the certificate.

In classroom page, students will be mapped to different subjects created by the faculty. In that they can see their attendance progress for each subject. Also, the student has the provision to attend the quiz created by the faculty.

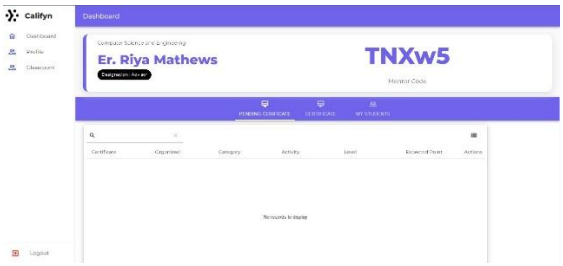


Fig 4.3(c) Faculty Dashboard Page

In Faculty portal Fig 4.3(c), they have the provision to manage the classroom and review certificates upload by the students. The document upload by students will be list out in pending certificate tab under dashboard page. They can review the documents. our system automatically calculates the points and they can modify if there is any change according to the University guidelines. After approval, it will be listed in the certificate tab and they can download it later as an excel sheet for any documentation purpose etc. In classroom page, they are provided with features of attendance Monitoring system, Online Quiz Portal and Student performance prediction using machine learning.

Fig 4.3(d) Attendance Monitoring System

In attendance Monitoring system as shown in Fig 4.3(d), the faculty can create classroom and the students will be automatically mapped based on batch and year of pass. After successful creation of subject page, they can mark the attendance of students along with the date. In that faculties are also provided with a graphical representation based on certain levels, so that faculty can know more about the class.

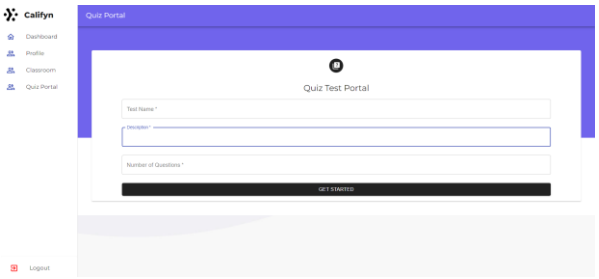


Fig 4.3(e) Online Quiz Portal

In Online Quiz Portal as in Fig 4.3(e), they can conduct quiz by filling out the necessary fields and it will be repeated based on the number of questions entered by the faculty.

In student performance prediction system, the faculty can analyze the performance of student based on their previous performance using a machine learning model. In this, faculties are provided with option to enter the student mark and our system automatically calculates the CGPA based on this, through this they can know more about the students and can help them to improve.

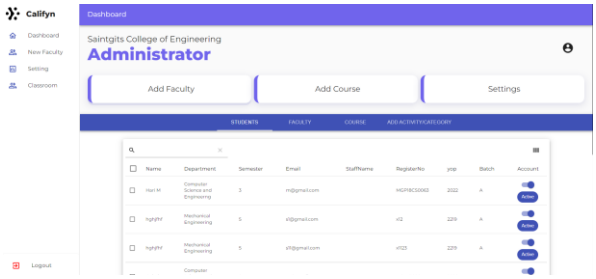


Fig 4.3(f) Admin Dashboard

Coming to the Admin portal in Fig 4.3(f), have the provision to manage faculties, students and courses. They are also provided with features to modify the point table or to add new category according to changes prescribed by the

University. The admin can manage faculties through various options.

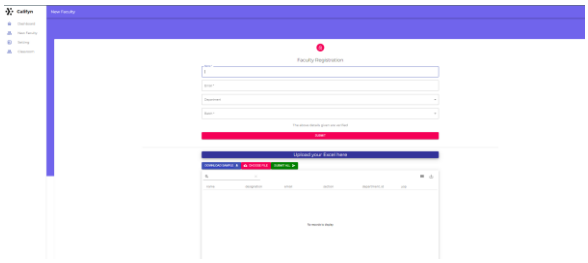


Fig 4.3(g) Faculty Registration

First, they can register faculties as single or bulk upload through an excel sheet as described in Fig 4.3(g). After their successful registration, the faculties will be listed out in faculty tab under dashboard and they can remove the faculties if they want. The same feature is applicable in case of course registration, in which they can create and drop the course. Admin also have the provision to deactivate the students, if no longer needed.

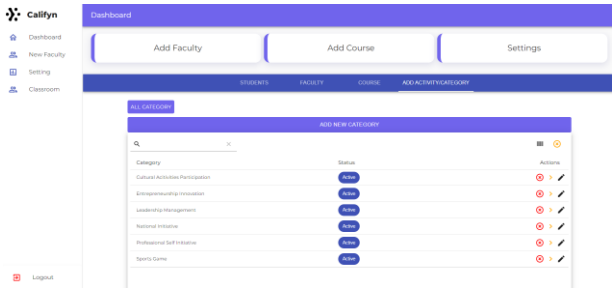


Fig 4.3(h) Add/Modify Activity Point

In add activity page, they have provided with option to create modify and can delete the category as shown in Fig 4.3(h). In case any change prescribed by university regarding activity point to certain category, they can modify the point table.

The software design phase shows a systematic development of the application. In order to develop our web application, we used React.js as our front end, which is an open-source framework and Laravel as our backend. We are using Jupyter notebook and Spyder for our machine learning model.

CHAPTER 5

FUTURE SCOPE

The future scope of our project includes:

- **AI Powered LMS**

An AI-powered LMS offers personalized learning and enhanced automation options. AI LMS features a variety of individualized learning solutions, detailing an enhanced learner journey. Catering to a tailored learning environment digitally was difficult prior to AI LMS. The recommendation engine of an AI-powered LMS provides a user-focused UI, with auto filtering of materials given to individualized learners based on intelligence obtained from user behaviors, skill sets, and information components. With its AI-algorithm that handles content scheduling and delivery procedures, Enhanced Automation AI LMS can automate even the most difficult human-intervened operations. Such an LMS recognizes skill gaps and delivers targeted competence mapping and recommendations, relieving administrators of the manual burden.

- **Gamified Learning**

Enhanced Automation AI LMS can automate even the most demanding human-intervened activities with its AI-algorithm that manages content scheduling and delivery procedures. An LMS of this type recognizes skill gaps and provides targeted competency mapping and recommendations, alleviating administrators of the manual burden.

- **Collaborativeness**

Collaboration is an essential component of a Learning Management System. Students will be able to collaborate using web conferencing technologies in futuristic LMSs through seminars, casual collaboration, group meetings, sub-chats, or group chats. On-demand and pre-planned sessions, effective course delivery tools, multi-point video, digital whiteboard tools, application and desktop sharing, and application and desktop sharing all offer an exceptional learning experience.

CHAPTER 6

CONCLUSION

The purpose of the system was to bring up a system that could improve the ongoing education system by identifying the missing and yet needed features that enhances learning. Current situations of the education system need to be improved in a way as the technology is being improved every second. A system designed individually for a student is not possible, but with the technology of AI, personal analysis can be done thereby identifying the ups and downs of a student. The research was done to understand the features that could improve the current LMS. Professional publications were identified and used to improve the system with all the existing and new features. The development and use of computers and computer-related technologies harbingered research and innovations that have led to the development and use of AI in LMS. AI has been extensively adopted and used in the education sector, particularly, in educational institutions, which were the focus of this study.

The analysis focused on evaluating the impact of AI on learning aspects of education, with a focus on assessing how AI can make an impact on education.

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