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Faculty Substitute Adjustment

Pallerla Shashank[#1], B Adithya[#2], Nookala Utpala[#3], S. Avinash[#4]
[1]B. Tech C.S.E TKREC Hyderabad Email: me@shashankpallerla.in
[2]B. Tech C.S.E TKREC Hyderabad Email: adithya.adi5931@gmail.com
[3]B. Tech C.S.E TKREC Hyderabad Email: utpalanookala1996@gmail.com
[4]Assistant Professor, TKREC, Hyderabad, TS-India, Email: avinash.seekoli@gmail.com

Abstract-- As the size of institute increases gigantically, it becomes a hefty task to adjust faculty substitutions which is time consuming and lengthy process. Faculty substitute Adjustment mainly deals with substitution of a faculty for particular class in case of original faculty absence. This system allows a faculty to request the other to take over a particular class on a specific date based on readiness. It is an enterprise application which allows automation of the whole scenario even without faculty presence. It also features a faculty to accept/reject a particular request made by other lecturers. A proper login with role based access is provided to Faculty, Administrator and Heads of the Department. It also generates a unique list of faculty for invigilation for examinations.

Keywords: - Faculty Management, Substitute adjustments, Invigilation Scheduling

I. Introduction

Today, there are a lot of institutes and many of them are continuously increasing their base gigantically, as a result it becomes a very hefty task to adjust faculty substitutions. It also eats away a lot of time and also is a very lengthy process. Here we introduce a new system called Faculty Substitute Adjustment which mainly deals with managing the substitutions of all the faculty in case they are going to take a leave. This system allows a faculty to request the other to take over a particular class on a specific date based on their readiness. The whole scene happens even without the faculty's physical presence. Faculty can either accept/reject a particular request made by other member. For Faculty, Administrator and HOD, we provide a proper login system. This system allows generation of a unique list of faculty for invigilation for examinations.

This thought process can be achieved using a dynamic web application and hybrid mobile application with the help of Representational State Transfer Server (RESTful web services). REST basically supports interoperable machine-to-machine interaction over a network allowing data exchange between the server and mobile application. In this REST server, a token based authentication is used which provides security to the mobile application/server over an HTTP protocol layer. Hybrid mobile application can be achieved using ionic framework which is based on Angular JS 2 and Apache Cordova for utilising the native functionalities of a smart phone.

Objectives

In order to avoid above existing leave adjustments problem, we are planning to design a system for to automate this process, so that leave requesting becomes more interactive, automated and effective.

1. Leave requests are placed will be placed through Web Application which can be maintained in the database. It reduces the paper work and storage area.
2. Save time & work load for Heads of Departments and Organisation Administration.
3. Easy to access.
4. Equally distribute invigilation duties to faculty.
5. Easy and quick process.
6. It will have a user friendly interface

II. Existing & Proposed System

A. Existing System

In the manual process, faculty members must contact administration department to request approval for the planned absence. This request should be submitted along with the name of substitute faculty. Later this request must be approved by the HOD and substitute, then allotted. This manual adjustment of faculties needs lots of effort and at times leads to mistakes. The whole scenario of a faculty requesting another faculty delays the process. Physical presence of the faculty is required to complete the process. It is an overhead for department to sort out the available faculty.

B. Proposed System

This system automates the task of manual substitution process by giving authority to the faculty to request approval with the available lecturers in the app. As the number of leaves allotted to faculty are limited, therefore this system checks for this constraint and also allows the faculty to request another faculty without overhead to the administrative department. This reduces the burden of the lecturer to manually check with the availability of other faculty. No physical presence is required as the app can be used anywhere. Assigning unique list of faculty for invigilation without repetition of old invigilators for the next examination.

Implementation of Tools

1. Leave Requesting:

A faculty can request other faculty for substitute by providing parameters such as requesting leave date, period, type of leave etc. Once the request is placed, it is routed to Head of Department. If HOD approves the request, then it's visible to the substitute faculty and will be able to approve or reject the request. While placing the request a system verifies whether a faculty is exceeding the threshold limit provided for leave per semester.

2. Invigilation Scheduling:

Schedule for the invigilation duties of faculty is generated in such a way that everyone gets equal number of duties. The scheduling is assigned in such a way that previously assigned faculty are not repeated. If any invigilation is scheduled by admin then it's notified on Faculty dashboard.

III. System Architecture

The development of the proposed model is not only depending on how the system works. It also depends on the working flow process that being identified and need to be implemented and followed. The proposed Faculty Substitute Adjustment web-application and Hybrid Mobile Application to ensure that the Leave Management and Invigilation Management works properly. The system architecture is shown in figure 1.

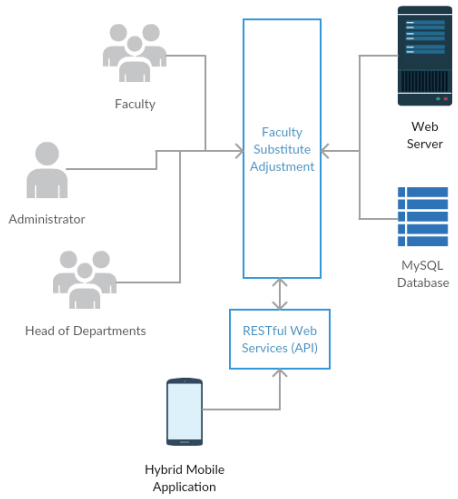


Fig.1. System Architecture

IV. Algorithm

The RESTful Web-Service API is widely used to support interoperable machine-to-machine interaction over a network. RESTful API allows the server to authenticate each client by cookies or session on HTTP protocol. However, it is easy for a hacker to steal the identification information, e.g., by tapping the broadcast packets or by providing a fake proxy to do so. With the stolen identify, the hacker can disguise himself as an authenticated client to interact with a server. In this project, we propose a new mechanism called disposable token, which is based on token authentication of RESTful API on HTTP protocol.

This mechanism asks a client to store the public and private token-pair computed by the server. In each communication, the client uses the stored public token, private token and the current timestamp to produce a disposable token, which is subsequently received by the server for verification. With this mechanism, each communication will be valid only in a fixed period of time, thus reducing risks of stolen identity.

V. Modules

A. Faculty

In this module, the faculty can go to the website/app and login with the help of their unique id and password. After they get access to their profiles, they can view their daily time table in the dashboard provided to them. A profile section dedicated to every faculty, where they can update their personal details. To get latest news and updates about the schedules and related information restricted only to the faculty is also present in this module. Faculty can also have an option to request a leave and these leaves are managed by HOD and Administrator.

B. Heads of Departments

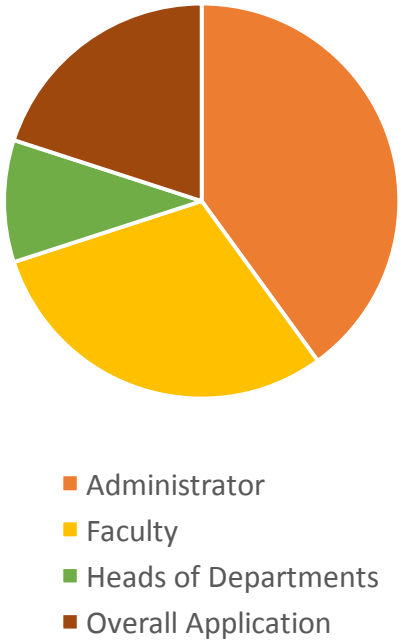
In this module, each Head of Department will perform some checks and grants the leave request. Once approved by respective Head of Department the request in routed to the substitute. If Head of Department rejects the leave request, then it's not routed to substitute.

C. Administrator

In this module, the administrator can view time tables as per year wise. He can manage all the faculty present in the college, he can add a new faculty, or remove the existing one. A section provided to manage the leaves requested by faculty. Admin has the ability to create news related to faculty and let them be updated with all the important updates or announcements. He can also generate the list of invigilation faculties for any exam and update it with the faculty.

VI. Result Analysis

The majority of the functionalities are available to the Administrator so 40% is assigned. Faculty module when compared to Heads of Departments has more functionality so 30% is assigned. All the functionalities require database which acts as a backend to the application. The database is used to store the data and retrieve to the application whenever required. The frontend which acts as an interface plays a major role. So the 20% is assigned to the Overall Application which involves the Frontend and Backend.



VII. Conclusion

This paper presents an overview of the development and implementation of Faculty Substitute Adjustment as a Web Service and Hybrid Mobile Application. The results obtained from implementation are encouraging and promising for development of more complex systems in the future. By using the prototype that has been developed will improve Leave Adjustments of organization.

VIII. Future Enhancements

In proposed Faculty Substitute Adjustment there is scope for improvement, System does not provide SMS Notifications on particular actions. Hence, it can be modified to allow SMS notifications. Apart from these there is scope for allowing user to request a leave for particular number of days rather than requesting leave for each period.

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