JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

STBCOE: A WEB BASED LEAVE MANAGEMENT SYSTEM

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Abstract - In educational institutions, the process of managing faculty leave applications is often carried out manually, leading to time delays, miscommunication, and inefficiencies. The "STBCOE: A Web-Based Leave Management System" is designed to automate the complete leave process for Shri Tulja Bhavani College of Engineering, Tuljapur (STBCOE). The system enables faculty members to submit leave requests online, which are then reviewed by the Head of Department (HOD). Upon approval, the request is automatically forwarded to the Principal for final authorization. Once approved or rejected, the system notifies the concerned faculty member instantly. This digital approach reduces paperwork, ensures transparency, and saves administrative time.

1. Introduction

Manual leave management in colleges often involves several steps — from filling out paper forms to physically submitting them to various authorities. This traditional process can lead to lost records, delays in approvals, and lack of clarity for both staff and administration. To solve these challenges, a web-based Leave Management System (LMS) is proposed for STBCOE.

The main objective of the system is to automate the leave application and approval workflow, ensuring seamless communication between faculty, HOD, and Principal. Through an interactive online portal, faculty can log in, submit their leave requests, view approval status, and receive real-time updates. The system helps administrators track all applications efficiently, maintaining a digital record that can be easily retrieved at any time.

The LMS leverages modern web technologies and database management tools to provide a secure and user-friendly experience. It eliminates unnecessary human intervention and reduces administrative workload, aligning with the vision of digital transformation in academic institutions.

2. System Design and Architecture

The system is designed using a three-tier architecture, consisting of a presentation layer (frontend), an application layer (backend), and a data layer (database). Each layer plays a specific role in ensuring a smooth flow of information.

1. Faculty Module:

Faculty members can log in using their credentials and submit leave requests online. They can also view the status of previously submitted applications.

2. HOD Module:

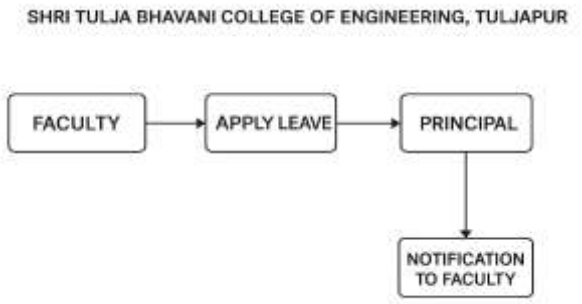
The HOD can view all leave applications submitted by faculty within their department. After evaluating the request, the HOD can approve or reject it with comments. Approved applications are automatically forwarded to the principal.

3. Principal Module:

The Principal reviews applications that have been approved by the HOD. Once the Principal gives final approval, the faculty member is notified through the system dashboard or email.

4. Database Management:

All details — user credentials, leave records, approval statuses, and comments — are securely stored in a MySQL database. The database ensures data integrity, security, and easy retrieval.



Dig: Workflow

This hierarchical workflow ensures that leave applications follow the proper chain of command. The system maintains complete transparency by storing timestamps for each action taken, allowing easy tracking and auditing.

3. Implementation

The frontend of the system is developed using HTML, CSS, and Angular, which provides a responsive and interactive user interface. The frontend allows users to access the system from any device, ensuring mobility and accessibility.

The backend is implemented using Spring Boot, a Java-based framework that simplifies API creation and business logic management. Spring Boot handles request routing, validation, and communication between the frontend and the database.

The database layer uses MySQL, which stores information such as user credentials, leave details, approval dates, and comments. Secure connections and proper encryption techniques are used to ensure that sensitive data is protected.

The system operation begins when a faculty member logs in to the portal and fills out a leave form specifying the leave type, duration, and reason. Once submitted, the application enters the HOD's dashboard for review. If approved, it automatically appears in the principal's dashboard for final approval. The principal's decision triggers a notification that updates the faculty's dashboard and sends an automated email confirming the status.

Additional features such as leave balance tracking, date validations, and role-based access control enhance usability and security.

4. Results and Discussion

The implementation of the web-based LMS at STBCOE demonstrates a significant improvement in efficiency compared to manual systems. The system eliminates the need for paper forms and physical signatures, reducing processing time by over 60%. Faculty members no longer need to visit administrative offices to check the status of their applications — all information is available in real-time through the web portal.

The digital system also improves record keeping. Every action (application, approval, rejection) is automatically stored in the database with timestamps, ensuring transparency and accountability.

In testing, the system successfully handled multiple simultaneous requests without performance degradation, indicating scalability for larger institutions. Feedback from faculty and administrators highlighted its simplicity and reliability.

Challenges encountered during implementation included network dependency and the need for user training. However, once users became familiar with the interface, adoption increased rapidly.

6. Advantages

I. Efficiency: The automated process saves time for faculty and administration.
II. Transparency: Every approval and rejection is recorded digitally, reducing disputes.
III. Data Security: Sensitive information is securely stored in a protected database.
IV. Paperless Operation: The system supports eco-friendly digital documentation.
V. Real-Time Updates: Faculty receive immediate notifications of application status.
VI. Scalability: The system can be expanded to include students and other staff in the future.

5. what LMS Provides ?

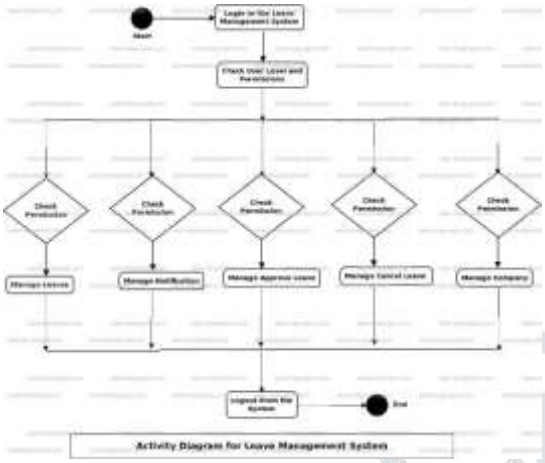
7. Conclusion

The "STBCOE: A Web-Based Leave Management System" provides a modern, efficient, and transparent approach to managing faculty leaves. By automating the entire process — from application submission to Principal approval — it enhances communication and reduces administrative burden.

The system's modular design, built with Angular, Spring Boot, and MySQL, ensures reliability, scalability, and security. Future enhancements could include integration with mobile applications, AI-based approval predictions, and analytics dashboards to monitor leave patterns.

By adopting this digital solution, Shri Tulja Bhavani College of Engineering, Tuljapur, moves closer to a fully automated administrative ecosystem, supporting its vision of technological excellence in education

8.Activity Diagram:



9. Literature Review:

Existing systems typically focus on enterprise organizations; however, academic institutions require specialized workflows and multiple user roles. Previous research suggests that implementing web-based leave systems enhances efficiency and reduces data errors. The need remains for a customizable solution suitable for educational workflows.

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