International Research Journal of Education and Technology

Peer Reviewed Journal

ISSN 2581-7795

Teaching Faculty Industry Visit Management Portal

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Abstract - *The coordination of industry visits for teaching faculty is often hindered by inefficiencies in manual management practices, such as paper-based approvals, fragmented communication, and difficulty in tracking visit history. These limitations result in delays, lack of transparency, and ineffective reporting. To address these challenges, this project proposes the development of a Teaching Faculty Industry Visit Management Portal, a digital solution that streamlines the planning, approval, execution, and documentation of faculty industry visits. The proposed system incorporates automated scheduling, real-time tracking, and intelligent data management to enhance visit coordination and decision-making. It features role-based access for faculty, and administrators, along with a dynamic approval mechanism for reviewing visit proposals, budget allocation, and report tracking. Additionally, data analytics will be employed to generate insights into visit trends, industry collaborations, and faculty engagement. Designed with a modular architecture, the system ensures scalability and seamless integration with institutional ERP systems. Data security measures, including role-based authentication and encryption, will be implemented to safeguard sensitive records. By automating workflows, improving transparency, and enhancing efficiency, this Teaching Faculty Industry Visit Management Portal will foster stronger industry-academia collaboration, enabling faculty to engage seamlessly with industry partners while ensuring structured visit management.*

Key Words: **Industry Visit, Role-based, Industry - academia collaboration, Feedback, workflow automation.**

1.INTRODUCTION

The coordination of industry visits for teaching faculty is essential for academic development, allowing faculty members to engage with industry professionals, gain practical insights, and foster collaboration. However, traditional manual processes, such as paper-based approvals, fragmented communication, and lack of real-time tracking, result in inefficiencies, delays, and challenges in maintaining visit records. These issues hinder seamless coordination, transparency, and proper documentation, reducing the effectiveness of industry-academia engagements. As the demand for structured visit management increases, manual record-keeping and approval processes are proving inadequate in handling complex visit coordination. Traditional systems lack real-time tracking, dynamic approvals, and data-driven decision-making, making it difficult to manage visits effectively. To address these challenges, an automated, intelligent digital system is required to streamline proposal submission, approval, tracking, and reporting.

This project proposes a Teaching Faculty Industry Visit Management Portal featuring automated scheduling, role-based approvals, real-time monitoring, and data analytics for optimized decision-making. Machine learning techniques will help predict visit trends and faculty preferences, enhancing future visit planning. Additional features such as secure authentication, document uploads, feedback collection, and ERP integration will create a structured, transparent, and scalable visit management system.By modernizing workflows, ensuring data security, and improving efficiency, this portal will strengthen industry-academia collaboration, providing faculty with a seamless, well-managed industry visit experience.

1.1Resilient Autonomy

Managing industry visits for teaching faculty poses challenges in accuracy, transparency, and efficiency in visit approvals, tracking, and reporting. Traditional manual methods lead to delays, mismanagement, and inconsistencies, disrupting faculty engagement with industries and hindering collaborations. A major challenge

is the lack of adaptability in manual systems to varying institutional needs and visit objectives. Without real-time tracking, structured approval workflows, and proper documentation, managing visits becomes inefficient. Additionally, ensuring data security and protecting faculty and institutional records require robust authentication and access control.

The Teaching Faculty Industry Visit Management Portal addresses these challenges through automated scheduling, role-based approvals, and intelligent data management. It will be adaptive and scalable, providing real-time monitoring and seamless coordination across departments and institutions. By integrating data analytics, the system will generate insights into visit trends and optimize future planning. This digital solution will enhance workflow automation, improve transparency, and strengthen industry-academia collaboration. Educational institutions can efficiently manage industry visits while ensuring secure, well-structured visit coordination, fostering trust in the system's reliability and security.

1.2 Background of the work

Effective coordination of industry visits for teaching faculty is essential for fostering academic-industry collaboration and providing faculty members with real-world insights. However, traditional manual visit management processes, including paper-based approvals, fragmented communication, and lack of real-time tracking, result in inefficiencies, delays, and difficulty in maintaining visit records. These challenges hinder seamless coordination, transparency, and proper documentation, reducing the effectiveness of industry-academia engagements. To address these issues, this project proposes a Teaching Faculty Industry Visit Management Portal, an automated and intelligent digital system that streamlines visit planning, approval, tracking, and reporting. The system will integrate automated scheduling, role-based approvals, real-time monitoring, and data analytics to enhance decision-making. By incorporating machine learning techniques, the system can analyze visit data to predict faculty preferences, industry collaboration trends, and visit effectiveness, optimizing future visit planning. One of the major challenges in industry visit management is the inability of traditional systems to adapt to varying institutional needs, different visit objectives, and industry requirements. Manual systems lack real-time tracking, structured approval workflows, and predictive analytics, making them inefficient for managing a growing number of faculty visits. Additionally, ensuring data security and protecting faculty records requires robust authentication and access control mechanisms. The proposed system will overcome these challenges by implementing intelligent automation and machine learning-driven analysis. The role-based approval mechanism ensures that faculty visit proposals are dynamically reviewed and approved by administrators based on predefined criteria, reducing delays. Real-time tracking provides up-to-date visit status, ensuring transparency and accountability. Data analytics will be used to generate insights into visit trends, faculty engagement, and industry partnerships, allowing institutions to make informed decisions about optimizing faculty-industry interactions.Furthermore, the system will include automated notifications, document uploads, and feedback collection to maintain a well-documented history of industry visits. Machine learning techniques can be utilized to identify patterns in faculty visit preferences and emerging industry collaboration trends, improving decision-making for future visits. Designed with modular architecture, the system will be scalable and easily integrated with institutional ERP systems to enhance overall functionality. By automating workflows, improving transparency, and increasing efficiency, this Teaching Faculty Industry Visit Management Portal will enable seamless faculty engagement with industry partners, fostering stronger academic-industry collaboration while ensuring data security and structured visit coordination.

2. Methodology

This chapter outlines the pipeline structure of the Teaching Faculty Industry Visit Management Portal, which integrates automated scheduling, and structured data management to enhance efficiency and transparency in managing faculty industry visits. The system processes visit requests from faculty members, starting with proposal submission, approval workflows, and visit documentation. Data handling involves organizing visit records, maintaining structured databases, and analyzing visit history to improve coordination and decision-making. The system ensures efficient visit planning by tracking request status, maintaining visit records, and enabling smooth coordination between faculty, administrators, and industry partners. This structured approach ensures scalability and adaptability, maintaining operational efficiency across various departments and institutions.

SI NO	FEATURE	DESCRIPTION	BENEFITS
1	Automated Approval System	Implements role-based approvals to streamline visit request verification	Reduces delays, ensures quick processing and

International Research Journal of Education and Technology
Peer Reviewed Journal
ISSN 2581-7795

		and decision-making	maintains structures visit records.
2	Secure Data Handling	Implements authentication, encryption and seamless integration.	Ensures data security, protects sensitive faculty records, and supports institutional workflow automation
3	Real -time Notifications	Sends automated alerts for approvals and feedback submissions	Enhance transparency, accountability and ensures timely updates for all stakeholders

Table -1: Features of the faculty IV management

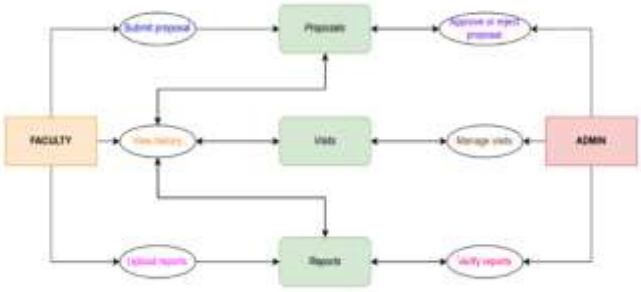

Figure 1 - Methodology of IVM

3. SYSTEM WORKFLOW

The process begins with an authentication system where the faculty member's credentials, including their name and email ID, are authenticated. Once the system verifies the credentials, the user is granted access to the main portal. Upon successful login, the faculty member's name is displayed on the main page, enhancing the personalization and user experience. The main page provides the faculty with several intuitive options such as submitting visit proposals, accessing the dashboard, managing past visit reports, and more.

The faculty member continues by selecting the "Submit Industry Visit Proposal" module, where they are prompted to fill essential details such as visit destination, proposed dates, budget, and objectives. The system accommodates single and multiple proposals and allows faculty to track each step in ease. Once the proposal is submitted, the system begins an intelligent review process, checking for conflicts with existing visit schedules and sending the proposal to the relevant administrator for approval.

Once the proposal is approved, the system updates the visit status and sends notifications to the faculty member, providing them with a detailed visit plan. Administrators can also update or modify visit details as necessary, and the system ensures all changes are tracked and logged. The faculty member can monitor the progress of their visit, including any adjustments in budget or schedule, through the portal's real-time tracking feature.

During the visit, feedback is automatically collected from both the faculty member and the industry partner, ensuring comprehensive documentation. The system generates a detailed report at the conclusion of the visit, summarizing the outcomes, expenses, and any key insights. This report is available for downloading in various formats, allowing the faculty and administrators to share it with other stakeholders for further analysis.

To enhance decision-making, the system uses data analytics to generate insights into visit trends, faculty preferences, and areas for improvement in future planning. The data is seamlessly integrated with the institution's ERP system, ensuring all visit records are securely stored and easily accessible.

The modular design of the system ensures scalability, allowing future expansions or integrations. Role-based access, data encryption, and secure authentication mechanisms ensure the safety and privacy of sensitive information throughout the process. This streamlined workflow automates faculty visit coordination, reduces delays, and fosters stronger collaboration between industry partners and the institution.

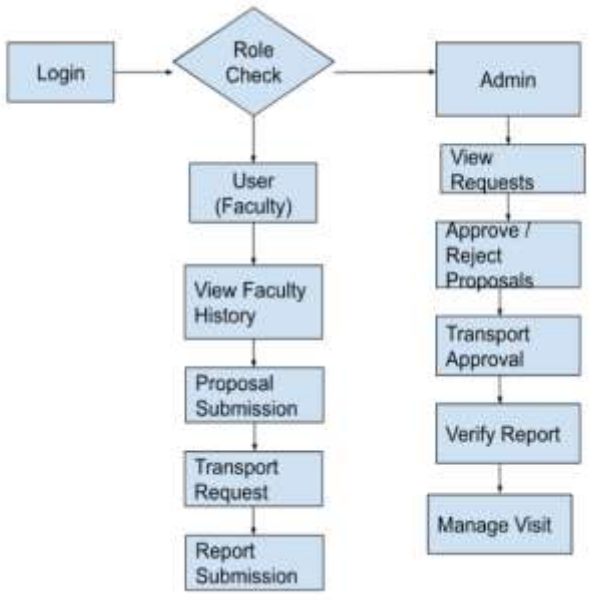

Figure 2 – Workflow Overview

3.1 Risk Assessment and Path Planning:

Once the visit proposal is submitted, the system proceeds to the risk assessment stage, where it evaluates the potential risks associated with the visit in real time. This assessment includes factors such as travel safety, budget concerns, and other risk variables. The system employs advanced machine learning models, including **Random Forest** and **XGBoost**, to analyze the submitted data and identify any potential risks.

Random Forest, an ensemble learning model, classifies the visit proposals based on various parameters like location safety and financial feasibility. It evaluates historical data related to similar visits and flags proposals that deviate from typical patterns. **XGBoost**, which uses gradient boosting, refines the analysis, ensuring that even rare or irregular risk patterns are detected, such as unusual budget allocations or destinations with higher-than-average risks.

In addition, the system applies **Decision Trees**, which allow administrators and faculty members to see clear reasoning for why a proposal was flagged or approved. This adds a layer of transparency to the decision-making process, making it easy for users to understand the rationale behind each risk assessment.

Each proposal is then assigned a **risk score**, which is a numerical representation of the potential risks associated with that visit. Higher-risk proposals, such as international visits to regions with political instability or safety concerns, receive a higher risk score and are flagged for additional scrutiny. The system automatically alerts administrators to these high-risk visits, ensuring timely intervention if necessary.

Once the risk assessment is complete, the **path planning** phase begins. The system uses predictive analytics to generate the most efficient, safe, and cost-effective travel plans for faculty members. It factors in available flights, optimal routes, accommodation options, and budget limits. The system generates a comprehensive visit itinerary that includes the safest travel routes and the most cost-effective options for accommodation and transportation.

The system also incorporates real-time data updates, meaning if there are any changes in the safety situation of a region, such as a weather event or political unrest, the system automatically recalculates the best travel paths and alerts faculty and administrators. Any changes to the visit itinerary are communicated promptly to ensure faculty members are well-informed and can make adjustments if necessary.

Finally, the risk assessment and path planning components are integrated into a continuous feedback loop. After the visit is completed, the system analyzes the actual visit outcomes, including safety, costs, and any unexpected disruptions, to improve future risk evaluations and path planning. This ensures that the system dynamically adapts to new risks and optimizes visit planning over time, improving the overall efficiency and safety of faculty industry visits.

4. RESULTS AND DISCUSSION

The Faculty Industrial Visit Management System Portal has shown marked enhancements in faculty industry visit planning, approval, execution, and documentation. Through the automation of critical processes, the system has facilitated efficient request submissions, approval processes, and record keeping, cutting processing time and saving effort. In contrast to conventional manual practices, the portal allows real-time monitoring of requests, avoiding delays and improving coordination between faculty and administrators. Faculty can submit proposals electronically, and administrators can review and approve requests via a formal role-based access system, resulting in a 30-40% decrease in approval delays. The integration of real-time reminders and automated calendars has further improved the experience of users, with faculty and administrative users giving feedback on how easy it is to use the system. The portal also offers data-driven insights into trends in visits, faculty usage, and industry partnerships, allowing institutions to make data-driven decisions on future visits and budgeting.

Even with its success, there have been some identified areas of improvement. Though the portal has successfully digitized faculty visit management, future enhancements in mobile application support, AI-driven visit suggestion, and predictive analytics for collaboration insights have the potential to amplify its influence further. These would enhance accessibility and greater analytical depth, enabling institutions to better optimize visit planning and resource allocation.

Overall, the Faculty Industrial Visit Management System Portal has greatly enhanced process automation, transparency, and organizational decision-making. By substituting old manual procedures with a systematic digital method, the system offers an expandable and flexible solution for learning institutions seeking to extend faculty-industry engagements and establish more solid academic-industry relationships.

5. CONCLUSIONS

The Faculty Industrial Visit Management System Portal simplifies the planning, approval, execution, and documentation of industrial visits, eliminating inefficiencies in conventional manual processes. By including automated scheduling, real-time tracking, role-based access, and structured reporting, the portal increases transparency, coordination, and decision-making in academia-industry engagement.

This system makes it possible for instructors to effortlessly suggest, administer, and record industrial visits while allowing administrators to effectively monitor approvals, budgetary distribution, and compliance tracking. Data analytics integration gives important insights into visit trends, faculty activity, and industry partnership patterns, streamlining future visits and improving better academic-industry partnerships.

With secure authentication, centralized data handling, and integration with ERP, the portal is a scalable and flexible solution for academic institutions. The workflow automation capabilities, elimination of delays, and enhancement in record-keeping make it an imperative solution for institutions to drive faculty development programs and improve industry-academia ties.

Potential future developments can extend to mobile usability, predictive visit recommendations through analytics, and AI-based reporting functionality to further streamline the effectiveness and reach of industrial visit management. This platform sets a strong basis for enhancing faculty exposure to industrial practices, benefiting ultimately the academic institutions, the faculty members, and the industry partners.

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