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MIT-Gram: Revolutionizing Campus Engagement and Event Management at MIT ADT Pune

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Abstract: *The vibrant and dynamic campus of the Maharashtra Institute of Technology Art, Design and Technology (MIT-ADT) Pune exposes students to a wide range of extracurricular and academic opportunities. This lively atmosphere is always humming with activity, thanks to the challenging coursework and interesting events that take place here. Nonetheless, it can be difficult to keep up with this vibrant tapestry of events due to the vastness of the campus and the ongoing schedule of events. In order to solve this, we have started developing a cutting-edge platform that will streamline data and make it easier to access the variety of experiences offered by our esteemed university.*

With the help of our cutting-edge platform, instructors and students will be able to easily navigate the diverse array of activities offered.

By utilizing technology, we hope to improve the MIT-ADT experience by fostering a sense of community and making it simpler for people to fully immerse themselves in the diverse MIT-ADT Pune community. This platform makes the MIT-ADT experience truly enriching and accessible to everyone by connecting people with the diverse opportunities that thrive within the walls of our esteemed organization, in addition to simplifying data.

I. INTRODUCTION

A. Introduction

The cutting-edge platform being developed for MIT-ADT Pune students has the potential to be even more valuable and useful with a number of extensions. For example, the platform could be used to provide personalized recommendations for events and activities, allow students to create and manage their own communities, integrate with other campus systems and services, and provide feedback to the university administration.

These extensions could be used in a variety of ways. For example, a student who is interested in computer science could receive personalized recommendations for events and activities related to computer science. A student who is a member of the school's rowing team could use the platform to create and manage a community for rowers. A student who is struggling with a particular topic in class could use the platform to find a tutor or study group.

A student who is unhappy with the quality of the food in the dining hall could use the platform to provide feedback to the university administration.

Overall, the potential extensions to this platform are numerous and exciting. By continuing to develop and improve the platform, the MIT-ADT Pune community can create a truly valuable resource for all students.

B. Existing Work

The current WhatsApp group-based system for disseminating event information at MIT-ADT Pune has a number of drawbacks. Among these gaps are:

- 1) *Lack of Organization:* Students may find it difficult to locate pertinent event information in WhatsApp groups as they frequently get overloaded with messages. Notable updates may be obscured by background chatter.
- 2) *Ineffective Categorization:* Students find it challenging to filter and access information relevant to their interests because the current method fails to effectively categorize events by domain.
- 3) *Limited Accessibility:* There may be a lack of inclusivity since some students may not be a part of the pertinent WhatsApp groups. Some students may lose out on important information as a result of this.
- 4) *Information Overload:* When several events are posted at once, students may experience information overload due to the sheer volume of messages they receive.



C. Motivation

Our deep-seated dedication to improving the MIT-ADT Pune student experience is the driving force behind this effort. We truly feel that in order for students to fully utilize their time at our prestigious institution, they must have simple access to information, particularly regarding events and activities. Our goal is to make the lives of our fellow students easier by developing a digital platform that streamlines information flow and promotes a greater feeling of community and involvement. The driving force is our commitment to supporting a dynamic, diverse, and knowledgeable MIT family.

D. Objectives

The main goal of this project is to create a web platform that is only available to MIT-ADT Pune students. This platform will function as the ultimate one-stop shop for all things campus life related, including the most recent information on events, news, and important dates. In order to facilitate the posting of information about forthcoming events by faculty organizers and approved members, we hope to create a single source of data that organizes events into several domains. By doing this, we hope to enable students to participate actively in the lively MIT community and easily keep updated.

E. Scope

MIT-Gram aims to establish an extensive virtual learning environment for instructors, staff, and students at MIT ADT University. In addition to extensive search features, it allows for user registration and profile construction, content sharing, real-time alerts, community and group engagement, event registration, academic cooperation, and professional networking. The platform, which promotes a thriving online community for academic and professional development, is available through web browsers and mobile applications while guaranteeing confidentiality and anonymity. Future development and ongoing innovation are essential to MIT-Gram because they enable it to adjust to changing demands and user input.

F. Summary

To put it briefly, we are starting to build a website that will completely transform the MIT-ADT Pune student experience. Our portal, which has an intuitive layout and organizes event information into categories, will become the primary resource for learning about events on campus, happenings in the classroom, and extracurricular activities. Our goal is very clear: to provide MIT students with an effective way to obtain information so they can stay informed and involved in the constantly changing campus community. With this project, we hope to unite the MIT community and provide every student the best chance to succeed and enjoy their stay at our esteemed university.

II. CONCEPTS AND METHODS

A. Dataset

Within MIT-ADT Pune's academic domain, our Faculty Dataset gathers essential details about our respected instructors. The main forces behind the mentoring and information sharing amongst different disciplines are faculty members. Their Name, distinct Faculty IDs, email addresses, and passwords are all included in this dataset. It is an essential tool for comprehending the academic environment and promotes effective faculty collaboration and communication.

The vibrant student community at MIT-ADT Pune is reflected in the Student Dataset. It includes important details about our students, including their varied academic interests and goals. Student IDs, names, contact email addresses, and passwords are important characteristics. This dataset allows for efficient administration and offers insightful information about the makeup of our student body by creating a window into the dynamic world of our students.

B. Basic Definitions

React.js: commonly referred to as React, stands as an open-source JavaScript user interface library that has redefined the way developers approach web application development. Created and maintained by Facebook, React simplifies the process of creating dynamic and interactive web apps. Its core strength lies in the ability to build reusable user interface components that seamlessly respond to data changes, resulting in a highly responsive and engaging user experience. One of the key techniques employed by React to achieve this level of responsiveness is Document Object Model (DOM) virtualization. This technique optimizes the rendering process by minimizing the manipulation of the actual DOM elements, making the web application more efficient and performant.

Node.js: Node.js is an open-source server-side JavaScript runtime environment that has revolutionized the way we build scalable and high-performance network applications. With Node.js, developers can harness the power of JavaScript on the server side, enabling the creation of server applications using the same language that runs in the browser. What sets Node.js apart is its event-driven and non-blocking architecture, making it particularly suitable for developing server-side logic and real-time applications. This design allows Node.js to handle multiple concurrent connections efficiently, providing responsive and high-throughput server applications. Moreover, Node.js boasts a rich ecosystem of packages and modules, readily accessible through the Node Package Manager (npm) repository, making it a versatile and developer-friendly platform. It's worth noting that Node.js is built on Google's V8 JavaScript engine, further enhancing its performance.

Mongo DB: MongoDB serves as a robust NoSQL database management system tailored for the handling of large volumes of unstructured or semi-structured data. Its strength lies in its flexible and document-based data format, making it an ideal choice for applications that require adaptability and real-time data access. Developers find MongoDB especially intuitive because of its schema-less nature, allowing for dynamic and agile data modeling. Scalability and speed are at the core of MongoDB's design. It can effortlessly accommodate the growing data needs of modern applications, making it a go-to choice for projects with evolving data structures. This makes it well-suited for applications in need of real-time data updates and responsive data handling.

In summary, React.js, Node.js, and MongoDB are fundamental technologies that have reshaped web application development. React enhances the user experience by simplifying UI development, Node.js empowers server-side logic with its event-driven model, and MongoDB excels in managing flexible, real-time data requirements. Together, they represent a powerful stack for building modern, dynamic, and responsive web applications.

C. Method/Algorithms/Models

MIT-Gram uses a variety of techniques and algorithms to make its operation easier. Secure authentication methods are used to handle user registration and profiles.

Notifications and content sharing make use of real-time database systems. Features driven by the community facilitate group interactions and event registration while incorporating graph algorithms for network research. MIT-Gram uses recommendation algorithms and natural language processing for document analysis in order to facilitate academic cooperation. Search engine algorithms are used by the platform's powerful search feature to provide precise results. To safeguard user data and privacy, security measures include encryption and access control systems. Agile approaches are used throughout the development cycle to guarantee frequent updates and user-centered enhancements.

III. LITERATURE SURVEY

1) Databases in Cloud Computing

Authors: Harrison John Bhatti and Babak Bashari Rad Journal: I.J. Information Technology and Computer Science, 2017, 4, 9-17
Publisher: MECS, Published Online April 2017 at MECS-Press DOI: 10.5815/ijitcs.2017.04.02

This paper conducts a literature review on the use of databases in the context of cloud computing. It highlights the shift from traditional relational databases to cloud-based solutions in the Information Technology industry, driven by factors like cost-effectiveness and flexibility. The paper discusses the emergence of cloud databases, such as Cloud databases, Big Table, Sherpa, and SimpleDB, and their role in information-intensive applications. It also addresses the challenges of employing databases with ACID properties in the cloud environment. The goal is to explore the advantages and disadvantages of databases in cloud systems and review the associated challenges.

2) Exploring Cloud Computing Services and Applications

Author: Ahmed E. Youssef Journal: Journal of Emerging Trends in Computing and Information Sciences Year: ©2009-2012
Publisher: CIS Journal, cisjournal.org

This paper delves into the world of cloud computing, which offers enhanced flexibility and cost-effective computing resources. It explores various cloud computing services and applications, including examples from popular Cloud Service Providers (CSPs) like Google, Microsoft, Amazon, HP, and Salesforce. The study highlights innovative applications of cloud computing in e-learning, Enterprise Resource Planning (ERP), and e-governance, demonstrating how it can provide customized, reliable, and cost-effective solutions across a range of domains for both individuals and organizations.

3) *Social Network Analysis: An Introduction*

Authors: Alexandra Marin and Barry Wellman Publisher: Handbook of Social Network Analysis, edited by Peter Carrington and John Scott, London: Sage, 2010 Publication Date: June 11, 2009

Social network analysis emphasizes the significance of relationships in shaping social life. It defines social networks as interconnected nodes tied by various relationships and offers a distinct perspective from traditional social science. This chapter introduces the key principles of the social network perspective, discusses its theoretical foundations, and highlights its role in fostering innovation through inter-organizational connections. Social network analysis is presented as a unique perspective within the social sciences.

4) *NFC Evaluation in the Development of Mobile Applications for MICE in Tourism*

Authors: David Silva-Pedroza, Ricardo Marin-Calero, and Gustavo Ramirez-Gonzalez Publisher: Sustainability, 2017, 9(11), 1937, <https://doi.org/10.3390/su9111937>

This paper explores the use of Near Field Communication (NFC) and mobile applications in the context of Meetings, Incentives, Conferences, and Exhibitions (MICE) tourism. It analyses existing market applications, identifies key features, defines functionalities for a new service, and conducts a performance test at the seventh Seminar on Emerging Technologies in Telecommunications (TET 2016) in Popayán, Colombia. The results show that NFC technology combined with mobile applications enhances the user and organizer experience during MICE events.

5) *Application of Firebase in Android App Development - A Study*

Authors: Chunnu Khawas and Pritam Shah Publisher: International Journal of Computer Applications, Volume 179 - No. 46, June 2018

This study delves into the utilization of Firebase, a technology designed to handle substantial amounts of unstructured data, in the context of Android app development. Firebase proves to be notably efficient in managing unorganized data, such as videos, images, audio, text, and files, outperforming traditional Relational Database Management Systems (RDBMS). The paper provides insights into Firebase's key concepts, related terms, advantages, and limitations, all while demonstrating its practical application by developing an Android app.

6) *Using Node.js to Build High Speed and Scalable Backend Database Server*

Authors: S. L. Bangare, S. Gupta, M. Dalal, A. Inamdar Publisher: International Journal of Research in Advent Technology, Special Issue - National Conference "NCPCI-2016," 19 March 2016 Online Link: www.ijrat.org

This paper addresses the need for efficient database servers in the context of the growing number of applications and website development. While 3rd party cloud database providers offer convenient solutions, they may not be cost-effective or privacy-sensitive for small-scale developers. To address this, the paper explores the use of Node.js, a server-side platform known for its real-time capabilities and non-blocking I/O. Node.js is found to significantly improve I/O operations and simplifies server-side coding for developers.

7) *Development of a Commercial Website*

Author: Md. Faruk Year: 2016 Publisher: Centria-ammattikorkeakoulu Online Link: URN.fi

This thesis presents the development of a commercial online store website, covering e-commerce classification, web design, and construction. It emphasizes the importance of planning and discusses the use of modern web technologies and programming languages. Front-end development involves HTML, CSS, JavaScript, and Bootstrap, while back-end development uses Python, Java, PHP, and MySQL. The project concludes with website testing to ensure proper functionality. The resulting website serves as a practical example and a step-by-step guide for commercial website development.

8) *A Framework for Web-Based Student Record Management System using PHP*

Authors: Er. Saurabh Walia and Er. Satinderjit Kaur Gill Journal: International Journal of Computer Science and Mobile Computing Volume and Issue: Vol. 3, Issue 8, August 2014 Pages: 24-33 Publisher: IJCSMC Online Link: www.ijcsmc.com

This research article presents a framework for a Student Record Management System (SRMS) using PHP. SRMS provides a user-friendly interface for efficiently managing student data in educational institutions. It encompasses student details, academic reports, college information, fee records, results, attendance, and various resource-related information.

The system tracks a student's progress throughout their academic journey and offers a secure online interface within the institution's Student Record Management System.

9) *Development of Student Information System*

Authors: N. M. Z. Hashim and S. N. K. S. Mohamed Journal: International Journal of Science and Research (IJSR), India Online ISSN: 2319-7064 Volume and Issue: Volume 2, Issue 8, August 2013 Publisher: www.ijsr.net

This article discusses the development of a Student Information System (SIS) at the Faculty of Electronics & Computer Engineering (FKEKK) at Universiti Teknikal Malaysia Melaka (UTeM). The system focuses on recording and updating student data, providing reports for lecturers to check student status. It uses a database concept and follows the Rapid Application Design (RAD) methodology for development. The software fully achieved its objectives, contributing to student information management and simplifying scheduling. Future improvements include making the system accessible via cell phones to meet modern demands.

10) *Web-Based Student Information Management System*

Authors: S.R. Bharamagoudar, Geeta R.B., and S.G. Totad Journal: International Journal of Advanced Research in Computer and Communication Engineering Volume and Issue: Vol. 2, Issue 6, June 2013 Publisher: IJARCCCE, www.ijarccce.com

This paper discusses the development of a Web-Based Student Information Management System (SIMS) designed for educational institutions and colleges. The system focuses on efficiently maintaining student information, academic records, course details, curriculum, and various resource-related data. It tracks a student's academic journey from the beginning to the end of their course, offering features for reporting, attendance tracking, and progress monitoring. The system is accessible through a secure online interface embedded in the college's website, providing faculty details, batch execution information, academic notifications, and extensive reporting options.

A. *Research Gap*

The goals of our project, MIT-Gram, are in line with the research gap in the studies that have been provided, which emphasises the necessity of sophisticated and comprehensive information management systems designed specifically for educational institutions. Although the aforementioned studies concentrate on some facets of database administration and software technologies in educational settings, they allow space for the investigation of more all-encompassing solutions. By incorporating cutting-edge technologies like cloud computing and mobile apps into the education sector, your project, MIT-Gram, can close this gap. MIT-Gram can meet the demand for more advanced and user-friendly educational information systems by providing a comprehensive platform that goes beyond conventional student information management. This creative solution will meet the changing needs of education by improving data management while also improving the entire educational experience.

B. *Problem Definition*

Lack of a dedicated platform for students to access and track campus events leads to challenges in time management and participation. A streamlined solution is needed to provide easy access to categorized event information, enhancing student engagement and maximizing their involvement in academic and extracurricular activities.

IV. SOFTWARE REQUIREMENT SPECIFICATION

A. *Objective*

The principal aim of the website is to create a stable and user-friendly platform that tackles the current obstacles faced by students as a result of the lack of a specialized system for accessing and controlling events on campus. The overarching objective is to develop a revolutionary approach that completely changes the way students participate in extracurricular and academic activities.

1) *Improved Interaction and Accessibility*

By offering a very user-friendly and accessible platform, you can help students have a more fulfilling time on campus by making a variety of events easier for them to access, discover, and participate in.

2) *Simplified Information Transmission*

Create a single point of contact with classified event data to streamline the process of finding and choosing events and encourage more people to participate.

3) *Enhanced Time Efficiency*

Encourage students to manage their time well by integrating with their calendars, sending out event reminders, and optimizing scheduling to help them better balance their personal, extracurricular, and academic obligations.

4) *Entire User Participation*

Increase student participation in campus events by offering a smooth, comprehensive platform that promotes active engagement in a variety of events and fosters a livelier campus community.

B. *Scope*

MIT-Gram aims to establish an extensive virtual learning environment for instructors, staff, and students at MIT ADT University. In addition to extensive search features, it allows for user registration and profile construction, content sharing, real-time alerts, community and group engagement, event registration, academic cooperation, and professional networking. The platform, which promotes a thriving online community for academic and professional development, is available through web browsers and mobile applications while guaranteeing confidentiality and anonymity. Future development and ongoing innovation are essential to MIT-Gram because they enable it to adjust to changing demands and user input.

C. *Functional Requirements*

1) *User Profiles and Registration*

It should be possible for users to set up accounts and make customized profiles.

Profiles ought to enable users to choose and personalize their event preferences.

2) *Listing and Classifying Events*

Events must be listed with all relevant information, including the date, time, place, and description.

For ease of browsing, events should be divided into different categories (academic, sports, arts, volunteer, etc.).

3) *Communication and Notifications*

Push alerts regarding impending events and modifications ought to be provided by the system.

In-app messaging support to facilitate communication amongst event coordinators.

D. *Non-Functional Requirements*

Non-functional requirements include performance, security, and usability aspects. The system should be efficient, capable of handling concurrent users, and secure student data with encryption. It should also provide a user-friendly interface for ease of use.

V. **PROPOSED METHOD**

A. *Formulation*

In this section, we will formulate the approach and methodologies that will be employed in the development of the MIT-Gram.

1) **Thorough Problem Identification** Perform a thorough examination of the difficulties brought about by the lack of a specialized platform for viewing and controlling campus events. Examine the effects these difficulties have on students' ability to manage their time and their involvement in extracurricular and academic activities.

2) **Specification Elicitation:** To ascertain the functionalities and features required in the platform, collect specific requirements from students, the university administration, and event planners. Verify these specifications to make sure they adequately address the issues found.

B. *Overview*

1) **Specifying the Main Goals:** Clearly state the main goals of the suggested solution and highlight how it will simplify campus event access. Describe the platform's goals and the transformative effect it hopes to have on student involvement and campus life in general.

2) **Study of Stakeholders:** Determine the needs and expectations of the many system stakeholders, such as academics, administrative staff, event planners, and students, and conduct an analysis of them.

C. Framework Design (Mathematical model, proposed system architecture):

Create or apply mathematical models or algorithms to classify and customize event recommendations according to user preferences. To guarantee successful and efficient event recommendations, optimize the system.

- 1) *System Architecture Suggestion*: Create a dependable, scalable architecture that can manage a high number of users and events. Make sure the navigation is smooth and the interface is user-friendly so that event information is easily accessed.
- 2) *Wireframing and prototyping*: In order to visualize the user interface and guarantee a user-centric design, create wireframes and prototypes.

D. Result and Analysis (Screenshots, Graphs)

Analytical Measures Define both quantitative and qualitative metrics, such as higher event participation rates, user engagement metrics, and user feedback scores, to evaluate the platform's effectiveness.

- 1) *Gathering and Examining Datasets*: To evaluate the performance and user experience, collect feedback, event data, and user interaction data.
- 2) *Graphical Representations and Evaluation of Performance*: Display visual aids demonstrating the platform's effect on boosting event participation and enhancing time management, such as screenshots, graphs, and statistical analysis.

With a focus on resolving the issues associated with student event management on campus, this intricate methodology guarantees a thorough understanding of the problem, the comprehensive development of a user-centric solution, and thorough evaluation through metrics and analysis.

VI. CONCLUSION AND FUTURE WORK

A. Conclusion

To sum up, this methodical approach to resolving the difficulties associated with managing student events on campus reflects a dedication to improving the learning environment. Our platform seeks to offer a comprehensive solution that promotes increased event participation rates and elevates user engagement via the establishment and monitoring of a set of quantitative and qualitative measures. We will be able to customise the platform to the particular requirements of the campus community and make data-driven enhancements by collecting information on user behaviour, event engagement, and feedback. In our effort to maximise event management and time efficiency, the graphical representations and performance assessments will provide as tangible proof of the platform's influence, guaranteeing accountability and transparency. We are committed to improving our solution going ahead and eventually making a contribution to a setting where students may easily engage with activities that enhance their time in college.

B. Future Work

Enhancing the system's flexibility and scalability is possible.

- 1) To link the entire system to the college database in order to improve verification.
- 2) Increase the site's overall security.
- 3) In addition, we intend to link it to the student database at the college.
- 4) It may be the official college app and is usable at all colleges except MIT.
- 5) The activities will be divided into two categories: colleges and domains.
- 6) Increasing the number of photographs and videos that may be posted.
- 7) AWS Cloud will be used for website deployment.

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