

## HACKATHON MANAGEMENT SYSTEM

<sup>1</sup>Dr. G. Prasuna, <sup>2</sup>Perugu Gnana Pravallika, <sup>3</sup>Shaik Fathima, <sup>4</sup>Vurata Jagadeesh, <sup>5</sup>Ravala Ravi Teja

<sup>1</sup> Associate professor, Dept COMPUTER SCIENCE AND ENGINEERING(CSE), St. Ann's College of Engineering & Technology Bypass Road, Nayunipalli, Chirala - 523187, Bapatla, District, Ap, India

<sup>2,3,4,5</sup>U.G student, Dept COMPUTER SCIENCE AND ENGINEERING(CSE), St. Ann's College of Engineering & Technology Bypass Road, Nayunipalli, Chirala - 523187, Bapatla, District, Ap, India

### ABSTRACT

*Hackathons have become an essential platform for fostering innovation, collaboration, and problem-solving among students and professionals. However, managing hackathons manually involves challenges such as inefficient registration, lack of real-time coordination, difficulty in project tracking, and delayed evaluation processes. This paper presents a hackathon management system developed using full stack technologies to automate and streamline the entire hackathon lifecycle. The proposed system provides a centralized platform for participant registration, team formation, hackathon creation, project submission, evaluation, and result management. The system is implemented using react for the frontend, node.js and express.js for backend services, and*

*mongodb for secure and scalable data storage. The proposed solution improves efficiency, transparency, and user experience for organizers, participants, and evaluators, thereby ensuring smooth execution of hackathon events.*

### KEY WORDS

Hackathon management system, Full stack development, React, Node.js, Express.js, Mongoddb, Automation, Web application.

### INTRODUCTION

Hackathons are time-bound collaborative events where individuals from diverse technical and non-technical backgrounds work together to develop innovative solutions for real-world problems. With the increasing popularity of hackathons across academic institutions, corporate

environments, and innovation communities, effective management of these events has become a critical requirement.

Traditional hackathon management approaches rely heavily on manual processes such as paper-based registration, spreadsheet tracking, and informal communication channels. These methods often result in inefficiencies, data inconsistency, lack of transparency, and administrative overhead. As the number of participants and projects grows, managing hackathons without a dedicated system becomes increasingly complex.

The proposed hackathon management system addresses these challenges by providing an integrated web-based platform that automates key processes such as user registration, hackathon creation, project submission, and evaluation. By leveraging modern full stack development technologies, the system ensures scalability, security, and ease of use. The motivation behind this system is to simplify hackathon organization while enhancing participant engagement and overall event effectiveness.

## LITERATURE SURVEY

Several studies have explored the role of hackathons as platforms for innovation and

collaborative learning. Mangione and Johnson (2018) analyzed hackathons as experiential learning environments that promote creativity and rapid problem-solving. Their study highlighted the need for structured digital platforms to manage large-scale hackathon activities.

McDowell et al. (2019) discussed the design of collaborative platforms for global hackathons, emphasizing features such as team formation, communication tools, and project tracking. However, their work identified limitations in scalability and real-time performance.

Marcotte (2016) and Robbins (2018) focused on responsive web design and user-centric interfaces, stressing the importance of accessibility and usability in web applications. Existing hackathon systems often lack intuitive interfaces and real-time updates, leading to poor user experience.

Siau and Li (2020) reviewed current hackathon management approaches and highlighted challenges such as limited customization, security concerns, and

inefficient evaluation mechanisms. The proposed system addresses these gaps by integrating modern web technologies and

providing a comprehensive, secure, and scalable solution.

## **RELATED WORK**

The development of the proposed system follows a full stack web development approach. Modern frontend frameworks such as react are used to create responsive and interactive user interfaces. Backend services are implemented using node.js and express.js to handle business logic and restful apis.

Mongodb is used as the database to store user details, hackathon information, project submissions, and evaluation scores. The system architecture follows a client-server model, ensuring modularity and maintainability. Unlike existing systems, the proposed solution integrates all hackathon-related activities into a single platform with real-time data handling and role-based access.

## **EXISTING SYSTEM:**

In the existing system, hackathons are typically managed using manual or semi-automated tools such as paper-based forms, spreadsheets, and email communication. These approaches lack a centralized data management mechanism, making it difficult to efficiently store, retrieve, and update participant and project information. Tracking

team progress and submitted projects becomes complex as the number of participants increases.

Additionally, evaluation and result declaration processes are often delayed due to the absence of automated assessment and coordination tools. Existing systems also provide limited security and data privacy, increasing the risk of data loss or unauthorized access. Moreover, the lack of interactive and user-friendly interfaces leads to a poor user experience for both organizers and participants. As a result, these limitations contribute to operational inefficiencies, increased administrative workload, and a higher likelihood of errors during hackathon execution.

## **PROPOSED SYSTEM:**

The proposed hackathon management system is a web-based application that automates the entire hackathon process. It provides separate interfaces for administrators and users. Administrators can create hackathons, manage participants, evaluate projects, and publish results. Users can register, participate in hackathons, submit projects, and view results. The system offers advantages such as improved efficiency, secure data handling, real-time updates, and scalability. The use of full stack technologies ensures seamless

interaction between frontend, backend, and database components.

## SYSTEM ARCHITECTURE

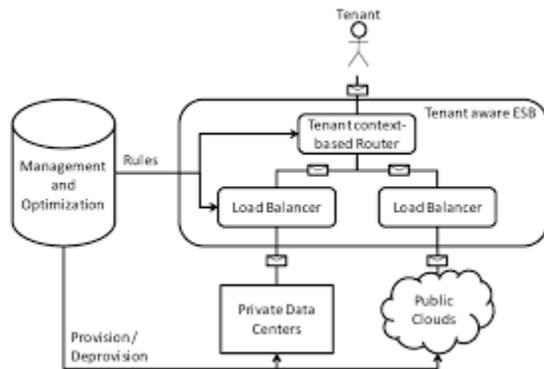


Fig:-1 System Architecture

## METHODOLOGY DESCRIPTION:

### Client side

The client side is developed using react, providing dynamic pages such as login, registration, dashboard, hackathon details, and project submission forms.

Api request / api response

Rest apis are used for communication between frontend and backend using http methods such as get and post. Json is used for data exchange.

### Server side

The server side is implemented using node.js and express.js, handling authentication,

hackathon management, project submission, and evaluation logic.

Store / retrieve

Crud operations are performed to store and retrieve data from the database efficiently.

Database

Mongodb is used as a nosql database, ensuring flexibility, scalability, and secure storage of data.

## RESULTS AND DISCUSSION:

The system was successfully implemented and tested. The results demonstrate smooth functioning of user registration, admin login, hackathon creation, project submission, and evaluation processes. The output screens include home page, login page, admin dashboard, hackathon details page, project submission page, and evaluation page.

Performance analysis shows reduced manual effort, faster processing, and improved user experience. The system effectively handles multiple users and hackathons simultaneously.

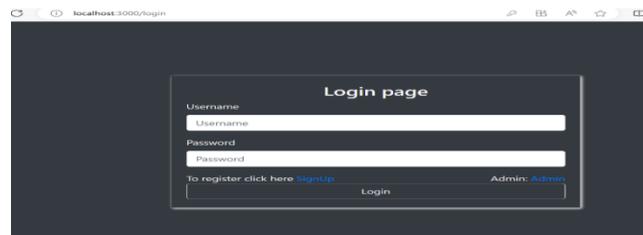
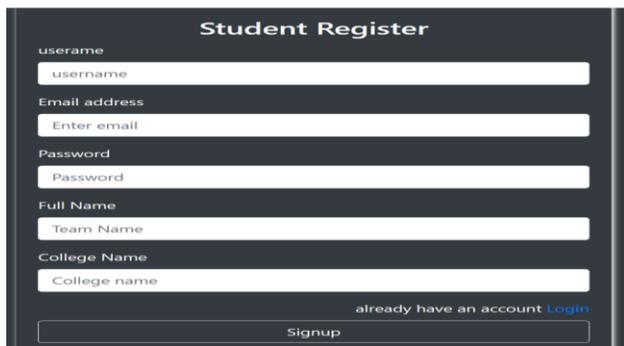


Fig1:Login page



**Fig2:Admin Page**



**Fig3: Student Register**



**Fig4:User Interface**

## CONCLUSION

THIS PAPER PRESENTED A FULL STACK BASED HACKATHON MANAGEMENT SYSTEM DESIGNED TO AUTOMATE AND STREAMLINE HACKATHON ORGANIZATION. THE SYSTEM SUCCESSFULLY ADDRESSES THE LIMITATIONS OF TRADITIONAL METHODS BY PROVIDING A CENTRALIZED, SECURE, AND EFFICIENT PLATFORM. THE IMPLEMENTATION DEMONSTRATES IMPROVED MANAGEMENT, TRANSPARENCY, AND SCALABILITY, MAKING IT SUITABLE FOR ACADEMIC AND PROFESSIONAL HACKATHON EVENTS.

## FUTURE SCOPE

THIS PAPER PRESENTED A FULL STACK BASED HACKATHON MANAGEMENT SYSTEM DESIGNED TO AUTOMATE AND STREAMLINE HACKATHON ORGANIZATION. THE SYSTEM SUCCESSFULLY ADDRESSES THE LIMITATIONS OF TRADITIONAL METHODS BY PROVIDING A CENTRALIZED, SECURE, AND EFFICIENT PLATFORM. THE IMPLEMENTATION DEMONSTRATES IMPROVED MANAGEMENT, TRANSPARENCY, AND SCALABILITY, MAKING IT SUITABLE FOR ACADEMIC AND PROFESSIONAL HACKATHON EVENTS.

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