Secure Project Collaboration Platform

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Abstract — In today's fast-paced and interconnected world, effective project collaboration is essential for organizations to thrive. However, ensuring the security and privacy of sensitive project information remains a significant concern. To address this challenge, a secure project collaboration platform has been developed to facilitate seamless collaboration while prioritizing data security. This platform offers a comprehensive set of features designed to streamline project management, task assignment, file sharing, and communication among team members. Users can register and login securely, accessing a centralized dashboard that provides an overview of ongoing projects, tasks, deadlines, and recent activity. Key functionalities include creating new projects, managing tasks with assigned deadlines, securely sharing files and documents, and leveraging communication tools such as messaging, chat, and video conferencing. Security measures such as encryption of data, role-based access controls, and audit logging ensure the protection of sensitive information. Additionally, the platform incorporates notification and reminder systems to keep users informed about upcoming deadlines, task assignments, and changes to shared documents. By offering a secure and user- friendly environment for collaboration, this platform empowers teams to work efficiently while safeguarding the confidentiality and integrity of their project data. Overall, the secure project collaboration platform serves as a vital tool for organizations seeking to enhance productivity and collaboration in a safe and secure manner.

Keywords- Project Management tools, Project Collaboration Tools, Collaboration platform, Task Management.

I. INTRODUCTION

Collaboration has become a vital component in the organizations to develop the projects effectively. In the contemporary landscape of fast-paced business operations and globally distributed teams, effective project collaboration stands as a cornerstone for organizational success. The project management becomes a challenging issue for the organizations because of the insufficient and ineffective communication, local on-sites, high number of projects and project complexity [2]. Hence, the necessity of remote or virtual interactions arose due the issue of globally distributed teams. In response to dynamic environment of the organizations and traditional methods of communication, the companies have introduced task management and project management tools. The advent of digital platforms has revolutionized the way teams collaborate, enabling seamless communication, task management, and resource sharing [7]. However, amidst the conveniences afforded by digital collaboration tools, concerns regarding the security and privacy of sensitive project information loom large. This research endeavors to address the critical need for a secure project

collaboration platform that not only fosters efficient teamwork but also prioritizes the protection of confidential data.

The platform under study represents a comprehensive solution tailored to meet the evolving demands of modern project management, offering a robust framework for secure collaboration among team members [6-8]. This research elucidates the design, implementation, and efficacy of the secure project collaboration

platform named ProtecTeam. By leveraging cutting-edge technologies and best practices in cybersecurity, the platform aims to mitigate risks associated with data breaches, unauthorized access, and information leakage [7-9]. Furthermore, it endeavors to provide users with a user-friendly interface that facilitates intuitive navigation and seamless interaction, thereby enhancing overall user experience. Key features of the platform include secure user authentication, role- based access controls, encrypted data transmission, and audit logging mechanisms. These functionalities are designed to fortify the platform's defenses against potential security threats while ensuring compliance with regulatory requirements and industry standards. Through a systematic examination of the platform's architecture, functionality, and performance, this research seeks to provide valuable insights into the efficacy of secure project collaboration solutions in contemporary organizational contexts. Additionally, it aims to identify opportunities for further enhancement and optimization, thereby contributing to the ongoing discourse on cybersecurity in project management.

In summary, the secure project collaboration platform represents a pivotal advancement in the realm of digital collaboration tools, offering organizations a potent means to enhance productivity, streamline communication, and safeguard sensitive project information. This research endeavors to shed light on the transformative potential of secure collaboration platforms in empowering teams to achieve their project objectives in a safe and secure manner.
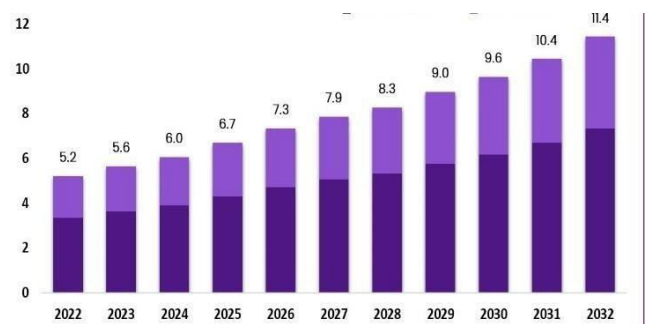

Figure 1: Increasing demand for project management tools

II. LITERATURE SURVEY

This study examines related current collaborative tools, task management and project management tools:

Nicholas C. Romano et al. proposed a prototype collaborative project management software (CPMS). The prototype allows project teams to manage multiple projects involving one or more project sites. It also allows users to communicate in both synchronous and asynchronous modes: team members can conduct on-line group meetings, software inspections, or send email [14]. The meeting notes and emails will be stored in the system for future reference. This increases both efficiency and effectiveness of individual project team members and project teams overall.

Prof. Chachal Bansal et al. proposed a web-based project management system. They believe that the success of project management system depends upon the integration of time and cost management [6].

Filippo La nubile et al. mentioned about the kind of tools used in collaborative platforms in distributed environment [4-13]. Also, mentions how the general collaborative tools differ from the model-based collaboration. It includes the difficulties faced during the integration of communication tools in project management platforms.

Helbrough believes that the effectiveness of collaboration can be achieved by using GSS (Group Support Systems). These systems are used for improving team productivity in collaboration tasks. GSS can facilitate HR groups to gauge user's opinions, readiness.

Dimitra Chasanidou et al. proposed a task management tool namely, UpWave. It provides a visual and simple interface, promoting user efficiency and motivation [15]. The use of UpWave is associated with various work-related activities, expanding the initial use of the tool. It supports checklists, leaderboards, points, templates, states, and artefacts. This includes a mixed- methods approach to gain a greater understanding of the tools. Scrum boards were used for these agile methods and considered as a lightweight project management practice for software development that defines a set of roles, tasks. The current project management model includes project management methods and tools, decision-making techniques, risk assessment tools.

III. SYSTEM ANALYSIS

A. Existing Systems

Trello is a visual online project and task management tool that provides features such as notifications, calendars, comments, file attachments [9]. This offers the users the flexibility to utilize it individually or for teams. It depends on external applications, including Google Drive, Dropbox, Box and OneDrive. Trello works in real time and is synchronized across devices. It doesn't support video conferencing and native DM chat features. Leaving comments on the uploaded task and files and tagging people are done through the Trello cards.

Slack is a cloud-based collaboration tool for team communication that provides an open channel to organize team conversations for a project. It provides a transparent view of teamwork and offers a private channel for sensitive information. Slack includes features such as direct messages, file sharing, comments, stars for later reference, connection, and synchronization with other services, such as Google Drive, Dropbox or Box, integration with other software tools, notifications. It doesn't provide features associating with the tasks management [6]. This application supports only secure communication among the team members.

Asana is a personal task and project management tool with features such as tasks, projects, conversations, and dashboards. It offers a quick progress view of projects [10]. Advanced features include task and project conversations, a searchable archive of files, calendars, dashboards for checking progress on all projects, an inbox for automatic updates, integration with other software tools (e.g. Dropbox, Slack, Chrome, GitHub, Google Drive). The challenging issue is the time tracking and limited task assignments. Beginners face complexities in using the application. Too many features associated with task makes the users perplexed.

Todoist is a task manager for personal task management tool [8]. It works well for personal tasks, rather than team projects. It allows users to create and manage multiple to-do lists. This tool supports collaboration on shared tasks and goals in real time and customizes the user experience. Some of its features are notifications, real-time data synchronization, visualization of productivity, comments, labels and filters. There are limited integration options and app settings. Users are facing issue with the synchronization and notification delays.

Teamwork is an online project management platform that supports features such as time logs to keep track of work hours per project task and team member, milestones, tasks view, the ability to quickly reassign all tasks from one person to another and more [7]. Other software tools for collaborative use – such as Dropbox and Google Docs for file sharing and Skype and Google Hangouts for communication. The advanced features require paid subscription. It sometimes led to miscommunications among users. Users receive overwhelming notifications.

B. Proposed System

The proposed system integrates all the necessary tools, features, and functionalities in one centralized platform. It offers a user-friendly interface. It provides secure authentication mechanism, dashboard overview, project and task creation, task management, file sharing, communication tools (chat, videoconferencing), notification and remainders. Initially, users are prompted to register and login with their accounts. The team head is responsible to create project and assign tasks to each member and establish deadlines accordingly. The descriptions of the project created by team head is securely encrypted and stored in the database. Once the tasks are assigned, members of the team will receive the notifications. It is operated on role- based mechanisms, where the team head will be privileged with all the access. Whereas team members are only permitted to view and complete the tasks assigned to them. This system also provides the feature of sharing the files regarding the project. To overcome the drawback of the existing system (Trello), the communication tools such as chatbot, videoconferencing is introduced. Team members have the liberty to involve in the discussions and respond to the uploaded content. The system incorporates the capability of monitoring the progress of the assigned tasks and view the recent activity. This system is fortified with robust security measures, includes encryption, role-based controls, multi-factor authentication and audit logging. Therefore, our proposed system is crafted to empower teams with seamless and private communication, efficient task management and real-time notifications/remainders associated with advanced security measures.

IV. METHODOLOGY

Module 1: User Authentication

Users are required to register with the necessary credentials before accessing the platform. This module is responsible for user login and authentication using secure protocols, hashing algorithms, and session management. It keeps the records of all users logged in and out with their session ID's, time duration. It allows the users to login with their credentials and authenticates by validating the credentials in database. It generates secure session tokens during login process. It secures the communication by invalidating the session tokens when the user logs out.

Module 2: Project and task management

This module includes the functionalities of creating, modifying, and deleting projects and tasks. This allows users to create and manage projects by adding details, assigning tasks team members, setting the deadlines, and tracking the advancement of individual tasks and overall project [4]. The module handles the delivery of notification and remainders to the users regarding deadlines, shared documents, scheduled meetings.

Module 3: File Sharing

The module enables users to share the files, documents of any format and size. It provides a secure environment for sharing and manages the files uploaded within the projects. It permits users to download and upload the files securely. It manages version control for files to ensure the integrity of the documents in the project. The files can only be retrieved by the users with proper access permissions. It secures the files by setting access control mechanisms.

Module 4: Communication

This module provides tools for real-time communication and collaboration among team. These include chats, messaging, and videoconferencing. It initiates group discussions in the chat sessions. It also handles the participants in the group by adding and removing them. It enables users to verify whether other participants received and viewed the messages.

Module 5: Dashboard

It facilitates users to communicate with the centralized interface. It is developed to provide an overview to the users of ongoing projects and tasks [12]. It displays the recent activity and the pending tasks to avoid perplexity. It enhances the transparency of the task progress.

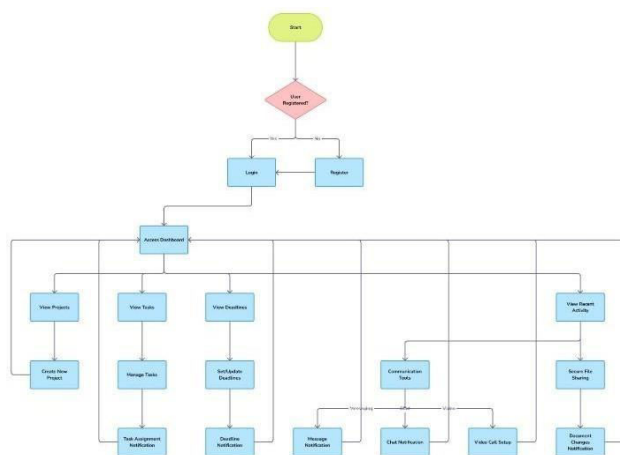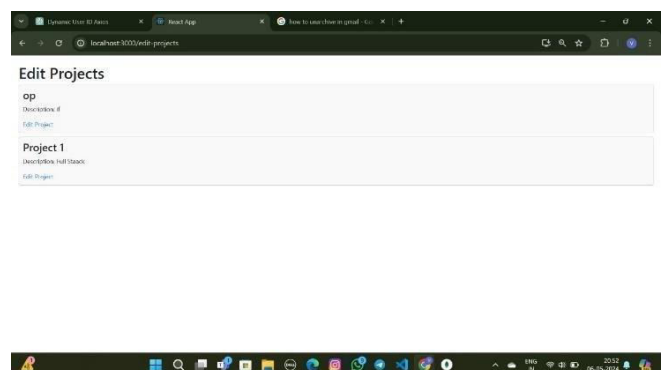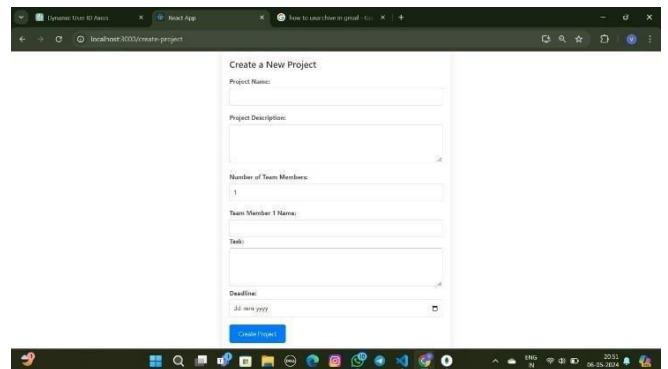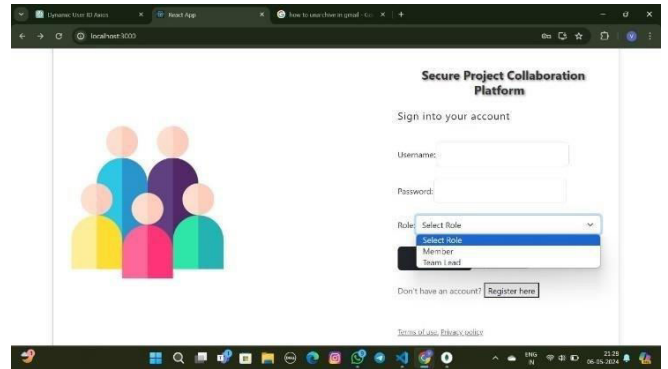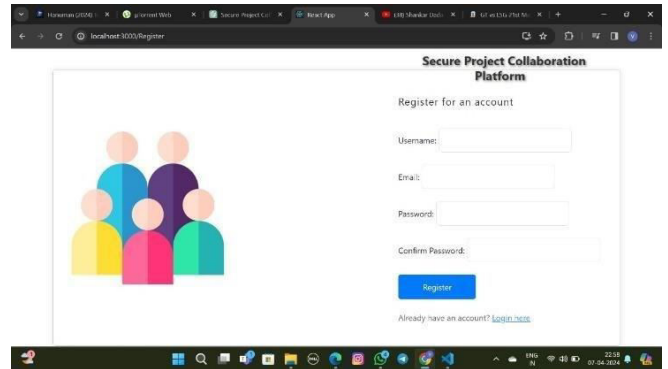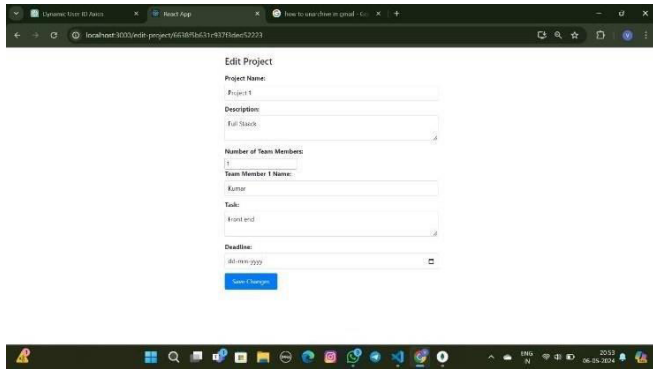Figure 2: Architecture Diagram

V. RESULTS

VI. CONCLUSION

The project collaboration and management continue to be a challenge to all the organizations. Moreover, security and risk mitigation present critical drawback in existing systems.

In this paper, we focused in providing a user-friendly interface equipped with streamlined tools essential for project management. The increasing significance of security in organizations has led us to prioritize the delivery of robust security measures.

VII. FUTURE SCOPE

Oue next focus will be on integrating with third-party tools and services to offer effective collaboration and management. And implement artificial intelligence to optimize the decision-making process. Our focus also includes expanding the security measures to mitigate risks from emerging threats.

REFERENCES

1. Riemer, K., & Schellhammer, S. (2019). Collaboration in the Digital Age: Diverse, Relevant and Challenging. Cham: Springer. doi:10.1007/978-3-319-94487-6

2. Ogunde A.O.(2017),"Challenges Confronting Construction Project Management System for Sustainable Construction in Developing Countries: Professionals Perspectives (A Case Study of Nigeria)",Journal of Building Performance, Vol. 8.2.

3. Sagar S. Mehta.et al.(2016), "A Review on Inventory Management System for Improving Efficiency of Project Development Cycle", Journal of Advanced Database Management and Systems , Vol. 3 , pp. 24-29**.**

4. Dimitra Chasanidou, Brian Elvesæter, and Arne-Jørgen Berre. 2016. Enabling team collaboration with task management tools. In Proceedings of the 12th International Symposium on Open Collaboration (OpenSym '16). ACM, New York, NY, USA.

5. Eppler, M. J. and O. Sukowski . "Managing team knowledge: Core processes, tools and enabling factors." European Management Journal 18(3): 334-341. G. Banga, "Why is cybersecurity not a human-scaleproblem anymore?" Commun. ACM, vol. 63, no. 4, p. 3034, Mar. 2020.

6. Slack. Available at: https://slack.com/

7. Teamwork. Available at: https://www.teamwork.com/

8. Todoist. Available at: https://todoist.com/

9. Trello. Available at: https://trello.com/

10. Asana. Available at: https://asana.com/

11. Meredith, J. R. and S. J. Mantel Jr (2011). Project management: A managerial approach. John Wiley & Sons

12. Lanubile, F. et al. (2010). "Collaboration tools for global software engineering." IEEE Software 27(2): 52-55.

13. Collaboration Tools. By Cyprien Lomas, Michael Burke, and Carie L. Page ELI Paper 2: 2008

14. Nicholas C. Romano et al., "Collaborative Project Management Software", Proceedings of the 35th Hawaii International Conference on System Sciences - 2002

15. B. Helbrough, "Computer assisted collaboration - the fourth dimension of project management?," International journal of project management : the journal of the International Project Management Association, vol. 13, No. 5, pp. 329-333