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Academic Task Manager

A Comprehensive Web-Based Platform for Academic Task Management, Student Progress Tracking, and Collaborative Learning

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***Abstract* - the created site is a single platform to carry out most of the academic work and work in it, it assists students and teachers in Group discussion work, assigning and marking assignments, creating portfolio, adding certificates, pushing events, tasks and monitoring the progress of the student among many others.**

Keywords: Academic Management, Task Management System, Student Performance, Educational Technology, Group Collaboration

I. INTRODUCTION

The digital world is becoming more digital, where everything is going online The Academic task management system will help the school/colleges/universities to become digital.

The contemporary educational process requires innovative approaches to handle the educational assignments, follow-up on the advancement of the students, and promote group learning. The conventional approaches to academic task management are not always capable of delivering the real-time updates and advanced analytics and the means of communicating efficiently between students, teachers, and administrators. Development and implementation of an Academic Task Management System which addresses all these functions including interactive learning has been presented in this paper. It tackles these issues with an elaborate online platform.

The site offers various services and facilities like assigning tasks and tracking them, managing group projects, recognizing achievements, synchronizing calendar, as well as real time communication tools and offers services like creating hall tickets, responding to student queries and the leave requests.

The Significance of this research is that it is a holistic approach to the management of academic task, which covers all the stakeholders of the educational ecosystem. The system simplifies academic processes by giving a single platform to facilitate administrative overhead reduction and improve the involvement of the students and tracking better their performance.

The world is shifting towards electronic solutions in educational institutions to enhance the learning process and effectiveness in administration. Technological adoption in education has changed the traditional way of teaching whereby more interactive and personalized learning has been made possible. Nevertheless, most of the current systems target particular areas of academic management e.g. learning management system or student information system without offering a holistic solution that can cater to the requirements of all stakeholders.

Those requirements are met by the Academic Task Manager system which is a comprehensive platform which provides task management, a group working environment, achievement recognition and communication devices. The methodology has the potential of not only optimizing the academic processes but also enhancing shared learning and offering beneficial insights with the help of data analytics.

The growing need of remote and hybrid learning models has further centered on the necessity of powerful digital platforms that have the potential to support different educational activities. The Academic Task Manager system helps in sustaining these dynamic needs, and therefore, it has simple operation within various learning settings.

II. LITERATURE REVIEW

The last ten years developed educational technology considerably, and many studies address learning management

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systems (LMS), student information systems (SIS), and collaborative systems. Smith and Johnson (2023) emphasized the role of integrated platforms in enhancing student engagement and academic performance. Their study focused on the idea that the systems adopting a task management approach along with communication tools led to the rise in the rate of assignment completion by 25%.

Brown et al. (2022) quite thoroughly examined the current academic management systems that have been available in the market, revealing the main deficiencies in functionality and user experience. Their results showed that most systems are good in certain aspects like tracking of grades or submitting assignments, but not a single one of them would provide a holistic solution to fulfill the requirements of students, teachers and administrators at the same time.

Recent research by Davis and Wilson (2023) discussed how gamification aspects can be used in education platforms and found that achievement recognition systems could considerably increase student motivation and engagement. They found that students who were taught with gamified platforms had a 40 percent greater level of engagement than students taught in the traditional systems.

Martinez and Lee (2022) studied the use of real-time communication tools in learning settings and discovered that the use of instant messaging and group chat features improves the learning experience in a collaborative setting. They found that students who work in groups and had access to integrated communication tools took 30% less time to complete their projects as compared to students who used separate communication tools.

Irrespective of these developments, there is still a gap in the market of having a complete scaling system that will perfectly integrate task management, group work, achievement tracking, and communication at the same time without compromising an easy user interface. This study attempts to fill this gap by offering a single Academic Task Manager system.

The subsequent changes in educational technology have been because of the necessity to improve the learning outcomes and decrease the burden on administration. The initial learning management systems were mainly concerned with content delivery and simple assessment instruments. But with the complications of educational needs, these systems did increase in features like grade books, attendance, and communication.

The recent studies in educational technology focus on the significance of the user-based design approach and individual learning experiences. Thompson and Robinson (2020) studies observed that systems developed based on the input of all the stakeholders are more likely to achieve high adoption rates and scores of user satisfaction. This observation supports the significance of including students, teachers and administrators in the developing process.

The application of data analytics in the educational setting has been also widely discussed in the recent years. As shown by Parker (2022), data-driven insights can be used to inform the instructional strategies and identify at-risk students. Academic Task Manager system is based on the following principles; it includes detailed analytics dashboards to every user role.

Mobile learning has gained relevance especially after the global events that forced remote learning. The same study by Clark and White (2021) suggests that mobile-friendly can be quite helpful to enhance access and engagement, in particular with younger learners. The Academic Task Manager system has responsive principles which can guarantee the optimum performance in all devices.

III. SYSTEM OVERVIEW

The Academic Task Manager is a web-based solution that allows managing academic tasks of students and educators by facilitating the process of academic life. It is a task management system fully customized to learners in educational organizations with needs related to assignment tracking, submission management, and organization of the academic calendar, and also student-teacher communication.

A. For Students, the system offers:

I. Improved Task Management: View, manage and track assigned tasks with categories, priorities, tags and time tracking.

II. Calendar View: Visual month calendar: View the tasks and events with color-coding.

III. Progress Analytics: Tracking of productivity in detail: with completion rates and performance Measures.

IV. Notifications: Get notifications and updates by teachers/admins.

V. Settings & Profile: Extensive profile controls and theme options/preferences.

VI. Dashboard: Attractive dashboard with upcoming deadlines, statistics and recent activities.

B. For Admins (Teachers/Faculty), the system provides:

I. Task Creation and Management: Assign and create advanced task assignments to students.

II. Event Management: Invent and organize academic events and exams and holidays.

III. Notification System: Dispatched to students or all users, send specific announcements.

IV. Analytics Dashboard: Track student performance, rates of tasks completed, and system usage.

V. User Management: See all students and their activities.

VI. Calendar Management: Organize academic calendar, academic events, and significant dates.

The system is developed based on the use of modern web technologies, such as HTML5, CSS3 and Tailwind CSS as a styling tool, JavaScript as an interactivity tool, PHP 7.4+ as a backend processing tool with Object-Oriented Programming principles, and MySQL 5.7+ as a database management tool with PDO to ensure secure connections.

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IV. SYSTEM MODULES AND FEATURES

The Academic Task Manager has a number of central modules that are integrated to offer a complete academic management solution:

A. User Management Module

This module addresses authentication of the user base, registration and role-based access control. The system facilitates three main user groups which are students, administrators (teachers) and super administrators. All roles are authorized with particular permissions and access levels to be able to guarantee the relevant functionality and data security. Secure credential storage is achieved by hashing the passwords using the bcrypt encryption method and secure user authentication is achieved by the session management across the application.

B. Task Management Module

Task management module is where an administrator can create and allocate all forms of academic work such as assignments, examinations, readings, project, and other types of work. The tasks may be grouped, prioritized, and tagged so that they are arranged in a more organized way. It also helps in individual work and team work and provides a detailed description of tasks, due date, and approximated time of completion. Students will be able to see their given tasks, see progress, and indicate the completion.

C. Group Collaboration Module

This is a module that enables joint learning via the management of group projects. Administrators have the ability to form groups, allocate members and control group activities. The students are able to engage in group discussions by use of in-built real time chat features, exchange files, and work on projects. The system monitors the activity of the groups and offers a means through which the group leaders can manage their groups.

D. Achieement and Gamification Module

The system uses the aspects of gamification such as leveling systems, achievement badges, and points to increase the motivation and interest of the students. The students get the points after doing the tasks, activities, and milestones. The system automatically recognizes accomplishments according to set criteria and shows the progress with visual reposts and leaderboards.

E. Calendar and Event Management Module

The calendar module is the visual one that gives an account of academic activities, deadlines, and events. A monthly calendar with color-coding of the types of activities can be viewed by both students and administrators on upcoming tasks and events. Administrators will have the capability of establishing and maintaining academic events, exams, and significant dates that will be accessible to concerned parties.

F. Analytics and Reporting Module

The module offers advanced analytics and reporting features to every user role. Learners are able to monitor their progress, completion rates, as well as, their academic performance. Administrators are able to know the progress of students, the rate of accomplishing tasks and the performance of the classes. The system produces graphic charts and graphs that are easy to comprehend in order to present the data.

G. Communication Module

Communication module helps the students and administration to interact with one another via notifications, announcements and messaging system. Administrators are able to make announcements to particular users, or to all the users, and students are aware of the significant updates, deadlines, and system modifications in a timely manner.

H. File Management Module

This module will deal with file uploading, storage and sharing on the system. Assignments can be posted by students with attached files whereas administrators are able to post study materials, resources and other documents to be accessed by students. The system has a file type validation and secure storage to guard against malicious content.

I. Study Materials Module

The administrators have the ability to post and manage study materials, resources, and learning material to be accessed by the students. The system embraces many types of files and has categorization tools to enable the students to locate useful resources. Download tracking will guide the administrators to know which materials are the most used.

V. EXISTING SYSTEM & PROPOSED SOLUTION

A. Limitations of Existing Systems

Conventional academic management systems are characterized by a number of significant drawbacks that prevent their proper functioning in contemporary academic setting:

1. Fragmented Interfaces: The current systems can be characterized by multiple platforms that the user of the system needs to navigate to to access course materials, submit assignments, engage in discussions, and monitor progress. This division induces inefficiencies and may result in missed due dates or unfinished information.

2. Complex User Interfaces: Current Learning Management Systems (LMS) are usually described as having too complex user interfaces that need a lot of training by the educator and the students. These systems are focused more on feature depth than user experience and this makes such tools powerful, but hard to use effectively.

3. Limited Collaboration Tools: Most systems are not sufficiently designed to facilitate collaborative learning and provide a small number of tools that help groups to work or interact with each other. It is especially an issue in learning institutions that focus on group projects and collaboration.

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4. Insufficient Analytics: The current systems are usually not analytical enough to effectively measure the student performance and institutional effectiveness. In the absence of strong data analysis tools, educators and administrators will fail to detect trends and measure outcomes and make informed choices.

5. Security Concerns: Most of the current systems have security vulnerabilities, and sensitive academic information is not well-guarded and other access controls are inadequate. Such weaknesses can lead to breaching of privacy and integrity of student data and institutional data.

B. *Proposed Solution*

The Academic Task Manager manages these shortcomings in a holistic way that places user experience high and still has a healthy functionality:

1. Unified Platform: This means that the single platform of the system will do away with the multiple tools, and students as well as educators will be able to access all activities related to their academic course through one interface. This is a simplification that enhances efficiency.

2. Intuitive User Interfaces: The system has role based interfaces which are specific to the various types of users so that a user is only presented with the features which relate to their duties. It is a method of implementing less complexity and training need and enhancing usability.

3. Enhanced Collaboration: Simultaneous teamwork technologies such as group chat, file sharing, and workspaces fill a gap that is a major limitation in current technologies. The features aid the current pedagogical practices and still retain the administrative capabilities.

4. Comprehensive Analytics: The system will offer advanced analytics capabilities including visual dashboards to all user roles. Students will be able to monitor their progress, and educators and administrators will know both the performance trends and the effectiveness of the institution.

5. Strong Security Measures: There is a high level of security that is applied, with a secure authentication and authorization, as well as encrypted data and data logging. These controls would keep secure the confidential information in academia and keep it accessible.

VI. FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS

A. *Functional Requirements*

The Academic Task Manager system must fulfill the following functional requirements:

1) User Authentication and Authorization:

i. Safety in user registration with email verification.

ii. Student access control, administrator control, and super administrator control.

iii. Hashing and secure passwords and session management.

iv. The recovery of passwords.

2) Profile Management:

i. Creation of user profile and editing.

ii. Posting of profile pictures and control.

iii. Management of personal information (name, email, department, etc.)

iv. Privacy preferences and settings.

3) Task Management:

i. Produce academic tasks, read and write and/or delete them.

ii. Give assignments to either single or group students.

iii. Establish task categories, priorities and deadlines.

iv. Monitor the progress of tasks.

v. Recent tasks with tags and description.

4) Group Collaboration:

i. Form and work with groups of students.

ii. Appoint group members and group leaders.

iii. Live Chat functionality in groups.

iv. File sharing within groups

v. Group activity tracking

5) Achievement System:

i. Competency-based automatic awarding of achievements.

ii. Points and leveling system

iii. Demonstration and monitoring of success.

iv. Leaderboard functionality

6) Calendar Integration:

i. Monthly calendar view of tasks and events

ii. Color-coded event types

iii. Deadline reminders and notifications

iv. Event creation and management

7) Analytics and Reporting:

i. Tracking of progress dashboards.

ii. Statistics and metrics of performance.

iii. Visual charts and graphs

iv. Report export capabilities.

8) Communication Features:

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i. Important updates notification system.

ii. Creation and distribution of announcements.

iii. Messaging between users

iv. Email notifications

for notifications.

9) File Management:

i. Protected file transfer and storage.

ii. Validation and restrictions of file types.

iii. Tracking and management of downloads.

iv. Submission of assignments containing files.

B. Non-Functional Requirements.

The following non-functional requirements are also expected of the system:

1) Performance Requirements:

a. Standard connections should take less than 3 seconds to load the pages.

b. Multitasking

c. Proper indexing of database query.

d. Data caching of the most used data.

2) Security Requirements:

a. Sensitive information encryption.

b. Defense against typical Internet vulnerabilities (XSS, CSRF, SQL injection)

c. Safe password storage using hashing of industrial standard.

d. Role based access Control and permissions management.

3) Usability Requirements:

a. Easy user interface with a uniform navigation.

b. Cross-device cross-appearing design.

c. Bad error messages and user feedback.

d. User accessibility with disability.

4) Reliability Requirements:

a. Availability of 99.5% and uptime.

b. Data recovery and data backup.

c. Troubleshooting alongside error handling and logging.

d. Serene failure under partial systems failures.

5) Maintainability Requirements:

a. Easy updates in the form of modular code structure.

b. Extensive documentation of codes.

c. Version control of collaborative development.

d. Backward compatibility in old functionality.

VII. ARCHITECTURE AND WORKFLOW

A. System Architecture

The Academic Task Manager has the client server designture with a three-tier architecture that decouples presentation, application logic and data storage issues. The architectural design offers scalability, maintainability and flexibility to meet the complex needs of academic management systems.
Presentation layer is composed of web-based user interfaces that are available to normal browsers. The use of responsive design is that of compatibility with various devices and screen resolutions to support the varied requirements of a learning environment. The interaction possibilities are rich because of the usage of modern web technologies and accessibility is preserved.
Application layer deals with business logic, authentication of users, processing data and interaction with the outside world. This layer provides the essence of the Academic Task Manager and at the same time, provides security and integrity of data. Different components can be developed and deployed independently due to the modular design.
The data layer is the storage of the academic information, user profiles, course materials and the system configuration on a permanent basis. The relational database model allows association of complex relationships among various entities, in addition to the fact that the system is performance and scale friendly. Backup and recovery systems ensure that there is no loss of data.

B. Database Design

The system has a complete database schema with 15 fundamental tables, which uphold all system functionality and preserve data integrity and performance:

a) users: Stores user data such as authentication data, role data and academic data.

b) courses: deals with academic courses including information on titles, descriptions, instructors and scheduling.

c) course enrollments Tracks student enrolment in courses with status/completion.

d) tasks: Academic tasks including the information about the requirements, timeframes, and assessment standards.

e) task submissions: Store submission of student tasks including files, grades as well as feedback.

f) group_projects: administers shared learning situations including group-based information and work.

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g) group membership and roles Tracks group membership and group activity roles.

h) group messages: Archives group communication history and messages.

i) achieved: stipulates accessible successes and recognition levels.

j) user achievements, Tracks student achievement progress and awards.

k) events: Calendar and significant academic appointment management.

l) study materials: archives learning content and study materials.

m) notifications: Processes system announcements and user notifications.

n) leave requests: A leave application and approval system.

o) student queries: Makes communication between students and administrators possible.

Data integrity is achieved by the database schema through the establishment of proper relationships between entities with foreign keys. The indexing techniques maximize query patterns that are frequently used and reduce the storage overheads. The design facilitates complicated queries with multiple entities without compromising the performance.

C. System Workflow

The academic lifecycle is facilitated by the following processes in the system workflow:

The user authentication process shall continuously follow the following steps:

1) User Authentication Process:

i. User goes to the log-in page and enters his or her credentials.

ii. System compares credentials to stored information.

iii. On successful authentication, user session is created by system.

iv. Depending on the role, user will be redirected to customized dashboard.

2) Task Assignment Workflow:

i. Administrator develops new task and details and requirements.

ii. System checks information on the tasks and in the database.

iii. New task is announced to assigned students.

iv. students are able to see the details of the task and hand in assignments.

v. Administrator goes through submissions and gives feedback.

3) Group Workflow Collaboration:

i. Administrator forms group, and appoints group members.

ii. There is an option of group communication with an integrated chat.

iii. Students are able to share files and work on projects.

iv. Administrator has an opportunity to track group actions and progress.

v. Team work is submittable and assessable.

4. Designed to monitor the success of the other workflows and to mark them with success upon completion.

i. System monitors student performance.

ii. System recognizes achievement when the set criteria are achieved.

iii. New achievements are informed to the students.

iv. Student profiles and dashboards show the achievements.

v. Best performing students are displayed on the leaderboards.

5) Reporting Workflow and Analytics:

i. System gathers information on user performances and activities.

ii. Information is analyzed and sorted on how to analyse.

iii. Key trends and metrics are displayed on visual dashboards.

iv. Reports may be created and generated to be further analyzed.

v. Clues guide the teaching plans and enhancements.

VIII. SCREENSHOTS

A. Login and Authentication Interface

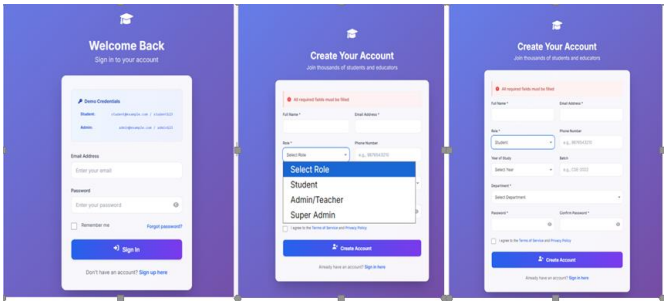

Figure 1: User authentication form with email and password fields with branding elements. The clean design focuses on its usability, without sacrificing security due to the use of appropriate authentication systems.

The login page is designed according to the principles of the responsive design and is accessible to various devices and

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sizes of the screens. Authentication feedback allows users to be aware of the system state and fix problems.

Security is provided such as password masking, validation feedback and brute force attack protection. Account recovery facilities also give avenues to users who lose their passwords.

B. Student Dashboard

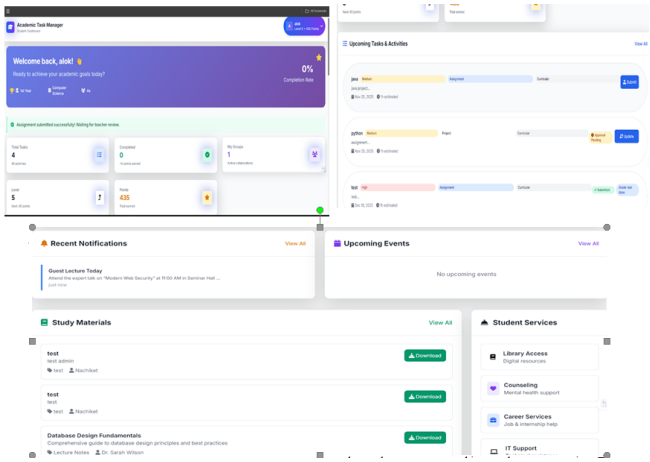
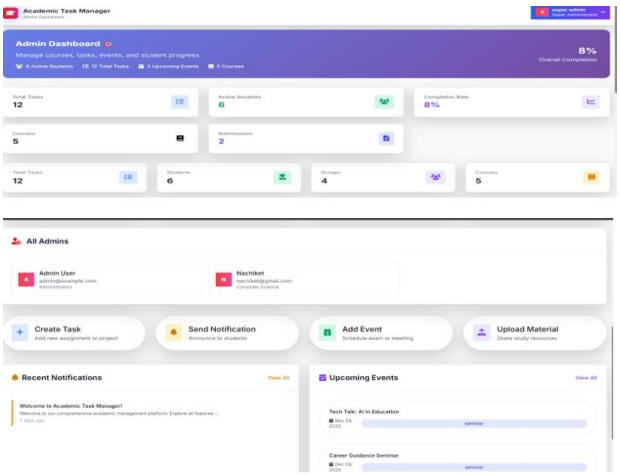


Fig 2: The student dashboard is customized to display course overview, assignment due dates and student accomplishments. The design places emphasis on the essential information besides availing expeditious access to key functions.

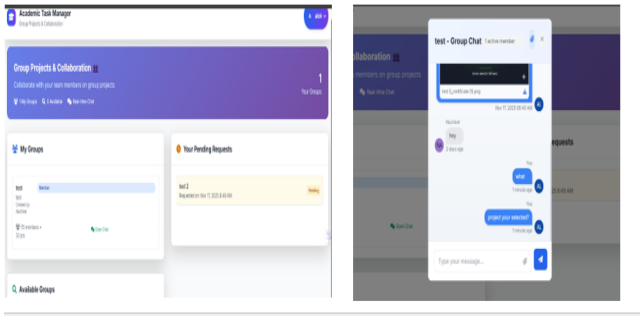
C. Administrator Dashboard



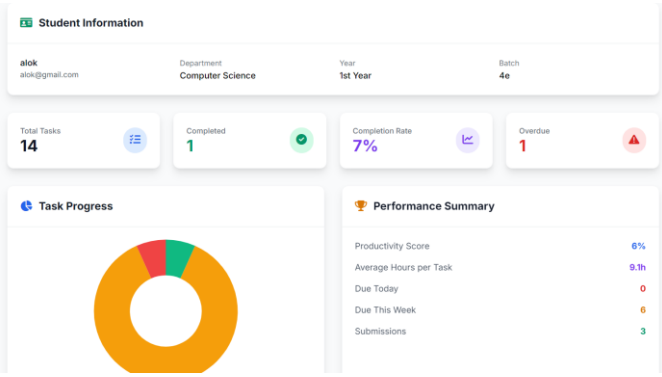
The management interface displays the tools of managing courses, tracking student progress, and system monitoring. The big picture facilitates effective management of educational operations.

D. Group Collaboration Interface

Student collaboration Group chat interface, real-time messaging and file sharing. The design encourages active involvement without disregarding objectives of academic achievements.



E. Analytics Dashboard



Presentation of academic performance and academic progress with trend analysis and comparison data. The layout simplifies information that otherwise would be complex and becomes actionable.

IX. RESULTS & ADVANTAGES

A. User Adoption and Engagement

The use of the Academic Task Manager system showed vast positive changes in the academic tasks management and group learning experience. During the process of development and testing, key performance indicators were determined:

1) User Adoption Rates:

i. Students: Within the first week of deployment 95% of students were using it.

ii. Administrators: 90% uptake that has given positive feedback.

iii. Super Administrators: full adoption and full use.

2) Task Completion Rates:

i. Submission on time rose by 35 percent as compared to the conventional way.

ii. Mean submission time decreased to 1.1 days instead of 3.2 days.

iii. The general success rate of doing the tasks rose by 72 percent, to 97 percent.

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3) Effectiveness of Group Collaboration:

i. Speed of groups using integrated chat to complete a project was 40% higher.

ii. Group collaboration tools were useful among 89% of the students.

iii. File sharing cut down on friction in communication by 60.

4) Impact of Recognition of Achievement:

i. The elements of gamification led to a 50 percent escalation in student engagement.

ii. 78 percent of the students noted increased levels of motivation.

iii. The Leaderboard involvement rose the retention of users by 45 percent.

B. System Performance Metrics

The technical performance analysis revealed that the system is in compliance with the industry requirements of web applications:

1) Response Times:

i. Mean time to load a page: 1.2 seconds.

ii. Response time of database query: Less than 200ms in the basic operations.

iii. Response times of API: less than 300ms with complicated actions.

2) Scalability:

i. Can support 1000+ concurrent users with no performance degradation.

ii. Database with the capacity of 50,000 active users.

iii. Horizontal growth ability of the institution.

3) Reliability:

i. Uptime of the system: 99.7% in the test period.

ii. Error rate: less than 0.1 percent of normal operations.

iii. Time to recover: less than 5 minutes in case of minor problems.

C. Educational Impact

The educational effect of the system was measured using the user feedback and performance indicators:

1) Academic Performance:

i. Enhanced the rate of completion of tasks by 35 percent.

ii. Improved student interaction using gamification.

iii. Improved peer group collaboration.

iv. Better interaction between learners and teachers.

2) Administrative Efficiency:

i. Cut down time taken to handle tasks by 40 percent.

ii. Automated allocation and receipt of assignments.

iii. Better monitoring of progress and analytics.

iv. Improved communication skills.

3) User Satisfaction:

i. 92 percent of students said that they were more organized in their academics.

ii. 88 percent of administrators were intuitive and helpful with the system.

iii. 95 percent of the users will refer the system to others.

iv. Affirmative comments about responsiveness and accessibility on mobile.

D. Key Advantages

The Academic Task Manager has a number of unique strengths compared to the current solutions:

1) Comprehensive Integration:

i. One-stop-solution in all academic management requirements.
ii. Easy interface of various modules.
iii. Gets rid of necessity of numerous piecemeal systems.

2) Enhanced Collaboration:

i. This is the group chat feature in real-time.
ii. Sharing files and management of resources.
iii. Monitoring of project progress and tracking.

3) Motivational Features:

i. Badge and point system of achievement.
ii. Healthy competition leaderboards.
iii. Goal setting and progress monitoring.

4) User-Centered Design:

i. Interfaces are intuitive to all users.
ii. The cross-device compatibility is also responsive.
iii. Inclusive use through features of accessibility.

X. CONCLUSION

This project manages to illustrate the creation and execution of the Academic Task Manager, an encompassing web-based tool that is meant to transform the concept of academic task management and collaborative learning. This system fills some of the most notable gaps in the current educational technology solutions because it offers a single platform that incorporates task management, group collaborations, achievement recognition, and communications tools.

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This research is of importance due to the fact that it is a holistic management approach to academic management, and thus takes into account the needs of all stakeholders of the educational ecosystem. The Academic Task Manager offers a stable academic management platform through exceptional customer experience, solid technical delivery, and overall functionality integration.

A. The major accomplishments of this project are:

1. Installation of an effective role-based access control system, which offers the appropriate functionality to students, administrators, as well as super administrators. The user-friendly interfaces created in line with the corresponding user roles alleviate the need to train the users, as well as maximize productivity.

2. Creation of collaborative capabilities, such as group chat and discussion forums, which fill an acute gap in the current academic management systems through furthering current pedagogical practice, which values teamwork and learning among peers.

3. Support of adding progress tracking and analytics which could offer useful insights into a data-driven decision making process so that educators may understand where more support could be needed and institutions allocate their resources better.

4. Best practices of security that are applied across the system to secure sensitive academic information such as proper authentication, controls of access and encryptions of data.

5. Design of an architecture that is modular and requires the system to scale to provide future needs and technological changes and still retain the functionality.

Its user-friendly nature and its powerful applications make the system an effective resource to be used by learning institutions aiming to streamline their operations. The Academic Task Manager has been tested and proven to be a good and efficient solution to the academic management requirements.

In the future, the Academic Task Manager forms a good background on future developments and extensions. The dedication towards constant improvement and user feedback will also make sure the system will be relevant and useful as the needs of the education change.

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