JCET Companion: Mobile Application for Campus Assistance

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Abstract

JCET (Jawaharlal College of Engineering and Technology) Companion, the innovative mobile app thoughtfully designed for JCET college community, introduces a comprehensive suite of indispensable features aimed at simplifying and enhancing campus life. At its core, the app provides a user-friendly event calendar intricately linked with a reminder system, ensuring students never miss vital dates or essential college events. The meticulously organized study material empowers efficient learning, while crucial announcements keep users informed. With seamless attendance tracking and notifications, students stay accountable and punctual. Homework management, to-do lists, fee handling through an integrated gateway, and efficient leave request management all find a home in this app, uncluttering the daily tasks that typically burden students. In essence, JCET Companion offers a centralized platform, fostering a sense of community and shared experience while ensuring everyone is consistently up to date, transforming college life into a well-organized and informed journey, marked by enhanced efficiency and connectivity for all its users.

Keywords: Attendance Tracking And Notifications, Homework Management, Fee Handling, To-Do-List, Leave Request, Mobile Application

1. Introduction

JCET Companion stands as a groundbreaking solution, positioned at the vanguard of reshaping the traditional college experience. It transcends established boundaries, adeptly addressing the multifaceted challenges endemic to educational institutions. This represents a meticulously crafted and seamlessly integrated application, functioning as the central nexus for a myriad of functionalities. Going beyond the mundane, JCET Companion seeks to simplify daily tasks and cultivate an unparalleled sense of connectivity among students and faculty. Its purpose is to ensure that everyone within the educational ecosystem remains consistently informed and empowered, effortlessly navigating the complexities of college life. This transformative platform is not a mere optimization of administrative processes; management and academic performance: revolutionary platform signifies more than just technological advancement; it embodies a dynamic force poised to redefine the very fabric of collegiate existence at JCET. With a visionary design, JCET Companion aspires to create an environment where efficiency, productivity, and overall engagement are intricately interwoven. Its mission is to alleviate the burdens associated with the fragmented approach to campus management, thereby propelling JCET towards a future characterized by streamlined operations, enriched experiences, and an elevated sense of communal connectivity. In essence, JCET Companion stands as a catalyst for positive change, a driving force that propels JCET into a future where the synergy of technology and education fosters a transformative journey. Through its innovative features and comprehensive approach, it envisions a college experience where the boundaries of conventional education dissolve, giving rise to a new era of seamless operations, enriched student experiences, and heightened communal connections

1.1 Methodology

This research follows a strategic methodology aimed at elevating the college experience through the development of a sophisticated mobile app. In the initiation phase of the research, objectives are meticulously defined, and key stakeholders, ranging from students to faculty, are identified to ensure comprehensive input. Requirement analysis involves collaborative efforts to prioritize features such as event calendars, study material organization, and attendance tracking, laying the foundation for an enriched user experience. System design includes the

meticulous crafting of a robust architecture and the creation of wireframes, ensuring the resulting interface is both intuitive and visually appealing. The technology stack is carefully curated, emphasizing scalability, security, and cross-platform compatibility. Development encompasses both backend and frontend implementation, with a focus on seamless integration to deliver a cohesive user experience. Rigorous testing, spanning unit and user acceptance testing, precedes the implementation of robust security measures to safeguard user data. Deployment involves a strategic release on relevant app stores and the deployment of a secure server environment to support optimal app performance. Training sessions and comprehensive documentation are integral to supporting user adoption and ensuring efficient app utilization. Postdeployment, continuous maintenance addresses any identified bugs and incorporates valuable user feedback, leading to ongoing improvements and refinements. The research concludes with a thorough evaluation against predefined objectives, documentation capturing lessons learned, and a forward-looking plan for future updates. This approach ensures the JCET Companion evolves iteratively, staying responsive to the dynamic needs of the college community and providing a transformative tool for streamlined, informed, and connected campus living.

2. Related Work

2.1 "An Overview of India's Unified Payments Interface (UPI)"

The Unified Payments Interface (UPI) [1] in India is a new way to send money fast and safe. It's a single platform for paying bills and getting paid. UPI has changed how people pay in India, making it easier and faster [2]. It's also safer and cheaper. But some problems with UPI include people not knowing enough about it and security issues. Still, UPI has big potential to change digital payments in India [3]. It can help businesses reach customers better. This article explains India's Unified Payments Interface (UPI), its benefits, challenges, and opportunities for businesses. This methodology is utilized in the process of fee handling in the application developed in the proposed.

2.2 "Learning Management System Calendar Reminders and Effects on Time Management and Academic Performance"

This research project [4] looks at a big research university in the Midwest to study how international students manage their time. It also checks if using the Course Hack, an online calendar tool in their Learning Management System (LMS), helps students manage their time better and do well in studies, based on survey answers. The university is mentioned in this study [5] as UMW.

2.3 "Making Online Homework Work"

Online homework systems send homework to students and give feedback on their answers quickly. They could help students learn more in college math classes. But, current research [7] is not sure if they really work well. Some studies say they help students do better, while others say they don't help much. Our own experience [8] shows that they can make students more interested and successful, especially in basic classes like statistics, precalculus, and calculus. Using online homework in regular math classes needs teachers to think about different things, like how online homework and tests in class are different. We talk about these things and share tips from our experience to help teachers and students use these systems better and learn more.

2.4 "Online Learning in Higher Education : Analysis during the Pandemic Covid-19"

This research aims to see how good UNINUS Bandung teachers are at teaching and how well students are learning. During the Covid-19 pandemic, online learning is super important. The study [10] uses a survey with Likert questions. The students from Nusantara Islamic University in Bandung who do online classes are the ones being looked at. The study finds that online learning during Covid-19 [11] is not very effective. Students find it hard to understand, classes are boring, there's not enough stuff to help with online learning, and the internet connection is bad. Students are also less motivated to learn. This affects their grades. Online learning doesn't help students understand stuff well. Using Zoom or Google Meet might be better for learning online [12].

2.5 "The Effectiveness of Using Google Classroom to Measure the Level of Understanding Student Materials"

This study aims to determine if using Google Classroom improves student understanding [13]. We conducted an experiment with 64 students from the Quantitative Research Methodology course, divided into Class A and Class B [15]. A test was used to measure their understanding. Descriptive analysis and an F test were employed for analysis [14]. The average test score for Class A was 69.21, and for Class B, it was 65.74. The findings suggest that Google Classroom enhances student comprehension. The Table.1 shows the summarization of the literature studied in the related work.

Table 1. Related Work

PEPER NAME	METHODOLOGY	MERIT/DEMERIT	RELEVANCE
Online Learning in Higher Education : analysis during COVID-19	Survey Research through questionnaire	**MERIT** Found current E-Learning methods are weaker than real classes. Found quality is improved when adding an E-Learning method to classes.	To find real world impacts of the application
LMS calendar rem inders and effects on time management and academic performance	Survey during cohorts	**MERIT** Found using a calendar reminder system in an LMS is very effective	Proves benefit of applying calendar reminder system for the college students
An Overview of India's Unified Payments Interface (UPI): Benefits, C hallenges, and Opportunities	Analysis	**MERIT** No transaction fees Instant & Secure **DEMERIT** Transfer limit	To find best implementati on of payment system can be more organized

Making Online Homework Work (OHW)	Using an OHW system to implement on line assessment	**MERIT** Enable instructors to keep track of academic indicators within the system. **DEMERIT** Uploading a clear digital copy from a hard copy could become tedious	To understand how to implement our OHW
The effectiveness of using google classroom to measure the level of understanding student materials	Descriptive analysis and F test on two groups of students	**MERIT** Study material and OHWs prove effective for students **DEMERIT** Cannot send important announcements No features useful for administration	To compare with a competitor and analyze requirements.
icampus	website	**MERIT** Scalable **DEMERIT** Does not focus on features that are most relevant to college students	To compare current campus management system in place

3.   Proposed Work

The development of the user interface utilized React Native components, a framework facilitating the construction of the app by managing interactions with native elements and

platform-specific APIs. Concurrently, an API server, functioning as the backend, furnished data and functionalities to the application, potentially stemming from either a custom server or a third-party service. In the operational flow, user interactions, encompassing actions such as button taps or text input, are captured and converted into events by React Native's event handling mechanism. Subsequently, these events trigger API calls to the server, eliciting JSON-formatted responses containing relevant data. Post-retrieval, the received JSON data is parsed and processed, leading to updates in the user interface components, thereby presenting the information to the user. This architectural approach aligns with a Model-View-Controller (MVC) pattern, delineating the API server as the model, the user interface components as the view, and the React Native framework as the controller, managing event handling and API communication logic. The Figure.1 below illustrates the system architecture.
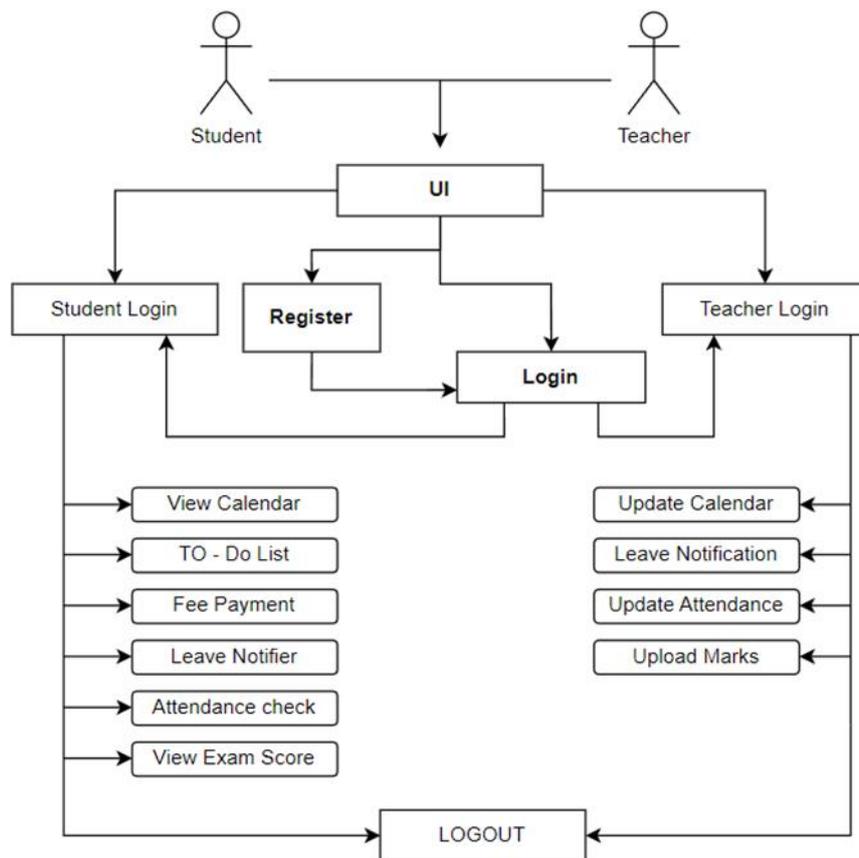
Figure.1 System Architecture

4. Results and Discussion

The frontend development phase has been successfully completed, with essential modules such as the login page, front page, academic calendar, to-do list, leave notifier, and nearly finished fee payment system. These achievements mark a substantial milestone in the project, bringing us closer to realizing a centralized platform that streamlines college tasks, fosters connectivity, and enhances the overall college experience. With the foundation laid and key features in place, the JCET Companion project is poised to revolutionize how students and faculty interact with the college environment, promising a future characterized by efficiency, engagement, and communal connectivity. The Figures 2 to 5 depict the mobile application developed.
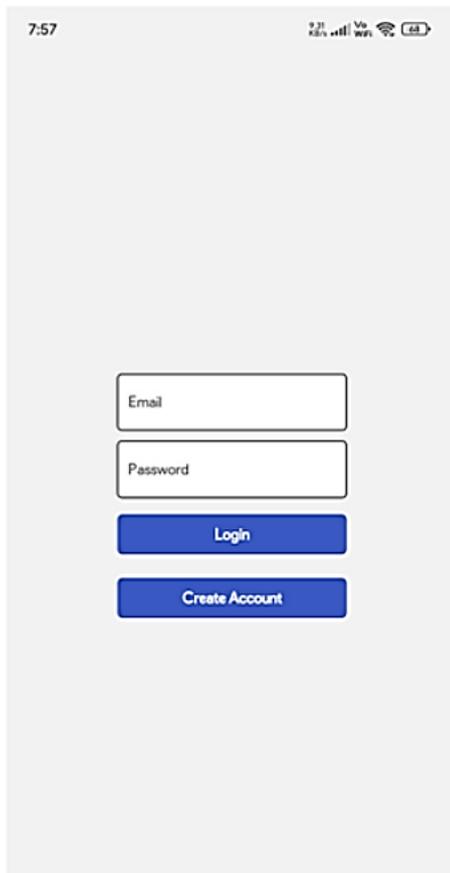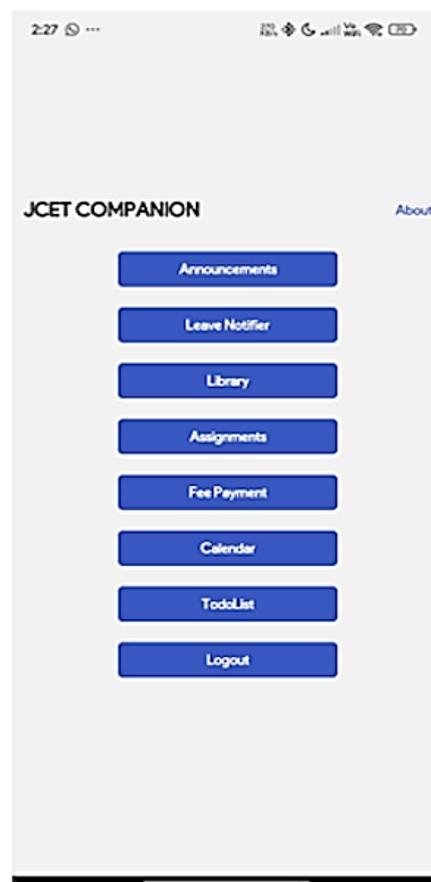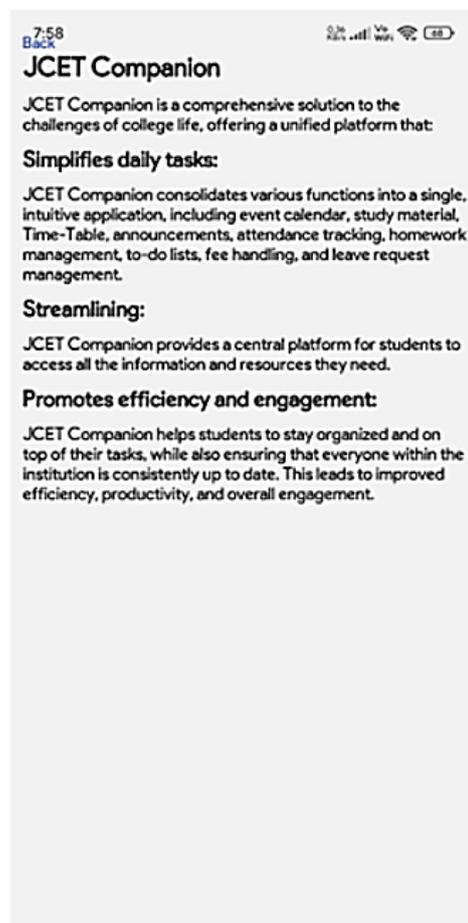
Figure .2 Login page   **Figure.3** Front page
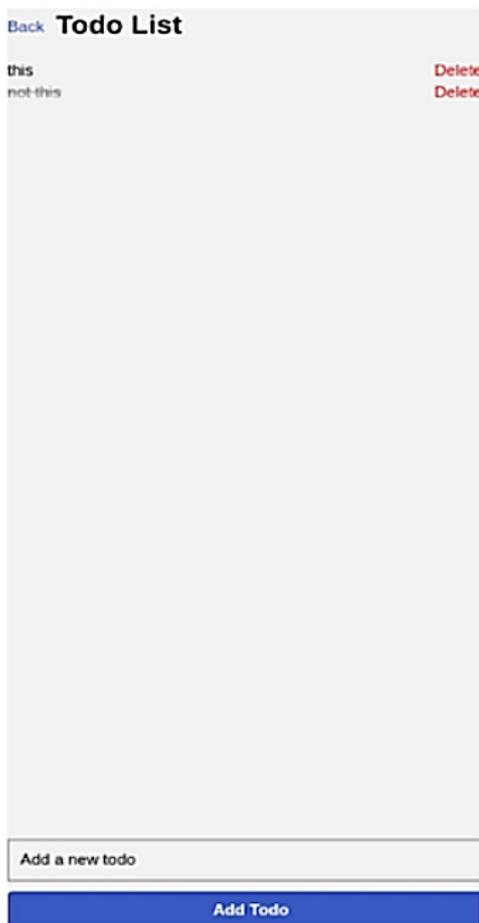
Figure .4 To-Do List (one of the features)

Figure .5 About

5.   Conclusion

In conclusion, the JCET Companion stands as a significant leap forward in the modernization and enhancement of the college experience at our institution. Recognizing and tackling the existing challenges within our educational setting, this innovative app consolidates vital functions into a unified and user-friendly platform, presenting the potential to revolutionize the way we navigate campus life. The app's intuitive event calendar ensures that crucial dates and significant college events are never missed, while its streamlined access to academic resources empowers efficient learning. Beyond optimizing administrative processes, JCET Companion fosters community building, creating a cohesive and interconnected environment for both students and faculty. This amalgamation of features converges into a powerful tool that not only simplifies daily tasks but also strengthens connectivity and cultivates shared experiences among the college community. The transformative impact of

JCET Companion extends beyond mere convenience. Its visionary design redefines our interaction with the academic environment, promising heightened efficiency and improved communication. By providing a centralized hub for diverse functionalities, the app aims to reshape the fabric of our collegiate existence, offering a future characterized by streamlined operations, enriched experiences, and an elevated sense of communal connectivity. In essence, JCET Companion symbolizes more than just a technological advancement; it represents a catalyst for positive change, propelling our institution towards a new era of enhanced collaboration and a more enriching college journey for all its users.

In the future, the JCET Companion app can expand its capabilities by integrating AI and ML algorithms to offer personalized recommendations and AI-powered chatbots for instant student support. Enhanced communication features, such as real-time messaging, discussion forums, and voice/video calling, will foster seamless collaboration among students, faculty, and administrators. The app's evolution may also include Augmented Reality (AR) campus maps for immersive navigation, guiding new students to classrooms and facilities. These advancements aim to create a connected and tech-savvy college environment, simplifying tasks, and enriching the overall campus experience.

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