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DEVELOPMENT OF MOBILE APPLICATION FOR EVENT MANAGEMENT SYSTEM

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Abstract: *Currently, mobile applications play a pivotal role in shaping the campus life experience. Existing event management mobile applications serve as versatile tools that seamlessly integrate technology into various aspects of academic and social activities. Therefore, the objective of this study is to develop a mobile application known as The EventHub: UiTM Machang Application that will make easier for the UiTM Machang campus community to keep track of upcoming events and manage them effectively. This study was motivated by the challenges to check all upcoming events since all related information was scattered. Besides that, there was no systematic way to track participant registration lists and participant attendance lists since the organizers kept track of both lists using paper and simple spreadsheets. Hence, the development of The Eventhub: UiTM Machang Application enables the UiTM Machang campus community to easily monitor all upcoming events, thereby enhancing the effectiveness of managing campus events. The Eventhub: UiTM Machang Application was developed using the Mobile Application Development Life Cycle (MADLC). As a result, this study developed interfaces for organizers, which are to create and manage events, create QR codes, track registered participants, track attendance lists, and track feedback. While interfaces for participants are to register events, record attendance by scanning the organizer's QR code during the event, submit feedback and admin interfaces are to track events and registered participants, track attendance lists and generate reports. Implicitly, The Eventhub: UiTM Machang Application contributes to increase productivity among the UiTM Machang campus community.*

Keywords: *Mobile Devices, Event Management System, Mobile Application, QR-Code.*

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Introduction

Events play a significant role in individuals' daily lives. Events at universities have the power to shape the lives of campus communities and contribute to a vibrant campus culture. Currently, many universities face challenges in managing and participating in events. For instance, the official campus website posts academic events, but the campus community may learn about social gatherings through social media. This is because there's no central place to check all upcoming events. The campus community needs to fill out the google form to join any program or event, while some event organizers still use paper and simple spreadsheets to keep track of attendance. Bhardwaj et. al. (2021) stated since the whole existing system was to be maintained using pen and paper, the process of keeping, maintaining, and retrieving the information was very tedious and lengthy. This issue was also supported by (Pinjari & Nur, 2016), who stated the inefficiency of manual event management systems can cause many problems, such as data security is not assured, difficult to maintain records in the long run, and it requires a large amount of manpower.

Furthermore, the absence of a centralized system hinders users' ability to receive accurate information at the appropriate time (Khan et al., 2008). This statement was also supported by B.K. and Mahitha (2023) that a lack of a centralized platform results in miscommunication, time delays, and conflicts in resource utilization. Therefore, this study aimed to develop a mobile application that would make it easier for the campus community to keep track of upcoming events and manage them effectively. Event organizers can create and manage events, create QR codes, track registered participants, track attendance lists, and feedback. Participants can register for events, record their attendance by scanning the organizer's QR code during the event, and provide feedback. On the other side, admins can track events, registered participants, attendance lists, and generate reports.

Literature Review

This section explores the existing research on the mobile devices in campus life, mobile application for event management systems and the use of qr code to enhance attendance tracking system.

The Role of Mobile Devices in Campus Life

Today, a significant number of higher education students own mobile devices. It shows mobile devices have become an indispensable criterion in everyone's daily life, and their impact on campus life is significant. They offer a multitude of functions that can fulfil the needs and preferences of the campus community. One of the most significant ways mobile devices have impacted the campus community from an academic perspective. Students leverage mobile devices to access digital textbooks, educational apps, and online resources, fostering a dynamic and interactive learning environment. For instance, mobile devices enable students to take and edit notes neatly, as well as to organise and structure notes effectively without messy paper handling (Nabil et al., 2017). A study by Hossain and Ahmed (2016) involving 316 university students revealed that a majority used their devices for academic purposes, such as accessing materials (65.5%), reading news (63.3%), and engaging with social media (60.1%). Specifically, students reported using mobile devices to read full-text articles (74.9%), watch educational videos (56.5%), and record class notes (45.4%).

Beyond academics, mobile devices play a crucial role in fostering social connections within the campus community. They enable students to stay connected with friends and participate in campus events, which is vital for building a supportive environment. Research by Gikas and

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Grant (2013) examined the importance of mobile devices in students' daily lives, facilitating interaction and communication through social media. This connectivity not only enhances their academic experience but also enriches their overall campus life, demonstrating the integral role of mobile technology in modern education.

Mobile Application for Event Management Systems

Mobile devices provide more functionalities to users by using mobile applications. Nowadays, the integration of mobile applications and event management systems has revolutionized how events are planned, executed, and evaluated. A study by Renjen and Gupta (2022) found that implementation of mobile technology can optimize functions and improve user experiences. For instance, it can enhance communication and engagement between organizers and participants. The enhanced user interfaces improve participants experiences by providing simple access to information about schedules, venues, and networking opportunities. This advantage is also supported by Bhanot et al., (2024) who found the evaluation of the Android application implementation showed promising results, demonstrating its potential to enhance efficiency, communication, and organization in event management. While Thirusanku and Ai (2024) in their study concluded technologies are critical for organizing modern events. They provide a better attendee experience, ensure real-time feedback, and enhance event marketing.

QR Code to Enhance Attendance Tracking Compared to Traditional Methods

Animated QR codes enhance attendance tracking significantly compared to traditional methods (Mohammed & Zidan, 2023). One of the primary advantages is increased security; these codes generate two QR codes per second, allowing only the legitimate one to be scanned, which helps prevent forgery and scams. This is also endorsed by Nuhi, et al., (2020) that the QR code-based attendance system offers better security than traditional methods, including eliminating chances of students signing up for others who may not be present, and is more attractive due to its accuracy and efficiency.

Additionally, the efficiency of QR codes streamlines the attendance process, allowing students to check in and out quickly, saving teachers valuable time that they can redirect toward instruction and student engagement. The QR code attendance system is an affordable and efficient solution for lecturers, saving time and reducing paper waste (Nuhi, et al., 2020). While Reddy et al., (2023) in their study also revealed that the accuracy of the attendance system has increased, and it mainly benefits in saving time and effort required for teachers to call students personally by name. In addition, Vishal, et al., (2023) in their study, reported that the system successfully automates user-friendly attendance tracking and generates reports efficiently.

Methodology

The Mobile Application Development Life Cycle (MADLC) methodology is adopted for this study because MADLC focuses on creating user-friendly mobile applications that ensure seamless interaction with the event management system for diverse users, such as students, faculty, and staff.

Identification Phase

This phase focuses on gathering all requirements to formalize interactions among diverse users. The requirements of the mobile app like the features are obtained from literature and users. The list of requirements is detailed as follows:

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User Requirements

Organizer Requirements

Organizers can create new events, manage existing ones, view upcoming or ongoing events, view registered participants, track attendance in real-time and view feedback for continuous improvement.

Participant Requirements

The system allows participants to view upcoming events, join or register for them, register attendance, view participants and, send feedback.

Admin Requirements

Admins can view events, participants and feedback, track attendance and, generate reports such as number of all events, number of upcoming events, number of ongoing events, percentage of events based on categories and number of events per month.

System Requirements

Hardware Requirements

Computer with at least 8GB RAM

Software

Android Emulator, Android Studio, Xampp, PhpMyAdmin and Visual Studio Code.

Design

The system architecture for *The EventHub: UiTM Machang Application* as shown in figure 1 consists of two primary actors: the user (organizer and participant) and the admin. The user interacts with the Android Studio Mobile App, while the admin manages the system through a VS Code admin website. Both send HTTP requests to a PHP-developed backend server, which processes these requests and performs database operations.

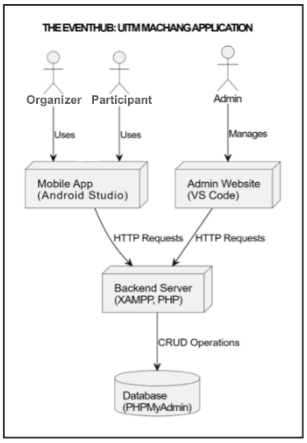

Figure 1: System Architecture of *The Eventhub: UiTM Machang Application*

A use case diagram and an entity relationship diagram (ERD) were designed to illustrate the project details. A use case diagram visually represents the specifics of a system and its users, while an ERD is a diagram that illustrates the relationships of entity sets within a database. steps.

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Figure 2 below shows ten use cases and three actors, which are organizer, participants, and admin. The organizer and participant consist of students or staff. The figure depicts the workflow and interaction between actors and the application, with the admin managing the system through the website. The organizers responsible for creating and managing events, *creating QR codes, tracking registered participants, tracking attendance lists, and tracking feedback.* The participants designated to register events, record attendance by scanning the organizer's QR code during the event and submit feedback. The admin can track events, registered participants, attendance lists, *and generate reports.*

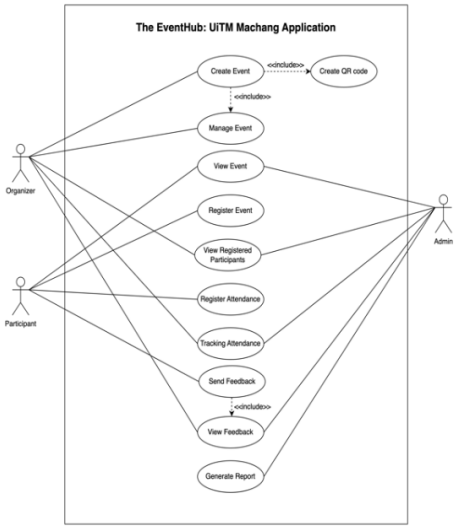

Figure 2: Use Case Diagram of *The Eventhub: UiTM Machang Application*

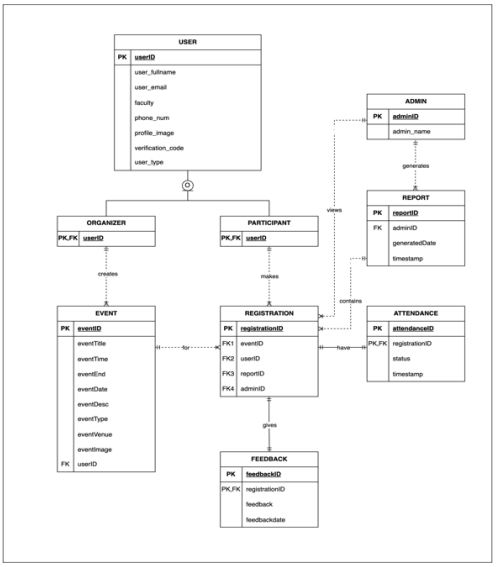

Figure 3: Entity Relationship Diagram (ERD) of *The Eventhub: UiTM Machang Application*

The EventHub: UiTM Machang Application's database structure is illustrated using the ERD as shows in figure 3 above. The user can be categorized into organizer and participant, each represented by their respective entities. The event entity, created by an organizer, holds event information. The participant registers in numerous events, and reports are generated for each. Attendance status is tracked for each event registration, and feedback is captured by participants

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for registered events. Additionally, the flowcharts were presented to outline the step-by-step process in *EventHub: UiTM Machang Application.* The flow charts were sketched for organizer, participant, and admin as shown in figure 4. It's an efficient technique for understanding the overall structure, as well as guidance in the development phase.

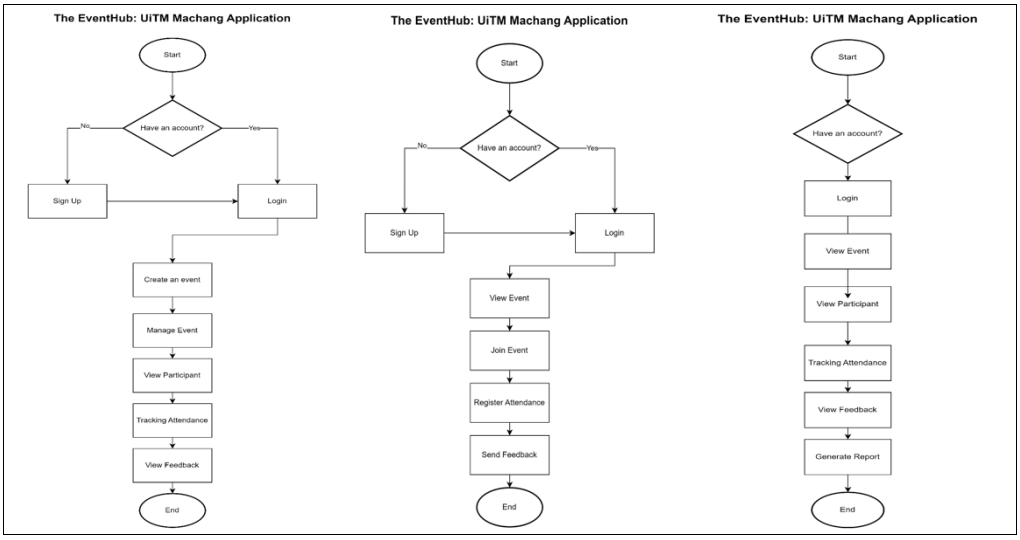

Figure 4: Flowchart of Organizer, Participant and Admin for *The Eventhub: UiTM Machang Application*

Development

In this phase, the source code was written according to the requirements. The design specification is translated into code. The initial of this phase was setup the development tools to develop user interface (UI) and functions which were Android Studio Giraffe for mobile application, Visual Code for admin website and the Xampp and PhpMyAdmin as a server and database.

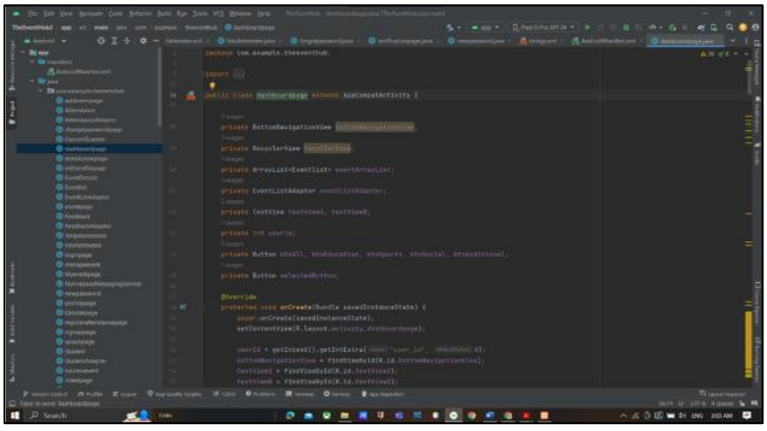

Figure 5: Implementation in Android Studio using Java

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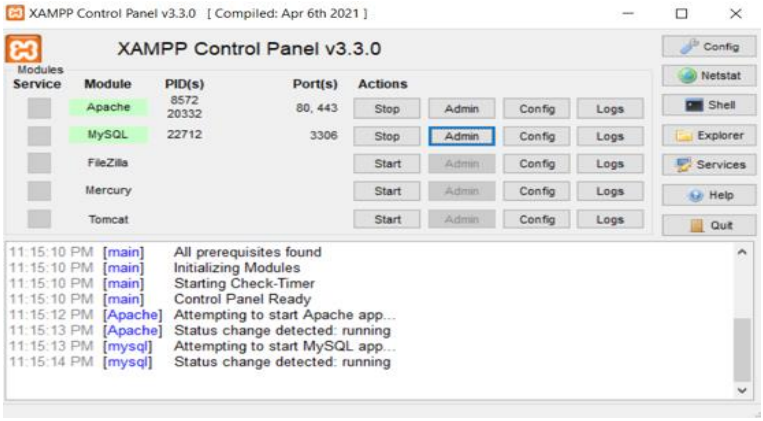

Figure 6: Xampp Control Panel

The figure 5 shows Android Studio, utilizing Java for Android application functionality, managing lifecycle, handling user interactions, and integrating XML-defined UI components. While figure 6 displays a XAMPP control panel, running Apache and MySQL modules, for *The EventHub: UiTM Machang Application*, ensuring a user-friendly interface for processing HTTP requests and database operations.

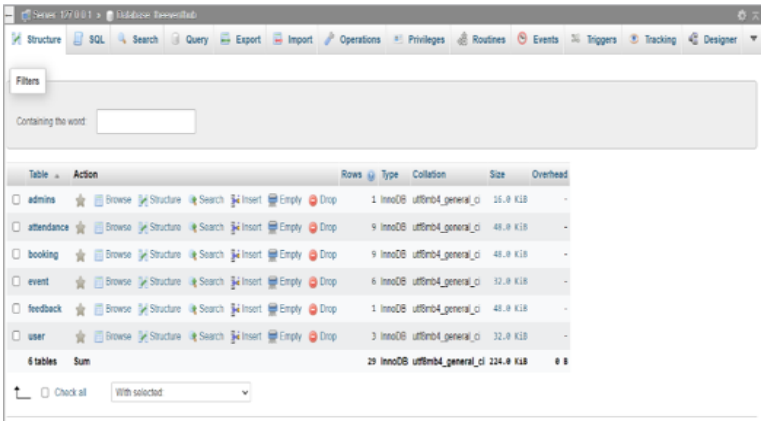

Figure 7: PHPMyAdmin Interface

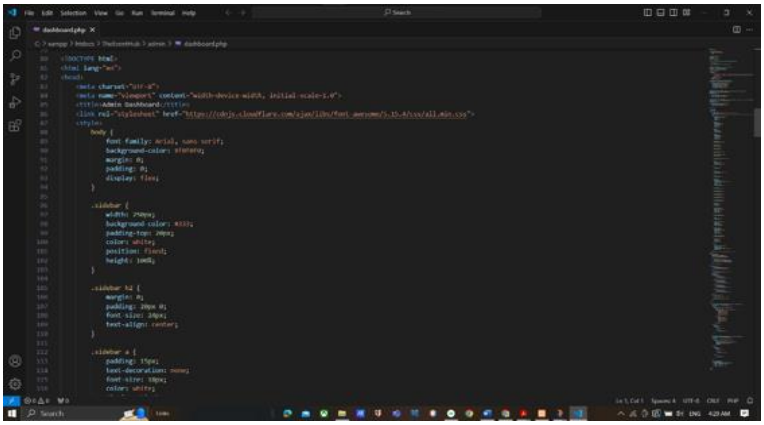

Figure 8: Developing Admin Websites using HTML, CSS, and JavaScript

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Figure 7 shows PHPMyAdmin, a MySQL database management utility, used in *The EventHub: UiTM Machang Application*, enhancing database management by providing an interface for managing records, tables, and queries. While for figure 8, it shows *The EventHub: UiTM Machang Application* admin website utilizes HTML, CSS, and JavaScript to create an organize, dynamic user experience. HTML provides a well-organized framework, CSS enhances design with uniform layouts, colors, and fonts, and JavaScript offers dynamic behavior and responsive interfaces.

Prototyping

The prototyping phase involves creating an initial version of the *EventHub: UiTM Machang Application* and developing subsequent versions using Android Studio. User feedback was crucial in this iterative process, ensuring design elements align with objectives. Multiple iterations were required until all requirements were met. Feedback from UiTM Machang community informs necessary enhancements, ensuring performance and quality. All activities were recorded and documented for future reference.

Testing

The EventHub: UiTM Machang Application project underwent testing to ensure it meets set requirements and operates according to specifications. Two types of testing were used: functional testing which evaluated the system's functionality against functional requirements, while usability, accessibility, and error messages were continuously tested throughout development, as illustrated in Table 1.

Table 1: Results of Functional Testing

Role	Feature	Expected Result	Result
Organizer	Create Event	Event was successfully created.	Pass
	Manage Event	Event is updated or deleted as expected.	Pass
	Create QR code	QR code was created successfully.	Pass
	View Registered Participants	Registered participant list displayed correct names and details.	Pass
	Track Attendance	Attendance was tracked correctly.	Pass
	View Feedback	Feedback was displayed correctly.	Pass
Participant	View Event	Events were listed and details were shown.	Pass
	Register Event	Registration was successful, and confirmation was shown.	Pass
	Register Attendance	Attendance was marked successfully.	Pass
	Send Feedback	Feedback was submitted and stored.	Pass
Admin	View All Events	Admin can access event details.	Pass
	View Registered Participants	Registered participant list displayed correct names and details.	Pass
	Track Attendance	Attendance data was visible and correct.	Pass
	View Feedback	Feedback was displayed correctly.	Pass
	Generate Report	Reports were generated with accurate data.	Pass

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Finding

This section displays the interfaces of *The EventHub: UiTM Machang Application* such as of login and signup page, organizer interfaces, participant interfaces and admin interfaces. The login page allows user to fully utilized the features provided by the app as shown in Figure 9. Users must enter their Student ID or Staff ID and password to access the application. If not previously registered, they can create one by clicking "Sign Up Here". After registering, they can log in.

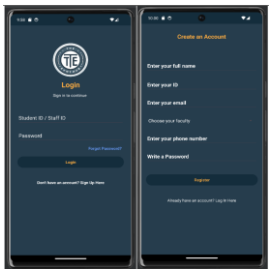

Figure 9: Login & Signup Page

Figure 10 shows interfaces for organizer. The interface allows organizers to create events by entering necessary details. Once created, a QR code can be generated. The organizer can download the QR code to display it to participants on the event day. The interface also displays upcoming events, ongoing events, and completed events. The completed events section displays feedback from participants.

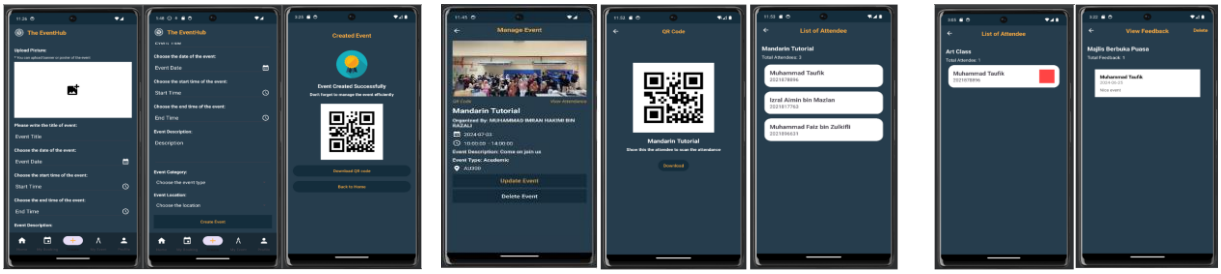

Figure 10 : Interfaces for Organizer

Figure 11 shows participant interfaces, including upcoming events, my booking, registered events, and registration. Figure 12 shows admin interfaces, including event statistics, categories, and a pie chart. The list of events and participants interfaces provide comprehensive information, while the admin interfaces show event distribution and attendance lists.

Figure 11 : Interfaces for Participant

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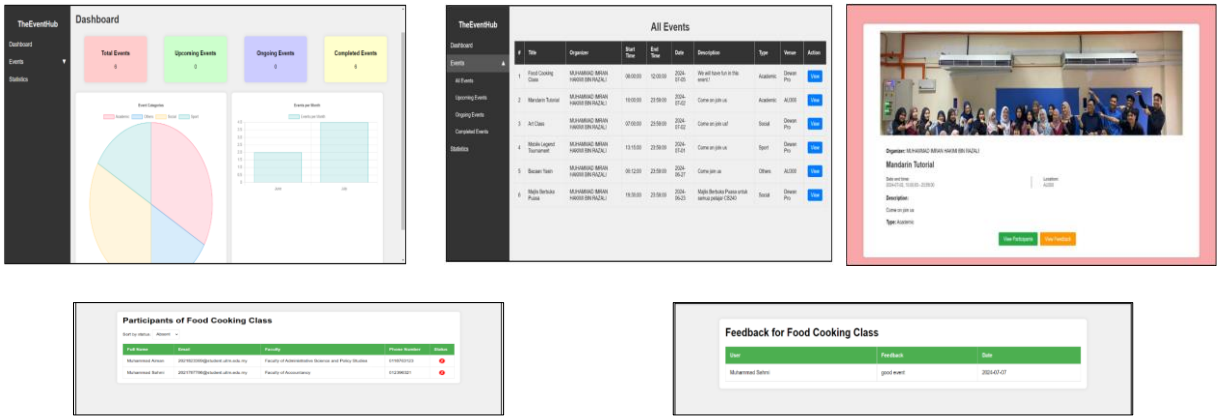

Figure 12 : Interfaces for Admin

Conclusion and Recommendation

The aim of this project is to develop a mobile application to ease the UiTM Machang campus community to keep updating upcoming events and to manage campus events effectively. By using *The EventHub: UiTM Machang Application*, the organizers can create and manage events, create QR codes, track registered participants, track attendance lists, and track attendee feedback. While participants can register events, register attendance by scanning the organizer's QR code during the event, and submit feedback. On top of that, *The EventHub: UiTM Machang Application* contributes not only to increase productivity among UiTM Machang campus community but also significantly contributes to multiple Sustainable Development Goals (SDGs) by enhancing educational opportunities (Goal 4) and fostering a culture of innovation within the university (Goal 9) (SDG, 2024).

The EventHub: UiTM Machang Application needs improvements to improve accessibility and reach. Future work areas include expanding compatibility to iOS devices, incorporating external event organizers and participants, implementing an event approval workflow, and enhancing security measures. These recommendations aim to make the application more robust, inclusive, user-friendly and enhancing event management experiences for the UiTM Machang community.

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