UKM APPLICATION FOR UNDERGRADUATE INTERNATIONAL STUDENTS

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Abstrak

UKM is one of the famous universities in Malaysia, with a complete education system, excellent teaching resources, and many advanced teaching equipment to help students learn better. They also have their own study websites like UKMFOLIO and UKMSMP to help students get more information easily. Also, they have a very important app: MYUKM, which is very useful in the daily life of UKM students. But there has a very serious common problem of all these website and app, the information in it is almost in Bahasa Malaysia, which is not useful to most international students. So, it is undoubtedly the undergraduate international freshmen who are most affected by this incident. They does not know any senior students and they does not understand Bahasa Malaysia, so when the first semester starts, they does not know what they need to do and which step is to start and communicate with each other. Additionally, they are confused about almost everything. This project will use the waterfall method as a development model and use Android studio as tools to design and develop a mobile application for international students to help them during their studies at UKM. There will have two kinds of users, one is students, who can scan the QR code for attendance, post some news and club announcements, and also view UKMFOLIO and SMP manual. Meanwhile, another user is admin who will check and validate all the news and comments posted by students as well as manages the students' accounts

Pengenalan

1.1   Introduction

With the development of Malaysia, education as a key development part of Malaysia has also received extensive attention from the government. According to a survey, Malaysia's education spending for 2021 was 16.37%, a 0.93% increase from 2020. And in 2022 invest RM52.6 billion annually in education, was equivalent to 16 percent of the total government expenditure. With the great investment from the government, Malaysian universities are also developing themselves rapidly, and many universities have achieved very good names in the world QS rankings, such as UM ranked 65th in the 2022 QS World Rankings, UPM 143rd, and UKM 144th.

With the development of universities in Malaysia, there has also been a lot of competition among them, and the healthy competition between these schools has further promoted the development of the school. Teaching quality is undoubtedly the primary aspect of school competition. Moreover, more competition is reflected in the competition of school hardware facilities and services. Often hardware upgrades, such as dormitory upgrades, stadium repairs, and computer classroom upgrades, mean a lot of capital investment. Therefore, the school pays more attention to the improvement and transformation of services, and UKM has also made its own efforts in this regard.

UKM provides UKMFOLIO and the UKMSMP website to help students take the course more easily. A mailbox is provided for all students so that students and lecturers can communicate. The exclusive SISWA mailbox for UKM students has also cooperated with many educational platforms, allowing students to use the originally expensive learning platform for free. Finally, UKM also has its own app: MYUKM, which not only help students scan the QR code to sign in, but also has an activity section where the latest announcements can be posted on it, as well as many useful functions such as UKM MAPS. This app is undoubtedly very useful for local students.

Through the seniors they know, they can get a good understanding of all the application websites and

practical apps of UKM. But UKM not only has local students but also thousands of international students from dozens of countries.

1.2 Objective

This app will implement the following objectives

1) To study and compare the current applications for international students in different universities.

2) To identify and design the IN-UKM, for aiding international undergraduate students during the registration process.

3) To develop an IN-UKM application for international undergraduate students.

Metodologi Kajian

For methodology, I will use the waterfall model as the development model of this app. Because all the requirements are fixed, the target group is also fixed for undergraduate international students. All the requirements and functions are already determined, so there is no need to change or add too much in the future. We only need to implement the functions separately first, then integrate and test the system. Finally, the system only needs to be maintained periodically, so the methodology will use the waterfall model.

Requirement Gathering and analysis − All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document. After researching, it was found that my requirement of the app is that the existing app is all in Malay language and cannot serve the international students. Also, many of the undergraduate students are not proficient in using the school website and cannot operate it properly. Therefore, the app needs to meet the convenience of international students. And orientation and assistance for undergraduate

freshmen.

System Design − The requirement specifications from the first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture. The system will be developed in Android studio as tools and java as programming language, and the app will be in English to meet the language needs of international students. It will also include the activation of siswa email, the manuals of UKMFOLIO and UKMSMP websites, the release of UKM news and events and the QR code scanning of UKM to sign in.

Implementation − With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing. App will start with the activation of the siswa mailbox and the manuals for the UKMFOLIO and UKMSMP websites. Afterwards, we will develop the login function, the news and event posting function and the UKM check-in function respectively. Finally all functions and manuals will be tested separately.

Integration and Testing − All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures. After testing all the small functions, all the programs were sequentially integrated into one big logical program and tested the connection of each step and the functionality and logic of the whole program.

Deployment of system − Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market. After the testing is completed, the app will be made available to the entire UKM undergraduate and international students.

Maintenance − There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment. After the app is used

by UKM undergraduates and international students, we will collect their feedback and continuously upgrade the system and make changes to the bugs. We will also update the latest manuals as changes are made to the siswa email activation, UKMFOLIO and UKMSMP websites.

HASIL KAJIAN

The following is a complete description of how the user will use this application from the user's perspective using a storyboard format. Determine the integrity of the entire application. And verify that it is easy and concise when used by the user.
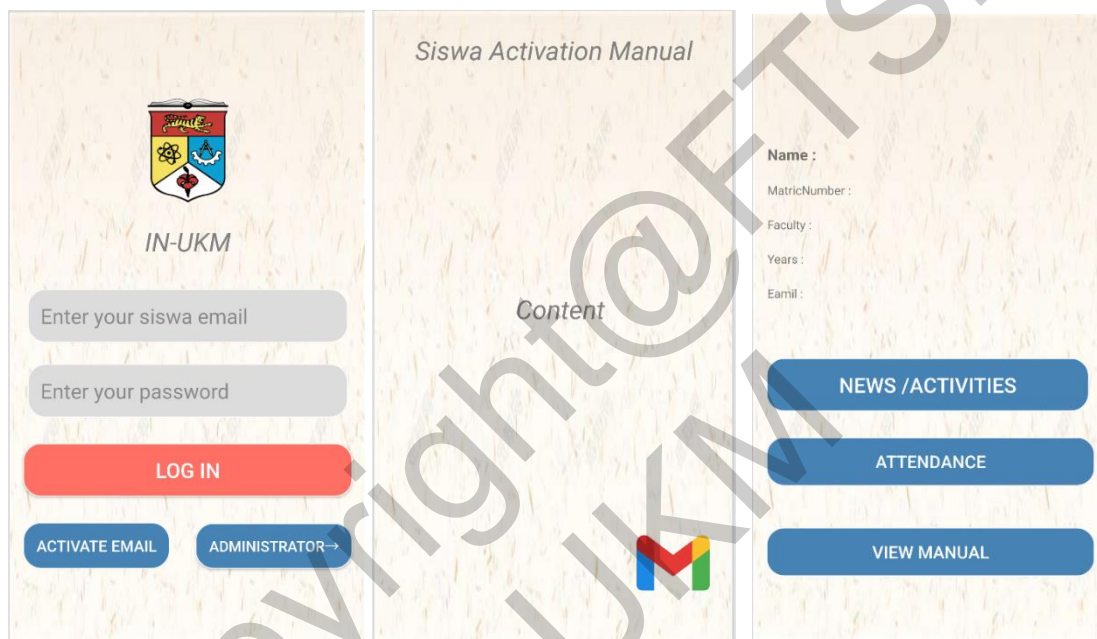
Figure 3.1 Login story

This international student from abroad used IN-UKM software for the first time. After opening the software, the first thing he faced was the login screen, clicked on the activate email button and opened the activate siswa email activation manual to read it. After studying it, he successfully activated his e-mail and returned to the login page. Login with the activated account. Once you have successfully logged in, you will come to the main page.
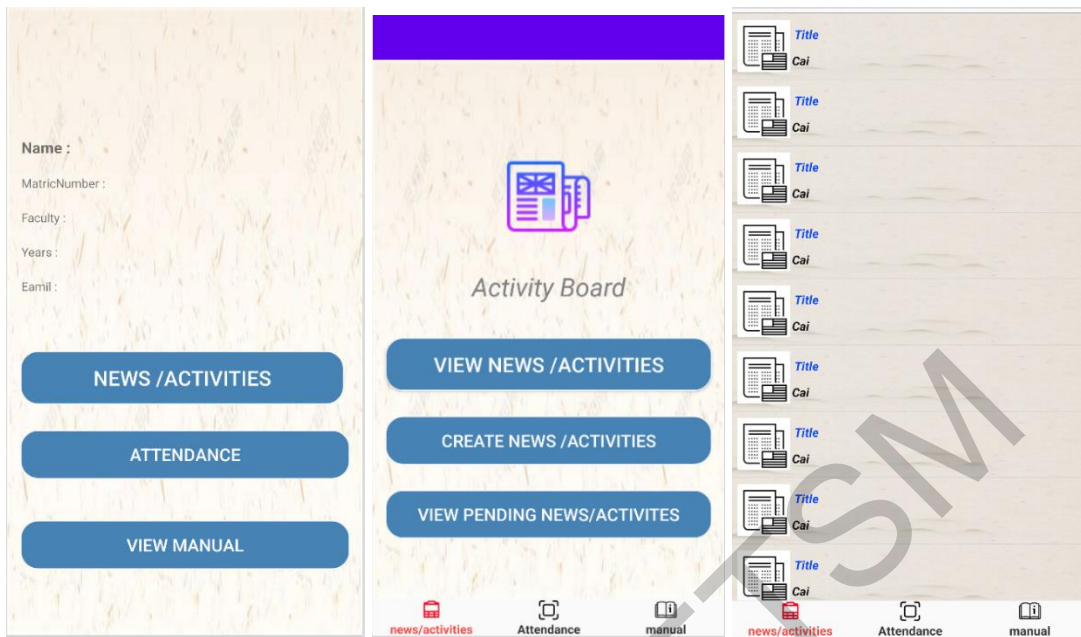
Figure 3.2 view News/Activities

Once logged in successfully, the user can go to the main page and view the latest news from the school. First click on the News/Events button, then clicked on the View News/Events button. The user then came to the full news/event information page. The user could select the most wanted news and viewed it.
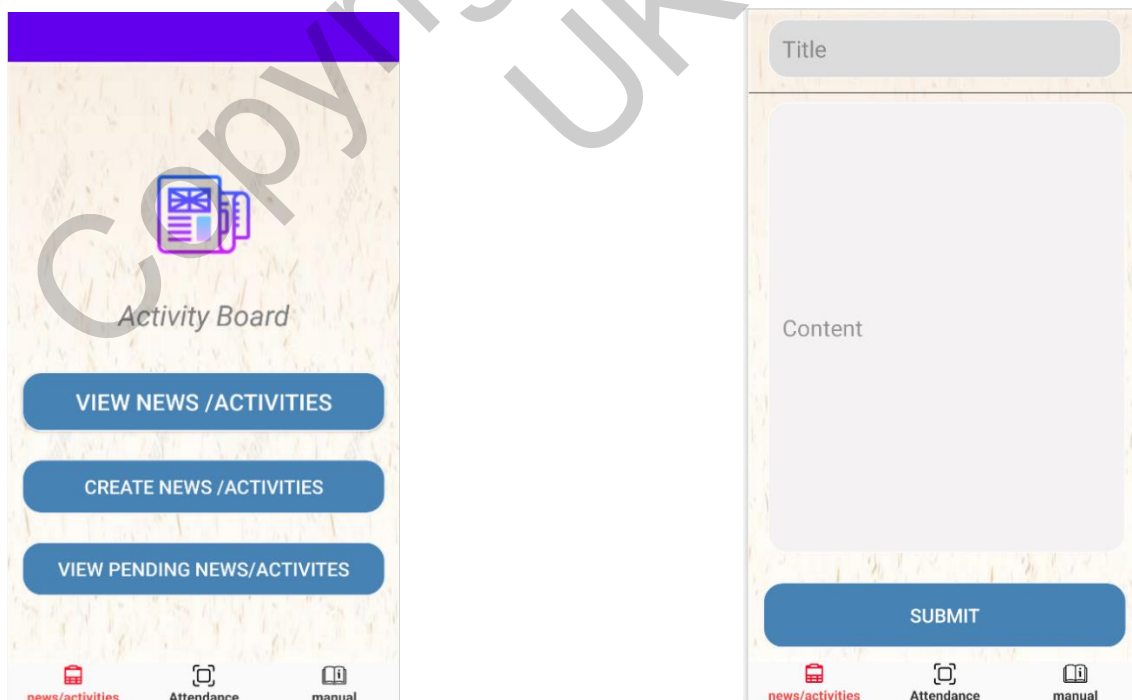

Figure 3.3 Create pending News/Activities

After reading the news, users wanted to create a new event. Gather all the freshmen to host a freshmen party to meet more freshmen. So the user went back to the news/event page and clicked on the create news/event button. After filling in all the required information, the user clicked on the Upload button to upload it. The new event appears in the News/Events screen .

Figure 3.4 upload pending News/Activities

The user wants to check the status of the news they just created, clicks on the View Pending News/Events button and realizes that the status has changed to Rejected, clicks on Enter, re-modifies it and clicks on the Upload button to re-submit. The status changes back to Pending.
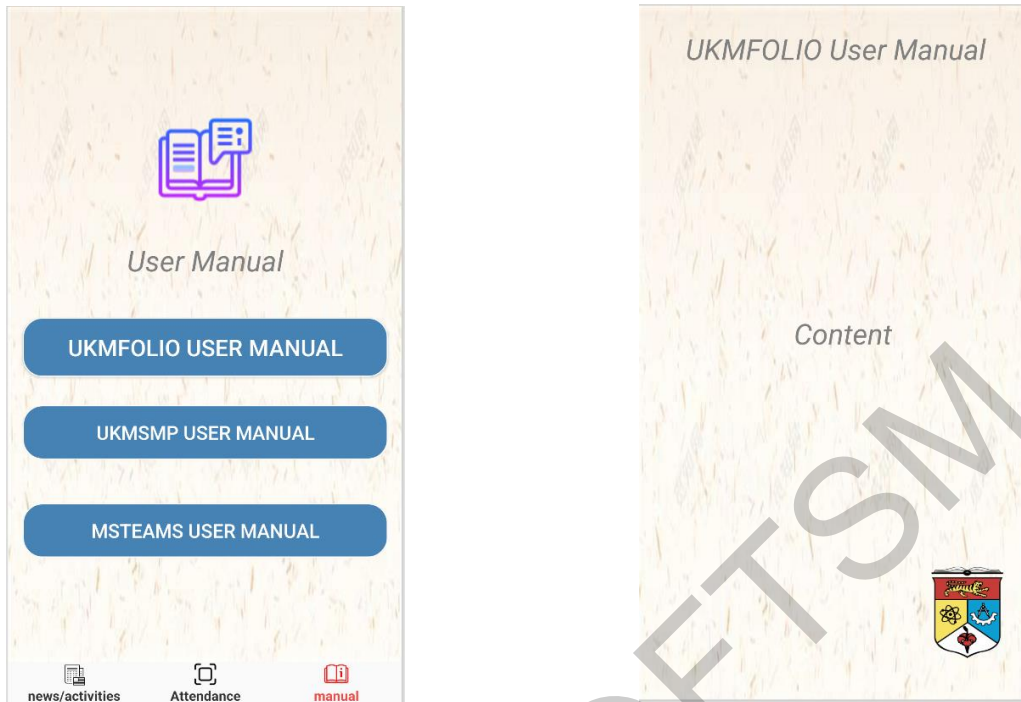
Figure 3.5 view manual

As a new student, the user wanted to find out about the websites they would need to study at the school and clicked on the Manuals button at the bottom to go to the User Manuals screen. The UKMFOLIO User Manual, UKMSMP User Manual and MSTEAMS User Manual buttons were then clicked on and the icons in the bottom right corner were clicked on to access the respective websites. The user had a more in-depth understanding of all the main school websites. At this point the user was ready for initial use of these sites.
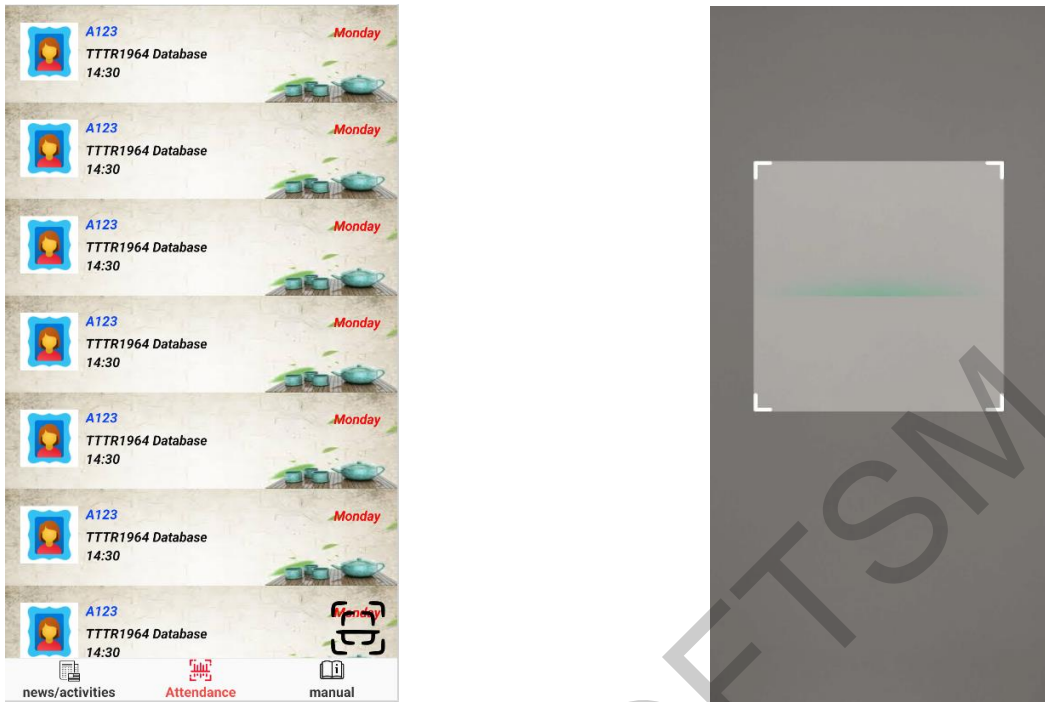
Figure 3.6 Attendance

After entering the school, the database teacher asks the user to sign in using the software. The user needs to click on the Attendance button to come to the sign-in screen. Then click on the scan icon in the lower right corner to open the scanning program for signing in and scanning. Once the scanning is complete, IN-UKM records the user's sign-in information on the attendance screen.
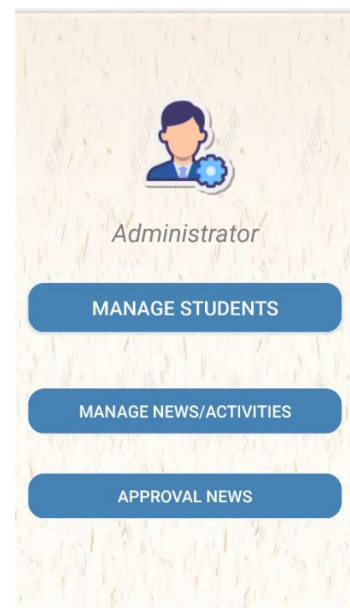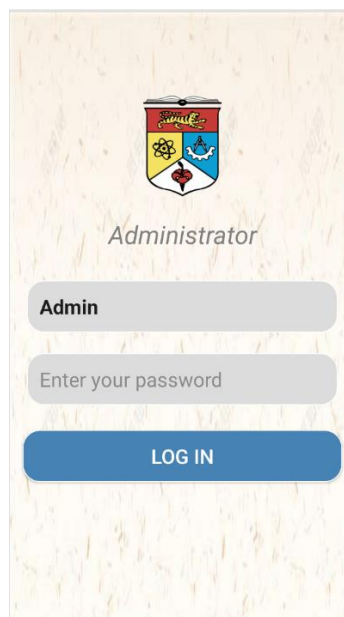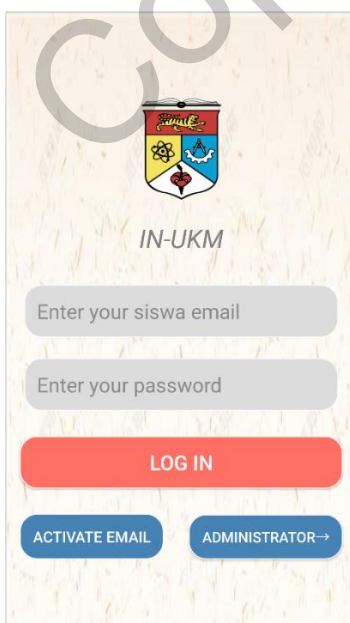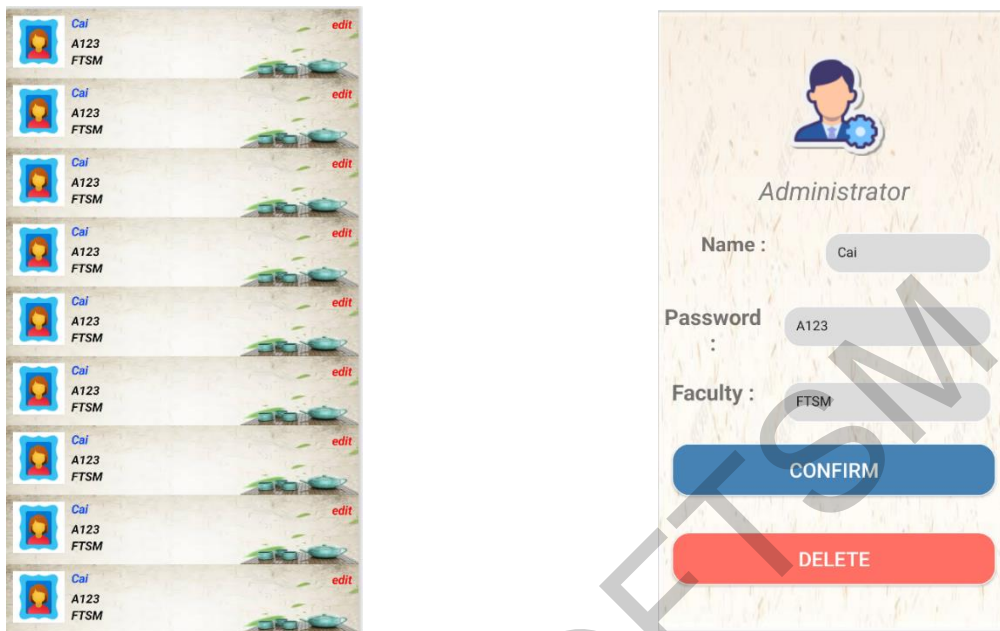
Figure 3.7 administrator login and management student

Due to certain family reasons, the student had to withdraw early from school. So the school told the administrator that the student had withdrawn from school and the school needed to delete all the information about the student. So the administrator went to the login screen and clicked on the administrator button. The administrator entered the correct administrator password. Successfully logged in to the administrator page. The administrator first selected the Manage Students button. After that found the student and clicked on the Edit button behind the student information. After coming to the student information page, he clicked on the Delete button. And successfully deleted all the student information of that student.
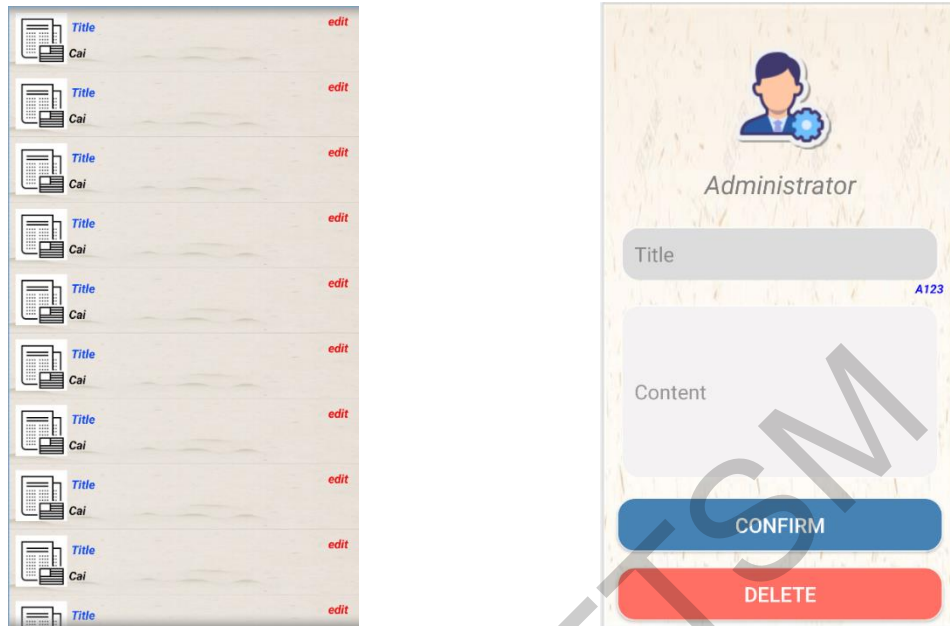
Figure 3.8 management News/Activities

The administrator then returns to the Admin screen and selects the Manage News/Events button. Locate the activity posted by the student and click on the Edit button. After that go to the activity posted by the student. Then click on the Delete button to remove it.
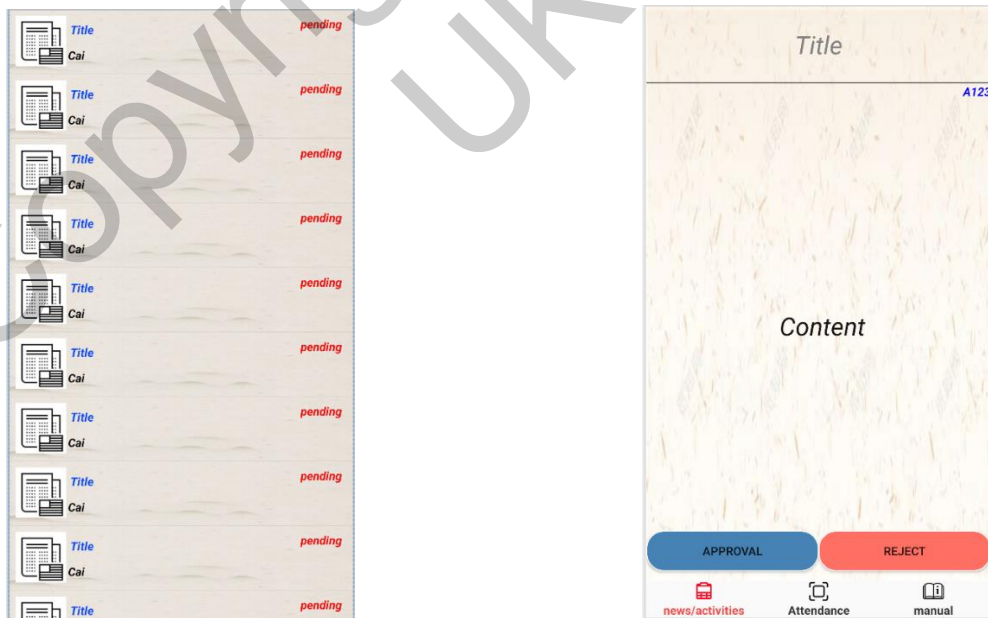

Figure 3.9 approval pending News/Activities

The administrator then needs to check the new news submitted by the students and decide which ones to approve and reject, so the administrator clicks on the "Approve News" button and selects the approved news.

Keputusan dan Perbincangan

The IN-UKM application was tested to ensure that all components of the application functioned correctly and that the correct connectivity functionality between each component was implemented after integration. The testing principle for this application was to use white-box testing methods for functional testing and usability testing as non-functional testing.   The purpose of white-box testing is to verify the correctness of individual functions, modules or the system as a whole. White-box testing is a software testing technique that involves examining the internal structure and implementation details of a software system. It focuses on understanding the internal logic, code paths, and data flow to ensure that the system is functionally correct. This section will be evaluated by testing specific components, paths, and conditions in the software. Usability testing focuses on evaluating the usability and user-friendliness of the software/system/technology. The purpose of usability testing in this section is to determine the extent to which the application meets the needs of the user, how easy it is to learn and use, and how satisfied the user is with the overall user experience. Usability testing is conducted to evaluate the user interface, navigation, layout, and overall user experience of a software/system/technology. It involves observing users performing specific tasks or scenarios and collecting feedback on their interactions with the system. The goal is to identify any usability issues, areas for improvement, and opportunities to enhance the user interface and experience. And the application is tested by conducting usability testing to ensure that it is intuitive, effective, and provides a positive user experience. Usability testing plays a critical role in refining the user interface and overall usability, resulting in increased user satisfaction and adoption.   When the test results show that the full functionality is process-ready

and passes at 90% or more. When a high level of user satisfaction is achieved, the test can be completed and exited. At this point the test is considered complete and successful.

Test Results

In the initial phase of testing, a comprehensive white-box approach was employed to evaluate the application's functionality. This involved conducting rigorous button tests, text tests, and function tests across all aspects of the application. Remarkably, the results obtained from these tests consistently aligned with the anticipated outcomes. Even when subjected to erroneous operations, the system adeptly handled and promptly communicated error messages to the users, ensuring transparency and effective error handling. Following the comprehensive white-box testing, the focus shifted towards conducting a usability test, which sought to gauge user satisfaction and assess the application's overall usability. More than ten users, representing a diverse range of backgrounds, participated in the test. The results unveiled a majority of users expressing high levels of satisfaction with the application's interface, functionality, and ease of use. These aspects garnered significant praise, reinforcing the successful design choices made during the development process. However, it is worth noting that a subset of users encountered challenges with the application due to the specific characteristics of their phone models. While this led to a diminished user experience for these individuals, they still acknowledged the availability and accessibility of all the application's functions. Despite these isolated instances, the overwhelming positive feedback from the majority of users solidifies the application's effectiveness and usability.

Summary

This pivotal chapter in my application development journey delves into the critical area of testing. Recognizing its importance, I employed two types of testing methods: white-box testing and usability testing. With meticulous attention to detail and the valuable contributions of many users, I successfully executed these tests, producing largely satisfactory results.

My comprehensive testing strategy encompassed both functional and usability aspects, allowing me to gain insight into the performance and user acceptance of the application. The great success of the white-box testing affirmed the robustness of the application and its excellent ability to handle errors. Through this rigorous examination, every corner of the application was meticulously evaluated.

In addition, the usability testing phase came to fruition in the form of overwhelmingly positive user feedback, which clearly underscored the application's broad appeal. Users experienced the user-friendly interface and the full functionality of the application. This strong confirmation of the application's reliability/

However, in the pursuit of a better experience, I must acknowledge the experience of a segment of users who face challenges due to the idiosyncrasies of their particular phone model. Their valuable feedback is what allows me to better reflect and improve. Armed with this knowledge, we are ready to begin future iterations of the app as we strive to improve compatibility and deliver an unparalleled user experience across a large number of devices.

And in the quest for continuous improvement, real-world applications and engagement will be critical. By engaging users in real-world scenarios and soliciting their feedback, it will also allow me to further refine and improve the core of the application.

In summary, this chapter exemplifies the great importance of testing for application development. The execution of white-box and usability testing plays a role in assessing the performance of an application, strengthening its robustness, and enhancing its appeal. Through continuous user involvement and assurance of improvements, I hope to create an application that not only meets expectations, but exceeds them, making users more satisfied with better functionality, an intuitive interface, and seamless compatibility with a myriad of devices.

Kesimpulan

In conclusion, the development of this app, designed to help undergraduate students integrate better and faster into UKM life, was a success. The app provides a range of valuable information and features to facilitate student navigation through all aspects of UKM. Through thorough white-box and usability testing, the application has proven to be functional, robust, and highly user-friendly.

One of the main strengths of the developed system is its excellent functionality. The application effectively fulfils its intended purpose by providing students with the tools and resources they need to navigate UKM smoothly. From providing guidance on activating the SISWA email address to providing a quick overview of the necessary UKMFOLIO and UKMSMP websites, the application ensures that students can easily access key information. In addition, a section dedicated to the latest UKM events and news keeps students informed and engaged with campus activities. The inclusion of a QR code scanning feature further enhances the usefulness of the app, allowing efficient and easy interaction with various services and resources.

Another significant benefit of the application is its user-friendly interface. The design and layout of the application has been highly praised by users who find it intuitive and easy to use. This user-centric approach contributes to user satisfaction as students can quickly and easily navigate through the different parts of the application. In addition, the application's error handling mechanism deserves recognition. Even when an incorrect action occurs, the application subtly communicates the error message to the user, ensuring that the problem is effectively resolved.

The positive user feedback received during the usability testing phase further validated the success of the development system. Most users expressed a high level of satisfaction with the overall usability, functionality, and ease of use of the application. This feedback affirmed that the design choices made during the development process were indeed successful in meeting user expectations. Users particularly liked the user-friendly interface, which allowed them to fully

explore and utilize the application's features. These positive responses enhanced the effectiveness and usability of the application, further enhancing its value to undergraduate students at UKR.

While the developed system has many advantages, it is important to acknowledge its limitations. One of these limitations is the issue of device compatibility. Some users experience challenges due to the specific characteristics of their phone models, resulting in a degraded user experience. To address this limitation, further testing and optimization is needed to ensure that the application works seamlessly on a wider range of phone models and operating systems. By improving device compatibility, the application can reach a broader user base and provide a consistent experience for all students.

In addition, the language limitations of the app may pose a challenge for non-English speaking students. Since the app is entirely in English, it may hinder the inclusion of international students who are not proficient in that language. To increase inclusivity and accessibility, multiple language options could be added to the app. By allowing users to choose their preferred language such as Chinese and Malay, the app could better cater to UKM's diverse international student population, foster a sense of belonging, and ensure equal access to information and resources.

To drive continuous improvement, future iterations of the application should focus on several key areas. First, enhanced device compatibility remains a priority, with ongoing testing and optimization efforts to ensure seamless performance on a variety of devices. Second, integration of multilingual support should be sought, providing language options to accommodate the linguistic diversity of the UKM student body. This step will promote inclusivity and increase accessibility for non-English speaking students. Third, exploring opportunities to integrate additional student services into the app, such as course registration, academic resources, and campus navigation, will further streamline the student experience and increase the value of the app as an integrated tool.

Finally, maintaining a continuous feedback loop with users is critical for future improvements.

Engage students in real-world scenarios and actively solicit their feedback.

Penghargaan

First of all I would like to express my deepest gratitude to my supervisor Dr. Kauthar Binti Mohd Daud for the guidance and support she provided to my research project. Her invaluable guidance, advice and support throughout the research and conduct of the project were invaluable. All of them have been very helpful to my project.

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RUJUKAN

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