Empowerment of Partner Schools Through the Development of the Mini Bank Application (m-MiniBank) at SMKN 7 Bandar Lampung

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ABSTRACT

SMKN 7 Bandar Lampung is an educational unit that manages a Mini Bank which is used for teaching factory practices in financial accounting practices, besides that it is also a school designated by the regional government of Lampung province which heads the Lampung regional public service agency (BLUD). The problems faced in the management of mini-banks are that the business processes are not running optimally, the transaction process is running manually, besides that the manager's capacity knowledge is also inadequate in managing it. The purpose of this community service activity is to develop the capacity and capabilities of partner schools through the development of the Mini Bank application. The empowerment method used is starting from identifying needs and problems, application design, implementation, testing, and finally evaluation. The result of this dedication is a mini bank application with testing carried out involving 10 respondents, the results of the UEQ (User Experience Questionnaire) test show the value of the efficiency aspect is 2.15, the accuracy aspect is 2.14, the clarity aspect is 2.44, the stimulation aspect that is 2.15 and the attractiveness aspect is 2.26 so that the scores on all aspects get an excellent score.

KEYWORDS
m-MiniBank;
Aplikasi;
UEQ;
SMKN 7 Bandar Lampung;

1. Introduction

Information technology provides broad and easy access to information [1]–[7]. Through the internet, students and teachers can find and access educational resources from around the world [8]–[10]. Learning materials, references, academic journals, and e-books can be accessed quickly and efficiently [11]–[15]. This helps students expand their knowledge and get information that is not limited to the material taught in class [16]. Apart from that, Information Technology enables collaboration and communicatio. Students can interact with teachers and classmates via email, online dialogue, discussion forums, and collaborative platforms [17]. It supports the exchange of ideas, group discussions, and collaboration on projects. Students can learn together, broaden their understanding, and develop social skills. IT supports education data management[18]–[23]. The school information system and student database enable efficient management of student data, such as academic records, attendance, schedules and other important information[24], [25]. This makes it easier for school administrators and teachers to track student progress, analyze data, and make data-driven decisions [26]–[29]. IT assists students in developing technology skills that are essential in today's digital age. The use of IT tools and applications in education helps students become more proficient in using technology, such as application productivity, collaborative tools, software design, and programming languages. These technological skills are invaluable in a variety of occupational fields[1], [6], [10], [20], [23], [30].

At SMK Negeri 7 Bandar Lampung, saving activities are carried out as a means to train students in terms of saving and being diligent in saving. In addition, this activity also serves as a place of practice for students majoring in accounting. The practice is carried out as part of the SMK curriculum which

adopts the teaching factory concept, where students are careful based on the vocational they choose. One of the practices carried out is a mini bank, where students take turns serving as administrators. Currently, the savings management system is still done manually by recording it in a savings book and an Excel file. Data recording and storage is carried out in a master book which is divided into several sections, such as a daily savings book and a monthly savings book. The data recorded in the book is then transferred to an Excel file which is also divided into several files, such as daily recap, monthly recap, and yearly recap.

From the results of interviews with the teacher in charge, bank staff (students majoring in accounting), and students, several problems were found in saving management. These problems include data discrepancies between records and the amount of money received due to changing officers every day, many streaks and calculation errors, confusing withdrawal slips with deposit slips, date or nominal input errors, the amount of data that must be inputted, difficulty finding student pages that want to save , and it takes a long time to process withdrawing money because you need to find and match data first. The process took a long time due to the large number of students saving, with around 100 people per day from each class. This causes delays in the withdrawal of funds, with completion times reaching 3-5 days before industrial visits, field practices, and graduation activities, because many students withdraw their savings at that time.

From this community service, it is hoped that it will facilitate a banking system that is designed according to user needs at SMK Negeri 7 Bandar Lampung. This system is web-based so that users do not need to download applications so that they can save cellphone memory, besides that the website is more flexible which can be opened by various hardware devices without having to adjust the operating system. The information system that is built requires testing to measure functionality and user experience testing to measure the usability of the system to be developed. Functionality testing is carried out by super admins (person in charge), admin (officers), and users (students, staff, teachers) using blackbox testing. In testing the user experience is done through the User Experience Questionnaire (UEQ) which involves respondents (superadmin, admin, users) in the test. The results of these tests are used to determine the feasibility of the system that has been built. The system developed in this study was also tested for system performance in load testing using the Jmeter software. Load testing is a performance testing technique in which response is measured under various load conditions. Load testing helps to find out how the system behaves when it is run under the condition that several users are accessing the system simultaneously.

In community service, it is hoped that the banking system that is designed according to the needs of users at SMK Negeri 7 Bandar Lampung can become easier. This system is a web-based system that does not require downloading an application, thereby saving cellphone memory. In addition, the advantage of the website is its flexibility which allows it to be accessed via various hardware devices without the need to adjust the operating system. In information system development, functionality testing and user experience testing are very important. Functionality testing is carried out by super admins (person in charge), admin (officers), and users (students, staff, teachers) using the blackbox testing method. Meanwhile, user experience testing is carried out through the User Experience Questionnaire (UEQ) which involves respondents (super admins, admins, and users) in the testing process. The results of this test are used to determine the feasibility of the system that has been built. In addition, the system developed in this study also underwent performance testing in load testing using the Jmeter software. Load testing is a performance testing technique that tests system response under various load conditions. Load testing helps in evaluating how the system performs when it is running with multiple users accessing it concurrently. The results of this performance test provide important information in assessing the performance of the system that has been developed. Thus, this community service aims to improve the banking system at SMK Negeri 7 Bandar Lampung by developing a web-based system that has gone through functionality testing, user experience testing, and performance testing.

2. Method

In developing an application that benefits the community, we choose to use the community service method. This method is an approach that involves active interaction with the community who will

become users or beneficiaries of the application being built. In carrying out the community service method, we have followed structured and organized stages. These steps can be seen in Figure 1.

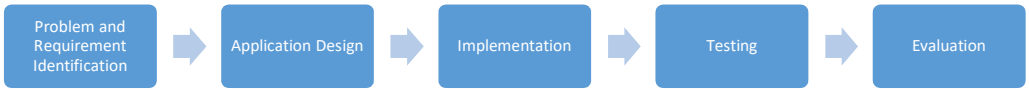

Fig. 1. Stages of Community Service Implementation

1. Identification of Problems and Needs: The initial stage is to identify the needs of the users or communities that will be served by the application. This involves gathering information about problems or deficiencies that need to be addressed with the application. The gathering of these needs was carried out through interviews and discussions with the person in charge of the mini bank and mini bank officers at SMK Negeri 7 Bandar Lampung. The needs obtained from interviews are written in the form of user stories.
2. Application Design: The design stage includes designing the user interface and application structure. This includes the selection of design elements, layout settings, navigation, and selection of appropriate technologies.
3. Implementation: After going through the application design stage, then after that it is implemented. At this stage, the application is installed, configured and officially launched.
4. Testing: After development, the application needs to be tested to ensure that the functionality is running properly and meets the needs of the users. Testing is conducted to detect bugs or errors, as well as test application performance and security. Next, the app is evaluated based on user feedback to ensure its usability and quality.
5. Evaluation: After testing, the next step is to evaluate the test results.

3. Results and Discussion

3.1. Identify Problems and Needs

This practical activity is carried out based on the vocational school curriculum for conducting teaching factories where students are trained based on the vocational they choose, one of which is the implementation of mini-banks which are carried out in rotation between students on duty, where the current system for managing savings is still manual, namely carried out by recording on passbook and excel file. Recording and storing data is written in the main book, which is divided into several sections such as daily passbook and monthly passbook, data recorded in the book will be transferred to an excel file which is divided into several files such as daily recap, monthly recap, and annual recap . Figures 2 and 3 are forms of data collection and service problems that are still being done manually.

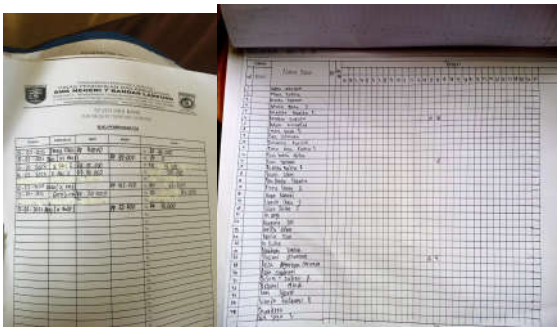

Fig. 2. Problems with manual data collection

Fig. 3. Service is done manually

In this needs analysis stage, the system requirements were obtained from the client through interviews and discussions on June 2, 2023 at SMK Negeri 7 Bandar Lampung. Interviews and discussions were conducted with the teacher in charge of the bank, bank officers, and students. The results obtained by the developer are written in the form of user stories with the format "As <type of user>, <I want to do something> so that <benefit from this action>". Descriptions of users or actors can be seen in table 1 below.

Table 1. System User Actors

No	Actors	Description
1	Responsible Person/ Super admin	System manager who has the authority to manage activities related to the system
2	Officer / Admin	Bank manager in charge of serving the user
3	Users/ Users	Teachers, staff, students of SMK Negeri 7 Bandar Lampung

On the transaction page the admin can manage savings and withdrawals such as adding, changing and deleting data. On the admin activity page, you can also manage it, namely adding, changing, and deleting data. Whereas on the dashboard the user can see the history of transactions that have been carried out that have been carried out by the admin.

3.2. Application Design

3.2.1. Use Case Diagram

Use Case Diagram describes the interaction of actors in this web-based mini-bank information system. Use case diagrams will explain the activities carried out by actors such as those in charge, admins, and users [31]–[40]. The use case of the system to be developed can be seen in Figures 4, 5 and 6.

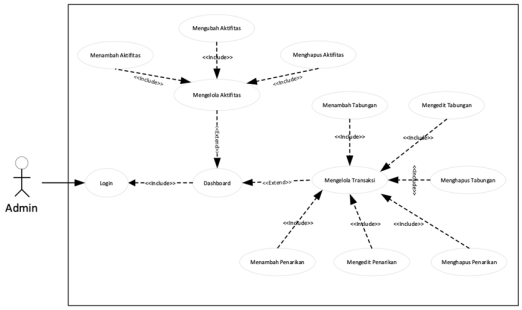

Fig. 4. Use Case Diagram Admin

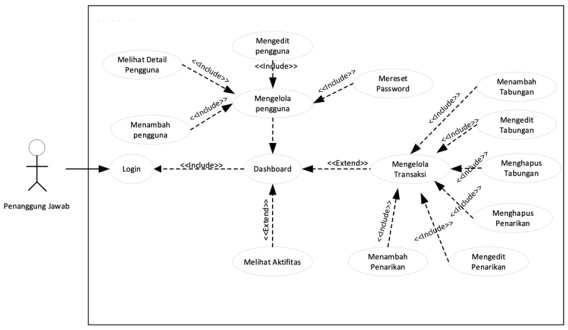

Fig. 5. Use Case Diagram Penanggung Jawab

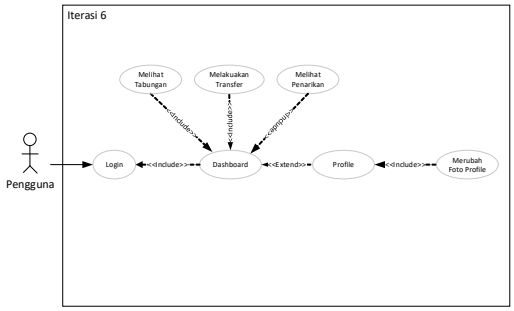

Fig. 6. Use Case Diagram Pengguna

3.2.2. Entity Relationship Diagram

Entity Relation Diagram is a model used to design a database so that data relations can be described. The design that is made still allows changes to the diagram structure [41]–[47]. The entities used in this database system are users, groups, groups_users, savings, withdrawals, activities, transactions, study programs, classes, academic_years, and total_savings [48]–[53]. Each table has a relationship with other tables such as one to one and one to many, each table has a primary key which is marked in italics and underscores and a foreign key which is marked in bold [54]–[59]. The entities that have been designed can be seen in Figure 7 below [60].

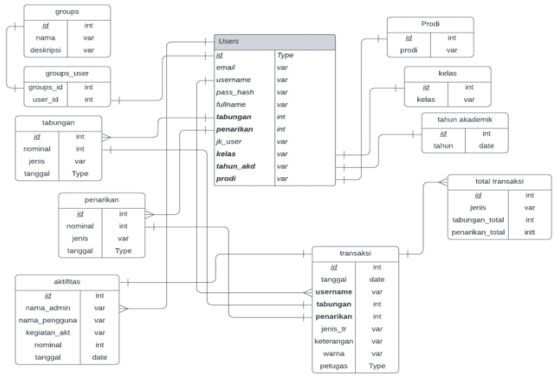

Fig. 7. Database Design

3.2.3. Interface Design

The design of the interface in the development of this mini bank information system is important because the interface will connect the user with the system. User interaction with the system will create a user experience that is closely related to the success of the system. The low-fidelity interface design for the development of this mini bank information system is as follows:

Fig. 8. Login Page

Figure 8 is the login page, there is a username and password form. After the user fills out the form correctly, they will enter the dashboard page according to their respective access.

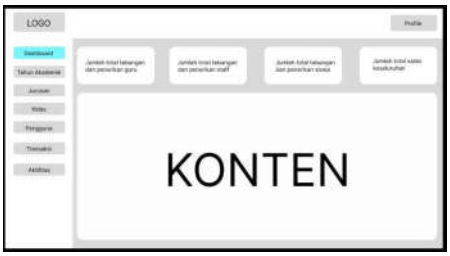

Fig. 9. Admin Dashboard Page

Figure 9 is the banking admin page, where there is unprocessed data information that is displayed based on savings, withdrawal and transfer transactions.

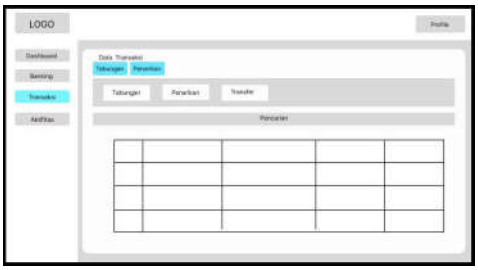

Fig. 10. Admin Transaction Page

Figure 10 is the admin transaction page, on that page there are buttons for inputting savings and withdrawal data, a search feature, and a table of transaction data compiled based on savings and withdrawal transactions.

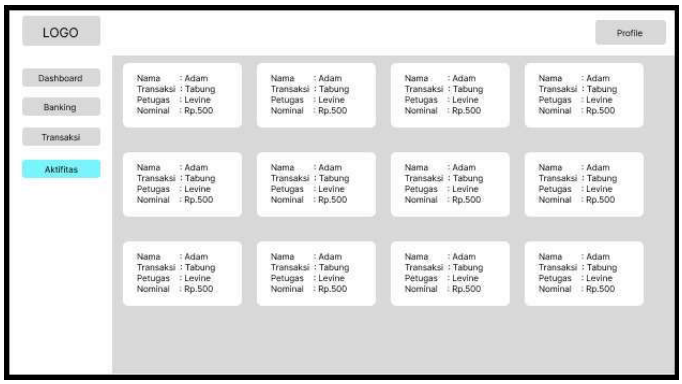

Fig. 11. Admin Activity Page

In Figure 11 is the admin activity page, on that page there is information on the history of transactions made, the data displayed is the name, type of transaction, the officer who inputted the data, and nominal.

3.3. Implementation

The stages described regarding the stages of making the system from the initial phase to the final phase that have been implemented so as to produce a website-based mini bank information system.

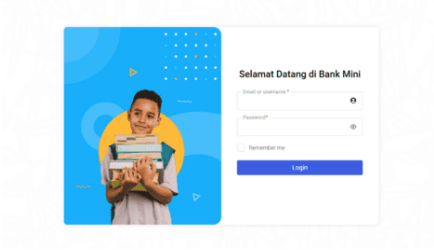

Fig. 12. Login Page

In Figure 12 is the login page to enter the system, the page has an email and password form that must be filled in, all users who want to enter the system must enter their email and password on this page, if the input is correct then it will be redirected to the dashboard page of each account based on roles.

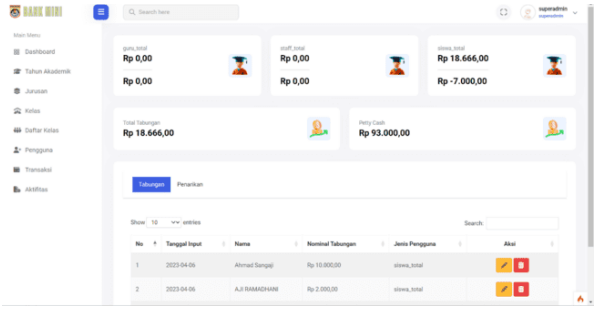

Fig. 13. Admin Dashboard Page

Figure 13 is the superadmin dashboard page that appears after logging in. This page displays information on the total savings of teachers, staff and students as well as the total amount of all savings and the amount of patty cash.

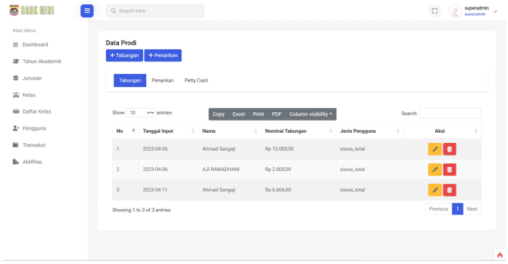

Fig. 14. Admin Transaction Page

Figure 14 is the superadmin transaction data management page, on this page superadmin can add, change, and delete transaction data made by admins and users as well as managing pattycash data.

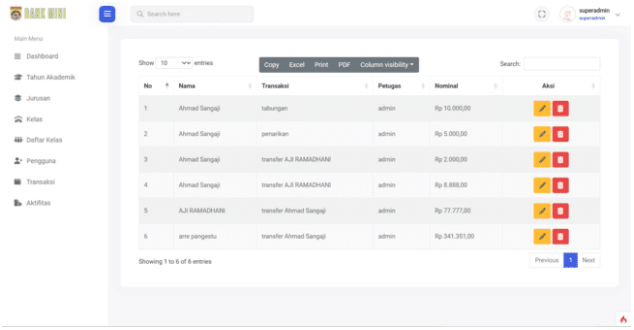

Fig. 15. Admin Activity Page

Figure 15 is the superadmin activity data management page, on this page superadmin can change and delete activity data carried out by the admin.

3.4. Testing

Testing of the system and program is carried out after the system work is complete. The results of the overall system design include programming and testing of the system. Tests on the mini bank service information system use the User Experience Questionnaire (UEQ) test to test user satisfaction in using the system. The results of the User Experience Questionnaire (UEQ) test on the mini bank service information system were carried out by distributing a questionnaire consisting of 26 questions which involved 10 respondents consisting of persons in charge, admins, and users.

On the transaction page the admin can manage savings and withdrawals such as adding, changing and deleting data. On the admin activity page, you can also manage it, namely adding, changing, and deleting data. Whereas on the dashboard the user can see the history of transactions that have been carried out that have been carried out by the admin. The following questions are contained in the User Experience Questionnaire (UEQ) which can be seen in Figure 16:

	1	2	3	4	5	6	7		
menyusahkan	○	○	○	○	○	○	○	menyenangkan	1
tak dapat dipahami	○	○	○	○	○	○	○	dapat dipahami	2
kreatif	○	○	○	○	○	○	○	monoton	3
mudah dipelajari	○	○	○	○	○	○	○	sulit dipelajari	4
bermanfaat	○	○	○	○	○	○	○	kurang bermanfaat	5
membosankan	○	○	○	○	○	○	○	mengasyikkan	6
tidak menarik	○	○	○	○	○	○	○	menarik	7
tak dapat diprediksi	○	○	○	○	○	○	○	dapat diprediksi	8
cepat	○	○	○	○	○	○	○	lambat	9
berdaya cipta	○	○	○	○	○	○	○	konvensional	10
menghalangi	○	○	○	○	○	○	○	mendukung	11
baik	○	○	○	○	○	○	○	buruk	12
rumit	○	○	○	○	○	○	○	sederhana	13
tidak disukai	○	○	○	○	○	○	○	menggembirakan	14
lazim	○	○	○	○	○	○	○	terdepan	15
tidak nyaman	○	○	○	○	○	○	○	nyaman	16
aman	○	○	○	○	○	○	○	tidak aman	17
memotivasi	○	○	○	○	○	○	○	tidak memotivasi	18
memenuhi ekspektasi	○	○	○	○	○	○	○	tidak memenuhi ekspektasi	19
tidak efisien	○	○	○	○	○	○	○	efisien	20
jelas	○	○	○	○	○	○	○	membingungkan	21
tidak praktis	○	○	○	○	○	○	○	praktis	22
terorganisasi	○	○	○	○	○	○	○	berantakan	23
atraktif	○	○	○	○	○	○	○	tidak atraktif	24
ramah pengguna	○	○	○	○	○	○	○	tidak ramah pengguna	25
konservatif	○	○	○	○	○	○	○	inovatif	26

Fig. 16. UEQ (User Experience Questionnaire)

The data that has been obtained from the questionnaire is then entered into the UEQ data analysis tool according to the guidelines on the official website https://www.ueqonline. org, then the data is transformed by calculating the value obtained from the UEQ questionnaire, the value is subtracted by 4 and the result of the reduction is a positive value or the lowest negative value is -3. From the results of the data transformation, the average value of each aspect of UEQ is obtained. The following are the results of UEQ data processing in table 2 below.

Table 2. The UEQ Result

Parameters	UEQ Score	UX Aspects	UES Score
Attractiveness	2.26	Attractiveness	2.26
Pragmatic Quality	2.24	Clarity	2.44
		Efficiency	2.15
		Accuracy	2.14
Hedonic Quality	2.05	Stimulation	2.15
		Novelty	1.95

After the data is processed according to the guidelines on the official website https://www.ueqonline.org, the results are shown in table 2. The highest UEQ scale value is in the Attractiveness aspect, namely 2.26. The value obtained indicates that the mini bank information system has a positive evaluation so that the system has attractiveness. The following results are obtained from the Pragmatic Quality aspect which is the result of the average clarity, efficiency, and accuracy aspects obtained by the UEQ scale of 2.24. The value obtained in the aspect of clarity is 2.44, where the results indicate that the developed online service information system has clarity in its use and is easy to understand. Furthermore, namely the aspect of efficiency, the value obtained is 2.15, from the results of this value, the information system can be used quickly and efficiently by users. Then the value obtained from the accuracy aspect is 2.14, the value obtained indicates that the interaction in the information system can be controlled by the user. In the Hedonic Quality aspect, the UEQ scale value is 2.05 which is obtained from the sum of the average stimulation aspects and novelty aspects. The results obtained from the stimulus aspect are 2.15, these results indicate that information systems can be useful for users. Then from the novelty aspect, the UEQ scale value of 1.95 is obtained from this value indicating that the information system can attract the user's attention in using it.

3.5. Evaluation

Testing was also carried out using the User Experience Questionniere (UEQ) to measure user experience in using the developed information system. The UEQ test uses a questionnaire with 10 respondents, where the respondents include students, staff and school teachers, and the results show excellent results. These results indicate that the designed information system is good.

4. Conclusion

Based on the results of community service that has been explained in the process of developing a website-based mini bank information system at SMK N 7 Bandar Lampung, the following conclusions are obtained:

1. The website-based mini-bank information system that was built will be used by the admin in the process of performing services such as savings, withdrawals, and transfers which can be done online so that the admin does not need to do the bookkeeping process. Users can find out information on savings balances, withdrawals, and the total balance they have, so it will be easier for users to find out their savings information.
2. Testing using blackbox testing carried out by the user obtains valid results. Then the results obtained from the UEQ test obtained the value of the efficiency aspect, namely 2.15, the accuracy aspect, which was 2.14, the clarity aspect, which was 2.44, the stimulation aspect, which was 2.15 and the attractiveness aspect, which was 2.26 so that the values for all aspects obtained excellent value.

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Author Contribution

The activity plan in order to implement the solutions offered that there are five series of activities, namely coordination, logo design, socialization of covid, marketing, and marketing education.

Funding

Special thanks to the Ministry of Education, Culture, Research and Technology, Republic of Indonesia for the trust given to our team. The financial support from this grant has enabled us to overcome challenges and implement our community service programs more effectively and efficiently.

Conflict of Interest

The authors declare no conflict of interest.

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