Implementation of Agile Methods on Development of Savings and Loan Cooperative Information Systems

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Abstract

Koperasi Sehati Makmur Abadi is a savings and loans cooperative whose data processing process still uses a system that is accessed through an old version of the browser and if the browser is updated to the latest version, it will result in the system not being able to run. The system used now sometimes experiences errors because it still uses old technology, it is certain that if it still uses old technology, it will make the business will be left behind with the times that continue to develop, and in the old system the appearance of the system is not attractive Anda lso the system used does not involve its members, in the development of technology which now the system has involved many users as in banks have given access to their customers so that they can check balances, transfer transactions and so on. This problem must be resolved so that the business can develop and not be left behind by other competitors. Using a web-based information system application can make it easier if you want to open it in various browsers or devices such as gadgets and can be used anywhere and anytime. The use of methods in this research starts from the type of data used is primary data or single data that researchers get through interviews, direct observations, and literature studies, while in the use of the system design method using agile methods and the implementation in this research uses PHP language for website development and for the database itself using databases MySQL. From the results of this research or research, it is hoped that the system created can process data such as member data, installments, loans, deposits and so on, it is hoped that it can facilitate the Sehati Makmur Abadi cooperative in managing data.

Keywords: Agile, Savings and Loan Cooperatives, Information Systems

1. INTRODUCTION

The increasing use of information and communication technology that makes people change the flow in the system of work. People are required to follow the flow of the system to survive, develop, and continue to learn. However, there are still many institutions or organizations or individuals who are not quick to respond to changing habits, shifts, and movements in work culture [1]. With the advancement of technology that continues to develop, it will provide various conveniences for companies or organizations in carrying out their tasks, so that if

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they do not follow developments, they will be left behind. Technology has always been associated with the internet, according to data [2], internet users in Indonesia alone are estimated at 212.35 million people or 76.8% of the total population touching 276.3 million people. The internet is very closely connected in people's lives now so that many use the internet and technology as helpers in doing work, from doing business to helping organizations in doing their jobs. For example, cooperatives that need technology to help and simplify work.

According to Law Number 17 of 2012 has stated that the cooperative is a business entity that is enforced by an institution or individual, through capital from the money of its own members to run the business or cooperative, which can cover common needs in all fields [3]. A cooperative is a legal entity that uses more administrative processes; therefore, computerization plays a very important role in making transactions so that the administrative process can be carried out quickly, accurately and precisely [4]. The number of cooperatives active in Indonesia in 2021 according to the Central Statistics Agency is around 127,846, this number continues to increase every year [5].

Koperasi Sehati Makmur Abadi which handles savings and loans to the community, currently the Sehati Makmur Abadi cooperative already has a system that uses java which is accessed through the old version of the firefox browser and if firefox is updated to the latest version it will cause the system to be unable to run, by preparing a device that must be available specifications needed by the system, this problem can hamper cooperative staff in doing work if they use a browser or a browser version above it. The system used now sometimes experiences errors because it still uses old technology, it is certain that if it still uses old technology, it will make the business will be left behind with the times that continue to develop and also the system used does not involve its members, in technological developments that now the system has involved many users such as in banks have provided access to its customers so that the system used does not involve its members, in technological developments that now the system has involved many users such as in banks have provided access to its customers so that can do balance checks, transfer transactions and so on. In this cooperative system, which uses the system, only the leader and admin or teller, in the system used by the leadership and admin there is no difference when accessing the system.

Seeing the problems owned by the Sehati Makmur Abadi cooperative, this research is aimed at solving problems or finding solutions, using a web-based system, it is hoped that it can make it easier for cooperative staff to process data, because this system can be run by accessing a link and then can be used on various devices anytime and anywhere without having to install specifications required by previously used systems. And in this system, it will later provide access to members so that they can see deposits and loan installments. From the problems seen, the

author wants to raise this research with the title "Implementation of the Development of Savings and Loan Cooperative Information Systems with Web-Based Agile Methods". With the creation of the system, it is hoped that it can provide solutions or provide convenience for the Sehati Makmur Abadi Cooperative without having to install Java and without having to adjust the browser version.

2. METHOD

2.1. Data Collection Method

A data collection method is a method that carries out the process of collecting information or data that is useful for the continuation of this study [6]. In this research, researchers get information or data derived from interviews, literature studies, and direct observations or observations.

2.1.1 Literature Studies

Library Studies are carried out by obtaining information or data sourced from e-books or articles that have been compiled. The e-book or article already contains an organized theoretical foundation. This method of data collection is more widely used for smoothness in research [7]. With literature studies researchers get references from previous research and can make this research more organized.

2.1.2 Observation

Observation or commonly called direct observation is a method of collecting data which is carried out by observing a research object from recognizing the object and then evaluating until the data is collected enough to continue the research [8]. With the observation method, researchers collect data by knowing or observing directly what is in the object and what is a problem with the object.

2.1.3 Interview

Interviewing is a process of communication between researchers and research subjects with a question-and-answer process in order to dig up information or obtain supporting data. In general, the purpose of interviews is to dig deeper into information about the themes raised in a study. In today's time when technology continues to advance, interviews can be conducted without having to meet in person, namely through telecommunications media [9]. The techniques used in these interviews were carried out systematically with the subject of study [10]. With interviews researchers know more about the system or anything that is not

known by means of observation or literature studies so that research can become more complex.

2.2. System Development Method

Agile, as a concept, became famous in the late 1990s through attempts to overcome perceived difficulties with existing solution development processes that take root and owe their rigidity to plan-driven practices. Agile seeds had been sown in the 1980s when the shortcomings of traditional methods were becoming more clearly driven by the emergence of new technologies and the increasing volatility of the business environment. Agile advocates promote the idea that the uncertainty of plans must be embraced and control with input and execution. Therefore, the agile plan demonstrates an open communication between stakeholders for diverse interests [11]. The Agile method certainly has its own advantages over other methods, namely, it can increase customer satisfaction, if there is a failure, it will not drain much loss both materially and immaterially, can reduce the failure ratio in terms of non-technical aspects, and can conduct a review of software or systems made earlier [12].
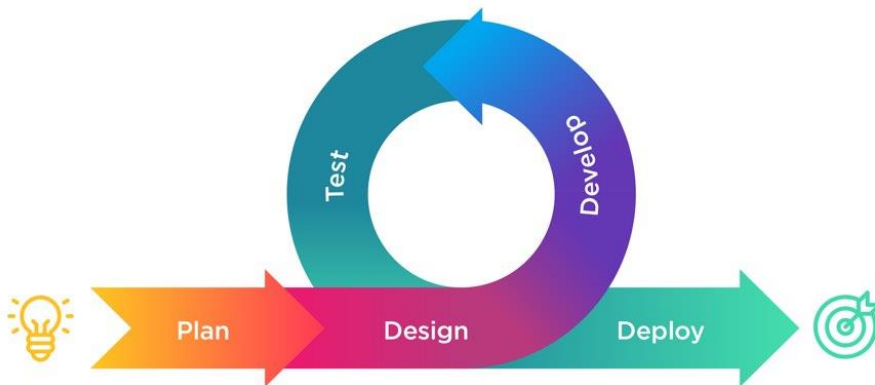

Figure 1. Agile Method [13]

In the agile method, there are several stages in the development of a software or system application, here are the stages of the agile method:

1. Plan

In this stage, the researcher will collect data or information related to the research by interviewing the leaders of the Sehati Makmur Abadi cooperative, then by means of observation or directly observing the performance starting from the process of borrowing, savings, data processing, installments. And the last stage is

the study of the library, by collecting information or data through e-books and journals related to the construction of this system.

2. Design

Design is a stage that focuses on coding including design, structure, interface representation and program creation procedures. This stage neutralizes the usefulness of the system or program from the stage of needs analysis to the representation of the design interface so that it can be designed or applied into an information system. [14].

3. Develop

The design stage needs to be implemented or implemented into a piece of software. At this stage of development will produce a program or system that is in accordance with the previous stage, namely design [15]. In this stage, it is implemented with the help of a framework, namely Laravel , which aims to make it easier to do coding separated by MVC methods or Model, View, and Controller so as to make the program structured [16].

4. Test

This stage is the stage where the system or program that has been implemented is tested using the black box method. From the results of the output whether it is in accordance with the planned [17]. If an error occurs, it will be returned to the develop stage to fix the problem with the system that has been created.

5. Deploy

Deploy is the final stage of this design stage, which is the stage to see the quality of the system, if the system does not have errors or shortcomings of the system created, the system will be handed over to the user for use.

3. RESULT AND DISCUSSION

3.1 Analysis of Ongoing Systems

The purpose of analyzing the running system is to find shortcomings or problems that are then made the basis for the proposal. Koperasi Sehati Makmur Abadi is a savings and loan cooperative whose data processing still uses a system accessed through the old version of the browser and if the browser is updated to the latest version, it will cause the system used to error or cannot be used, if this problem arises it will make users reinstall or reinstall the system.

The system procedures that are currently running in this cooperative will be explained in the flowchart below:
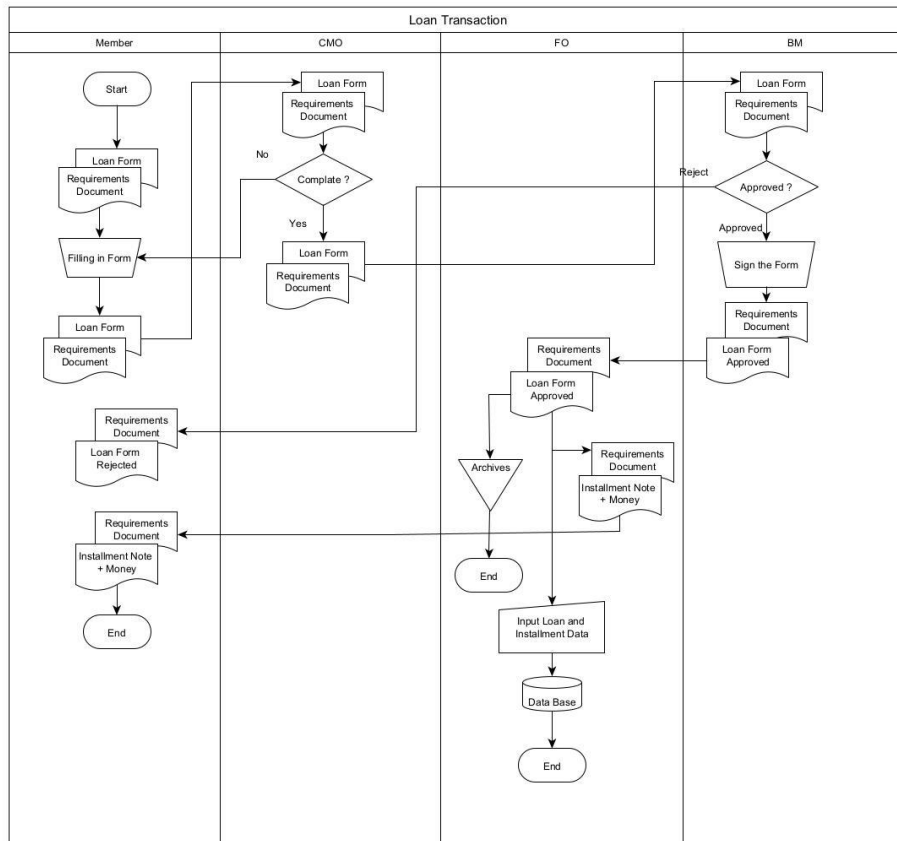

Figure 2. Loan Transaction Flowchart

The system procedures for loan transactions that run from the Sehati Makmur Abadi cooperative are:
1. Members or prospective members come to the office to make a loan with the terms
2. Then members or prospective members are required to fill out the form provided by the cooperative with the help of the CMO and CCO
3. Then check the collateral item which is next in the photo
4. If the form has been filled out, it will be submitted to the BM or leadership for approval or rejection
5. Furthermore, if the application is received, it will be forwarded to the FO or the person who plays a role in entering the data into the system
6. Then the member submits a guarantee in the form of bpkb to the FO and gets proof of bpkb handover

7. Fo inputs member data into the system
8. Furthermore, the FO will hand over the agreed amount of money to the member then get a membership card and a piece of paper containing 10 basic information for the member.

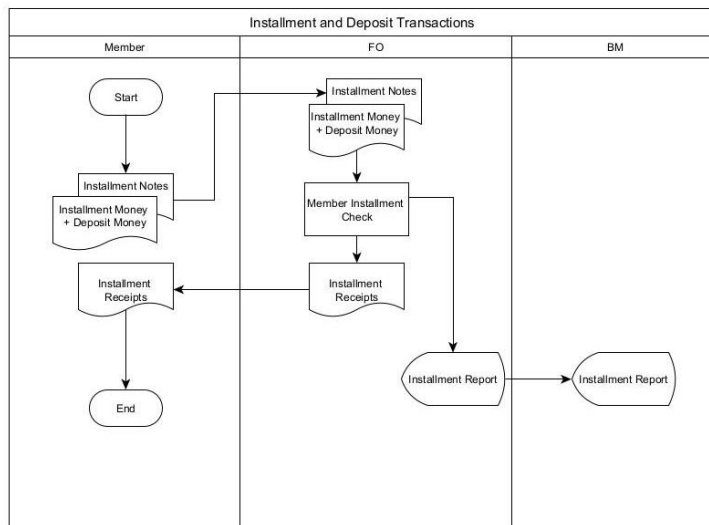The flowchart of the stages of installments and deposits in this cooperative is as follows:

Figure 3. Installment and Deposit Transaction Flowchart

The system procedure on the ongoing installment transaction of the Sehati Makmur Abadi cooperative is as follows:
1. Members come to the office carrying a piece of paper containing 10 basic information for members
2. Then come to the FO or admin to make the payment
3. If you have made a payment, the member will get an installment receipt and a paper containing 10 basic information returned to the member again.
4. If the installment has been completed, the member will get the last installment receipt and the member's bpkb will be returned with proof of bpkb handover

The system procedure on the ongoing installment transaction of the Sehati Makmur Abadi cooperative is as follows:
1. Members come to the office with deposit money with a membership card
2. Then go to the FO or admin to make a deposit deposit
3. When completed, the FO will provide proof of deposit in the form of a deposit receipt and get a new membership card

After analyzing the object of study, you can see the weaknesses that are owned, the following weaknesses are found in the object:
1. The system used still uses old technology
2. Members do not know the number of deposits and loans or installments but can only be seen from a few sheets of paper
3. In the system used by BM, it can input data which is a task of the FO

3.2 System needs analysis

The purpose of analyzing the needs of this system is to find out what is lacking from this system so that a solution can be found to complement the old system, the needs of the system are divided into two parts, namely functional needs and non-functional needs.
1. Functional needs
    1. FO Needs
       The system used by FO is the same as the old system except that there are reductions in various menus
    2. Leadership / BM Needs
       The system used by the leader only displays information in the form of reports
    3. Member Needs
       In the system used by members display information on loans, installments and deposits

4. Non-functional needs
    1. The system is used to provide user convenience according to their respective needs
    2. The system can be used on a variety of devices connected to the internet
    3. The needs of a specification system involving software and hardware are as follows:
       Hardware, which plays a role in building this system is:
        1. Laptop: Acer Aspier 514-54
        2. Processor : Intel Core i3 gen 11th
        3. Memory   : 8 GB
        4. SSD   : 512 GB
        5. Printer   : Canon IP2700

       The software used is:
        1. Windows 10 operating system
        2. Visual Studio Code
        3. Browser Google Chrome
        4. XAMPP
        5. Laravel

The system to be used can be described through a use case diagram, a use case diagram is a modeling of the behavior of the software or system created. In the use case diagram depicts what functions can be performed and who can perform these functions [18]. In the use case of the system created there are several factors such as FO, BM, and members, the following is an overview of the use case diagram of the system to be made:
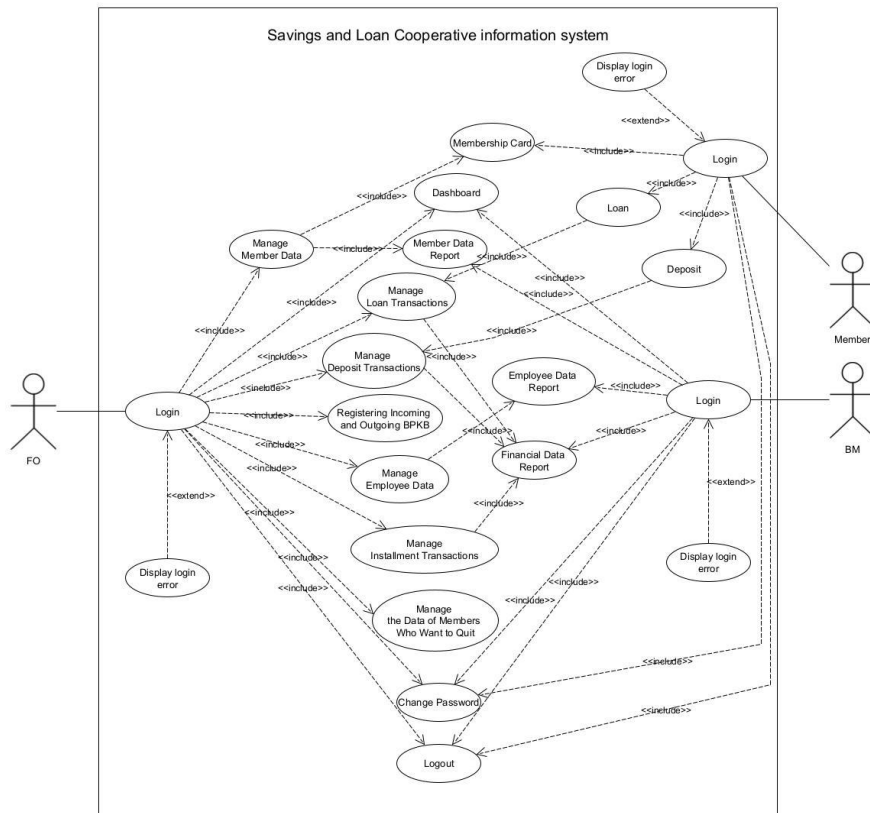

Figure 4. Use Case Diagram on the Savings and Loan Cooperative System

In the use case above, there are several actors, including FO, BM, and members. FO can carry out the process of managing member data, managing employee data, recording loan transactions, recording deposit transactions, installments, managing the data of members who want to stop, changing passwords, logging in and logging out. Then BM can log in, log out, change passwords, view member data, view employee data, and financial reports. Finally, members can view membership cards, view loan data, installments, deposits, change passwords, logins, and log out.

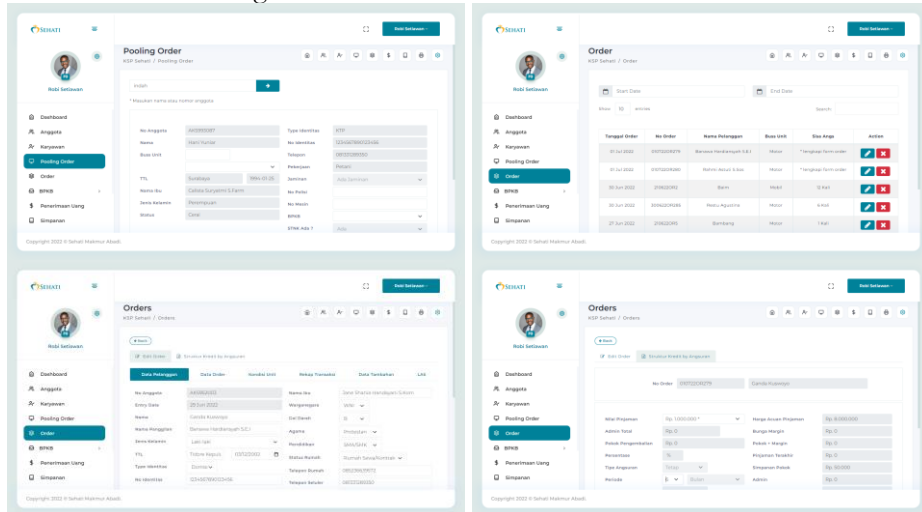### 3.3 Interface Design

1.   Loan Process Page View

Figure 5. Loan process display

This display is a process where customers or members make loans, which starts with the display of pooling orders by looking for the name or member number, then will be directed to the order display, then carry out the process of completing loan data such as loan amount, collateral data, and so on.
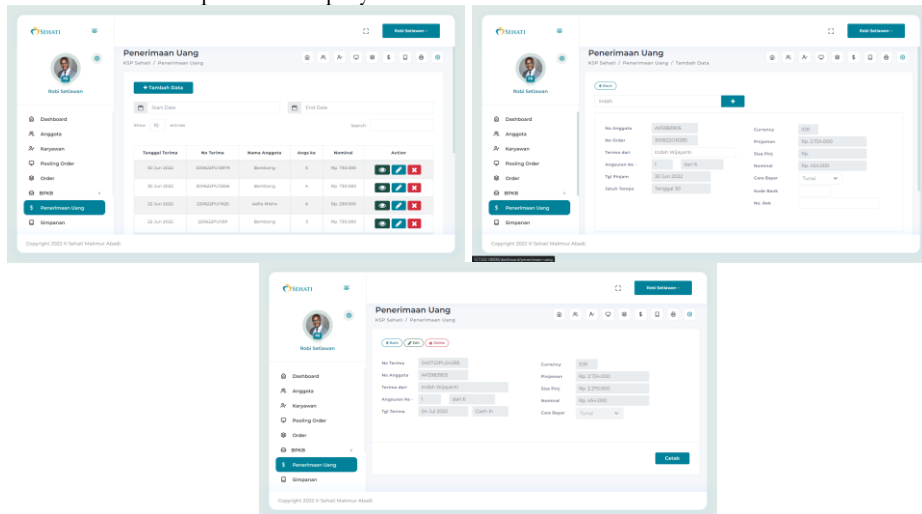
1.   Installment process display

Figure 6. Installment process display

This display is a member installment process, can add installment data by looking for the name or number of the member who made the loan, then can print proof of installments.
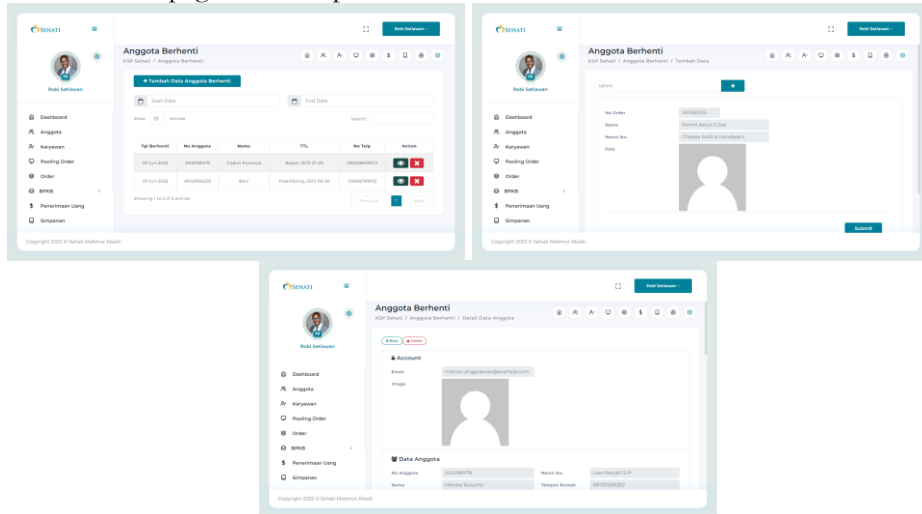
1.   Member page views stop

Figure 7. View of the member logging process stopped

The above view is a logging view of members who want to leave as members of the cooperative, which consists of a view of all data of members who have stopped, a view of adding data to members who want to stop, and a view of the complete data of members who have stopped.
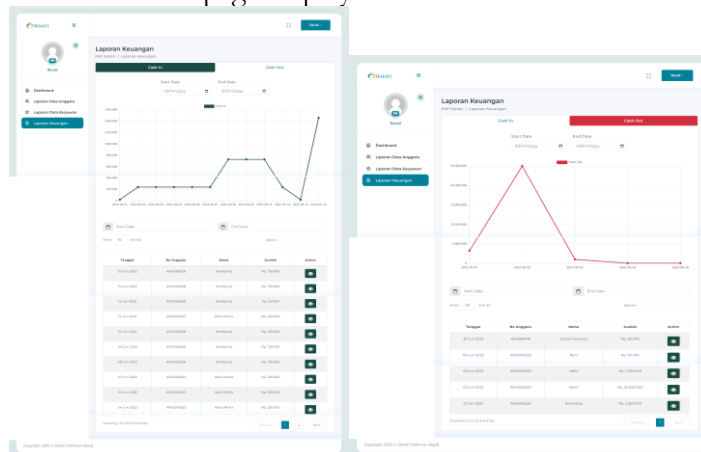
1.   Cash in and cash out page display

Figure 8. Cash in and cash out page display

In this page, leaders can see financial data reports such as money entering through installments and deposits, then money out through loan disbursements and withdrawals of member deposits.

3.4 Testing Using Black Box

Black Box is a system testing method that is more towards functional specifications on the system, the tester conditions the input and performs testing on the system specification [19].

Table 1. Black box testing on FO systems

Input	Process	Output	Test Results
Email and password > login	Log in to the system	View dashboard pages	Succeed
Click the members menu	Go to the members page	• Add members • Edit member data • View member details • Delete member data	Succeed
Click the employee menu	Go to the employee page	• Add employees • Edit employee data • View employee details • Delete employee data	Succeed
Click the Pooling Order menu	Displaying the order pooling page	Looking for members who want to make a loan	Succeed
Click the Order menu	Displaying the order page	• Edit order data • Clearing order data	Succeed
Click the BPKB menu in and out	Displaying incoming and outgoing BPKB pages	• Add bpkb data in and out • Edit incoming and outgoing bpkb data • Delete data	Succeed
Click the Receive Money menu	Display the money receipt page	• Add installment data • Edit installment data • View installment details and print proof of installment • Delete installment data	Succeed
Click the Save menu	View the save page	• Add data of the member who performed the save • Edit your save data • Delete backlog data	Succeed

Click the Stop Members menu	Display the members stop page	• Add data of members who want to stop • View data on members who quit • Delete the data of a member who stopped	Succeed
Click the Print Membership Card menu	Displaying a printed page of a membership card	Find the name or number of the member you want to print	Succeed

Table 2. Black box testing on BM systems

Input	Process	Output	Test Results
Email and password > login	Log in to the system	View dashboard pages	Succeed
Click the Member Data Report menu	Go to the member data report page	View registered member data	Succeed
Click the Employee Data Report menu	Go to the employee data report page	View employee data	Succeed
Click the Financial Statements menu	View the financial statements page	• Displaying cash in and cash out charts • Displaying data on the origin of cash in and cash out	Succeed

Table 3. Black box testing on Member systems

Input	Process	Output	Test Results
Email and password > login	Log in to the system	View dashboard pages	Succeed
Click the Membership Card menu	Go to the membership card page	Displaying personal data	Succeed
Click the Loan menu	Go to the loan page	Displaying loan data and details of the loan	Succeed
Click the Save menu	View the save page	View deposit data and details of the deposit	Succeed

In the black box test above, the tester performs tests starting from the access rights system, there are no failures and displaying the system according to the appearance of their respective actors, and if the email and password are not or have not been registered then the login to the system fails. Then from testing the

system create, read, edit, and delete from all the menus in the system are as desired, and there are no errors, it has also validated if the data entered is not appropriate. Furthermore, on the menu or print feature there is also no problem and when clicked the print button such as printing installment proof, it will be directed to the print menu as when you want to print. On the menu on the members, they have displayed loan data, deposits, and membership card data according to the email that has been registered or in accordance with the data of their respective members. Finally, the report menu on the BM system is already related to what has been input by the FO and will be displayed in the form of a report.

4.   CONCLUSION

Based on the analysis and design that can be concluded, this web-based savings and loan cooperative system is: (1) Producing a web-based savings and loan cooperative information system at KSP Sehati Makmur Abadi that can be accessed anywhere only needs an internet connection and a browser or browser to access it. (2) The system created can already be used by members, so that members can find out data on loans, deposits, and installments, which were previously only through paper and can be lost at any time. (3) The system used already uses the latest technology, because technology cannot stay in place every second technology will always develop. The next suggestion for researchers is that the system can be developed again using the mobile application version by applying notification using SMS gateways as in member actors to be reminded to pay installments before maturity.

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