

The Implementation of Waterfall Method in the Development of Accounting Information Systems for Web-Based Savings and Loans Data Processing (Case study: Sompak Awe Jaya Cooperative)

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ABSTRACT

The Sompak Awe Jaya Cooperative currently manages conventional data, namely recording every savings and loan transaction in a ledger, which is then summarized in Microsoft Excel. Calculations for financial transactions use a calculator, so it takes a long time to process them. So, the authors are interested in designing a savings and loan information system at the Sompak Awe Jaya cooperative. The idea of this design is that the finance department can efficiently process savings and loan data, automatic financial calculations are carried out by the system, and membership registration through the application will increase work efficiency. Meanwhile, cooperative managers can track savings and loan activities, view financial transaction data, receive reports, and print existing reports and this system is accessed by two actors, namely admin and finance. Therefore, the author aims to create an accounting information system for processing savings and loans so that data management is carried out efficiently and effectively and helps secure existing data because the data is stored in the database. This design uses entity relationship diagram modeling and logical record structure for database design while modeling system flow using user case diagrams, deployment diagrams, activity diagrams, and sequence diagrams.

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1. INTRODUCTION

Information technology is a technology used to process data, including processing, collecting and storing data in various ways to produce quality information, namely information that is relevant, accurate and timely, which can then be used for personal, commercial and government purposes. . as well as strategic information for decision making [1]. Savings and loans are activities that are needed in the field of cooperatives [2]. In today's modern era, the development of the internet makes it easy for people to manage information anytime and anywhere, so that the role of web-based applications is very easy to use and very useful for managers [3][4].

Savings and loan cooperatives are business entities that organize the utilization and utilization of the economic resources of their members based on cooperative principles [5] and the principles of economic enterprise to improve the standard of living of members in particular and society in general. Cooperatives are a driving force for the people's economy and pillars of the national economy [6][7]. The Sompak Awe Jaya Cooperative is a financial institution with its complete address at Jalan Rain Mas No. 2 Tayan Hilir, Sanggau Regency, which is one of the Savings and Loan Cooperatives that is most in demand by the people of West Kalimantan. At Credit Cooperatives, the types of loans that are most often submitted by members are Welfare Loans (PKJ) and Productive Loans (PPR), so it is necessary to evaluate the credit application system that applies to the Sompak Awe Jaya Cooperative, especially savings and loan application systems for both types of loans [8][9]. An evaluation of the existing savings and loan system at the Sompak Awe Jaya Cooperative is needed to provide clear knowledge to members regarding the credit application system applied to the Sompak Awe Jaya Cooperative [10][11].

The purpose of this study is to create a web-based savings and loan application that can facilitate Cooperatives in their operational activities [12], starting from recording and recording savings and loan data [13], data search, reporting process [14], and registering savings and loans and using waterfall software development method in designing and building web-based applications [15]. The advantage of the waterfall method is that it has a clear path, making project work more detailed. In this way, errors can be reduced. The more complex the task to be done, the smaller the potential for mistakes to be made. In addition, web applications that are built can be accessed by users in real-time. Unified Modeling Language modelling produces several proposed diagrams, namely Use Case Diagrams, Class Diagrams, Activity Diagrams, and Sequence Diagrams [16]. In the process of implementing the program using the PHP programming language with MySQL database [17].

2. RESEARCH METHOD

2.1 Data Collection Methods

Data collection is very important in research because data is needed for the data [18] Some techniques used in this research, among others:

1. Observation

Observation is a data collection technique, researchers make observations directly to the object of research [19]. The author made direct visits and observations to the Sompak Awe Jaya Cooperative, related to savings and loans, whose address is Jalan Rain Mas No 2 Tayan Hilir, Sanggau Regency.

2. Interview

Interview is done by question and answer between researchers and resource persons using a tool called interview guide. An interview was also conducted with Mrs. Susi as treasurer, asking about the current problems with the Sompak Awe Jaya Cooperative. The problem that occurs is that data management is still conventional, namely recording every saving and loan transaction in a ledger, which is then summarized in Microsoft Excel and calculations for financial transactions using a calculator, so it takes a long time to process it.

3. Study library

Literature study can support the writing of this Final Project, the author conducts a literature study obtained on the <http://ejournal.bsi.ac.id> page and reads other final references such as journals, and assignments that have the same title.

2.2 Software Development Methods

Researchers used the waterfall method to design an Accounting Information System for Savings and Loans Data Processing at the Sompak Awe Jaya Cooperative [20].

The stages of software development using the waterfall method can be described as follows [13]:

1. Needs Analysis

This is the first stage when the author comes to the Sompak Awe Jaya Cooperative and asks what systems are needed for companies engaged in savings and loan cooperatives. Deposit and loan transactions.

2. Design

In this design stage, a multi-step process focuses on the design of making applications based on the results of the data obtained from the analysis stage, which will later be implemented. At this design stage, Entity Relationship Diagrams (ERD) and Logical Record Structures (LRS) are used for modeling database designs, and Unified Model Language (UML) diagram modeling, which consists of several diagrams, namely use case diagrams, activity diagrams, sequence diagrams, class diagrams, and deployment diagrams.

3. Code Program

In this stage, continue coding the program using the hypertext preprocessor (PHP) programming language, and Sublime Text as a text editor, and XAMPP, which is an application package containing Apache, MySQL.

4. Testing

The testing stage is carried out so that the application, whether there are program defects in each form, or there are no errors, then the application that has been made is feasible for the user to implement.

3. RESULTS AND DISCUSSION

3.1. Activity Diagrams

The current system business process regarding savings and loans that is applied to the Sompak Awe Jaya Cooperative will be described as a business process activity diagram model. The description of the activity diagram of a running business process can be seen in the image below.

1. Activity Diagram of Prospective Member

Registration Process The following is an overview of the prospective member registration business process modeled in the form of an activity diagram. The results of modeling the business process for registering prospective members can be seen in Figure III.1.

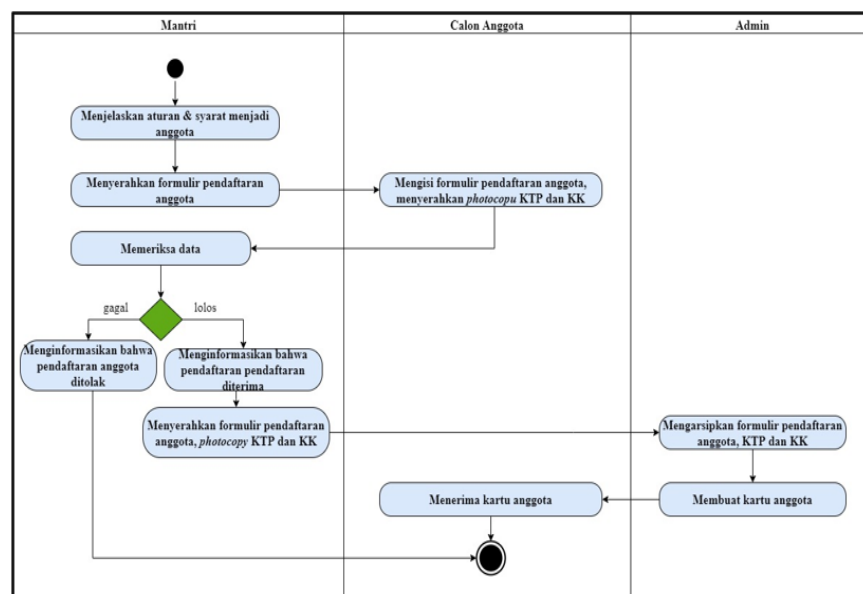


Figure III.1 Activity Diagram of Prospective Member

2. Lending Process Activity Diagram

The following is an overview of the lending business process modeled in the form of an activity diagram. The results of the lending business process modeling can be seen in Figure III.2

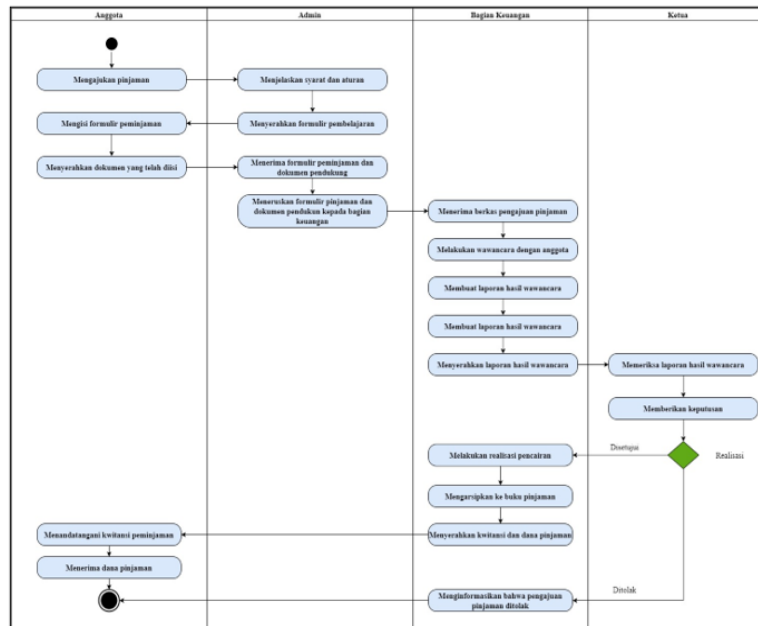


Figure III.2 Lending Process Activity Diagram

3. Activity Diagram Process of Reporting

The following describes the report creation business process, which is modeled in the form of an activity diagram. The results of reporting business process modeling can be seen in Figure III.3.

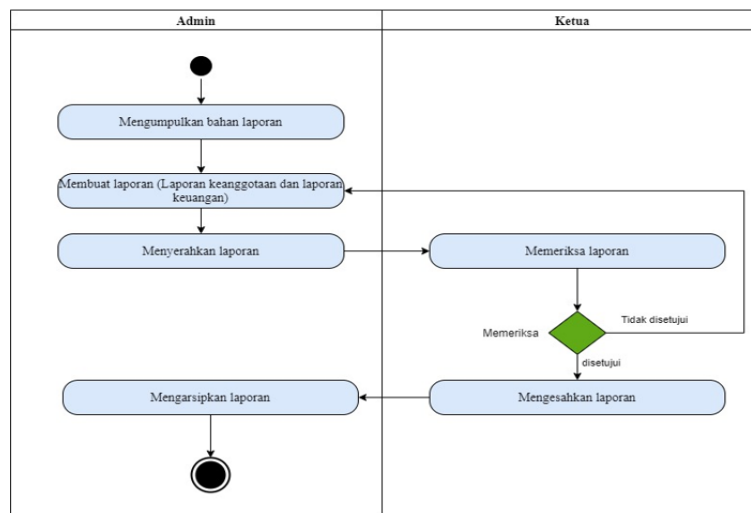


Figure III.3 Activity Diagram Process of Reporting

3.2. Software Requirements Analysis

The Sompok Awe Jaya Cooperative really needs software to help process savings and loan data. Therefore, in this statement, the author would like to propose a system design proposal to assist the Sompok Awe Jaya Cooperative in managing savings and loan transactions. The software requirements analysis phase consists of an analysis phase that describes user needs and is modeled on use case diagrams and activity diagrams. Design of a Web-Based Savings and Loan Management Accounting Information System at the Sompok Awe Jaya Cooperative consists of two levels of access, namely Admin and Finance operate the system. The features of each user level are as follows:

1. Need for Admin Access
 - a. Can log in.
 - b. Can manage member data.

- c. Can manage loan data.
 - d. Can manage installment data.
 - e. Can access loan reports.
 - f. Can access installment reports.
 - g. Can manage time deposit list.
 - h. Can manage deposits.
 - i. Can manage deposit withdrawals.
 - j. Can access savings reports.
 - k. Can manage operational cost data.
 - l. Can access operational expense reports.
 - m. Can logout
2. The Need for Access to Finance
- a. Can log in.
 - b. Can manage account data.
 - c. Can manage loan-type data.
 - d. Manage deposit type data.
 - e. Access loan reports.
 - f. Access installment reports.
 - g. Can manage user data.
 - h. Can manage initial balance data.
 - i. Can access savings reports.
 - j. Can access operational expense reports.
 - k. Can access general journal reports.
 - l. Can access ledger reports.
 - m. Can access the trial balance report.
 - n. Can access reports on the remaining results of operations.
 - o. Can access reports on changes in capital.
 - p. Can logout.

3.3. Designing Use Case Diagrams

From the stages of the needs analysis described, the author can explain the design of the device or system according to user needs. The method of the Savings and Loans Accounting Information System at the Sompak Awe Jaya Cooperative in the form of a use case diagram is as follows (Figure III.3).

3.4. Design

Design of Accounting Information System for Processing Savings and Loans at the Sompak Awe Jaya Cooperative. Starting with database design using entity relationship diagram (ERD) modeling techniques, logical record structures (LRS), file specifications for each entity, sequence diagrams, deployment diagrams, and user interfaces.

3.4.1 Entity Relationship Diagram (ERD)

Entity relationship diagram (ERD) is used as a database design modeling technique to describe relationships between entities in a database based on objects that are interconnected between relations. The following is a form of an entity relationship diagram (ERD) for the database design of the savings and loan accounting information system at the Sompak Awe Jaya Cooperative (Figure III.4).

3.4.2. Logical Record Structure (LRS)

The designed entity relationship diagram (ERD) is then transformed into a logical record structure (LRS) to provide a complete picture of the proposed database design. As for the logical record structure (LRS) design of the Sompak Awe Jaya Cooperative Savings and Loans Accounting Information System (Figure III.5).

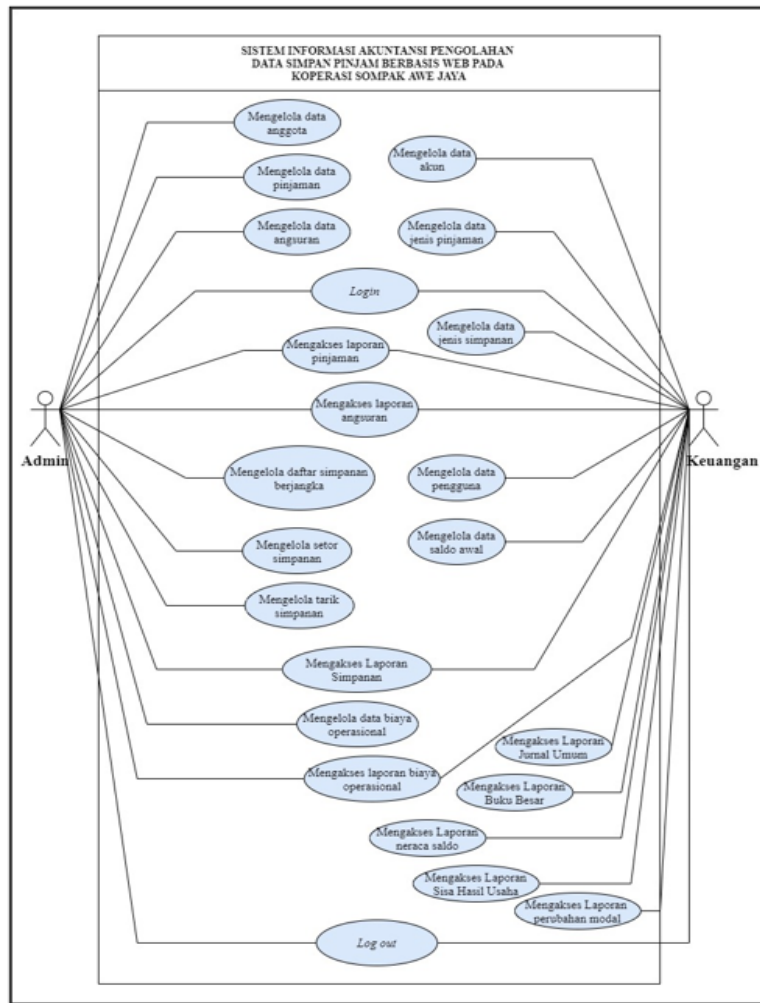


Figure III.3 Use Case Diagrams

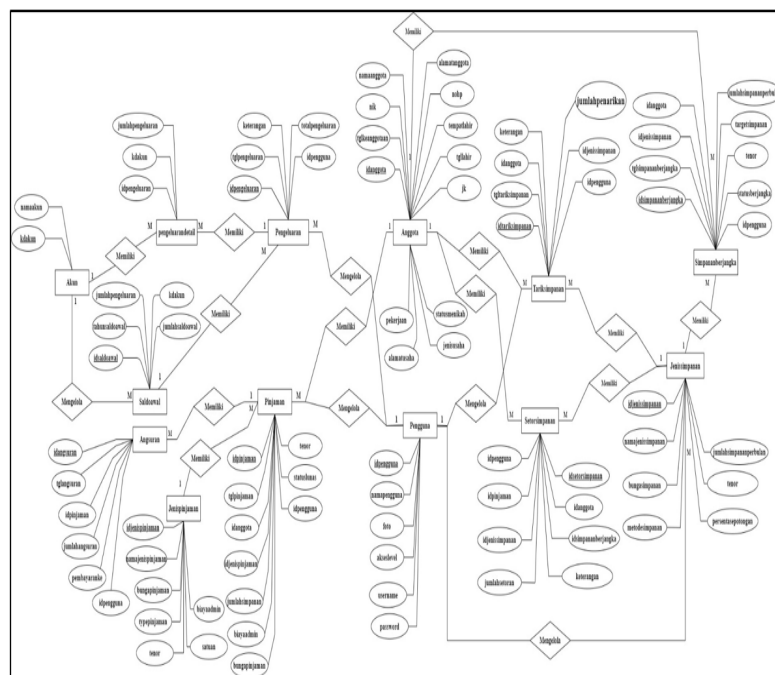


Figure III.4 Entity relationship diagram (ERD)

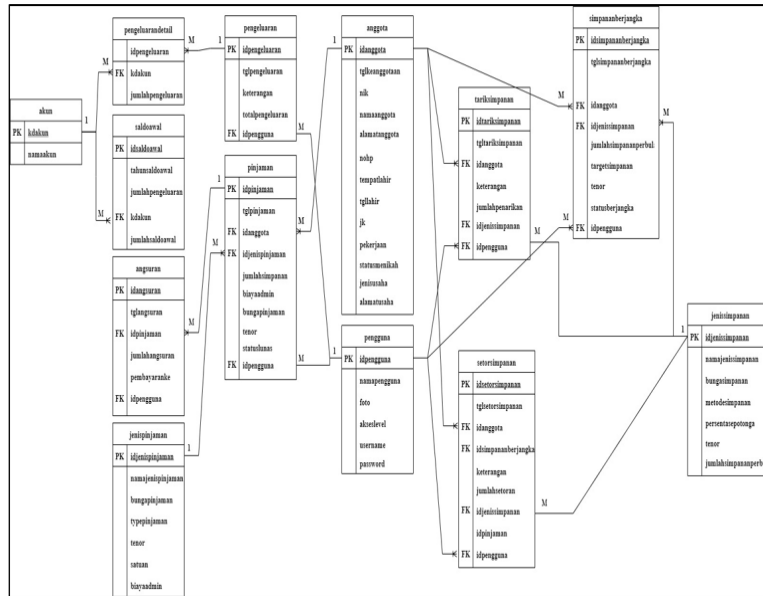


Figure III.5 logical record structure (LRS)

3.5. User Interface

This User Interface will display the display form of the design of the savings and loan processing accounting information system [17], which has two displays in the user interface design or the interface of the savings and loan processing program at the Sompak Awe Jaya Cooperative, namely the admin section and the finance section. As for some of the pictures taken on the following page. A. User Interface in the Admin Section The admin view is one of the access levels that can manage master data consisting of accounts and members, manage member loans consisting of: loans, installments, loan reports, and installment reports, manage member deposits consisting of a list of time deposits, deposit deposits, withdraw deposits, and report deposits, manage operational costs which consist of operational and operational expense reports.

1. Login User Interface

The login user interface is the default menu or is displayed first by the system before accessing the main page of the savings and loan processing accounting information system. Admin is required to fill in the username and password, then click the login button. Then the system will validate the username and password.

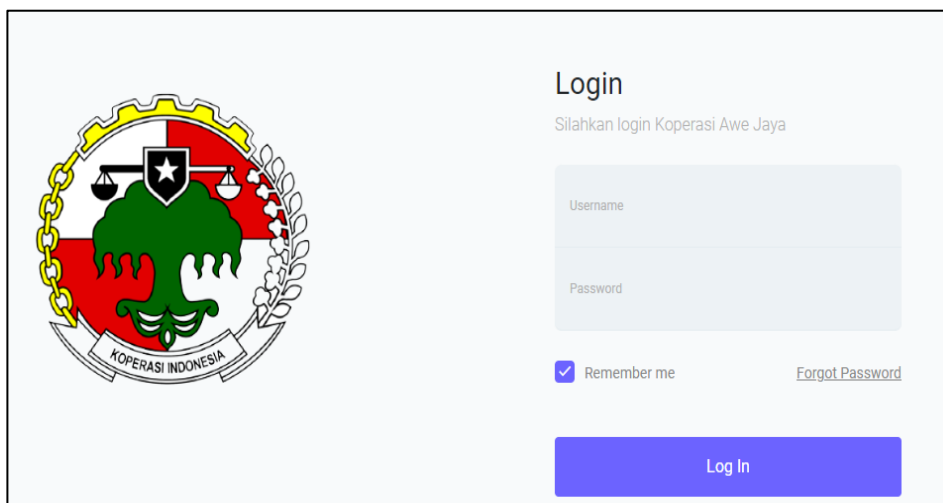


Figure III.6 Login User Interface

2. Home Admin User Interface

The home user interface is a menu that appears after the admin accesses the login. This home menu contains master data, member loans, member savings and operational costs.



Figure III.7 Home Admin User Interface

3. Member Data List User Interface

The user interface for the list of member data is a list managed by the admin. The display can be seen in Figure III.8 as follows.

No	Nama Anggota NIK	Jenis Kelamin Tempat/ Tgl Lahir	Alamat/ No HP	Aksi
1	Dicky Setiawan 1282839748837463	Laki-laki Pontianak/ 1990-04-23	Tayan 082346847746	
2	Sudirman 6453728194756466	Laki-laki Tayan/ 1987-06-03	Pontianak 082399392992	
3	juna 97553679884636	Laki-laki pontianak/ 1987-08-03	jln.purnama 089765765467	
4	Ridwan Sutedjo 2289382939289289	Laki-laki Jakarta/ 2004-01-15	Jl. Merpati 085262771719	

Figure III.8 Member Data List User Interface

4. User Interface Add Installment Data

This user interface is a form for adding installment data which is managed by the admin. The display can be seen in Figure III.9 as follows.

Figure III.9 User Interface Add Installment Data

5. User Interface Page Printable Loan Reports

This user interface is a printout of installment reports managed by the admin. The display can be seen in Figure III.10 as follows.

KOPERASI SOMPAK AWE JAYA						
LAPORAN ANGSURAN PINJAMAN ANGGOTA						
PERIODE 08 FEBRUARI 2022 S/D 30 JULI 2022						
NO	ID ANGSURAN TANGGAL	NAMA ANGGOTA NIK	JUMLAH PINJAMAN TANGGAL	SUDAH DIBAYAR SEBELUMNYA	JUMLAH ANGSURAN	SISA PINJAMAN
1	AS21050001 19 Mei 2022	Ridwan Sutedjo NIK: 2289382939289289	2,100,000 02 Apr 2022	0	120,750 (Angsuran Ke - 1)	2,100,000
2	AS21050002 18 Mei 2022	Ridwan Sutedjo NIK: 2289382939289289	1,500,000 12 Mei 2022	0	431,250 (Angsuran Ke - 1)	1,500,000
3	AS21050003 19 Mei 2022	Ridwan Sutedjo NIK: 2289382939289289	2,100,000 02 Apr 2022	120,750	120,750 (Angsuran Ke - 2)	1,979,250
4	AS21050004 23 Mei 2022	Ridwan Sutedjo NIK: 2289382939289289	2,100,000 02 Apr 2022	241,500	120,750 (Angsuran Ke - 3)	1,858,500
5	AS21070001 21 Jul 2022	Dicky Setiawan NIK: 1282839748837463	500,000 20 Jul 2022	0	20,000 (Angsuran Ke - 1)	500,000
TOTAL					813,500	

Figure III.10 User Interface Page Printable Loan Reports

4. CONCLUSION

The web-based savings and loan process accounting information system at this cooperative will facilitate the processing of savings and loan data. From the results of the research that has been done, the authors can draw conclusions regarding the several benefits of using application programs, including:

1. The savings and loan data processing system implemented by the Sompok Awe Jaya Cooperative still uses recording techniques used on stationery, paper and calculators to manage member loan transaction data. Errors often occur in general ledger entries that affect report results, and the resulting reports are not in accordance with the rules of Accounting Standards.

2. The savings and loan information system created by the admin uses it to access account details, members, loans, installments, loan reports, installment reports, manage fixed savings lists, savings deposits, withdraw deposits, report deposits, manage operational costs, and access bills.
3. The Savings and Loans information system is also provided to the finance section including types of loans, types of deposits, users, initial balances, access to loan reports, installment reports, savings reports, operating expense reports, general journals, ledgers, trial balances, the rest provides functions or functions to manage income reports, transactions, reports on changes in capital, balance sheets.
4. This system can be developed by further researchers in the field of information technology and accounting, because in making the report it is in accordance with Financial Accounting Standards (SAK).

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