

Analysis and Design of an Accounting Information System for Loan Distribution at the Employee Cooperative of the Republic of Indonesia Teachers' Association (PGRI)

Mayli Wulandari^{1*}, Muhammad Anggionaldi²

Departemen Akuntansi, Fakultas Ekonomi dan Bisnis, Universitas Jenderal Achmad Yani^{1,2}

*Email Korespondensi: mayliwulndrii26@gmail.com^{1*}, muhammadanggionaldi@ak.unjani.ac.id²

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ABSTRACT

The increasing demand for accurate financial management requires cooperatives to adopt integrated accounting information systems. The employee cooperative of the Indonesian Teachers Association in Arjawinangun still uses manual procedures for recording loans, installment payments, and financial reports, causing delays, data duplication, calculation errors, and limited access to timely information. This study aims to analyze the existing loan accounting information system and design a computerized system to improve operational effectiveness and reporting quality. Using a descriptive approach and the Waterfall development method, data were collected through observation, interviews, and documentation. The results show that the current manual system is inefficient in processing loan applications, verifying member data, managing installment transactions, and generating reports. The proposed system integrates member, loan, and installment data into a centralized database, automates calculations and report generation, and enables real-time monitoring. The design is expected to improve data accuracy, operational efficiency, internal control, and management decision-making, while supporting the digital transformation of cooperatives and serving as a reference for similar financial institutions.

INTRODUCTION

There are many financial institutions in Indonesia, one of which is savings and loan cooperatives. Savings and loan cooperatives are financial institutions that operate in the financial sector, accepting deposits and providing loans. They have several individual members who are open or voluntary. Savings and loan cooperatives are managed independently and democratically (Jamsi, 2022).

In conducting their business, all types of cooperatives adhere to the same principle: the principle of family. This is intended to help improve the welfare of the Indonesian people. Savings and loan cooperatives derive their capital from two sources. The first source is derived from cooperative member savings, whether in the form of principal savings, mandatory savings,

voluntary savings, or grants. The second source can be obtained from loan capital to other business entities or cooperatives (Jamsi, 2022).

Cooperatives, as a form of people's economic organization, play a vital role in improving the welfare of their members and society at large. As noted in the literature, cooperative financial reports are a crucial instrument for describing a cooperative's financial condition, business results, and cash flow, enabling management and members to assess the cooperative's performance and sustainability (Susanti, D. & Sari, N. 2020).

A cooperative is an entity owned and controlled by the same individuals who utilize its services ('Aini et al., 2012). Cooperatives are considered the "Pole Guru" which is an inseparable structured part of the national economic system. Based on data from the Central Statistics Agency (2022), the number of cooperatives in Indonesia reached 130,354 units in 2022 and West Java Province ranks second in contributing the largest number of cooperatives in Indonesia, with the number of cooperatives reaching 15,621 and the number of members reaching 2,370,819 people. This figure experienced an increase of 7.5% from 2,204,780 members in 2020 (Department of Cooperatives and Small Enterprises, 2021). Increasing membership is also an important aspect in cooperatives because it can affect business success (Ardiansya, 2011).

Savings and loan cooperatives play a crucial role in improving the welfare of their members, particularly by providing easily accessible financial services. As commercial organizations focused on the interests of their members, cooperatives strive to provide a number of social benefits in addition to generating profits. For example, cooperatives help members obtain low-interest loans and expand their access to financial services (Ryan Irwansyah Pasaeibu & Kusmilawaty Kusmilawaty, 2024).

According to Paul Hubert Casselman, cooperatives are an economic system that incorporates social elements. Through financial services such as savings and loans, as well as business activities that distribute basic necessities, cooperatives enable their members to obtain goods and services at affordable prices. This increases purchasing power and increases real income (Supriyadi, 2022).

An accounting information system (AIS) is crucial for the proper and effective financial management of savings and loan cooperatives. Recording every daily transaction in detail, from receiving member funds to seeking loans to calculating interest income, is one of the primary responsibilities of an AIS. In addition to reducing the potential for human error that often occurs with manual approaches, this system speeds up the process of creating financial reports needed for decision-making and performance evaluation (Capah, 2020).

It is expected that the AIS will streamline and accelerate a number of cooperative administrative procedures, including transaction recording and interest calculations, which can improve the timeliness and accuracy of services provided to members. Furthermore, the implementation of an AIS is crucial for maintaining the financial stability of cooperatives because an effective system makes fund management more transparent and controlled. For cooperatives

to continue to offer long-term benefits to their members, cooperative management must ensure that the use of this technology supports the growth and sustainability of cooperatives (Manuri & Devi, 2022). Along with the development of information technology, the implementation of an accounting information system (AIS) is a solution to increase efficiency and accuracy in managing cooperative financial data. An accounting information system is a system that collects, records, stores, and processes accounting data to produce useful information for decision-making. With an AIS, cooperatives can accelerate the process of recording transactions, reduce manual errors, and produce more accurate and reliable financial reports (Romney & Steinbart, 2018).

Based on Law No. 25 of 1992 Article 35 Concerning Cooperatives, it states that cooperatives are required to prepare annual reports containing at least: Balance Sheet, Calculation of Business Results, Notes to Financial Statements. Then the financial report is completed in accordance with the Financial Accounting Standards for Entities Without Public Accountability (SAK ETAP) which is a guideline for preparing cooperative financial reports as explained in the Regulation of the Minister of Cooperatives and SMEs No. 12 of 2015. Then for cooperatives engaged in savings and loan activities based on the Regulation of the Minister of Cooperatives and SMEs No. 12 of 2015, the cooperative financial report includes: Balance Sheet, Report on Calculation of Business Results, Report on Changes in Equity, Cash Flow Report, Notes to Financial Statements.

Previous research, particularly on the analysis of accounting information systems for loans, has several shortcomings. Some studies have focused solely on non-performing loans, while others have focused on the existing information system and provided recommendations for improvement. Research aligned with this discussion explains that the credit guarantee mechanism is appropriate and that there are several issues with non-performing customers (Nurindyah, 2023). However, some studies contradict this discussion. This study explains that the loan accounting information system implemented does not meet standards, leading to an increase in non-performing loans (Hidayah & Hari, 2022). There is insufficient research explaining the analysis of additional loan programs and the design of their accounting information systems.

Research conducted by Suryani and Lestari (2022) shows that the effectiveness of implementing accounting information systems (AIS) in cooperatives remains low due to limited technical capabilities of management and a lack of information technology infrastructure support. Most cooperatives lack an integrated system that can automatically manage transaction data, so the financial reporting process still relies on manual input. This leads to low work efficiency and an increased risk of errors in financial reporting.

A common phenomenon in savings and loan cooperatives (KSP) in Indonesia is financial reporting that still does not comply with applicable accounting standards. Many KSPs face challenges in preparing complete, accurate, and accountable financial reports to their members. Frequent problems include unsystematic transaction recording, inaccurate recognition of revenue and expenses, and a lack of proper segregation of financial accounts.

Furthermore, various studies show that most savings and loan cooperatives still use manual recording methods in their accounting processes. This condition makes financial reports vulnerable to human error, delays in recording, and potential data manipulation. According to Wulandari & Nurhidayah (2023), many cooperatives are unable to prepare financial reports in accordance with accounting standards due to limited use of adequate accounting information systems.

A similar phenomenon is confirmed by Julianto (2022), who stated that low human resource (HR) competency in accounting results in inaccurate presentation of cooperative financial reports and often fails to comply with applicable SAK requirements. Furthermore, research by Dewi & Sujana (2021) shows that the quality of cooperative financial reports is significantly influenced by human resource capacity and the use of information technology. Cooperatives that still rely on manual recording tend to produce less accountable reports.

A prominent phenomenon is the high number of non-performing loans, which has impacted the liquidity and health of cooperatives. According to Pratama and Darmayanti (2021), the increase in non-performing loans is due to weak loan feasibility analysis and suboptimal risk management systems within cooperatives.

The Indonesian Teachers' Union Cooperative is a cooperative whose membership covers schools, focusing on teachers at the cooperative schools concerned, and serving teachers who apply for loans. With the current unstable economic situation, employees cannot rely solely on their monthly salaries while economic needs increase. Therefore, the PGRI cooperative was established as a solution to solve the problem of employee needs, especially for teachers at PGRI in Arjawinangun District.

In carrying out its primary task of managing its members' loan data, the PGRI cooperative in Arjawinangun District still uses manual recording, not computer technology, and not Excel. This is still not optimal because it still uses manual recording. Loan management is recorded using a general ledger, and the data is stored in hard files.

The weakness of the system used in the PGRI cooperative is that to view loan and installment data, members must come directly to the PGRI Arjawinangun office, this is of course less effective and efficient. In addition, making financial reports (member loans and installments) also takes a long time because the treasurer must first search for the member's loan and installment files and then summarize them to be made into a report that will be submitted to the chairman of the cooperative, another weakness is that loan and installment files are vulnerable to being lost because the PGRI Arjawinangun cooperative still uses a manual system that does not have a copy of the data.

Based on the research background above, the author is interested in conducting research with the title "Analysis and Design of an Accounting Information System for Loan Distribution at the Indonesian Teachers' Association (PGRI) Employee Cooperative".

RESEARCH METHODS

This study uses the Waterfall method as a system development approach because each stage is carried out sequentially and interrelated, starting from analysis, design, implementation, to system testing. Stages include needs analysis, device specifications, system design, implementation, and testing. If errors are found during the testing stage, the process is returned to the previous stage until the system runs optimally. An analysis was conducted at the PGRI Arjawinangun Cooperative to identify weaknesses in the savings and loan system that is still managed manually, including the loan application process, installment payments, and report preparation.

The analysis results showed various obstacles, such as a slow verification process, book-based recording, a high risk of calculation errors, inefficient data searches, long-term reports, the lack of an integrated database, and limited real-time information monitoring by the cooperative chairman. Based on these findings, it is proposed to develop a computer-based savings and loan information system with an integrated database, automatic installment calculations, printing of transaction receipts, real-time report preparation, and monitoring facilities to improve efficiency, accuracy, speed of service, and support more informed decision-making (Pressman, 2019).

RESULTS AND DISCUSSION

Proposed System Procedure

After studying the current loan disbursement system at the PGRI Arjawinangun Cooperative, the author designed a proposed system to optimize the manual system and transform it into a computerized system so that all tasks, from receiving input data to output data, are processed by the computer.

The system proposed by the author at the PGRI Cooperative regarding the loan distribution system has several stages which can be described as follows:

- 1) Loan Application Procedure. Cooperative members who wish to apply for a loan must first fill out a form stating their name, loan amount, loan term, and purpose. This form is then submitted to the treasurer.
- 2) Data Verification Procedure. The treasurer checks membership status, previous loan history, and any outstanding loans. The treasurer then provides the member's loan data and loan application form to the chairperson.
- 3) Loan Approval Procedure. The cooperative chairman reviews the loan application and data, including the loan amount and loan history, and then issues a decision on whether to approve or reject the loan. If approved, the chairman forwards the loan application and member loan data to the treasurer for disbursement.
- 4) Loan Recording Procedure. The treasurer processes loan transactions, calculates installments, determines payment schedules, and stores loan data on file.

5) Fund Disbursement Procedure. The treasurer disburses the loan funds to members. The treasurer then records the disbursement date and the disbursement amount, and then prints a disbursement receipt.

6) Installment Payment Procedure. Members make payments within the specified timeframe. The treasurer inputs the payment, calculates the remaining installments, and then prints proof of payment, which is then given to the member.

7) Reporting Procedure. The treasurer prepares a member loan data report and payment report by reviewing the member data and payment files. The member loan data report and payment report are then submitted to the chairperson.

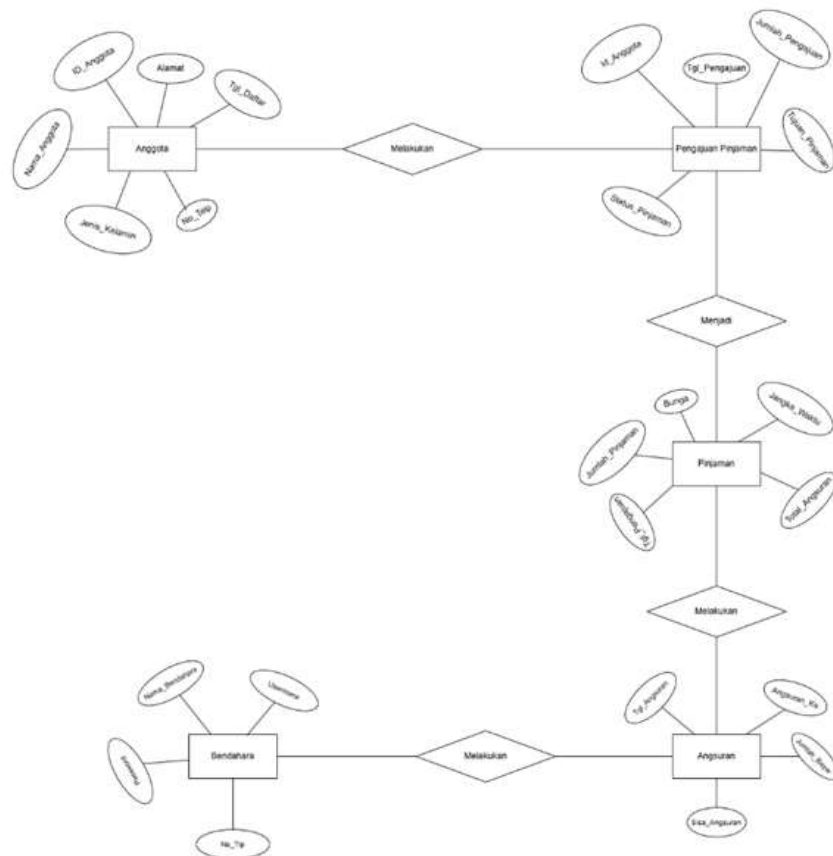
Proposed System Data Flow Diagram

The proposed system design is illustrated using a Data Flow Diagram (DFD) that includes flowcharts, decomposition, context diagrams, and zero-level diagrams. The design models the loan application process, data verification, loan approval, loan recording, fund disbursement, installment payments, and report generation as the basis for implementing an integrated accounting information system (Pressman, 2015; Jogiyanto, 2005).

Entity Relationship Diagram of Proposed System

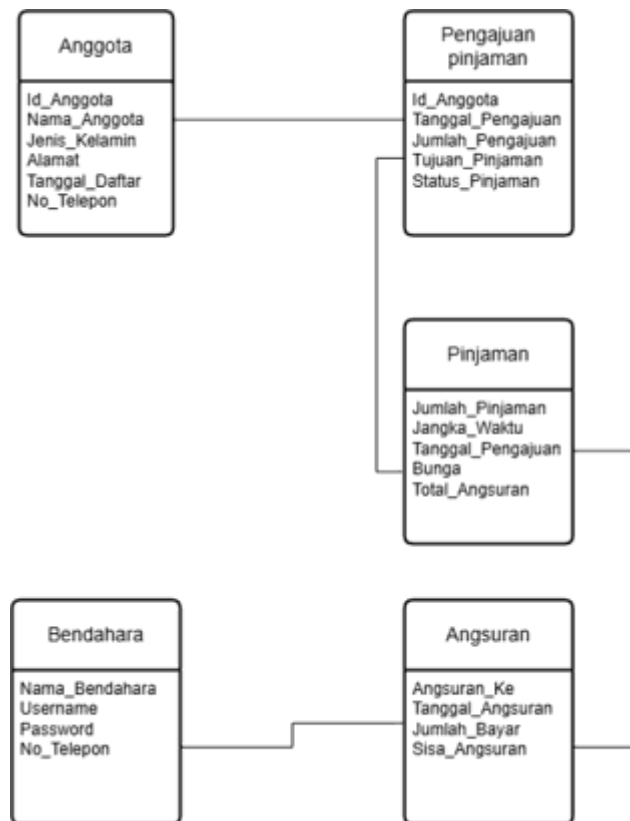
The depiction of the relationship process created in the data flow diagram is further developed into an entity relationship diagram, so that the relationships between entities can be seen and involve the design of the fields in the database. The following is the ERD that the author created for reference:

1. Entity Relationship Diagram



2. Logical Record Structure

The designed Entity Relationship Diagram (ERD) is then displayed in the form of a Logical Record Structure (LRS) to provide an explanation of the database image designed by the author. The logical record structure (LRS) designed by the author can be seen below:



Proposed Entity Design Specifications

The proposed system design specifications for the PGRI Arjawinangun Cooperative are designed to support computerized loan disbursement management through input documents, output documents, database normalization, code structure, and interface design. Input documents include member data, loan applications, loan records, installment payments, and loan and installment reports, which are used as the main source of data processing. Output documents include proof of loan approval, proof of loan disbursement, proof of installment payments, loan data reports, and installment payment reports that are generated automatically to support operational needs and reporting to the cooperative chairman. Database design is carried out through a normalization process up to Third Normal Form (3NF) to eliminate redundancy and maintain data integrity. The results of normalization produce tables for Members, Treasurer, Loan Applications, Loans, and Installments that are interrelated using primary keys and foreign keys, so that data management becomes more efficient and consistent (Pressman, 2015). In addition, the system applies a unique code structure, such as the Employee Identification Number (NIP), to facilitate data identification. The interface design includes a login page, member menu, member data management, loan applications, installments, installment payments, the main admin menu, loan application approval, installment approval, and a member

list. The overall design is expected to improve business process efficiency, speed up data searches, minimize recording errors, and produce loan and installment information that is accurate, integrated, easily accessible, and supports timely decision-making (Jogiyanto, 2005).

Computer System Specifications

The proposed system specifications use a computer with an AMD A8 Quad Core processor, 4 GB of RAM, a 500 GB hard disk, a Windows 10 operating system, an AppsScript web server, PHP, and a browser. The standalone configuration supports loan management, installments, data storage, report printing, and improves the efficiency and integration of the accounting information system (Pressman, 2015).

Implementation Schedule

Implementation is a procedure that outlines the steps required to complete all the necessary steps in the computerized system implementation process. This implementation process requires a schedule that serves as a guideline for the activities and steps required to implement the system:

The implementation schedule is:

- 1) Initial Data Preparation. By conducting research, the data needed to build the new system can be obtained. Activities carried out include preparing and recording data into files. This activity is estimated to take one week, in the first week of the first month.
- 2) Analysis. The process of studying the current system and its existing problems. The goal is to gain an overview of the nature of the problems within the institution, thereby reducing misunderstandings between the system proposed by the author and the current system. The analysis takes two weeks.
- 3) System Design. The process of designing the system that will be proposed by the author. This process takes two weeks.
- 4) Software Design. The process of designing the software that will be used and that will support the creation and operation of the proposed program submitted by the author. This process takes one week.
- 5) Program Testing. Program testing is grouped into main menus and submenus. Program creation and testing takes two weeks.
- 6) System Testing. This activity is carried out to thoroughly test the system and determine how well and correctly it can be understood. The system testing takes one week.

No	Activity	Activity Time Per Week	
	Stages	May	June
1	Initial Data Preparation	■	
2	Analysis	■	■
3	System Design		■

4	Software Design			
5	Program Test Creation			
6	System Test			

CONCLUSION

Based on the results of research on the analysis and design of the accounting information system for loan distribution at the Indonesian Teachers' Association (PGRI) Employees' Cooperative in Arjawinangun District, the following conclusions can be drawn, the current accounting information system for loan distribution at the PGRI Employee Cooperative in Arjawinangun District is still carried out manually, using ledgers and physical files as a medium for recording loan transactions and member installment payments, without utilizing computer technology or data management software.

Based on the results of identification and analysis of the current system, obstacles were found that hamper the effectiveness and efficiency of loan data management, namely the high risk of errors or human error in the process of recording and calculating installments, the long process of preparing financial reports due to manual data recapitulation, and the lack of integrated data storage media so that data is vulnerable to loss or damage.

The proposed system design uses PHP programming with the support of a local standalone web server and can be accessed via a web browser, so that all operational activities of loan management at the PGRI Employee Cooperative in Arjawinangun District can be carried out in a more computerized, accurate and efficient manner compared to using the previous system.

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