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Design and Build a Teacher Savings and Loans Cooperative Application Based on Visual Basic.Net (Case Study: Teacher Cooperative At SMKN 1 Karawang)

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Abstract. *The progress of information technology is currently so rapid, this technological progress greatly affects all aspects of life in society. These technological advances have penetrated all corners of the business world, industry, education, banking industry and even cooperatives. The Savings and Loans Cooperative of SMKN 1 Karawang is one of the cooperatives engaged in business. This cooperative consists of 138 teachers and 48 administrators with a cash turnover of ± Rp. 131,642,257/month. In daily transactions, Savings and Loans Cooperatives still use data recording and report generation manually. Constraints faced by cooperative management such as the chairman, secretary, treasurer and members themselves are the inaccuracy of calculating the remaining business results, confusion in collecting data on bills for each member which causes members' interest data to be often confused, and difficulties in archiving data. The purpose of this research is to design a savings and loan cooperative application using Vb.net. The method used is the System Development Life Cycle (SDLC) waterfall, while the data collection methods used are literature study, observation and interviews. The result of this research is the application of savings and loan cooperatives which are expected to assist cooperatives in carrying out their transactions.*

Keywords: *BPMN, Cooperative, SDLC Waterfall, Vb.net*

1. INTRODUCTION

The current rapid technological progress is actually not being used optimally by the cooperative sector, the existing cooperatives seem to be managed only modestly without a touch of technological progress. Whereas cooperatives play an important role in sustaining the economy in an organization. One of the cooperatives that is often ignored is the teacher cooperative in schools.

Cooperatives are businesses that carry out many administrative transactions, so computerization in the field of administration is very important to support the smooth running of all transactions carried out by cooperatives so that they can provide transaction services quickly, precisely, and accurately. The Savings and Loans Cooperative of SMKN 1 Karawang is one of the cooperative bodies engaged in business. This cooperative consists of 138 teachers and 48 administrators with a cash turnover of ± Rp. 131,642,257/month. In daily transactions, the Savings and Loans Cooperative still uses data recording and report generation using the manual method. Constraints faced by cooperative management such as the chairman, secretary, treasurer and the members themselves are the inaccuracy of the calculation of the remaining operating results (SHU), confusion in collecting data on bills for each member which causes

member interest data to be often confused, and difficulty in archiving data. With these various obstacles, errors still often occur when doing bookkeeping and making reports, even though it still takes quite a long time. In this era of globalization, the development of science and technology is very rapid, especially now that information is spreading rapidly all over the world. With this fact, we are required to solve existing problems by utilizing technological sophistication as well as speed, accuracy, and accuracy in providing information so that in carrying out our work we will get optimal results. One of them is the use of computer technology.

Several previous studies conducted (Permana, 2017), (Rumetna et al., 2020), (Prasetya et al., 2020), (Atika, 2018) and (Maranti et al., 2018) have designed a savings and loan cooperative system. The results of this study indicate that the existence of the cooperative system is able to increase the effectiveness and efficiency of all transaction activities in the cooperative. Therefore, in order to improve the performance of the Savings and Loans Cooperative of SMKN 1 Karawang, it is necessary to apply a management technique in managing existing data information so that it becomes useful to assist the management of the savings cooperative in providing services to each member and can provide input to the SMKN 1 Karawang campus in improving the Savings and Loans Cooperative transaction system.

2. LITERATURE REVIEW

2.1 Design Build

According to Pressman (2017) in (Irawan et al., 2020) Design is a series of procedures for translating the analysis results from a system into a programming language to describe in detail how the system components are implemented. Then According to Pressman (2017) Build is the activity of creating a new system or replacing or improving an existing system in whole or in part.

Design is closely related to system design which is a unit for designing and building an application. System design is the determination of the processes and data required by the new system. If the system is computer based, the design may include a specification of the type of equipment to be used. System design can be defined as a description, planning, and sketching or arrangement of several elements that are separated into a unified whole and functioning. The purpose of system design is to meet the needs of system users and provide a clear picture and complete design to the programmer. These two objectives are more focused on designing or designing a detailed system, namely making a clear and complete design that will later be used for making computer programs. From the explanation above, it can be concluded that system design is an activity of translating the results of the analysis into the form of a software package and then creating the system or improving the existing system (Dayat et al., 2019).

2.2 Application

An application is a software unit that is intentionally created to meet the needs of various activities or jobs, such as commercial activities, advertising, community services, games and various other activities carried out by humans (Susanty et al., 2019). Meanwhile, according to Aris (2016) in (Siregar & Sari, 2018), applications can be defined with a subclass of computer software that utilizes the capabilities of a direct computer to perform a task the user wants. Usually compared to system software that integrates various computer capabilities, but does not directly apply these capabilities to perform a task that benefits the user.

2.2 Cooperative

According to Law Number 25 of 1992 Article 1 concerning cooperatives is given the following understanding: cooperatives are business entities consisting of people or cooperative legal entities based on their activities based on cooperative principles as well as a people's economic movement based on the principle of kinship (DWIPRADNYANA et al., 2020). Another opinion says that a Cooperative is an association consisting of individuals or entities, which provides freedom of entry and exit as members; by working together in a family manner to run a business, to enhance the physical well-being of its

members (Monoarfa et al., 2020).

2.3 Saving and Loan Cooperative

Credit cooperatives or savings and loan cooperatives are cooperatives that are engaged in the field of capital formation through the savings of members on a regular and continuous basis to then be loaned back to members in an easy, cheap, fast and appropriate way for productive and welfare purposes (Agustine, 2021). Savings and loan cooperatives are non-bank institutions that operate as business units and trade money services to members on the basis of service principles. In accordance with what was stated by the Department of Cooperatives and Small and Medium Enterprises in its journal (2000: 4) that the USP (Savings and Loans Business Unit) is defined as a cooperative business unit that trades money services to members on the basis of service principles. Selling here means pledging money to members, while buying means receiving members' money deposits (Ihsan & Murah, 2020).

2.4 Microsoft Visual. Net

Microsoft Visual Basic .Net is a tool for developing and building applications that move on top of the system. Net Framework, using the BASIC language. By using this tool, programmers can build Windows Forms applications, ASP.Net-based web applications, and also Command Line applications. This tool can be obtained separately from some other products (such as Microsoft Visual C++, Visual C#, or Visual J#), or it can also be obtained integrated in Microsoft Visual Studio .Net. The Visual Basic .Net language itself adheres to the object-oriented programming language paradigm which can be seen as an evolution of the previous version of Microsoft Visual Basic which was implemented on top of the .Net Framework (Subagio, 2017).

2.5 Microsoft SQL Server

Microsoft SQL Server is an enterprise group RDBMS software that is often used in corporate companies. By using and utilizing SQL server users can store data groups and implement them for business activities in the business and industrial world. The architecture in Microsoft SQL Server is client/server which is a very reliable RDBMS software designed to support complex transactions. In accessing relational databases, we must know the syntaxes in SQL (Structured Query Language) that can support SQL as a language in processing queries into the database. Microsoft SQL Server is also widely used in the business and business world, education and government agencies as a solution in building databases or data storage (Setiyadi et al., 2020).

3. RESEARCH METHODS/METHODOLOGY

The research method used in this study is the Waterfall System Development Life Cycle (SDLC), which consists of several stages of activity flow that run in one direction from the beginning to the end of the system development project. The waterfall model is often also called the linear sequential model or the classic lifeline model. This model provides a systematic and sequential approach to software development starting at the analysis, design, code, testing and implementation levels (Ayu & Sari, 2020). While the data collection technique used is literature study, by studying and collecting theories relevant to the topics discussed in order to obtain data and written information related to the problems studied. Observation, in this case the author made observations or direct observations on the Savings and Loans Cooperative at SMKN 1 Karawang. and interviews, which are two-way communication to obtain data from reliable respondents as input to complete this research.

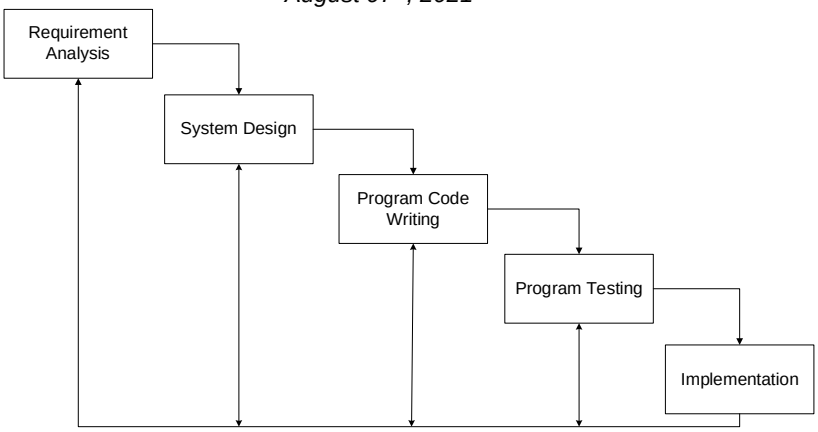


Figure 1. SDLC (System Development Life Cycle) Waterfall

The following is a description of the SDLC Waterfall Method:

a. Requirement analysis, the analysis phase is carried out to collect the data needed in the research. At this stage the aim is to obtain information about the expectations of users of the system or application that will be developed.
b. System Design, the design stage is carried out to create a design simulation that is ready to be implemented. At this stage a system design will be made such as system architecture.
c. Program Code Writing, the coding stage is carried out by developing an information system using a certain programming language.
d. Program Testing, after the coding is complete, the testing phase of the system that has been developed is carried out.
e. Implementation of the program, after the test is felt to have been successful, the information system is applied to the user for use.

4. RESULTS AND DISCUSSION

4.1 Ongoing Business Process Analysis

The following is a business process that is currently running at the Savings and Loans Cooperative of SMKN 1 Karawang:

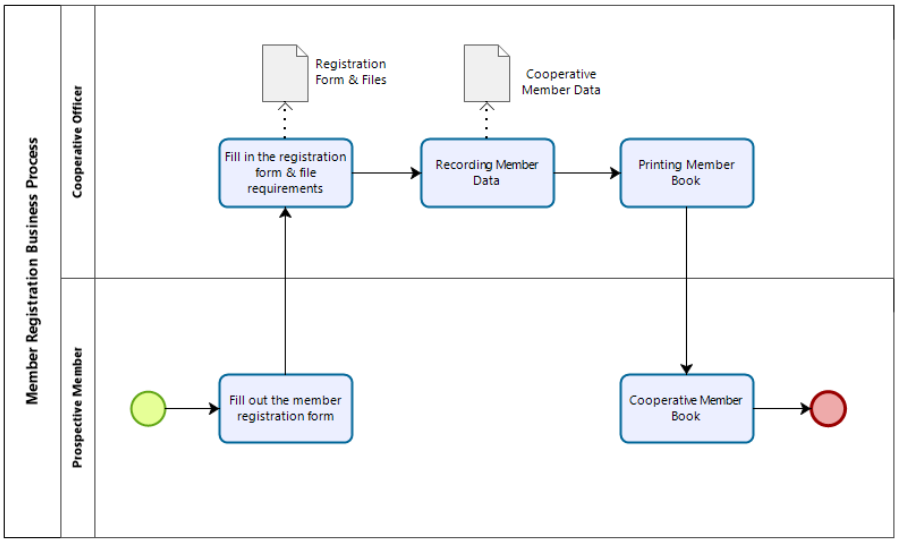


Figure 2. Current Business Process Member Registration

a. Cooperative members register to become cooperative members by bringing the conditions for registering. The requirements for cooperative membership are photocopy of ID card and bring some money for the cooperative's mandatory dues.
b. Cooperative officers accept the requirements for applying for cooperative member registration.
c. Cooperative officers record the data of new members and their savings to be published into the member book, then the member book is given to the cooperative

member who submits the registration.

d. Cooperative officers make reports for new members and savings reports, which are then given to the chairman of the cooperative.
e. Cooperative officers archive cooperative registrant data.

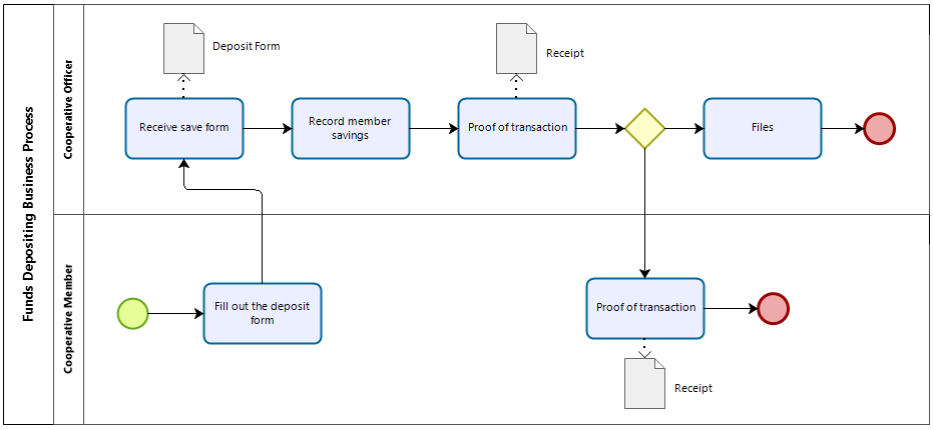


Figure 3. Current Business Process Lending Funds

a. Cooperative members come to the cooperative to apply for a loan with the cooperative member's book.
b. Members submit the membership book to the cooperative officer to check the loan requirements, if they do not meet the requirements then the membership book is returned. If they meet the requirements, the cooperative officer will provide a loan application form to members.
c. Members fill out the loan application form provided by the cooperative officer and signed by the member who made the loan. Then the completed form is given back to the cooperative officer.
d. The cooperative officer receives the loan application form, then gives the form to the cooperative chairman.
e. The chairman of the cooperative approves the member's loan application.
f. The cooperative officer records it into the loan book, then the cooperative officer returns the membership book and provides the loan funds that have been submitted previously.

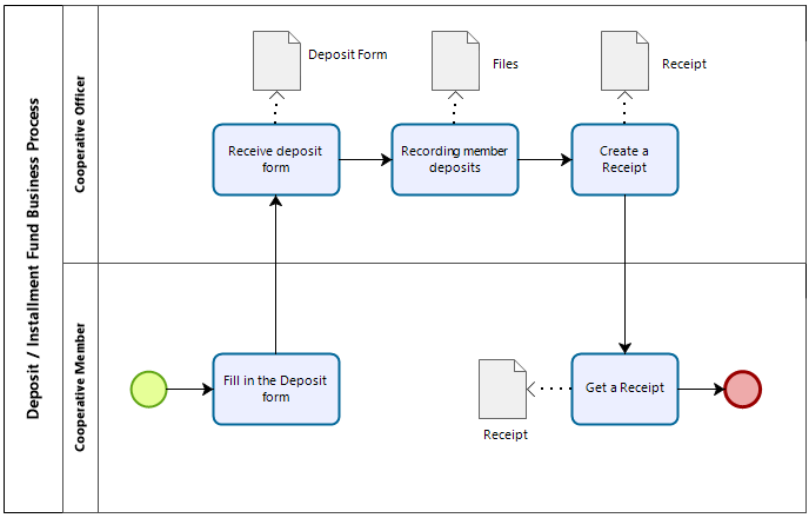


Figure 4. Current Business Process Installment Payment / Deposit

a. Cooperative members come to the cooperative to apply for a loan with the cooperative member's book.
b. Members fill out the deposit payment form provided by the cooperative officer. Then the completed form is given back to the cooperative officer.
c. Cooperative officers receive a deposit payment form.
d. The cooperative officer makes a record into the deposit book, then the cooperative

officer returns the membership book and provides proof of the transaction in the form of a receipt.

4.2 Business Process Analysis Recommendations

After knowing the business processes running savings and loan cooperatives at SMKN 1 Karawang, the authors conducted an analysis of business processes recommendations to improve cooperative business processes more effectively and efficiently.

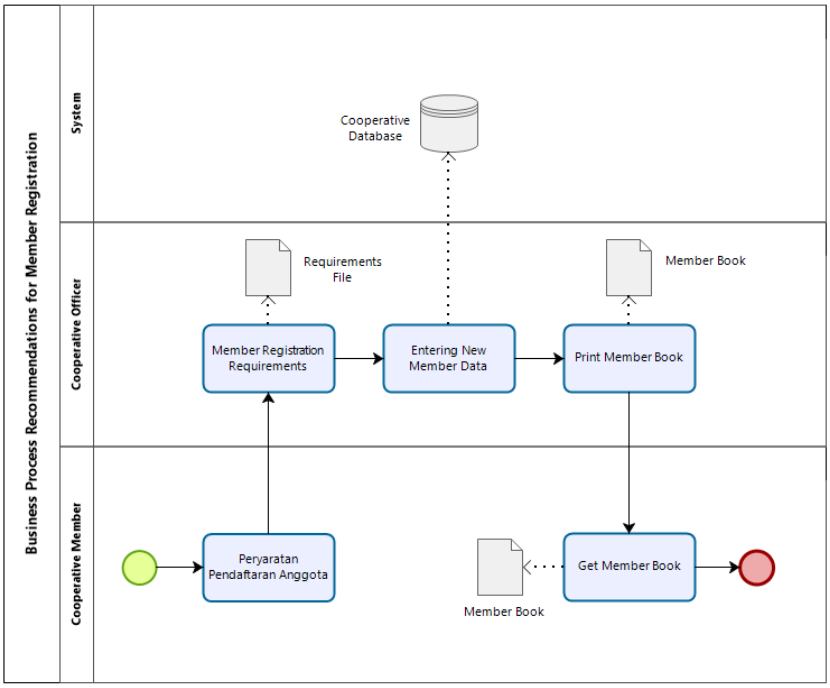


Figure 5. Business Process Recommendations for Member Registration

a. Prospective members come to the savings and loan cooperative at SMKN 1 Karawang.
b. Prospective members provide cooperative member registration requirements.
c. Cooperative officers input prospective member data into the cooperative system.
d. Cooperative officers print and give cooperative books to new cooperative members.

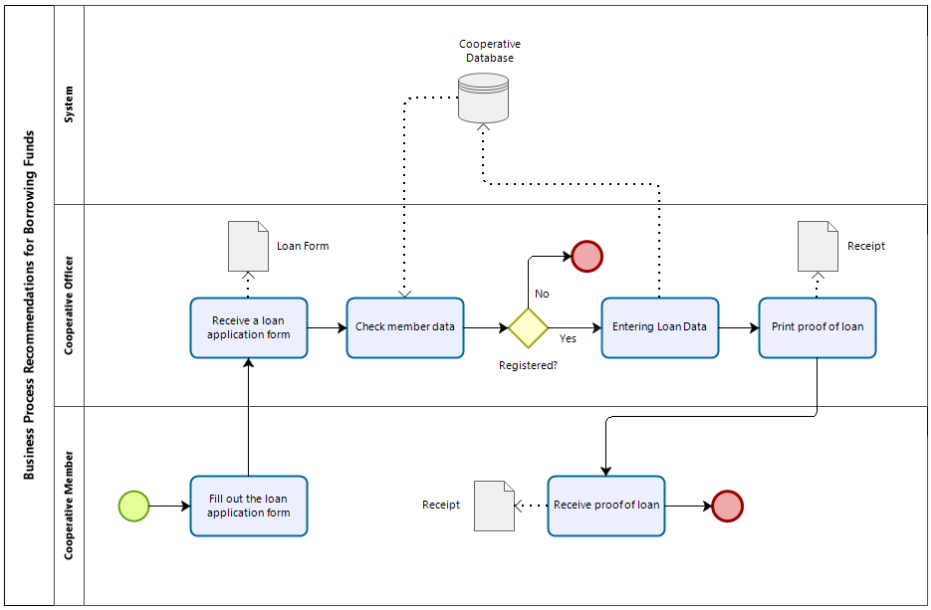


Figure 6. Business Process Recommendations for Borrowing Funds

a. Prospective members come to the savings and loan cooperative at SMKN 1

Karawang.

b. Members fill out a funding application form.
c. The cooperative officer checks the data, if the member is registered, the member can apply for a loan, if not, the procedure is complete.
d. Cooperative officers input loan data.
e. The cooperative officer prints out the loan proof (transaction in the form of a receipt).
f. Members receive loans and proof of transactions.

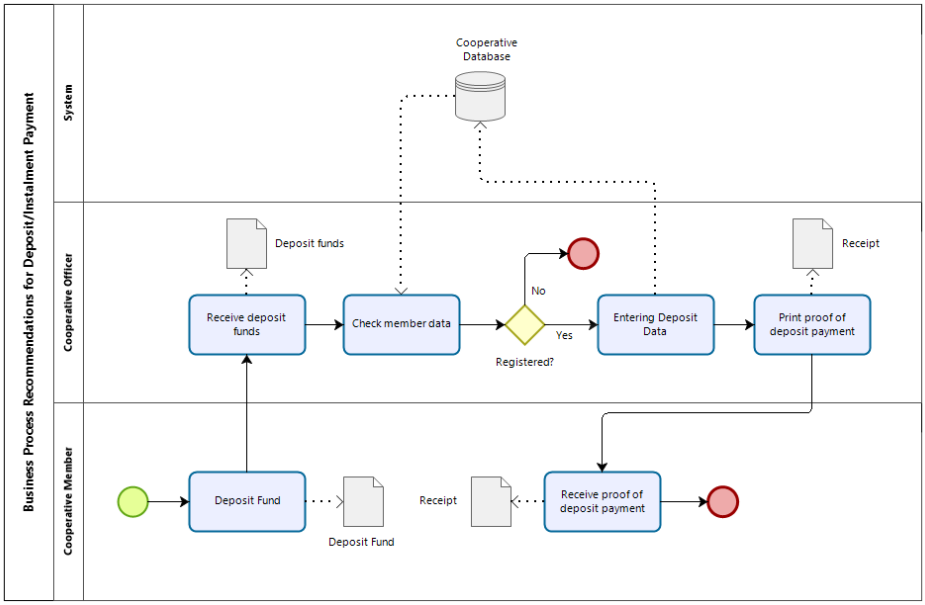


Figure 7. Business Process Recommendations for Deposit/Instalment Payment

a. Prospective members come to the savings and loan cooperative at SMKN 1 Karawang.
b. Members fill out a deposit form.
c. The cooperative officer checks the data, if the member is registered then the member can apply for a loan, if not, the procedure is complete.
d. Cooperative officers input member deposit data.
e. Cooperative officers print proof of deposit (transaction in the form of receipts).
f. Members receive proof of transactions.

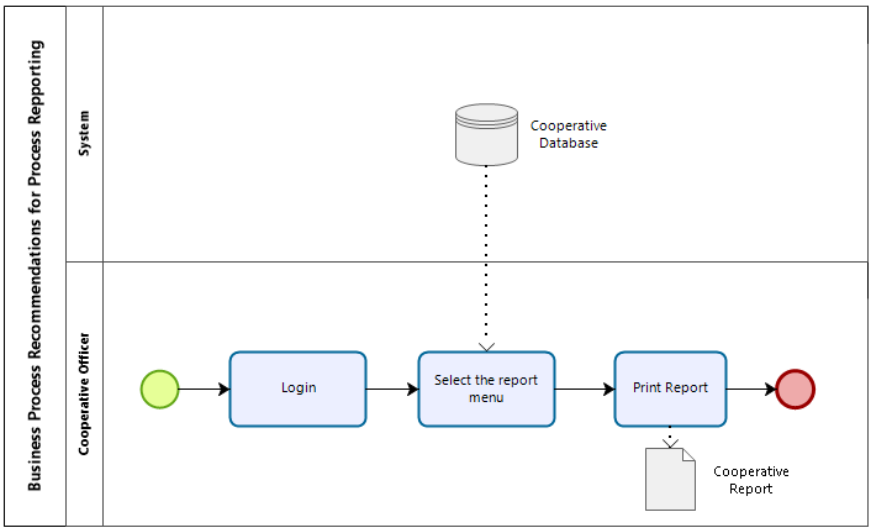


Figure 8. Business Process Recommendations for Process Repporting

a. Cooperative officers log into the system.
b. Cooperative officer selects the report menu.
c. Cooperative officer prints the desired report.

4.3 Analysis of Functional and Non-functional Requirements

4.3.1 Installment / Deposit Payment Business Process

Functional analysis was conducted to provide an overview of the proposed savings and loan cooperative system at the Savings and Loans Cooperative of SMKN 1 Karawang.

a. The system must be able to validate user logins.
b. The system can process Input data (save, modify, delete) and generate output data.
c. The system is able to produce up to date and relevant information for both cooperative officers and cooperative members.

4.3.2 Sub head (For example: Public Service or Good Governance)

Non-functional analysis is carried out to determine the specification of requirements for system design. Requirements specification involves hardware/hardware analysis, and software/software analysis.

a. Hardware/hardware analysis:
   1) Intel® Core™ i5 Processor (3.2 GHz).
   2) 4 GB DDR-3 memory.
   3) Hard disk 250 GB Data.
   4) Printers.
b. Software analysis:
   1) Windows 10 operating system
   2) Microsoft Visual Basic .Net
   3) Microsoft SQL Server 2012

4.4 Application Design

4.4.1 Usecase Diagram

Use case diagram is a diagram that describes the relationship between actors and the system. Use case diagrams can describe an interaction between one or more actors and the system to be created.

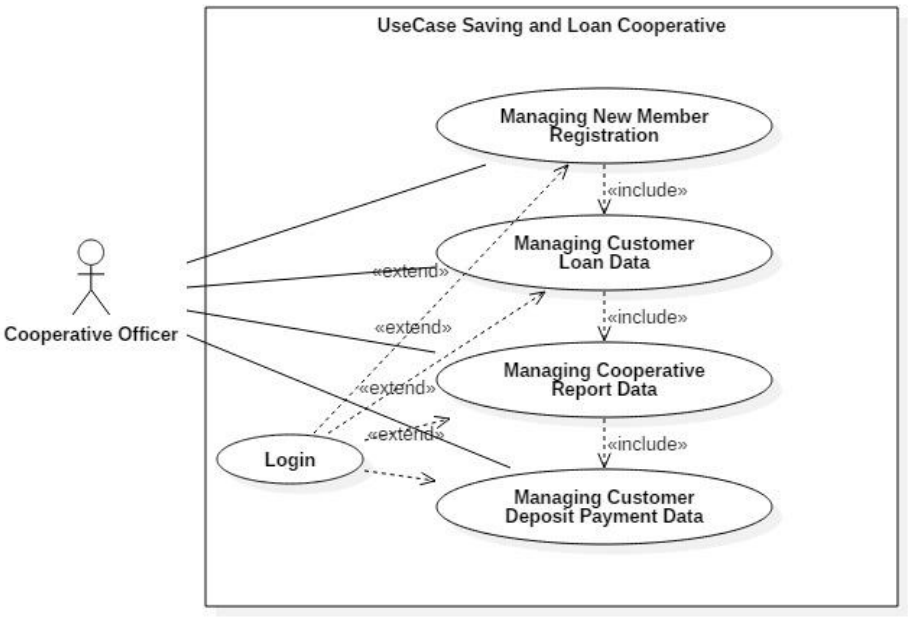


Figure 9. Usecase Diagram

4.4.2 Entity Relationship Diagram (ERD)

Entity Relationship Diagram (ERD) or entity relationship diagram of the proposed savings and loan system which serves to describe the database model that will be used.

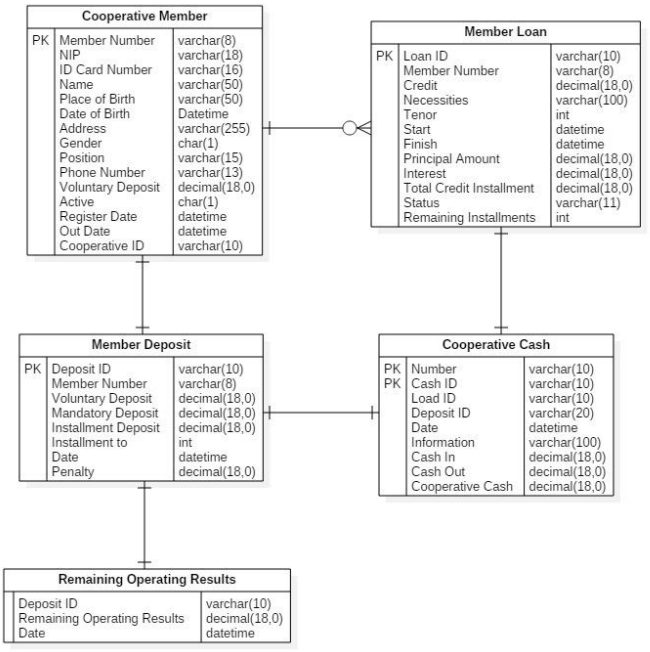
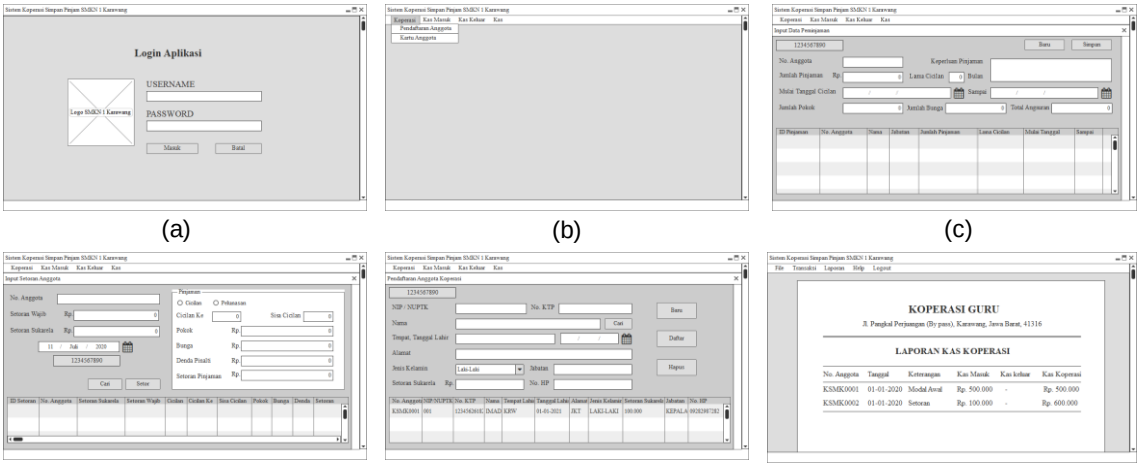


Figure 10. Entity Relationship Diagram (ERD)

4.4.3 Mockup Design

The mockup design of the proposed system is made based on the results of the analysis of the business process recommendations and the results of the analysis of functional requirements. The mockup of the proposed savings and loan cooperative system at SMKN 1 Karawang is as follows.



(a) (b) (c)

(d) (e) (f)

Figure 11. (a) Login Page Mockup, (b) Home Page Mockup, (c) Loan Data Input Form Mockup, (d) Member Deposit Input Form, (e) New Member Registration Form Mockup, (f) Cooperative Report Mockup

4.5 Testing Program

Testing this application using the black box testing method. Black box testing focuses on the functional requirements of the software. The following are the results of testing the savings and loan cooperative application using blackbox testing.

Tabel 1. Black box Test Results

No.	Tested Form	Test Items	Results
1	Login	Password Verification	*Success*
2	Cooperative New Member Registration Data Processing	Add Member Data	*Success*
		Change Member Data	*Success*
3	Processing of Lending Transactions	Add Fund Loan Data	*Success*

No.	Tested Form	Test Items	Results
4	Installment Deposit Transaction Processing	Add Member Installment Deposit Data	*Success*
		Search Member Data	*Success*
5	Report Data Processing	Print Report	*Success*

4.6 System Implementation

Implementation is a continuation of system design activities and can be seen as an effort to realize the designed system. The implementation of the system that has been designed by the author is as follows.

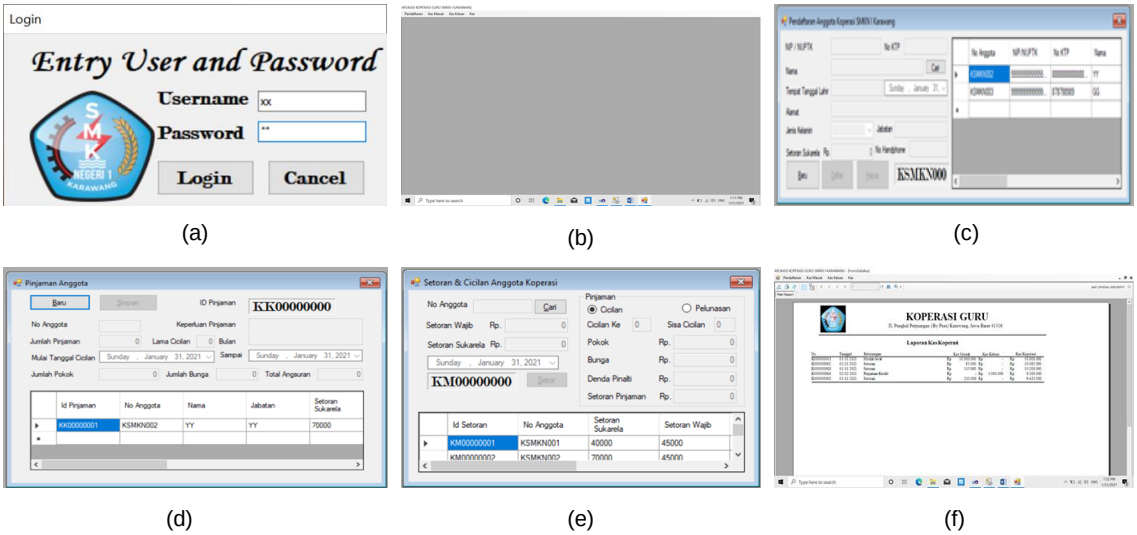


Figure 12. (a) Application Login Display, (b) Application Start Page Display, (c) New Member Registration Form Display, (d) Loan Application Form Display, (e) Member Deposit Form Display, (f) Cooperative Report Display

CONCLUSION

Based on the results of the writing that has been done, it can be concluded that the process of the Savings and Loan Cooperative at SMKN 1 Karawang still uses the manual method in conducting transactions with its customer members. Based on the results of the analysis of existing problems, the authors provide solutions by improving the business processes of savings and loan cooperatives and building a simple application to help process transactions in the cooperative. This application is built using Microsoft Visual Basic. Net and Microsoft SQL Server 2012 as storage. Furthermore, the author has succeeded in designing the Savings and Loans Cooperative application so that the data processing, data input and report generation becomes computerized so that it is fast and accurate. And the savings and loan cooperative application has gone through a testing process using black box testing, the result is that the system is able to work well, there are no errors or errors in the application. Based on the test results, the Savings and Loans Cooperative application at SMKN 1 Karawang is ready to be used to assist the entire transaction process in the cooperative.

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