Designing a Website-Based Cooperative Application

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Article Info	Abstract
	The development of the times in the field of technology allows information to be obtained quickly and easily. We often encounter exchange of information in the world of work, one of the business entities that is very dependent on the exchange of information is cooperatives. In traditional cooperatives, the use of services requires users to come directly to the physical location of the cooperative. The process of recording user data and transaction history is also still done manually, namely by writing it on a book, so it takes a long time. The cooperative system created is a web-based application with the Laravel framework and cooperative data managed using MySQL. Designing a web-based application will provide easy access to cooperative services and decrease the time required for transaction processing for users and increase the efficiency of cooperative management for cooperative managers.

Info Artikel	Abstrak
	Perkembangan zaman dalam bidang teknologi memungkinkan informasi diperoleh secara cepat dan mudah. Pertukaran informasi sering kita jumpai dalam dunia kerja, salah satu badan usaha yang sangat bergantung pada pertukaran informasi adalah koperasi. Pada koperasi tradisional penggunaan jasa mengharuskan pengguna untuk datang secara langsung pada lokasi fisik koperasi. Proses pencatatan data pengguna dan riwayat transaksi juga masih dilakukan secara manual yaitu dengan penulisan pada buku sehingga memakan waktu yang lama. Sistem koperasi yang dibuat merupakan aplikasi berbasis web dengan framework Laravel serta data koperasi yang dikelola menggunakan MySQL. Perancangan aplikasi berbasis web akan memberi kemudahan akses jasa koperasi dan peningkatan waktu yang dibutuhkan dalam proses transaksi bagi pengguna serta meningkatkan efisiensi pengelolaan koperasi bagi pengelola koperasi.

1. INTRODUCTION

1.1 BACKGROUND

The evolution of the era in the field of information technology enables the rapid and easy acquisition of available information. Information such as current news, entertainment, and learning materials can be accessed through websites on the internet. Websites contain a collection of information provided by individuals, groups, or organizations [1]. Information exchange is a part of human life aimed at obtaining information, and information exchange is often encountered in daily human activities, such as work. One of the business entities that heavily relies on information exchange in its management is the cooperative business entity.

Cooperatives are business entities that operate based on cooperation among their members to achieve mutual benefits. This business entity offers various services such as transactional buying and selling of goods and savings and loan transactions. In traditional cooperatives, all offered services are manually conducted at physical locations available in each region, making the operations of this business entity less optimal. The processes of buying and selling transactions and savings and loan transactions involve manual data recording of user information, which takes a long time to complete transactions. The

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distance of cooperatives also affects the interest of cooperative users in conducting transactions. The distant location of cooperatives can hinder the coordination process among management members in regulating the cooperative business entity.

The creation of a cooperative website will facilitate all cooperative users in utilizing cooperative services. Users can carry out cooperative transactions quickly and conveniently because the recording of transaction data is no longer done manually but rather, all user data will be stored in the cooperative website database. The use of the website will also streamline the cooperative management process; tasks such as inventory checks, coordination among members, and transaction history checks can be accessed directly through the website.

2. RELATED THEORY
2.1 WEBSITE PROGRAMMING

Website is an internet information medium used for information dissemination. Websites consist of pages within a domain or subdomain, located on the World Wide Web (WWW) on the Internet [2]. Web pages on the internet are written in HyperText Markup Language (HTML) format. Web programming is the process of creating a website for internet purposes. Various languages are used in web development, including HyperText Markup Language (HTML), Cascading Style Sheet (CSS), Hypertext Preprocessor (PHP), JavaScript, and Structured Query Language (SQL).

PHP is a programming language used to develop web applications. PHP is a server-side scripting language, where data processing occurs on the server side, so the script program translation process is done by the server, and the results are then sent to the client making the request [3]. HTML is the format of a web page. This format can be accessed via HTTP, a protocol that conveys information from the website server to be displayed to users through a web browser [4]. XAMPP is software on a computer that serves as a local server to support various types of website data in the development process. XAMPP can test the performance of features or display content on the website without the need to connect to the internet.

2.2 DATABASE

Database is a collection of interconnected data and a representation of data designed to meet the information needs of an organization [5]. Databases can store a set of data managed in a structured manner based on specific rules that are interconnected, making them easy to manage.

3. SYSTEM DESIGN
3.1 SYSTEM FLOW DIAGRAM

In this research, a digital savings and loan cooperative application based on a website will be developed. The cooperative website will be built using the Laravel framework as a web development file organizer that will be locally hosted with the assistance of the XAMPP application. Web development will be carried out using the PHP programming language along with CSS and JavaScript for the layout and design of the website.

The use of the cooperative website is governed by a role system that serves as a limit to access cooperative features. There are four types of roles in place: "User," "Member," "MSME," and "Admin." The "User" role applies to users who have registered on the website but choose not to become cooperative members. The access granted to this role is limited to using only the top-up feature as a payment method for other services offered by the website, namely the marketplace. Next, there is the "Member" role, which can be obtained by users with the "User" role who have registered as cooperative members. The "Member" role has access to all cooperative features such as savings, loans, and withdrawals.

Following that, there is the "MSME" role, specifically designed for users who want to sell goods on the marketplace. The "Admin" role is directed at cooperative managers responsible for approving transactions and accessing website data in the database, such as transaction history and user balances. The Use Case Diagram for the design of a digital cooperative application based on a website can be seen in Figure 1 below:
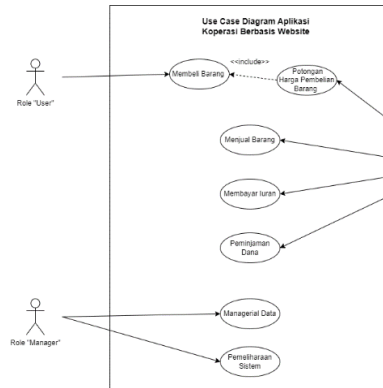
Figure 1 Use Case Diagram

The system flow diagram for the design of the digital cooperative application can be seen in Figure 2 below:
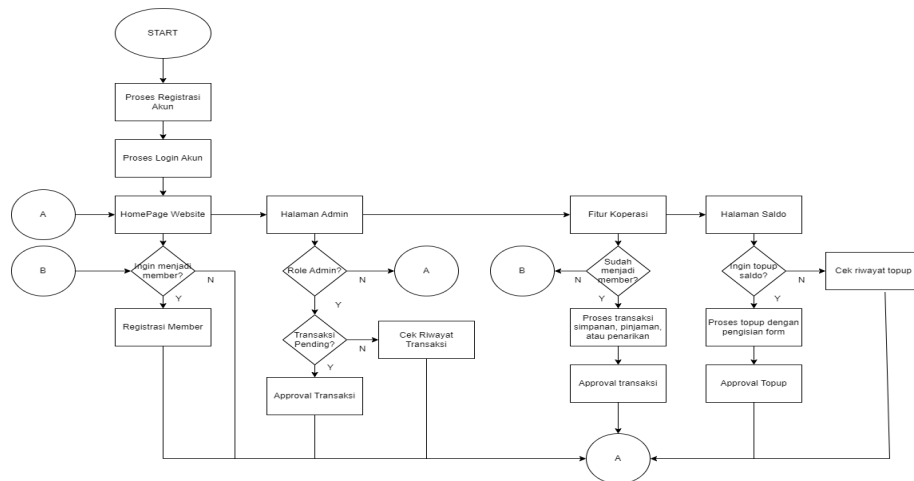

Figure 2 System Flow Diagram

3.2   COOPERATIVE DATABASE DESIGN

The Entity-Relationship Diagram (ERD) of the cooperative web system can be seen in Figure 2 below. Personal user data such as name, email, password, and address will be entered into the user table. The cooperative transaction table for savings, loans, and withdrawals will record data related to the user's transaction history on the website, which has been approved by the cooperative admin.
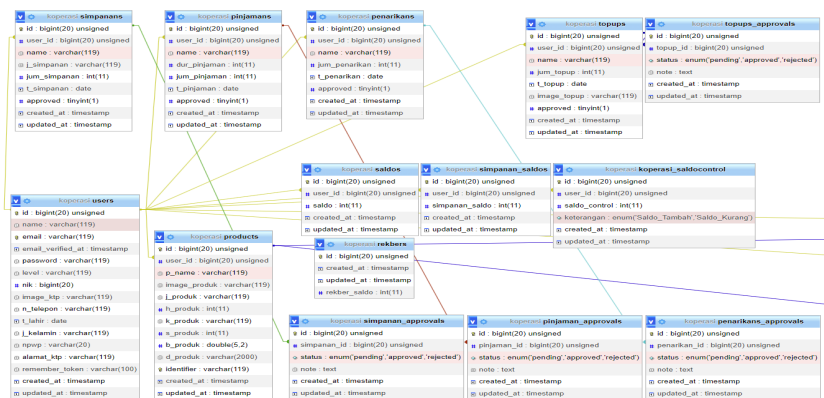
Figure 3 Cooperative ERD

The web cooperative database will be divided into several tables, each containing cooperative component data. The number and use of balances as a transaction method will be recorded in the balance and koperasi_saldokontrol tables.

4. SYSTEM TESTING

4.1 RESULTS OF BALANCE TOP-UP SYSTEM DESIGN

All types of transactions on the website require a valid balance as a payment method. The balance can be obtained through the top-up feature by filling in the data on the following form:

Figure 4 Top-Up Form

The form data will be sent to the cooperative admin for approval after the submit button is pressed. If the top-up is approved by the admin, the balance will be added to the account, and the top-up history can be checked on the top-up history page.

Figure 5 Top-Up History Page

4.2 RESULTS OF MEMBER REGISTRATION DESIGN

Most services offered by the web cooperative, such as savings, loans, and withdrawals, can only be accessed by cooperative members. Users willing to become cooperative members can fill out the following member registration form:

Figure 6 Member Registration Form

After successful registration, the user's level in the database will change to "member."

Figure 7 User Level Change

4.3   RESULTS OF COOPERATIVE SAVINGS SYSTEM DESIGN

Savings are a cooperative business service where users who have registered as members can deposit savings with the cooperative. There are three types of savings that can be made on the web cooperative: basic savings, mandatory savings, and voluntary savings. The savings deposit method is carried out through the cooperative balance system. In this section, four testing methods are performed for several savings conditions:

1.   Savings Exceeding Balance

The nominal amount of savings that a cooperative member can apply for must match the balance amount held. In this testing phase, user_id 1 will initiate a savings transaction without having a balance.

Figure 8 Balance Table

An error message will appear when filling out the savings form.

Figure 9 Savings Error Message

2.   Basic Savings Type

User_id 1 will initiate a basic savings transaction. Before this, user_id 1 has topped up by Rp. 100,000, as seen in the balance table below:

Figure 10 Initial Balance Table

The user then proceeds to the basic savings process of Rp. 10,000 by filling out the savings form.

Figure 11 Savings Form

After submitting the form, the transaction data will be sent to the cooperative admin for approval. If the transaction is approved, the deduction of the balance due to the savings will be performed. Basic savings have a fee of Rp. 50,000, so if user_id 1 has applied for basic savings of Rp. 10,000, the deducted balance for user_id 1 will be Rp. 60,000. The balance activity can be seen in the koperasi_saldokontrol table below:

Figure 12 Koperasi_saldokontrol Table

The fee of Rp. 50,000 will be added to the cooperative "rekber" table as a source of cooperative funding. It can be seen that the rekber balance has increased by Rp. 50,000.

Figure 13 Rekber Table

The final balance value owned by user_id 1 is Rp. 40,000.

Figure 14 Final Balance Table

3.   Mandatory Savings Type

User_id 1 will initiate mandatory savings. The current balance held by user_id 1 after basic savings is Rp. 40,000. The user then proceeds to the mandatory savings process of Rp. 10,000 by filling out the savings form. After submitting the form to the admin and approval, the applied mandatory savings transaction will enter the savings table:

Figure 15 Savings Table

Mandatory savings have a fee of Rp. 100. Therefore, if user_id 1 applies for savings of Rp. 10,000, the deducted balance for user_id 1 will be Rp. 10,100. The balance deduction activity can be seen in the koperasi_saldokontrol table.

Figure 16 Koperasi_saldokontrol Table

The Rp. 100 fee will be added to the cooperative rekber table.

Figure 17 Rekber Table

The current balance owned by user_id 1 is Rp. 29,900.

Figure 18 Final Balance Table

4.   Voluntary Savings Type

User_id 1 will perform a voluntary savings transaction with the remaining balance of Rp. 29,900. The user will save Rp. 10,000. After filling out and submitting the form to the cooperative admin, the applied voluntary savings will enter the savings table as follows:

Table Figure 19 Savings Table

Voluntary savings do not have a fee, so the deducted balance will only be the amount of the applied savings, which is Rp. 10,000 in this case. The balance activity can be seen in the following table:

Figure 20 Koperasi_saldokontrol Table

There is no fee added to the cooperative rekber table because the user_id 1 performed voluntary savings.

Figure 21 Rekber Table

The current balance owned by user_id 1 is Rp. 19,900.

Figure 22 Final Balance Table

4.4   RESULTS OF COOPERATIVE LOAB SYSTEM DESIGN

The loan service allows cooperative members to borrow money. The loan feature has a fee of 0.5% of the loan amount, which will be used as operational funds for the cooperative. In this testing process, two testing stages are performed for the loan system conditions:

1. Loan Exceeds Balance
    The amount of balance user_id 1 has deposited with the cooperative is Rp. 30,000.

Figure 23 Savings Table

This indicates that the loan amount that user_id 1 can apply for is not more than Rp. 30,000. If user_id 1 tries to apply for a loan with an amount exceeding Rp. 30,000, an error message will appear on the loan form.

Figure 24 Loan Balance Error Message

2. Loan by User_id 1
    User_id 1 will apply for a loan of Rp. 10,000. The current savings of user_id 1 in the cooperative are Rp. 30,000. The user then fills out and submits the loan form to the cooperative admin. The approved loan transaction will appear in the loan table.

Figure 25 Loan Table

The activity of adding balance due to the withdrawal transaction will be stored in the koperasi_saldokontrol table.

Figure 26 Koperasi_saldokontrol Table

The loan fee of 0.5% of the loan amount, which is Rp. 500, will be recorded in the cooperative's rekber table.

Figure 27 Rekber Tabke

The balance of user_id 1, initially Rp. 19,900, now increases to Rp. 29,400 (including a loan fee of Rp. 500).

Figure 28 Final Balance Table

4.5   RESULTS OF COOPERATIVE WITHDRAWAL SYSTEM DESIGN

The withdrawal service allows cooperative members to withdraw from their savings balance in the cooperative. The withdrawal amount cannot exceed the savings amount in the cooperative. In this stage, testing is conducted based on withdrawal conditions:

1.   Withdrawal by User_id 1

User_id 1 will make a withdrawal of Rp. 10,000. If the withdrawn amount exceeds the savings amount, an error message will appear.

Figure 29 Withdrawal Form

User_id 1 then decides to withdraw Rp. 10,000. After filling out the form, sending it, and getting approval from the cooperative admin, the requested withdrawal transaction will be stored in the withdrawal table.

Figure 30 Withdrawal Table

The activity of adding balance will also be stored in the koperasi_saldokontrol table.

Figure 31 Koperasi_saldokontrol Table

The balance of user_id 1, now increased by Rp. 10,000.

Figure 32 Final Balance Table

4.6   RESLUTS OF COOPERATIVE ADMIN SYSTEM DESIGN

All types of transactions in the cooperative must await admin approval. This feature is provided to prevent fraud. Transaction approval can be done on the admin dashboard page:
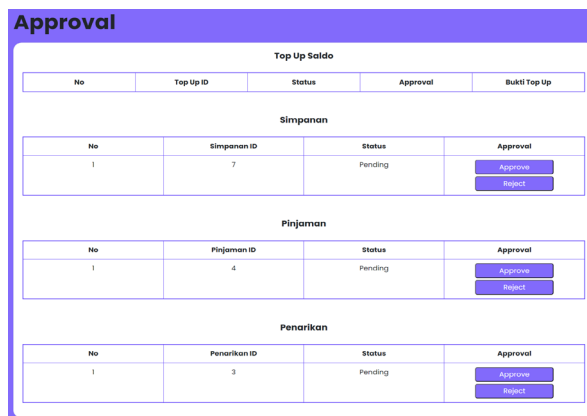
Figure 33 Admin Dashboard Page

At this stage, the admin will review the data entered in the transaction form. If the data is correct, the admin can approve the transaction request. Approved transactions will appear on the transaction history page. The following is an example of the savings transaction history page:

Figure 34 Savings Transaction History Page

4.7   RESULTS OF BLACKBOX TESTING FOR COOPERATIVE WEBSITE-BASED APPLICATION

The results of the design for each system in the web-based digital cooperative application can be seen in the following Table 1:

Table 1 Blackbox Testing

Testing Section	Description	Expected Result	Status
Access Website	Enter the website address in the browser	The cooperative website can be accessed through the browser	Successful
User Registration	Enter Name, Email, Password, Phone Number, Date of Birth, and Gender in the registration form, then press submit	The system will send the registration data to the user table in the database	Successful
User Login	Enter Username and Password in the login form, then press submit	The system can reject the login process if user data is not found in the user table in the database	Successful
Top-up Balance	Enter Name, top-up amount, top-up date, and top-up proof in the form, then press submit	The system will send the top-up data to the cooperative admin for approval	Successful
Member Registration	Enter additional information such as NIK and address in the member registration form	The system will add additional data to the user table, and the user's level will change from "User" to "Member"	Successful
Transaction Exceeding Savings	Enter the amount of savings that exceeds the balance in the savings application form, then press submit	The system will reject the savings process and display an error message in the savings form	Successful
Basic Savings Transaction	Select the basic savings transaction type and enter the savings amount that is equal to or less than the balance	The system will send the savings data to the admin for approval, and a basic savings fee of Rp. 50,000 will be charged to the user as operational costs	Successful
Mandatory Savings Transaction	Select the mandatory savings transaction type and enter the savings amount that is equal to or does not exceed the balance	The system will send the savings data to the admin for approval, and a mandatory savings fee of Rp. 100 will be charged to the user as operational costs	Successful
Voluntary Savings Transaction	Select the voluntary savings transaction type and enter the savings amount that is equal to or does not exceed the balance	The system will send the savings data to the admin for approval	Successful
Transaction Exceeding Savings	Apply for a loan by entering an amount that exceeds the saved amount in the loan application form, then press submit	The system will reject the loan transaction and display an error message in the loan form	Successful
Loan Transaction	Enter Name, loan amount, loan duration, and loan date in the loan application form, then press the submit button	The system will send the loan form data to the cooperative admin for approval	Successful
Withdrawal Transaction	Apply for a withdrawal with an amount that matches the stored savings balance	The system will send the withdrawal form data to the cooperative admin for approval	Successful
Admin Approval System	Check the data entered in the transaction-related form submitted by cooperative members	Valid form data will be approved by the cooperative admin, and the transaction process can proceed	Successful
Cooperative Transaction History	Display all transaction histories approved by the admin on the transaction history page	Display complete data related to transaction history, including customer name, transaction date, transaction type, transaction amount, and approval status	Successful

5. CONCLUSION

Based on the results of the testing of the web-based cooperative application system, it can be concluded that:

1. The web-based cooperative application allows easy access to cooperative services since it can be accessed anywhere as long as the user is connected to the internet.
2. The transaction process on the cooperative website involves recording and processing data in the database, ensuring that the necessary transaction processes for cooperative users occur quickly.
3. Operational data stored in the database will facilitate cooperative managers in conducting management tasks such as inventory checks and monitoring ongoing transactions.

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