

## **Sustainable Cooperative System based on Self-Management: Empowerment of "Gambuh" All-Business Cooperative Gongseng Megaluh Jombang**

<sup>1</sup>Izzatul Umami, <sup>2</sup>Rizka Mudiyanti, <sup>3</sup>Linda Rata Sari, <sup>4</sup>Agus Raikhani

<sup>1</sup>Faculty of Informatics Engineering, Darul Ulum Jombang University, Indonesia

<sup>2</sup>Regional Development Planning Agency (BAPPEDA) of Jombang Regency,  
Indonesia

<sup>3</sup>Faculty of Economics, Darul Ulum Jombang University, Indonesia

<sup>4</sup>Faculty of Engineering, Darul Ulum University, Indonesia

Email: <sup>1\*</sup>izzatulumamimuslim@gmail.com, <sup>2</sup>rizkamudiyanti\_ub@yahoo.co.id,

<sup>3</sup>lindaratnasari46@gmail.com, <sup>4</sup>agus.raikhani@gmail.com

### **Abstract**

*In Indonesia, cooperatives play a role in improving economic and social welfare and play an active role in improving the quality and standard of living of people and society. Currently, many cooperatives are still run manually even though the development of information systems has made very rapid progress. This information system technology can create an online-based cooperative system, making it easier and more efficient to work. The system is built by using MySQL as a database. This research uses a Research and Development (R&D) approach with seven stages: research, planning, development, Preliminary field testing, Main product revision, and Main field testing and testing. This system needs a model designed using Unified Modelling Language (UML), which is depicted through use case diagrams and activity diagrams. Testing this cooperative system uses the Black Box Testing method. Black box testing, also called Behavioral Testing, is a test carried out to observe the input and output results of the software without knowing the code structure of the software.*

**Keywords:** Cooperative System; R&D; Unified Modelling Language; Black Box Testing; System RAT.

### **Abstrak**

*Di Indonesia, koperasi berperan dalam meningkatkan kesejahteraan ekonomi dan sosial serta berperan aktif dalam meningkatkan kualitas dan taraf hidup masyarakat dan masyarakat. Saat ini banyak koperasi yang masih dijalankan secara manual meskipun perkembangan sistem informasi telah mengalami kemajuan yang sangat pesat. Teknologi sistem informasi ini dapat menciptakan sistem koperasi berbasis online, sehingga lebih mudah dan efisien dalam bekerja. Sistem ini dibangun dengan menggunakan MySQL sebagai database. Penelitian ini menggunakan pendekatan Research and Development (R&D) dengan tujuh tahap: penelitian, perencanaan, pengembangan, Preliminary field testing, Main product revision, dan Main field testing and testing. Sistem ini membutuhkan model yang dirancang menggunakan Unified Modelling Language (UML), yang digambarkan melalui diagram use case dan diagram aktivitas. Pengujian sistem koperasi ini menggunakan metode Black Box Testing. Pengujian kotak hitam, juga disebut Pengujian Perilaku, adalah tes yang dilakukan untuk mengamati hasil input dan output dari perangkat lunak tanpa mengetahui struktur kode perangkat lunak.*

**Kata Kunci:** Sistem Koperasi; R&D; Bahasa Pemodelan Terpadu; Pengujian Kotak Hitam; Sistem RAT

## 1. Introduction

The "Gambuh" Gongseng Megaluh Jombang East Java All-Business Cooperative was born 23 years ago, but the bookkeeping process is still manual. The number of members released last was 420. One of the all-business activities in Gongseng Village is the "Gambuh" All-Business Cooperative and the empowerment of Gongseng village administrators and members. Cooperative activities and community empowerment in Gongseng Village are always carried out well. The problems in cooperatives require cooperative management to innovate in cooperative management. The management of the manual system burden some for the cooperative management, but it is slightly helped because members can come every week to the Cooperative office.

There are several systems engaged in services such as savings and loan cooperative businesses, where this business often experiences problems with data acquisition, namely recording transactions due to human error. Members with a large number will certainly make the cooperative management feel heavy in handling the financial management process. Currently, the automated financial system is needed because the cooperative financial information system is one part of the controlled financial management process. Moreover, it was triggered by the spread of the Covid Virus, which was a problem for Members not being able to attend every week activities and make transactions like the previous year. This business can rely on software or applications in daily work activities to make it easier to process or manage both member data and credit installment payment data to business report recaps. To minimize human error and improve the performance of savings and loan cooperatives because all transaction recording is carried out through the application [1]. Currently, many cooperatives run manually in Indonesia, especially in Gongseng Megaluh Jombang village; this is certainly experiencing obstacles during the Covid-19 pandemic, which causes limited attendance of members and administrators in running cooperatives leads to inhibition of all activity processes within the cooperative.

Research needs a theoretical foundation to strengthen and relate to new knowledge and facilitate research to compile a hypothesis and research methodology. Some supporting theories about this research are about systems, information systems, cooperatives, storage data, and supporting tools in building cooperative system software. A system is a network of interconnected procedures coming together to accomplish a certain activity to achieve a certain goal [2]. This system describes a real event as a real object, such as places, objects, and people that exist and occur [3]. Information System is a tool to display all information online through the web or applications that provide information in planning, launching, organizing, and operating companies, academics, cooperatives, and others [4]. The information system has components consisting of input blocks, model blocks, output blocks, technology blocks, database blocks, and control blocks.

The cooperative has a savings and loans sub-unit, storage, and loan medium for its members, where transaction operations use an interesting system just like banks [5]. A cooperative is a joint effort of a group with common interests to improve its members' well-being. Cooperatives are microeconomic movements based on family principles [6]. This is in line with the definition of cooperatives according to Law No. 17 of 2012, which states: "A cooperative is a legal entity established by an individual or a cooperative legal entity, with the separation of the wealth of its members as capital to run a business, which meets common aspirations and needs in the economic, social, and cultural fields in accordance with the values and principles of cooperatives".

## 2. Research Methodology

In conducting the research carried out, researchers use the Research and Development (R&D) Method approach. The R&D method used in research for system development Research Development (R&D) method is utilized to create a specific product and evaluate that product's efficacy [7]. This R&D method itself has seven stages, namely research,

planning, creation, initial field testing, final product revision, and final field testing, and testing.

## 2.1. Use Case Diagram

In designing this system, researchers use UML as the system's basic design. UML itself is UML (Unified Modelling Language) which is a visual modeling method for designing object-oriented systems. UML is a language that has become a standard in software systems' visualization, design, and documentation [8]. This study designed UML with two diagrams, namely use case diagrams and activity diagrams. Case Study Diagrams are descriptions or sets of connected objects that frequently constitute a system [9]. The use case describes an intersection of both a pair of actors and the information system to be created. Here is a picture of the use case diagram of the All-Business Cooperative System.



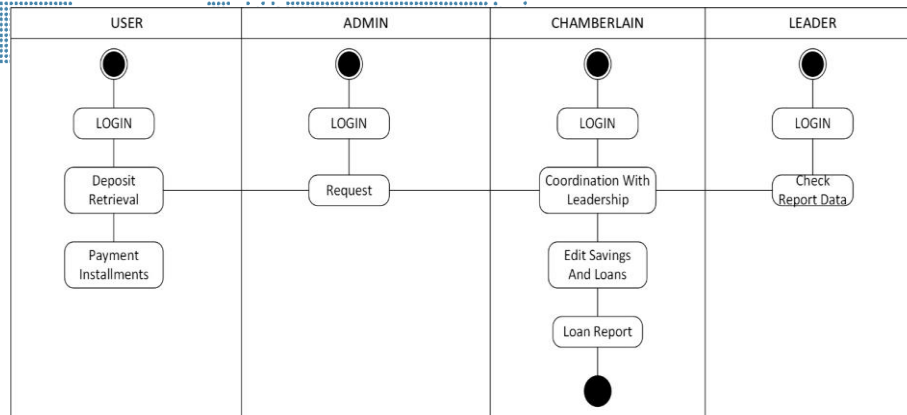
**Figure 1.** Use Case Diagram of Peat All-Business Cooperative System

**Table 1.** Use Case Actor Description

No	Aktor	Deskripsi
1	Admin	Actors have system-wide access rights
2	Leader	Actors have access rights to dashboards and view reports
3	Chamberlain	Actors have access to dashboards and Transactions
4	Member	Actors have access to transactions, withdraw, credit and others

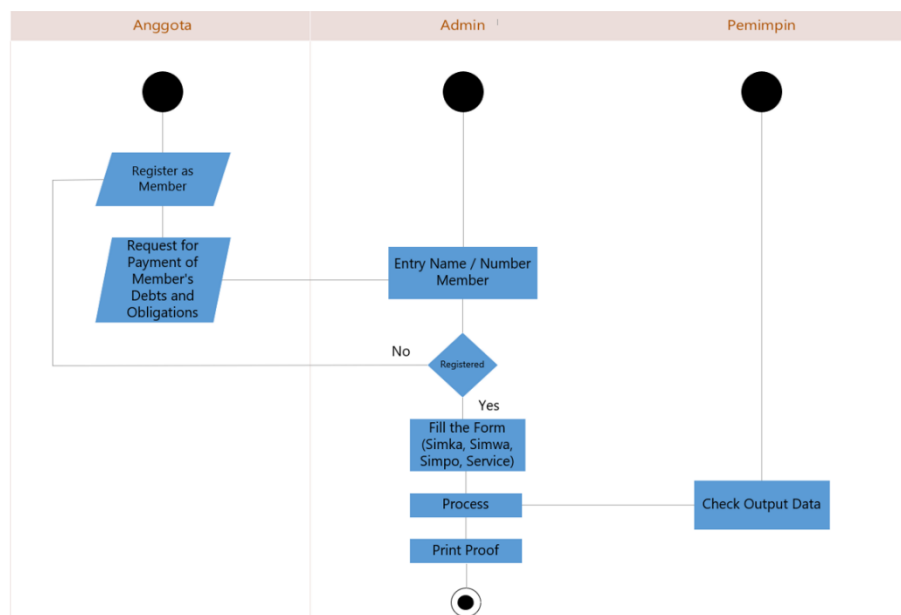
## 2.2. Activity Diagram

An activity diagram is a modeling of a working system of an object or a system, and an activity diagram is described with a structured process. A diagram activity is depicted with a structured pipeline [10]. The activity diagram will illustrate the different activity flows in the system being created, how each flow starts, potential decisions, and how they might behave [11]. The following are the results of the activity diagram of the All Business competency system

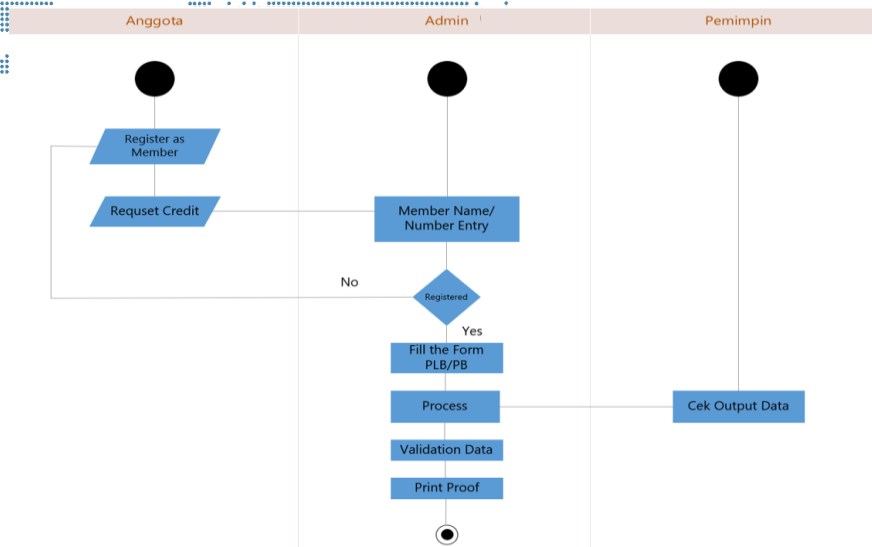


**Figure 2.** Activity Diagram of the All Business Cooperative System

The transaction activities of the All-Peat Business Cooperative consist of two processes, namely the payment of members and the demand for debts. The process of all activities is synchronized with the members. Members can apply for payments or loan requests. The admin will execute the process requested by the members, and the Peat all-business cooperative supervisor will also know the information. Below is the flow of payment activities and the application for receivables funds.



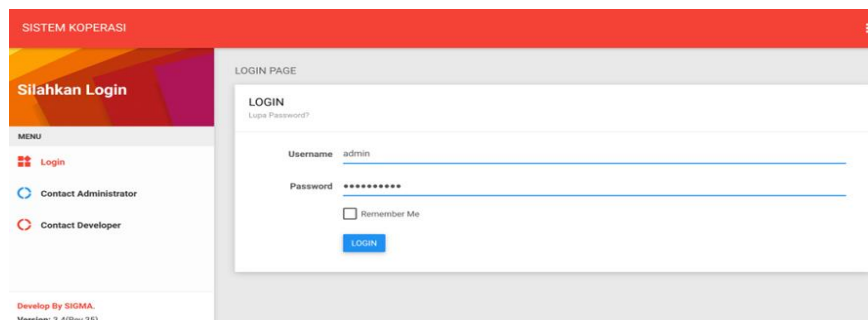
**Figure 3.** Activity diagram Payment of debts and obligations of members



**Figure 4.** Activity diagram of Borrowing / Debt by Members

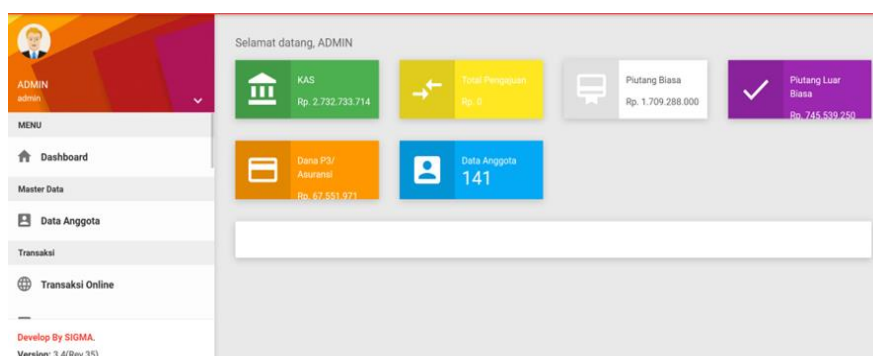
### 3. Result And Discussion

The results of this research and discussion contain the design of the system and an explanation of the features available in the Peat All-Business Cooperative system, and explain the stages of testing the system using the black box testing method.



**Figure 5.** Cooperative System Login View

Figure 5 contains the initial display before entering the dashboard of the All-Business Cooperative system by entering the username and password to enter the web page



**Figure 6.** Dashboard view by Admin level

Figure 6 is described a small part of the system that has been built. Admin level can determine the system's overall performance from data entry to the reporting process. The Peat All-Business Cooperative system has four levels of login that have different access rights, including Admins, Leaders, Treasurers, and Members



Black box testing is a software quality test focusing on software functionality [12]. Black box testing aims to find incorrect functions, interface, data structure, performance, and initialization errors [13]. Black Box testing using the equivalence partitions technique is a test based on data on each form contained in the system [14]

**Table 2.** Black Box Testing Phase

No	Test Scenarios	Test Login	Expectations	Result	Conclusion
1	Clear all login data and click "login."	Username: - Password: -	The system denies access, and an incorrect username and password notification appears	As expected	Valid
2	Just fill in the username "admin," then click login	Username: admin Password: -	The system denies access, and an incorrect username and password notification appears	As expected	valid
No	Test Scenario (Member Level)	Receivables Input Test	Expectations	Result	Conclusion
1	Fill out the receivables application by not filling in the part of the installment amount	Number of Installments: -	The system cannot save, and the message "Please enter a number" appears	As expected	Valid
No	Test Scenario (Lead Level)	Cash Statement Test	Expectations	Result	Conclusion
1	Processing cash statement data by only filling in the initial date column	Original date: 07/04/2022 End date: mm/dd/yyyy	The data cannot be processed and the message "please fill out this field" appears	As expected	Valid
No	Test Scenario (Member Level)	Test Transaction Report	Expectations	Result	Conclusion
1	Print the report without filling in the start date and end date fields, then click print report	Start date: mm/dd/yyyy End date: mm/dd/yyyy	The system cannot print and the message "please fill out this field" appears	As expected,	Valid

## 4. Conclusion

The built Cooperative System is intended to assist in financial management. This cooperative system was built according to the needs of the Gambuh All-Business Cooperative (KSU) course, which aims to build independent cooperative management. The need for a cooperative system, according to KSU Gambuh, is a system with (4) levels of management; the system can be monitored in real-time; the admin only enters the incoming and outgoing money data; an automated RAT system; automated financial statements; the founder of KSU Gambuh can monitor finances at any time; members can monitor the progress of their money movements in real-time. Research on the cooperative system can continue to be continuous to make KSU Gambuh have a unified system based on Independent Management. Of course, the empowerment of all-business cooperatives in the form of a management system does not stop at KSU "Gambuh" Gongseng Megaluh Jombang. Still, it can develop in KSU or Cooperatives other than Gongseng village. We want to thank the Regional Development Planning Agency (BAPPEDA) of Jombang Regency for the success of this research which is the largest facilitator in the sustainability of the system and the use of the system at "KSU Gambuh" Gongseng Megaluh Jombang.

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