Construction of a Web-Based Farmer Group Livestock Information System

Ricky Ramadhan Harahap[1*], Irwan[2], Supiyandi[3], Chairul Rizal[4], Barany Fachri[5], Hendry[6]
[1,2,3,4,5,6]Universitas Pembangunan Panca Budi, Medan

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***Correspondence**
rickyramadhan@dosen.pancabudi.ac.id

Abstract-Errors between administrators and warehouses regarding stocks of fertilizers, seeds, and tools are still common, resulting in less effective accounting and information processes for farmer groups. A web-based application simplifies data processing and transmission, helping farmer groups manage and oversee the company's strategy to match it with the empowerment of farmer groups in a balanced manner. Therefore, this study aims to design a farmer group application that operates over the internet. The study resulted in a farmer group application built with admin features that can create, read, change, and delete (CRUD) stock items, member data, tool stock, and reports. However, farmers have the ability to view stock items and submit online pickups. Waterfall method, web-based design using integrated modeling language method (UML). The black box method combined with the Partitioning Test Case Equivalence technique produced successful software testing results. This application is expected to help the Farmer Group work better and increase solidarity and food quality for all farmers.

INTRODUCTION

The accelerated spread of technology has a huge impact on many things, especially the fisheries economy, particularly agriculture, where the majority of Indonesians work (H. Hermawan, 2016). As a result, Indonesia is now considered a developing country. The day-to-day processes within the agricultural sector are heavily influenced by this role. Given the amount of work that cannot be abandoned, a means is needed to facilitate data or information processing. One way to help a group or community process data and information effectively and efficiently is to use a computerized system (M. Farhan Setiawan, M. Nur Witama, and R. Hikmah, 2020). This farmer group is a collection of farmers in the Orong Tenga area who have more than 40 members who work together to meet the needs of their respective lands. The activities of this group provide tools and materials provided by the government.

Based on observations where the process of bookkeeping and information is still

done manually, it is less effective because there are often errors between the management and the warehouse. In cases such as fertilizer, seeds, and any tools, members should know how many items there are, then the caretaker should check it on the logbook or go directly to the warehouse to make sure if it exists. If it is there, the member should give it directly to the caretaker without making any changes. However, this is the reality of farmer data management: farmer groups still use books to process their data.

Researchers looked at this farmer group system that decided to change some of its data with standardized interfacing tools (such as web browser interfacing tools) to enable data exchange (H. Herfandi, M. Julkarnain, and M. Hanif, 2022). Web-based applications make data processing and distribution easier (N. Purwanti and I. D. Fatmaningtyas, 2020) due to advances in information and communication technology. This application is expected to help farmer groups manage their organizational and information strategies so that their empowerment remains balanced. This application is expected to help Farmer Groups overcome their problems and increase solidarity and food quality for all farmers.

The research conducted by S. Fitrianti, S. Lecturer of the Agricultural Study Program, A. Agriculture, P. Agriculture, and N. Payakumbuh (2018) in this article developed a management information system to support decision-making for managers. The application is capable of processing data and providing the information needed by the manager; however, the limitation is that the application can only be accessed from one computer. The difference with the current research is that the application being developed can be accessed on any mobile phone or computer. Research by Y. P. Ariyani, H. Suryamen, and F. Akbar (2017) resulted in the development of a search application or GPS regarding the layout of farmer groups in Agam Regency. The application created is very comprehensive, displaying details and names of the locations of these farmer groups. The drawback of this research is the lack of specific information about the farmer groups. The difference lies in its function, where applications in current research can provide more specific information to farmer groups [7]. Research conducted by J. Suganda and M. Solahudin (2017) developed a system that is a web-based software application specifically designed to manage information regarding farmer groups. The application allows agricultural offices or farmer groups to easily view information, add information, and edit information according to their roles. However, this farmer group information system has not yet become a two-way communication medium, and it also does not record

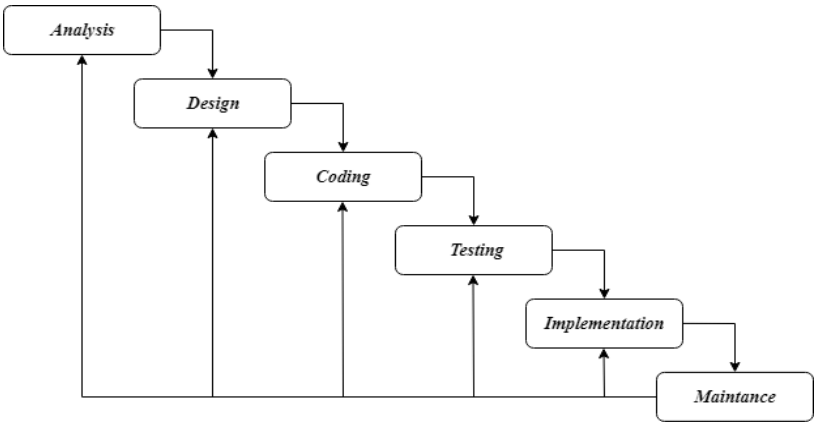
the activities or assets received by the farmer groups. The difference lies in who the research is aimed at; my research is directed towards a Farmer Group (Poktan), while that research aims to manage a Joint Farmer Group (Gapoktan) [8]. Research by M. F. Hidayatullah (2020) developed an application that produces integrated online financial health analysis according to each level. The application has financial reporting that can be accessed by both members and the parent organization. The lack of inspection of goods has resulted in discrepancies with the stock. The difference lies in the research and application, where the application being developed prioritizes the suitability of the available items with the notes [9].

In this research, the researcher designed an application to facilitate data processing and information delivery. The developed application includes a video menu for educational purposes. Considering the references above, the strength of this research lies in its more specific activity information features, which can be accessed at any time and supports both mobile devices and computers. Additionally, it has comprehensive activity information features, allowing researchers to develop it using various existing methods. The researcher employs the waterfall method, which is deemed very effective for the design of the application.

RESEARCH METHODOLOGY

SDLC (*Software Development Life Cycle)*

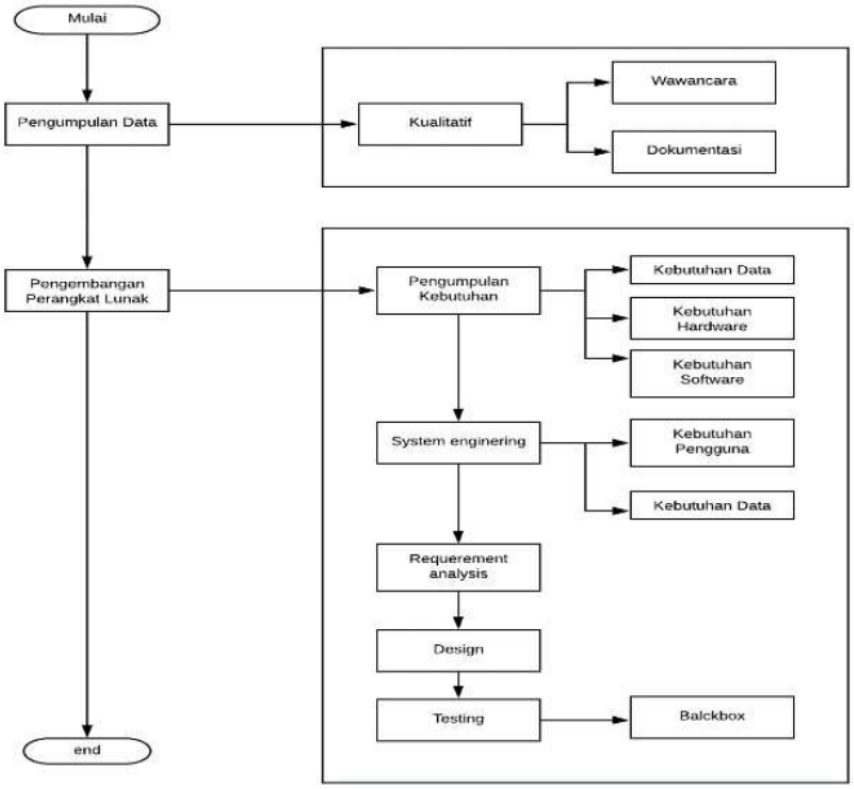
Software Development Life Cycle is a conceptual model used in research management to outline the steps involved in a research project. Various SDLC methods have been developed to guide system development including the waterfall model, Rapid Application Development (RAD), Joint Application Development (JAD), Fountain model and Spiral model and so on. The model that the author uses in developing information systems is the waterfall model. Figure 1 shows the classic methodology Waterfall model, which is the first SDLC method that outlines the various stages involved in system development.



Gambar 1. Metode Waterfall

Figure 1 shows the stages of the system planning process. The explanation of each of the stages is as follows:

1. Requirments definition stage where recognising the problems that exist in users is then carried out the process of the initial stages in creating a new system.
2. System and Software design At this stage, data design is carried out, interface (interface). The design created focuses on creating a software support programme design.
3. Implementation and unit testing At this stage is the implementation of the design stage which is then tested partly or per unit.
4. Integration and System Testing at this stage the process of testing the system or testing the design of the information system is carried out and then the system is tested as a whole whether it is in accordance with the expected results.
5. Operation and Maintanance at this stage the software that has been made is handed over to the user to run and maintenance is carried out by the agency.



Gambar 2. Kerangka Pemikiran

Figure 2 shows the stages of the system planning process. The explanation of each of the stages is as follows:

1. Identification of business processes at a stage where recognising the problems that exist in users is then carried out the process of the initial stages in creating a new system.
2. System Analysis At this stage data design is carried out, interface (interface). The design created focuses on creating a software support programme design.
3. System design At this stage is the implementation of the design stage which is then tested partly or per unit.
4. Implementation At this stage, the process of testing the system or testing the design of the information system is carried out, then the system is tested as a whole whether it is in accordance with the expected results.
5. Finalisation at this stage the software that has been made is submitted to the user to run and maintenance is carried out by the agency.

RESUL AND DISCUSSION

Login Form

In Figure 3 is the implementation of the member login display by filling in the username and password to be able to access the application which is the initial display before entering the farmer group application.

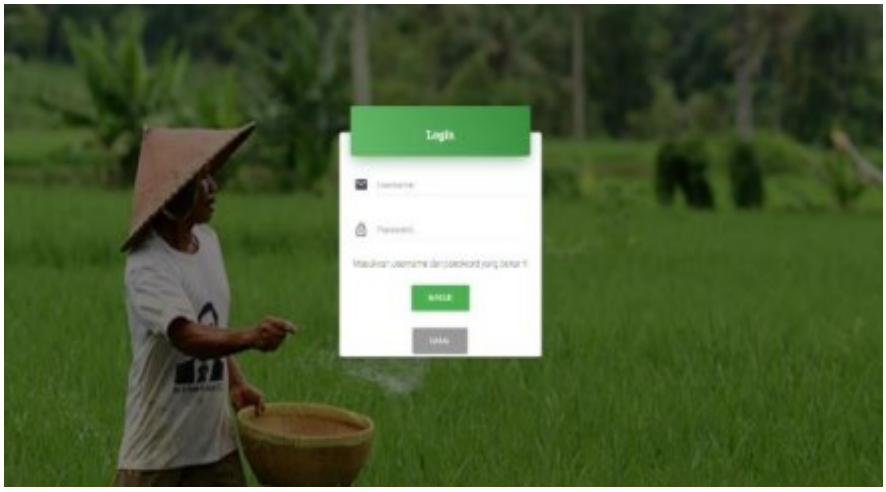


Figure 3. Login

Stock Form

In Figure 4 is the implementation of the seed and fertiliser stock view of the farmer group admin which contains seed and fertiliser data that can be edited.

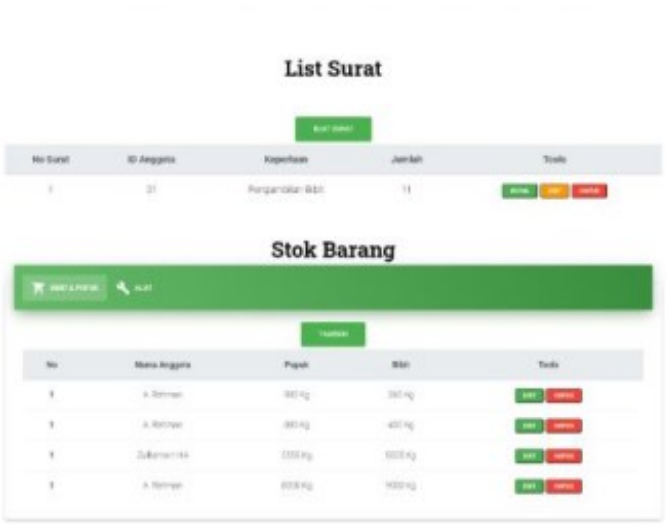


Figure 4. Stock

Testing System

In testing this application using the Black Box Testing method with the Test Case Equivalence Partitioning technique. The following are the stages carried out in Black Box testing using the Test Case Equivalence Partitioning technique which can be seen in Table 1

Table 1. Black Box Testing

Test Class	Scenario	Outcome	Conclusion
Login *(berhasil)*	*Enter username and password Enter the main page*	*Enter the main page*	*Success*
Instansi	*Add, delete, view and edit data agency*	*Enter the agency page and can perform data CRUD*	*Success*
Stakeholder	*Add, delete, view and edit data Stakeholders*	*Enter the stakeholder page and can CRUD data*	*Success*
Business Unit	*Conduct transactions buying and selling goods and / or services*	*Enter the business unit page (livestock, general trade, water) and make a sale transaction purchase*	*Success*
Financial Accounts	*To see income and transaction expenses and transaction reports*	*Log in to your financial account and be able to see the income that has occurred in the business unit, and can input expenses, and view financial*	*Success*

		statements of transaction results	
Manage Admin Data	*Manage admin data if there are changes data*	*Enter the edit information page admin*	*Success*
Logout	*Pressing the exit*	*Exit the system*	*Success*

CONCLUSION

The research shows that (1) the waterfall software development method is used; (2) the Farmer Group application is built with a web-based, using the Unified Modelling Language (UML) approach; (3) the programming language used is PHP (PHP: Hypertext Preprocessor), with the codeigniter framework and MySQL database; and (4) the software testing method with the black box method is used resulting in successful conclusions from various types of tests. (5) The farmer group application built has the ability of the admin to create, read, change, and delete (CRUD) stock items, member data, tool stock, and news. On the other hand, farmer members have the ability to view stock items and submit online pickups.

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