Farmer Group Information System at the Jombang Regency Agriculture Service

Thalisa Septia Firdaus[1], Zulfikar[2],
[1]Information Systems,
[2]Informatic,Universitas KH. A. Wahab
Hasbullah Email:
thalisafirdaus@gmal.com

Correspondence author:
zulfikardia@gmail.com

ABSTRACT

The Jombang Regency Agriculture Service is one of the Regional Government Apparatus. The Agriculture Service has the task of assisting the Regent in government affairs and the Regional Government's authority in agriculture. In this case study, the following problems were found: the existence of agricultural extension workers whose performance was poor due to the lack of systematic monitoring. This study aimed to build an Information System for Agricultural Development Patterns in Jombang Regency. The results obtained were in the form of increased agricultural competitiveness in the era of the Industrial Revolution 4.0. With the sipotan system, the agriculture service can track, monitor, and identify regional potential by agricultural extension workers. With the sipotan system, it can be seen which extension workers are performing well and which are not.

Keywords: Information System, Farmer Groups, Department of Agriculture, Monitoring.

INTRODUCTION

In the current Era of Globalization, science has an important role in determining the progress and success of a country, the development of science, especially in the field of technology, is utilized to improve national development and capabilities and accelerate the process of renewal toward the creation of a prosperous society. As we see, information technology has been utilized in all areas of life, ranging from industrial engineering education, services, offices, government, health, and other fields (Pontoh et al. 2022).

Information technology is an important part of every business plan. Almost all companies use information technology as one of the activities needed to improve the business services they manage. An information system is a system consisting of collecting, processing, storing, and analyzing information to achieve certain goals, (Perdana & Fajrizal (2023). Information systems play a role in making daily operational decisions for long-term planning. Web-based information systems are very helpful for farmers in efforts to increase agricultural productivity (Hartami & Guntarayana, 2022).

Santoso et al. (2016) explained that the use of Information and Communication Technology can be one strategy to realize this. The application of information technology in developing countries provides great support for the availability of access to data, information, and knowledge in the field of agriculture. The system developed is also able to expand the network for farmers to various other stakeholders in the field of agriculture.

Monitoring is the process of collecting and analyzing information based on the determination of indicators systematically and continuously for an activity in order to take corrective action to improve the next program/campaign (Hikmat, 2010). Monitoring aims to find out, review whether the reported data is in accordance with reality, and to ensure that the policies being implemented are in accordance with the goals and objectives (Muhammadun et al. 2022). In conducting this case study, problems were found, namely: Miscommunication often occurs when wanting to ship products because the distributor does not respond when contacted, so it is hoped that the system can provide real-time inventory information, cannot determine when the right time is to add products to the distributor, before the system, suppliers only guess about the stock of products available at the distributor for delivery, so it is hoped that the

system can provide information on recommendations for which distributors are a priority for delivery.

METHOD
Waterfall Method

According to Pressman & Bruce (2015) describes the Waterfall method as a systematic and sequential approach that is suitable for projects where system requirements can be fully understood before development begins. Pressman also notes that although the Waterfall model has weaknesses in handling changing requirements, this model still has a place in projects that require a structured and well-documented approach.

The Waterfall method has the advantage of a structured approach and complete documentation, but also has disadvantages such as being less flexible to changing needs during the development process. The advantage of using the waterfall method is that it allows for control. The development process of the one-by-one phase model thus reduces the possibility of errors that will occur (Puspa & Mulawati, 2020).

Research Design

The parts of this system are a description of the proposed system to obtain information that is made with the assumption of object-oriented modeling, therefore the existing components are Use Case, Activity. In the use case modeling section, a Use Case Diagram and a description of each actor in the system are presented. For each use case in the use case diagram, it will be described in detail in the next sub-chapter as shown in Figure 1.
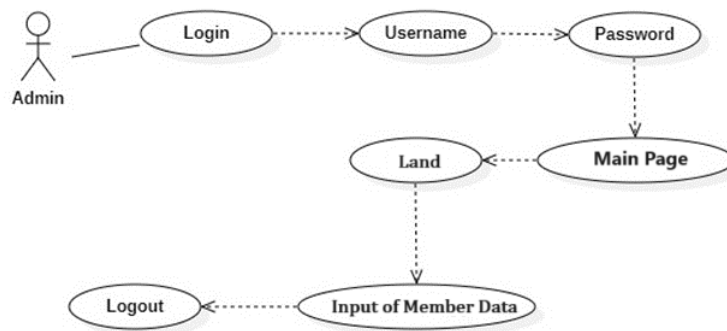
Figure 1. Use Case

In the Use Case Admin section, the flow explanation can be seen in the following table:

Table 1. Use Case

Use Case	Information
Login	Before entering the main page, you must log in first
Username	Admin enters the username according to the registered name.
Password	Admin enters the password according to his username.
Main Page	Admin login main page
Land	Admin of form land
Input Number Data	Admin inputs data on farmer group name, address, number of members, and coordinate points.
Logout	Admin dapat melakukan logout dari sistem

The Activity Diagram section explains the workflow and sequence of activities of a system process. The activity diagram in this study is as follows:

1. Login and Logout

Login and logout of the Activity Diagram describes 2 actors, namely super admin and admin. Before logging in, the user fills in the username and password to enter the system. If the username and password are incorrect, it will return to the login page, and if the username and password are correct, the main page of the system will appear. More details can be seen in Figure 2.

Figure 2. Login and Logout Activity Diagram

2. Account Registration Activity Diagram

The account registration activity diagram explains the flow of super admins before logging in, they are required to fill in the account registration to obtain a username and password. By pressing the register button, the system will display the registration form. Fill in the registration form completely. Click the save button, the system will save the data. If the form is filled in, the data is successfully saved. If the form is incomplete, the data fails to be saved. More details can be seen in Figure 3.
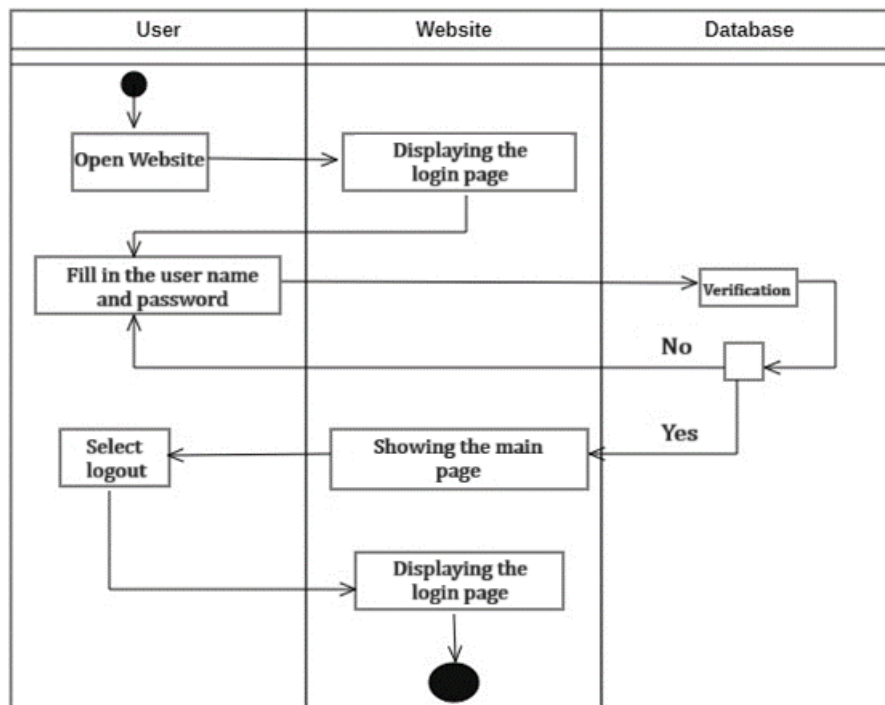
Figure 3. Account Registration Activity Diagram

3. Activity Diagram Data

Activity Diagram Data explains the flow of inputting farmer group data, so that it will display farmer data. And the system will display a summary of farmer data. More details can be seen in Figure 4.
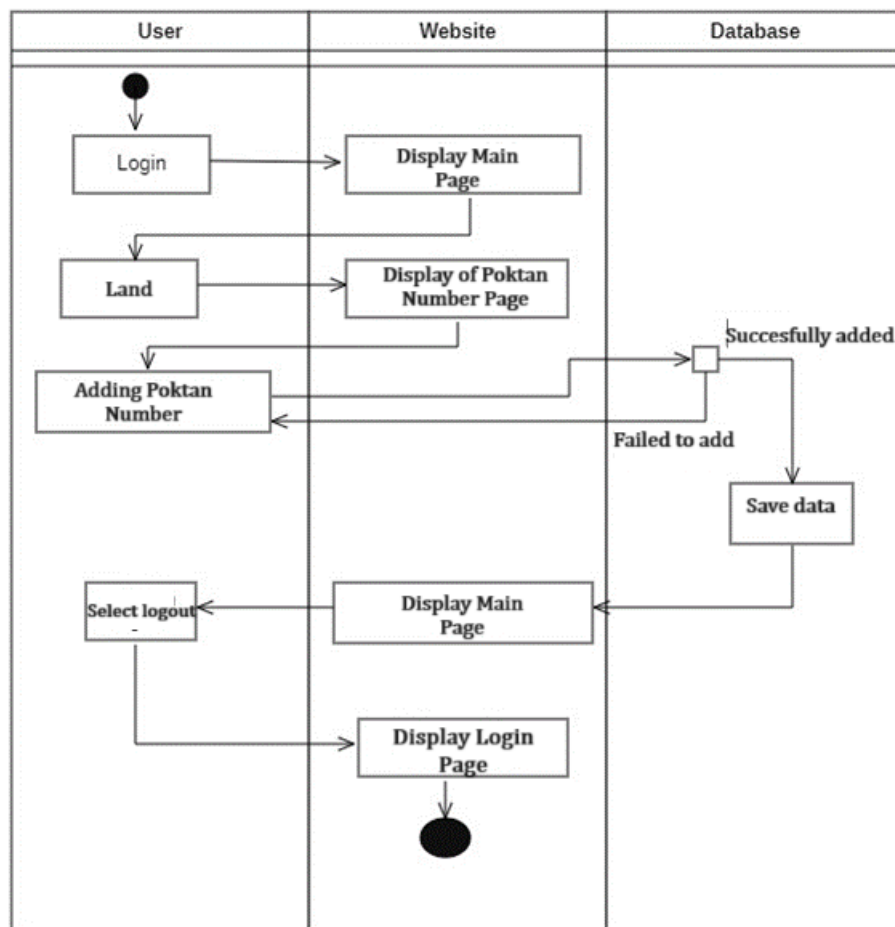
Figure 4. Activity Data Diagram

4. Sequence Diagram

    Sequence Diagram to explain the series of messages sent and interactions between projects, as can be explained by Figure 5.
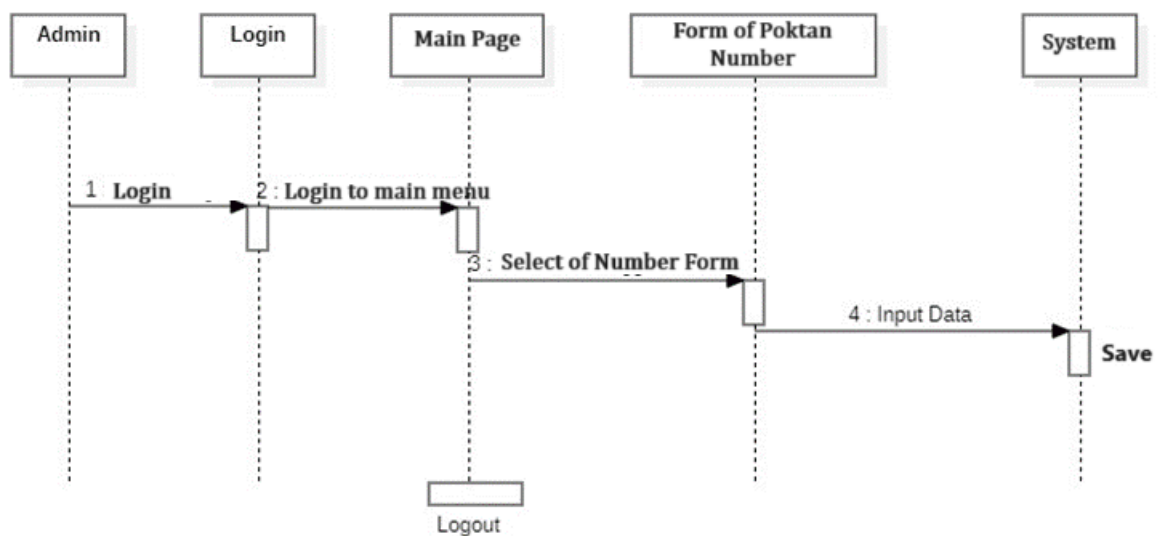
Figure 5. Sequence Diagram

5. Entity Relationship Diagram (ERD)

    Entity Relationship Diagram is used to show the relationships between entities required by the

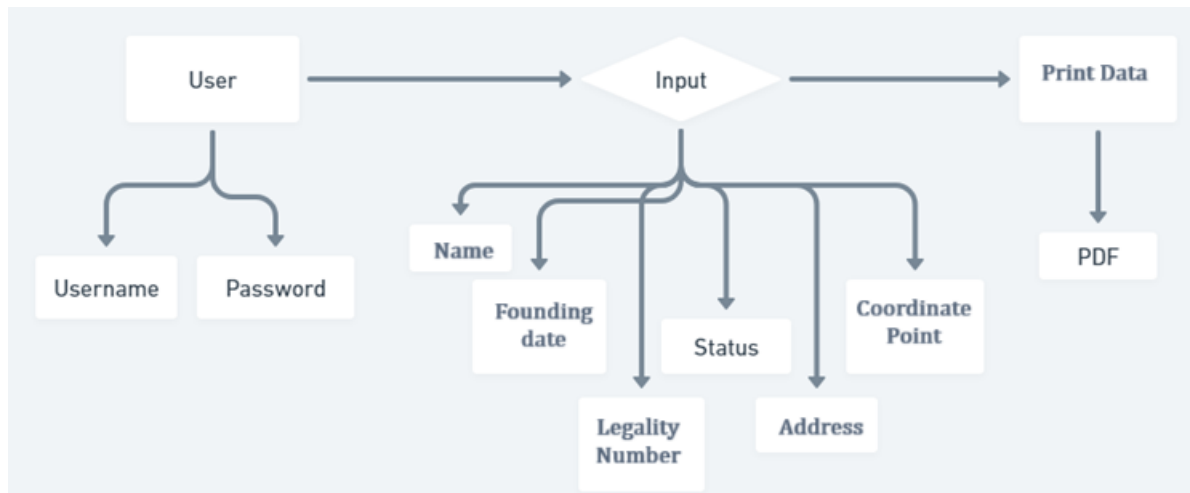system, as can be explained by Figure 6.

Figure 6. Entity Relationship Diagram

RESULT AND DISCUSSION
Implementation and testing

The development environment is the hardware and software specifications used during the software development process (Purba et al. N.D.). The hardware specifications used include: Processor, Hard disk, RAM. The specifications of the hardware used can be seen in table 2.

Table 2. Hardware

Name	Spesification
Processor	Intel(R) Core(TM) i3-6006U CPU @ 2.00GHz
Hardisk	520
RAM	4 GB
LCD	14 Inci
VGA	14.0 HD

The specifications of the software used during the process of creating this information system are as follows. In table 3.

Table 3. Software

Name	Specifications
Operational System	Windows 10
Programming Language	Dart
Database	phpMyAdmin
Tools Pendukung	VS Code, XAMPP, Chrome

Implementation aims to find out the flow of monitoring data addition so that it can be understood and can produce information that meets the objectives. The test itself is intended to ensure that each use case (feature) is running as it should.

1. Home Page

The main page contains the home, about, monitoring, agricultural data, and login. The display is in Figure 7.

Figure 7. Main Page

2. Testing the Login Page

This login page is used to log in by filling in the username and password. If the information filled in is correct, it will enter the dashboard page. If one of the usernames and passwords does not match, the login fails. The login page display can be seen in Figure 8.
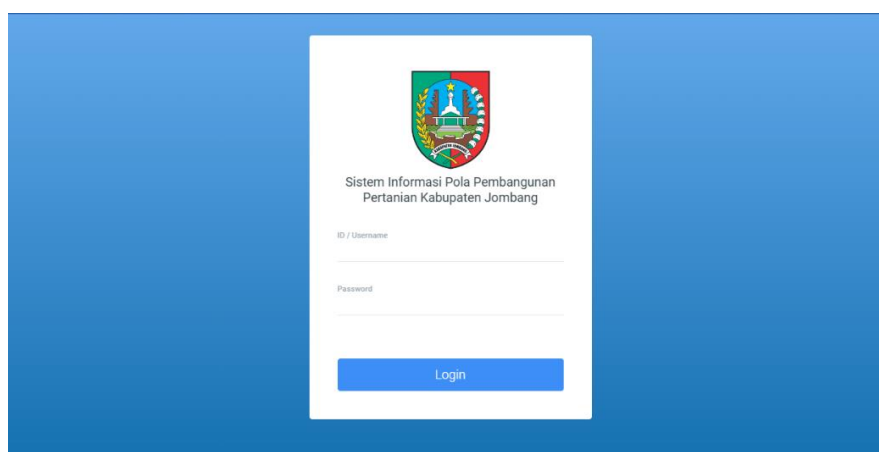
Figure 8. Login Page

Login page testing is done to test the functionality of the login page. Page testing is explained in table 4.

Table 4. Login Test

Testing of Login Form		
Tester	Thalisa Septia Firdaus	
Test date	28/06/2024	
Objective	Admin can access the website	
Testing Scenario		
Scenario I testing username column is empty	Input Data	Username:<kosong> Password: super
	expected	There is a notification that the login failed, there are still blank fields.
	Conclussion	accepted
Scenario II testing column is all filled	Input Data	Username: admin Password: super
	expected	Login of dashboard Page
	Conclussion	Accepted

3. Dashboard Page

The dashboard page will appear after successful login. The dashboard page display contains a master data system, crop commodities, land distribution, nutrients, farm record dem plot, tractor, simluh, and simluhja. The dashboard page display is in Figure 9.
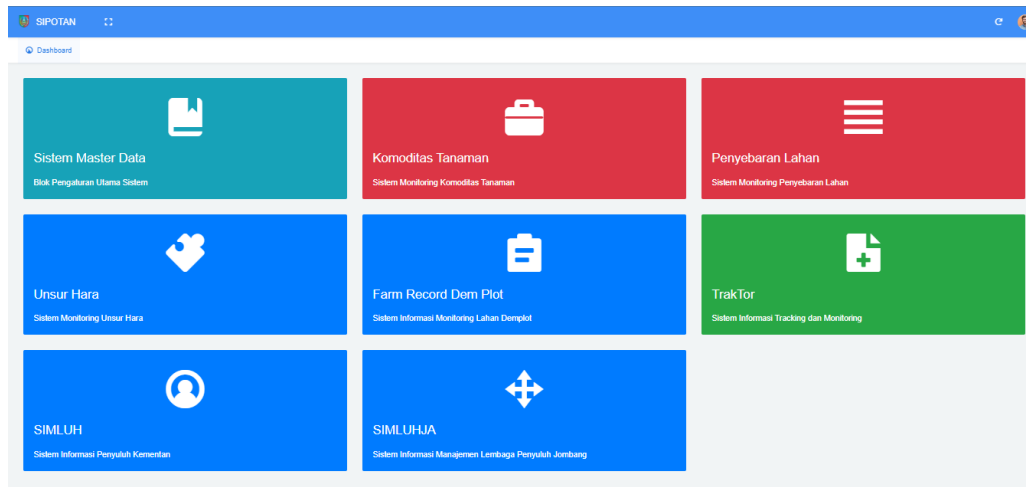
Figure 9. Dashboard

4. Land Distribution Page

The Land Distribution page contains the number of system blocks, the number of forms, and the number of accounts. The land distribution page display is in Figure 10.
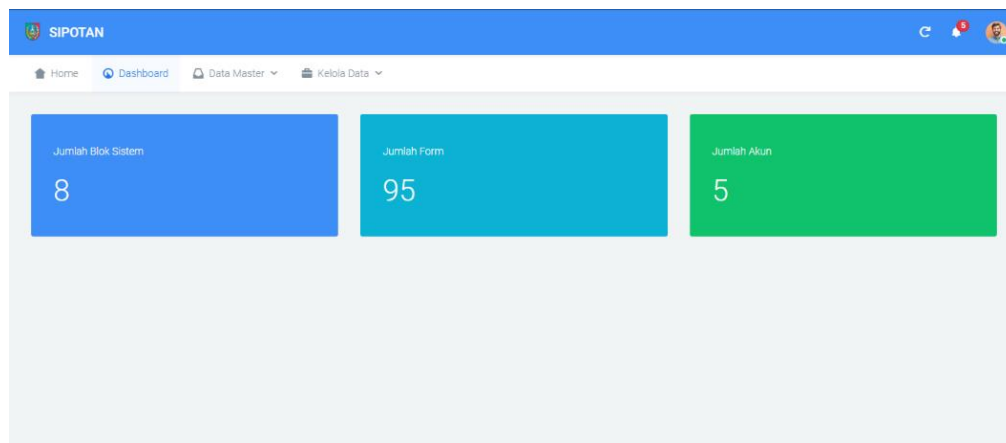
Figure 10. Land Distribution Page

5. Testing the Poktan Member Management Page

The Poktan member management page functions to fill in the data of farmer groups in Jombang Regency. The appearance of the Poktan member management page is in Figure 11.
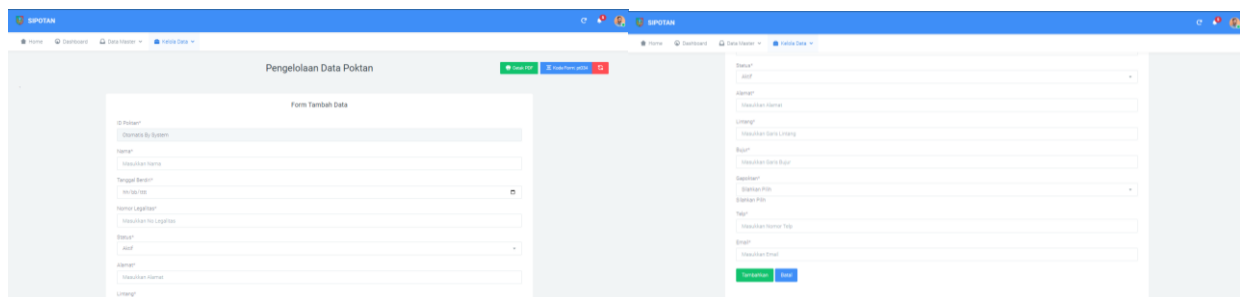
Figure 11. Testing of Farmer Group Member Management

In this testing of the management of farmer groups, it is done to test the function of the

management page of farmer groups. The testing of the management of farmer groups is explained in table 5.

Table 5. Testing of the Management of Farmer Group Members

Testing of Login Form		
Tester	Thalisa Septia Firdaus	
Tast date	28/06/2024	
Objective	Adding Farmer Group Member Data	
Testing Scenario		
Scenario I testing username column is empty	Input Data	One of the columns is not filled
	Expected	There is a notification that the addition failed, there is a field that you have not filled in.
	Conclussion	Accepted
Scenario II testing all filled columns	Input Data	All data is filled in
	Expected	Enter the dashboard page
	Conclussion	Accepted

6. Data Display Page

This data display page contains data that has been successfully added. The data display page contains ID, name, number of members, date of establishment, legality number, status, address, coordinates, Gapoktna, telephone, and email. The data display page is in Figure 12.
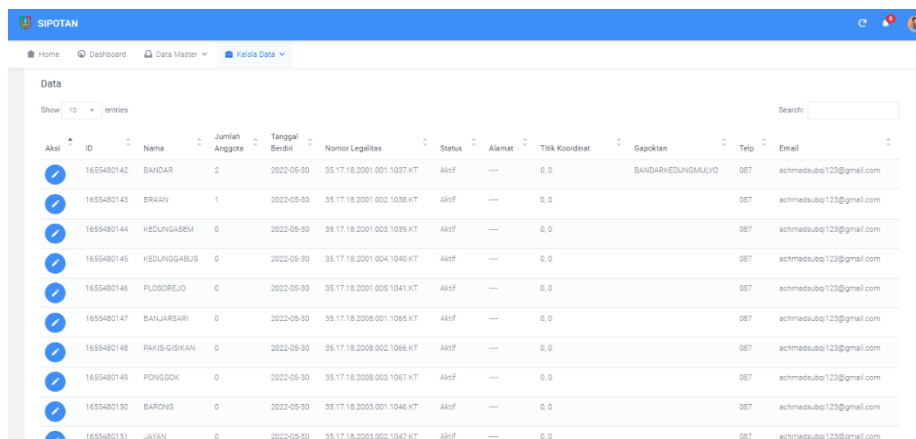
Figure 12. Data Display Page

7. PDF Data Print Page

The PDF data print page will appear after the admin selects the PDF print feature. The PDF print page contains ID, name, number of members, date of establishment, legality number, status, address, coordinates, Gapoktna, telephone, and email. The PDF data print page is in Figure 13.

Figure 13. PDF Data Print Page

Result

Database implementation is based on database design carried out using phpMyAdmin software. The farmer group table consists of 15 attributes, namely id, name, date_established, legality_no, status, address, latitude, longitude, farmer group_id, phone, email, date_created, date_updated, id_created, and id_updated. The appearance of the farmer group table can be seen in Figure 14.

Figure 14. Database Implementation

Discussion

Information and communication technology in the agricultural sector has a significant impact, especially on improving the national economy and public welfare by implementing strategies to increase productivity and quality of agricultural products so that public welfare will increase (Puspa & Mulawati, 2020). The agricultural sector currently has a strategic role, especially as a food provider for the Indonesian people, contributing to providing food, providing industrial raw materials, bioenergy, absorbing labor which has a significant impact on reducing poverty rates and maintaining environmental sustainability. This shows that a farmer group information system is needed to increase agricultural production based on information technology. Sophian (2015) added that with this group, farmers can find solutions regarding the

fulfillment of agricultural production facilities, production techniques, and marketing of results together.

CONCLUSIONS

Based on the results of the discussion and testing that have been carried out, the author can conclude that the Jombang Regency Agriculture Service Farmer Group Member Information System is a proposed system to facilitate farmers in monitoring farmer members in the Jombang Regency. This system can facilitate the Jombang Agriculture Service in seeing the development of farmer groups in Jombang and can provide information on obstacles that occur for farmers in Jombang Regency. In addition, this system can help the Jombang Agriculture Service in making decisions regarding farmers in Jombang Regency.

REFERENCES (font size 12pt)

Hartami S. I., & Guntarayana, I. (2022). Sosialisasi Pemanfaatan Sistem Informasi Berbasis Web Sebagai Sarana Promosi Bagi Kelompok Tani. *Journal*, *1*(3), 169–174.

Hikmat, D. H. (2010). *Monitoring Dan Evaluasi Proyek.* 1–19.

Muhammadun, Euriga, E., & Nurlaela, S. (2022). *Penerapan Fungsi Manajemen Pada Kelompok Tani Di Kalurahan. 1*(2), 103–112.

Perdana, D., & Fajrizal (2023). Informasi Geografis Kelompok Tani Kampung Pinang Timur Berbasis Web. Vol. 2 No. 1 (2023): Prosiding SEMASTER: Seminar Nasional Teknologi Informasi & Ilmu Komputer.

Pontoh, M. F., Lahinta, A., & Rohandi, M. (2022). Sistem Informasi Perkembangan Komoditi Tanaman Pangan Berbasis Web Pada Dinas Pertanian Kabupaten Bolaang Mongondow Utara. *Journal Of System Information Technology*, *2*(1), 62–76.

Purba, M. M., & Katuju, I. (N.D.). *Perancangan Sistem Pengolahan Data Panen Berbasis Web Pada Kelompok Tani Harvest Mind.*

Puspa, A. M. & Mulawati M. P. (2020). Aplikasi Sistem Informasi Kelompok Tani Pada Dinas Pertanian Kabupaten Pohuwato Berbasis Android. Semantik 6(2): 23 - 28

Pressman R. S. &, Bruce R. Maxim (2015). *Software Engineering: A Practitioner's Approach*. McGraw-Hill Education, p 941.

Santoso R. Delima & J. Purwadi (2016) Kajian Aplikasi Pertanian Yang Dikembangkan Di Beberapa Negara Asia dan Afrika, Prosiding SNATi 2016, pp. B-19.

Sophian, S. (2015). Sistem Informasi Kelompok Tani Kecamatan Danau Kerinci Pada Kantor Unit Pelaksana Teknis Dinas Kecamatan Danau Kerinci, Jurnal Momentum, Vol. 17, No. 2, ISSN : 1693-752X.