Design and Implementation of an Agricultural Commodity Area Data Collection System Using the Waterfall Method

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Article Info :	ABSTRACT
	Agriculture plays a crucial role in a country's economy, not only as a food provider but also as a driver of economic growth, earning foreign exchange through the exports of agricultural products. This research aims to analyse the status of the continent, preserve agrarian production data collection, and develop and disseminate the effectiveness of a technology-based agricultural product data collection information system. This research employs a development method known as the waterfall approach, a methodology commonly used in descriptive-qualitative research. This method is a software development process carried out sequentially, where progress is seen as the air that continues to flow downwards (like a waterfall) through the phases of planning, modelling, implementation (construction), and testing. The result of this research is a system implementation, which at the system design stage is converted into program code that can be run. This will explain the implementation process of the Agricultural Commodity Area Data Collection Information System.

1. INTRODUCTION

Agriculture plays an important role in a country's economy, not only as a food supplier but also as a driver of economic growth and earns foreign exchange through agricultural exports. (Muhammad Nasir & Andi Santoso. 2021) This data is the basis for production planning, resource allocation, and evaluation of the success of agricultural programs. Therefore, it is important to understand the relationship between agricultural land measurements and the evolution of inflation and deflation.

The information system collects agricultural product sector data along with related inflation and deflation data, thereby enabling a deeper understanding of the dynamics of the agricultural economy. (H. Rokhman. 2020) This will also help develop more effective policies to increase agricultural output, control prices and improve food security.

Therefore, research linking agricultural land data collection practices with inflation and deflation is relevant and strategic to improve our understanding of the interactions between the agricultural sector and macroeconomic factors. (Esabella, S & Sangga Rasefta, R. 2020) This can also provide a broader perspective on how to increase the efficiency and sustainability of the agricultural sector in facing complex economic challenges.

2.　RESEARCH METHODS

This research uses a development method called waterfall, namely a development method from the approach used in descriptive-qualitative research. (D, Setiawan, S., & Supendar, H. Abdiati, A. 2021) This method is a software development process that is carried out sequentially, where progress is seen as water that continues to flow downwards (like a waterfall) through the phases of planning, modeling, implementation (construction) and testing.
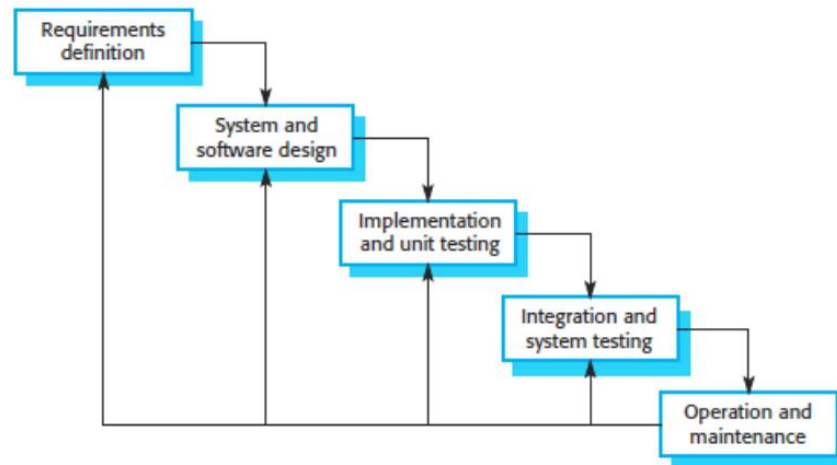

Figure 1. Research Methods

3.　RESULTS AND ANALYSIS

The result of system testing is system implementation, where at this stage the system design is converted into program code that can be run. This chapter will explain the implementation process of the Agricultural Commodity Area Data Collection Information System.

3.1.　Implementation

System implementation is an important phase where all previously developed plans and designs are converted into executable program code. This process includes various stages involving preparing the development environment, designing the database, writing code as well as testing the system to ensure that all functions work according to predetermined specifications.

3.2.　System Implementation

Deployment after the system stage is complete, includes following testing procedures whose results will be outlined in a report, then deploying the system by applying it to the research location. The system must be able to support users in searching for information such as product data, subsidized and non-subsidized land area data, and post-harvest yield quantity data. It is hoped that this agricultural product data collection information system can run well and provide optimal benefits for users in managing agricultural product data.

3.3.　Implementation of system interfaces

System interface implementation The system interface is the part that interacts directly with the user. Implementing a system interface is an important step in the process of developing an agricultural data collection information system because a good interface can increase user comfort and system operating efficiency. (AZPCP Gunawan. 2019) The following are the displays created in the system :

a. Login Page :

The Login page is the initial display of the information system for collecting data on the area of this commodity. The login page contains security system facilities for users, namely in the form of filling in a username and password which must be filled in before accessing this application system.
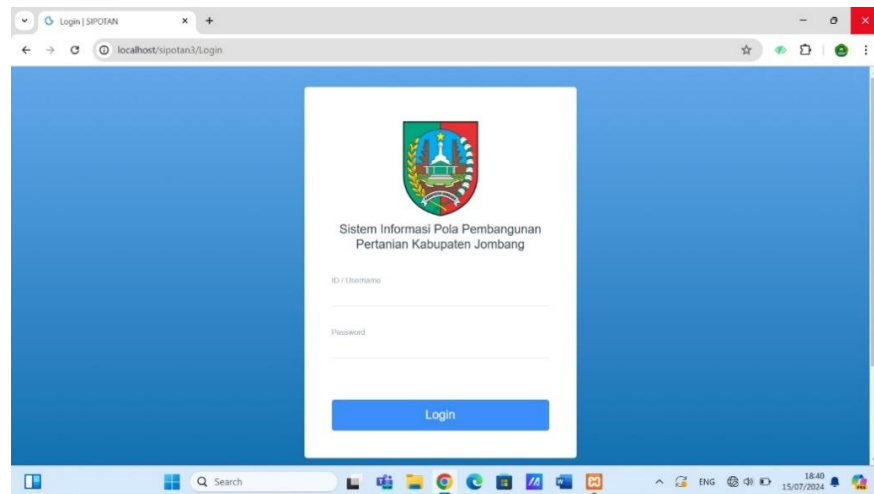

Figure 2. Login Page

b. Home Page :

The Home page is the second display of the information system for collecting data on the area of this commodity. This page contains menus that will be filled in and developed according to the needs of the Jombang Regency Agricultural Service.
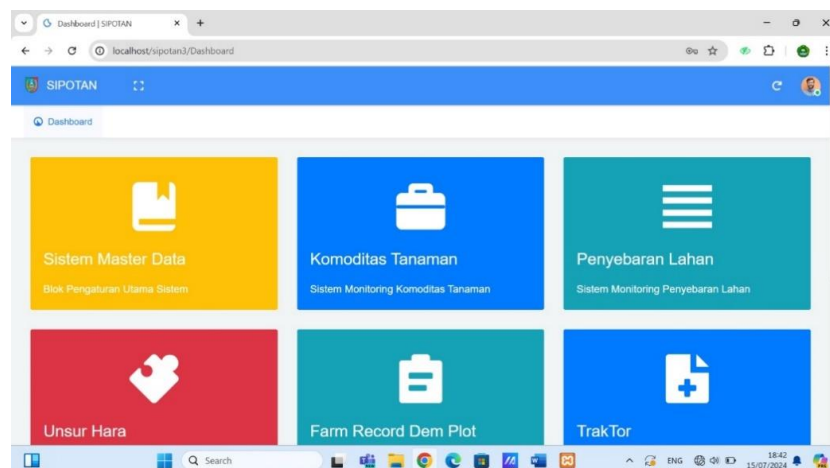

Figure 3. Home Page

c. Plant Commodity Menu Page :

The Plant Commodity Menu Page is the third display of the information system for data collection on the area of this commodity. This page contains a sub-menu consisting of home, dashboard, master data and data management.
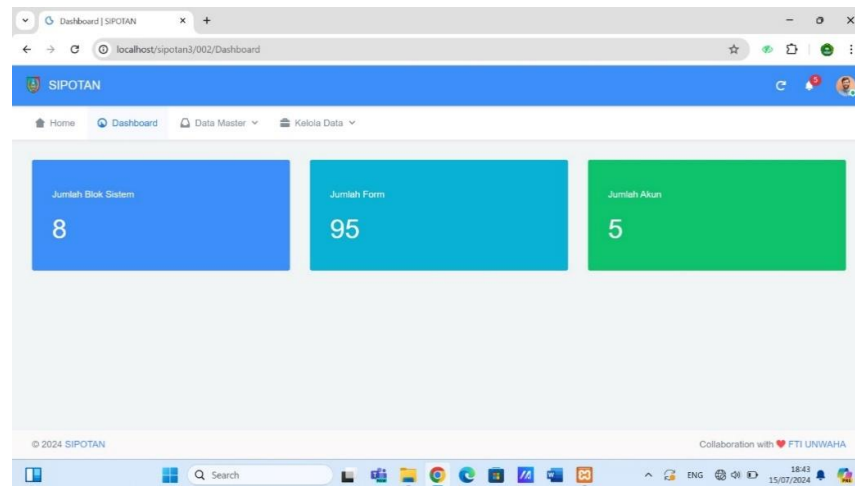
Figure 4. Plant Commodity Menu Page

d. Crop Commodity Master Data Page :

　　　This master data sub-menu is used to manage the main data used in the system. Master data can include commodity lists, information about regions, and other data that serve as references in managing crop commodities.
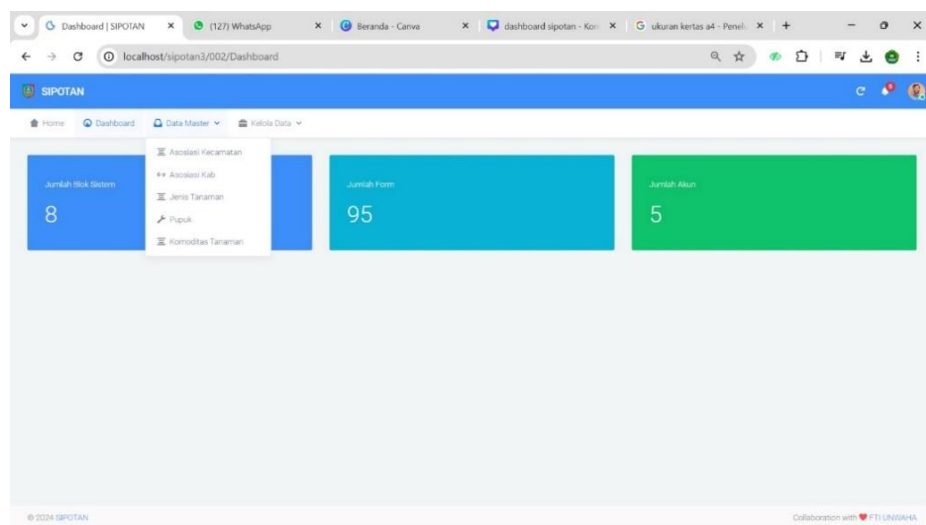

Figure 5. Crop Commodity Master Data Page

e. Plant Commodity Data Management Page :

　　　This page contains a plant commodity data table and a data add form which contains actions for editing data, ID, plant type, name and planting time.
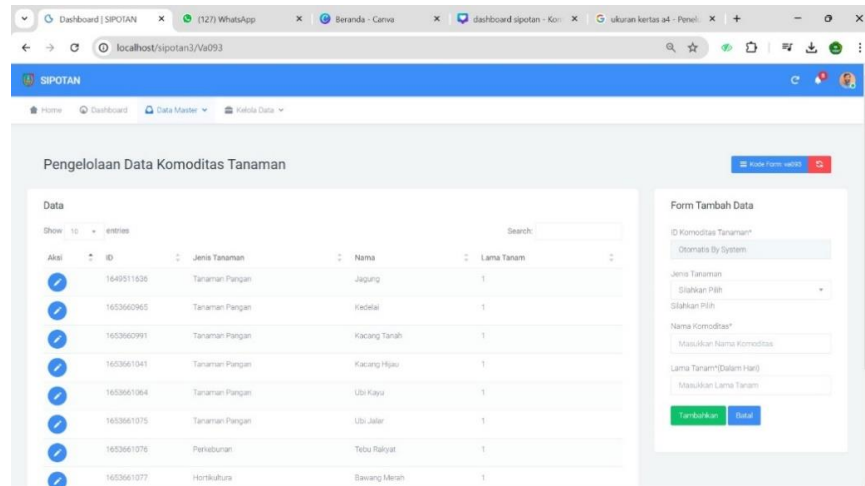
Figure 6. Plant Commodity Data Management Page

f. Manage Plant Commodity Data Page :
    Through this sub-menu, users can input, update and delete data related to the area of crop commodities. This feature is important to ensure that recorded data is always up-to-date and accurate.
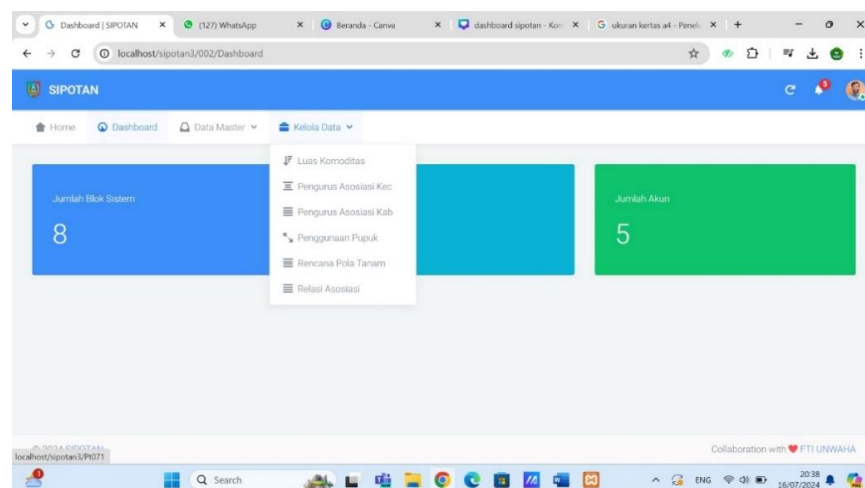

Figure 7. Manage Plant Commodity Data Page

g. Commodity Wide Data Manager Page :
    This page contains a commodity area data table and a data add form which contains actions for editing data, automatic data ID by system, Commodity, Village, Land Area and Number of Commodities after harvest.
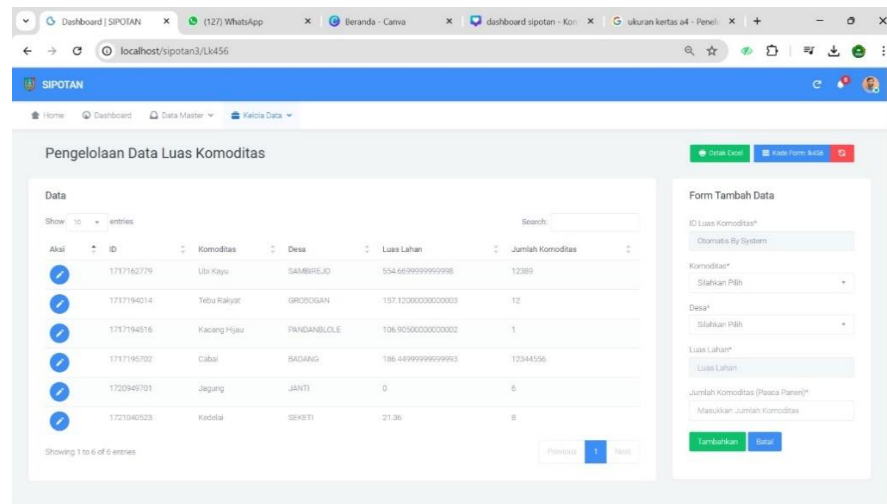
Figure 8. Commodity Wide Data Manager Page

h. Excel Print Page:
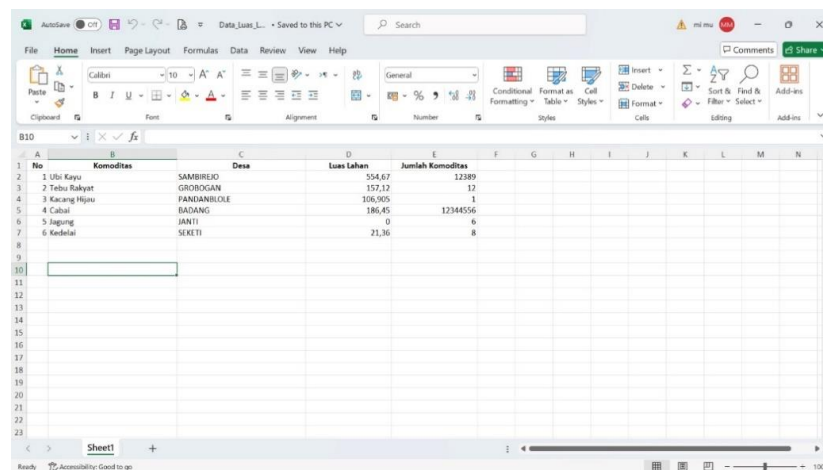>   This page is the final result of the data entered.

Figure 9. Excel Print Page

4. CONCLUSION

Based on the results of research and development of a web-based Agricultural Commodity Area Data Collection Information System at the Jombang Regency Agriculture Service.

1. Data collection on agricultural commodity areas in Jombang Regency was previously carried out manually. This results in data that is less accurate, prone to errors, and requires quite a lot of time and human resources.
2. Manual data collection faces various challenges such as human error, long time, high costs, and lack of efficiency in data management.
3. The use of information and communication technology in collecting data on agricultural commodity areas has been proven to increase the efficiency and accuracy of data collection. The information system developed is able to provide data that is faster, more accurate and easily accessible to related parties.

4. The information system developed includes various important features such as commodity area data input, commodity quantity reports after harvest, integration with inflation and deflation data, as well as open access for the general public to view data published by the Jombang Regency Agriculture Service.

Implementation of this system provides significant benefits for the Jombang District Agriculture Service in managing agricultural data, increasing efficiency and better decision-making. Apart from that, this system is also useful for farmers in obtaining relevant information and for universities in improving reputation and external collaboration.

5. ACKNOWLEDGEMENTS

6. DECLARATION OF COMPETING INTEREST

We declare that we have no conflict of interest.

7. REFERENCES

Abdiati, A. D., Setiawan, S., & Supendar, H. (2021). Pemilihan Web Browser Pada Mobile Menggunakan Metode Analytical Hierachy Process. *Jurnal Infortech*, *3*(1), 26–32. **https://doi.org/10.31294/infortech.v3i1.10298**

Andi Santoso, & Muhammad Nasir. (2021). Pemetaan Lahan Dan Komoditas Pertanian Berbasis Webgis Di Kabupaten Oku Timur. *Jurnal Ilmiah Betrik*, *12*(2), 129–138. https://doi.org/10.36050/betrik.v12i2.320

AZPCP Gunawan. (2019). *Landasan Teori 2.1 Konsep Dasar Sistem 2.1.1 Pengertian Sistem*. 9–22.

Rokhmah, H. (2020). *Sistem Informasi Statistik Pertanian Hortikultura Sayuran Buah Semusim (E-SBS) Di Dintapangan Kabupaten Temanggung*.

Sangga Rasefta, R., & Esabella, S. (2020). Sistem Informasi Akademik Smk Negeri 3 Sumbawa Besar Berbasis Web. *Jurnal Informatika, Teknologi Dan Sains*, *2*(1), 50–58. https://doi.org/10.51401/jinteks.v2i1.558