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Information System Design of financial bookkeeping at UD Dewi Sri

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***Abstract*—** *The current condition of the rice milling business is getting tougher. Price competition between rice milling companies and local rice price competition with imported rice makes companies need to improve efficiency to survive in business competition. Various ways are done to increase efficiency, including utilizing conceptual resources (information) to manage the company's physical resources. This research designs a financial bookkeeping information system which is the initial stage of the development stage of an integrated information system at UD. Dewi Sri. The first step is to search and collect company profile data for company workflows. After the objects are identified and the relationship between the objects is known, the next step is to make a data flow diagram for each process. The diagram is used to create entity relationship diagrams (Entity Relationship Diagrams) and programming flows. After writing the programming language, initial testing is carried out by entering sample data. The result of this research is a computer-based financial bookkeeping information system application design that is expected to be able to be applied in companies and can be developed toward an integrated information system.*

Keywords : *Information, Financial, Bookkeeping, UD Dewi Sri.*

I. INTRODUCTION

UD Dewi Sri is an MSME (Micro Small and Medium Enterprises) company engaged in rice milling services. Currently, it has 3 branch companies that are actively operating in the districts of Magelang and Temanggung. The company, which was founded in 1970, is still using manual financial bookkeeping. This is common at the beginning of the company. Along with the development of information technology and computers, manual financial bookkeeping has weaknesses, including: takes a long time, especially to make reports, The human error factor is relatively large in calculations, requires employees who understand the flow of financial bookkeeping, so when there is a change of employees it takes a long time to train.

To overcome these problems, it is necessary to design a computer-based bookkeeping information system that is following the company's business processes. This application was developed using the Java programming language, while the database uses Postgresql.

II. LITERATURE REVIEW

2.1 Information Manajemen System

2.1.1 System

The system is the entire interaction between the elements of an object in a particular environment that works to achieve goals [1].

2.1.2 Data and information

Data are raw values that have no meaning on their own [2]. Information is data that has been processed so that it has a meaning that can be useful in making decisions.

2.1.3 Information Manajemen System

A Management Information System is a computer-based system that makes information available to users with similar needs [3].

The function of the Management Information System is: Providing the information needed by company management accurately and quickly, Make the decision-making process effective, Manage the flow of information across departments to be effective and efficient, Facilitate data management and reduce data storage media

2.2 Information system analysis and design

2.2.1 Object Oriented Programming

Object Oriented Programming is a programming method where we see problems through real-world observation where each object is a single entity that has a combination of data structures and specific functions [4].

2.2.2 Object Oriented Development

Object Oriented Development is a way of developing software and information systems based on the

abstraction of objects in the real world. Abstraction is finding and modeling the facts of an object [5].

2.2.3 Object Modelling Technique

Object Modelling Technique is a method of developing object-oriented information systems, first introduced in 1987 by researchers at General Electric (GE) – Research & Development Center: James Rumbaugh, Michael Blaha, Wiliam Premerlani, and friends in Schenectady – New York [6].

The OMT method uses 3 types of models to describe the system:

1. Object Model, describing objects and relationships between objects.
2. Dynamic Model, describing the interaction between objects in the system.
3. The functional Model describes the data transformation that occurs in the system.

The following describes the three models above.Object modeling is a method to describe the structure of the system that shows all the objects that exist in the system. Objects are people, places, objects, events, or concepts that exist in the real world that are important for an application (software and or information systems). A class is a collection of objects with the same attributes. Attributes are data that belong to an object in a class. Each object must have attributes with different values.

2.2.4 Information System Development Stage

1. The planning stage is where the system analyst tries to find out what is needed by the users of the information system to be developed.
2. The System analysis stage to get a thorough understanding of the system to be developed based on input from potential users.
3. The design stage consists of two parts, system design, and object design.
4. The implementation stage, at this stage, is carried out programming and the creation of the database.

2.3 Accounting Information System

An accounting Information System is a subsystem of a computer-based information system that collects data describing company activities, converts data into information, and makes information available to users both inside and outside the company [8]

According to Raymond McLeod Jr. and George Shell (2001), SIA performs four data processing tasks, namely data collection, data processing, data storage, and document presentation.

III. RESEARCH METHODS

3. Data Collection

Every company's action in providing products or services is described as a data record. When the action involves environmental elements, then the action is called a transaction.

3.1 Data Processing

Data needs to be processed into information. Data processing operations include:

- Classification
- Sortation
- Calculation
- Conclusion

3.2 Data Storage

All data that has been collected and processed must be stored somewhere until it is needed. That is the purpose of data storage.

3.3 Document Presentation

SIA produces output for individuals and organizations both within the company and outside the company.

3.4 Data Collection

Required Data :

- Responsibilities and authorities
- Process flow within the company

From the existing data it is known:

- There are four different rice milling tariff classifications for each branch:
  - Tariffs for farmers by calculating grain weight.
  - Tariffs for farmers by calculating rice weight.
  - Tariffs for distributors by calculating grain weight.
  - Tariffs for distributors by calculating rice weight.

- There are three ways of payment systems for rice milling services:
  - Payment in cash.
  - Payment by deposit, usually when there is a remaining cash payment the previous transaction is put into a deposit.
  - debt with the promise of payment date.

- There is cashback with savings terms that can be taken before the special holiday for distributor

customers with the terms of payment in cash or deposit, while for debts no cashback is given.

IV. RESULT AND ANALYSIS

4. Analysis and Design

4.1 Required Specification

1. Procedure for entering branch data and tariff rice milling.
2. Customer data entry procedure.
3. Procedure for entering transaction data (rice milling, weighing, payments)
4. Cashback calculation procedure
5. Reports (transactions per period, recap of deposits, recap of debts, recap of cashback).

4.2 Object Modelling

Based on the available data, the development of a computer-based accounting information system design can solve the existing problems.

Object modeling is used to identify objects and the relationships between objects. The following figure shows that the customer is one of the objects in the accounting information system. The customer object has a relationship with the rice mill object, where the customer is the buyer of rice milling services.

The object of the rice mill has a relationship with the deposit, if the customer has a deposit, the payment is automatic using the existing deposit. The object of rice milling also has a relationship with debt, if there is a lack of payment or the customer delays payment, the underpayment goes into debt, if it has been paid or the customer pays the fee in installments it will be recorded as payment in debt. The object of rice milling also has a relationship with cashback, when paying for rice milling services using a deposit or cash, customers will get cashback that can be taken before Eid al-Fitr. The design of the relationship model between tables can be seen as shown in Figure 1.

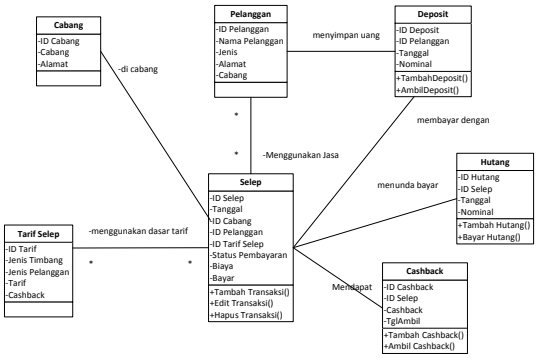

Figure 1. Table Relation Model Design

4.3 Functional Modelling

4.3.1 Context Diagram

Context Diagram shows who interacts with the Financial Bookkeeping Information System at UD Dewi Sri. The context diagram of the Financial Bookkeeping Information System at UD Dewi Sri can be seen in the following can be seen in figure 2.

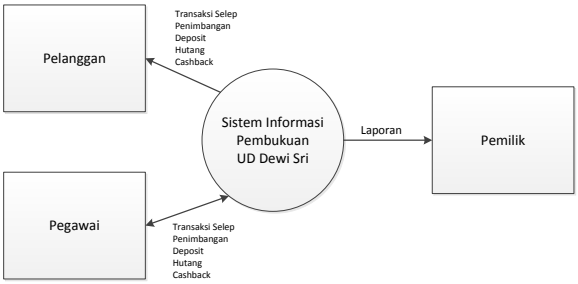

Figure 2. Context Diagram Design

4.3.2 DFD Level 0

In this system, the first things to input are branch data, rice mill tariff data, and new consumer data.
The data above is used as a reference when other data is input, starting from rice milling transactions using consumer data, deposits, branches, and rice mill rates, then the data is used to fill in or update data on deposits, cashback, and debt. The global data flow diagram can be seen in the following figure 3.

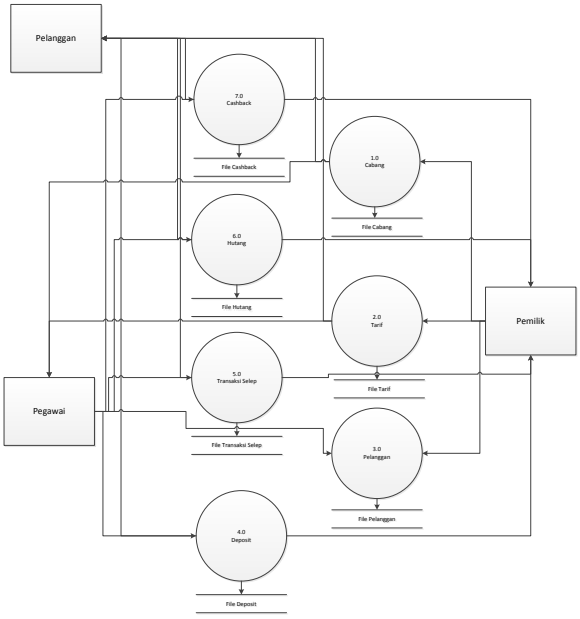

Figure 3. DFD Design Level 0

4.4 System Architecture

Applications are developed using the Postgre SQL database engine because the software is open source, is a high-end database, and can run on various operating systems (UNIX and Windows). For the front-end application, the Java programming language is used, because the software is open source, multi-platform so it has high portability and can be run on various operating systems.

4.5 Comparative Analysis of Old Systems With New Systems

The new system has advantages compared to the old system, including:

1. Work can be done faster

The new financial bookkeeping information system makes the process of recapitulating financial books faster. In the old system, to make a recap in one month, it takes an average of 2 days per branch. The new system can be done in real-time because it is done automatically by the computer.

2. Work can be done easier

With the new system, some jobs are easier to do, including the payment calculation process, deposit calculation process, debt calculation process, and calculation process.

3. Data Validity

Data storage in the new system uses a database to avoid data duplication (the same data is written more than once). In addition to maintaining data validity, it also reduces the volume of data storage.

4. Cost Reduction

Calculations on the new system are carried out in real-time so that it can reduce the cost of employee salaries to carry out monthly recaps.

5. Data Security

The new system applies different authority rights for each user group (for example, the employee group can only view tariff data and can input rice mill transaction data and so on) so that data can only be viewed, inputted, updated, and deleted by the group that has the authority. For system security, every ID used in the application is encrypted, so the data is not easily visible.

6. Ability to developed

The new system is an open source information system, making it easy for further development.

However, the new system has weaknesses compared to the old system, it requires investment in hardware, software, and brainware. Hardware investment includes server procurement, client computer upgrades, network installation, and other required equipment. Software investment includes application and database development costs and application and database maintenance costs. Brainware investment includes improving the computer skills of workers, especially in using new applications and recruiting or upgrading workers as database administrators. Therefore, supporting the implementation of the use of manufacturing information systems requires commitment from top management and the full participation of workers. Without it all, the implementation of the information system will fail.

V. CONCLUSION

Based on the research that has been done, it can be concluded that a computer-based financial bookkeeping information system has the following advantages:

1. Work can be done faster because the things computers do can be done faster.
2. Work done easier. Using computers to do technical tasks, the workload of technical workers becomes lighter, so workers can more freely think about how to develop the company, from the department level to the corporate level.
3. Data validity. There is no duplication of data, there may be no data differences.
4. Cost Reduction. The calculation system that is carried out automatically will reduce the component in employee costs.
5. Data security. Implementation of data access authority rights for each user group, data security becomes more secure.

Achieving these benefits requires a strong commitment from top management and the full participation of workers.

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