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Applying Waterfall Method on Sales Information System

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ABSTRACT

During the Pandemic, people's behavior in shopping experienced a significant change, from what people often shopped conventionally to shopping through e-commerce. With these conditions, business people must transform digitally to maintain their existence in their business. The decrease in direct contact with consumers leads to reduced sales and disrupted productivity problems. By using the waterfall method, the problem limitation in the sales information system process starts from the process of ordering goods, processing payments, the process of making reports and journals, starting from the login, main menu, transaction menu (sales of goods), and the report menu (reports of weekly and monthly sales of goods). With data processing using computerization, it is expected to help smooth sales data processing in providing fast, precise and accurate information and can be used for decision making.

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1. Introduction

During the Pandemic, people's behavior in shopping experienced a significant change, from what people used to shop conventionally to shopping through e-commerce. Statistical data on electronic commerce (e-commerce) activities show an increase every year[1].

Pandemic crisis which resulted in difficulties for businesses to survive let alone expand its business[2]. The emergence of various e-commerce platforms in the midst of Indonesian society has become a new alternative that facilitates the current pattern of people's shopping behavior [3]. With these conditions, business people must transform digitally to maintain their existence in their business. The decrease in direct contact with consumers causes reduced sales to disrupted productivity problems so that many companies suffer heavy losses[4].

Sales is the purchase of something (goods or services) from one party to another in exchange for money from that party. Sales are also a source of company income, the greater the sales, the greater the income earned by the company [5].

The method used in this Information System is the waterfall method, the waterfall model is one of the SDLC models that is often used or often referred to as the conventional model or classic life cycle [6], where the waterfall method is adopted to solve the problem [7]. The method consists of five sequences, which are: analysis, design, coding, testing, and implementation [8].

By using the waterfall method, the problem limitation in the sales information system process starts from the process of ordering goods, processing payments, the process of making reports and journals, starting from the login, main menu, transaction menu (sales of goods), and the report menu (reports of weekly and monthly sales of goods). With the implementation of this sales information system, it is expected to improve performance and competitiveness [9].

2. Research Methods

The waterfall method is a sequential software development process, where progress is seen as continuing to flow downward (like a waterfall) through the phases of planning, modeling, implementation (construction), and testing[10].

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a. Needs Analysis
   Determine what needs are needed in building a sales system based on users.
b. Design
   The design phase includes the design Entity Relationship Diagram (ERD) to describe a database of forms of entities, attributes and relationships. Planning Logical Record Structure (LRS) to describe the relationship between one entity and another entity in a system of selling goods. The design of Activity Diagrams, Use Case Diagrams, Sequence Diagrams and Deployment Diagrams uses a software architecture such as enterprise architecture which will describe the relationship between the current system of selling goods. Make an interface design in accordance with the required analysis of the needs using the Netbeans IDE 8.1 application.
c. Code generation
   Writing program code using the object-oriented Java programming language.
d. Testing
   The process of finding fault with the system by using black box testing.
e. Support
   The activity of conducting training to users by maintaining the data on the goods sales system that must be carried out regularly.

3. Result and Disscusion

3.1 Business process

The business process in sales begins with customers who come directly to the store, then provide information on the goods to be ordered to the SPG who serve them. SPG will check the availability of goods. If it is appropriate, it will be processed immediately at the cashier. The cashier record customer orders, and then informs the total orders to customers. Customers can make payments in cash or with a debit/credit card. Then the cashier gives goods sales orders and invoices to customers. Before the store closed, the cashier made a daily report consisting of daily sales reports and daily cash reports. The finance department makes financial reports based on daily reports, makes employee salary reports and reports sales activities every month to the store manager.

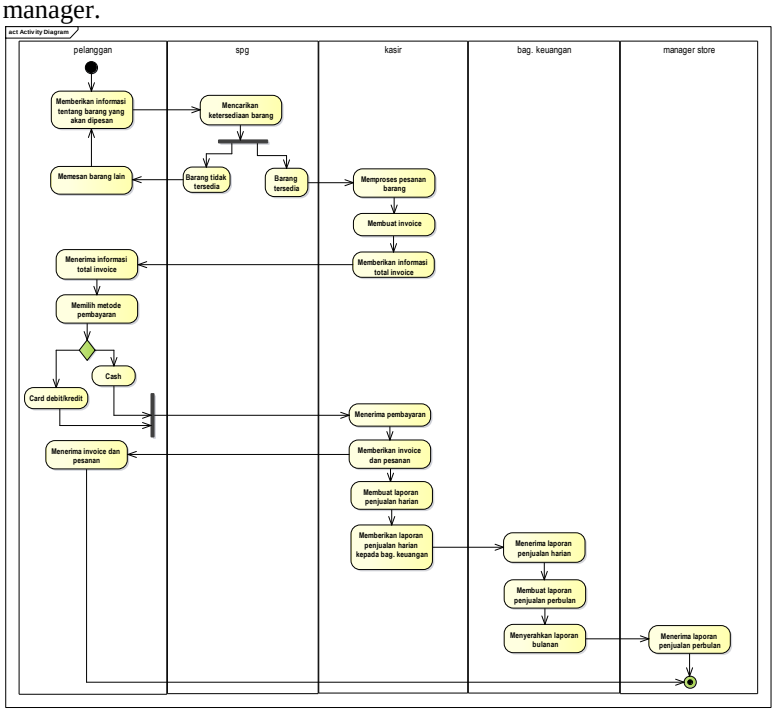

Fig 1. Sales Business Process

Source: (Apriana & Fauziah, 2021)

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In Fig 1 is a business process in sales, where there are 4 actors namely customer, spg, cashier, bag_keuangan and manager_store.

A common problem on the sale of such errors in calculating total customer orders, as well as the finance department should record back daily reports, which make many time-consuming. alternative problem solving is in the form of a computerized sales system, so that all transactions can be stored in the database so that data cannot be manipulated and to minimize various risks.

3.2 Needs analysis

Based on the results of the analysis, analysis of software requirements on sales information systems, as follows:

a. Cashier
   1) Section Cashier Login
   2) The cashier section accesses the Transaction menu
      a) Can access the Sales menu
   3) The Cashier section exits the system

b. Finance Department
   1) Finance Section Login
   2) Finance Section accesses the Master Data menu
      a) Can access the User menu
      b) Can access the Accounting Period menu
      c) Can access the Customer Data menu
      d) Can access the Product menu
      e) Can access the Incoming Items menu
   3) Finance Section accesses the Transaction menu
      a) Can access the Sales menu
   4) The Finance Section accesses the Data Information menu
      a) Can access the Sales Information menu
   5) The Finance Department exits the system.

3.3 Design

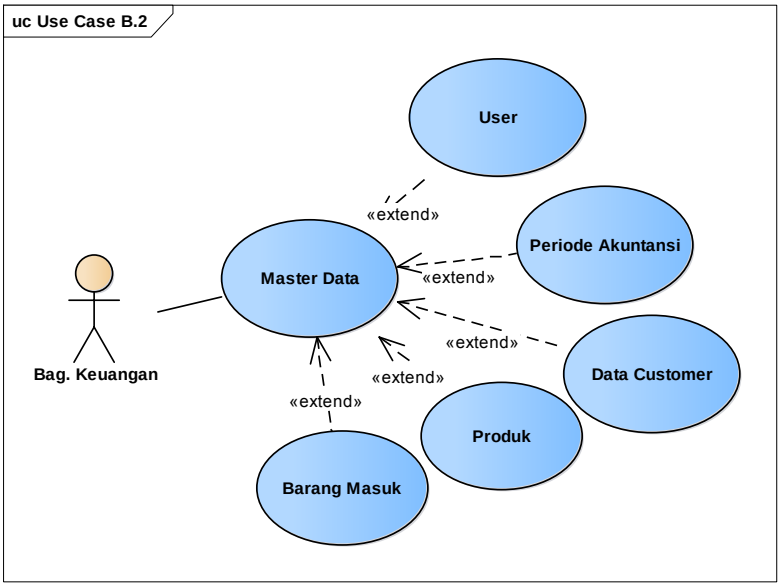

Fig 2. use case diagram of the Finance Section accessing the Master Data menu
Source: (Apriana & Fauziah, 2021)

In Fig 2 is a use case diagram for the Finance section in accessing the Master Data menu

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Table 1.
Description of the use case diagram Finance Department to access the menu Master Data

Use Case Narrative Finance Department to access the menu Master Data	
Goal	Users can perform the processing of master data on the sales information system
Description	This system allows actors to process request data from input, search, delete to print data.
The main scenario	
Actor	Finance department
Initial conditions	Actors open sales information system
Actor Action	**System Reaction**
The actor selects the master data button	The system will display the master data sub-menu such as user, accounting period, customer data, products and incoming goods
Final condition	If the command is appropriate then the system will display as desired by the Actor.

Source: (Apriana & Fauziah, 2021)

In Table 1. It is a description of the use case diagram in accessing finance part master data menu

3.4 Entity Relationship Diagram (ERD)

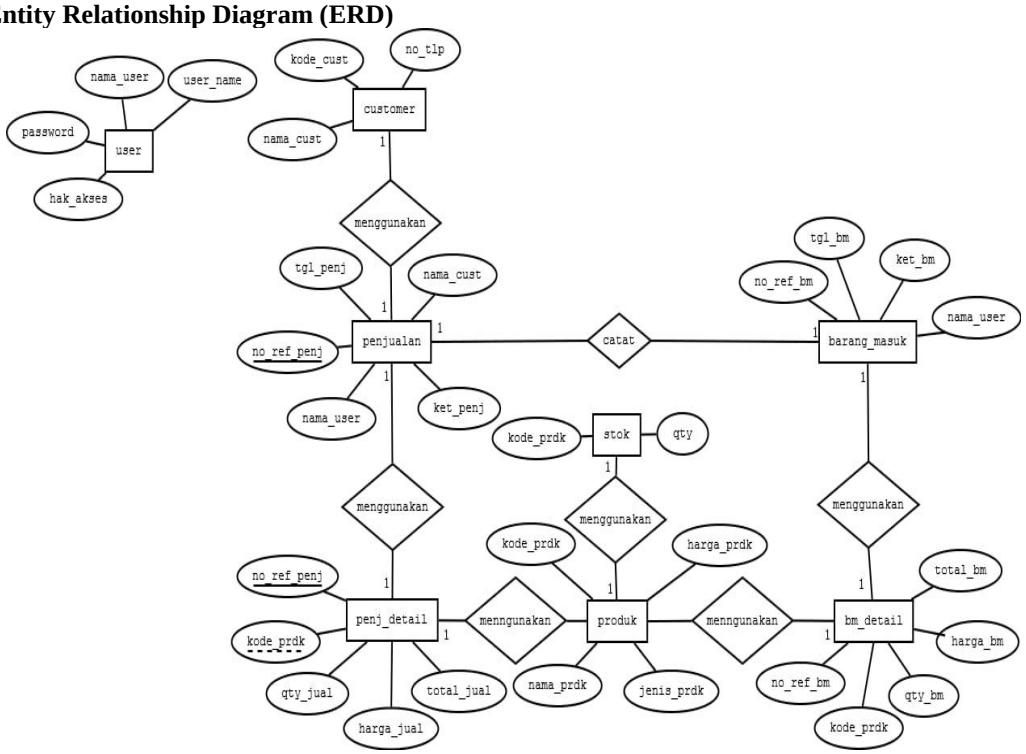

Fig 3. ERD Sales information system

Source: (Apriana & Fauziah, 2021)

Fig 3 is an Entity Relationship Diagram (ERD) on sales information system.

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3.5 Logical Record Structure (LRS)

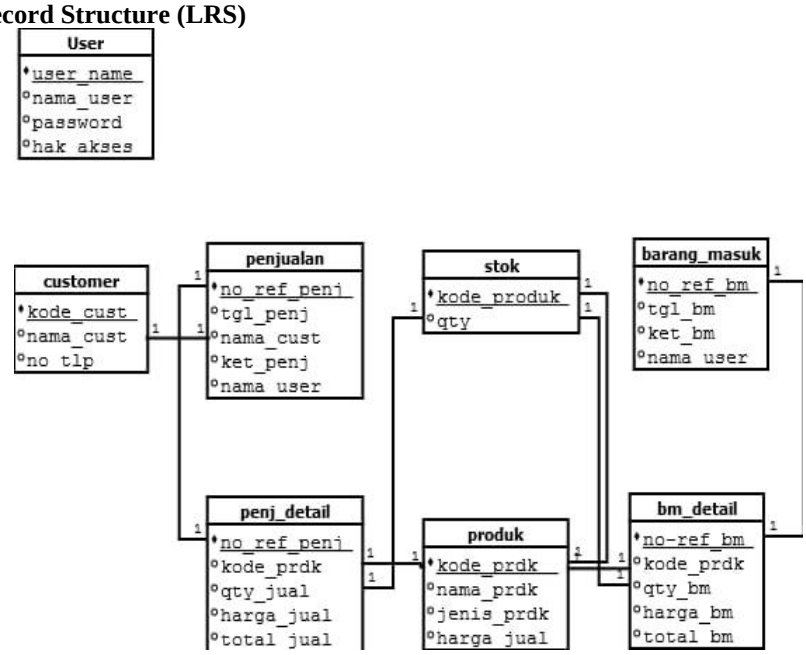

Fig 4. LRS sales information system

Source: (Apriana & Fauziah, 2021)

In Fig 4 is the Logical Record Structure (LRS), which is the basis for the design of a database on the sales information system.

3.6 User Interface

Fig 5. User Login

Source: (Apriana & Fauziah, 2021)

In Fig 5. is the display on the Login menu. In this menu function for data security. Each user must use the user id that has been determined by the administrator.

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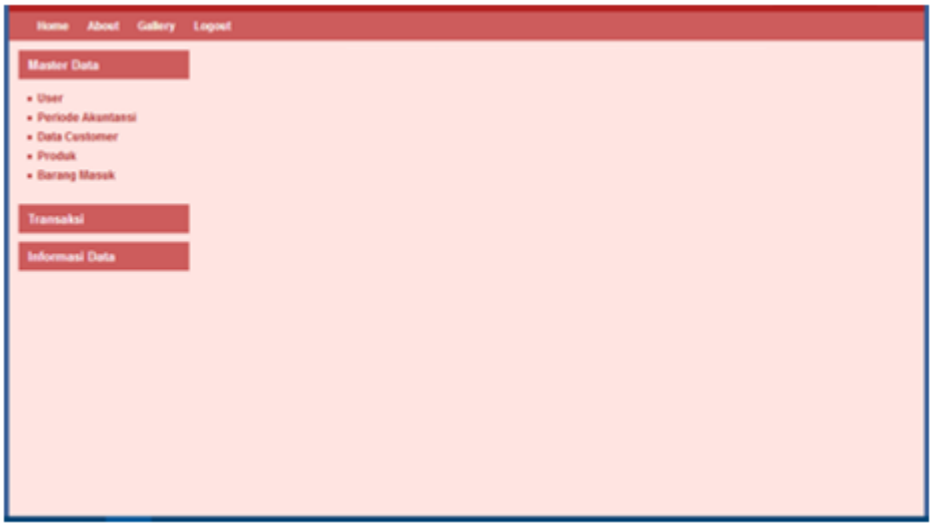

Fig 6. Main Menu
Source: (Apriana & Fauziah, 2021)

On the main menu of the Sales Information System there is a Master data menu, a transaction menu and a data information menu with each menu having a sub-menu as shown in Fig 6.

3.7 Code Generation

In making a sales information system, using the PHP programming language and the software used is MySQL.

3.8 Testing

Table 2.
Test results black box testing admin login page

No.	Scenario	*Test case*	Expected results	Test result	Conclusion
1.	User id and password are not filled then click the login button	Username=blank and password=blank	The system will display the message "Username or password must be filled"	As expected	*valid*
2.	Type in a blank user id and password then login	Username = Kamelia Password = (blank)	The system will display the message "Password cannot be empty!."	As expected	*valid*
3.	User id is not filled in	Username = (empty) Password = c4ntik	The system will display the message "Username cannot be empty!."	As expected	*valid*

Source: (Apriana & Fauziah, 2021)

3.9 Support

This section describes the hardware and software specifications used by the asset management system.

Table 3.
Hardware and Software Specifications

needs	Description
Processor Operating System	*Windows Profeisonal Edition Core 2 Duo 2.4 Ghz*

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needs	Description
RAM	2GB
Hardisk	500GB
Monitor	SVGA 15"
Keyboard	108 *Key*
Mouse	Standart
Printer	Deskjet
Browser	Mozila Firefox, Google Chrome
Software	*PhpMyAdmin, Xampp, Adobe Dreamweaver*

Source: (Apriana & Fauziah, 2021)

4. Conclusion

Data processing that is still manual in sales is an obstacle in increasing the quality and quantity of company data processing. With data processing using computerization, it is expected to help smooth sales data processing in providing fast, precise and accurate information and can be used for decision making.

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