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MEDICINE SALES INFORMATION SYSTEM DESIGN AT PHARMACIES

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Abstract- *Pharmaceutical service facilities that carry out pharmaceutical practices are called pharmacies. Management of medicine data in medicinestores must be carried out effectively in order to provide administrative certainty about the condition of medicines which in this case are supplies. In addition, the quality of service to customers is an important factor by providing complete and guaranteed information. The computerized system helps in solving a problem. Processing of medicine sales transactions requires processing speed and data security. This is to ensure the effectiveness of the medicine supply administration process and is especially focused on excellent service for pharmacy customers. Pharmacy as a form of mass business related to the offer of goods in the form of medicines and services requires a system that is able to collect, store, and process data to produce information. This study aims to analyze and design a medicine sales information system. The system design uses the Unified Modeling Language modeling language. The study was conducted at one of the pharmacies in Ponorogo City.*

Keywords: system design, information system, medicine sales, pharmacy, pharmacy, inventory

INTRODUCTION

Pharmaceutical work related to the distribution process or distribution of pharmaceutical preparations at distribution facilities or pharmaceutical preparations must be recorded by pharmacists according to their duties and functions (Poudel et al., 2009). Pharmaceutical workers in carrying out pharmaceutical work in distribution and distribution facilities of pharmaceutical preparations must follow the development of science and technology in the field of distribution or distribution. Pharmacy is a certain place to do pharmacy work and distribute medicines to the public. According to Government Regulation No. 51 of 2009, pharmacies are places or distribution terminals for pharmaceutical medicines that are managed by pharmacists in accordance with pharmaceutical standards and ethics. As a pharmaceutical service facility where pharmacists practice pharmacy, the quality of business management, including service to customers, is certainly an important factor that needs to be considered and improved.

In terms of implementation, management and service to consumers in the business world today is strongly influenced by the development of information technology (Darmawan, 2012). Information systems have evolved forms and processes (Mardikaningsih, 2021). Computerized systems are the mainstay of data and information management (Chaulagai et al., 2005). The involvement of computerized systems in business activities has improved the quality of work, especially in producing complete and better information (Arifin & Sinambela, 2021). This is because computerized data processing can make a major contribution to the performance of a company. Today's computerized system is the standard. Manual data processing is almost completely abandoned. Computerized data processing has advantages, such as fast data processing and supporting large-scale data processing (Crawford, 2003).

One of the pharmacies in Ponorogo City was affected by changes in the data processing system. This pharmacy still uses a manual system that uses the Microsoft Excel application as a data processor. With a system that is still manual, service to consumers becomes less than optimal and hampers the speed of employees and pharmacists in obtaining information on medicine availability and allows errors in recapitulation of medicine sales data (Mahoney et al., 2007). Whereas for a profit-oriented business, the speed of data processing is one of the important elements in administrative service activities and customer service. Every business needs a system capable of collecting, storing and processing data to generate information. In medicine sales information systems at pharmacies that run manually, there is a vulnerability to errors in the processing and searching of data.

Information systems are needed for business and this is related to customer service and business performance (Leitch & Davis, 1992). Therefore, pharmacies need accurate and efficient information. To manage this information, the pharmacy as the object of observation must have an information system. The information system that supports the pharmacy's needs in medicine data processing is very helpful for a management in creating work efficiency and effectiveness and improving pharmacy services to customers (Tomasi et al., 2004). Based on the results of observations and interviews with officers, it was conveyed that the current medicine data processing information system is conventional. Sales transactions are still done on a piece of paper. The bad possibility that can happen is if the paper is lost before it is put in the report book. In addition to this, the problems faced are that officers take a long time to monitor the availability of medicines, and officers have difficulty in making reports (Opit, 1987). From these shortcomings, the pharmacy should have a computerized medicine data processing information system. Information

systems play an important role in processing medicine data in pharmacies (Gladwin, 2003). In addition, it can facilitate the storage and retrieval of data so that it is hoped that the existing system can make it easier to store and retrieve data

Information system is one of the results of the development of information technology (Darmawan, 2008). Information system is a system within an organization that brings together the daily transaction data processing needs, supports operations, is managerial and strategic activities of an organization and provides certain outside parties with reports (Leitch & Davis, 1992). Unified Modeling Language (UML) is a standard specification language used to document, specify and build software.

The purpose of this study is to analyze and design medicine sales information systems in pharmacies. This system is designed to include data processing in the medicine sales department that can be used by employees and pharmacists.

RESEARCH METHODS

The system development method used by the author is the SDLC (System Development Life Cycle) method by applying the waterfall process model. The waterfall method consists of several stages, namely needs analysis (requirements), design (design), implementation (coding), and testing (testing). Needs analysis is done by data collection techniques used in this study is observation and interviews. Direct observation of operational activities in the pharmacy is focused. The pharmacy does not want to be mentioned for reasons of lagging and business strategy. Interview activities were carried out to obtain primary data that had not been obtained at the time of observation. The results of the interview are not only in the form of primary data, but can also be in the form of secondary data which may be provided by the source in the form of data that has been processed. The parties involved in the interview process are the owner of the pharmacy and the pharmacy staff. This is to find out medicine sales procedures and analyze and design medicine sales information systems at pharmacies. Based on direct observation and interviews, it can be seen the obstacles that arise from existing business processes and can immediately find out the cause. In addition, a literature study is carried out with references to relevant books that help carry out research and become a source of theoretical foundations in research.

The next stage is system design. This design includes the main menu display design, the system process design using the UML (Unified Modeling Language) design model, the database design, and the ERD (Entity Relationship Diagram) design. The design of the system process uses a UML design model using a use case diagram. The use case diagram consists of four accesses, namely access to medicine sales, medicine purchases, reports, and medicine functions. The database design is made using MySQL. ERD is the first system analysis tool that will be used to focus on data and the interrelationships between data and data organization. Thus the design tools involved in this study are use case diagrams, activity diagrams, flow of events, collaboration diagrams, and class diagrams.

RESULTS AND DISCUSSIONS

This pharmacy has two main activities in running business processes. The main activities are the process of making a list of medicine orders and the process of purchasing medicines by customers. The medicine order list contains the name and quantity of the medicine to be ordered. The order list is made by employees which is compiled based on medicine sales data by considering requests from customers and the safe limit of inventory or minimum inventory.

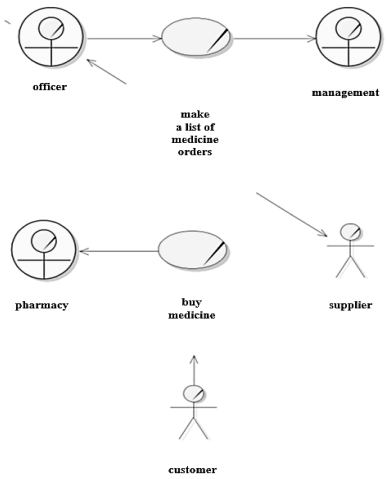


Figure 1.
Business Use Case Diagram of Medicine Sales Information System

In managing data on medicine purchases by customers, all medicine and customer data and sales are still recorded manually, using a daily sales book. Monthly sales results are recapitulated manually based on the daily sales log book. To create a list of medicine orders, employees use the Microsoft Excel application but have not grouped medicines based on certain codes. After analyzing, the author focuses on designing the system on the medicine sales process, with the consideration that daily sales transactions are the main process that forms the basis for making medicine order lists. Figure 1 is a Business Use Case Diagram showing the business model for the running system. The identified business actors are suppliers and customers, while business workers include employees, leaders, and pharmacists.

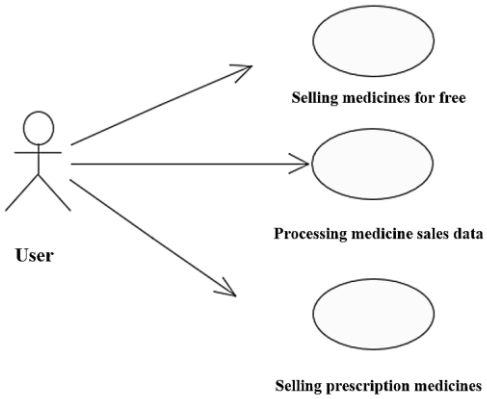


Figure 2.
Use Case Diagram of Medicine Sales Information System

In the general system design, some of the functionalities described in the use case include selling medicines freely and using prescriptions as well as processing sales data (Fraser et al., 2005). Actors defined as system users are employees and pharmacists who are generalized to be user actors. These two actors will then interact and be involved in the three functionalities in the designed system. The relationship between actors and use cases is illustrated in the Use Case Diagram in Figure 2.

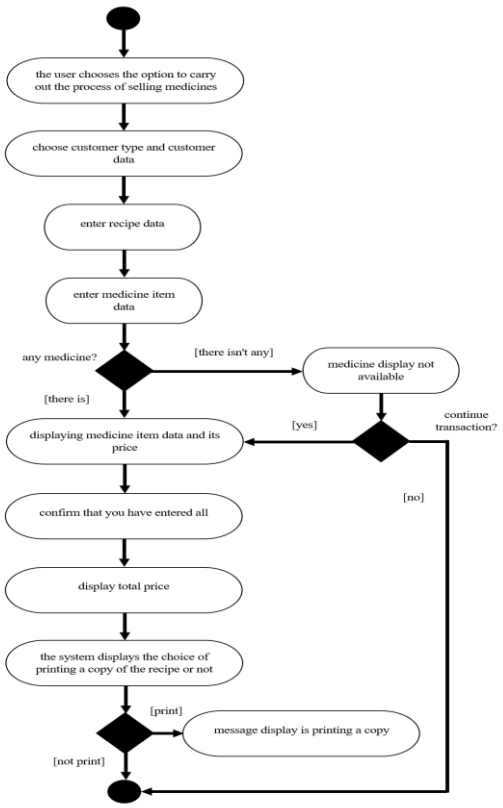


Figure 3.
Activity Diagram of Medicine Sales Information System

Workflow information for use cases processing medicine sales data in the system is illustrated using the activity diagram in Figure 3.

The logical flow in the use case that describes in detail what the user will do and what the system itself does is then documented using the Flow of events. For use cases processing medicine sales data, the workflow information in the system is depicted in the flow of events as shown in Figure 4 below.

Description of Use Case		
Short description	:	Use cases allow users to sell medicines
Person	:	User (Officer, Pharmacists)
Main line	:	1. Choose the process of selling medicines
		2. Selecting customer data input
		3. Entering recipe data
		4. Entering medicine item data
		5. Displays medicine item data including the price
		6. Confirming the end of data entry for medicine items
		7. Displays the total price to be paid
		8. Confirm the purchase after payment is made
		9. Use case ends
Alternate line	:	There is no medicine display. After the actor confirms, go back to step 3
Final Conditions of Success	:	The medicine purchase transaction was successful
Final Condition Fail	:	If the failure is in the medicine is not available, then transaction canceled

Figure 4.
Flow of Events Medicine Sales Information System

The specification is then instantiated and produces an object that is the core of object-oriented development and design. Objects that are interconnected in this system include the main sales form, customer type form, prescription form, message form, medicine sales form, medicine sales manager, sales, medicines, and database drivers. Relationships and sending messages between objects in the system are designed based on data flow using collaboration diagrams. The design of the medicine sales information system collaboration diagram is modeled as shown in Figure 5 below.

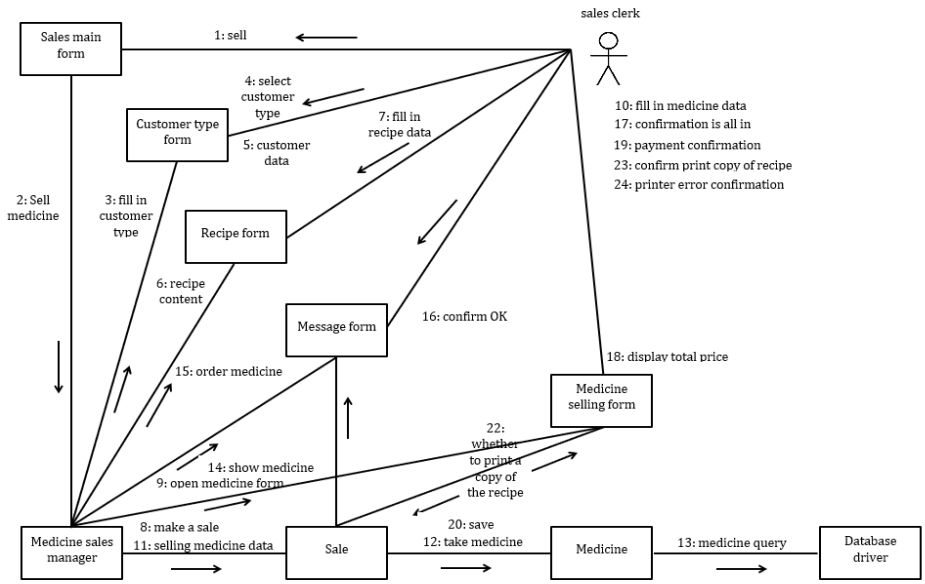


Figure 5.
Diagram of Medicine Sales Information System Collaboration

The following class diagram shows the existence of classes and their relationships in the system logic view. The single class in this class diagram represents the class structure point of view of a system. This class also describes the state of the attributes/properties and methods/functions of a system of a system. This class also describes the state of the attributes/properties and methods/functions of a system.

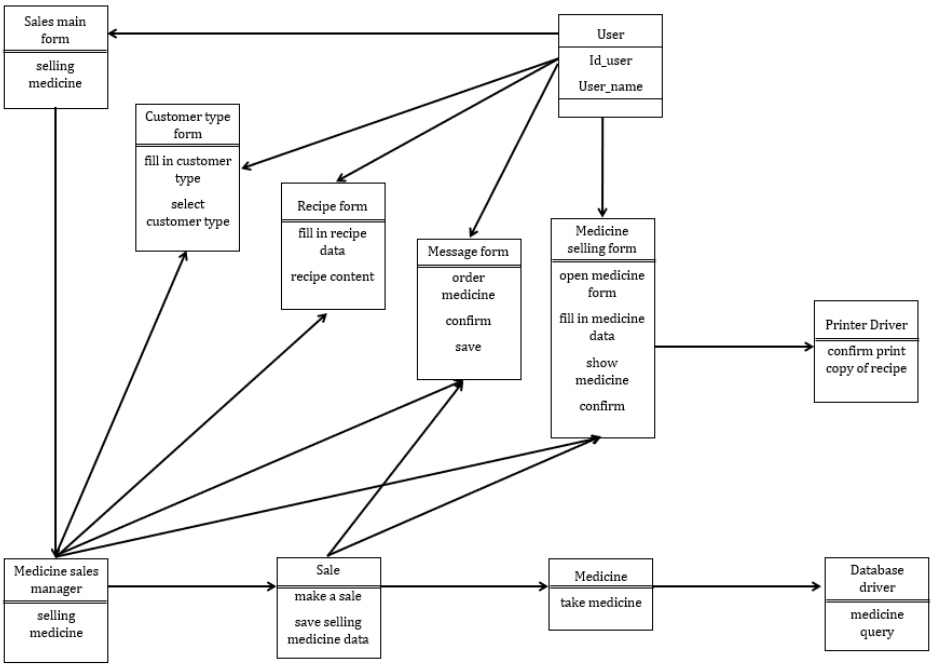


Figure 6.
Class Diagram of Medicine Sales Information System

Based on the results of the design using design tools, the resulting program display design is the basis for making applications for the Medicine Sales Information System.

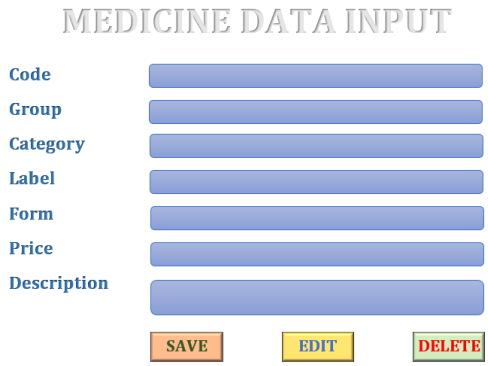


Figure 7.
Design of Medicine Sales Information System Input Form

In the detailed system design, the design is divided into two main parts, namely the input design and the output design. Figure 7 shows the design form for the facility to input customer data and medicine data to be used by employee users or pharmacists. In this system, the input design consists of a customer input form design, medicine data, and prescription data, while the output design consists of a prescription copy design, sales receipt and sales report.

From the discussion, the advantages of this pharmacy information system are as follows: (1) this information system is in accordance with the pharmacist's request; (2). this information system helps manage medicine sales and purchasing systems to be more effective and efficient; (3). This information system helps to obtain complete and accurate information about the function of the medicine. Thus, the result of the system that has been completed is in the form of an information system that can manage medicine sales information systems more effectively, efficiently, and well recorded.

CONCLUSIONS

Based on the results of the research that has been carried out, it can be concluded that the medicine sales system has been successfully modeled. By using a computerized system, owners, pharmacists, and pharmaceutical technical personnel can find out the amount of medicine stock quickly and accurately and can find out medicine data that will expire. The process of recording sales transaction data, purchases can be made quickly. This system can provide convenience in the process of making reports that are usually needed.

The results of the analysis and design of the information system at this pharmacy can be implemented on a computer application to facilitate the management of sales data at the research location so that the administration department knows the state of stock that can be marketed in real time. The author hopes that this system is developed into a website-based system, if the pharmacy wants to open a branch, so that the data between the central and branch pharmacies can change immediately if there is a change in data at the central or branch pharmacy. In addition, it is necessary to carry out optimal maintenance for all hardware and software related to the application and manufacture of this information system. Efforts to update or update this information system application, in accordance with the addition of new existing data. The results of this study are expected to be able to overcome the problems faced by pharmacies and can be used as a reference for the development of further research using the same method or other research methods.

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