OBJECT-ORIENTED PARTS INVENTORY INFORMATION SYSTEM MODELING USING UNIFIED MODELING LANGUAGE

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ABSTRACT-The availability of spare parts in a vehicle service workshop needs to be correctly recorded and recorded, making it easier for workshop owners to ensure the complete availability of vehicle spare parts. From the results of the author's observations, the Rizki Prima workshop has several obstacles in recording the availability of spare parts where the business processes being carried out are still a hassle for the employees working in the workshop. The problem often occurs when recording is the incompleteness of data related to incoming and outgoing goods. So the recording made in the ledger needs to be more accurate and requires a relatively long time to search one by one in the register if the workshop owner needs it. As a result of poor recording of goods, it is difficult for the owner to order goods again, worried that duplicating data will record incoming goods. The above problems are the basis for the authors to conduct research by utilizing information systems and modeling with an object-oriented approach using a unified modeling language to design a spare parts inventory information system according to user needs. To provide an overview of the Rizki Prima workshop transforming from conventional spare parts data recording to digital spare parts recording. The above problems are the basis for the authors to conduct research by utilizing information systems and modeling with an object-oriented approach using a unified modeling language to design a spare parts inventory information system according to user needs. To provide an overview of the Rizki Prima workshop transforming from conventional spare parts data recording to digital spare parts recording. The above problems are the basis for the authors to conduct research by utilizing information systems and modeling with an object-oriented approach using a unified modeling language to design a spare parts inventory information system according to user needs. To provide an overview of the Rizki Prima workshop transforming from conventional spare parts data recording to digital spare parts recording.

KEYWORDS: Modeling, Information Systems, Spare Parts Inventory, Availability, Unified Modeling Language

1. INTRODUCTION

Changes in time and era have affected the pattern of human thought in today's modern era. Where the touch of technological progress changes the perspective and steps taken by humans to make it easier for all forms of affairs and tasks to be carried out[1]. Technology promises convenience for humans to solve all the problems in their lives—one of the technological developments in information systems. Information system design can improve performance that requires accuracy and speed and processing large amounts of data into information[2], [3]. There are many applications of information systems, including a spare parts inventory information system. The inventory system is a system for managing the inventory stock of goods and can record incoming and outgoing goods[4]–[6]. The existence of this inventory system is based on the ineffectiveness of recording goods. Both incoming and outgoing goods[7], [8]. This research was conducted in one of the workshops in Pontianak, which is engaged in the service of spare

parts for motor vehicles and trucks. Spare parts as an element of the existing general inventory stock to meet the maintenance needs of a car [9]. Spare parts with good inventory management allow businesses to achieve maximum service levels and reduce or even eliminate additional inventory costs[9], [10]. Companies need supplies to ensure the smooth running of their business activities, such as when a consumer wants to buy car parts in the form of spare parts; as a running company, they need raw materials and finished product inventories.[11], [12].

1. From the results of the author's observations, there are still problems with recording goods in the form of the availability of spare parts with a manual data processing system. Obstacles in the recording process, such as incomplete data, which results in inaccurate records of all incoming and outgoing goods from the workshop, errors in recording

2. the amount of stock of goods, and the inaccuracy of recording goods, can make it difficult to place an order again. With a lack of efficiency, it also impacts errors in making reports on incoming and outgoing goods transactions on spare parts data for workshop owners. This can lead to suboptimal business activities at the Rizki Prima Workshop. From the problems above, it is necessary to model an object-oriented spare parts inventory information system using a unified modeling language (UML) to manage data more quickly and accurately to produce quality and optimal information according to needs [13]. Several tools are used for modeling information systems, namely use case diagrams, activity diagrams, class diagrams, and designs using UML tools based on a system architecture [14].

2. RESEARCH METHODS

The research method was carried out starting from the system requirements analysis process and then modeling the system design according to object orientation using the unified modeling language (UML) shown in Figure 1.
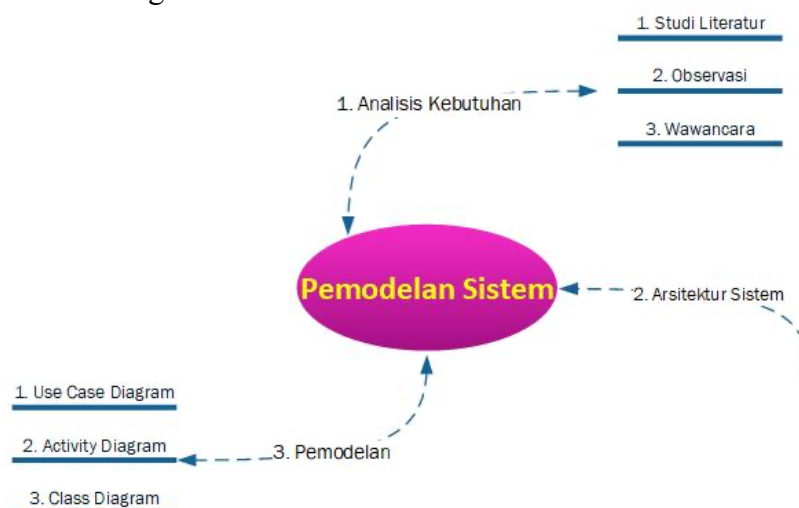

Figure 1. Research Methodology

Figure 1 above is the author's way of conducting research, starting with a needs analysis, then designing the system architecture and modeling with the tools that have been determined.

2.1 Needs Analysis

There are three activities in conducting a needs analysis; the first is that the author performs a literature study to find references about research related to system modeling. Secondly, the authors made observations with surveys at research locations to see the spare parts inventory business process at the Rizki Prima workshop. And finally, the author conducted interviews with the workshop owner to gain knowledge and information related to the ongoing business processes in recording spare parts inventory at the workshop and, at the same time, asking about the obstacles encountered in the continuous business processes.

2.2 System Architecture

After collecting data in the form of needs analysis, the author designed the required system architecture for the spare parts inventory information system. The goal is to visually view the system framework and describe the shape of the information system from the users, connectivity, and databases needed to store data[15], [16].

2.3 Modeling

After carrying out the system architectural design through the needs analysis phase, the authors modeled object-oriented design using a unified modeling language.

3. RESULTS AND DISCUSSION

3.1 Analysis of the Running System

The ongoing process at the Rizki Prima workshop begins with checking the spare parts owned and then purchasing spare parts by the workshop owner when stock runs out, transaction of spare parts when there is vehicle maintenance from customers who come. In addition, spare parts inventory is recorded using manual bookkeeping and still needs system reporting.

3.2 System Required

The results of the ongoing system analysis show that the Rizki Prima workshop requires a system or application that can help manage spare parts inventory data. Therefore we need a system that can facilitate the Rizki Prima workshop in managing spare parts inventory data so that it runs more effectively and efficiently. Some things that need to be discussed, such as managing spare parts data which makes it easier for workshops to collect data on spare parts that have been recorded or not, and managing spare parts transactions so that the recording of incoming and outgoing spare parts is neater and recorded, and lastly managing reports to make it easier for workshops to record printable details transaction results. The system will be built based on the website,

3.3 System Architecture

The system architecture is a general description of the system to be built[17]. The system created is a website-based application where the database and data processing logic are located on the server, so input and changes to data can be directly synchronized to all application users. The application has two user levels, namely administrators and supervisors. The system architecture can be seen in Figure 2 below.
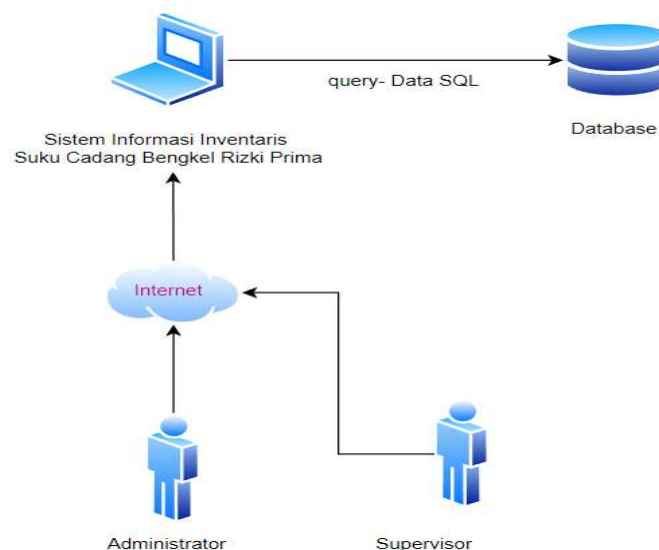

Figure 2. System Architecture

3.4 Modeling

After carrying out the process of analyzing system requirements, the next step is modeling the information system. The Inventory Information System uses UML (Unified Modeling Language) as the standard language used to define requirements, make analyses, and design and describe architecture in object-oriented programming[18]–[20]. The several UML (Unified Modeling Language) that will be loaded are use cases, activity diagrams, and class diagrams.

3.5 *Use case diagrams*

The use cases created in the spare parts inventory information system can be seen in Figure 3 below.
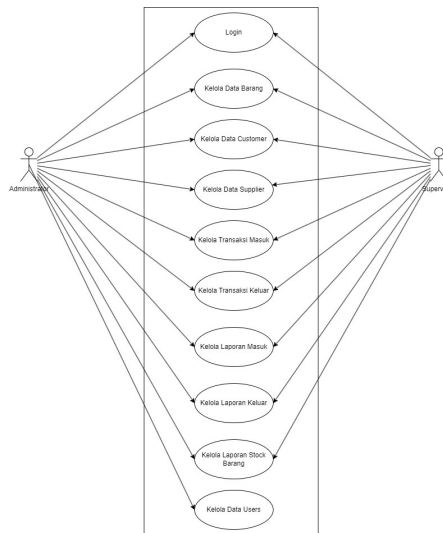

Figure 3. Use case diagrams

Figure 3 shows the use case diagram of the system to be created, and there are ten use cases in it that have their respective roles and functions.

3.6 *Activity Diagrams*

Activity diagrams describe a system's workflow (workflow) or activity. In the inventory information system, activity diagrams are divided into 10 (ten) diagrams, namely: login, manage data
goods, manage customer data, manage supplier data, manage incoming transaction data, manage outgoing transaction data, manage incoming transaction reports, manage reports
outgoing transactions, manage inventory data reports, and manage users. However, only one activity of managing inventory data reports on the system is shown below, which can be seen in Figure 4.
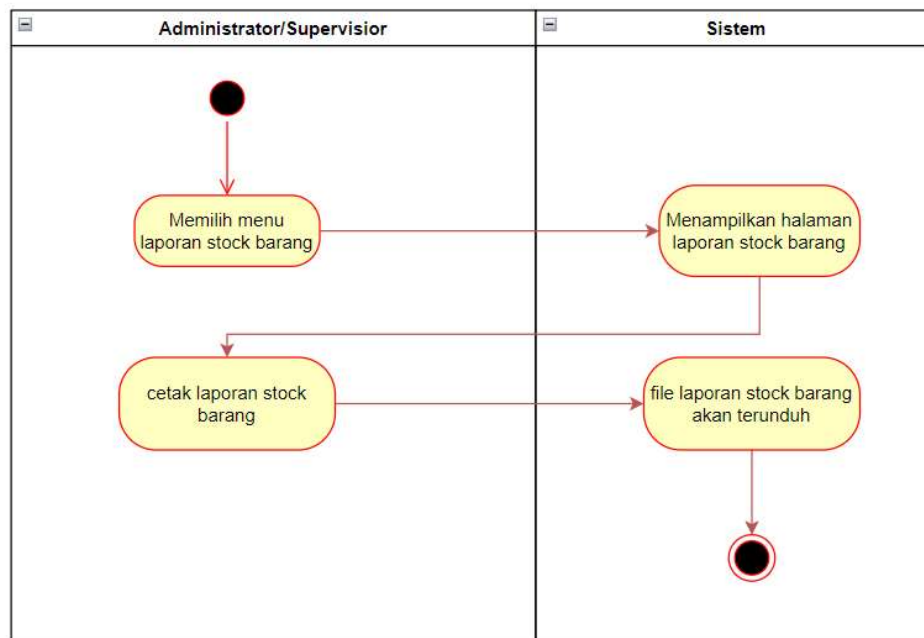
Figure 4. Activities to manage inventory data reports

Figure 4 above shows the activity of managing goods stock reports. In the process that is passed, the user selects the item stock report menu then the system displays the item stock report page. The user can print the item stock report and can download the item stock report.

3.7 *Class Diagrams*

Class diagrams or class diagrams describe the structure of the system in terms of defining the classes that will be made to build the system[21], [22]. Class diagrams are made so that programmers or programmers create courses according to the design in the class diagram so that the design documentation and software are synchronous. The class diagram of the system that will be made can be seen in Figure 5 below.
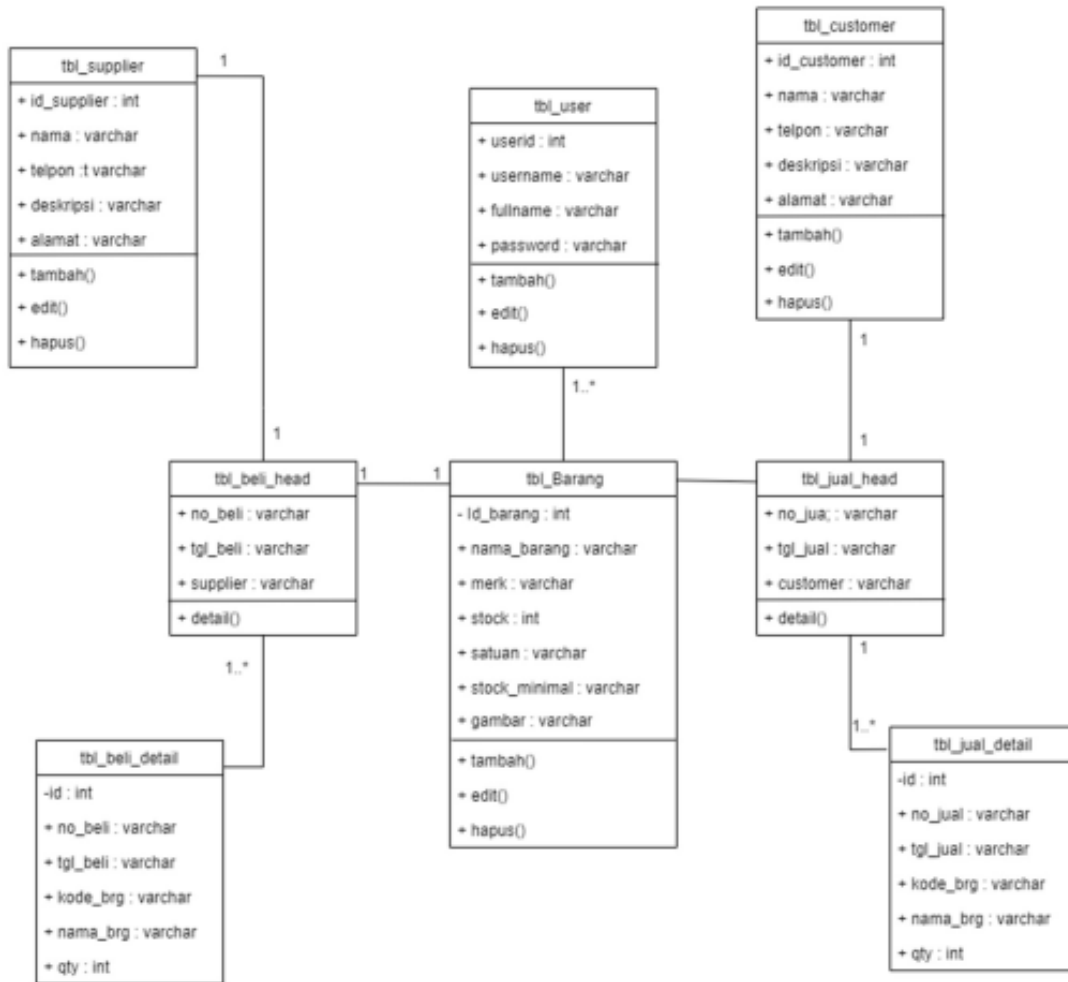
Figure 5. Class diagrams

Figure 5 above consists of 8 predetermined classes, and each type has attributes and operations.

CONCLUSION

From this study, object-oriented design modeling of the spare parts inventory information system using a unified modeling language has been carried out so that it can provide an overview for designing the spare parts inventory system at the Rizki Prima workshop. With this modeling, it is hoped that it can be compared between the current business processes and the proposed method in optimizing services. Not only that, but this modeling also provides hope in the ease of managing inventory data of incoming goods, outgoing goods, searching for goods data, and generating reports. The process of searching and changing data can be done in a shorter time and can be accessed by admins and workshop owners.

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