JURNAL TEKNOINFO
Volume 17, Nomor 2, Juli 2023, Page 593-604
ISSN: 1693-0010(Print), ISSN: 2615-224X(Online)
Available online at https://ejurnal.teknokrat.ac.id/index.php/teknoinfo/index

WEBSITE-BASED INVENTORY INFORMATION SYSTEM AT WAHANA SERVICE

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Abstract

The rapid development of Information Technology at this time has changed human activities and mobility. These changes occur in various areas of human life, including in the world of industry and business. Many companies are starting to compete to take advantage of this Information Technology development to provide convenience and increase their competitive advantage in order to increase competitiveness. This phenomenon has also begun to affect the Wahana Service workshop business processes. Wahana Service Workshop at this time still does not utilize Information Technology in its business processes, especially in the process of recording stock, incoming goods and outgoing goods. The process of recording and processing the data is still done manually so it is quite time consuming and prone to errors. The process of making reports is also still done manually so it is quite time consuming and prone to errors. To solve this problem, this research was made. The end result of this research is the Wahana Service inventory information system. Inventory is a process related to recording data on goods and assets owned by the company. Inventory itself is an important thing in a sales company like Wahana Service. Therefore the designed Wahana Service inventory system will play an important role in the company's business processes. Wahana Service's inventory information system will be designed based on a website to increase flexibility and responsiveness. The process of making the system will use the Waterfall method as the system development method. Waterfall itself is the most commonly used system development method in making systems. It is hoped that by using the waterfall, the designed system will have good quality and minimal errors. In designing the Wahana Service inventory information system, it adopts a structured programming paradigm and is written using the HTML, CSS, PHP, Javascript and MySQL database programming languages. The author also uses the Boostrap5 framework to produce an attractive and responsive website appearance. It is hoped that with the website-based Wahana Service inventory information system, the process of recording and reporting stock, incoming and outgoing goods can be done more quickly and safely. In addition, the use of this system will also be easier because it is compatible with any device and the data displayed is realtime.

Keyword: *Website, Information System, Inventory, Waterfall, Wahana Service*

1. INTRODUCING

Currently Information Technology (IT) is developing very rapidly because now information has turned into a necessity [1]. These changes make information technology currently play an important role in society to support daily activities or mobility [2]. The industrial and business world have also begun to adopt information technology to provide convenience for business people to increase competitive advantage and create efficiency and effectiveness for companies and increase competitiveness in the global market. [3]. The use of IT can help increase the effectiveness and efficiency of business processes, decision making, and competitiveness in rapidly growing markets. [4].

Wahana Service is a company engaged in the sale of spare parts and car repair services. In its business process, the process of recording and processing stock at the Wahana Service workshop is still done manually, namely in a book. In addition, the process of recording transaction data is also still done manually, so this often causes errors in stock and transaction processing, loss of data because stock writing on paper can fade and book paper pages can be damaged due to negligence. Calculation of the remaining stock is quite time consuming because it is done manually.

Seeing these problems the author is interested in implementing Information Technology in the form of an information system at the Wahana Service workshop. The information system itself is the result of the implementation of information and communication technology systems within the organization [5]. The system is a collection of procedures that are interrelated and work together to achieve certain goals [6], while information is data that has been processed into a form that is useful and provides added value to the recipient [7]. Based on this understanding it can be concluded that the information system is the procedures used to collect, process, and store data with the aim of producing information

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for an organization to achieve the goals set [8].

The information system that can be applied in the Wahana Service case above is an information system for recording stocks of goods which is commonly called inventory. Inventory is an inventory activity or action to carry out calculations, management, implementation of regulations, data recording and reporting of company-owned goods in units of use [9]. Companies whose inventory is well managed can maintain and improve the company's business processes [10]. This is because if the company's inventory is managed properly, the company will be better able to meet customer needs so that it can maintain its business continuity [11]. Therefore the use of inventory information systems is a must for companies engaged in the sales and purchasing industry so that transaction data related to inventory can be managed effectively and efficiently [12].

The implementation of this inventory information system is carried out with the help of the SDLC (Systems Development Life Cycle) waterfall method which is the most commonly used method in the development of information systems [13]. Waterfall itself is a stage of system development where each process flows downward like a waterfall. Each stage in Waterfall must be completed sequentially one by one and cannot move to the next stage if the previous stage has not been fully completed [14]. The use of the waterfall method makes the designed system have better quality because it is designed in stages and sequentially and errors in the development process can be minimized [15] . This inventory information system is designed in the form of a website. A web-based inventory information system has several advantages, such as being easily accessed and used by various devices and allowing users to monitor stocks in real-time. In addition, a web-based inventory information system can also be used by various types of companies, both small and large scale companies [16].

It is hoped that with this research, business processes at Wahana Service can run more quickly and easily. The process of recording goods data, incoming and outgoing goods data and goods returns can be stored more neatly, safely and quickly. With the Wahana Service inventory information system, it is also hoped that the process of making stock reports, incoming goods, outgoing goods and returns can also be faster and with fewer errors. Because the designed information system is website-based, it is also hoped that the stored information is real-time and can be accessed without any device, place and time limitations.

2. RESEARCH METHODS

The method used by the author to create a website-based inventory application is the Waterfall Method. This waterfall model is a sequential flow of software design starting from analysis, design, coding, testing and implementation [17]. The next stage will not be executed before the previous stage has finished executing and cannot return or repeat to the previous stage [18].

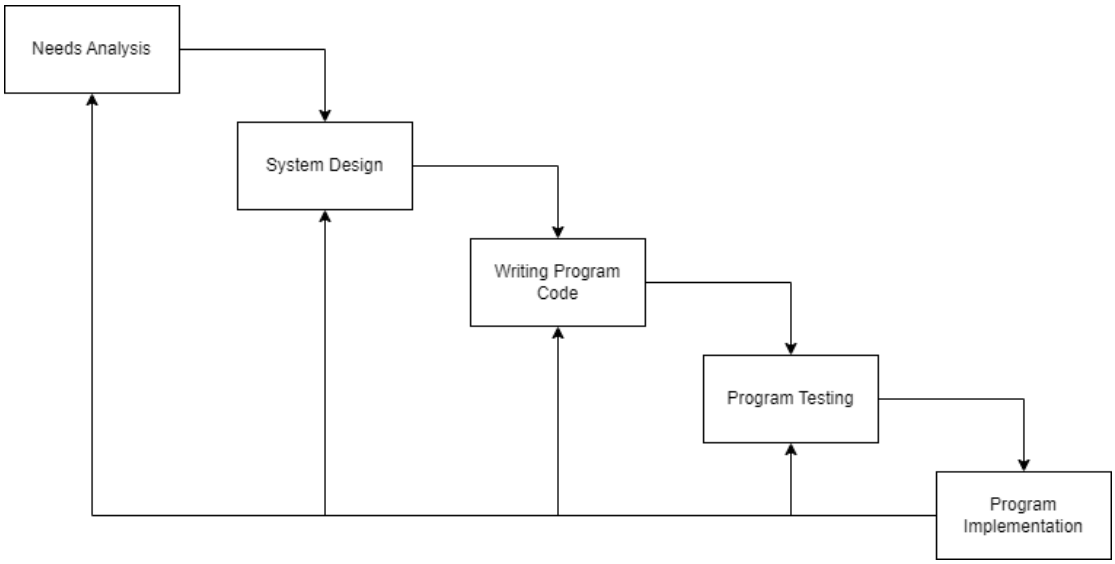

Figure 1. Waterfall Method [19]

Figure 1 describes the stages in the waterfall method [20]:

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1. Needs Analysis
   At this stage an analysis of system requirements is carried out. The data needed at this stage is collected by means of interviews or literature studies to find all the information needed so that the designed computer system can perform tasks that are in accordance with what the user wants and needs.
2. System Design
   The stage where the results of the analysis and design of solutions to existing problems are presented using system modeling tools such as data flow diagrams, entity relationship diagrams and data structures and their discussion to produce a system blueprint.
3. Writing Program Code
   Writing program code or coding is the process of implementing a design that has been designed into a program that can be used using a programming language that is understood by computers. From this process a system program will be generated that can be used to solve existing problems.
4. Testing Program
   The stage where the newly created system is tested for its effectiveness and capabilities so that errors and deficiencies can be identified from the system being designed for later reassessment and improvement so that it becomes a better and more perfect system.
5. Program Implementation
   Programs that have been designed and tested are implemented for users.

3. RESULT AND DISCUSSIONS

3.1. Needs Analysis

The first stage is to do a needs analysis first to find what is needed in the Wahana Service workshop web inventory. Before the analysis process begins, it is necessary to collect data first as material for analysis. The data collection process was carried out in 2 ways, namely direct interviews with Wahana Service to collect primary data and Literature Reviews from related journals and books to collect secondary data. From the interview results, it was found that the company's business processes are illustrated in figure 2.

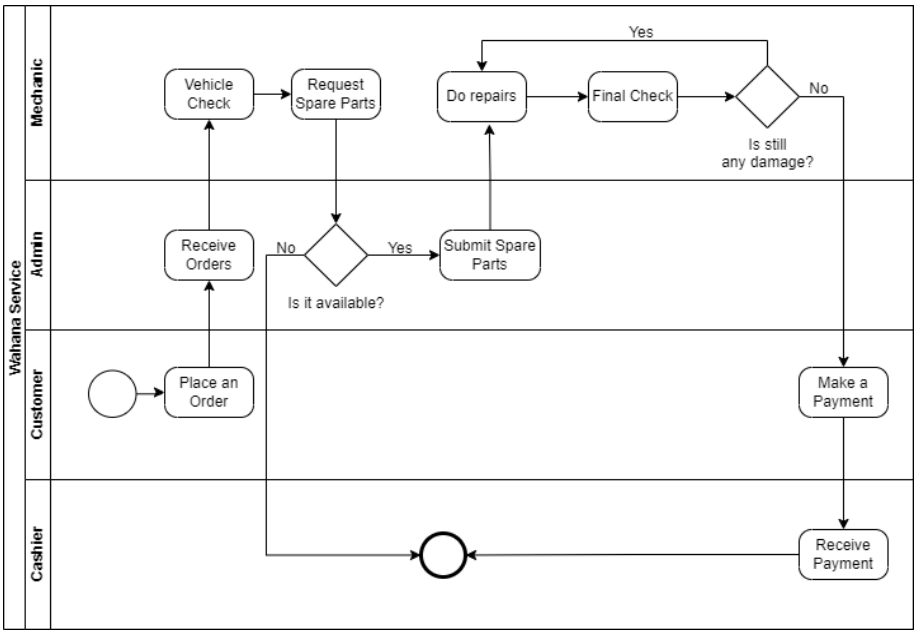

Figure 2. Wahana Service Business Process

In Figure 2, the Wahana Service workshop business process begins when a customer who wants to do car repairs visits the Wahana Service workshop. In the workshop the customer will meet the admin to place an order for repairs. After that the admin will continue the order to the mechanic to check the vehicle. The mechanic will check for damage to the vehicle and decide what repair process is needed along with the parts to be replaced. After the mechanic knows what repair process must be carried out along with the spare parts, the mechanic will ask the admin for the spare parts needed. Admin will check the availability of these spare parts. If the spare part is not available, Amin will notify the customer that the

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required spare part is not available so that the customer can go home. If these spare parts are available, the admin will hand over these spare parts to the mechanic, then the mechanic will carry out repairs and replacement of spare parts. After the repair process is complete, the mechanic will carry out a final check. If there is still damage, the mechanic will return to repair it. If there is no damage, the mechanic will hand over the vehicle to the customer. Then the customer will make payments for repairs and spare parts to the cashier. The cashier will receive the payment, after the payment is complete the customer can go home.

After obtaining the business process, a SWOT analysis is carried out to analyze the strengths, weaknesses, opportunities and threats that exist in the company.

Table 1. SWOT Analysis

	Strengh (S)	**Weakness(W)**
	a. The company has a strategic location in the city center. b. The company has the best service at an affordable price. c. The company provides quite complete and varied spare parts. d. The company has experienced employees in the field of car repair. e. The company has been around for 20 years so it has quite good experience in the car repair field.	a. The company had quite a hard time finding information on the availability of spare parts stock. b. The company still records spare parts manually. c. The company still records transaction data manually.
OPPORTUNITIES (O)	**S-O STRATEGIC**	**W-O STRATEGIC**
a. The spare parts are quite complete. b. he number of car owners in Singkawang increases every year. c. Improving ease and accuracy in managing data and documents.	a. Creating a system that can help admins and owners in processing data and documents. b. Maintain service quality standards. c. Always up to date on technology and auto parts.	a. Creating a system that can assist in recording and storing data. b. Creating a system that can manage and print reports easily and quickly.
THREATS (T)	**S-T STRATEGIC**	**W-T STRATEGIC**
a. Risk of losing important data. b. The emergence of new competitors.	a. Create a system that can record and store important data into a database as a storage medium. b. Maintain and even increase the type of spare parts and service quality to customers.	a. Designing a system that can store incoming and outgoing goods data into a database so that it is easier to find and manage goods data. b. Designing a system that can record and manage transaction data safely and easily.

Finally, a functional requirements analysis was carried out to find out the functional requirements for the Wahana Service workshop web inventory. The functional requirements for the Wahana Service workshop web inventory require three different users, namely the owner, admin and cashier. The following is the system interaction and information needs of the three users:

a. Owner

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- Obtain and manage data on goods, users, suppliers, incoming goods, outgoing goods and goods returns
- Make reports on stock, incoming goods, outgoing goods and goods returns.

b. Admin
- Obtain and manage data on goods, suppliers, incoming goods and goods returns
- Make reports on stock, incoming goods and goods returns.

c. Cashier
- Obtain goods data information.
- Obtain and manage outgoing goods.
- Make reports of outgoing goods.

3.2. System Design

In the second stage, a description of the system design is carried out. There are several tools used in making system design. Because the paradigm used in making Wahana Service's web inventory system is a structured programming paradigm, the system design diagram used is DFD. The first uses a context diagram to describe an overview of the designed Wahana Service workshop web inventory system.

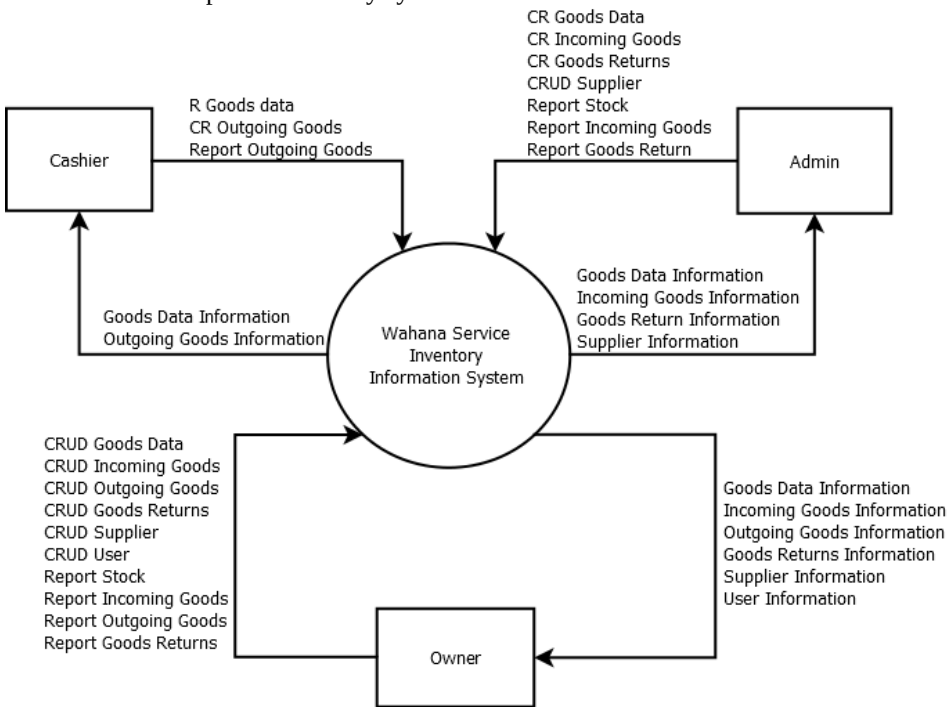

Figure 3. Context Diagram

Figure 3 is a context diagram of the designed system. In this diagram, there are 3 main entities, namely owner, admin and cashier. Each entity has its own function and access rights. The owner can do CRUD (Create, Read, Update, Delete) goods data, incoming goods, outgoing goods, goods returns, suppliers and users as well as reporting goods data, incoming goods, outgoing goods and goods returns. After that the Owner will get information on goods data, incoming goods data, outgoing goods data, goods returns data, supplier data and user data. Admin can do CR (Create, Read) item data, incoming goods and returns, CRUD (Create, Read, Update, Delete) supplier data and report goods data, incoming goods and returns. After that the Admin will get information on goods data, incoming goods data, goods returns data and supplier data. The cashier can do R (Read) item data, CR (Create, Read) outgoing item data and report outgoing goods. After that, the cashier will get information on goods data and outgoing goods.
Then the context diagram that has been designed is described in more detail in the overview diagram.

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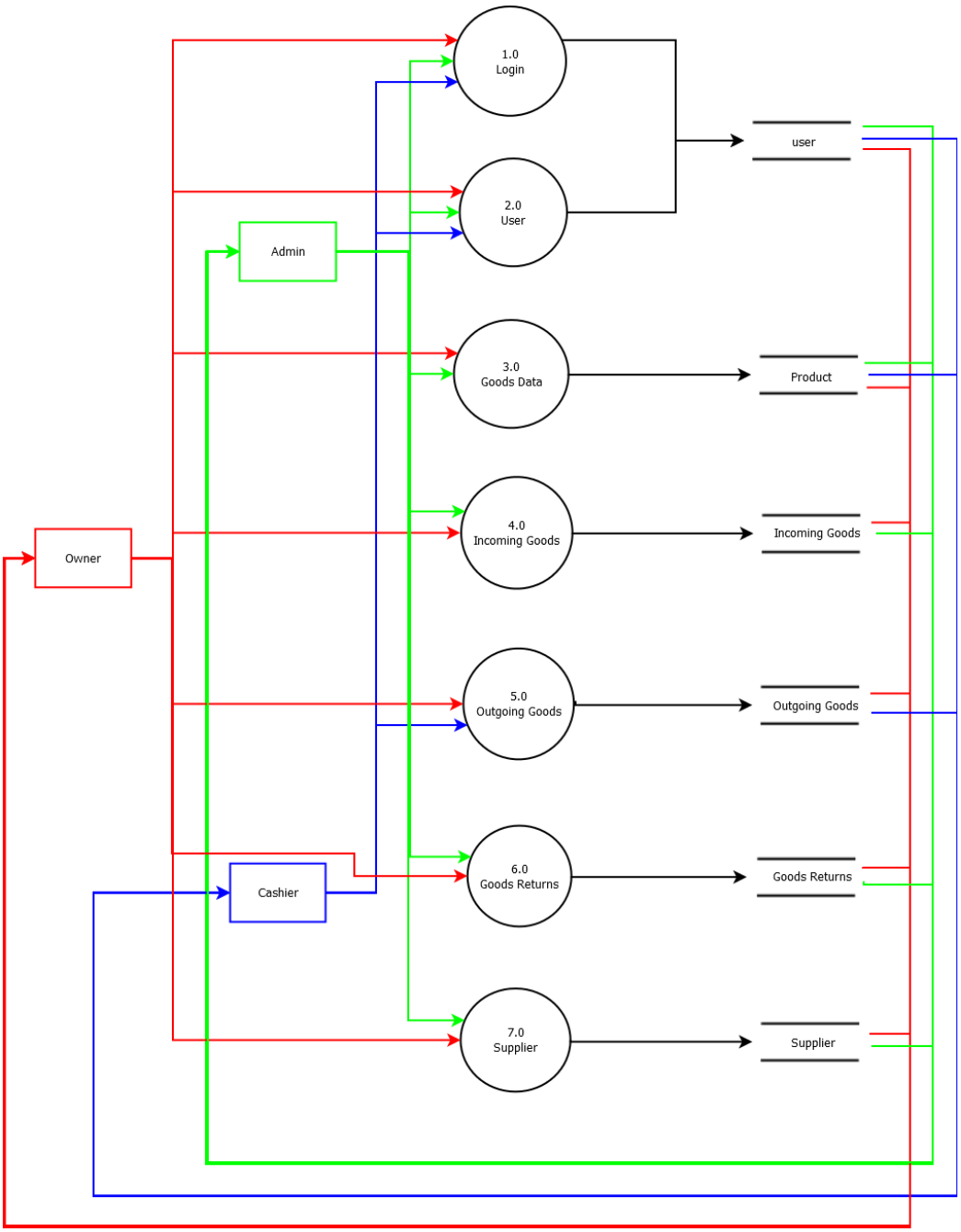

Figure 4. Overview Diagram

Figure 4 is an overview diagram which is a more detailed description of the context diagram. The diagram shows 3 main entities consisting of owner, admin and cashier, 7 main processes consisting of logins, users, goods data, incoming goods, outgoing goods, goods returns and suppliers, and 6 data storage areas consisting of users, product, incoming goods, outgoing goods and goods returns. The owner can access and receive data from the login process, user, goods data, incoming goods, outgoing goods, goods returns and suppliers. Admin can access and receive data from the login process, user, item data, goods returns and suppliers. The cashier can access and receive data from the login and user processes and can only receive data from the goods data process. In addition, data from these processes will be stored in data storage media. Login and user process data will be stored in user storage media, goods data process data will be stored in goods data storage media, incoming goods process data will be stored in incoming goods storage media, outgoing goods process data will be stored in outgoing goods storage media, process data Goods returns will be stored in the goods returns storage

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media and supplier process data will be stored in the supplier storage media.
After the Wahana Service workshop web inventory system has been described, a database design is carried out as a data storage medium. The database used in the system is designed using an ERD diagram as shown in figure 5.

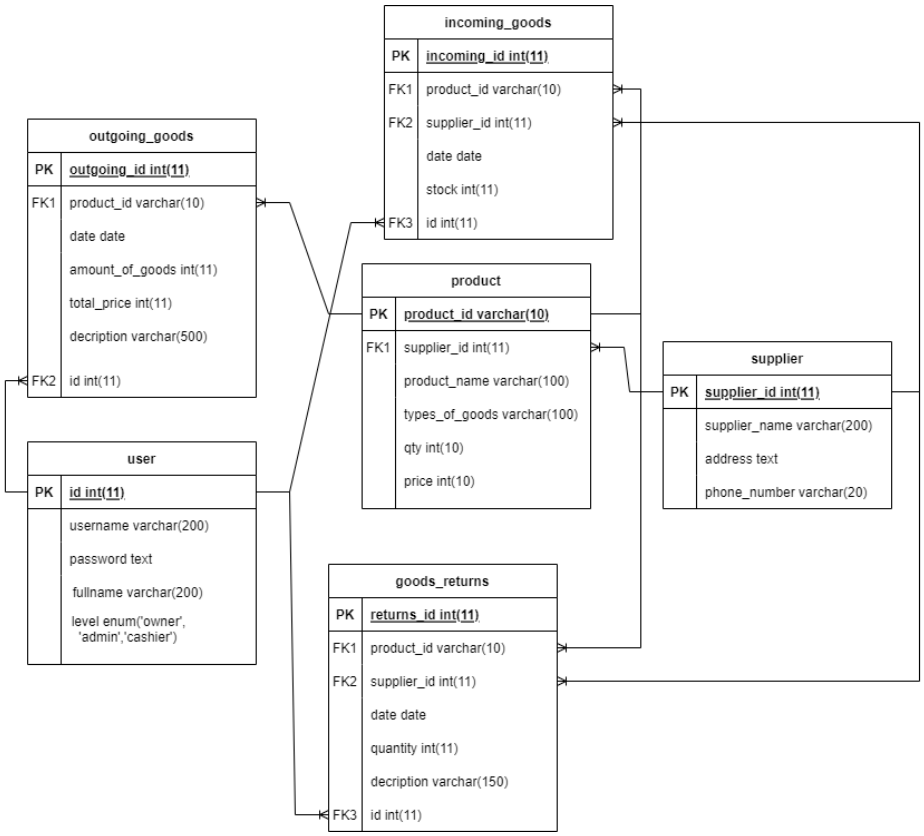

Figure 5. ERD

Figure 5 shows the ERD with crowdfoot notation from the web inventory at Bengkel Wahana Service. In the ERD diagram there are 6 entities, namely user, suppliers, product, incoming_goods, outgoing_goods and goods_returns. Each entity has its own attributes and relationships. The user table will store user account data for the Wahana Service workshop web inventory and have a 1 to Many relationship with the incoming_goods, outgoing_goods and good_returns tables. The supplier table will store supplier data and relate 1 to Many with the product, goods_included and returned_goods tables. The product table will store goods data and have a 1 to Many relationship with the incoming_goods, outgoing_goods and good_returns tables. In addition, the product table also has a Many to 1 connection with the user table. The incoming_goods table will store incoming goods data and will have a Many to 1 relationship with the product, supplier and user tables. The outgoing_goods table will store outgoing goods data and will have a Many to 1 relationship with the product and user tables. Finally, the goods_returns table will store goods_returns data and have a Many to 1 connection with the product, supplier and user tables.

3.3. Program Writing

At this stage the system design that has been designed is implemented. This system is implemented into a website written using the programming language HTML, CSS, JavaScript, PHP and MySQL database. Making this website will also use the boostrap5 framework to produce a more attractive and responsive website appearance. The writing of the program uses a structured programming paradigm according to the DFD diagram design that has been made. The following shows the User Interface of the Wahana Service web inventory.

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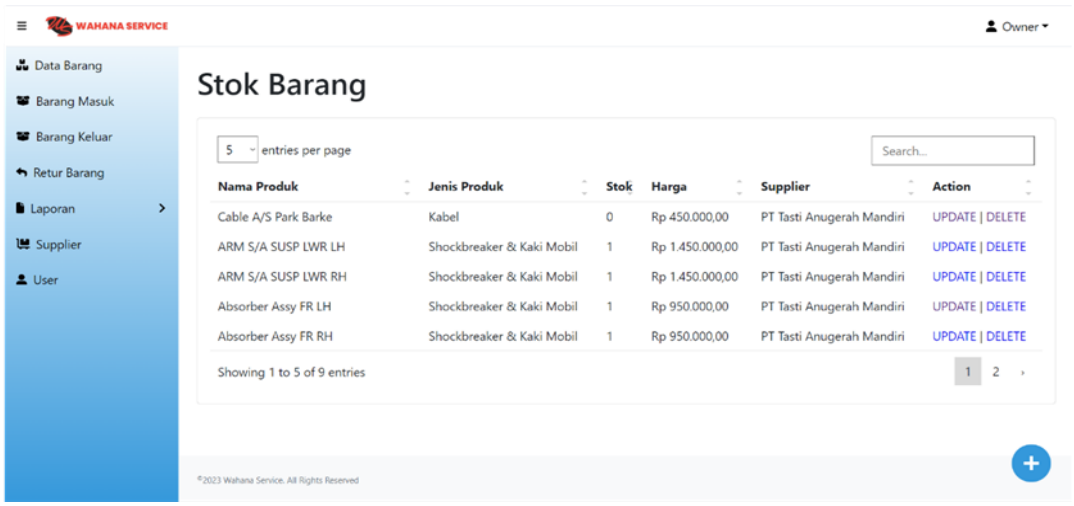

Figure 6. Main Page Display of Goods Data

Figure 6 is a display of the main item data page. This page is an item data page which is the main page in the Wahana Service inventory information system. After the user logs in, the user will be automatically redirected to this page. This page will display item data such as product name, product type, stock price and supplier. This page can be accessed by all users from all accounts through the item data menu. At the top of the website page there is a header consisting of a hamburger icon, company logo and active account username information. On the left there are menus that can be accessed based on account type. The owner account can access the goods data menu, incoming goods, outgoing goods, goods returns, incoming goods reports, outgoing goods reports, goods returns reports, suppliers and users. The admin account can access the goods data menu, incoming goods, goods returns, incoming goods reports, goods returns reports, and suppliers. The cashier's account can access the item data menu, outgoing goods and incoming goods reports, goods returns reports. On the right of the website will display website pages based on the selected menu.

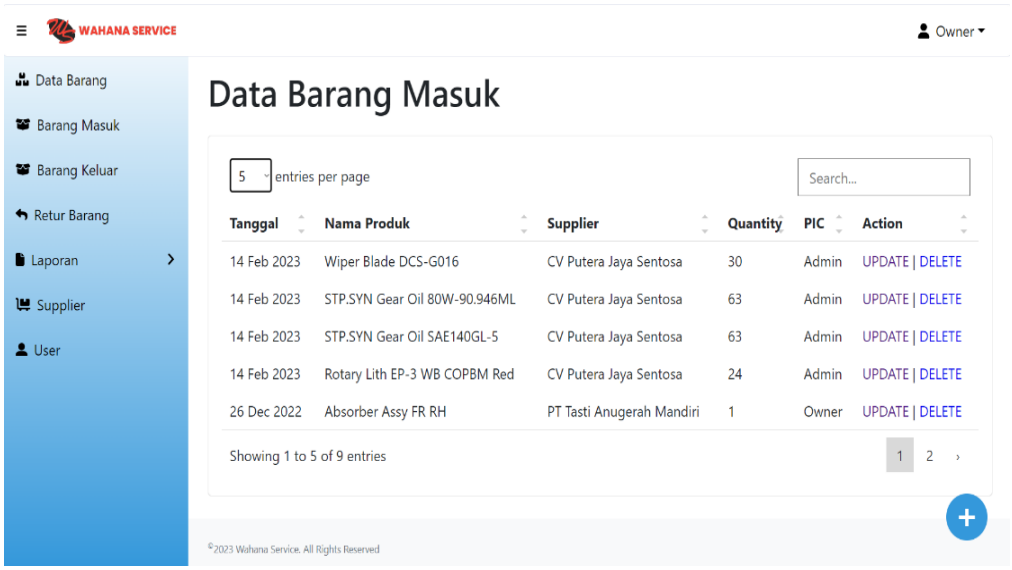

Figure 7. Incoming Goods Page Display

Figure 7 is a view of the incoming goods page. On this page the owner and admin can see incoming goods data such as date, product name, supplier and quantity. Owner and admin can access the add item feature, while the update and delete features can only be accessed by the owner.

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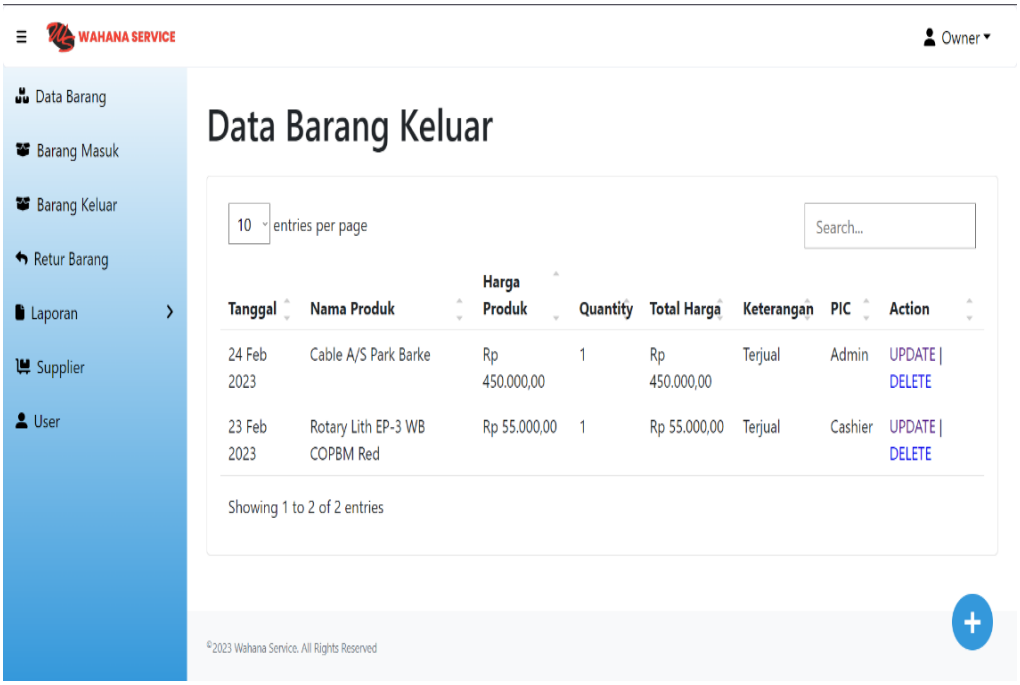

Figure 8. Outcoming Goods Page Display

Figure 8 is a view of the outgoing goods page. On this page, the owner and cashier can see data on outgoing items such as date, product name, price, quantity, total price and description. The owner and cashier can access the add item feature, while the update and delete features can only be accessed by the owner.

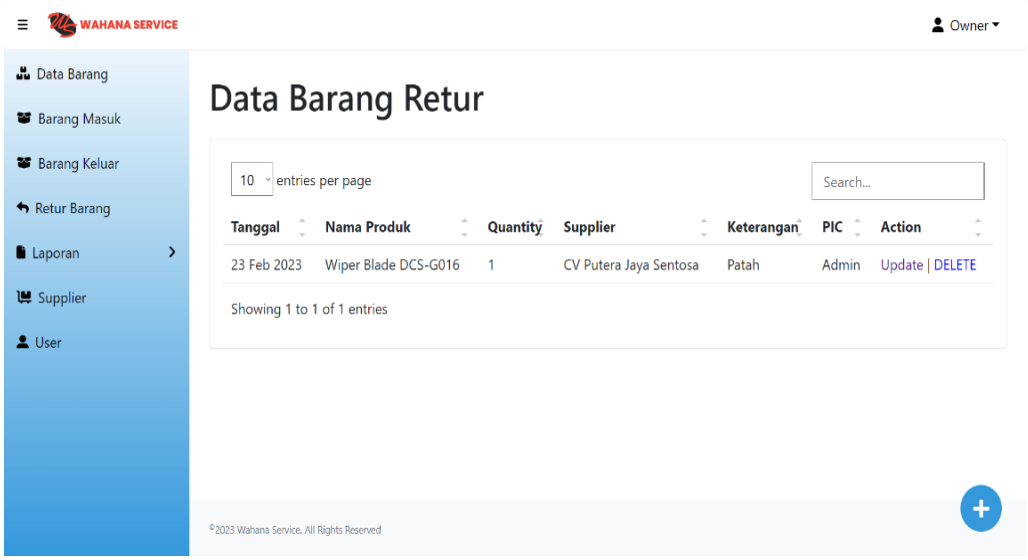

Figure 9. Goods returns Page Display

Figure 9 is a display of the goods returns page. On this page the owner and admin can see data on goods returns such as date, product name, quantity, supplier and description. Owner and admin can access the add item feature, while the update and delete features can only be accessed by the owner.

3.4. Program Testing

After the Wahana Service inventory website has been created, the functionality of the website will then be tested. This is done to minimize the error rate and ensure the output produced by the system is as expected. This testing process is carried out using the Blackbox Testing method. Blackbox Testing itself is a testing method in which this method will test the

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program in terms of specifications and functionality without testing the program code. From the Wahana Service web inventory testing process, the test results obtained are in accordance with those listed in table 2.

Table 2. Blackbox Testing Results

No	Pre-condition	Expected Result	Actual Result	Status
1.	The user logs in by entering the username and password	The user enters the website page	The user has successfully entered the website page	OK
2.	The user logs out.	The user logs out and is redirected to the login page.	The user is successfully logged out and redirected to the login page.	OK
3.	User adds item data	Item data will be stored in the database and appear on the item data page.	The item data has been successfully stored in the system	OK
4.	The user adds incoming items	Incoming goods will be stored in the database and appear on the incoming goods page.	The incoming goods have been successfully saved in the system	OK
5.	User adds items out	Outgoing goods will be stored in the database and appear on the outgoing goods page.	Outgoing items are successfully stored in the system	OK
6.	User adds item return	Goods returns will be stored in the database and appear on the goods returns page.	The returned item has been successfully saved in the system	OK
7.	User adds supplier	Supplier data will be stored in the database and appear on the supplier page.	Supplier data is successfully stored in the system	OK
8.	User adds user	User data will be stored in the database and appear on the user page.	User data is successfully stored in the system	OK

3.5. Program Implementation and Maintenance

After Wahana Service's web inventory has successfully passed the test without any problems and errors, then the web can be implemented into the workshop. The implemented web will change the workshop business process flow for the better. The proposed business process related to the Wahana Service web inventory will be illustrated in figure 8.

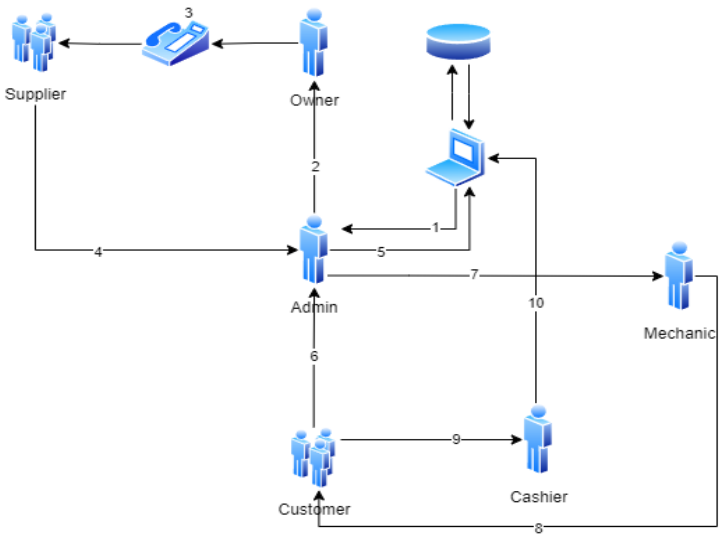

Figure 8. Proposed Business Process

The proposed business process illustrated in Figure 8 starts with the process of purchasing spare parts from suppliers. (1) Admin will check the remaining stock of spare parts via web inventory. (2) Admin will then notify the owner of any spare parts that have run out. (3) Then the owner will order the spare parts to the supplier by telephone. (4) The supplier will

receive the order and then send the spare parts to the repair shop. Admin will receive the spare parts sent. (5) Then the admin will store the spare parts in the warehouse and enter the incoming goods data into the web inventory. Furthermore, after the process of purchasing spare parts, there is a process of selling spare parts which starts when (6) the customer comes to the repair shop to carry out car repairs. The customer will come to the admin to place an order. Then the admin will receive orders and pick up the necessary spare parts. (7) Then the admin will ask the mechanic to make repairs. (8) After the repair is complete, the mechanic will notify the customer that the car repair has been completed. After there are no more problems in the car (9) the customer will make payments to the cashier. (10) The cashier will receive the payment, then enter the outgoing goods data into the web inventory.
Once implemented, Wahana Service's web inventory will be routinely maintained to ensure that the web inventory can run properly without any bugs and problems. Routine maintenance can be done every week or every month depending on the agreement with the workshop. In addition, in the future web inventory can also be improved by adding new features.

4. CONCLUSION

Based on the results of the analysis, it can be concluded that the problems that exist in the Wahana Service workshop are due to the non-utilization of information technology in the process of recording and processing existing item data. This causes frequent data loss and stock discrepancies in book data and warehouse data. Through this research, a website-based Wahana Service inventory information system was obtained to help overcome these problems. Based on the results of development and testing, it is known that the designed Wahana Service inventory information system runs smoothly and without any problems/errors. The features and menus in the system are in accordance with the problems and needs that exist in the Wahana Service workshop. With the existence of an inventory information system, the service for recording inventory, incoming goods, outgoing goods and returns has been recorded neatly. With database storage media, there is no need to worry about losing data. Stock and price information can also be seen easily and in real time. The process of making reports can also be made easily and quickly without fear of data errors. The website-based Wahana Service inventory information system has also increased the flexibility and responsiveness of the system that has been created. Wahana Service can access the system anywhere and anytime with any device that is connected to the internet network. In addition, Wahana Service's inventory information system will be easier to develop and add new features because the developed system is still in its early stages and can still be further optimized in the future.

ACKNOWLEDGEMENT

The author thanks and gratitude to God Almighty for his permission, the author can complete this research. The author is also grateful to all parties who directly or indirectly helped and supported the author in completing this research. The author is also grateful to the University, lecturers who have provided guidance, input and constructive suggestions to the author. Finally, the authors also thank the Wahana Service workshop for providing the time, place, and opportunity for the authors to conduct and complete the research.

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