



Inventory System Design Using Weight Average Cost (WAC) and Graphic Methods

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Article Info

Article history:

Received 05 31, 2023

Revised 06 11, 2023

Accepted 06 22, 2023

Keywords:

Inventory System

Chart

WAC

ABSTRACT

The internet is currently being used by businesses or business divisions for business activity. Applications for supporting business operations, including those for administration, finance, marketing, and inventory management, have started to be web-based so that information can be accessed more quickly and conveniently, anywhere and whenever. But as of today, there isn't a system that can manage data on inventory supply, thus the business wants a system that can be utilized to find inventory. The inventory inventory system is not yet successful since data processing is still carried out in a manner that is still manual, making it difficult to determine the quantity and location to store inventory. The goal of this study was to evaluate the store's inventory and compare monthly sales and purchases using data from the register. The results of these two approaches' forecasting demonstrate that by using both of them, together with a website's assistance, one may swiftly and accurately predict future inventories.

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1. Introduction

The corporate world is becoming more and more competitive, so acting quickly and accurately is important. In order to improve a company's success, good management is required. A corporation has a number of systems, one of which is the inventory information system, which works to estimate the quantity of goods in the warehouse. The quantity of products kept in the warehouse can be found using the goods inventory information system. Additionally, it is anticipated that using a strong inventory system will lessen the possibility of inventory loss or theft. Companies that operate production processes require an inventory of items (also known as inventory) [1]. Inventory must be kept to a minimum while still satisfying customer demand because excessive inventory might result in expensive costs [2]. Proper inventory management enables a company to accomplish objectives like making the most profit possible while incurring the fewest expenses, necessitating the need to plan ahead for inventory shortages [3]. Applications that can aid humans in creating accurate and timely information are necessary given the presence of advanced technology. Companies that offer information services compete to deliver the most recent information required by the public. Information systems are crucial for contributing to the expansion of human life [4]. It is astonishing, given the speed at which technology is developing, that so many businesses, government agencies, and other

organizations rely on computers as a tool for storing and processing data of all types quickly, precisely, and accurately [5].

In the West Sumatra city of Padang, there is a company called Nilmaizar Sport Apparel that sells sporting goods. Football, futsal jerseys, football, deker, headbands, finger savers, and knee pads are among the items sold. Decker says all of the tasks are still done by hand, including tracking incoming and outgoing commodities, looking for items, and creating reports by writing them down in a book. This is deemed unproductive and inefficient since it is time-consuming, has a significant chance of errors, and solely uses a calculator to determine inventory value, which leaves room for calculation errors. To overcome this problem, an inventory system has been developed that has been computerized so that it can assist in carrying out data input, data search, calculating inventory values and making reports that can minimize the occurrence of errors.. Information systems are important for playing a role in the growth of human life. In the field of retail, the role of technology and information is very influential. In order to survive, we need a system that can manage and organize data and information on purchasing and selling goods, which was originally using Microsoft Excel, has developed rapidly. With this in place, it can simplify and speed up implementation buying and selling of goods [6].

Inventory is a fixed facility, which is designed to achieve the target level of service with the lowest total cost. Inventory is needed in the process of coordinating the distribution of goods, which arises as a result of an imbalance between the demand and supply processes which encourages the emergence of inventory (inventory), inventory requires space as a temporary storage area which is referred to as a warehouse. To build an inventory system, you must understand what inventory is and have a design or things related to an inventory system so that the system can match the expected results, the design itself is a picture of the activities of a project that will be built using a method or technique specifically to carry out the design [7]. In addition to this, to support the running of the system, a graphical method is needed which aims to review the progress of transactions that occur every month in order to make it easier for employees to report sales transaction data [8].

2. Research Method

Data collection techniques are the most important step in the research process, because of the main goal research is to get data[9]. Collection technology. The data needed here is the most appropriate data collection technique to get the data valid and reliable[10]. The research that will be carried out uses the type of data that exists in Nilmaizar Sport. Collecting data for this study uses several methods as follows:

a) Interview (Interview)

The technique of collecting data by asking questions directly with related parties, namely Store Staff and Warehouse Staff related to the process of entering and leaving goods in inventory at Nilmaizar Sport Apparel.

b) Observation

The data collection technique is by making direct observations at the Nilmaizar Sport Apparel Warehouse regarding matters related to Inventory system problems.

c) Literature Review (Library Research)

Data collection techniques obtained from college reading books, library books and scientific papers related to the issues raised by the author, these books are used by the author in conducting research. The data used in this study are inventory data and sales data in nilmaizar sport. In the system that will be built, an inventory system application will be created that functions to manage inventory data of goods stored in the warehouse, report the entry and exit of goods to the warehouse so that it is more precise and accurate, calculate the value of inventory and a report in the form of sales and purchase charts

3. Result and Discussion

System analysis is the process of breaking down a whole information system into its constituent elements in order to recognize and assess issues, opportunities, challenges, and anticipated needs in order to suggest improvements. The system to be constructed is not to replace the current system but to take advantage of opportunities by establishing a new system based on a web application. The system to be built is based on the results of an analysis of the problems that have been outlined in order to be able to create alternative solutions to these difficulties. UML (Unified Modeling Language) is a modeling language for systems or devices. object-oriented paradigm[12]. "UML (Unified Modeling Language) is a standard language that is widely used in the industrial world to define requirements, make analysis & design, and describe architecture in object-oriented programming [13]. UML is not only used in the software modeling process, but in almost all fields that,require it modeling [14]. Creating a database design, making an

implemented inventory system can also provide stock reports for users to view stock data[11]. Screen display and output of the inventory information system application and design with a context diagram as follows:

3.1. Use Case Diagram

A use-case diagram describes how one or more actors interact with information systems. The actor is someone who interacts with the system, and the use case diagram depicts how someone will use or employ the technology. Use-case diagrams also show the actions taken by actors within a system. A use-case diagram is a visual representation of how the system and the actors interact [15]. The use case design of the model explains how the actions in the information system will be developed and what data the actor will input [16]. As for acting as an actor in this inventory system is only the admin. The use case diagram designed can be seen in Figure 3.1 below:

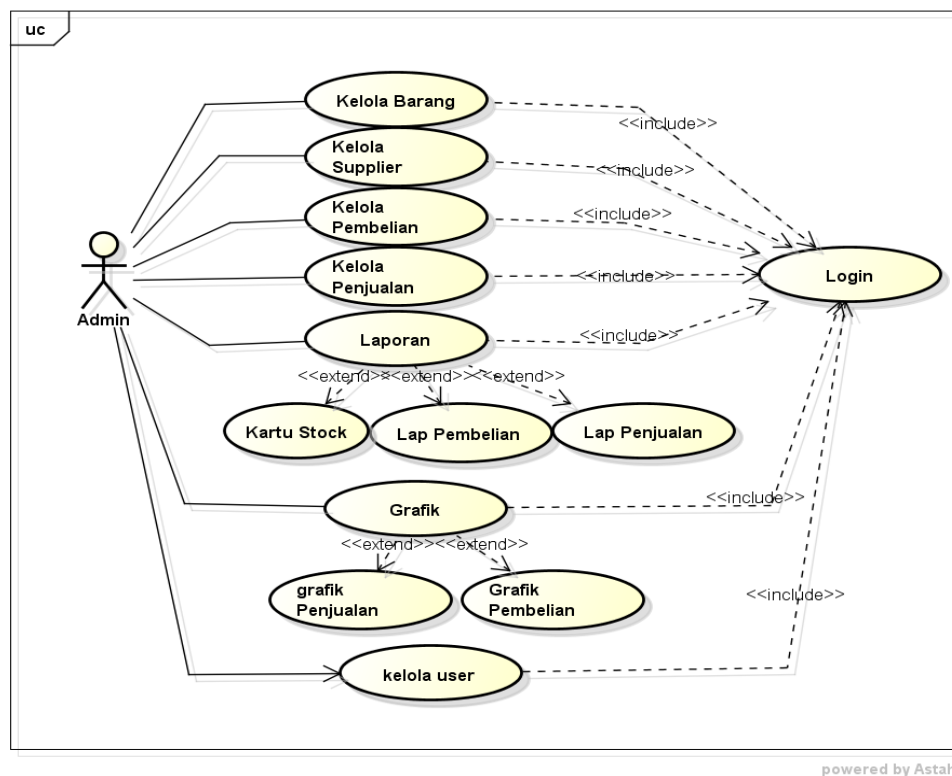


Figure 3.1 Use Case Diagram

In Figure 3.1 it can be explained that in a system where the admin can carry out various activities on the system by logging in first so that he can manage goods data, manage supplier data, sales, purchases, view reports and view graphs.

3.2. Class Diagram

The basic structure that houses and maintains information in the system is the class diagram [17]. The basic structure of the system for managing and storing information is the class diagram [18]. Class diagrams are used to explain the link between tables in a database and the structure of the system based on the definition of the classes that will be used to build the system. There are two more components in the class diagram: the center component, which contains class attributes used to characterize class quality, and the upper component, which contains the class name used to categorize objects. Lastly, extra parts that include a variety of classes and data types. The class diagram serves to describe the structure of the system from defining classes that will be made to build a system and describes the relationships between tables in the database. Class diagrams are models that describe the structure and description of classes and their relationships between other classes[19]. Class diagrams themselves are very useful in all forms of object-oriented programming[20]. Class diagrams are very helpful in class visualization of a system [21]. The class diagram design can be seen in Figure 3.2 below :

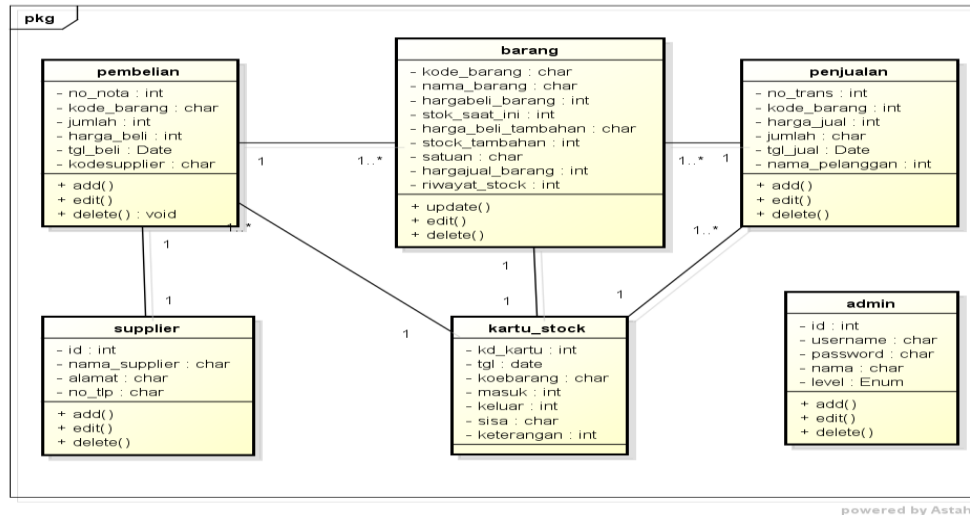


Figure 3.2 Class Diagram

In Figure 3.2 it can be explained that the class diagram consists of several classes, namely admin, goods, suppliers, sales, selling_details, purchases, and selling_details. With add, edit and delete operations.

3.3. Activity Diagram

Activity diagrams outline each flow's beginnings, potential decisions, and endings, as well as the work flow of a system or menu procedure in the software. An activity diagram is a visual representation of how system users interact with the system's full menu [22]. Activity diagrams are used to describe the various activities in the designed system, how each functionality works, and how a functionality ends[23]. activity diagrams describe system activity not what actors do, and activities that can be done by the system[24]. Activity diagrams can be used to display business workflows at the business modeling stage[25]. Activity diagrams are widely used to define things as follows :

1. business process design where each sequence of activities described is a defined system business process.
2. Sequence or grouping of displays from the system / user interface where each activity is considered to have a display interface design.
3. Test design where each activity is considered to require a test that needs to be defined test cases.
4. The menu design displayed on the software.

3.3.1 Admin Diagram

The admin activity diagram describes the activities that can be carried out by the inventory system admin starting from logging in to the admin page, inputting to logging out. The following is the admin activity diagram as shown in Figure 3.3 below:

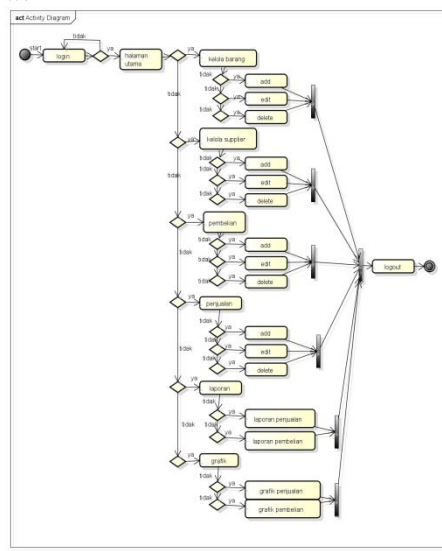


Figure 3.3.1 Admin Chart

The admin activity diagram describes the activities that can be carried out by the inventory system admin starting from logging in to the admin page, inputting to logging out. On the admin page there are menus that will be managed by the admin such as goods, suppliers, purchases, sales, reports and graphs. On the admin page there are menus that will be managed by the admin such as goods, suppliers, purchases, sales, reports and graphs 2.

3.3.2 Graphical diagram

Admin can see sales charts and purchase charts. It can be seen in Figure 3.3.2 below:

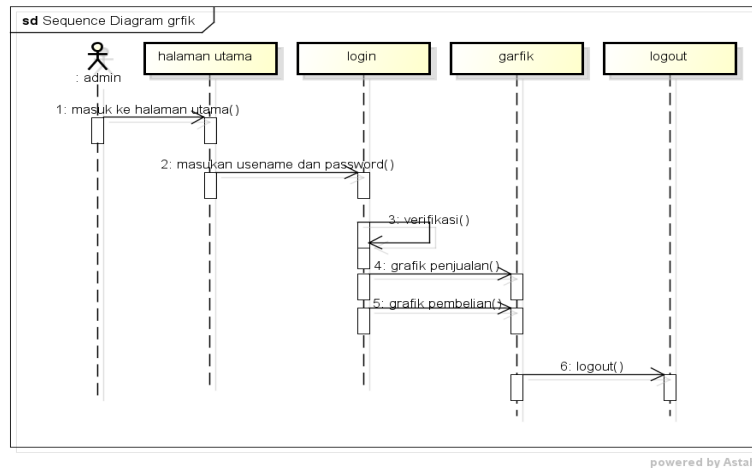


Figure 3.3.2 Graphical diagram

Sequence diagrams are used to describe behavior in a scenario in detail over time. This diagram shows the number of objects and messages that are placed between the objects in the use case. This page displays graphical results between sales and purchases which can later be used as a guide for inventory in the future.

3.4 Display Of Application

The admin page is the page used by the admin to input data and perform inventory data processing, as shown in Figure 3.4 below :

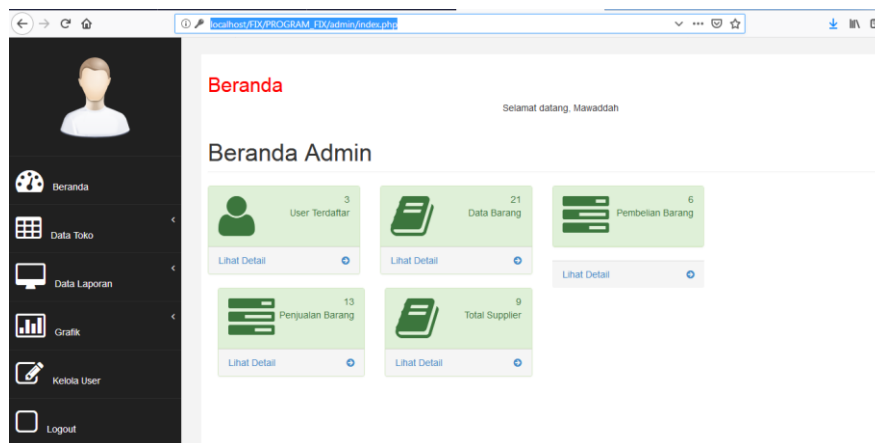


Figure 3.4 Admin

On this page the admin can carry out inventory system data management activities by clicking on the menus provided by the system such as Goods Data, Sales, Purchases, Suppliers, reports and viewing purchase charts.

3.5 Goods Data Page

The item data page is used to see what items are in stockThis page is used by admins to add, edit, and delete item data, as shown in Figure 3.5 below:

No	Kode Barang	Nama Barang	Harga Beli	Stok Awal	Harga Jual	Stok Saat Ini	Total WAC	Opsi Anda
1	B008	Street Rider II Specs	Rp. 375,840	6	Rp. 469,800	4	Rp. 350,240	Edit Hapus
2	B007	Baricada Ultra FT Specs	Rp. 399,840	6	Rp. 499,800	5	Rp. 399,840	Edit Hapus
3	B006	Swervo Thunder Bolt Specs	Rp. 523,840	6	Rp. 569,800	3	Rp. 523,840	Edit Hapus
4	B005	Swervo Thunder Bolt In Specs	Rp. 423,840	6	Rp. 529,800	5	Rp. 423,840	Edit Hapus
5	B004	Tomawawk FG Specs	Rp. 295,840	6	Rp. 369,800	5	Rp. 295,840	Edit Hapus
6	B003	Cherokee FG Specs	Rp. 279,840	6	Rp. 349,800	4	Rp. 279,840	Edit Hapus
7	B002	Baricada Ultima Specs	Rp. 343,840	6	Rp. 429,800	3	Rp. 343,840	Edit Hapus
8	B001	Swervo Meteor Specs	Rp. 343,840	6	Rp. 429,800	3	Rp. 343,840	Edit Hapus
9	B009	Morelia Neo II MD Spring	Rp. 1,439,840	6	Rp. 1,799,800	5	Rp. 1,439,840	Edit Hapus
10	B010	Monarcida 2 FS MD Spring	Rp. 503,840	6	Rp. 629,800	2	Rp. 503,840	Edit Hapus

Figure 3.5 Goods Data Page

This item data page is used by the admin to view the item data that has been inputted, by using the item data page the admin can edit and delete item data. This view also contains the item code, item name, stock and price.

3.6 Goods Data Report

The Goods Data Report page is a page that the admin uses to view and print item data, as shown in Figure 3.6 below:

Toko Nilmaizar Sport Apparel
 Alamat: Jl. Aru, Lubuk Begalung Nan XX, Kota Padang, Sumatera Barat
 No Telp (0811) 6616670

Laporan Data Barang 02-01-2019

No.	Kode Barang	Nama Barang	Satuan	Harga Beli	Harga Jual	Stock
1.	B008	Street Rider II Specs	pcs	375840	469800	6
2.	B007	Baricada Ultra FT Specs	pcs	399840	499800	6
3.	B006	Swervo Thunder Bolt Specs	pcs	523840	569800	6
4.	B005	Swervo Thunder Bolt In Specs	pcs	423840	529800	6
5.	B004	Tomawawk FG Specs	pcs	295840	369800	6
6.	B003	Cherokee FG Specs	pcs	279840	349800	6
7.	B002	Baricada Ultima Specs	pcs	343840	429800	6
8.	B001	Swervo Meteor Specs	pcs	343840	429800	6
9.	B009	Morelia Neo II MD Spring	pcs	1439840	1799800	6
10.	B010	Monarcida 2 FS MD Spring	pcs	503840	629800	6
11.	B011	Basarada 103 Saka Spring	pcs	679840	849800	6
12.	B012	Monarcida 2 FS IN Spring	pcs	503840	629800	6
13.	B013	Eva Trainer "Dark Pack" Piero	pcs	319840	399800	6
14.	B014	Razor "P2019R" Piero	pcs	367840	459800	6
15.	B015	Webster "P30223" Piero	pcs	367840	459800	6
16.	B016	Candice Piero	pcs	311840	389800	6
17.	B017	Vix9 Diamond Metric Piero	pcs	423840	529800	6
18.	B018	Setselan Nike	pcs	90000	150000	9
19.	B019	Kaca Mata Renang	pcs	50000	75000	8
20.	B020	Bola Basket	pcs	450000	500000	7
21.	B021	Bola Futsal	pcs	350000	400000	4

Padang, 02-01-2019
 Manager

 Jeni Rahmad

Figure 3.6 Goods Data Report

This report provides a comprehensive calculation of the stock or supply of various items available. This page also displays several available items, starting from the item code, item name, unit, purchase price, selling price, and available stock.

3.7 Sales Data Pages

This page is used by the admin to process sales data, starting from adding, editing, and deleting sales data, as shown in Figure 3.7 below.

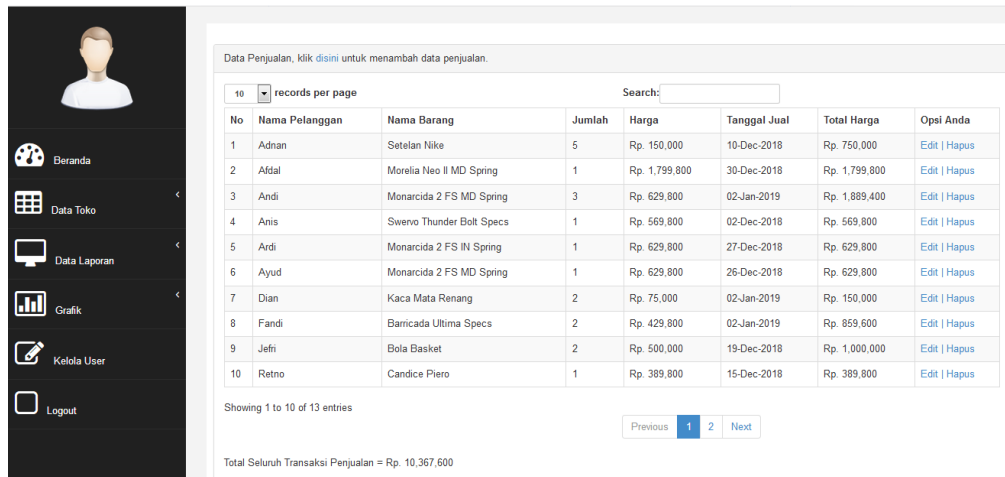


Figure 3.7 Sale Data Pages

This Sales Data page is used by the admin to view sales data that has been entered, by using the sales data page the admin can edit and delete sales data.

3.8 Purchase Data Page

This page is used by the admin to process purchase data starting from adding, editing, and deleting purchase data, as shown in Figure 3.8 below.

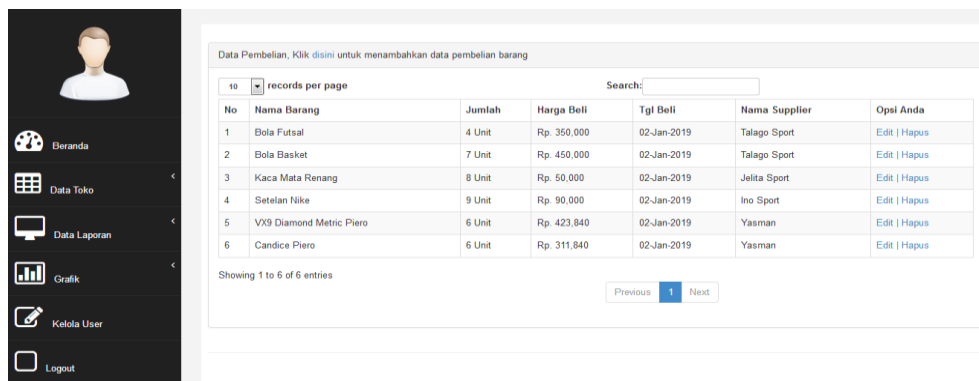


Figure 3.8 Purchase Data Page

The administrator uses this buy data page to view the item data that has been entered and to add, update, and delete purchase data-related actions.

3.9. Graph Sales Page Grafik

sales is a page that is used by the admin to see the monthly sales chart, as shown in the following figure 3.9

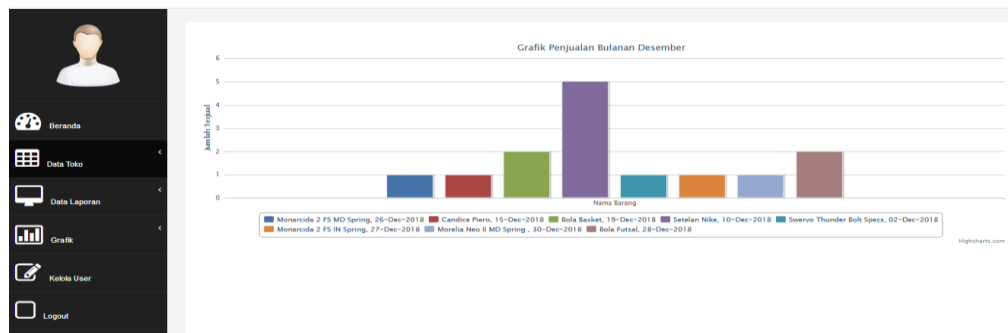


Figure 3.9 Graph Sales Page Grafik

The goods sales graph page is the page that will appear if you want to see a graph of goods sales per month by selecting the month from which the graph you want to display. On this page the information displayed is also very easy to understand because there are clear graphic images.

3.10 Purchase Graph

The Purchase Graph page is the page used by the admin to view purchase graphs, as shown in Figure 3.10 below.

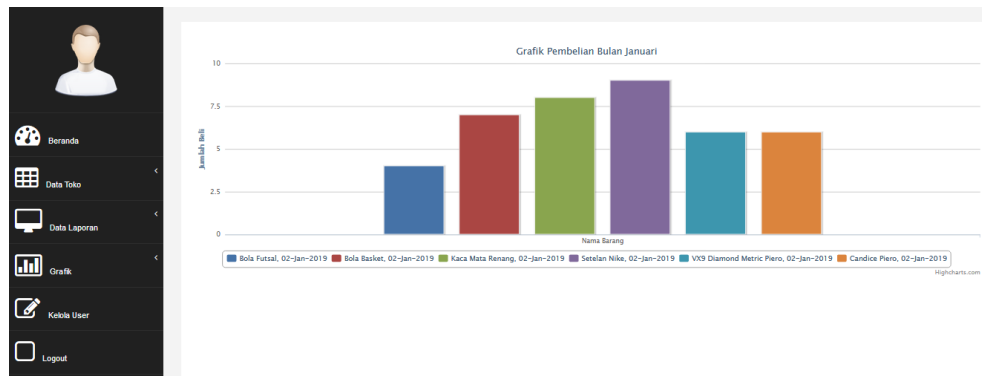


Figure 3.10 Purchase Graph

The goods purchase chart page is a page that will appear if you want to see a graph of goods purchases per month by selecting the month from which you want to display the chart. On this page, the information displayed is also very easy to understand because there are clear graphic images.

4. Conclusion

Conclusions that can be drawn based on the research must be made in order for the inventory of goods at the Nilmaizal Sport Apparel Store to be able to offer relevant information to individuals in need. The following conclusions can be reached in light of the findings of the analysis that was conducted:

1. By optimally utilizing computers, inventory data processing will help smooth the inventory processing of Nilmaizal Sport Apparel Store goods.
2. With an inventory system using the Weight Average Cost (WAC) method, it can help determine inventory values and generate reports quickly, precisely, and accurately.
3. With the graphical method, you can see a comparison of the level of sales and purchases each month.
4. The existence of storage media in the form of a database so that it is more secure, accurate, and orderly which can be accessed quickly if the data needs to be changed and viewed at a time when it is needed.

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