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APPLICATION OF DATA MINING TO PREDICT STOCK INVENTORY IN RAGIL MART SHOP USING MULTIPLE LINEAR REGRESSION METHODS

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Abstract
As information technology develops, the need for fast, accurate, and highly relevant information increases. Data mining is the process of extracting or extracting large amounts of previously unknown, but understandable, useful and highly important data and information from large databases. Based on interviews with 2020-2022 inventory data for Ragil Mart stores and a total of 150 data variables used by the system to influence inventory estimates. Toko Ragimart can be used for decision making when using multiple regression algorithms. This is an analysis involving multiple independent variables, called multiple linear regression analysis. Perform calculations to forecast inventory. Prediction results were obtained using a sample of test data, namely X1 2957, X2 = 1531, and X3 3034700, yielding 1620,399 predictions. This forecast can help companies make decisions and reduce the occurrence of stock-outs at Ragil-Mart stores. The need for accurate information is demanded in everyday life. Inventory is the most important thing in running a business. Inventory must be properly and accurately managed to avoid overstocking or overstocking.

I INTRODUCTION

Advances in information technology have rapidly increased the amount of data collected and stored in large databases. Data mining is a technology that can be used to achieve this [1]. Inventory is the most important thing in running a business. Master inventory must be properly and accurately managed to prevent inventory from accumulating or becoming too large.

Data is the fundamental piece of information that is further processed to produce information. Data is a compound term for a fact or part of a fact that includes meanings associated with reality, symbols, images, numbers, letters, symbols, etc. that indicate ideas, objects, states, situations, etc. [2].

Data mining is the process of extracting or extracting from large databases large amounts of previously unknown but understandable, useful and highly important business decisions of data and information. The Data Analysis Techniques phase performs data mining operations using Knowledge Discovery in Database (KDD). [3]. Recently, data mining and knowledge discovery have been suggested as the most appropriate names for the entire KDD process. Knowledge Discovery in Databases describes the knowledge discovery process as it applies to databases. [4].

Inventory is a company's ability to organize and manage all its raw, semi-finished and finished goods needs so that they are always available in both stable and fluctuating market conditions. A commodity is any kind of thing that can be used to meet a human need [5]. eating is a necessity An irreplaceable staple food for humans [6].

Inventory is the stock of goods Used to support production or meet customer demand. Some argue that accumulated inventory can even have economic value, and in some cases it doesn't come cheap. Empty inventory is often thought of as inventory or inventory, but it is actually capacity [7]. In this sense, estimating inventory for the next period is important.

This is done to avoid running out of stock and discouraging customers from leaving the store because they don't have the item they're looking for. Also, do not store excess inventory of the same type for a long period of time, as this can damage the product, render the inventory useless, and reduce your sales profit. [7]. This serves as one of the basis for the need to estimate the quantity of products that will be sold and can remain open in the next period. [7].

Forecasting is the process of systematically estimating the most likely future event based on past and present information to minimize the error (the difference between what happened and the estimated outcome)[8].Demand is the different types and quantities of goods that consumers are looking for in the market to meet their daily needs. [9].

Products are people whose needs and desires are met by goods and services. We use the term "product" to encompass both. Products are designed to meet consumer needs and desires [6]. Possible causes include demand exceeding production, crop failures, distribution barriers, and import problems that affect food price volatility. Food prices are one of the factors contributing to the development of domestic inflation [10]. Basic needs are the supplies that people need for their daily lives. Humans are dependent on the satisfaction of these basic needs. This is natural. In daily life, humans need to ingest basic needs that are beneficial to the body in order to meet the nutrients in the body. [11].

This Laguill Mart store is still facing the challenge of providing the products that the region will need in the future. Researchers are therefore interested in using multiple linear regression methods to solve this problem so that they can determine the forecast of the supply of commodities to the basic needs of the community. The multiple linear regression algorithm is an analysis that uses multiple independent variables, called multiple linear regression analysis. Several linear regression techniques are used to determine whether two or more independent variables (X1, X2, X3, ..., Xk) have a significant impact on the dependent variable (Y)[12].

The researcher's goal is to determine the community's need for merchandise in Ragil-Mart stores and help the stores provide inventory to the community.

II. RESEARCH METHODS

2.1 Population and Sample Population

In conducting this study, the population taken was data on the stock of basic needs of the community at the Ragil Mart Store, North Lampung from 2020 to 2022. In this study, a sample data of 150 inventory data was used for the basic needs of the community at the Ragil Mart Mart Store, North Lampung.

2.2 Data Collection Technique

Research always requires a data collection process according to the nature and characteristics of the research being conducted, so an appropriate collection method is necessary to obtain the necessary data. Therefore, in order to obtain the data mentioned by researchers, researchers use the following data collection methods: [1]:

1. Observation method
   is a data collection technique performed for direct observation and verification. The authors conducted a first-hand review to obtain information and data on local staple supply in Lagirumart stores from 2020 to 2022.
2. Interview
   That means your questions and answers are sent directly to her Ragil Mart shop owner. The author asks some questions about the title of the research paper and discusses it.
3. Literary studies
   Authors research and understand journals, books, and reports relevant to the problem they are solving to facilitate the research process.

2.3 framework of thinking

framework of thought is a rationale that includes a combination of theory, facts, observations, and literature review, which later becomes the basis for writing scientific papers. Because it becomes the basis, this framework is created when presenting the concepts of re.

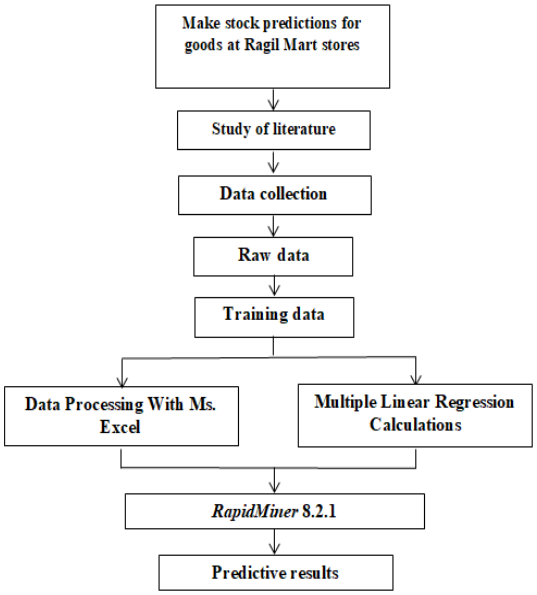

Figure 1. frame of mind

2.4 Multiple Linear Regression (Linear Regression)

The multiple linear regression algorithm is an analysis that uses multiple independent variables, called multiple linear regression analysis. Several linear regression techniques are used to determine whether two or more independent variables (X1, X2, X3, ..., Xk) have a significant impact on the dependent variable (Y). Some linear regression models like [12]:

Y = b1+(B2X1) + (B3X2) + ... + (BnXn)

Information

Y = related variable

X = independent variable (1,2,3,4, ... , n)

B1 = regression constant/Y-intercept

B2 = regression coefficient (1,2,3,4, ... ,n)

2.2. Theories system used

III. RESULTS

The process of calculating projected inventory levels for Ragil Mart stores uses multiple regression methods using Microsoft Excel 2010. Here is the stock dates information for 2020-2022 at Ragil Mart stores:

A. Inventory forecast result of Ragil Mart store

• 2020 Ragil Mart Store Inventory = 9.001073365

• 2021 Ragil Mart Store Inventory = 9.843131797

• Ragil Mart store inventory in 2022 = 9.722632824

Starting with the data above and using the application, the author performs the forecast calculations in the following steps:

The training data used for this implementation is based on 2022 inventory data

Table 1. Inventory Training Data for 2022

Bulan	X1	X2	X3	Y
Januari	4647	1623	3045200	1488
Februari	3123	1632	3045200	1491
Maret	4073	1568	3045200	2505
April	2939	1473	3045200	1466
Mei	3587	1370	3045200	2247
Juni	3304	1391	3045200	1913
Juli	3273	1691	3045200	1582
Agustus	3341	1549	3045200	1792
September	3649	1522	3045200	2127
Oktober	3022	1574	3045200	1448
November	3825	1434	3045200	2391
Desember	3005	1581	3045200	1487
Jumlah	41788	18345	36542400	21937

The test data currently being used for the implementation is his December 2022 data, and the results can later be used in his January 2023 shipment forecast for the next month.

Table 2. Test data for 2022 supply predictions.

Bulan	X1	X2	X3	Y
Desember	3005	1581	6542400	0

Below is the implementation of RapidMiner data prediction using the above training and test data.

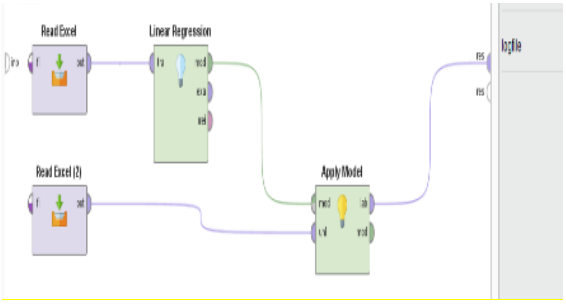

Figure 2. The arrangement of the linear regression implementation model.

To get the prediction results, connect the training data to the linear regression operator and connect it to the applied model. On your test data, connect to the Appyl model operator and then to the results and click the Run button. After all stages have been executed, the running process provides prediction results from RapidMiner.

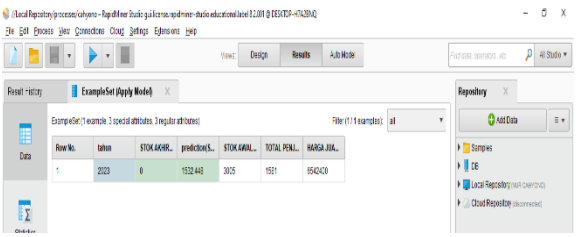

Figure 3. Calculation Results *Rapidminer*

To get the prediction results, connect your training data to the linear regression operator. After all stages have been executed, the running process produces a predicted result. rapid miner.

IV. CONCLUSION

Based on discussion with 2020-2022 Ragil Mart store inventory data and a total of 150 data variables used in the system to influence inventory forecasts. Ragil Mart Stores can be used for decision making when using multiple linear regression to perform calculations to predict inventory. The prediction results obtained using the test data samples, X1 2957, X2 = 1531, and X3 3034700 yield 1620,399 predictions. These forecasts can help businesses make decisions and reduce the occurrence of stock shortages in Ragil-Mart stores.

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