



Analysis of Consumer Purchase Patterns Using Apriori Algorithm at Ryo Jaya Buah Store

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Abstract: This study aims to analyze consumer purchasing patterns at Ryo Jaya Buah Stores using a priori algorithm. A priori algorithm is one of the data mining methods used to find relationships between items in a large dataset through the process of association. This research was conducted by collecting sales transaction data in a certain period at the Ryo Jaya Buah Shop. The data obtained is then processed and analyzed using software that supports the implementation of the Apriori algorithm. The results of this study show a significant variety of purchasing patterns among the products sold in the store. By knowing these patterns, Toko Ryo Jaya Buah can optimize product structuring, marketing strategies, and promotional offers to increase sales. In addition, testing a total of 173 transactions with a support value of 0.02 and a confidence value of 0.01 resulted in a number of rules that can be used as useful new information. After comparing the test results with and without Rapidminer 10.0 software, it is clear that the results of manual calculations are not significantly different from the results of Rapidminer 10.0 software.

Keywords: Analysis, Consumer, Strategy, Marketing, A priori

Introduction

The growing era of technology has a huge effect in the world of trade, of course, a lot of data or tally accumulates in the store which results in the data not being processed properly (Ahmed et al., 2020). Fruit shops that trade fresh fruit in general have problems including the quality and freshness of fruit, fluctuations in fruit prices influenced by the season, fierce market competition, and challenges in keeping stock fresh and not wasted (Ishak et al., 2020). In addition, issues of efficient inventory management and appropriate marketing strategies are also some of the factors that are often a concern in the fruit shop sales business (Bilal et al., 2024). Toko Ryo Jaya Buah is a shop engaged in the sale of fruits that cannot be separated from the needs of all consumers (Sachani, 2020). Ryo Jaya Buah shop is strategically located at Jl. Merdeka, Curup Kota, Rejang Lebong Regency. Toko Ryo Jaya Buah operates every day except holidays, such as holidays (Qazzafi, 2019). Every day Toko Ryo Jaya Buah conducts many sales transactions (Bandy et al., 2019). The problem that is often faced is that the availability of goods often does not meet consumer desires, making consumers switch to other fruit

shops. Transactions in fruit shops generally involve the use of notes or receipts (Lin et al., 2019). These notes or receipts serve as proof of purchase for both consumers and sellers. It includes transaction details such as date of purchase, list of items purchased and their quantities, price per item, total payment. The information in the receipt is not utilized and is only wasted (Siddiqui et al., 2021). The sales transaction data can be used as a student thesis proposal to process the data by utilizing data mining using the apriori association rule algorithm. Association rule mining can be used in utilizing sales transaction data obtained from items purchased simultaneously by consumers when shopping. The data is used to find out items that are often purchased by consumers to increase their stock in order to fulfill market desires and reduce the stocking of goods that are less marketable (Nayak, n.d.).

Methodology

This research was conducted by collecting sales transaction data in a certain period at the Ryo Jaya Buah Shop (Y. Lin et al., 2021). The data obtained is then processed and analyzed using software that supports the implementation of the Apriori algorithm. A cross-industry standardized process for data mining (CRISP-DM) was used for data mining in this study (Vázquez-Martínez et al., 2021). To obtain data, this data collection method is useful. Information obtained from interviews and written records. In the case of Toko Ryo Jaya Buah, the sales data of fruits are obtained from the relevant agencies or institutions through direct conversations with parties related to the location under study (Sharma et al., 2023). Cross-Industry Standard Process for Data Mining, or CRISP-DM method. In the Data Mining stage of this research, the CRISP-DM technique is used. There are six stages in this method (Shavitt & Barnes, 2020):



Figure 1. Steps of CRISP-DM

a. Business Understanding

The first stage of CRISP-DM is very important for the project and subsequent process work. This stage requires information about business objects, how to build and obtain

information, and how to match demonstration objectives with business objectives so that all these models can be created (Ghose et al., 2019).

b. Data understanding

Through summarizing and identifying potential problems in the data, this stage provides the analytical foundation of the project. This step should be done carefully and not rushed, as with data visualization, where it is difficult to gain insights when linked to the summary data. The modeling stage will be disrupted if there are unresolved issues at this stage (Ellison et al., 2021).

c. Preparation Stage

This stage certainly requires careful thought and hard work to ensure that the information obtained is appropriate for the calculations used. This does not mean that the data can be used until the end of the initial data preparation stage, when any problems with the data have been resolved. When problems arise during model development, this stage is often revisited. Therefore, repeat until there is a good match with the data (Roe et al., 2021).

d. Modeling

At this point, we can finally use statistics and machine learning to gain useful insights from the data to achieve the project goals. Classification, assessment, ranking, clustering, relationship identification, and characterization are common types of modeling (A. Sharma & Foropon, 2019).

e. Evaluation

Once we have a model, we need to find out if it fits our needs (Sudirjo et al., 2023).

f. Deployment

This stage is the most valuable stage in the CRISP-DM process. During Business Understanding, deployment planning should include not only how to generate model values but also how to convert decision scores into operational systems and incorporate decisions (Kumar et al., 2021)

Result and Discussion

Based on the results of interviews conducted by researchers on September 03, 2023, where interviews were conducted with Mrs. Wati as the owner at the Ryo Jaya Fruit shop. Data collection in this study was carried out using receipts and purchase transaction notes at the ryo jaya fruit shop within 1 month. Below is the data on fruit purchase transactions that will be input using RapidMiner 10.0. Data obtained from ryo jaya fruit shop before the form of receipts and notes and then entered into excel form and used for research.

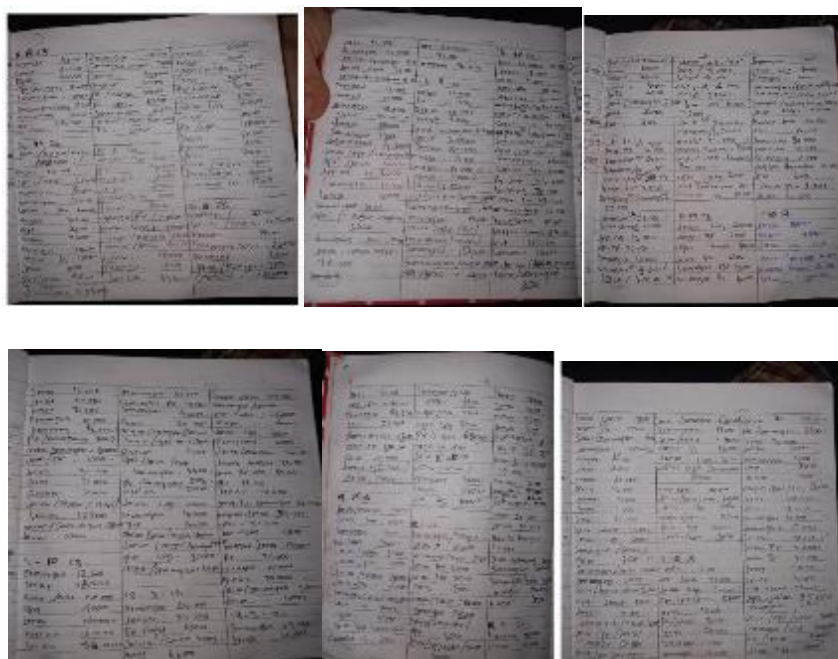


Figure 2. Initial Data Of Fruit Sales

The transaction data above is real data on fruit sales at Ryo Jaya Buah shop. The existing data is then processed into excel so that the data can be implemented in the Rapidminer tool.

Conclusion

From the results of the discussion of research on the application of Data Mining Using Apriori Algorithm as follows:

1. New information that can be used by Ryo Jaya Fruit Shop is obtained from the findings of the analysis. This information relates to the relationship pattern of goods purchased in combination. Testing a total of 173 transactions with a support value of 0.02 and a confidence value of 0.01 produces a number of rules that can be used as useful new information.
2. The a priori method with association rules is able to recognize the pattern of purchasing fruit (items).
3. Implementation of Data Mining to analyze fruit purchase transaction patterns easily and quickly using the RapidMiner 10.0 application.

4. After comparing the test results with and without Rapidminer 10.0 software, it is clear that the results of manual calculations are not significantly different from the results of Rapidminer 10.0 software.

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