

Use of Apriori Algorithm on Building materials Sales Transaction Data of Building Materials

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Abstract. The purpose of the study was to use of apriori algorithm on building sales transaction data of building materials. Currently, many ways are done by companies, shops or markets in increasing sales including strategic planning in sales. One of the strategy used by the management is using information system. In efficient management of the purchase cost and also goods ordering made based on estimation without knowing the stock of existing goods and could be over stocks and the stocks running out without control. Era of information technology continues to evolve requires new innovations, so it does not seem monotonous in the sales process and can increase sales by providing recommendations to buyers. This research will use apriori algorithm as one branch of data mining to analyze the pattern of consumers pending (market based analysis). An information system sales of building materials using apriori algorithm helps to find patterns in the form of building materials products often purchased simultaneously (or tend to appear together in a transaction) by each customer based on transaction data. The results of this study apriori algorithm can be used to consider in making marketing strategies, sales optimization, as well as consideration for decision making in purchasing building materials.

1. Introduction

Technological developments are increasing rapidly. The more sophisticated the technology is usually the price also going high. This will reverse when the technology is abandoned by new technology, the price will go down from the price of first buy, that is the technology where its development in Indonesia has made progress so rapidly at this time. Talking about economy certainly will not be separated with corporate with greater coverage, then a good planning and controlling will needed to support performance and processes, so that all existing processes can run well. The most important thing that companies need to pay attention to is the availability of stock. It is one of the most popular assets and 50% of the total capital invested. The most important thing for the company is good control [1].

Setia Wargi material store is store that selling building materials that has many transactions every day with a substantial income but still use conventional sales system so that the performance of the store not effective. A purchase is a set of actions to obtain goods and services by exchange, for the purpose of self-use or resale [2]. And sales is a process whereby the needs of buyers and sales needs are full filed, through information inter change and interests [3]. To utilize the existing transaction data required an application that aims to determine the associated goods. One way in processing these data is to use Data Mining with apriori algorithm used to derive conclusions on the data to take a decision From



previous research conducted by Kennedi Tampubolon, Hoga Saragih and Bobby Reza [4], also mentioned that apriori algorithm helps in forming possible candidate item combinations, then testing whether the combination meets the parameters of support and minimum confidence which is the given threshold value by user. Apriori algorithm is a basic algorithm for determining frequent item sets for Boolean association rules [5]. Apriori Algorithms include the Association Rules type in data mining. The rules that state the association between several attributes are often called affinity analysis or market basket analysis.

This conventional process poor in its management. It can be seen when the search process of data such as purchase invoice or sales invoice will have difficulty and often made a mistake in the purchase of goods to the supplier or the sale of goods to customers. Therefore, Setia Wargi material store intends to computerize the purchasing & selling activities to maximize the processes. Expected after the establishment of computerized system of purchase, sales and returns, the collection, storage and processing of each transaction data will be accurately and quickly. And with the help of the apriori algorithm process is expected in efficient management of purchase costs and also the ordering of goods made based on estimates without knowing for sure the stock of existing goods and we could pile goods that are still a lot of supplies while goods that are not controlled condition is not will happen again. Association analysis or association rule mining is a data mining technique for finding the rules of a combination of items. One phase of association analysis that attracts many researchers to produce an efficient algorithm is the analysis of frequent pattern mining. The importance of an association can be identified by two benchmarks, namely: support and confidence. Support is the percentage of combinations of items in the database, where confidence is a strong relationship between items in association rules [6].

2. Methods

System approach method used is object oriented system approach method. Object-oriented system approach method is a software development strategy that organizes software as a collection of objects that contain data and operations that apply to it [7]. Object oriented method using UML (Unified Modeling Language) as the tools. The method proposed in this study is to use the Data mining Association Rule technique with Apriori algorithm to find the frequent item set as reference to get the associated goods. This research can provide information of transaction pattern of goods by consumer which is used for decision making by knowing the possibility of goods purchased simultaneously. System development method used is prototype development method.

Here's a paradigm Prototype overview:

- Communication and initial data collection, is analysis of user needs (in this case are learners).
- Quick design, which is general design for subsequent development.
- The establishment of prototype, which is making of prototype device including test and perfection.
- Evaluation of prototype, is evaluating prototype and refine analysis to user requirement.
- Improved prototype, which is the actual type creation based on the result of prototype evaluation.
- The final production, is producing the device properly so that it can be used by the user [8].

3. Results and discussion

The design of the system here will define the functional requirements in preparation to design purchasing and selling information systems in the proposed material store. The design of this system includes the design of the system based on the needs identified at analysis phase, design of the architecture program, design of the menu and display.

The purpose of this system design is to meet the needs of users and as direction to build the system. In building this information system, the author tries to make the information system user friendly and easy to use and in accordance with the needs of users.

Sales transaction data every minute, every day, every week or even years more and more piles up both from the manual process and computing process that stores a large amount of computer resources.

But the data that many have not been used very well by the entrepreneur is only left and archived it even discarded or deleted. Large data and large sales transactions, can be analyzed sales in terms of availability of goods [9]. Goods needed for the purpose of customer satisfaction, and increase sales transactions, and can know the development of the customer market that can meet their needs. In this regard, to solve the problem, data mining applications were created for sales analysis with web-based a priori algorithms.

The items that are often purchased simultaneously on each month are different, but there are also items that are constantly purchased equally every month. In fact, the sales traffic that occurs on a monthly basis is not always the same [10]. Based on the results of the analysis in this study found differences in rules / rules are often purchased simultaneously in each particular month. However, there are also items that are often purchased together continuously / periodically.

General view of propose system to improve on going system at figure 1:

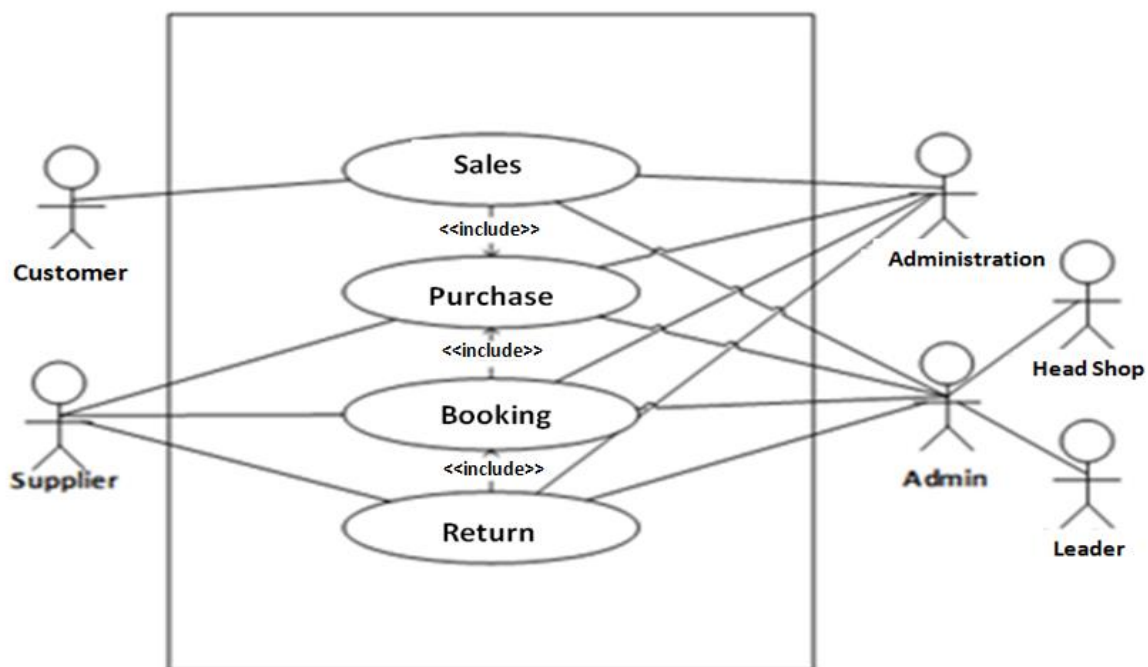


Figure 1. Propose use case diagram.

This sales transaction is made to the customer. The sales process is in accordance with customer request and the data is taken from the customer data previously must input first and the goods to be sold take data from the data items and seen in the figure 2.

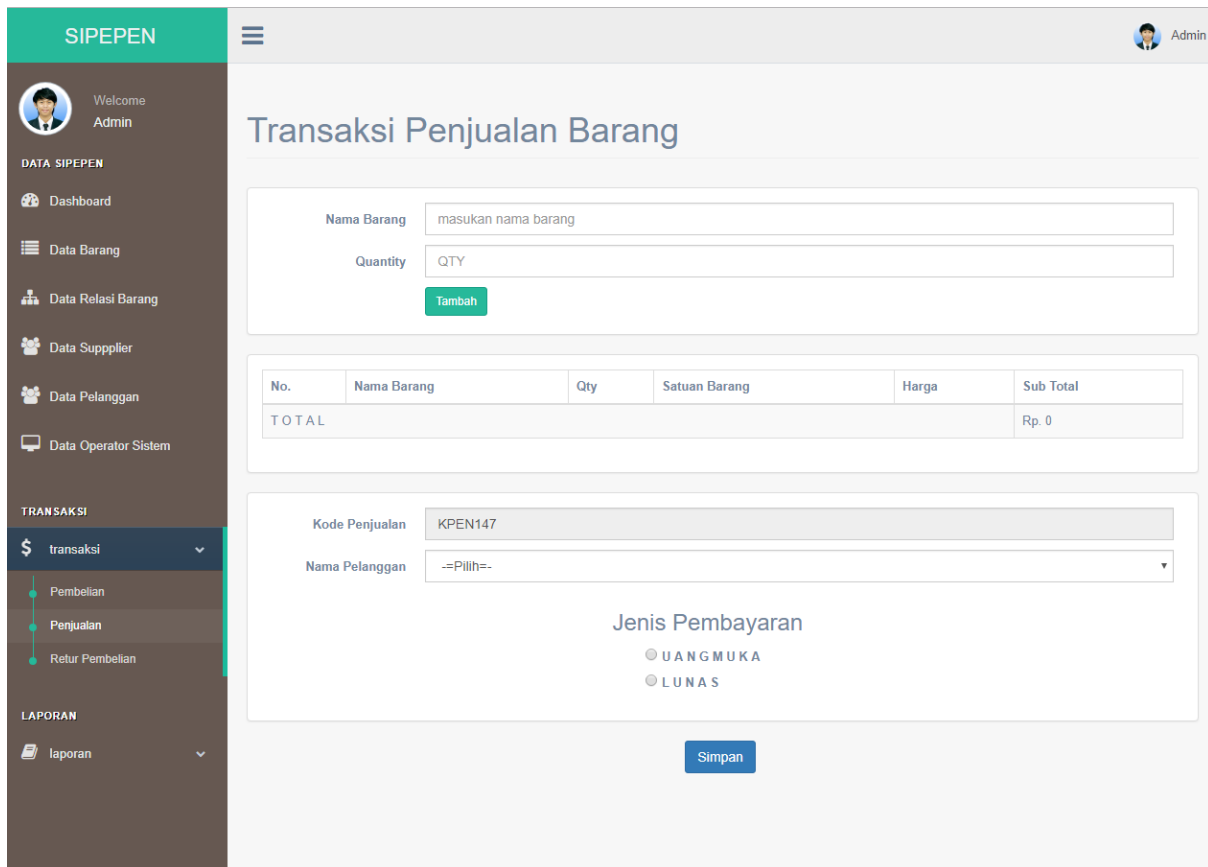
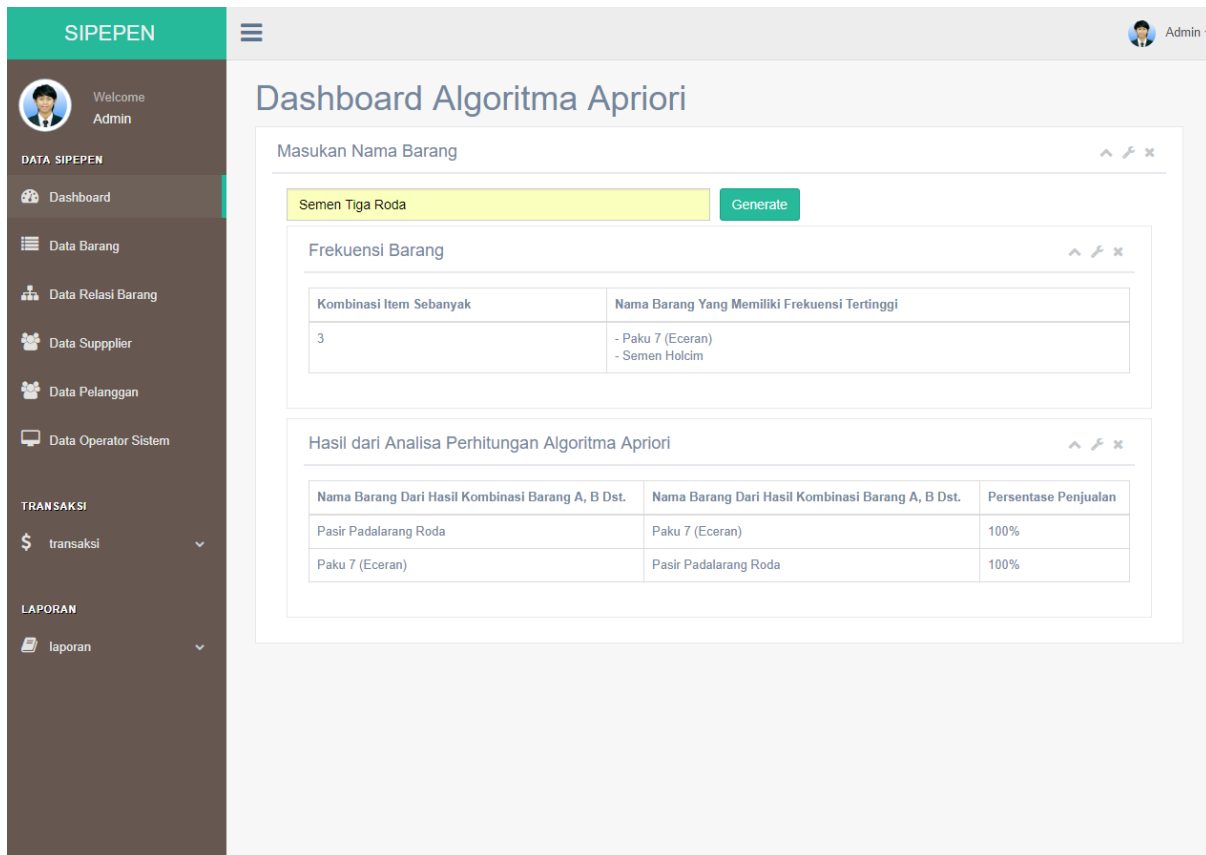


Figure 2. Sales transaction.

The results of sales transactions will form an algorithm that is a priori algorithm which will become a decision support system for which stock inventory items should first be first in order that the company does not accumulate a lot of unnecessary goods and payment transactions can choose advance or paid off. This a priori page is a page that is used to find the rule - rule of relationships between products that are often purchased simultaneously. This is shown in Figure 3.



Dashboard Algoritma Apriori

Masukan Nama Barang

Semen Tiga Roda Generate

Frekuensi Barang

Kombinasi Item Sebanyak	Nama Barang Yang Memiliki Frekuensi Tertinggi
3	- Paku 7 (Eceran) - Semen Holcim

Hasil dari Analisa Perhitungan Algoritma Apriori

Nama Barang Dari Hasil Kombinasi Barang A, B Dst.	Nama Barang Dari Hasil Kombinasi Barang A, B Dst.	Persentase Penjualan
Pasir Padalarang Roda	Paku 7 (Eceran)	100%
Paku 7 (Eceran)	Pasir Padalarang Roda	100%

Figure 3. Home page.

4. Conclusion

Previous conventional process has been converted to computerized and computer usage can be more effective in terms of time and efficient in terms of energy when conducting the search process and will reduce the occurrence of errors in data processing either purchased to suppliers or sales for customer. Purchase of Setia Wargi material store to the Supplier already has a better data processing than before because goods purchasing more integrated and well documented assisted by a database that can store well all the existing data. Management of purchasing cost and goods ordering performance more efficient based on the precise estimation of stock of existing goods, and as decision support as the results of apriori algorithm to sales process and prevent the accumulation of stock where it is still has a lot of supplies while the finished goods are not in controlled condition.

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References

- [1] Kohavi R and Provost F 2010 "Application of Data Mining to E-commerce (editorial), Application of Data Mining to Electronic Commerce," *Special issue of the International Journal Data Mining and Knowledge Discovery*.
- [2] Linof G S 2004 *Data Mining Techniques: For Marketing, Sales dan Customer Relationship Management* (Wiley Publishing, Indianapolis).

- [3] Romney, Marshall B, Steinbart and Paul J 2006 *Accounting Information System: Tenth Edition* (New Jersey: Prentice Hall).
- [4] Kennedy T, Hoga S and Bobby R 2013 "Implementasi Data Mining Algoritma Apriori Pada Sistem Persediaan Alat - Alat Kesehatan," *Informasi dan Teknologi Ilmiah (INTI) I* (1) 93-106.
- [5] Shruti A and Ranveer K 2013 "Comparative Study of Various Improved Versions of Apriori Algorithm," *International Journal of Engineering Trends and Technology (IJETT) 4* (4) 687-690.
- [6] Othman Y, Osman H and Ehab E 2012 "An Efficient Implementation Of Apriori Algorithm Based On HADOOP-MAPREDUCE Model," *International Journal Of Reviews In Computing (IJRIC) 12*.
- [7] Satzinger J W 2005 *Object-Oriented Analysis and Design with the Unified Process* (Thomson Course Technology).
- [8] Pressman R S and Maxim B R 2015 *Software Engineering a Practitioner's Approach* 8th Edition (New York: McGraw-Hill).
- [9] Adewole K S et al. 2014 *Frequent Pattern and Association Rule Mining from Inventory Database Using Apriori Algorithm* (Computer Science. Nigeria: University of Ilorin).
- [10] Jogi S and Ramanjaneyulu T 2013 "Mining Frequent Itemsets Using Apriori Algorithm," *International Journal of Computer Trends and Technology (IJCTT) 4* 23-25.

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