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Bob Foster1*, Muhammad Deni Johansyah2

BELONGING TO

¹University of Business and Informatics Indonesia ²Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Padjajaran

SENT TO OUR EDITORIAL COMMITTEE AN ARTICLE NAMED

BATIK SALES PRODUCT RECOMMENDATION SYSTEM ON E-COMMERCE WEBSITE USING FP-GROWTH ALGORITHM

WHICH, AFTER HAVING BEEN SUBJECT TO EVALUATION BY THE ARBITRAL COMMITTEE, WAS ACCEPTED FOR PUBLICATION IN THE REGULAR ISSUE APRIL CORRESPONDING TO 2020.

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(2019) *Opcion*, 35 (SpecialEdition24), pp. 746-778. Cited 88 times. http://produccioncientificaluz.org/index.php/opcion/article/download/30711/31760

² Aliyu, M., Kissinger, S.

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(2017) International Journal of Engineering Science Invention, 6 (9), pp. 65-74.

Arinin, E., Chelovenko, T., Dorzhigushaeva, O., Glagolev, V., Markova, 3 N., Matushanskaia, I., Sibirtseva, I., (...), Vorontsova, E. Religion, science and 'religious education' in Russia six regional

(2019) European Journal of Science and Theology, 15 (4), pp. 137-156. Cited 3 times.

http://www.ejst.tuiasi.ro/Files/77/12_Arinin%20et%20al.pdf

⁴ Jazayeriy, H., Mohammadi, S., Shamshirband, S. A Fast Recommender System for Cold User Using Categorized Items (2018) Math. Comput. Appl., 23, p. 112. Cited 14 times.

⁵ Maheshwari, A., Davendralingam, N., Delaurentis, D.A.

A comparative study of machine learning techniques for aviation applications

(2018) 2018 Aviation Technology, Integration, and Operations Conference, art. no. AIAA 2018-3980. Cited 17 times. ISBN: 978-162410556-2 doi: 10.2514/6.2018-3980

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Sidhu, S., Meena, U., Nawani, A., Gupta, H., Thakur, N. 6 FP Growth Algorithm Implementation (2014) International Journal of Computer Applications, 93 (8), pp. 1-6. Cited 7 times.

Sumathi, K., Kannan, S., Nagarajan, K. Data Mining: Analysis of student database using Classification Techniques (2016) *International Journal of Computer Applications*, 141, pp. 22-26. Cited 5 times.

⁸ Sun, Y., Zhang, J., Xiong, Y., Zhu, G.

Data Security and Privacy in Cloud Computing (Open Access)

(2014) International Journal of Distributed Sensor Networks, 2014, art. no. 190903. Cited 125 times. http://journals.sagepub.com.ezproxy.umt.edu.my/loi/dsn doi: 10.1155/2014/190903

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Batik Sales Product Recommendation System On E-Commerce Website Using FP-Growth Algorithm

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Abstract

Batik is a traditional Indonesian fabric that has been famous to foreign countries. The types and motives of batik in Indonesia are different and have very deep philosophical values. Batik is currently found in traditional markets with very diverse values and patterns. In the conventional market system buyers are not only foreign tourists but also involve local tourists. Sales like this will make direct interaction between consumers and buyers so that the transaction and buying and selling processes occur. In this system, traditional shops and markets are abundant, causing uneven sales systems. This is because not all stores can sell and offer simultaneously sometimes there are some stores visited by many buyers and some do not. The solution to this problem is to create a sales system that is online or known as E-commerce. The products offered are superior products or best sellers. The product will appear on the system, each buyer opens the product website page offered and then processed using the FP-Growth algorithm. The algorithm will calculate the most sold products in the database and appear on the website. The system will work automatically so that the product offered are evenly distributed and will increase to become sales media and promotional media for products sold.

Keywords — Batik, Product Recommendation System, E-Commerce, FP - Growth, Algorithm

1. INTRODUCTION

On E-commerce websites we have found many sales of goods and services. The system allows the transaction process to be faster and more precise and over time and costs, so that customer and buyer meetings are virtual and transactions are carried out in cyberspace. This system is able to replace a conventional sales system where buyers meet directly with customers. Conventional systems allow the process of offering goods directly so that buyers are satisfied with the goods offered while the weakness of this system is time wasted if the items are sought out or there are no recommendations for superior products (Abbas and ashor, 2016; Lopes and Roy, 2014).

The second factor is in terms of security that is not guaranteed, for example the market is a crowded area where transactions are carried out with relatively large amounts of cash. In some cases sales made online with e-commerce websites have many features offered, for example stock items, discount prices, and information on goods sold. In an online system buyers can buy more than one item (Revathi and Geetha, 2015). The weakness of the system is the possibility that the goods purchased are not as expected and the shipping process is long because E-commerce sales will use a third party as a freight forwarder. This becomes more risky and risky because of the security and warranty of the condition of goods delivered to third parties. Some of these weaknesses can be avoided by using a product recommendation method or best seller that is displayed on the front page of the website (Shah, 2015; Suganda and Sharmila, 2013). The system performs a scanning process according to previous sales data in this case batik cloth. The computer system will automatically select sales data with the help of algorithms. FP-Growth will record the value of support and confident. Support is the frequency of the amount of goods purchased while confident is the estimate of the best-selling item based on sales in the previous month or year (Joshua et al., 2016; Sidhu et al., 2014). With this system the shop owner does not need to assume or offer another product because the system will recommend periodically and automatically. This system is able to attract buyers to buy one or more items that previously the buyer only wants to buy one or two items, finally interested in buying the recommended item (Anil and Gladston, 2016).

2. SYSTEM DESIGN

2.1 Hardware a. Computer

In this system the computer is used as an E-commerce website creation process and the website maintenance process itself. The owner or admin can record and view data on ongoing transactions. The admin function is to add data or update batik products offered to customers.

b. Server

The server function in this system is used to store product databases and identity data of customers who make transactions. The purpose of using the server is to make the transaction process safe and confidential by relying on the security features that are available on the server.

2.2 Software

a. My SQL

The MySQL function is used as a process of storing and creating sales transaction data. The data will be processed using A priori and FP-Growth algorithms to record sales results and display automatically by the system.

b. Rapid Miner

The miner function in this system is used to record and process previous sales data by testing the data with an algorithm. The concept of rapid miners is to take an interesting feature and information on a sales or transaction data.

c. Adobe Photoshop

The Adobe Photoshop function on this system is used to design products in attractive forms.

d. Dreamweaver

The Dreamweaver function is used to design the form of pages from websites that are created using the PHP and mysQL programming languages.

3. IMPLEMENTATION AND TESTING

In the implementation of testing this system will be applied in three stages. First, test the algorithm. Second, testing on sales transactions, and third, testing product recommendations or best sellers.

No.	Product Name	Weight (Kg)	Price	Stock	Entry Date			
1	Batik Besurek	0	300	49	January 13, 2019			
2	Batik Jambi	0	12	300	January 13, 2019			
3	Batik Jawa Pekalongan	0	300	10	January 13, 2019			
4	Batik Gentongan	0	200	50	January 13, 2019			
5	Batik Tuban Corak	0	200	50	January 13, 2019			
6	Batik Jawa Pekalongan	0	300	49	January 13, 2019			
7	Batik Tuban	0	0	50	January 13, 2019			
8	Batik Solo	0	40	40	January 13, 2019			
9	Batik Gentongan	0	300	20	January 13, 2019			
10	Batik Cianjur	0	125	20	13 January 2019			

Table 1. Testing of transaction data patterns

References: (Kurniati and Prajanti, 2018; Nawawi et al., 2017; Steelyana, 2012)

Information:

Table 1. is a data weighting pattern taken from transaction data. This system is used to determine the value of support and confident that there are batik sales transaction data.

No	Batik	Batik	Batik Jawa	Batik			
INU.	Besurek	Jambi	Pekalongan	Gentongan			
1	1	0	0	1			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	1	1			
5	0	0	0	0			
6	1	0	0	0			
7	0	0	0	0			
8	0	1	0	0			
9	0	0	0	0			
10	0	0	0	0			
Support	2	1	1	2			

Table 2. Data normalization system

Information:

Table 2. is the process of removing unnecessary data on sales transaction data. This system is needed so that only important data is taken when testing.



Information:

Table 3. is the testing process using rapid miner tools. The data tested is the result of batik sales transactions. In the test, the value of support and confidence will be made between 50 to 90%, which means to see the total number of items that are in demand with a presentation calculation of 50 to 90%. In this system, a pattern of data linkages will be generated in the number of rules, the rule will differ depending on the combination of products purchased.



Information:

Table 4. is the testing process and calls for the FP-Growth algorithm method and a priori using the PHP programming language directly on the sales transaction data.

Table 5	. Testing	with	rapid	miner
---------	-----------	------	-------	-------

240	71818385	Conclusion	Gapport Config.
Ŧ	Bath jawa pakalongan_colak	Dahk jawa pekalongan	0.400 1
	Bath Jawa pekalungan	Balik jawa pelalongan_catal	0.439 1
2	Bahh besurist, Bath jawa pakalongan_torak	Dath jawa penatorigan	0.100 1
4	Bath hexards, Rafe java peraturgan	Rolling perceburgen_constit	0.380 1

Information:

Table 5. is the process of using rapid miner software by using a circuit scheme and recording the number of related items purchased simultaneously from a combination of 2 item set items and 3 item set items.



Figure 1. Display of the main page of the website

Information:

Figure 1. is the main page display of batik sales. The page will be seen most often by the customer. Web pages are systematically designed not to use many menus to make it easier for customers and do not eliminate the element of beauty and interaction between humans and computers.

Add Prod	uct
Province)	
Caregory'	I Change Categoria -
reaight	41
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(ten)	
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Parame	(
Distant Marri	

Figure 2. Display the website admin page

Information:

Figure 2. is the main page in the admin settings, on that page can be accessed by the shop owner and has a level of access rights to add transaction data. Data that can be added include item data, customer data, data of adding product categories and recommendations.

No	Product	Name Product	Weight(Kg)	Qty	Price	Sub Total	Delete
1	100	Østik besurek	0.00	1	300.000	300.000	*
2	No.	Batik jambi	0.00	1	12.000	12.000	*
3		Batik Gentongan	0.00	1	200.000	200.000	*
4	Reit	Batik jawa pekalongan	0.00	1	300.000	300.000	*
5	NEW ST	batik Tuban corak	0.00	1	200.000	200.000	-

Figure 3. Display of purchase transaction data

Information:

Table 3. is a sample data of purchases made over several months, the data will be processed automatically to see how much and what type of item is most purchased. The system will then display recommendation data that has been calculated previously using a priori and FP-Growth algorithms.

Category

NO	CATEGORY	ACTION
1	Batik Aceh	Edit Delete
2	Batik sumatra	Edit Delete
3	Batik Jawa	Edit Delete
4	Batik Daerah	Edit Delete

Figure 4. Display of products sold

Information:

Figure 5. is the process of adding product data that has been updated by the admin, with estimates of the cost and amount of stock and product description.



Figure 5. Display of product recommendations page

Information:

Figure 5. is the process of implementing product recommendations that can be categorized as a best seller product, the product will appear directly on the main page of the website, product recommendations will change according to needs.

4. CONCLUSION

From this research, it can be concluded that the application of a product recommendation system on e-commerce websites selling batik can be implemented. The system is able to display data on some of the best-selling products. The product is temporary and will always change according to the presentation and type of batik sold or promoted at a certain time.

The suggestion for further research is to add a larger data storage system. This is done so that the storage data becomes larger and can be used for a long time. The system of maintenance and repair of hardware and software is very necessary because the web is online so it needs to be monitored because the transaction process will last for 24 hours. The products offered in the future must be more creative in promoting their products to make them more attractive.

Acknowledgments

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References

- Abbas, A.R. and Ashor, S. 2016. Design Recommendation System in e-Commerce Site. *Iraqi Journal of Science*, 2016, Vol. 57, No.4A, pp: 2549-2556.
- Anil, K.R. and Gladston Raj, S. 2016. N-list based Friend Recommendation System Using Pre-rule Checking. International Journal of Computer Science and Information Technologies, Vol. 7 (1), 2016, pp. 338-341.
- Joshua J.V., Alao O.D., Adebayo A.O., Ehinlafa E.O., and Ajayi O.E. 2016. Data Mining: A Book Recommender System Using Frequent Pattern Algorithm. *Journal of Software Engineering and Simulation*, Volume 3 ~ Issue 3(2016) pp: 01-13.
- Kurniati, E.D. and Prajanti, S.D.W. 2018. Batik SMEs Efficiency and Entrepreneurship Role in Innovation. *Jejak*, Vol 11 (2) (2018): pp. 375-389. DOI: https://doi.org/10.15294/jejak.v11i2.16058
- Lopes, P. and Roy, B. 2014. Recommendation System Using Web Usage Mining for Users of E-Commerce Site. International Journal of Engineering Research & Technology (IJERT), Vol. 3 Issue 7, July – 2014, pp. 1714-1720.
- Nawawi, T., Husin, R., and Wiryawan, Z.Z. 2017. Profile and Marketing Strategy of SME's Towards Jambi Batik. *Business* and Economics Journal, Volume 8, Issue 4, pp. 1-6.

- Revathi, R. and Geetha, M. 2015. Re-Modified Apriori Algorithm in E-Commerce Recommendation System. International Journal of Innovative Research in Computerand Communication Engineering, Vol. 3, Issue 7, July 2015, pp. 6737-6744.
- Shah, A.M. 2015. E-Commerce Recommendations Using Multidimensional Association Rule Mining With Clustering A Review. International Journal of Innovative and Emerging Research in Engineering, Volume 2, Issue 1, 2015, pp. 55-60.
- Steelyana, E. 2012. Batik, A Beautiful Cultural Heritage that Preserve Culture and Support Economic Development in Indonesia. *Binus Business Review*, Vol. 3 No. 1 Mei 2012, pp. 116-130.
- Suguna, R. and Sharmila, D. 2013. A Technique for Web Page Recommendation Using Markov Model Associated with Quality and Time Based Fp Mining. *Journal of Theoretical and Applied Information Technology*, October 2013. Vol. 56 No.2, pp. 373-381.
- Sun, Y., Zhang, J., Xiong, Y., and Zhu, G. 2014. Data Security and Privacy in Cloud Computing. International Journal of Distributed Sensor Networks, Volume 2014, Article ID 190903, 9 pages: 2-10.

Batik Sales Product Recommendation System On E-Commerce Website Using Fp-Growth Algorithm

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Batik Sales Product Recommendation System On E-Commerce Website Using Fp-Growth Algorithm

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Abstract — Batik is a traditional Indonesian fabric that has been famous to foreign countries. The types and motives of batik in Indonesia are different and have very deep philosophical values. Batik is currently found in traditional markets with very diverse values and patterns. In the conventional market system buyers are not only foreign tourists but also involve local tourists. Sales like this will make direct interaction between consumers and buyers so that the transaction and buying and selling processes occur. In this system, traditional shops and markets are abundant, causing uneven sales systems. This is because not all stores can sell and offer simultaneously sometimes there are some stores visited by many buyers and some do not. The solution to this problem is to create a sales system that is online or known as E-commerce. The advantage of this system is that buyers do not need to come to conventional markets and enough through cyberspace. The current E-Commerce system only offers one product so that other items cannot be offered. The weakness of the system can be overcome by adding product recommendation concepts that will be offered automatically by the system. The products offered are superior products or best sellers. The product will appear on the system, each buyer opens the product website page offered and then processed using the Fp-Growth algorithm. The algorithm will calculate the most sold products in the database and appear on the website. The system will work automatically so that the products offered are evenly distributed and will increase to become sales media and promotional media for products sold.

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1. Introduction

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The second factor is in terms of security that is not guaranteed, for example the market is a crowded area where transactions are carried out with relatively large amounts of cash. In some cases sales made online with e-commerce websites have many features offered, for example stock items, discount prices, and information on goods sold. In an online system buyers can buy more than one item. The weakness of the system is the possibility that the goods purchased are not as expected and the shipping process is long because E-commerce sales will use a third party as a freight forwarder. This becomes more risky and risky because of the security and warranty of the condition of goods delivered to third parties. Some of these weaknesses can be avoided by using a product recommendation method or best seller that is displayed on the front page of the website. The system performs a scanning process according to previous sales data in this case batik cloth. The computer system will automatically select sales data with the help of algorithms. Fp-Growth will record the value of support

and confident. Support is the frequency of the amount of goods purchased while confident is the estimate of the best-selling item based on sales in the previous month or year. With this system the shop owner does not need to assume or offer another product because the system will recommend periodically and automatically. This system is able to attract buyers to buy one or more items that previously the buyer only wants to buy one or two items, finally interested in buying the recommended item.

2. Background

A transaction data that is too large in a database can be found useful information about purchasing consumer data using data mining techniques. This technique can be used to find out market conditions or consumers by observing sales data. In the e-commerce system the sales database is stored on a server so that the amount of data is very large. The concept of data mining is to search for information from a data by observing patterns and connections between data. This relationship will produce a pattern match or what is called a product recommendation. With the addition of an algorithm help, the data relations and relationships can be exploratory and determined. [1]

The development of data mining algorithms is known as FP-Growth and still functions with a priori algorithms. The disadvantages of a priori algorithms will be adjusted by FP-Growth. The working system of the algorithm is to determine a data that often appears in a transaction or called the frequency of itemsets. [2]

Grouping the types of goods in a sales system is generally implemented on an online certified sales system. This system is commonly referred to as market basket analysis. This calculation works by looking at the relationship between the goods sold. For example goods of 'A' and 'B' and are not influenced by the number of items. In the data mining technique the apiriori algorithm will produce a number of rule methods to read and pay attention to the total number of goods transactions. This calculation is taken from a data item itemset that is different in each sales transaction. [3]

The procedure of connectedness between tables at the pole of purchasing goods is called a system association rule. This system looks for a pattern of combinations in an itemset with a value called condition and result. In a pattern of goods association processing a data is called support, a measure that shows the level of dominance and a measure of the feasibility of a transaction. This system is called confident. Confident measurement itself is influenced by the connection of two types of goods, for example buyers '1' buy goods '2' seen in a transaction. [4]

The function of a data mining is used to analyze a form of a pattern or rule on a set of data using a software or software that can be used to identify data inputted by the user. [5]

Knowing an association pattern in a data transaction can use data mining techniques. With this technique the system knows a rule of a product's relationship with other products, where patterns and ways consumers can buy a product can be known. The process for determining a product relationship is known as data mining techniques. This technique works by using mathematical calculations and Artificial Intelligence statistical techniques and machine learning and generally data mining techniques are implemented in a large database. [6]

In making an online sales system application is usually made in the programming language PHP and mySQL as the supporting database. This programming language is used because it is easily implemented and used to create a web page that is static and dynamic. The PHP programming language is combined with an HTML webpage where programs are made able to connect with databases and web pages to be more dynamic and interactive. [7]

An interactive and dynamic sales website will have interactions between sellers and buyers, resulting in a process of buying or ordering goods. The purchase data will automatically be stored in a database, the database system used using MySQL, and transaction data stored in a database, maintains data security faster and is multi-user and open source. [8]

3. System Design

In designing this system, the data processing process will be explained on the E-commerce website. In this case the sale of batik cloth is website-based. The website system is made in the PHP programming laguage. The system was chosen because it is easy to use and apply, and can run on devices that are mobile or use a home PC. In order for the system to work, software and hardware support is needed as follows:

Hardware

a. Computer

In this system the computer is used as an E-commerce website creation process and the website maintenance process itself. The owner or admin can record and view data on ongoing transactions. The admin function is to add data or update batik products offered to customers.

b. Server

The server function in this system is used to store product databases and identity data of customers who make transactions. The purpose of using the server is to make the transaction process safe and confidential by relying on the security features that are available on the server.

Software

a. My SQL

The MySQL function is used as a process of storing and creating sales transaction data. The data will be processed using Apriori and Fp-Growth algorithms to record sales results and display automatically by the system.

b. Rapid Miner

The miner function in this system is used to record and process previous sales data by testing the data with an algorithm. The concept of rapid miners is to take an interesting feature and information on a sales or transaction data.

c. Adobe Photoshop

The Adobe Photoshop function on this system is used to design products in attractive forms.

d. Dreamweaver

The Dreamweaver function is used to design the form of pages from websites that are created using the PHP and mysQL programming languages.

4. Implementation and Testing

In the implementation of testing this system will be applied in three stages. First, test the algorithm. Second, testing on sales transactions, and third, testing product recommendations or best sellers.

No.	Product Name	Weight (Kg)	Price	Stock	Entry Date
1	Batik Besurek	0	300	49	13 Januari 2019
2	Batik Jambi	0	12	300	13 Januari 2019
3	Batik Jawa Pekalongan	0	300	10	13 Januari 2019
4	Batik Gentongan	0	200	50	13 Januari 2019
5	Batik Tuban Corak	0	200	50	13 Januari 2019
6	Batik Jawa Pekalongan	0	300	49	13 Januari 2019
7	Batik Tuban	0	0	50	13 Januari 2019
8	Batik Solo	0	40	40	13 Januari 2019
9	Batik Gentongan	0	300	20	13 Januari 2019
10	Batik Cianjur	0	125	20	13 Januari 2019

Table 1.1 Testing of transaction data patterns

Information:

Table 1.1 is a data weighting pattern taken from transaction data. This system is used to determine the value of support and confident that there are batik sales transaction data.

No.	Batik Besurek	Batik Jambi	Batik Jawa Pekalongan	Batik Gentongan
1	1	0	0	1
2	0	0	0	0
3	0	0	0	0
4	0	0	1	1
5	0	0	0	0
6	1	0	0	0
7	0	0	0	0
8	0	1	0	0
9	0	0	0	0
10	0	0	0	0
Support	2	1	1	2

Table 1.2 Data normalization system

Information:

Table 1.2 is the process of removing unnecessary data on sales transaction data. This system is needed so that only important data is taken when testing.

Table 1.3 Test results with algorithms

Step 1: Jumlah Mengikut Item
Array
(
· r
1 => 5
[Batik besurek
] => 0
[Batik jambi
] => 0
[Batik jawa pekalongan
1 => 0
[Batik Gentongan
] => 0
[batik Tuban corak
1 => 0
[batik Tuban
1 => 0
[Batik Solo
] => 0
[Batik Cianjur
] => 1
)

Information:

Table 1.3 is the testing process using rapid miner tools. The data tested is the result of batik sales transactions. In the test, the value of support and confidence will be made between 50 to 90%, which means to see the total number of items that are in demand with a presentation calculation of 50 to 90%. In this system, a pattern of data linkages will be generated in the number of rules, the rule will differ depending on the combination of products purchased.





Information:

Table 1.4 is the testing process and calls for the FP-Growth algorithm method and a priori using the PHP programming language directly on the sales transaction data.

Table 1.5 Testing with rapid miner

No.	Premises	Conclusion	Support	Confid
1	Bafik jawa pekalongan_corak	Batik jawa pekalongan	0.400	1
2	Batik jawa pekalongan	Batik jawa pekalongan_corak	0.400	1
3	Batik besurek, Batik jawa pekalongan_corak	Batik jawa pekalongan	0.300	1
4	Batik besurek, Batik jawa pekalongan	Batik jawa pekalongan_corak	0.300	1

Information:

Table 1.5 is the process of using rapid miner software by using a circuit scheme and recording the number of related items purchased simultaneously from a combination of 2 itemset items and 3 itemset items.



Figure 1.1 Display of the main page of the website

Information:

Figure 1.1 is the main page display of batik sales. The page will be seen most often by the customer. Web pages are systematically designed not to use many menus to make it easier for customers and do not eliminate the element of beauty and interaction between humans and computers.

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Figure 1.2 Display the website admin page

Information:

Figure 1.2 is the main page in the admin settings, on that page can be accessed by the shop owner and has a level of access rights to add transaction data. Data that can be added include item data, customer data, data of adding product categories and recommendations.

No	Produk	Nama Produk	Berat(Kg)	Qty	Harga	Sub Total	Hapus
1		Batik Solo	0.00	1	40.000	40.000	*
2		Batik Cianjur	0.00	1	125.000	125.000	*
3		Batik Gentongan	0.00	1	200.000	200.000	*

Figure 1.3 Display of purchase transaction data

Information:

Table 1.3 is a sample data of purchases made over several months, the data will be processed automatically to see how much and what type of item is most purchased. The system will then display recommendation data that has been calculated previously using a priori and Fp-Growth algorithms.

NO	NAMA KATEGORI	AKSI
1	Batik Aceh	Edit Hapus
2	Batik sumatra	Edit Hapus
3	Batik Jawa	Edit Hapus
4	Batik Daerah	Edit Hapus

Figure 1.4 Display of products sold

Information:

Figure 1.5 is the process of adding product data that has been updated by the admin, with estimates of the cost and amount of stock and product description.



Figure 1.5 Display of product recommendations page

Information:

Figure 1.5 is the process of implementing product recommendations that can be categorized as a best seller product, the product will appear directly on the main page of the website, product recommendations will change according to needs.

5. Conclusion

From this research, it can be concluded that the application of a product recommendation system on e-commerce websites selling batik can be implemented. The system is able to display data on some of the best-selling products. The product is temporary and will always change according to the presentation and type of batik sold or promoted at a certain time.

The suggestion for further research is to add a larger data storage system. This is done so that the storage data becomes larger and can be used for a long time. The system of maintenance and repair of hardware and software is very necessary because the web is online so it needs to be monitored because the transaction process will last for 24 hours. The products offered in the future must be more creative in promoting their products to make them more attractive.

Acknowledgments

The authors would like to thank all the families who had been supporting the authors completing the research.

References

- [1] Erwin, "Analisis Market Basket Dengan Algoritma", Jurnal Generic, vol. IV, no. 2, 2009.
- [2] Samuel; David, "Penerapan Stuktur FP-Tree dan Algoritma FPGrowth dalam Optimasi Penentuan Frequent Itemset", Institut Teknologi Bandung, 2008.
- [3] Hanj; M. Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publisher, 2006.
- [4] Possas B.; M. Wagner; C. Marcio; R. Rodolfo, "Using Quantitative Information for Efficient Association Rule Generation", ACM SIGMOD, vol. 29, pp. 19-25, 2000.
- [5] Dana Sulistiyo Kusumo; Moch. Arief Bijaksana; Dhinta Darmantoro, "Data Mining dengan Algoritma Apriori pada RDBMS Oracle (Dana Sulistiyo Kusumo)", Faculty of Electrical Engineering of Telkom University, 2016.
- [6] Pane, D. K., "Implementasi Data mining Pada Penjualan Produk Elektronik Dengan Algoritma Apriori (Studi Kasus: Kreditplus)," Pelita Informatika Budi Darma, vol. IV, no. 3, p. 25, 2013.
- [7] Doyle, M., "Beginning PHP 5.3.", Indianapolis, USA: Wiley Publishing, 2010.
- [8] Agus Nursikuwagus; Tono Hartono, "Implementasi Algoritma Apriori Untuk Analisis Penjualan," Jurnal SIMETRIS ISSN: 2252-4983, vol. 7, no. 2, 2016.





Batik Sales Product Recommendation System On E-Commerce Website Using Fp-Growth Algorithm

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Dear Dr. Bob Foster:

Manuscript ID Opcion 2341 entitled "Batik sales product recommendation system on ECommerce Website using FP-Growth Algorithm" which you submitted to the Opcion Journal, has been reviewed. The comments of the reviewer(s) are included at the attachment.

The reviewer(s) have recommended publication, but also suggest some minor revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript.

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Thanks you very much. We have completed for revision. Please check for file revision. Thanks

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We will review it and you can expect to get the review result in one weeks. Thanks

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Peer Review Report

Manuscrip	t Info	rmation
Manuscript ID:	Opcio	on 2341
Manuscript Title:	Batik FP-G	Sales Product Recommendation System On E-Commerce Website Using rowth Algorithm
Evaluation	Rep	ort
General Comments	T c	he topic of this Opcion is attractive, easy to read and understand the oncept and aim of the paper.
How to improve		 a. Author describes the sale of batik products on the E-Commerce website using the FP-Growth Algorithm. The background study in the abstract section is explained in detail by the author. But the main objective, methodology and results are not clear b. Structure of article is very good. However, Literatur review of paper should be added in separate section. In this section, author can discussion about previous research related e-commerce and author can mention about novelty and contribution of this paper. c. In design system, author must discussion about data processing process, programming language, software and hardware. d. English is very poor; I suggest author use proofread for improve quality of this paper e. Please replaced "Implementation and Testing" to "Results" f. Please removed word "information" to "Implementation and Testing"
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Batik Sales Product Recommendation System on E-Commerce Website Using FP-Growth Algorithm

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Muhammad Deni Johansyah

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Abstract

The study aims to investigate the Batik sales product recommendation system on E-Commerce Website using the FPGrowth Algorithm. In this case, the sale of batik cloth is websitebased. The website system is made in the PHP programming language. As a result, the process of implementing product recommendations that can be categorized as a best seller product, the product will appear directly on the main page of the website, product recommendations will change according to needs. From this research, it can be concluded that the application of a product recommendation system on e-commerce websites selling batik can be implemented.

Keywords - Batik, Product Recommendation System, E-Commerce, FP - Growth, Algorithm

1. INTRODUCTION

On E-commerce websites we have found many sales of goods and services. The system allows the transaction process to be faster and more precise and over time and costs, so that customer and buyer meetings are virtual and transactions are carried out in cyberspace. This system can to replace a conventional sales system where buyers meet directly with customers. Conventional systems allow the process of offering goods directly so that buyers are satisfied with the goods offered while the weakness of this system is time wasted if the items are sought out or there are no recommendations for superior products.

The second factor is in terms of security that is not guaranteed, for example the market is a crowded area where transactions are carried out with relatively large amounts of cash. In some cases sales made online with e-commerce websites have many features offered, for example stock items, discount prices, and information on goods sold. In an online system buyers can buy more than one item (Revathi and Geetha, 2015). The weakness of the system is the possibility that the goods purchased are not as expected and the shipping process is long because E-commerce sales will use a third party as a freight forwarder. This becomes more risky and risky because of the security and warranty of the condition of goods delivered to third parties. Some of these weaknesses can be avoided by using a product recommendation method or best seller that is displayed on the front page of the website (Shah, 2015; Suganda and Sharmila, 2013). The system performs a scanning process according to previous sales data in this case batik cloth. The computer system will automatically select sales data with the help of algorithms. FP-Growth will record the value of support and confident. Support is the frequency of the amount of goods purchased while confident is the estimate of the best-selling item based on sales in the previous month or year (Joshua et al., 2016; Sidhu et al., 2014). With this system the shop owner does not need to assume or offer another product because the system will recommend periodically and automatically. This system is able to attract buyers to buy one or more items that previously the buyer only wants to buy one or two items, finally interested in buying the recommended item (Anil and Gladston, 2016).

2. LITERATURE REVIEW

A transaction data that is too large in a database can be found useful information about purchasing consumer data using data mining techniques. This technique can be used to find out market conditions or consumers by observing sales data. In the e-commerce system the sales database is stored on a server so that the amount of data is very large. The concept of data mining is to search for information from a data by observing patterns and connections between data. This relationship will produce a

pattern match or what is called a product recommendation. With the addition of an algorithm help, the data relations and relationships can be exploratory and determined (Ahmad & Ahmad, 2019: Arinin et al, 2019).).

The development of data mining algorithms is known as FP-Growth and still functions with a priori algorithms. The disadvantages of a priori algorithms will be adjusted by FP-Growth. The working system of the algorithm is to determine a data that often appears in a transaction or called the frequency of item sets.

Grouping the types of goods in a sales system is generally implemented on an online certified sales system. This system is commonly referred to as market basket analysis. This calculation works by looking at the relationship between the goods sold. For example goods of 'A' and 'B' and are not influenced by the number of items. In the data mining technique the apriori algorithm will produce a number of rule methods to read and pay attention to the total number of goods transactions. This calculation is taken from a data item item set that is different in each sales transaction (Jazayeriy, Mohammadi & Shamshirband, 2018).

The procedure of connectedness between tables at the pole of purchasing goods is called a system association rule. This system looks for a pattern of combinations in an item set with a value called condition and result. In a pattern of goods association processing a data is called support, a measure that shows the level of dominance and a measure of the feasibility of a transaction. This system is called confident. Confident measurement itself is influenced by the connection of two types of goods, for example buyers '1' buy goods '2' seen in a transaction (Ahmad & Ahmad, 2019).

The function of a data mining is used to analyze a form of a pattern or rule on a set of data using a software or software that can be used to identify data inputted by the user (Sumathi, Kannan, & Nagarajan, 2016).

Knowing an association pattern in a data transaction can use data mining techniques. With this technique the system knows a rule of a product's relationship with other products, where patterns and ways consumers can buy a product can be known. The process for determining a product relationship is known as data mining techniques. This technique works by using mathematical calculations and Artificial Intelligence statistical techniques and machine learning and generally data mining techniques are implemented in a large database (Maheshwari et al., 2018).

Making an online sales system application is usually made in the programming language PHP and mySQL as the supporting database. This programming language is used because it is easily implemented and used to create a web page that is static and dynamic. The PHP programming language is combined with an HTML webpage where programs are made able to connect with databases and web pages to be more dynamic and interactive (Aliyu and Kissinger, 2017).

An interactive and dynamic sales website will have interactions between sellers and buyers, resulting in a process of buying or ordering goods. The purchase data will automatically be stored in a database, the database system used using MySQL, and transaction data stored in a database, maintains data security faster and is multi-user and open source (Sun, Zhang, Xiong, & Zhu, 2014).

3. METHODOLOGY

In designing this system, the data processing process will be explained on the E-commerce website. In this case the sale of batik cloth is website-based. The website system is made in the PHP programming language. The system was chosen because it is easy to use and apply, and can run on devices that are mobile or use a home PC. In order for the system to work, software and hardware support is needed as follows:

3.1 Hardware

a. Computer

In this system the computer is used as an E-commerce website creation process and the website maintenance process itself. The owner or admin can record and view data on ongoing transactions. The admin function is to add data or update batik products offered to customers.

b. Server

The server function in this system is used to store product databases and identity data of customers who make transactions. The purpose of using the server is to make the transaction process safe and confidential by relying on the security features that are available on the server.

3.2 Software

a. My SQL

The MySQL function is used as a process of storing and creating sales transaction data. The data will be processed using A priori and FP-Growth algorithms to record sales results and display automatically by the system.

b. Rapid Miner

The miner function in this system is used to record and process previous sales data by testing the data with an algorithm. The concept of rapid miners is to take an interesting feature and information on a sales or transaction data.

c. Adobe Photoshop

The Adobe Photoshop function on this system is used to design products in attractive forms.

d. Dreamweaver

The Dreamweaver function is used to design the form of pages from websites that are created using the PHP and mysQL programming languages.

4. RESULTS

In the implementation of testing this system will be applied in three stages. First, test the algorithm. Second, testing on sales transactions, and third, testing product recommendations or best sellers.

No.	Product Name	Weight (Kg)	Price	Stock	Entry Date
1	Batik Besurek	0	300	49	January 13, 2019
2	Batik Jambi 0		12	300	January 13, 2019
3	Batik Jawa Pekalongan	0	300	10	January 13, 2019
4	Batik Gentongan	0	200	50	January 13, 2019
5	Batik Tuban Corak	0	200	50	January 13, 2019
6	Batik Jawa Pekalongan	0	300	49	January 13, 2019
7	Batik Tuban	0	0	50	January 13, 2019
8	8 Batik Solo 0 40 Ja 20		January 13, 2019		
9	Batik Gentongan	0	300	20	January 13, 2019
10	Batik Cianjur	0	125	20	13 January 2019

Table 1. Testing of transaction data patterns

References: (Kurniati and Prajanti, 2018; Nawawi et al., 2017; Steelyana, 2012)

Table 1 is a data weighting pattern taken from transaction data. This system is used to determine the value of support and confident that there are batik sales transaction data.

rubic 2. Dutu normalization system				
No.	Batik Besurek	Batik Jambi	Batik Jawa Pekalongan	Batik Gentongan
1 1 0 0		0	1	
2	0	0	0	0
3	0	0	0	0
4	0	0	1	1
5	0	0	0	0
6	1	0	0	0
7	0	0	0	0
8	0	1	0	0
9	0	0	0	0
10	0	0	0	0
Support	2	1	1	2

Table 2. Data normalization system

Table 2 is the process of removing unnecessary data on sales transaction data. This system is needed so that only important data is taken when testing.

Table 3. Test results with algorithms

Step 1: Total List Of Item
Array
(
 [
 -~ 5
 [Datik Desurek
 -~ 0
 [Datik Jambi
] =~ 0
 [Latik Gentongan
] =~ 0
 [Matik Gentongan
] =~ 0
 [Atik Gentongan
] =~ 0
 [Datik Tuban Gurak
] =~ 0
 [Datik Tuban
] =~ 0
 [Datik Solo
] =~ 0
 [Datik Solo
] =~ 0
 [Datik Solo
] =~ 0

Table 3 is the testing process using rapid miner tools. The data tested is the result of batik sales transactions. In the test, the value of support and confidence will be made between 50 to 90%, which means to see the total number of items that are in demand with a presentation calculation of 50 to 90%. In this system, a pattern of data linkages will be generated in the number of rules, the rule will differ depending on the combination of products purchased.

Table 4. Testing with FP-GROWTH



Table 4 is the testing process and calls for the FP-Growth algorithm method and a priori using the PHP programming language directly on the sales transaction data.

140.	71414385	Conclusion	Gapport Config
ŧ.,	Bate jawa pakalongan_colak	Dahk jawa pekalongan	0.400 1
8	Bata jawa pekalungan	Balik jawa pekalongan_cetal	0.493 1
2	Balth besonen, Bath jawa pekalongan_torak	Dath jawa penatorgan	9.101
12	Bain benures, Bain jawa pekatingan	Ralik jawa pekalangan_carali	0.380 1

Table 5. Testing with rapid miner

Table 5. is the process of using rapid miner software by using a circuit scheme and recording the number of related items purchased simultaneously from a combination of 2 item set items and 3 item set items.



Figure 1. Display of the main page of the website

Figure 1 is the main page display of batik sales. The page will be seen most often by the customer. Web pages are systematically designed not to use many menus to make it easier for customers and do not eliminate the element of beauty and interaction between humans and computers.

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Figure 2. Display the website admin page

Figure 2 is the main page in the admin settings, on that page can be accessed by the shop owner and has a level of access rights to add transaction data. Data that can be added include item data, customer data, data of adding product categories and recommendations.

No	Product	Name Product	Weight(Kg)	Qty	Price	Sub Total	Delets
1	100	Østik besurek	0.00	1	300.000	300.000	*
2	10000	Batik jambi	0.00	1	12.000	12.000	*
3		Batik Gentongan	0.00	1	200.000	200.000	*
4	Rei	Batik jawa pekalongan	0.00	1	300.000	300.000	*
5	NEWS	batik Tuban corak	0.00	1	200.000	200.000	*

Figure 3. Display of purchase transaction data

Table 3 is a sample data of purchases made over several months, the data will be processed automatically to see how much and what type of item is most purchased. The system will then display recommendation data that has been calculated previously using a priori and FP-Growth algorithms.

Add Category						
NO	CATEGORY	ACTION				
1	Batik Aceh	Edit Delete				
2	Batik sumatra	Edit Delete				
3	Batik Jawa	Edit Delete				
4	Batik Daerah	Edit Delete				

Figure 4. Display of products sold

Figure 4 is the process of adding product data that has been updated by the admin, with estimates of the cost and amount of stock and product description.



Figure 5. Display of product recommendations page

Figure 5. is the process of implementing product recommendations that can be categorized as a best seller product, the product will appear directly on the main page of the website, product recommendations will change according to needs.

5. CONCLUSION

From this research, it can be concluded that the application of a product recommendation system on e-commerce websites selling batik can be implemented. The system is able to display data on some of the best-selling products. The product is temporary and will always change according to the presentation and type of batik sold or promoted at a certain time.

The suggestion for further research is to add a larger data storage system. This is done so that the storage data becomes larger and can be used for a long time. The system of maintenance and repair of hardware and software is very necessary because the web is online so it needs to be monitored because the transaction process will last for 24 hours. The products offered in the future must be more creative in promoting their products to make them more attractive.

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References

- Abbas, A.R. and Ashor, S. 2016. Design Recommendation System in e-Commerce Site. *Iraqi Journal of Science, 2016*, Vol. 57, No.4A, pp: 2549-2556.
- Aliyu, M.B. and Kissinger, S. 2017. Analysis of PHP and Java Languages for Enterprise Applications. *International Journal of Engineering Science Invention*, Volume 6, Issue 9, September 2017, pp. 65-74.
- Anil, K.R. and Gladston Raj, S. 2016. N-list based Friend Recommendation System Using Pre-rule Checking. *International Journal of Computer Science and Information Technologies*, Vol. 7 (1), 2016, pp. 338-341.
- Jazayeriy, H., Mohammadi, S., and Shamshirband, S. 2018. A Fast Recommender System for Cold User Using Categorized Items. *Math. Comput. Appl.*, 2018, 23, 1, pp. 1-12.
- Joshua J.V., Alao O.D., Adebayo A.O., Ehinlafa E.O., and Ajayi O.E. 2016. Data Mining: A Book Recommender System Using Frequent Pattern Algorithm. *Journal of Software Engineering and Simulation*, Volume 3 ~ Issue 3(2016) pp: 01-13.
- Kurniati, E.D. and Prajanti, S.D.W. 2018. Batik SMEs Efficiency and Entrepreneurship Role in Innovation. *Jejak*, Vol 11 (2) (2018): pp. 375-389. DOI: https://doi.org/10.15294/jejak.v11i2.16058
- Lopes, P. and Roy, B. 2014. Recommendation System Using Web Usage Mining for Users of E-Commerce Site. International Journal of Engineering Research & Technology (IJERT), Vol. 3 Issue 7, July – 2014, pp. 1714-1720.
- Maheshwari, A., Davendralingam, N., and DeLaurentis, D.A. 2018. A Comparative Study of Machine Learning Techniques for Aviation Applications. *Proceeding*, AIAA AVIATION Forum, June 25-29, 2018, Atlanta, Georgia, pp. 1013.
- Nawawi, T., Husin, R., and Wiryawan, Z.Z. 2017. Profile and Marketing Strategy of SME's Towards Jambi Batik. Business and Economics Journal, Volume 8, Issue 4, pp. 1-6.
- Revathi, R. and Geetha, M. 2015. Re-Modified Apriori Algorithm in E-Commerce Recommendation System. International Journal of Innovative Research in Computerand Communication Engineering, Vol. 3, Issue 7, July 2015, pp. 6737-6744.
- Shah, A.M. 2015. E-Commerce Recommendations Using Multidimensional Association Rule Mining With Clustering A Review. International Journal of Innovative and Emerging Research in Engineering, Volume 2, Issue 1, 2015, pp. 55-60.
- Sidhu, S., Meena, U.K., Nawani, A., Gupta, H., and Thakur, N. 2014. FP Growth Algorithm Implementation. *International Journal of Computer Applications (0975 8887)*, Volume 93 No.8, May 2014, pp. 1-6.
- Steelyana, E. 2012. Batik, A Beautiful Cultural Heritage that Preserve Culture and Support Economic Development in Indonesia. *Binus Business Review*, Vol. 3 No. 1 Mei 2012, pp. 116-130.
- Suguna, R. and Sharmila, D. 2013. A Technique for Web Page Recommendation Using Markov Model Associated with Quality and Time Based Fp Mining. *Journal of Theoretical and Applied Information Technology*, October 2013. Vol. 56 No.2, pp. 373-381.

- Sumathi, K., Kannan, S., and Nagarajan, K. 2016. Data Mining: Analysis of student database using Classification Techniques. *International Journal of Computer Applications (0975 – 8887)*, Volume 141 – No.8, May 2016, pp. 22-26.
- Sun, Y., Zhang, J., Xiong, Y., and Zhu, G. 2014. Data Security and Privacy in Cloud Computing. International Journal of Distributed Sensor Networks, Volume 2014, Article ID 190903, 9 pages: 2-10.
- Zongjiang, W. 2011. E-Book Recommender System Design and Implementation Based on Data Mining. *Proceeding*. Fourth International Conference on Machine Vision (ICMV 2011): Computer Vision and Image Analysis; Pattern Recognition and Basic Technologies. http://proceedings.spiedigitallibrary.org/on 02/19/2016 Terms of Use: http://spiedigitallibrary.org/ss/TermsOfUse.aspx



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Opcion Decision on Manuscript ID Opcion 2341

2 pesan

Revista Opcion <revistaopcion3@gmail.com> Kepada: bob foster <bobriset@unibi.ac.id> 6 April 2020 13.09

Dear Dr. Bob Foster:

Manuscript ID Opcion 2341 entitled "Batik sales product recommendation system on ECommerce Website using FP-Growth Algorithm" which you submitted to the Opcion Journal, has been accepted. Acceptance letter can be downloaded in the attached file.

Thank you for your fine contribution. On behalf of the Editors of the Opcion Journal, we look forward to your continued contributions to the Journal.

Sincerely,

DR. JOSÉ VICENTE VILLALOBOS ANTÚNEZ Editor–Chief/ Journal OPCIÓN

Acceptance letter.pdf

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Dear Editor

Thanks you very much. It is good news for us. Thanks

Best Regards

Dr. Bob Foster [Kutipan teks disembunyikan]



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Bob Foster1*, Muhammad Deni Johansyah2

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SENT TO OUR EDITORIAL COMMITTEE AN ARTICLE NAMED

BATIK SALES PRODUCT RECOMMENDATION SYSTEM ON E-COMMERCE WEBSITE USING FP-GROWTH ALGORITHM

WHICH, AFTER HAVING BEEN SUBJECT TO EVALUATION BY THE ARBITRAL COMMITTEE, WAS ACCEPTED FOR PUBLICATION IN THE REGULAR ISSUE APRIL CORRESPONDING TO 2020.

It is made known that the journal is indexed and/or cataloged in: Scopus (Q3), Latindex- Catálogo, Registro de Publicaciones Científicas y Tecnológicas Venezolanas (Revencyt), The Library of Congress USA, Directory of Open Access Journals, Scimago Journal & Country Rank (Q3), Índice Bibliográfico Publindex (A2 Homologation), DIALNET (Clasificación Integrada de Revistas Científicas-Grupo C), Ulrich's International Periodicales Directory, Qualis/Capes (B2 Homologation).

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DR. JOSÉ VICENTE VILLALOBOS ANTÚNEZ Editor–Chief/ Journal OPCIÓN

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Universidad del Zulia Facultad Experimental de Ciencias Departamento de Ciencias Humanas Maracaibo - Venezuela

Batik sales product recommendation system on E-Commerce Website using FP-Growth Algorithm

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Abstract

The study aims to investigate the Batik sales product recommendation system on E-Commerce Website using the FP-Growth Algorithm. In this case, the sale of batik cloth is websitebased. The website system is made in the PHP programming language. As a result, the process of implementing product recommendations that can be categorized as a best seller product, the product will appear directly on the main page of the website, product recommendations will change according to needs. From this research, it can be concluded that the application of a product recommendation system on e-commerce websites selling batik can be implemented.

Keywords: Batik, Product recommendation system, E-Commerce.

Sistema de recomendación de productos de ventas de Batik en el sitio E-Commerce Website utilizando el algoritmo de crecimiento FP

Resumen

El estudio tiene como objetivo investigar el sistema de recomendación de productos de ventas de Batik en el sitio web de

comercio electrónico utilizando el algoritmo FP-Growth. En este caso, la venta de tela batik se basa en el sitio web. El sistema del sitio web está hecho en el lenguaje de programación PHP. Como resultado, el proceso de implementación de recomendaciones de productos que pueden clasificarse como un producto más vendido, el producto aparecerá directamente en la página principal del sitio web, las recomendaciones del producto cambiarán según las necesidades. A partir de esta investigación, se puede concluir que se puede implementar la aplicación de un sistema de recomendación de productos en sitios web de comercio electrónico que venden batik.

Palabras clave: Batik, Sistema de recomendación de productos, Comercio electrónico.

1. INTRODUCTION

On E-commerce websites, we have found many sales of goods and services. The system allows the transaction process to be faster and more precise and overtime and costs, so that customer and buyer meetings are virtual and transactions are carried out in cyberspace. This system can replace a conventional sales system where buyers meet directly with customers. Conventional systems allow the process of offering goods directly so that buyers are satisfied with the goods offered while the weakness of this system is time wasted if the items are sought out or there are no recommendations for superior products.

The second factor is in terms of security that is not guaranteed, for example, the market is a crowded area where transactions are carried out with relatively large amounts of cash. In some cases, sales made online with e-commerce websites have many features offered, for example, stock items, discount prices, and information on goods Batik sales product recommendation system on e-commerce website 199 using fp-growth algorithm

sold. In an online system, buyers can buy more than one item. The weakness of the system is the possibility that the goods purchased are not as expected and the shipping process is long because E-commerce sales will use the third party as a freight forwarder. This becomes more risky and risky because of the security and warranty of the condition of goods delivered to third parties. Some of these weaknesses can be avoided by using a product recommendation method or bestseller that is displayed on the front page of the website. The system performs a scanning process according to previous sales data in this case batik cloth. The computer system will automatically select sales data with the help of algorithms (AHMAD & AHMAD, 2019). FP-Growth will record the value of support and confidence. Support is the frequency of the number of goods purchased while confidence is the estimate of the best-selling item based on sales in the previous month or year. With this system, the shop owner does not need to assume or offer another product because the system will recommend periodically and automatically. This system can attract buyers to buy one or more items that previously the buyer only wants to buy one or two items, finally interested in buying the recommended item.

2. LITERATURE REVIEW

A transaction data that is too large in a database can be found useful information about purchasing consumer data using data mining techniques. This technique can be used to find out market conditions or consumers by observing sales data. In the e-commerce system, the sales database is stored on a server so that the amount of data is very large. The concept of data mining is to search for information from data by observing patterns and connections between data. This relationship will produce a pattern match or what is called a product recommendation. With the addition of an algorithm help, the data relations and relationships can be exploratory and determined (AHMAD & AHMAD, 2019: Arinin et al, 2019).

The development of data mining algorithms is known as FP-Growth and still functions with a priori algorithms. The disadvantages of a priori algorithms will be adjusted by FP-Growth. The working system of the algorithm is to determine data that often appears in a transaction or called the frequency of item sets.

Grouping the types of goods in a sales system is generally implemented on an online certified sales system. This system is commonly referred to as market basket analysis. This calculation works by looking at the relationship between the goods sold. For example goods of 'A' and 'B' and are not influenced by the number of items. In the data mining technique, the apriori algorithm will produce some rule methods to read and pay attention to the total number of goods transactions. This calculation is taken from a data item set that is different in each sales transaction (JAZAYERIY, H., MOHAMMADI, S., & SHAMSHIRBAND, 2018).

The procedure of connectedness between tables at the pole of purchasing goods is called a system association rule. This system looks Batik sales product recommendation system on e-commerce website 201 using fp-growth algorithm

for a pattern of combinations in an item set with a value called condition and result. In a pattern of goods association processing a data is called support, a measure that shows the level of dominance and a measure of the feasibility of a transaction. This system is called confidence. The confident measurement itself is influenced by the connection of two types of goods, for example, buyers '1' buy goods '2' seen in a transaction (AHMAD &AHMAD 2019).

The function of data mining is used to analyze a form of a pattern or rule on a set of data using software or software that can be used to identify data inputted by the user (SUMATHI, KANNAN, & NAGARAJAN, 2016).

Knowing an association pattern in a data transaction can use data mining techniques. With this technique, the system knows a rule of a product's relationship with other products, where patterns and ways consumers can buy a product can be known. The process for determining a product relationship is known as data mining techniques. This technique works by using mathematical calculations and Artificial Intelligence statistical techniques and machine learning and general data mining techniques are implemented in a large database (MAHESHWARI, DAVENDRALINGAM, & DELAURENTIS, 2018).

Making an online sales system application is usually made in the programming language PHP and mySQL as the supporting database. This programming language is used because it is easily implemented and used to create a web page that is static and dynamic. The PHP programming language is combined with an HTML webpage where programs are made able to connect with databases and web pages to be more dynamic and interactive (ALIYU & KISSINGER, 2017).

An interactive and dynamic sales website will have interactions between sellers and buyers, resulting in a process of buying or ordering goods. The purchase data will automatically be stored in a database, the database system used to use MySQL, and transaction data stored in a database maintains data security faster and is multi-user and open source (SUN, ZHANG, XIONG, & ZHU, 2014).

3. METHODOLOGY

In designing this system, the data processing process will be explained on the E-commerce website. In this case, the sale of batik cloth is website-based. The website system is made in the PHP programming language. The system was chosen because it is easy to use and apply, and can run on devices that are mobile or use a home PC. For the system to work, software and hardware support are needed as follows:

3.1. Hardware

a. Computer

In this system, the computer is used as an E-commerce website creation process and the website maintenance process itself. The Batik sales product recommendation system on e-commerce website 203 using fp-growth algorithm

owner or admin can record and view data on ongoing transactions. The admin function is to add data or update batik products offered to customers.

b. Server

The server function in this system is used to store product databases and identity data of customers who make transactions. The purpose of using the server is to make the transaction process safe and confidential by relying on the security features that are available on the server.

3.2. Software

a. My SQL

The MySQL function is used as a process of storing and creating sales transaction data. The data will be processed using 'A' priority and FP-Growth algorithms to record sales results and display them automatically by the system.

b. Rapid Miner

The miner function in this system is used to record and process previous sales data by testing the data with an algorithm. The concept of rapid miners is to take an interesting feature and information on sales or transaction data.

c. Adobe Photoshop

The Adobe Photoshop function on this system is used to design products in attractive forms.

d. Dreamweaver

The Dreamweaver function is used to design the form of pages from websites that are created using the PHP and MySQL programming languages.

4. RESULTS

In the implementation of testing, this system will be applied in three stages. First, test the algorithm. Second, testing on sales transactions, and third, testing product recommendations or best sellers.

No.	Product Name	Weight (Kg)	Price	Stock	Entry Date
1	Batik Besurek	0	300	49	January 13, 2019
2	Batik Jambi	0	12	300	January 13,

Table 1: Testing of transaction data patterns

					2019
3	Batik Jawa Pekalongan	0	300	10	January 13, 2019
4	Batik Gentongan	0	200	50	January 13, 2019
5	Batik Tuban Corak	0	200	50	January 13, 2019
6	Batik Jawa Pekalongan	0	300	49	January 13, 2019
7	Batik Tuban	0	0	50	January 13, 2019
8	Batik Solo	0	40	40	January 13, 2019
9	Batik Gentongan	0	300	20	January 13, 2019
10	Batik Cianjur	0	125	20	January 13, 2019

Batik sales product recommendation system on e-commerce website 205 using fp-growth algorithm

Table 1 is a data weighting pattern taken from transaction data. This system is used to determine the value of support and confidence that there are batik sales transaction data.

No.	Batik Besurek	Batik Jambi	Batik Jawa Pekalongan	Batik Gentongan			
1	1	0	0	1			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	1	1			
5	0	0	0	0			
6	1	0	0	0			
7	0	0	0	0			
8	0	1	0	0			
9	0	0	0	0			

Table 2: Data normalization system

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10	0	0	0	0
Support	2	1	1	2

Table 2. is the process of removing unnecessary data on sales transaction data. This system is needed so that only important data is taken when testing.



Table 3: Test results with algorithms

Table 3 is the testing process using rapid miner tools. The data tested is the result of batik sales transactions. In the test, the value of support and confidence will be made between 50 to 90%, which means to see the total number of items that are in demand with a presentation calculation of 50 to 90%. In this system, a pattern of data linkages will be generated in the number of rules, the rule will differ depending on the combination of products purchased.



Table 4: Testing with FP-GROWTH

Table 4 is the testing process and calls for the FP-Growth algorithm method and a priori using the PHP programming language directly on the sales transaction data.

No.	Premises	Conclusion	Support	Confid
1	Batik jawa pekalongan_corak	Batik jawa pekalongan	0.400	1
2	Batik jawa pekalongan	Batik jawa pekalongan_corak	0.400	1
3	Batik besurek, Batik jawa pekalongan_corak	Batik jawa pekalongan	0.300	1
4	Batik besurek, Batik jawa pekalongan	Batik jawa pekalongan_corak	0.300	1

Table 5: Testing with rapid miner

Table 5 is the process of using rapid miner software by using a circuit scheme and recording the number of related items purchased simultaneously from a combination of 2 item set items and 3 item set items.



Figure 1: Display of the main page of the website

Figure 1 is the main page display of batik sales. The page will be seen most often by the customer. Web pages are systematically designed not to use many menus to make it easier for customers and do not eliminate the element of beauty and interaction between humans and computers.

Name Product	1
Category	: - Change Category - 🛶
Weight	1
Price	
Stock	1
	x 4 k k k k k k k k k k k k k k k k k k
Picture	Browse No file selected. Type Of Distance Must be 106/00/66 and widths 400 ex

Figure 2: Display the website admin page

Batik sales product recommendation system on e-commerce website 209 using fp-growth algorithm

Figure 2 is the main page in the admin settings, on that page can be accessed by the shop owner and has a level of access rights to add transaction data. Data that can be added include item data, customer data, data of adding product categories and recommendations.

₹ sho	opping eart						
No	Product	Name Product	Weight(Kg)	Qty	Price	Sub Total	Delete
1		Batik besurek	0.00	1	300.000	300.000	*
2		Batik jambi	0.00	1	12.000	12.000	*
з		Batik Gentongan	0.00	1	200.000	200.000	*
4	and the second	Batik jawa pekalongan	0.00	1	300.000	300.000	*
5		batik Tuban corak	0.00	1	200.000	200.000	*
					Total:	IDR. 1.012	.000

Figure 3: Display of purchase transaction data

Figure 3 is a sample data of purchases made over several months, the data will be processed automatically to see how much and what type of item is most purchased. The system will then display recommendation data that has been calculated previously using a priori and FP-Growth algorithms.



Figure 4: Display of products sold

Figure 4 is the process of adding product data that has been updated by the admin, with estimates of the cost and amount of stock and product description.



Figure 5: Display of product recommendations page

Figure 5 is the process of implementing product recommendations that can be categorized as a best seller product, the

product will appear directly on the main page of the website, product recommendations will change according to needs.

5. CONCLUSION

From this research, it can be concluded that the application of a product recommendation system on e-commerce websites selling batik can be implemented. The system can display data on some of the bestselling products. The product is temporary and will always change according to the presentation and type of batik sold or promoted at a certain time.

The suggestion for further research is to add a larger data storage system. This is done so that the stored data becomes larger and can be used for a long time. The system of maintenance and repair of hardware and software is very necessary because the web is online so it needs to be monitored because the transaction process will last for 24 hours. The products offered in the future must be more creative in promoting their products to make them more attractive.

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REFERENCES

- AHMAD, I., & AHMAD, S. 2019. "The Mediation Effect of Strategic Planning on The Relationship Between Business Skills and Firm's Performance: Evidence from Medium Enterprises in Punjab, Pakistan". Opcion, Vol. 35, N° 24: 746-778.
- ALIYU, M. & KISSINGER, S. 2017. "Analysis of PHP and Java Languages for Enterprise Applications". **International Journal of Engineering Science Invention.** Vol. 6, N^o 9: 65-74. Netherlands.
- ARININ, E., CHELOVENKO, T., DORZHIGUSHAEVA, O., GLAGOLEV, V., MARKOVA, N., MATUSHANSKAIA, I., ... & VORONTSOVA, E. 2019. "RELIGION, SCIENCE AND 'RELIGIOUS EDUCATION'IN RUSSIA SIX REGIONAL PROJECTS". European Journal of Science and Theology. Vol. 15, N° 4: 137-156.
- JAZAYERIY, H., MOHAMMADI, S., & SHAMSHIRBAND, S. 2018. "A Fast Recommender System for Cold User Using Categorized Items". Math. Comput. Appl. Vol. 23, N° 1: 1-12. Netherlands.
- MAHESHWARI, A., DAVENDRALINGAM, N., & DELAURENTIS, D. 2018. A Comparative Study of Machine Learning Techniques for Aviation Applications. Proceeding, AIAA AVIATION Forum. pp. 1013. Atlanta, Georgia.
- SIDHU, S., MEENA, U., NAWANI, A., GUPTA, H., & THAKUR, N. 2014. "FP Growth Algorithm Implementation". International Journal of Computer Applications. Vol. 93, N° 8: 1-6. UK.
- SUMATHI, K., KANNAN, S., & NAGARAJAN, K. 2016. "Data Mining: Analysis of student database using Classification Techniques". International Journal of Computer Applications. Vol.141, Nº 8: 22-26. UK.
- SUN, Y., ZHANG, J., XIONG, Y., & ZHU, G. 2014. "Data security and privacy in cloud computing". International Journal of Distributed Sensor Networks, Vol. 10, N° 7: 190903.



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(2019) *Opcion*, 35 (SpecialEdition24), pp. 746-778. Cited 88 times. http://produccioncientificaluz.org/index.php/opcion/article/download/30711/31760

² Aliyu, M., Kissinger, S.

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"Analysis of PHP and Java Languages for Enterprise Applications"

(2017) International Journal of Engineering Science Invention, 6 (9), pp. 65-74.

Arinin, E., Chelovenko, T., Dorzhigushaeva, O., Glagolev, V., Markova, 3 N., Matushanskaia, I., Sibirtseva, I., (...), Vorontsova, E. Religion, science and 'religious education' in Russia six regional

(2019) European Journal of Science and Theology, 15 (4), pp. 137-156. Cited 3 times.

http://www.ejst.tuiasi.ro/Files/77/12_Arinin%20et%20al.pdf

⁴ Jazayeriy, H., Mohammadi, S., Shamshirband, S. A Fast Recommender System for Cold User Using Categorized Items (2018) Math. Comput. Appl., 23, p. 112. Cited 14 times.

⁵ Maheshwari, A., Davendralingam, N., Delaurentis, D.A.

A comparative study of machine learning techniques for aviation applications

(2018) 2018 Aviation Technology, Integration, and Operations Conference, art. no. AIAA 2018-3980. Cited 17 times. ISBN: 978-162410556-2 doi: 10.2514/6.2018-3980

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Sidhu, S., Meena, U., Nawani, A., Gupta, H., Thakur, N. 6 FP Growth Algorithm Implementation (2014) International Journal of Computer Applications, 93 (8), pp. 1-6. Cited 7 times.

Sumathi, K., Kannan, S., Nagarajan, K. Data Mining: Analysis of student database using Classification Techniques (2016) *International Journal of Computer Applications*, 141, pp. 22-26. Cited 5 times.

⁸ Sun, Y., Zhang, J., Xiong, Y., Zhu, G.

Data Security and Privacy in Cloud Computing (Open Access)

(2014) International Journal of Distributed Sensor Networks, 2014, art. no. 190903. Cited 125 times. http://journals.sagepub.com.ezproxy.umt.edu.my/loi/dsn doi: 10.1155/2014/190903

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