APPLICATION OF CUSTOMER RELATIONSHIP MANAGEMENT IN SALES STRATEGY WITH THE ASSOCIATION RULES METHOD IN ZHAFRAN CLOTHING SHOP

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ABSTRACT

Zhafran is a business unit supervised by PT. Dsantren *in* Bandung *engaged in clothing, sales offered by* Zhafran *such as hats, accessories, t-shirts and others. The situation that is happening at* Zhafran *right now there are some problems in the marketing process in recommending the right product as a promotion on social media, and the* CS (*Customer Service*) *section that has difficulty in determining other products to be recommended to customers so that complaints arise from the late delivery of products in stock. the product is empty or the purchase of the product exceeds the amount of available stock, as a result Part* CS *tells the customer to delay the order, another indication is seen from the many complaints that feel bored with the product purchased because of lack of information about other products offered. Therefore, a sales strategy is needed by applying the Association Rules method in* Zhafran *to help problems that occur in order to facilitate customers in getting information and assist* Zhafran *in managing management and customer relations properly with the Customer Relationship Management approach. Based on the results of the user acceptance test, it can be concluded that the application of Customer Relationship Management with the Association Rules method can help the Marketing Section in promoting the products offered and can also help the* CS *Section at* Zhafran *find out the right product as an offer to the customer.*

Keywords *: Customers, Customer Relationship Management, Sales Strategy, Association Rules, User Acceptance Test*

1. *INTRODUCTION*

Zhafran *is a business unit supervised by* PT. Dsantren *in* Bandung *engaged in clothing, sales offered by* Zhafran *such as hats, accessories, t-shirts and others. The clothing products offered by* Zhafran *are works that have the purpose of broadcasting Islam such as various types of monotheistic hats intended for children and adults, monotheism pin accessories, ganci and syiar shirts. In service to customers,* Zhafran *classifies customers into* 3 *types, namely customers who only ask, new customers and regular customers. The regular customers are divided into* 3 *types, namely regular customers, resellers and distributors.*

Based on interviews with Mr. Ruston Pirmansyah *as* CEO *of* PT Dsantren Kreatif Global *and Mr.* Azi Giandy Permana *as Head of the* Zhafran *Business Unit, the current situation at the company, based on ordering data in the January period there were* 34% *of purchases of more than one product carried out 36 regular customer. While there are* 66% *of one product purchase transactions made by* 71 *regular customers, customer transactions will be served by the Customer Service* (CS) *Section, in this case the* CS *Section does not make product offerings from the customer's habit of buying products because there is no reference information related to decisions from Marketing section in recommending other products that are right, as a result, Section* CS *does not try to offer other products to customers for the products needed only serve orders. As for complaints from customers directly through whatshapp and filling out questionnaires distributed to* 30 *regular customers, as a sample detail of complaints taken from* 10 *respondents, customers said they were bored with existing products because less information was known about other products being sold, whereas in complaints which directly through whatshapp customers complained of late delivery of products purchased, late delivery of products due to empty product stock or the occurrence of product purchases exceeding the amount of existing stock, as a result Part* CS *tells customers to delay orders. Then another obstacle in the promotion process on Facebook and Instagram social media that utilizes the Facebook fb ads facility that has been integrated with Instagram is only done when the ready stock is sometimes uncertain, in doing this promotion the Marketing Section also has difficulty in recommending the right product as a promotion.*

Based on the existing problems, an information system is needed to facilitate customers in obtaining information and assist Zhafran *in managing management and customer relations well*

with the Customer Relationship Management approach. The information system needed can also facilitate the Marketing Section and CS *Section in determining the product as a recommendation to customers, by applying the Association Rules method which is one of the techniques in data mining to determine related relationships between items in a dataset (a set of data) that have been determined* [1].

Therefore, a sales strategy is needed using the Customer Relationship Management approach by applying the Association Rules method in Zhafran *to help the problems that occur.*

2. *RESEARCH CONTENTS*

2.1 *Information Systems*

The information system presented by O'Brien, *which is a combination of people, hardware, software, communication networks, and databases that gather, change and disseminate information in the form of an organization. An information system is formed from a group of operating activities that have been fixed, as follows :*

1. *Data announcement*
2. *Grouping data*
3. *Counting*
4. *Analysis*
5. *Provide reports*

As for information system goals are : a) *Optimizing task completion. : users must be productive to get good results* b) *Optimize overall effectiveness. : The system must be easy and can be used.* c) *Optimizing economic effectiveness.* : *The benefits gained from the system can be greater than the costs that have been out* [2].

2.2 CRM (*Customer Relationship Management*)

CRM is an integrated information system to be used in planning, scheduling, and controlling pre and post-sales activities carried out in the organization. CRM *covers all aspects related to prospects and customers, sales force, support from marketing, and field services. The purpose of* CRM *is to increase growth and profitability over the long term through a good explanation of customer behavior and better results* [3].

2.3 *Stages in* CRM

There are 3 stages of CRM according to Kalakota and Robinson: 2001, namely :

a. *Acquire*, Acquire, this stage is to attract new customers by offering convenience in getting information, new innovations, and services that are made interesting.
b. *Enhance*, Enhance, this stage is to remind a good relationship with existing customers or regular customers through the services provided by Customer Service in the company.
c. *Retain, is the stage in retaining customers in creating loyalty and trust in the company* [4].

2.4 *Research Methodology*

The research methodology is the stages carried out in conducting research.

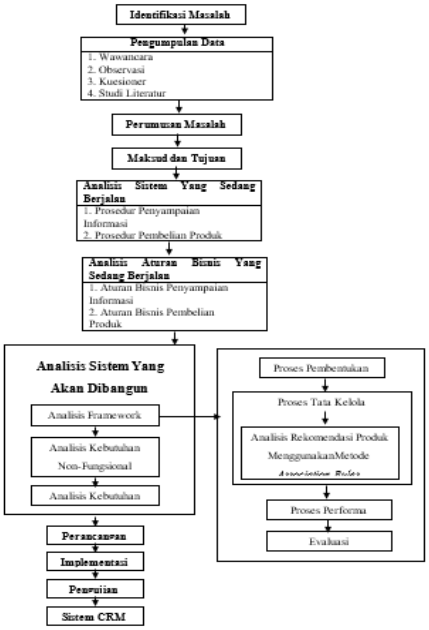

***Figure* 1.** *Research Methodology*

2.5 *Framework CRM*

The CRM process framework consists of four stages consisting of four sub-processes, as follows: the process of establishing customer relations; relationship management and governance processes; the relational performance evaluation process, and the evolution of CRM or the improvement process.

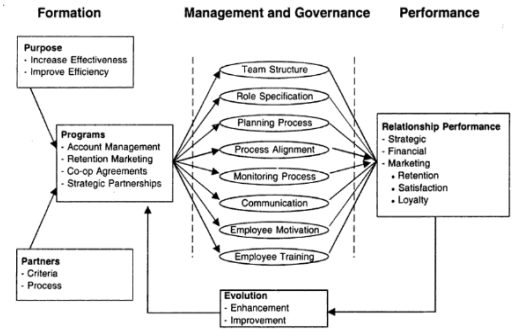

***Figure* 2.** *Framework* CRM

2.5.1 CRM *Formation Process*

The process of forming CRM *refers to decisions regarding, goals, programs to be made and initiation of relational activities for a company in connection with a particular group of customers or*

individual customers with whom the company wants to be involved in a cooperative relationship.

2.5.2 CRM *Governance Process*

After a CRM *program is developed and launched, relationships with programs and individual relationships must be managed and managed. For mass market customers, the degree to which there is symmetry or asymmetry in the primary responsibility for whether the customer or company sponsoring the program will manage relationships varies with market size*.

2.5.3 CRM *Performace Evaluation Process*

Periodic assessment of results in CRM *is needed to evaluate whether the program meets expectations or does not meet expectations. Performance evaluation also helps in taking corrective action in terms of relationship governance or in modifying relationship marketing objectives and program features.*

2.5.4 *Evaluation Process*

Individual customer relationships and CRM *programs tend to experience evolution as they mature. Some evolutionary paths might be planned in advance while others evolved naturally. However, some decisions must be made by partners involved with the company about evolution. This includes decisions regarding continuation, termination of employment, promotion and modification of engagement* [5].

2.6 *Problem Analysis*

Problem analysis is an assumption of problems that occur in the company that will be described in the procedure. The following analysis of the problem at Zhafran includes :

1. *The Marketing Section has difficulty in promoting products to customers* Zhafran, *so the Marketing Section cannot determine which products are suitable for promotion on social media (Facebook and Instagram). Therefore it requires a system in recommending products as a reference for what products will be advertised or promoted*.
2. *Part* CS *has difficulty in determining the offer of other product recommendations to customers, so that when the product is empty or purchases exceed the number of existing products, Part* CS *does not offer other products. Therefore it requires a system in recommending other products as a convenience Part* CS *in seeing which rules the product is suitable to be offered as a recommendation.*

2.7 CRM *Framework Analysis in* Zharan

Based on the explanation of the stages of the CRM *framework in the previous sub-chapter, the application of the association rules method is at the design stage. This stage looks for combinations of items that meet the minimum requirements of the support value in the database.*

The value of support is the relationship of several items in the existing ordering data (for example from the existing ordering data, the relationship between items A *and* B *to be purchased simultaneously*) [6]. *Customer order data stamp taken from the period* 2 *February* 2019 *can be seen in table* 1.

***Table* 1.** *Sample ordering data*

Transaction Code	***Products Sold***
001	Topi Tauhid Reguler
002	Topi Tauhid Reguler, Topi Trucker Tauhid, Mikhat
003	Topi Tauhid Reguler
004	Ganci & Pin
005	Topi Tauhid Reguler
006	Topi Tauhid Reguler

After determining the sample from the order data, then can determine the minimum support to determine what products will be recommendations, for example a minimum support of 15%, *by counting the number of transactions containing* A (*products sold*) *in the above table and dividing it by the total transactions by the formula following* :

$$Support(A)=\frac{Number\ of\ Transactionsi}{Total\ Transactions} \quad (1)$$

***Table* 2.** *Value of support from product combinations*

Product Combination	***Number of Transactions***	***Support***
Topi Tauhid Reguler	5	83,33%
Topi Trucker Tauhid	1	16,67%
Topi Tauhid Anak	0	0
Kaos Syiar	0	0
Topi Baseball Tauhid	0	0
Five Panel	0	0
Mikihat	1	16,67%
Bendera	0	0
Ganci & Pin	1	16,67%
Topi Tactical Tauhid	0	0
Topi Komando Tauhid	0	0
Ripet Tauhid	0	0

Looking for a predetermined support value, the following table support values on candidate 1 *product, can be seen in table* 3.

***Table* 3.** 1 *product support values*

Product	***Transaction Qty***	***Support***
Topi Tauhid Reguler	5	83.33 %
Topi Trucker Tauhid	1	16.67 %
Mikihat	1	16.67 %
Ganci & PIN	1	16.67 %

The following table supports the value of the candidate 2 *products, can be seen in table* 4.

***Table* l 4.** 2 *product support values*

***Product* -1**	***Product* -2**	***Transaction Qty***	***Support***
Topi Tauhid Reguler	Topi Trucker Tauhid	1	16.67 %
Topi Tauhid Reguler	Mikihat	1	16.67 %
Topi Trucker Tauhid	Mikihat	1	16.67 %

The following table supports the value if the candidate 3 *products, can be seen in table* 5.

***Table* 5.** 3 *product support values*

Product -1	**Product -2**	**Product -3**	**Transaction Qty**	**Support**
Topi Tauhid Reguler	Topi Trucker Tauhid	Mikihat	1	16.67 % (Lolos)
Topi Tauhid Reguler	Topi Trucker Tauhid	Mikihat	1	16.67 % (Lolos)
Topi Tauhid Reguler	Mikihat	Topi Trucker Tauhid	1	16.67 % (Lolos)

After the predetermined support value is found, then we can look for associative rules that meet the minimum requirements for confidence by calculating the confidence of associative rules A → B. *Confidence is the magnitude of the relationship between 2 items, such as the number of times item* A *is purchased by a customer if the customer purchases item* B [8].

To find out the value of Confidence (Probability) can be calculated by the formula below :

$$Confidence = \frac{Number\ of\ Transactions\ containing\ A\ and\ B}{jNumber\ of\ Transactions\ Containing\ A} \quad (2)$$

The confidence value can be seen in table 6.

Table 6. *Association rule of confidence values*

Product purchased	***Recommendation***	***Support***	***Confidence***
Topi Tauhid Reguler, Topi Trucker Tauhid	Mikihat	16.67 %	16.67 %
Topi Tauhid Reguler, Mikihat	Topi Trucker Tauhid	16.67 %	16.67 %
Topi Trucker Tauhid, Mikihat	Topi Tauhid Reguler	16.67 %	83.33 %
Topi Tauhid Reguler, Topi Trucker Tauhid	Mikihat	16.67 %	16.67 %
Topi Tauhid Reguler, Mikihat	Topi Trucker Tauhid	16.67 %	16.67 %
Topi Trucker Tauhid, Mikihat	Topi Tauhid Reguler	16.67 %	83.33 %
Topi Tauhid Reguler, Mikihat	Topi Trucker Tauhid	16.67 %	16.67 %
Topi Tauhid Reguler, Topi Trucker Tauhid	Mikihat	16.67 %	16.67 %
Mikihat, Topi Trucker Tauhid	Topi Tauhid Reguler	16.67 %	83.33 %
Topi Trucker Tauhid	Topi Tauhid Reguler	16.67 %	16.67 %
Topi Tauhid Reguler	Topi Trucker Tauhid	16.67 %	83.33 %
Mikihat	Topi Tauhid Reguler	16.67 %	16.67 %
Topi Tauhid Reguler	Mikihat	16.67 %	83.33 %
Mikihat	Topi Trucker Tauhid	16.67 %	16.67 %

The value of this support and confidence is used by the CS *and Marketing Sections in determining product recommendations. From the results of the table above is a sales strategy which is a benchmark of the company's strategy in increasing product sales and customer loyalty* [9], *for Marketing and* CS, *for example when customers make a purchase transaction* Topi Tauhid Reguler, Topi Trucker Tauhid *then Section* CS *will recommend* Mikihat *to These customers to*

customers via WhatsApp while for promotions carried out on Facebook and Instagram.

2.8 *Functional Requirements Analysis*

This analysis is an analysis phase that describes the design in the process of establishing a system that is made. The following is an overview of DFD *level* 1 Zhafran, *can be seen in Figure* 2.

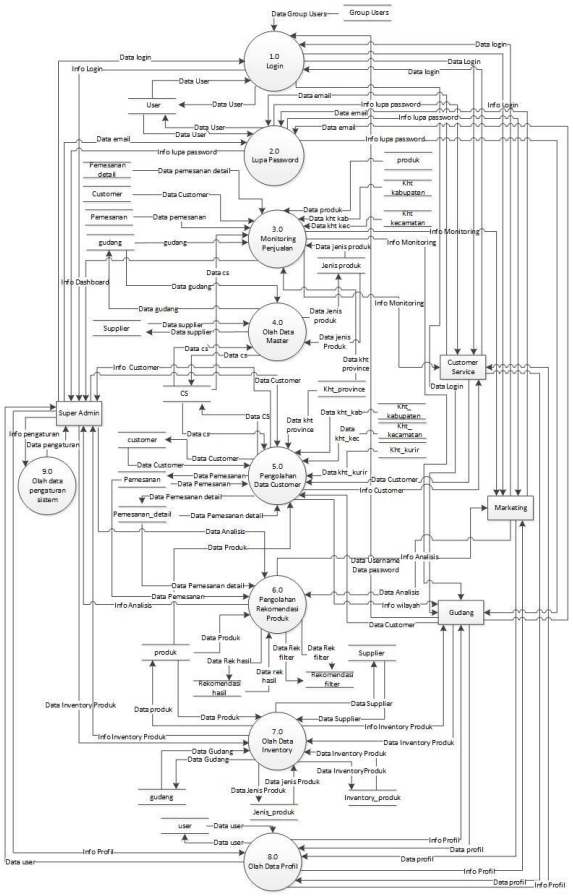

***Figure* 3.** DFD *level* 1 Zhafran

2.9 *Implementation and Testing*

The results obtained are CRM *information systems that can recommend a product as facilitating Customer Service* (CS) *in offering other products appropriately to customers and making it easier for the Marketing Department to determine which products will be promoted. The following is a display of the interface implementation of the product recommendations used at* Zhafran, *which can be seen in Figure* 4, *Figure* 5 *and Figure* 6.

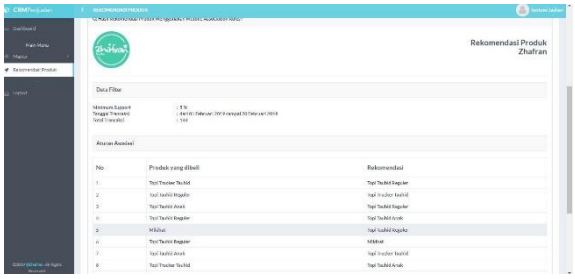

***Figure* 4.** *Implementation of the product recommendation interface*

Figure 5. *Implementation of the ordering data interface*

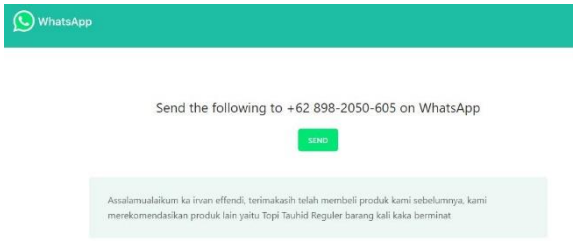

***Figure* 6.** *Implementation of the product recommendation message interface*

The test used is User Acceptance Testing (UAT), *this test is a testing process by the user and produces documents to be used as evidence that the application developed is acceptable to the user and the test results are considered to meet the needs of users* [7]. *The* UAT *stages include* :

a) Check compliance with user requirements
b) See clearly the functionality or business processes
c) *Limit the system that has been made* [10].

3. *CLOSING*

From the analysis results and test results, conclusions can be drawn as follows :

1. *CRM with the Association Rules method in recommending products made can help the Marketing Section at* Zhafran *in promoting the products offered by Zhafran to customers.*
2. *Customer Relationship Management with the Association Rules method in recommending products made can help the Customer Service Section know the right product as an offer to the customer*.

In addition, suggestions for the development of this CRM *system, namely* :

1. *Showing the results of product recommendations there needs to be a ranking position for the product to be recommended based on the possibility of customers in the transaction.*
2. *Add product charts as information to get product information that is often purchased by customers.*

BIBLIOGRAPHY

[1] Adhi, Bayu. "Penerapan Strategi Penjualan Menggunakan Association Rules Dalam Konteks CRM", Jurnal Generic, vol. 1, no. 2, 2010.

[2] Heryandi, Andri. "*Pembangunan Sistem Informasi Pengisian Survey Evaluasi Perkuliahan Online Di Universitas Komputer Indonesia*", Jurnal Ilmu Komputer dan Informatika (KOMPUTA), vol. 1, no. 2, 2012.

[3] Buttle. Francis and Stand Maklan, *Customer Relationship Management*, 2015.

[4] A. J. Kundre, Irya Wisnubadra, Thomas Suselo." *Penerapan Customer Relationship Management Dengan Dukungan Teknologi Informasi Pada PO. Chelsy*", 2013.

[5] P. Atul, Jagdish N. Sheth. "*Customer Relationship Management : Emerging Practice, Process, and Discipline*" , Journal of Economic and Social Research, 2012.

[6] G. Goldie, Dana Indra Sensuse, "*Penerapan Metode Data Mining Market Basket Analysis Terhadap Data Penjualan Produk Buku Dengan Menggunakan Algoritma Apriori Dan Frequent Pattern Growth (Fp-Growth) : Studi Kasus Percetakan Pt. Gramedia*", vol. 4, no. 1, 2012.

[7] M.B. Achmad, Rifki Awaludin, Aries Muslim, Teddy Oswari, "*Testing Implementasi Website Rekam Medis Elektronik Opeltgunasys Dengan Metode Acceptance Testing*", vol. 8, 2014.

[8] Altien J. Rindengan. "Perbandingan Assosiation Rule Berbentuk Biner dan Fuzzy C-Partition Pada Analisis Market Basket dalam Data Mining", Jurnal Ilmiah Sains, Jurusan Matematika, Universitas Sam Ratulangi, Vol. 12, No. 2, 2012.

[9] W.P. Widharta, Sugiono Sugiharto. "*Penyusunan Strategi dan Sistem dalam Rangka Meningkatkan Penjualan Toko Damai*", Jurnal Manajemen Pemasaran Petra, Jurusan Manajemen Pemasaran,Universitas Kristen Petra, Vol. 2, No. 1, 2013.

[10] MuntheRouli, Pauus Insap Santosa, Ridi Ferdiana. "*Usulan Metode Evaluasi User Acceptance Testing (UAT) Dalam Pengembangan Perangkat Lunak*" Prosiding Seminar Nasional Pendidikan Teknik Informatika, Universitas Gadjah Mada, Yogyakarta, 2015.