DEVELOPMENT OF DETERMINATION SYSTEM FOR OPENING NEW BRANCHES USING MARKET ANALYSIS WITH CRM APPROACH IN TRIDAYA SINERGI INDONESIA INC

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ABSTRAK

PT Tridaya Sinergi Indonesia is a company engaged in the distribution of goods in this case is a herbal cigarette made from 17 spices composition that is believed to normalize blood pressure, suppress cholesterol and gout. The company whic located at Jl. Sukamulya No.44 A, Pasteur, Sukajadi, Bandung, West Java is distributing hundreds of thousands packs of cigarettes every month to meet consumers demands who have reached 52.325. But PT Tridaya Sinergi Indonesia experiencing constraints when it wants to open a new branch where the marketing feel difficult in choosing which areas have high market potential, especially for the herbal cigarette market. From these problems it is necessary to have a system that can analyze market share and market segmentation to customers of PT Tridaya Sinergi Indonesia using Customer Relationship Management (CRM) approach. The method used to determine which area of town or district is suitable for opening the new branch is Simple Additive Weight (SAW). Based on the results of blackbox testing and interviews it can be concluded that this system has helped the company in determining which area of the city or district that has a high market potential for the opening of new branches in the place.

Keys : Customer relationship Management, Market Segmentation, Simple Additive Weight, alternative braches location, information system, Market Expantion

1. PREFACE

PT Tridaya Sinergi Indonesia is a herbal cigarette distributor company made from 17 spices composition which is believed to normalize blood pressure, suppress cholesterol and gout. The company is located at Jl. Sukamulya No. No.44 A, Pasteur, Sukajadi, Bandung, West Java is distributing hundreds of thousands of packs of cigarettes every month to meet consumers who have reached 52,325. PT Tridaya Sinergi Indonesia implements a multi level marketing system consisting of stockists and members in raising their products.

Based on an interview with Mr. Ramli Ilham as the head of marketing division since the inception of PT. Tridaya Sinergi Indonesia until now the sales graph and consumer increase continue to show a positive movement. In 2011 the company only had 3243 subscribers but in the following year, in 2012 the company managed to increase the number of subscribers to 12465 customers. This continues to happen until 2017 where the number of subscribers in 2017 recorded 52,325 customers. With the increasing number of customers will certainly result in an increase in the amount of revenue generated by the company. In 2011 the company only earned a net income of around 2.5 billion rupiah. But in 2012, the company managed to increase its income to 7.5 billion rupiah. The increase in income continues until 2017 with the highest income of 22.7 billion rupiah. This is certainly an opportunity to enlarge the business network of companies that currently only have 3 branches and spread only in West Java alone. While the market share in Indonesia is still very open considering the number of people who smoke in Indonesia is spelled out very much.

Based on the description of the problem that occurred at PT. Tridaya Sinergi Indonesia, it needs a system that can analyze the share in each region and can give recommendation whether the area is suitable to be a new branch place with CRM (Customer Relationship Management) approach. Customer Relationship Management itself is the way how a company builds long-term relationships with its customers and retains customers whose purpose is to create mutually beneficial relationships between companies and customers. There are three types of companies that can be done to develop with customers, namely financial benefits, social benefits and structural bonds.

1.1 *Customer Relationship Management*

Customer relationship management (CRM) is a strategy in business development that brings together various processes and functions with all existing networks to create value for customers or consumers profitably [1].

1.2 Framework CRM Analysis

Framework is a framework dedicated to the development of CRM systems. Currently, a company needs to have a web based cem information system where the company is given the opportunity to choose how the company interacts with customers and select potential customers to do strategy in maintaining it. So the company can get feedback directly through this website technology.

To determine the exact target crm feature of course required framework or framework as a reference. CH Park & YG Kim proposed a CRM Framework called "A framework of Dynamic CRM" [2].

This framework describes a series of stages on the development / deployment of CRM. The CRM framework can be seen in Figure 1.

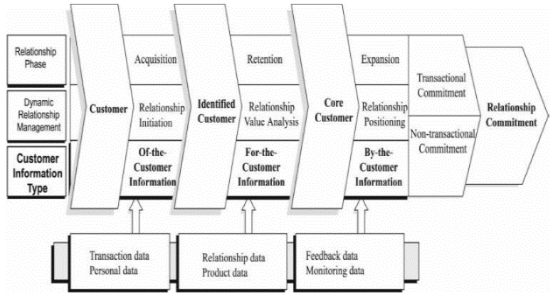


Figure 1 Framework of Dynamic CRM

1.3 Type and Rank of CRM

The following is the type and level of Customer Relationship Management [1].

1. Strategic CRM

This type of CRM is more focused on how the company's efforts to develop a customer-oriented business culture.

2. Operational CRM

This type of CRM is more focused on how the company automates in dealing with its customers.

3. Analitic CRM

This type of CRM is more focused on how companies empower customer information, partners and internal companies so as to provide information that is important to decision makers and provide added value to companies and customers and partners.

1.4 Target Marketing

In conducting marketing activities, we need to determined in advance which target market is intended to get the expected results . Target market can be determined when a company has to segment the market of goods / services sold. Target market determination is very important, considering that companies that fall into several markets such as consumer markets, industrial / producer markets, merchant markets and government markets know that they can not serve all customers in some of these markets. The number of existing customers is not proportional to the number of tbsp owned by the company to serve them, so that the competing company will take advantage by serving a certain market segment (customer) that is not served by the company [3].

Here are 3 steps in target marketing.

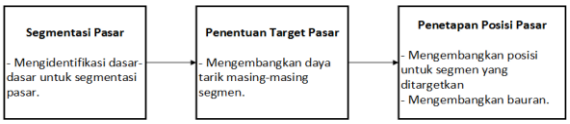


Figure 2 Market Targeting

1. Segmentation of The Consumer Market

Market segmentation is a way to segment the consumer market. Some researchers attempt to define segments by looking at geographic and demographic characteristics.

Below is an explanation of geographic and demographic segmentation:

a. Geographical segmentation, which is to devote the market in the form of geographic units. Examples of geographical segmentation are the division of the State, the district and the city.

b. Demographic segmentation, which divides the market divided into several variables such as age, family size, family life cycle, gender, income, occupation, education, religion, race, generation, nationality and social class.

2. Market Targeting

Market targeting is done after market segmentation has been evaluated. The goal of market targeting itself is to select targeted target markets [4]

3. Positioning

Positioning is the stage where the company creates its own space for customers to be more loyal to the products sold by the company [4].

1.5 Decision Support System

For taking a right decision of course required tools to make decisions that are made not harm the company. With the use of decision support systems are expected to assist companies in taking a right decision [5].

1.5.1 Simple Additive Weighting (SAW)

SAW method is one method of decision support system that has a basic concept that is the weighted sum of the performance rating on each alternative on an attribute [6].

There are 2 attributes on the SAW method of benefit and cost criteria. Where profit criteria are criteria that can provide benefits for the company.

While the cost criterion is the criteria that incur costs for the company.

2. CONTENT

2.1 Problem Analysis

Problem analysis is an estimate of the problems described in data processing on the development of Information Systems using Customer Relationship Management approach in PT Tridaya Sinergi Indonesia. Analysis of problems of the current system is PT Tridaya Sinergi Indonesia difficulties in determining the area to be a new branch and has a potential market opportunity.

2.2 Analisis Framework CRM

The CRM framework used in the development of information systems with customer relationship management approach in PT Tridaya Sinergi Indonesia is Dynamic CRM. It can be seen that the CRM steps in a framework is a series of processes consisting of Aquitition, Retention, and Expansion stages. As an integrated CRM framework based on several types of customer information arranged in pyramids, the process or activity in the phases of the Framework of Dynamic CRM are as follows:

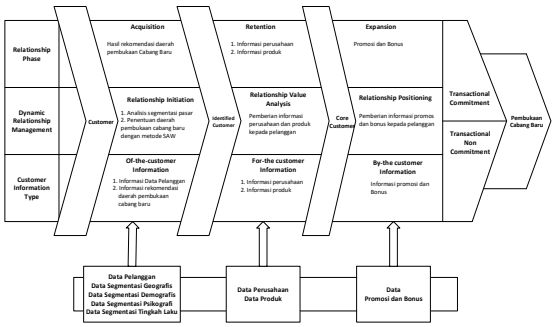


Figure 3. Framework Dynamic CRM

2.2.1 Acquisition Phase

Phase Acquisition is the process of acquiring a new relationship. In this phase will be a process to attract new customers or at the stage of CRM development called Acquire.

The facility built in the acquisition phase is the facility of determining the area to be a new branch by Marketing Manager.

2.2.1.1 Analysis of Market Share

Analysis of market opportunity is done to know the market potential in each regency / city spread in West Java Province to the products sold by PT Tridaya Sinergi Indonesia. To know the potential of sales in a region, it will be 3 stages of analysis of Market Segmentation, Market Targeting and Market Positioning:

1. Market Segmentation

The potential market owned by PT Tridaya Sinergi Indonesia is divided into districts / cities spread in West Java Province. So market segmentation needs to be done so that new target consumers become targeted according to the desired company. The market segmentation used to calculate the market potential for determining the opening area of a new branch is as follows:

a. Geographic Market Segmentation
   Geographic market segmentation is a way to classify customers into parts of the market by region or geographical scale by region, climate, city or village. In research at PT Tridaya Sinergi, geographical segmentation is done based on geographical area division become districts / cities spread in West Java Province.

b. Demographic Market Segmentation
   Demographic Market Segmentation is a way to classify consumers into market segments according to demographic variables such as; age, sex, occupation, income, number of family members, education, social class, descent or ethnicity, religion and religion. In research at PT Tridaya Sinergi, the variable used is the population of Men over 20 years in every District and City in West Java Province and the number of existing customers in each District or City in West Java Province.

2. Case Analysis

At this stage, preparing prepared data is calculated to obtain the percentage value of potential market opportunities per region.

Table 1. Market Share Analysis

Kabupaten/Kota	Penduduk Pria Diatas 20 Tahun (PPD20)	Total Seluruh Penduduk(TSP)	(PPD20/TSP)*100%
Kab. Bogor	1.955.355	14.467.340	13.52%
Kota Bekasi	958.725	14.467.340	6.63%
Kab. Karawang	816.552	14.467.340	5.64%
Kab. Cianjur	808.642	14.467.340	5.59%
Kab. Subang	540.682	14.467.340	3.74%

3. Market Targeting

Market Targeting is a way to adjust the market opportunity recommendations that have been made in the segmentation phase with targets set by the Marketing Manager of PT Tridaya Sinergi. The process of ranking kabupeten / kota among others as follows:

a. Determine of Criteria and Weight (W)
   Define criteria and weights before performing calculations. Based on the interview with the Marketing Manager, the weight value in the table below is the weighted value based on the analysis of the Marketing Manager. Manurut Marketing Manager, Number of Customers has a higher sales value compared to

other variables. This is because the customer becomes the end of the goods chain distribution process, while the other variables are only supporters of market potential in a region. Therefore, the Marketing Manager believes that the number of customers is has the highest market potential value with other variables.

Table 2. Weight of Criterias

No	Kriteria	Bobot
1	Jumlah Pelanggan	50%
2	Jumlah Pengeluaran Perkapita	25%
3	Jumlah Transaksi	25%

The result of the above table will form the matrix W = [0.50 0.25 0.25] Where:

W_{11} = 0,50 is the weight for number of customer.

W_{12} = 0,25 is the weight for expenditure per capita.

W_{13} = 0,25 is the weight for number of transactions.

b. Determine of Benefit and Cost

Table 3. Cost and Benefit

No	Kriteria	*Cost*	*Benefit*
1	Jumlah Pelanggan		√
2	Jumlah Pengeluaran Perkapita		√
3	Jumlah Transaksi		√

Based on table 3, all criteria include criteria that are of value to the benefit (benefit) for the company.

c. Provide Data that will be Analyzed

The data used is the data of market segmentation that has been done before. Based on the selection of alternatives conducted in the market segmentation phase, five districts / municipalities have been analyzed beforehand into the SAW (Simple Additive Weight) method.

Table 4. The Data being Analyzed

No	Kabupaten/Kota	Jumlah Pelanggan	Pengeluaran Perkapita	Jumlah Transaksi
1	Kab. Bogor	5160	9537	214567
2	Kota Bekasi	7332	15236	144522
3	Kab. Karawang	4064	10379	109867
4.	Kab.Cianjur	3557	7074	128977
5.	Kab. Subang	3742	10012	115686

d. Convert Data Into Matrix Form

After getting the data to be analyzed, then the data is converted into the form of X matrix.

$$X = \begin{bmatrix} X11 & X12 & X13 \\ X21 & X22 & X23 \\ X31 & X32 & X33 \\ X41 & X42 & X43 \\ X51 & X52 & X53 \end{bmatrix} \longrightarrow X = \begin{bmatrix} 5160 & 9537 & 214567 \\ 7332 & 15236 & 144522 \\ 4064 & 10379 & 109867 \\ 3557 & 7074 & 128977 \\ 3742 & 10012 & 115686 \end{bmatrix}$$

e. Perform normalized decision matrix (X) for each criteria.

The criteria of the number of customers included in the attribute of profit (benefit), because the greater the value produced, then considered the better.

$$R_{11} = \frac{5160}{Max(5160;7332;4064;3557;3742)} = \frac{5160}{7332} = 0.70$$

Nilai 0.70 untuk perhitungan Kab. Bogor.

$$R_{12} = \frac{7332}{Max(5160;7332;4064;3557;3742)} = \frac{7332}{7332} = 1$$

Nilai 1 untuk perhitungan Kota Bekasi.

$$R_{13} = \frac{4064}{Max(5160;7332;4064;3557;3742)} = \frac{4064}{7332} = 0.55$$

Nilai 0.55 untuk perhitungan Kab. Karawang.

$$R_{14} = \frac{3557}{Max(5160;7332;4064;3557;3742)} = \frac{3557}{7332} = 0.48$$

Nilai 0.48 untuk perhitungan Kab. Cianjur.

$$R_{15} = \frac{3742}{Max(5160;7332;4064;3557;3742)} = \frac{3742}{7332} = 0.51$$

Nilai 0.51 untuk perhitungan Kab. Subang.

From the above data can be concluded that with the criteria of the number of members, the highest value is in the City of Bekasi with a value 1.

If the calculation with normalization of decision X has been done, then obtained matrix R as below:

$$R = \begin{bmatrix} 0.70 & 0.63 & 1 \\ 1 & 1 & 0.57 \\ 0.55 & 0.68 & 0.61 \\ 0.48 & 0.46 & 0.60 \\ 0.51 & 0.65 & 0.54 \end{bmatrix}$$

f. Peform Ranking Precess

After getting the matrix R, it will be calculated ranking with equation formula based on the matrix equation V on SAW method written at page 34, then obtained equation below.

v_1 = ((0.50)(0.0.70)) + ((0.25)(0.63)) + ((0.25)(1))
= 0.35 + 0.1575 + 0.25.
= 0.7575

0.7575 is the value of Kab. Bogor.

v_2 = ((0.50)(1)) + ((0.25)(0.1)) + ((0.25)(0.67))
= 0.5 + 0.25 + 0.1675
= 0.9175

0.9175 is the value of Kota Bekasi.

v_3 = ((0.50)(0.55)) + ((0.25)(0.68)) + ((0.25)(0.61))
= 0.275 + 0.17 + 0.1525
= 0.5975

0.5975 is the value of Kab. Karawang.

v_3 = ((0.50)(0.48)) + ((0.25)(0.46)) + ((0.25)(0.60))

= 0.24 + 0.115 + 0.15
= 0.505

0.505 is the value of Kab. Cianjur.

v_3 = ((0.50)(0.51)) + ((0.25)(0.65)) + ((0.25)(0.54))
= 0.255 + 0.1625 + 0.135
= 0.5525

0.5525 is the of Kab. Subang.

From the above data it can be concluded that the City of Bekasi is superior to other areas with a value 0.9175.

4. Conclusion of Market Targeting Case

Based on the calculation stage with the method of SAW (Simple Additive Weight) for the determination of new branches of 5 potential areas analyzed ie Kab. Bogor, Kota Bekasi, Kab. Karawang, Kab. Cianjur and Kab. Subang, Then based on the calculation of recommendations for the opening of a new branch is the City of Bekasi with a value of 0.9175 which occupies the 1st position in ranking, Kab. Bogor with a value of 0.7575 which occupies the 2nd position in perankingans and Kab. Karawang with a value of 0.5725 which occupies the 3rd position in ranking, Kab. Cianjur with the value 0.505 who occupied the 4th position in perankingans, Kab. Subang with a value of 0.5225 which occupies the fifth position in perankingans. Below is a table after ranking based on the recommendations for opening new braches.

Table 5. Ranking Table

No	Kabupaten/Kota	Nilai Akhir	Ranking
1.	Kota Bekasi	0.9175	I
2.	Kab. Bogor	0.7575	II
3.	Kab. Karawang	0.5725	III
4.	Kab. Subang	0.5525	IV
5.	Kab. Cianjur	0.505	V

2.2.1.2 Retansion Phase

In this phase, the company undertakes a strategy to retain its customers by improving services. Based on interviews with the Marketing Manager, the current strategy by the company is as follows:

a. Branding
b. Promotion and advertisement
c. Giving bonus to customer
d. Product return

2.2.1.3 Expansion Phase

This stage aims to maintain customer loyalty to products distributed by PT Tridaya Sinergi Indonesia. Features that will be built in the expansion stage is a feature that will provide information on promotions imposed by PT Tridaya Sinergi Indonesia.

2.3 Analisis Basis Data

Database analysis on the information system of the establishment of new branches using Entity Relationship Diagram (ERD). The designed ERD can be seen in Figure 4.

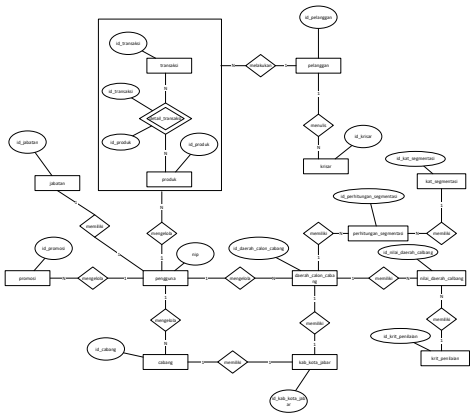


Figure 4. ERD of Information System for Determination for Opening New Branch in Tridaya Sinergi Indonesia INC

2.4 Context Diagram

Context diagram is the highest level diagram of the DFD that describes the input or output of a system and relationships in the system with its users. Context diagram information system of the establishment of new branches in PT Tridaya Sinergi Indonesia can be seen in Figure 5.

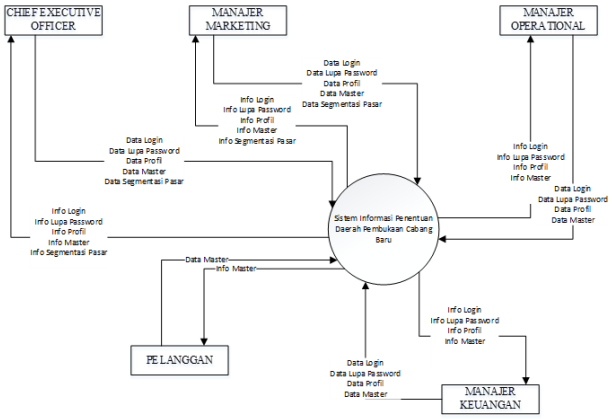


Figure 5. Context Diagram

2.5 Interface Design

Interface design is made to describe the appearance of the program to be built. The design of interface juaga aims to merancanga interfaces that will be by the users who. The design is made based on the interface of both input and output that will be generated when the application is implemented.



Figure 6. Login Interface Design

2.6 Semantik Network Design

Semantic network design is a representation of interface design that shows where each interface is connected. Semantic network design in the information system of the establishment of new branches in PT Tridaya Sinergi can be seen in Figure 7.

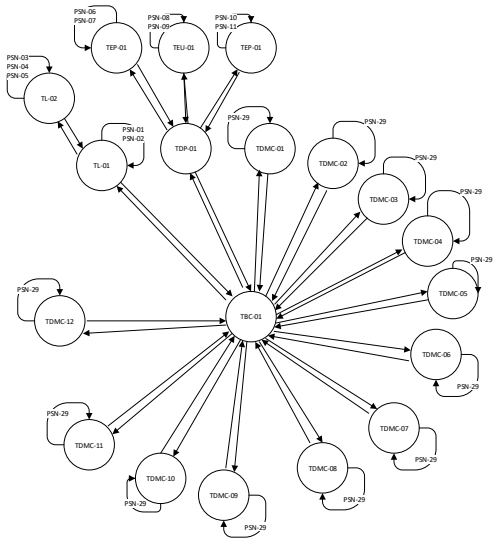


Figure 7. Semantic Network

2.7 System Testing

System testing is done to find out what errors or deficiencies in the system of determining the opening area of new branches tested. Testing intends to determine the system of determining the opening of new branches that have been made to meet the performance in accordance with the design objectives.

2.7.1 Functional Testing

Functional testing is done to determine whether the input and output on the system according to what has been expected. Here is an example of functional testing:

Table 6. Forget Password Testing

Data Masukan	Yang Diharapkan	Pengamatan	Kesimpulan
Kasus dan Hasil Uji (Data Benar)			
Contoh masukan NIP : BDG256645	Muncul pesan "Permintaan lupa kata sandi sedang diproses. Silahkan cek email anda untuk melihat pemulihan kata sandi."	Muncul pesan "Permintaan lupa kata sandi sedang diproses. Silahkan cek email anda untuk melihat pemulihan kata sandi."	☒ diterima ☐ ditolak
Kasus dan Hasil Uji (Data Salah)			
Contoh masukan NIP: 1313	Muncul pesan "NIP yang anda masukkan tidak terdaftar dalam sistem."	Muncul pesan "NIP yang anda masukkan tidak terdaftar dalam sistem."	☒ diterima ☐ ditolak
Kasus dan Hasil Uji (Data Kosong)			
Contoh masukan NIP:	Muncul pesan "NIP tidak boleh kosong."	Muncul pesan "NIP tidak boleh kosong."	☒ diterima ☐ ditolak

2.7.1.1 Conslusion of Functional Testing

Based on the test results with the sample test cases that have been done to give the conclusion that the functional system has been able to generate system requirements in accordance with the expected. Likewise with the filtering process error in the form of landing page view of the message is quite maximal.

2.7.2 User Testing

User testing is a test done by delivering software that has been built to the user and tested by the user to see if the software that has been built works as expected. Users will conduct an assessment of the system using interview methods addressed to the Chief Executive Officer, Marketing Manager, Operations Manager and Financial Manager as users of the company with questions based on the purpose of the research. So the questions given will be appropriate and clear.

Table 7. Interview Recapitulation

No.	Pertanyaan	Jawaban
1	Bagaimana pendapat Anda mengenai pengelolaan data/informasi yang berkaitan dengan perusahaan Anda dengan adanya sistem informasi ini?	Dengan adanya aplikasi sistem informasi ini cukup membantu dalam mendapatkan informasi dan pengelolaan data-data yang berkaitan dengan perusahaan.
2	Apakah dengan adanya sistem informasi ini memudahkan Anda berkoordinasi dalam penentuan daerah pembukaan cabang baru di perusahaan?	Ya, karena informasi dapat diakses kapan dan dimana saja sehingga mudah dalam melakukan koordinasi.
3	Apakah dengan adanya sistem informasi ini dapat meningkatkan hubungan perusahaan Anda dengan pelanggan?	Dengan adanya aplikasi sistem informasi ini pelanggan dan perusahaan menjadi lebih mudah dalam mencari dan memberikan informasi.
4	Bagaimana pendapat Anda mengenai bahasa yang digunakan pada sistem informasi ini?	Bahasanya mudah dimengerti.
5	Bagaimana pendapat Anda mengenai tampilan antarmuka pada sistem informasi ini?	Bagus, karena desain dan kombinasi warnanya padu sehingga enak dilihat.
6	Bagaimana pendapat Anda mengenai kemudahan penggunaan sistem ini?	Sistem ini cukup mudah untuk digunakan
7	Apakah Anda memiliki kritik dan saran terhadap sistem informasi ini agar dapat lebih baik lagi?	Saran saya agar aplikasi ini dapat diterapkan pada aplikasi mobile pada pengembangan selanjutnya.

2.7.2.1 Conclusion of User Testing

Based on the answers from users and customers regarding the information system of determining the opening area of new branches tested it can be concluded that:

1. Application of interface, language and use of information system application can be accepted by all users and customers in Tridaya Sinergi Indonesia environment.
2. The application of the information system created can help the Chief Executive Officer (CEO) of PT Tridaya Sinergi Indonesia in obtaining information from data managed by other users, especially information on the determination of marketing and product development areas so as to facilitate the coordination between the CEO and other users.
3. The application of the information system created can assist the Marketing Manager in performing the management of customer data and provide recommendation of opening new potential branch area which become reference of company promotion step after determining a company area.
4. The application of information systems created can help the Operational Manager in managing product data.
5. The information system application created can assist the Finance Manager in exercising control over all application users.

3. CLOSING

3.1 Conclusion

After doing the analysis, design, implementation and testing. So it can be concluded that the information system determining the area of determination of the opening area of this new branch can help Marketing Manager PT Tridaya Sinergi Indonesia in determining the potential market opportunities in selected districts / cities to be a new branch.

3.2 Suggestion

In order for the system that has been built to work better, should be done additions / improvements such as:

1. There is a deeper improvement in the analysis of the establishment of new branches.
2. Can be built into Mobile Apps to simplify the management of operational data.

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