DEVELOPMENT OF CUSTOMER RELATIONSHIP MANAGEMENT (CRM) INFORMATION SYSTEM IN PT. INDOTO TIRTA MULIA

Dony Surya Manggala[1]

[1] Teknik Informatika – Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
Email : dony_manggala@gmail.com[1]

ABSTRACT

PT. Indoto Tirta mulia is one of West Java Industrial Company who specialised in Ladies shoes and slippers. as a company asset, costumer is one of valuable asset that make every company boost their service and product quality gradually from time to time to maintain costumer satisfaction. as a matter of fact in this time, PT. Indoto Tirta Mulia main obstacle is lack of management in costumer and marketing that lead to costumer loss because costumer choose to buy product from other company who run in the same industry as PT. Indoto Tirta Mulia.

This Research give a solution to this problem by applying Costumer Relationship Management concept or CRM to bolster PT. Indoto Tirta Mulia Business activity by use Recency, Frequency, Monetary analysis who could segmented and calculated costumer, base on costumer transaction.

The outcome of this research is a CRM Information System who could help Director evaluated company business process, and help Vice Director in processing costumer data, base on the result of RFM analysis and facilitate costumer to get information. With applying this system , we expected to maintain and even increase loyalty of PT. Indoto Tirta Mulia's costumer.

Keyword: *PT. Indoto Tirta Mulia, Information System, Customer Relationship Management (CRM), Recency, Frequency, Monetary (RFM).*

1. INTRODUCTION

PT Indoto Tirta Mulia was one of the efforts in the field of processing industry and sandals women's shoes, which was built in 2000 and is located at JL. Cilisung No. 04 RW RT. 39. 05 DS. Sukamenak Subdistrict Margahayu, Bandung, West Java, Indonesia. This company alone produced more than 20000 thousand shoe products within 1 month. As for the types of sandals or shoes that are produced such as Boots, Flats, Heels, Sandals, platforms and Wedges. The company became one of the companies that produce products that are safe and of high quality.

Based on the results of an interview with one of the parties of the company, explained that the large number of customers who come into the company is from corporations engaged in the industrial sales of sandals and women's shoes, where the prospect of booking to the company with their own trademark. Along with the development of competition in the field of sandals and shoes which occurred at this time, the transfer of customers from a company to the company's competitors have become a reasonable case occurs. Where competitors here are companies engaged in processing industry sandals and shoes. The shift is caused due to the lack of relationship between the company and the customer after the transaction is completed, the appearance of the goods substitution as well as the large number of existing supplier selection, in addition to other factors such as price, quality and can also affect customer loyalty. Product innovation factors also influence the occurrence of the transition of customers because competitors keep trying to develop products with the latest market trend following. So it can be known of the problems encountered by PT Indoto Tirta Mulia currently is the lack of customer management and marketing, which led to the transfer of the company's customers to competitors. Something like this would certainly affect the stability of the Profit from the venture, PT Indoto Tirta itself. As for customers who switch from PT Indoto Tirta Mulia to competitors within the last 1 year is ± 23 companies.

One of the efforts made by the company in maintaining customer loyalty is by implementing a marketing strategy, because the marketing strategy has an important role to the success of the company. This type of marketing strategy that is used in this study i.e. strategy marketing mix that includes product, pricing, and promotion. In support of the company to execute the marketing strategy required a strategy where we can determine the target prospect. One way to determine target prospect is to do an analysis of market share so that the company can determine precisely target potential customers. In addition it takes an information technology that provides a major role in the management of the business. One of the technologies of the information until now widely used by people of the world is to disseminate information through a website, where

companies are expected to follow the trend of marketing in the present era, if not as a result of more competitors have great opportunities in providing information to the customers who cause customers switch to competitors. In addition to maintaining market share, owned the company, the company also implemented a service complaint service, where customers can deliver the complaint to the company in order to enhance customer loyalty.

Therefore, the need for a medium that can manage the relationship between a company with customers. By looking at the conditions and problems of PT Indoto Tirta Mulia, then it can be concluded that at PT Indoto Tirta Mulia needed information systems Customer Relationship Management (CRM). As for the types of CRM is Analitikal. The existence of this system is expected to assist the company in providing strategies for increasing customer loyalty at PT. Indoto Tirta Mulia.

2. CONTENT RESESEARCH

2.1 *Customer Relationship Management*

CRM is a business strategy by applying information technology in the company's comprehensive, reliable, and integrated based on the perspective of the customer, so that all processes and interactions of mutual help to maintain and develop a relationship that is beneficial. [1]

CRM is a business strategy that is applied to study the needs and behaviors of customers so that the company can maintain the customers how to build strong relationships between companies with customers. Customer Relationship Management (CRM) is not merely technological, although in practice must be supported by a series of technology. CRM can also be defined as a process that combines the various pieces of information about customers, sales, marketing effectiveness, the level of response to the market, and market trends.

The purpose of the CRM system is to improve services to customers, increase customer satisfaction, and make sure the memories of customers with straightening way to do business with technology integration. In addition, the main goal of CRM is to identify, anticipate, retaining, understanding the needs of customers both current customers or potential parties to a Subscriber by means of gathering information about customers, sales and marketing and keefektivan market trends, that CRM can be managed with good organization is the need to know exactly what type of information you want and it brings its customers and what will be done with the information known.

2.1.1 Tahapan dalam CRM

Pengimplentasian the concept of CRM is CRM process organizing around customers and not only on the internal functions of the company. [1]

There are three stages in CRM, namely:

a. Acquire

Acquire is a stage of acquiring customers. Through this stage can provide an assessment to the company by assessing the first impression to the company. If the customer has a good judgment against the company, then the transaction will be able to run well. Acquiring new customers by doing promotions on products and services offered.

b. Enhance

Enhance is a process where the company builds good relationships with customers. By listening to complaints from customers and receive advice from customers is one of the effective ways in building relationships with customers. In this stage, there are two things to be aware of:

1. Cross selling, that is one of the strategies for identifying customers in order to manambah sales. For example, complementary product offering to customers.
2. Up Selling, that is the strategy of increasing sales of products through the addition of a quantity of products. For example, offer the same product with a larger quantity.

c. Retain

Retain is the stage where the company sought mampertahankan relations with customers, in other words get a customer and then maintain a relationship with them. In order to establish rapport by constantly and maintain relationships with customers, then the company should use the view using the customer by providing services and applications.

The ideal company to perform CRM are companies that want to optimize profits by way of organizing the process of CRM around customers and not only on the internal corporate functions in order to establish a closer relationship and harmonious with its customers. Thus the value of CRM can be optimized in the streamline and mengefesiensikan costs to acquire new customers and retaining old customers so the cost and marketing efforts were not in vain.

2.2 Framework Dynamic CRM

Research on CRM framework conducted by Chung-Hoon Park and Young-Gul Kim, reviewed the relevance of information and marketing strategies, and create a model that is described in the "Framework of Dynamic-CRM". Described that phase of CRM in a framework in the form of a series of processes of Acquisition-Retention-Expansion. As an integrated CRM framework based on the types of information about customers who are

clustered in a multilevel customer relationship development in accordance with Figure 1 [2]

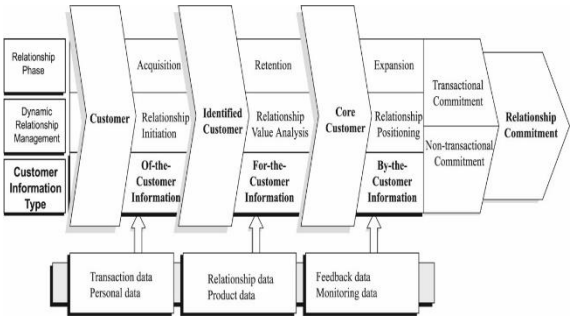


Figure 1. *Framework Dynamic* CRM

In the framework of the above described that there were three types of customer information (Customer Information). Among other things:

1. Of - the - Customer Information (information about the customer) information regarding personal data and customer transaction data. The information in this category are often known as database marketing and target marketing.
2. For - the - Customer Information (customer information) information about products, services and company information are considered important by customers. This information could be channeled through various media of communication in the form of direct mail, auto response system, and internet sites.
3. By - the - Customer Information (customer information) information nontransaksional feedback from customers that include complaints, proposals, claims, customer needs and others. This information is usually manifested in the form of an expanded customer data because this information is very helpful in customer interaction. In addition, because it contains complaints, needs and suggestions, information of this type can be applied to develop the product.

Generally, Dynamic-CRM actually describes a series of phases to do an organization in achieving customer management corresponding to the main business of the company. This framework can be considered a pattern or model of reference an organization in improving the maturity of management of their customers. In the framework there are several phases including:

1. Relationship Initiation

At this stage of the initiation of the relationship with the customer, the organization conducts logging against customers, typically with membership registration. After record customers, organizations can infer information about the offer is right for the customer (for the customer). After a certain period the customer is satisfied with what the Organization has to offer, then the relationship with the customer can escalate into core customer. At this stage the organization can continue to the next phase, namely the CRM. On this phase occurs a two-way interaction between the customer and the organization. Customers will be told what is needed specifically (by the customer). Things like this opens up the opportunity for the Organization to offer new products or services to customers, improve business processes and to satisfy the core customer.

2. Relationship Value Analysis

In order to make CRM more effectively, we recommend every customer relationships are analyzed from both the point of view of either the customer or organization. There are two dimensions in determining the value of every relationship the values from the viewpoint of customers and customer rights from the perspective of the organization. In this phase of the relation between customers psychologically with the organization. This usually happens with granting discounts to customers when making a purchase in large quantities, indirectly increasing customer loyalty.

3. Relationship Positioning

Build mutually beneficial relationships is very important to keep a long-term relationship between the customer and the organization. In the implementation of the strategy of building a mutually beneficial relationship, the Organization maximizes the right customers will automatically increase the value of customers. In addition to fair organisation should also evaluate the relationship with customers from the viewpoint of benefit obtained. If such a relationship continues between the customer and the Organization will form a strong commitment either transactional or nontransactional and the relationship developed to the stage of relationship commitment.

2.3 Segmentasi Pelanggan

Customer segmentation (customer segmentation) is a division of the market into specific groups of customers who have similar characteristics. Customer segmentation can be a powerful means to identify the needs of customers who are not served so then can outperform competitors by developing unique products and services. The most effective customer segmentation when a company tailor the service with the most profitable segments and serve them with a unique competitive advantage. These priorities can help companies develop marketing campaigns and pricing strategies to take the maximum value from both the customers that provide high returns as well as low. Companies can use customer segmentation as the basis in allocating resources to product development, market, service and distribution.

2.4 Analisis Sistem

System analysis (systems analysis) can be defined as a description of a whole information

system into parts of its components with a view to identifying and evaluating problems, opportunities-kesampatan, barriers that occur and the expected needs of the proposed improvements so it can fix.

2.5 Analisis Masalah

As for the analysis of the problem is an assumption of the problem which will be outlined in the procedures. From the results of research that has been done by mobilising a problem which consists of:

1. The difficulty of determining the Services to attract new customers.
2. lack of product innovation, factors that affect the transfer of customers to competitors.
3. The difficulty of determining the market share in order to remain attractive to customers.
4. lack of good relationships between the customer with the company.
5. lack of factors strategies in doing so affects the marketing process is the lack of customers.
6. lack of process approach to the customers who make connections to customers declining.
7. lack of customer transaction data processing so it is difficult to get information about customers.

2.6 Analisis Framework CRM

In making a CRM system that will be built as a Framework of reference is required in order for the feature of CRM can be built quickly and precisely. As for the CRM Framework that corresponds to the system to be built was the Framework of Dynamic CRM that describes a series of stages in the development/implementation of CRM.

As for arrangement/stages of the Framework of Dynamic CRM such as follows:

1. Relationship phase

This is a substantive step that consists of the Acquisition, retention, and Expansion. Where each of the phases is explained as follows:

a. Acquisition

This section described how to get customers to make his wide variety of strategies. As for the strategy of realization at this stage is done with a lot of ways, and that's how to expand marketing with the various media that exist to be able to achieve what it wants, especially in attracting customers against the marketed products. The existence of such strategies can assist the company in achieving anything you want, adpun involved in this case is section Deputy Director.

b. Retention

This section described how a company can implement a variety of strategies to retain customers by way of improving the services. As one strategy to retain customers is by way of delivering products with the best quality of materials at low prices, in addition the company also offers a model – a model of shoes/Sandals the best trend following the latest market so that customers don't get bored with the old design – design, as for the parts that are involved in this case is section R & D section production.

c. Expansion

At this stage is the stage of how to build good relationships against existing customers with complaints, always listen to the wishes of the customer, as well as how to serve customers well. With the stage – the stage of how to build a good relationship with customers above it can be concluded that the company wants to make the company better by listen complaints – complaints and feedback – entries so that future complaints – complaints that there can be improved as well as input – input that can be implemented into the company, for the part involved in this case is the Director of the company.

2. Dynamic Relationship Management

This is the most important substantive framework of the CRM system analitikal will be built. There are three stages in this framework i.e. Relationship Initiation, Relationship Analysis, Relationship Value Positioning.

a. Relationship Initiation

At this stage the company doing data collection is needed, so that the obtained data transaction and customer data. Transaction data obtained when customers make transactions associated booking customers against existing products in the company and for the customer data is obtained when the customer at the time of booking in advance customers fill out customer data before committing to the transaction. And for customer transaction data and customer data is held by the Deputy Director of the company, because the associated data is an important company data and will be used by the company to do a review against the customers loyal to the company.

b. Relationship Value Analysis

Performed analysis of data already available, where the process analysis refers to the RFM Model will generate points for each transaction according customers. At this stage this is where data-data that have been collected last carried out calculations with model RFM (Recency, Frequency, Monetary) and made into three parts on the first part i.e. Recency data made earlier will be made based on the last transaction point, while Frequency refers to the number of times customers Transact within 1 year, while for Monetary is the part which refers to the average number of total customer purchase.

c. Relationship Positioning,

In this section customers will be positioned in accordance with the points that have been obtained so that it can be done penindaklanjutan services to their respective customers in accordance with predetermined positions are included in the regular customer, potential customer, or the customer is not fixed. When customers including into one of those

categories then it will proceed to the next process, i.e. notification to customers about a category that has been in the can.

3. Customer Information Type

It contains substantive concerning any customer information to help achieve a Relationship Commitment, where information becomes the focus of attention, namely information regarding customers, information for customers, and information by customers that have been discussed in the two previous substantive. In focus – focus the attention we can figure out what that Relationship Commitment, so the Relationship of the Commitment is a commitment of the company to build a relationship between customers and companies so interwoven with good cooperation between the two. In the company that holds an important role in this Substantive is the Director of the company.

2.7 Segmentasi Pelanggan dengan Analisis RFM

Segmentation of customers is pengkategorikan customers into several parts (clustering) with the aim to measure the level of customer loyalty, so that penindaklanjutan can do about the service to the customer in accordance with the levels. Customer segmentation processes will be done using the RFM Analysis Model will be accompanied by the assumption of the case.

2.7.1 Analisis RFM

RFM analysis is a Model of computation consisting of three attributes of the domain that is paying attention to the transaction the customer based on the last transaction/keterkinian (Recency), the number of transactions (frequency), as well as the average amount of the total of the transactions (Monetary). As for the steps/phases in this RFM analysis is as follows:

1. Data Transaksi telah tersiapkan

   In the process of this RFM analysis of initial data about the customer transactions to be prepared in advance, this transaction data that will be used as the reference material in the awarding of points.

2. Perhitungan point dari transaksi pelanggan berdasarkan RFM

   At this point begins the process of calculation against the transaction the customer accordingly RFM, as for the provisions granting point is determined based on the attributes of each domain. As for the process of the calculation as follows:

   1. Recency

      At this stage the use of point depends on the last transaction carried out by the customer.

      Where is the note:

      The formula of calculation is used, namely: 30/R, where 30 is the total days in 1 month.

      Suppose 2 days ago a customer transaction, then the points will be obtained by the customers is: 30/2 = 15 points

   2. Frequency

      At this stage the formula calculation performed depends on the number of transactions customers.

      Note:

      The formula of calculation used are: F * 12, of which 12 were obtained within 1 year there are 12 months.

      Suppose that in 1 year customers Transact as much as 8 times then the point that will be acquired are: 8 * 12 = 96 points.

   3. Monetary

      This stage is the stage of a very influential towards the profit of PT Indoto Tirta noble, so in this section taken point.

      Note:

      T = Total transactions in 1 time booking

      H = The average shoe price per unit

      M = T / H

      Suppose that in 1 month customers ordering shoes with total transactions of Rp. 15,681,600 and the average price of shoes per unit is Rp. 120,000 then point that will be acquired are M = 15,681,600/130.68 = 120,000 point

3. Pengelompokan Pelanggan berdasarkan Point RFM

   After each customer gets done, then the next point grouping consumers. There are 3 groups of consumers where the Division is based on the total points earned. As for the details of the total points obtained as follows:

1. Details of 300 regulars point to point retrieved from 10 (the regulars do more than 10 transactions in 1 year) x 30 (Total days in 1 month).
2. While details point to customers who it said 300 potential > > 150 Point where 150 points earned from customers who make transactions of more than 5 x transactions in 1 year, 5 (total transactions in 1 year) x 30 (total days in 1 month).

Grouping can be seen in table 1

Table 1. Kelompok konsumen

No	Kategori konsumen	Total Point	Jenis Pelanggan
1	*Most valuable Customer*	Point>300	Pelanggan Tetap
2	*Most growable Customer*	300>Point>150	Pelanggan Potensial
3	*Below zeros*	Point<150	Pelanggan tidak tetap

2.8 Analisis Email

Analysis of the emails here as penindaklanjutan from customer segmentation has been done based on RFM. In the development of this system Email serves as a liaison between companies with customers through Email data. How it works essentially the same Email by sending an Email via your laptop, mobile phone or computer in General. It's just not pengiriminnya device, laptop, computer, or mobile, but automatically from the system that has been built. Based on the category of existing customers.

2.9 Analisis Kebutuhan Non Fungsional

Non functional requirements analysis undertaken to produce details about things done system when implemented. As for some of the sections that are included into the Non-functional needs analysis i.e. analysis of hardware requirements, software requirements analysis and the analysis of the user.

2.9.1 Analisis Kebutuhan Perangkat Keras

As for hardware (hardware) used in PT Indoto Tirta can be seen in table 2.

Table 2. Analisis Kebutuhan Perangkat Keras

No	Perangkat Keras	Spesifikasi
1	Processor	Intel Core i3 3,4 Ghz
2	Monitor	Monitor dengan Resolusi 1024 x 768
3	Memori	RAM 4 GB
4	Hardisk	512 GB
5	VGA	2 GB

Whereas the minimum computer specs in PT Indoto Tirta Noble to be able to run this application can be seen in table 3.

Table 3. Analisis kebutuhan perangkat keras yang diusulkan

No	Perangkat Keras	Spesifikasi
1	Processor	Dual Core 1,8 Ghz
2	Monitor	Monitor dengan Resolusi 1024 x 768
3	Memori	RAM 1 GB
4	Hardisk	256 GB
5	VGA	256 MB

After looking at the comparison between the tables 3.6 and table 3, hardware (hardware) owned by PT Indoto Tirta Mulia currently meet the standard requirements a minimum hardware specification required to use the CRM information system will be built.

2.9.2 Analisis Kebutuhan Perangkat Lunak

As for software (software) used by PT Indoto Tirta Noble can be seen in table 4.

Table 4. Analisis kebutuhan perangkat lunak di PT. Indoto Tirta Mulia

No	Perangkat Keras	Spesifikasi
1	Sistem Operasi	Microsoft Windows 7
2	Aplikasi Perangkat Kerja	Microsoft Office 2010
3	Web Browser	Internet Explorer dan Google Chrome

Whereas the minimum software specifications required PT Indoto Tirta noble to be able to run applications that are built can be seen in table 5.

Table 5. Analisis Kebutuhan Perangkat Lunak Yang Diusulkan

No	Perangkat Keras	Spesifikasi
1	Sistem Operasi	Microsoft Windows XP
2	Aplikasi Perangkat Kerja	Microsoft Office 2007
3	Web Browser	Internet Explorer dan Google Chrome

Software (software) which has been owned by PT Indoto Tirta Noble currently meet the minimum requirements of the standard specifications of the software needed to use the CRM information system will be built.

2.9.3 Analisis Pengguna

Analysis of the users intended to find out who the user is involved in the use of information systems software to be built, so the user is expected to use the software (software) can satisfy several criteria in using the software. As for the parties to companies involved in the use of software can be seen in table 6.

Tabel 6. Analisis Pengguna yang sedang berjalan

Stakeholder	Tanggung Jawab	Tingkat Pendidikan	Pengalaman Menggunakan Komputer
Direktur	Mengatur dan mengawasi kinerja semua karyawan.	S1	Bisa (Sedang)
Wakil Direktur	Mengatur dan mengawasi kinerja semua karyawan.	S1	Bisa (Sedang)
HRD	Mengelola dan mengembangkan sumber daya manusia.	S1	Bisa (Sedang)
R & D	Mengelola aktivitas riset dan pengembangan.	S1	Bisa (Sedang)
KA. Produksi	perencanaan, pengkoordinasian, pengarahan, dan pengawasan atas pelaksanaan produksi	S1	Bisa (Sedang)
Purchasing	mengkoordinir dan mengawasi pelaksanaan kegiatan pembelian	S1	Bisa (Sedang)
PPIC	Merencanakan dan mengendalikan rangkaian proses produksi agar berjalan sesuai dengan rencana	S1	Bisa (Sedang)
Pelanggan / pengunjung	Melakukan transaksi dengan perusahaan.	Tidak didefinisikan	Bisa (Sedang)

The user who will use the software to be built this at least have to master some of the following specifications and can be seen in table 7.

Table 7. Analisis Pengguna yang diusulkan

Stakeholder	Tanggung Jawab	Tingkat Pendidikan	Pengalaman Menggunakan Komputer
Direktur, Wakil Direktur	1. Memonitoring Seluruh aktivitas penjualan yang terjadi. 2. Mengevaluasi hasil monitoring penjualan. 3. Memberikan strategi dalam meningkatkan loyalitas pelanggan. 4. Mengolah data admin.	S1	Bisa (Sedang)
R & D	1. Dapat melakukan pengolahan data seperti *insert, update, delete, search* pada data promosi, kuesioner kepuasan pelanggan, mengevaluasi serta memberikan inovasi produk kepada pelanggan.	S1	Bisa (Sedang)
KA. Produksi, Produksi	1. Dapat melakukan pengolahan data seperti *insert, update, delete, search* data produk, kategori, promosi.	Minimal SMA/SMK	Bisa (Sedang)
Purchasing	1. Dapat melakukan pengolahan data seperti *insert, update, delete, search* pada data transaksi, detail transaksi, maupun melakukan konfirmasi transaksi pelanggan.	Minimal SMA/SMK	Bisa (Sedang)
Pelanggan / pengunjung	1. Memberikan kritik & saran 2. Melihat informasi perusahaan 3. Melakukan transaksi 4. Memberikan komplain 5. Melakukan konfirmasi pemesanan	Tidak didefinisikan	Bisa (Sedang)

2.10 Analisis Kebutuhan Fungsional

A functional needs analysis is an analysis that explains the flow of data or information that includes depictions of, planning, and production sketches or settings of some separate elements into a unified whole and functioning in the process of making software that will be built.

2.10.1 Diagram Konteks / *Context Diagram*

Context diagram illustrates the data flow system in General. It includes what is being input, output and the external entity that is associated with the system. Context diagrams are used for customer relationship management application development can be seen in Figure 2.

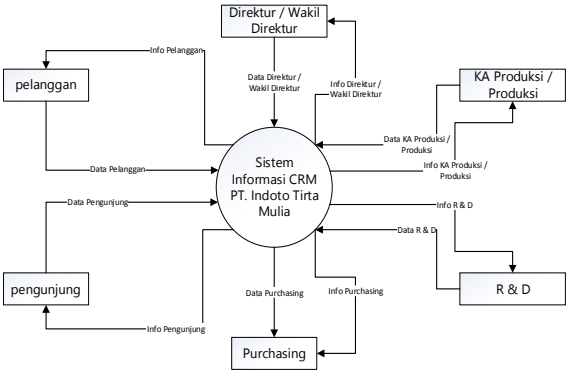


Figure 2. Context Diagram

2.10.2 *Data Flow Diagram*

Data flow diagram (DFD) is a model of logic or process data that was created to describe where the origin of the data and where the purpose of the data out of the system, where data is stored, what process that generates the data and transactions between the data stored and the process that is imposed on them.

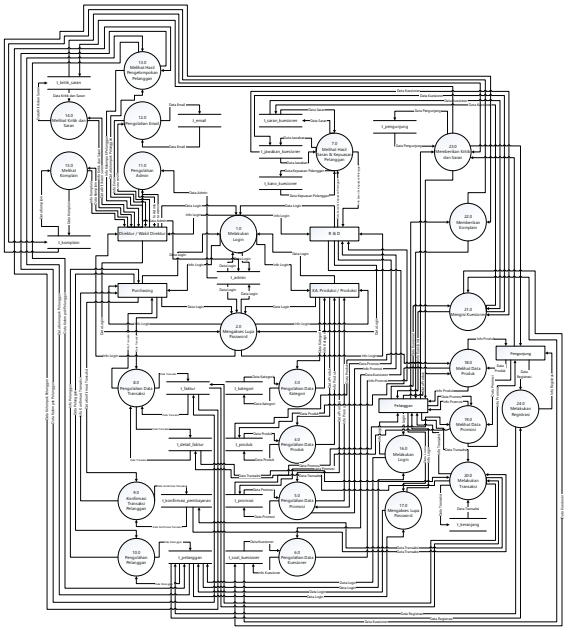


Figure 3. *Data Flow Diagram* (DFD) Level 1

2.10.3 Spesifikasi Proses

The specification process used to describe the process flow model of the data contained in the Data Flow Diagram (DFD). Specifications of the existing processes in the system can be seen in table 8.

Table 8. Spesifikasi Proses

No	Proses	Keterangan
1	No. Proses	1.0
	Nama Proses	Melakukan Login
	Source (Sumber)	Direktur / Wakil Direktur, R & D, Purchasing, KA. Produksi / Produksi
	Input	Data Login
	Output	Info Login
	Destination (Tujuan)	Direktur / Wakil Direktur, R & D, Purchasing, KA. Produksi / Produksi
	Logika Proses	1. User Menginput *username* dan *password*. 2. Setelah username dan password terisi, Kemudian user mengklik tombol Login, apabila username atau password salah maka akan muncul pemberitahuan *maaf username / password yang anda input salah* 3. Jika benar, maka user akan masuk ke dalam sistem

2.10.4 Kamus Data

The data dictionary is the formal description to explain all the data tercangkup in the DFD, then used the data dictionary. Dictionary of the data contained in the system that is created can be seen in table 9.

Table 9. Kamus Data

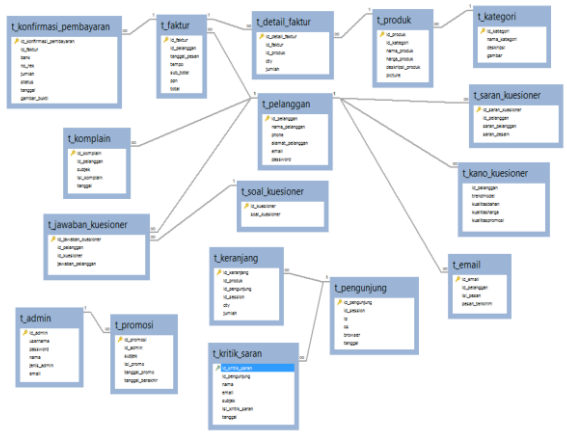
No	Detail	Keterangan
1	Nama	Data Admin
	Digunakan pada saat	Proses 1.0 Melakukan Login Proses 2.0 Mengakses Lupa password Proses 11.0 Pengolahan Admin
	Deskripsi	Merupakan data yang berisi identitas admin yang berhubungan dengan proses login dan pengolahan admin.
	Struktur data	username, password, nama, jenis_admin, email.
	Penjelasan Struktur Data id_admin username password nama jenis_admin email	 [0..9] [0..9 | A..Z | a..z | symbol] [0..9 | A..Z | a..z | symbol] [A..Z | a..z] [A..Z | a..z] [0..9 | A..Z | a..z | symbol]

2.11 Perancangan Sistem

The design stage is conducted after a stage of analysis. In this section described the design of the CRM system to be built.

2.11.1 Skema Relasi

Scheme relation describes the interrelated data between multiple data and their boundaries. The schemes described can be seen from Figure 4. below:



Gambar 4. Skema Relasi

2.11.2 Perancangan Struktur Menu Direktur / Wakil Direktur

Menu structure the Director/Deputy Director is a menu structure that has a function as monitoring against the CRM system to be built. Menu structure the Director/Deputy Director can be seen in Figure 5.

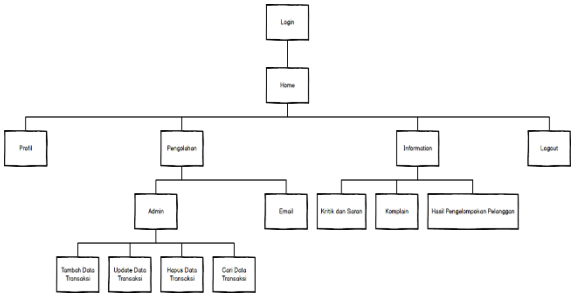


Figure 5. Struktur Menu Direktur / Wakil Direktur

2.11.3 Perancangan Antarmuka

Interface design is a picture of the display system to be built. The design is based on the input or the output of the system used.

2.11.3.1 Perancangan Antarmuka Login

Login interface is the appearance that are specific to a user who has permissions to log on to a system processing and monitoring, the design of the interface of the login can be seen in Figure 6.

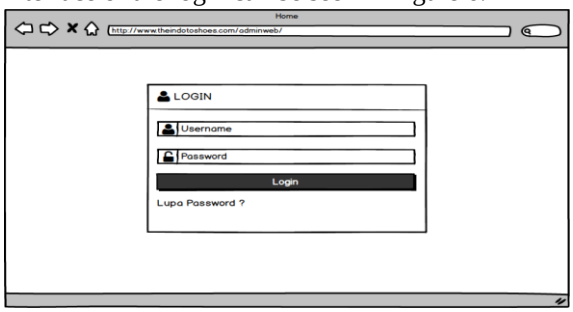


Figure 6. Antarmuka Login

2.11.4 Jaringan Semantik

The design of the Semantic Network is a network that connects the design menus that can be accessed by each user is accompanied by the appearance of the notification messages, errors, and warnings.

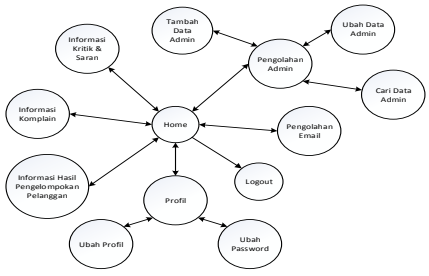


Figure 7. Jaringan Semantik Direktur

2.11.5 Perancangan Prosedural

Procedural design is a change of structural elements of the architecture program into a procedural description of the components of the software. Procedural design of CRM system PT Indoto Tirta Mulia is as follows.

2.11.5.1 Prosedural Login

Procedural Login procedure is performed when the user will enter into the look of the system. The login procedure can also be seen in Figure 8.

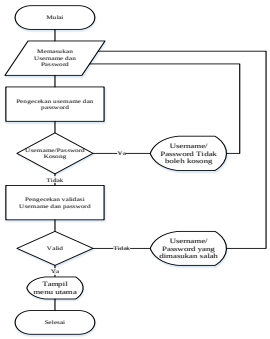


Figure 8. Prosedural Login

2.11 Implementasi Sistem

System implementation made after the design was completed and will be implemented in the programming language will be used.

2.11.1 Implementasi Antarmuka

Implementation of Interface do with each page program made in the form of program files.

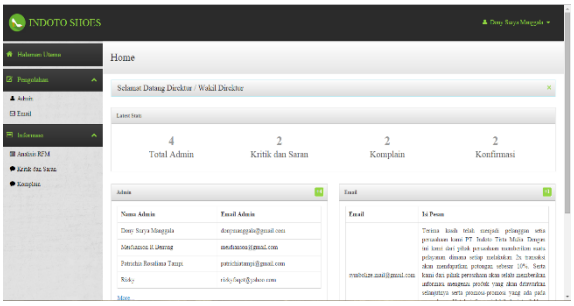


Figure 9. Antarmuka Halaman Utama Direktur

2.12 Pengujian Sistem

System testing is performed to find the errors on systems that are built and know the system that has been built in accordance with the objectives of the design of the system. Methods used in this test is the Black Box testing focuses on the requirements of functionality of the system being built.

2.12.1 Pengujian *Alpha*

Alpha testing is done using Black Box methods, i.e., testing which is done by observing the results of execution through test data and functional checks of the software. Alpha testing on customer relationship management information systems that are built consisting of alpha testing scenario, cases and the results of the alpha testing, alpha testing and the conclusion.

The test results from testing that has been carried out, indicating that the application was built already meet the functional requirements. However, in the process still allows for error. Functionally the system that has been built up already can produce the expected output.

2.12.2 Pengujian *Beta*

Beta testing is the testing that was done objectively where tested directly onto the field that is concerned about the company's user satisfaction with the content of points i.e. the fulfilment of the initial goals of development information systems and customer relationship management interface of the website information systems customer relationship management. Beta testing is done by conducting interviews to all the users who use this information system based on the access rights of each user. The interviews consisted of open-ended questions that will be asked to the user and according to access rights system.

Based on answers from Deputy Director regarding testing on systems that are built, can be drawn the conclusion that information systems Customer Relationship Management that have been built: can assist Deputy Director in increasing customer loyalty by determining the next based on the type of service the customer. As well as retaining existing customers with the services provided to customers, can be helpful in determining the Deputy Director of its market share. Because of the existence of the internet as a means to reach out to new customers, can help R & D along with the Bag. Production in giving promotions to customers, can help the Director to determine the type of product innovation which creates the trend right now.

3. CLOSING

Based on the description that has been discussed in previous chapters as well as the process that has been undertaken in making this final task, then retrieved a few things as follows:

1. The CRM information systems can assist the Director or Deputy Director in the Group of customers and determine strategies to enhance customer loyalty.
2. Information systems CRM can help R & D and Part Production in marketing/promoting products to its customers.
3. Information systems CRM can assist the Director or Deputy Director in determining the development trend of the products that are currently popular.
4. Information systems CRM can make it easy for visitors or customers to get information about the product.

Based on the conclusion that has been outlined, it is expected the CRM information system in PT Indoto Tirta Noble could be developed again by way of:

1. Add the facilities can be used by customers to be able to interact directly with the company, such as chat or forum facilities for mutual discussion.

4. REFERENCES

[1] G. Zikmund, J. R. McLeod dan F. W. Gilbert W, Customer Relationship Management, LLC: Leyh Publishing, 2003.

[2] E. K. Budiardjo dan A. Prasetyo, "Kesamaan Antara Front-CRM dengan Dynamic-CRM Sebagai Costumer Relationship Management (CRM) Framework," *Seminar Sistem Informasi Indonesia (SESINDO2008)*, 2008.

[3] M. Xu dan J. Walton, "Gaining customer knowledge through analytical CRM," vol. 105, pp. 955-971, 2005..

[4] N. Adi, Konsep Pengembangan Sistem Basis Data, Bandung: Informatika, 2004.