DETERMINATION OF PRIORITY HANDLING COMPLAINTS AND TECHNICIAN'S SCHEDULE IN PT. RYNDO JAYA VISUAL BY CRM APPROACH

Andre Zulkarnain R.Husain[1], Utami Dewi Widianti[2]

[1,2] Teknik Informatika – Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
E-mail : edhohusain23@gmail.com[1], utami.dewi.widianti@email.unikom.ac.id[2]

ABSTRACT

PT.Ryndo Jaya Visual is a company which engaged in CATV (cable antena television). A company that offers paid channel products for the customers. The system of filling complains in progress can be throungh databesm, call center, and also through the office. The current complaints process has some drawbacks, Especially on the determination of priorities and scheduling technician. Complaints are handled only upon order of complaints without seeing the priority of the complaints. Scheduling technician also having problems, The head of the technician feels that technicians solve the complaints in a group thus causing the complain which is important and can be solved faster be delayed. These problems caused a trouble to the director in determining priority of handling complaints and to the head of technician in determining technician's schedule. In determining the priority of handling complaints and the determination of technician's schedule the company is helped by approaching costumer relationship management and the use of the method weighted product for helping in determining the priority of handling complaints. According to the result of functional testing, UAT (user acceptence test) and last testing of applications in a corporate environment can be concluded that this system can help the director to determine the priority of handling complaints and the determination of technician's schedule.

Key words *:* Determination of priority of handling complaints, Customer Relationship Management, the method of Weighted Product.

1. INTRODUCTION

PT. Ryndo Jaya Visual or Ryndo vision is a company which engaged in CATV (cable arena television), A company that offers paid channel products for the costumers. The Channels are given 24 hours non stop, and the channels contain sport, drama , news , fashion, and etc. Ryndo vision is located in east-indonesia which is Parigi mautong regency parigi sub-district central sulawesi province.

Ryndo vision already has 3000 costumers from Dolago village to Toboli village. The system of filing complaints in progress can be through database, call center, and through the company. Complain which is offered by the costumer can be conveyed to the admin of service in the company. After complain from the costumer is accepted by the admin of service, admin of service will fill service of interruption form. After that, service of interruption form will be given to the technician as a proven that the complaint is in process. After the complaint is handled, service of interruption form will be given to the admin of service as a company's data.

According to the result of an interview with the director in PT. Ryndo Jaya Visual the process of complaining service has some drawbacks, especially on the priority of handling complain. In handling complain, the costumer who has offered complain once keep doing the same complain many times to the admin of service because the complaint that can be done faster actually be delayed. This thing happens because the complaint to be done only based on the first complain that come first without seeing the priority of complain. So it caused the complaint which is not important being handled first, and the important one being delayed. Costumer who often offer complain has a potential to not using the company's service anymore, So the company will lose their costumer. It has been proven in 2016 and 2017 that some of costumers don't use PT. Ryndo Jaya Visual's service anymore.

Handling of complaints handled by technicians also experienced problems. The complaint handling process handled by technicians at PT. Ryndo Jaya Visual is based on teamwork. The team in question is where when there are problems or complaints all the employees of the technicians at PT. Ryndo Jaya Visual to immediately move to the location of the problem. Based on the results of interviews with the head of the network engineering and interference section at PT. Ryndo Jaya Visual, Mr. Andi Rahmat, stated that the complaint handling system was excessive in determining the technician in handling a complaint. This is hampering the system quickly and on time because it only performs work based on the order of the first complaints received from the service admin and is carried out together, so

that complaints that should be resolved quickly become delayed because there is no division of technicians in every complaint that exists.

Based on the results of interviews with the Director and the head of the Network and Disorders Engineering section it can be concluded that the management of complaints at the service at PT. Ryndo Jaya Visual is needed to assist the Director in setting priorities for a complaint and how to determine the right technician to resolve the complaint. Therefore, the right solution to overcome these problems is to build a priority determination system for handling complaints and scheduling technicians using the Customer Relationship Management approach.

2. CONTENTS OF RESEARCH

2.1 Research Methodology

In this research, the authors used a descriptive method, which is to collect data and then analyze and present observations in the field. The methods to be used in data collection and application development can be seen in Figure 1.
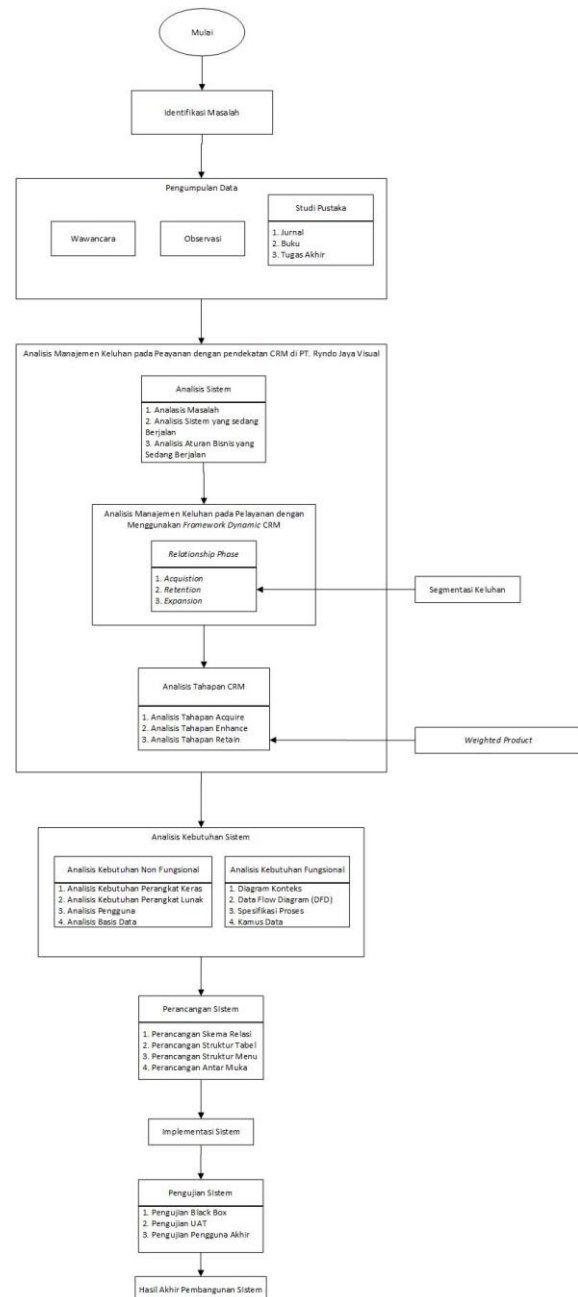

Figure 1. Research Methodology

2.2 Base of Theory

The theoretical foundation discusses theories which are related to a system that will be built.

2.2.1 The Meaning Of Information System

Information system is system that contain a network of data processing system which is complete with communication channels that will be used in a data organization system. A process in which an element of an information system includes gathering data gathering, managing a data that has been stored and disseminating information.

In order for an information system to always be relied upon and run very well, an operator is needed

to process and maintain the resources and service equipment for an information system that is used to support the processes in an organization.

In the chain of an information system, computers interact with humans and computers interact with other computers. The data of an information or knowledge in a computer Carried through documents or electronic communication media, such as telephone or computer networks.

The existence of information systems is needed in organizations to assist business processes and organizations. For example, the sales process in a supermarket is accompanied by a sales information system that records, collects data and information about sales [1].

2.2.2 Customer Relationshp Management

The definition of Customer Relationship Management is essentially a simple concept, gathering information about prospects from customers, then using that information to create specifically targeted offers. (Jill Griffin, 2002). [2]
The purposes of the CRM framework are [3]:
1. Company profits can be increased by using relationships / relations between customers and the company. This is due to the company's point of view that extends to customers in establishing maximum relationships to conduct an up-selling and cross-selling sales activities, at the same time also through the withdrawal, identification, and maintenance of the best customers to increase the profit of a company.
2. By using customer information and integrated information can create a satisfying service to save time and become better at sufficing customers needs.
3. To fix a process and procedural consistency in the management of accountants and sales can be through improved relations with customers and workers.

2.2.3 Type Of CRM

The types of Customer Relationship Management are divided into 3 which are Operational, Analytic, and Collaborative [4]:
1. **CRM Operational**
   Customer Relationship Management Operational or also known as a company's front office is a CRM that plays a very important role in interactions with customers. One of the integrated processes, such as marketing, sales, and services, has been guaranteed for the automatic operation of all business processes in CRM. This is a form of web application, through the web, a company can provide services to customers.

2. **CRM Analytics**
   Customer Relationship Management Analytic or also known as a company's back office is a CRM that plays a role in understanding all the needs of a customer as well as conducting analysis of customers and market needs which has become trending and also analyzing customer behavior. The data which is used for this CRM based on the CRM Operational data.

3. **CRM Collaborative**
   Collaborative Customer Relationship Management or also known as CRM which includes all types of CRM is CRM that acts as a container of customer loyalty that aims as a magnet so that other customers who still have not reached the level of loyalty can be loyal or loyal to the company.

2.2.4 Dynamic *Customer Relationship Management*

Dynamic Customer Relationship Management is an overview of a CRM framework viewed based on environmental perspectives or customer perspectives that have been developed by scientists from Korea namely Chung-Hoon Park and Young-Gul Kim. This CRM framework is an idea and the maturity of an organization in establishing relationships with its customers [5].
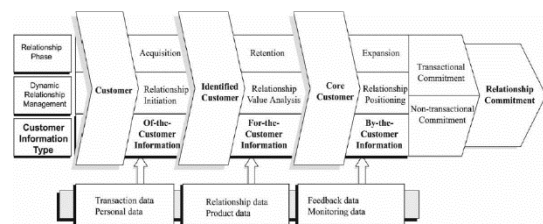

Figure 2. Framework *Dynamic* CRM

It can be concluded, Dynamic-CRM is a overview of a series process that must be carried out by an organization or company in achieving the company's main objectives in managing existing customers. This Dynamic-CRM framework can be used as a reference model or pattern of an organization or company to improve maturity in customer management.

2.2.5 Weighted Product (WP) Method

The Weighted Product method requires a normalization process because this method multiplies the results of the assessment of each attribute. The results of the multiplication have not been significant if they have not been compared (divided) with standard values. The weight for the benefit attribute has functions as a positive rank in the multiplication process, while the cost weight functions as a negative rank. Weighted Product is a method of decision making by multiplying to connect attribute ratings, where the rating of each attribute must be raised first with the corresponding attribute weights to get the results [5].

Preference for Ai alternative is given as follows:

$$S_i = \prod_{j=1}^{n} Xij^{Wj}$$

Where $\sum wj = 1$. w_j, is the rank of positive value for the profit attribute, and the negative value of the cost attribute.

The relative preference of each alternative is given as:

$$V_i = \frac{\prod_{j=1}^{n} Xij^{Wj}}{\prod_{j=1}^{n} (Xij)^{Wj}} \qquad (1)$$

2.2.6 Complaints Management

Complaints management is planning, organizing, implementing and controlling the feeling of dissatisfaction over the service that can affect customers so that with limited resources in business goals and target can be achieved effectively and efficiently [6].

2.2.7 Decision Making

Decision is the activity of choosing a strategy or action in solving the problem. The act of choosing a strategy or action that the manager believes will provide the best solution for something is called decision making [7].

2.2.8 Context Diagram

Context diagram is the top level of the data flow diagram, which is a diagram that is not detailed from an information system that uses data flows into and out of external entities. Context diagram provides clear boundaries of the quantities of entities that are outside a system that is being created [8].

2.2.9 Hypertext Prepocessor (PHP)

Hypertext Preprocessor (PHP) is a Server-side language specifically designed for web applications. PHP can be inserted between the HTML language and the Server-side language arena [10].

2.3 Framework Dynamic CRM Analysis

In use of CRM as the basis for its creation, the Framework of Dynamic CRM is used. This framework is for reference to the implementation of CRM where we can find out the features that will be applied to CRM in accordance with the background of the problem. Based on the background of existing problems, PT. Ryndo Jaya Visual will build a CRM system that supports better services based on existing complaints, therefore the stage to be taken is the Relationship Phase. The followings are analysis of the Framework of Dynamic CRM:
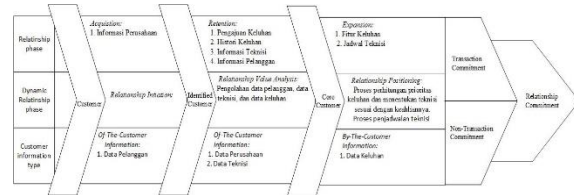

Figure 3. *Framework Dynamic* CRM in PT. Ryndo Jaya Visual

1. Acquistion Phase
This phase is implemented in the acquire process. The Acquistion Phase is the stage where the company tries to get to know its customers better by providing information to the company. At this stage will be explained about information of PT. Ryndo Jaya Visual to attract new customers. The following features will be built in this phase:

a. Company Information
Company Information Is a feature of company information which has a function to make customers can find out the profile of the company. Such information includes information on filing a complaint which contains what types of complaints are complained of and complaints handling information by technicians.

2. Retention Phase
This phase is the implementation of Retention in the dynamic CRM Framework. This stage has the aim to provide information from the company to the customer so that a good relationship can be established with the customer and can maintain a regular customer. The followings feature will be built in this phase:

a. Filing a Complaint
Customers can submit complaints through the system so that it does not cost too much like filing a complaint using the telephone and the customer does not need to come to the company to offer a complaint, by only accessing the system.
b. Complaint History
The complaint filing feature has a function for customers to know the schedule for handling complaints that are set by the company.
c. Technician Information
This feature is a feature used by customers to find out which one is technician and their expertise in handling complaints.
d. Costumer Information
This feature is a feature used to find out customers in the company.

3. Expansion Phase
This phase is the implementation of the retain phase, Expansion is also a phase that can help the company in getting an information from customers which can be implemented as a strategy to improve company services. The following features will be built in this phase:

a. Complaint feature

This feature is a feature that can be used customers to submit complaints online. The purpose of this complaint feature is to change the complaint data into information that can help the Director in determining strategies to improve the quality of complaints handling services. The decision making system method in this case uses the Weighted Product method which has an output in the form of priority complaints that are based on complaint criteria.

1. Asessment Criteria

There are 3 types of criteria that will be used in this study, those are the type of complaint, damage, and complexity.

2. Level of Importance to the Criteria

This criterion is performed to find out which criterion value has the highest priority scale with a predetermined range. Following are the importance levels of the criteria can be seen in Table 1.

Table 1. Table Level of Importance to the Criteria

Tingkatan	Range
Sangat Penting	80 – 100
Penting	59 – 79
Kurang Penting	38 – 58
Tidak Penting	17 – 37

Table 2. Table Information on the Importance of Criteria

Tiers	Explanation
Very important	Preferably to do service improvement
Important	Number two is prioritized for service improvement.
Less important	The third number must be made to improve services.
Not important	The fourth number must be improved services.

3. Alternative Weighting for each Criterion

Alternative weighting for each criterion is based on the level of importance. This weighting can change according to company regulations. The following weightings can be seen in Tables 3,4, and 5.

Table 3. Table Complaint Type Criteria Value

Type of complaint	Weight
Disconnect optical fiber	90
Disconnect Main Cable	85
Disconnect the cable	80
The cable creeps	78
Blurred broadcast	75
Replace the cable	70
There is no broadcast	50
Broadcast spots	38
Broadcast program	30

Table 4. Table Damage Criteria Value

Type of Damage	Weight
Awfully	80
Pretty bad	70
Not severe	60

Table 5. Table Complexity Criteria Value

Complexity type	Weight
Very complicated	80
Quite complicated	70
No complicated	60

4. Complaint Assumption

In this research, six complaints data samples will be used at PT. Ryndo Jaya Visual. The following are complaint data samples for 2018 in Table 6.

Table 6. Table Complaints Sample Data PT Ryndo Jaya Visual in years 2018

No	Tanggal	Nomor Pelanggan	Nama Pelanggan	Jenis Keluhan	Kerusakan	Kerumitan
1	20/08/2018	3132	Awan	Kabur Siaran	Tidak Parah	Tidak Rumit
2	25/08/2018	244	Herman Musa	Program Siaran	Tidak Parah	Tidak Rumit
3	27/08/2018	5591	Daiman Hidayat	Putus Kabel	Cukup Parah	Sangat Rumit
4	27/08/2018	9140	Halis	Putus Kabel Induk	Sangat Parah	Sangat Rumit
5	29/08/2018	811	Dony	Tidak Ada Siaran	Cukup Parah	Tidak Rumit
6	30/08/2018	5029	Marten	Kabur Siaran	Tidak Parah	Tidak Rumit

5. Criteria Weight

The following weight table for each criterion based on complaint data Table 6 can be seen in Table 7.

Table 7. Table Criteria Weight

Nama Pelanggan	Kriteria		
	Jenis Keluhan	Kerusakan	Kerumitan
Awan	75	35	40
Herman Musa	30	35	40
Daiman Hidayat	80	65	80
Halis	85	80	80
Dony	50	65	40
Marten	75	35	40

6. Determining Initial Weight

In this step the initial weighting of each predetermined criterion is determined, this initial weight can change according to company requirements to determine priority handling complaints. Determination of the initial weight is

determined by the Director and can be seen in Table 8.

Table 8. Table Determining Initial Weight

No	Criteria	Initial Weight	Initial Weight Conversion (W)
1	Jenis Keluhan	Sangat Penting	5
2	Kerusakan	Penting	4
3	Kerumitan	Penting	4
$\sum W$			13

7. Weight Improvement

In this step, weights will be improved first. Judging from the formula 1 initial weighting W = (5,4,4) will be corrected so that the total weighting $\sum Wj = 1$, where W is the weight of each criterion. The calculation of repair criteria with the following formula:

$$W_j = \frac{Wj}{\sum Wj}$$

$$W_1 = \frac{5}{5+4+4} = \frac{5}{13} = 0.38$$

$$W_2 = \frac{4}{5+4+4} = \frac{4}{13} = 0.30$$

$$W_3 = \frac{4}{5+4+4} = \frac{4}{13} = 0.30$$

8. Calculate Vector S Value

This calculation is done by multiplying all attributes (criteria) for an alternative with W (weight) as a positive rank for the profit attribute and a negative rank weight for the cost attribute. Following is the calculation to find the S vector value using the following formula:

$$s_i = \prod_{j=1}^{n} X_{ij}^{\,w_j}$$

simply put :
$$Si = K1^{W1} \times K2^{W2} \times K3^{W3}$$

$S_1 = (75^{0,38})\,(35^{0,30})\,(40^{0,30})$
   $= 5,1584 \times 2,9054 \times 3.0242 = 45,3243$

$S_2 = (30^{0,38})\,(35^{0,30})\,(40^{0,30})$
   $= 3,6417 \times 2,9054 \times 3,1330 = 33,1490$

$S_3 = (80^{0,38})\,(65^{0,30})\,(80^{0,30})$
   $= 5,2865 \times 3,4984 \times 3,7232 = 68,8579$

$S_4 = (85^{0,38})\,(80^{0,30})\,(80^{0,30})$
   $= 5,4097 \times 3,7232 \times 3,7232 = 74,9904$

$S_5 = (50^{0,38})\,(65^{0,30})\,(40^{0,30})$

   $= 4,4218 \times 3,4984 \times 3,0242 = 46,7820$

$S_6 = (75^{0,38})\,(35^{0,30})\,(40^{0,30})$
   $= 5,1584 \times 2,9054 \times 3,0242 = 45,3243$

Total seluruh nilai *vektor S*
STotal = 45,3243 + 33,1490 + 68,8579 +
   74,9904 + 46,7820 + 45,3243
   = 314,4279

9. Calculate Vector V Value

After obtaining the total value of vector S, then look for the value of vector V to determine the ranking of alternative complaints that will be handled by dividing the value of V for each alternative with the total value of all alternative values (vector S). The following is a ranking calculation using the following formula:

$$V_i = \frac{\prod_{j=1}^{n} Xij^{Wj}}{\prod_{j=1}^{n} (Xij)^{Wj}}$$

simply put :

$$Vi = \frac{Si}{S1 + S2 + \cdots Sn}$$

$V1 = \dfrac{45,3243}{45,3243 + 33,1490 + 68,8579 + 74,9904 + 46,7820 + 45,3243}$

$= \dfrac{45,3243}{314,4279} = 0,1441$

$V2 = \dfrac{33,1490}{45,3243 + 33,1490 + 68,8579 + 74,9904 + 46,7820 + 45,3243}$

$= \dfrac{33,1490}{314,4279} = 0,1054$

$V3 = \dfrac{68,8579}{45,3243 + 33,1490 + 68,8579 + 74,9904 + 46,7820 + 45,3243}$

$= \dfrac{68,8579}{314,4279} = 0,2189$

$V4 = \dfrac{74,9904}{45,3243 + 33,1490 + 68,8579 + 74,9904 + 46,7820 + 45,3243}$

$= \dfrac{74,9904}{314,4279} = 0,2384$

$V5 = \dfrac{46,7820}{45,3243 + 33,1490 + 68,8579 + 74,9904 + 46,7820 + 45,3243}$

$= \dfrac{46,7820}{314,4279} = 0,1487$

$V6 = \dfrac{45,3243}{45,3243 + 33,1490 + 68,8579 + 74,9904 + 46,7820 + 45,3243}$

$= \dfrac{45,3243}{314,4279} = 0,1441$

10. Selected Alternative

The final step is ranking complaints data that has been calculated based on the value of vector V from the largest to the smallest value. Following are the results of alternative ranking can be seen in Table 9.

Table 9. Table Complaint category with Alternative Selected

Kategori	Nama Pelanggan	Jenis Keluhan	Kerusakan	Kerumitan	Vektro S	Vektor V	Tingkatan
Putus Kabel Induk	Halis	85	80	80	74,9904	0,2384	Sangat Penting
Putus Kabel	Daiman Hidayat	80	65	80	68,8579	0,2189	Penting
Tidak Ada Siaran	Dony	50	65	40	46,7820	0,1487	Kurang Penting
Kabur Siaran	Marten	75	35	40	45,3243	0,1441	Kurang Penting

b. Determining Technician

After getting the complaint category table that has been selected as in the table above, and next we will do the technician scheduling. Technician scheduling is done by making a team of technicians who will resolve complaints one by one. There are 7 technicians and 1 team in handling one complaint which consists of a maximum of 3 people those are 1 team leader and 2 team members. The following is a table of technicians and their expertise in PT Ryndo Jaya Visual, which can be seen in Table 10.

Table 10. Table Technicians and their Field of Expertise

| Technician	Areas of expertise
Andi Rahmat	Electricity and Electronics
Arsyad	Electricity and Electronics
Darwis	Cable TV Network Engineering
Madun Karama	Cable TV Network Engineering
Haerudin	Cable TV Network Engineering
Ramdan	Fiber Optic Network Engineering
Ibrahim Boutihe	Cable TV Network Engineering

To do the scheduling, the data is taken from table 9. The data will be made automatically by the team by the system based on the expertise of each technician. In the team has a team leader and in 1 team there are 3 or 4 people in it. Anyone can be the team leader regardless of their expertise. For the determination of technicians themselves are determined randomly by the system it seen based on the amount of work that is again done by the technician. The following are the results of the complaints table that the team made based on their expertise can be seen in Table 11.

Table 11. Table The Result of Making a Technician Team

| No	Tanggal	Pelanggan	Alamat	Kategori Keluhan	Keluhan	Tim	Status
1	2018-08-27	Halis	Maesa	Putus Kabel Induk	-	-Ramdan -Arsyad -Darwis - Madun	Update
2	2018-08-27	Daiman Hidayat	Loji	Putus Kabel	-	-Ramdan -Arsyad -Darwis - Madun	Update
3	2018-08-29	Dony	Maesa	Tidak Ada Siaran	-	- Ibrahim Boutihe -Andi Rahmat -Haerudin	Update
4	2018-08-30	Marten	Masigi	Kabur Siaran	-	- Ibrahim Boutihe -Andi Rahmat -Haerudin	Update
5	2018-08-20	Awan	Kampal	Kabur Siaran	-	- Ibrahim Boutihe -Arsyad -Darwis	Update
6	2018-08-25	Herman Musa	Toni kota	Program Siaran	-	- Ibrahim Boutihe -Arsyad -Darwis	Update

2.4 Database Analysis

This stage is the stage where the system to be built can be in accordance with what is expected, for the analysis part will be used entity relationship diagram (ERD), ERD can facilitate the work on the database, because of the ERD we can know the relationship of each data. Database analysis at PT. Ryndo Jaya Visual by using ERD can be seen in Figure 4.
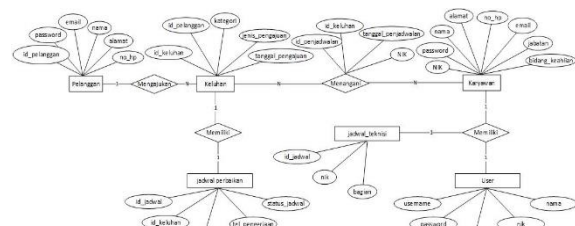
Figure 4. Diagram ERD

2.5 Context Diagram

Diagram that has the highest level of DFD (Data Flow Diagram), also known as Context Diagram, is an overview of user relations and information systems. The context diagram in the PT Ryndo Jaya Visual system can be seen in Figure 5.
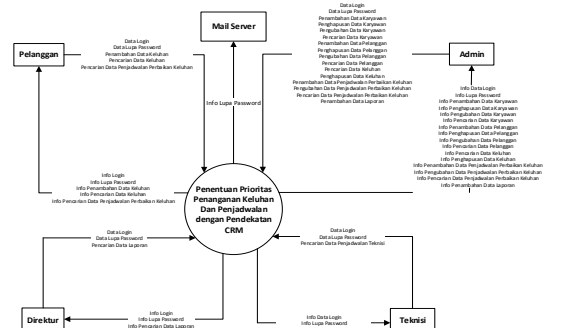
Figure 5. Context Diagram

2.6 Relation Scheme

Relation scheme is an overview of some data that are interconnected with each other and their limitations. The scheme illustrated in the design stage can be seen in Figure 6.
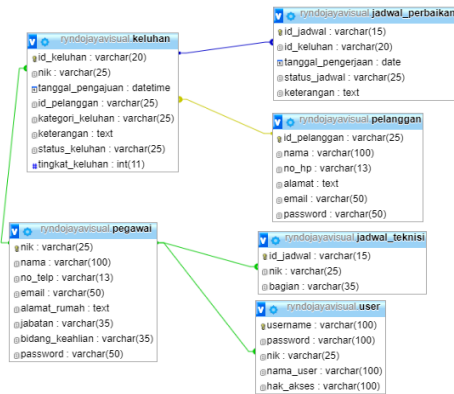

Figure 6. Relation Scheme

2.7 The Conclusion of Black Box Test

Based on the results of functional tests that have been carried out above on CRM information systems at PT Ryndo Jaya Visual, it can be concluded that the functional system created can produce system requirements as expected by the company.

2.8 The Conclusion of User Acceptance Test

Based on the results of UAT testing that has been carried out on CRM information systems at PT Ryndo Jaya Visual, it can be concluded that the system can be continued to the next stage, which is to the end user acceptance testing stage.

2.9 Conclusion of End-User Acceptance Test

1. The information system built can help the Director to determine priorities for handling complaints
2. This CRM information system can be able to assist the Head of Network and Interference Engineering in determining the technician's schedule.

3. CLOSING

1.1 Conclusion

as we see from the results of testing a system and the discussion of the whole chapter, it can be concluded that this system has been able to assist the Director of PT Ryndo Jaya Visual in determining priority handling complaints with the CRM approach as well as the Head of network engineering and disruption in determining technicians according to their expertise.

1.2 Suggestion

So that the system that has been built is more developed in the future, the suggestion will be very useful. Suggestions for system development include:
1. This CRM system can be developed by adding the Google Maps feature so that technicians can find out the distance from each complaint.
2. The scheduling process is expected to be made even better.

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