

# Improving the Quality Sla of Customer Services in Enterprise System using Dmaic Method at Pt. Telin

Yogi Osadhani, Nilo Legowo

**Abstract** – The development of information technology is currently growing rapidly so that many companies need software products to improve the efficiency and effectiveness of company operations. This makes more and more new information technology (IT) companies cause business competition to become more competitive. PT Telin as an old IT company since 1995 must have a reliable strategy to be able to retain old customers and reach new customers by improving the quality of software products. Quality products will increase customer satisfaction and company value. At present, PT Telin, as one of the largest telecommunications companies providing various types of services to its customers, is aware that there is a lack of service management. The service here is meant to be more focused to internet data service services. This can reduce customer satisfaction and have a negative impact on the company both short and long term. This problem can be influenced by various factors that exist in the company. This can be like business processes, company databases, databases and users that cause shortages that result in poor service to customers so that the SLA exceeds the limits specified in the contract. One of the quality improvements that are widely studied and applied by companies is the DMAIC Method, which is Define, Measure, Analyze, Improve, and Control. This method is a method that focuses on improving product quality and increasing the effectiveness and efficiency of all operational processes to meet customer needs and satisfaction. The purpose of using this method is to change the Business Process that is currently running to be better than before and the results of this project are expected to help the company in improving the quality of the company's Management Services to customers and can be better in business development. After all the recommendations in this research are implemented, the estimated sigma level of the quality service management increases by 0.39σ (3.80σ to 4.19σ)

**Keyword:** DMAIC, Service Management, SLA

## I. INTRODUCTION

In the midst of fierce competition in the business world, companies have to try extra hard to survive and continue to be productive, but of course all of that requires ideas and innovations to survive this business competition. In line with the company's rapid development, increasingly sophisticated database processing, and of course all accurate information will affect the infrastructure that is handled and used. However, there is still a desire to further improve this company, namely improving the SLA (Service Level Agreement). The desire of management to improve this is by

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adding some functions or parameters in the Enterprise System. One way that has been widely accepted by many parties in the world today is by adopting ITIL (Information Technology Infrastructure Library) best practices in managing ITSM (Information Technology Service Management). Therefore, we need a method to find some of these defects. The method in question is the DMAIC Method. This method is used to repair broken customer SLAs.

Product quality is an important part of increasing customer satisfaction. Therefore, we need a fairly good method to improve the quality of Service Management. One method of quality improvement that is widely studied and applied by companies is the DMAIC Method. DMAIC is a method that focuses on improving product quality and increasing the effectiveness and efficiency of all operational processes to meet customer needs and satisfaction [1].

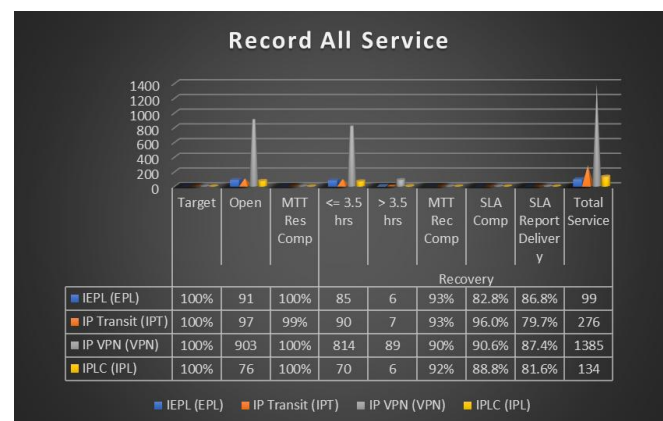


Figure 1. Record all Service PT Telin

## II. STUDY LITERATUR

The system is a group of things or activities or elements or subsystems that work together or are connected in certain ways to form a unity to carry out a function to achieve a goal. Enterprise System is a system that supports all organizations. including the support provided by an enterprise system is the support of business processes, information flow, recapitulation of reports and very complex data analysis [2]. The function of the Enterprise System is to help to manage business processes such as marketing, production, purchasing, and accounting in a well-integrated unit. With the existence of the Enterprise System, the company can improve operational efficiency and provide managers with an overview of the overall condition of the company for decision making [3]. This research is intended to change



or add some functions in PT Telin Enterprise System for the better. In this research, guidelines are needed to implement better IT services. The intended service is ITIL

Business processes supported by the Enterprise System:

- Financial and Accounting Processes; includes large books, accounts / debts, fixed assets, cash management, production predictions, accounting cost centers, asset accounting, tax accounting, credit management, and financial reports.
- Human Resources Process; include employee administration, payroll, time accounting, employee benefit / facility accounting, employee training and development, employee performance management, employee personal expense reports, employee candidate records.
- Production and Manufacturing Processes; covering procurement, stock management, purchasing, shipping, production planning, production schedule, planning of material requirements, quality control, distribution, transportation, plant maintenance & production equipment.
- Sales and Marketing Process; including order processing, price proposals, contracts, product configuration, pricing, billing, credit checks, incentive and commission management, sales plans.

ITIL (Information Technology Infrastructure Library) is a general framework that describes best practices for IT Service Management (ITSM). ITIL is not a standard that must be followed, it is a guide that must be read and obeyed and used to create value for service providers and their customers

Benefits of applying ITIL to other organizations:

- Increase user and customer satisfaction with IT services.
  - Increasing the availability of services (Service Availability) which directly impacts on increasing business profits and revenues.
  - Financial savings from reduced repetitive work (rework), lost time, and improved management and use of resources.
- The DMAIC method is very helpful for a repair team to provide a road map for quality improvement by using tools that help complete the DMAIC stages.

DMAIC consists of five stages. The first stage D (define) is defining the main problems and getting support from the company to drive the improvement process. The second step M (measurement) is carried out an assessment of operating performance and uses it as a basis for initial assessment when implementing solutions, such as determining sigma level (sigma value). The third stage A (analyze) is the stage in which thinking and analysis are based on the evidence of the problem that has been measured, for the initial identification of the root causes of problems that arise and have a negative impact on company performance. The fourth stage I (improvement) is a stage of improvement, at this stage the results of the data from the analyze phase are used to get ideas for improvement and implementation of the changes needed for the fifth stage C (control) where in this stage set steps for controlling the performance results which has been re-measured in order to get a standard or quality parameter that can always be accepted by looking at the sigma level to get better results.

### III. RESEARCH METHODS

Problems faced by PT. The current survey indicates that existing business processes are not running efficiently and effectively. Even though there are no direct gaps in existing business processes, by looking at the approach of analyzing

existing business processes, it is clear that there are many disruptions that occur in some services that result in its SLA Broke which should still be reduced and even eliminated. An improvement is not possible if it does not have a benchmark of quality, because quality is a measurement value that reflects the quality of a product / process and there is control over quality that is standardized in a company. In other words, quality control is the most important thing in making improvements, so the six-sigma approach is used, where the DMAIC Method emphasizes quality control (both process quality or product quality) which includes Quality Control (QC) and Quality Assurance (QA).

In general, the mindset used in this study is arranged in the following diagram

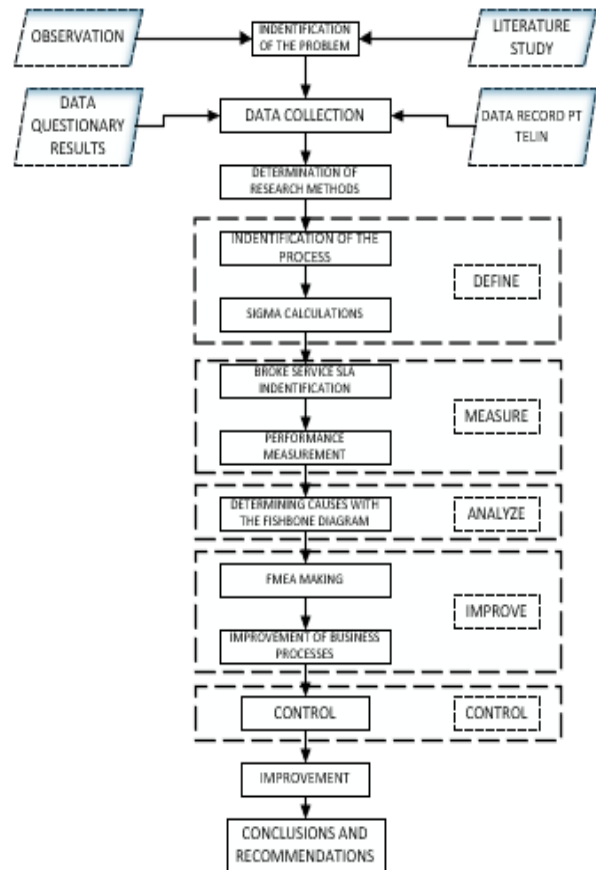


Fig 1. Research flow

After determining and defining the flow, try processing it using the DMAIC Method. Next for an explanation of each step

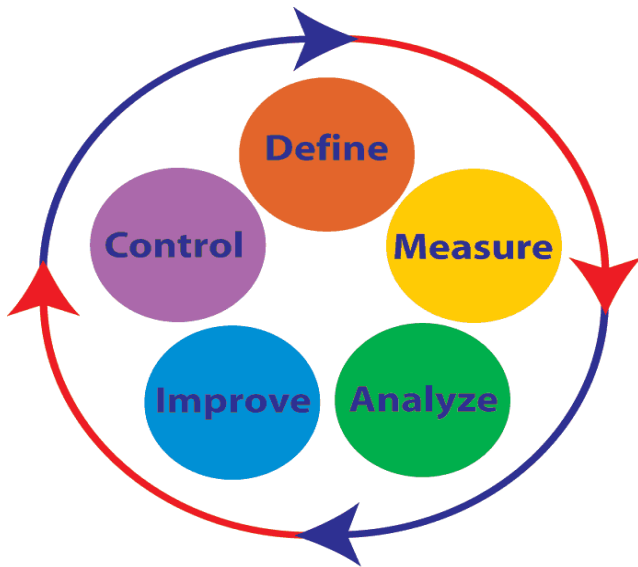


Fig 2. DMAIC Method

- Define is to find CTQ (Critical to Quality) which is a focus of the problem that is the most important thing to meet the wishes of customers.
- Measures are taken to take samples to measure the characteristics of CTQ and the capability of the process before the measurement is done and so that the results of the measurements to be carried out can be declared valid or more convincing then it must be tested first on the measurement system to be used.
- Analyze is more focused on the selection of factors that have significant influence on the productivity of users or from customers that are used as CTP (Critical to Process) so that targeted productivity can be achieved.
- Improve makes ideas for improvement of the factors that have been found in the Analyze stage.
- Control is maintaining and maintaining the condition of the results of ideas for improvement that have been made or applied to the System

IV. DISCUSSION AND RESULTS

A. Define

The first phase of the Six Sigma methodology is define [3]. This phase defines the problems that occur, determine the desired improvement and identify what is important for customers At this stage we carry out the definition and mapping of the flow and data collection of services or services that are served by the company. In this phase the writer tries to list some services that are included in the SLA Broke group.

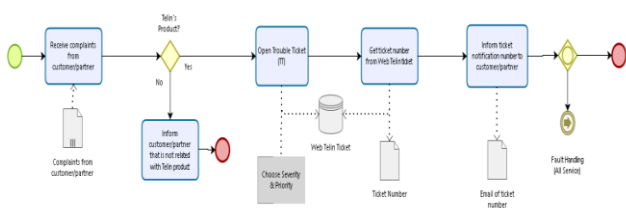


Fig 3. Interruption reporting process flow

At this stage, we are registering what services are experiencing problems with SLA Broke. Can be seen in the table below, the figures are the results of the report for 8 months from November 2018 to June 2019. We dance the conclusions below from November 2019 to June 2019 the number of various interferences

Table- I: Number of interruptions for all service services

Month	EPL	IPLC	IPVPN	IP Transit
November	9	9	67	11
December	5	17	50	13
January	8	5	70	15
February	6	4	90	14
March	6	2	67	18
April	4	5	43	18
Mei	3	15	45	22
June	3	8	37	13
<b>Total</b>	<b>44</b>	<b>65</b>	<b>469</b>	<b>124</b>

From the table that has been taken we change in the form of a bar diagram, so that writers and readers more easily understand the data

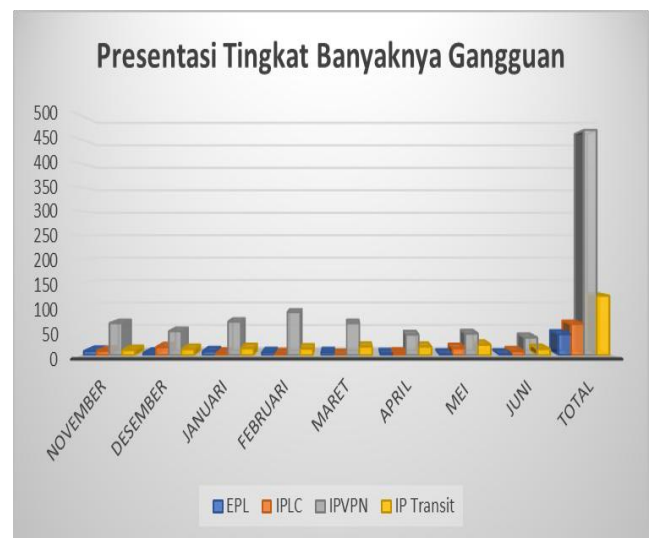


Fig 3. Number of interruptions for all service services

After determining the service, we will focus on solving the problem the next step is to calculate the sigma value. Sigma calculation is done to determine the initial conditions of a process that states how much the ability of a process. By searching for DPMO (Defect Per Million Opportunities) and converted to a sigma value the results of which serve as a benchmark for the condition of the previous service. The following are the steps to find the sigma value by first determining the value of defects (D), Opportunities (OP), Total Opportunities (TOP), Defect Per Opportunities (DPO), and Defect Per Million Opportunities (DPMO).



Units 209	The fields below will show the results of your process.
Opportunities/Unit 4	DPMO 106,459.33014354068
Defects 89	Defects (%) 0.01
Sigma Shift 1.5	Yield (%) 99.99
<input checked="" type="checkbox"/> Advanced Calculator	Process Sigma 2.75
<b>CALCULATE</b>	

Fig 4. Sigma Calculation

From data taken by the company, a number of results can be calculated in a six-sigma calculator. From the Unit results with a total of 209, opportunities 4, and with a total defect of 89. Sigma calculation results obtained with a value of 2.75. We also use the Project Charter document, which can be seen in the table below, as a document to provide guidance in working on this project. This document describes several elements, such as problems with the company, the scope of the project, the role of each team member, what will be provided (milestones / deliverables), and the support needed.

Table- II: Project Charter

<b>Business Case</b>
The development of information technology is currently growing rapidly so that companies must continue to provide improvements to the field in which they live. Improvement in the existing system will greatly help maintain the quality of service provided by the company. This is quite necessary considering business competition in the telecommunications sector is increasingly competitive. PT Telin as a telecommunications company that has been established for a long time since 2007 must have a reliable strategy to be able to retain old customers and reach new customers by improving the quality of their service SLAs. Providing quality service will increase customer satisfaction and corporate value.
<b>Problem Statement</b>
PT Telin in particular the Operations team which provided corporate internet services realized that there were deficiencies in the quality of its services. This can reduce customer satisfaction and have a negative impact on the company. These quality problems can be influenced by various factors that start from the analysis process, troubleshoot and the system, causing low SLAs that affect the quality of service provided.

<b>Goal Statement</b>
Improving the quality of service services to customers so as to reduce customer complaints and have a positive impact on the company.
<b>Project Scope</b>
1. Quality of service to customers handled by the Operation unit - PT Telin. 2. The study was conducted on SLA Report data for the period of January 2018 to December 2019.
<b>Milestones</b>
Start Date: 01 November 2018 End Date: 30 November 2019

Project Charter and SIPOC Diagram. Project charter is used to describe customer requirements, process maps, and Voice of Customer (VOC) data [4]. The format of project charter varies greatly, but at least it must contain basic information about business cases, problem statements, project scope, project goals, project benefits, roles and timelines [5].

**B.Measure**

The second phase of the Six Sigma methodology is measure. The main activity undertaken is to identify problem areas and provide baseline data on current process performance [6]. In this stage, the determination of what services will pass the SLA work time is done to focus on the problem and be analyzed in the next stage. Data is taken from incident tickets that are exported from web ticketing.telin.co.id with total incident tickets measured as many as 1167 for all types of services (EPL, IPLC, IPVPN, IP Transit). In discussing this issue, we will take an example of the application in IP VPN because it is felt that the service is the most numerous and often miss technical data. It can be concluded that, from a total of 1167 open tickets for disturbance reports, there are still 108 services that still exceed the SLA. This will be discussed later in the points below to find out the cause of the problem that occurs in the data that has been collected

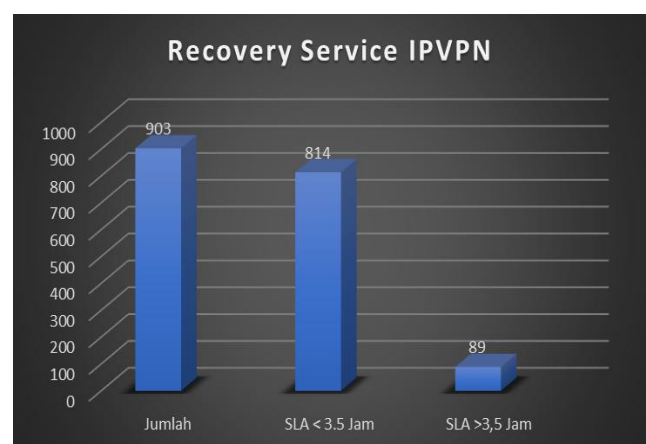


Figure 5. Recovery Service IPVPN

The IPVPN service in the graph above was generated from the SLA report for the last 10 months, November 2018 - June 2019.

We can see from the total of 903 interference tickets for the IPVPN service, there are still 89 interference tickets that have experienced SLA Broke, while the remaining 814 are still included in the safe category, i.e. solve in <3.5 hours. If seen in percentage, there are still around 10.9% of disturbances that still need to be increased.

For the type of problem that most occurs in the Management Service process, the Pareto Diagram is used. Data used in making pareto diagrams is data on the number of complaints on the survey and based on reports from customers and SLA reports from ticketing of PT. Telin taken in the period November 2018 - June 2019.

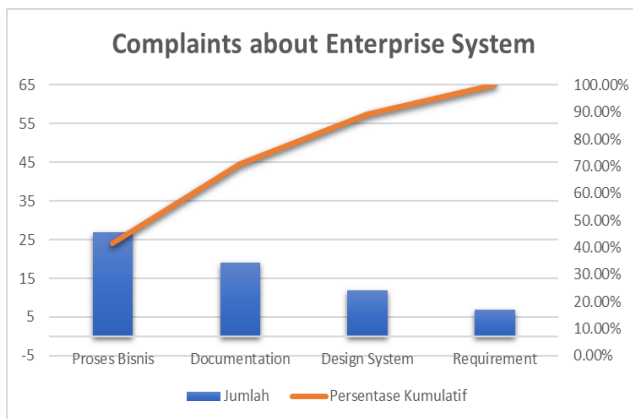


Fig 6. Complaints about Enterprise System

Based on the pareto diagram above, it can be seen that the highest type of problem contributes to the total survey and data in the period November 2018 - June 2019, namely "Business Process" with a percentage of 41.54% of the total Service Management problems. From the pareto diagram, the priority order of handling the problem of complaints is (1) Business Process, (2) Documentation, (3) Design System, (4) Requirements.

**C.Analyze**

the analyze phase aims to identify the root cause of the problem that has been determined from the results of the measure stage process which is the focus of the improvement effort. The tool used is a fishbone diagram that is used to look for root causes based on analysis of people, methods and products / tools). This tool is usually used during the analysis phase of the Six Sigma DMAIC project. Six Sigma is a quality strategy that can be implemented as a quality improvement procedure [7]. The root of the problem that appears on the fishbone diagram will be the basis for acting to improve. The results of the analysis of the factors causing the lack of performance of PT. NIT's Directorate of incident management and problem management can be described using a fishbone diagram

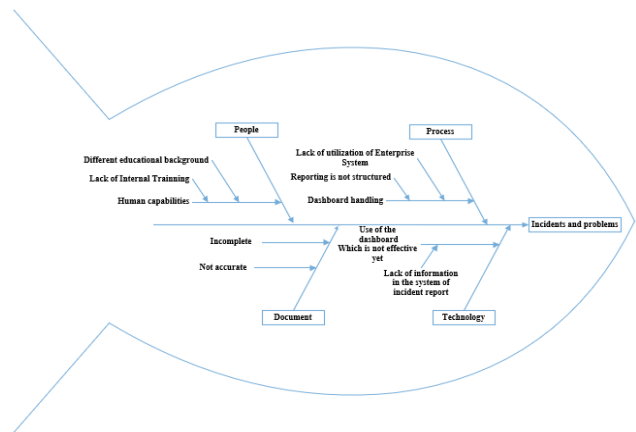


Fig 7. Fishbone Diagram

**1) People**

- a) The capabilities of the Operations unit at PT Telin are still diverse, due to differences in educational backgrounds and the lack of internal training within the company to improve the ability and performance of incident and problem handling
- b) The number of HR on the Unit Operations team is deemed insufficient to handle all incidents and problems that occur in the services handled by PT. Telin the Network Infrastructure Technology Division that is delivered to customers which causes delays in handling incidents and problems. And there are still a number of human resources who are still not very familiar with the management function due to lack of training in the internal team

**2) Process**

The Dashboard Enterprise System owned by PT TELIN is not fully utilized by the Operation and Provisioning units. The document in the Ticketing for reporting disturbances referring to the Enterprise System does not display clear information to conduct detailed analysis in the event of a disturbance reporting

**3) Document**

- a) *Incomplete documentation*  
Lack of attention or inaccuracy of the provisioning unit in providing all documents relating to data services to customers uploaded in the Enterprise System.
- b) *Inaccurate documentation*  
Lack of knowledge or attention from the provisioning unit in the documentation of data uploaded in the enterprise system. This slows down the unit that will search or use the document as a reference for solving the problem

**4) Technology**

Currently the Enterprise System and Ticketing dashboard as a database for handling disturbances is still ineffective, due to frequent downtime during working hours, a user interface that is less friendly to the Operation unit, thus hampering the process of handling incidents and problems.

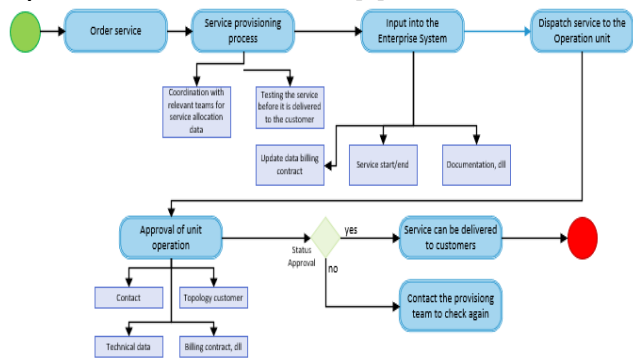
**D.Improve**

In improving, we provide recommendations for steps that can be taken by PT. To improve the SLA process for services that are served according to the needs of the company based on an analysis of the root causes of the fishbone diagram, an FMEA table is made with a format that has been adapted to the needs of the company. Here for the FMEA table,

Description	Failure Mode Analysis			Action Plan
	Potential Failure Mode	Potential Effect of Failure	Potential Causes of Failure	
People	Different educational background	Still lack of HR capabilities	Not all employees have an IT education background	More often there will be internal training related to company management systems and external training for employee information development
	Still lack of training		Lack of training	
Process	Still less structured	Use of Enterprise Systems	Management functions in the Enterprise System	1. Making the latest SOP related to upload document validation 2. Weekly meeting to add new business processes
	Enterprise System Utilization		Added new features in the Enterprise System	
Documentation	Incomplete	Lack of information on using Enterprise System	The related unit in charge of providing Management is still not firm enough with the completeness of	"1. Doing internal sharing 2. Check internal documents "
	Not accurate		Establish document standardization	
Technology	Downtime often occurs	The use of Enterprise Systems that have not been effective	Still usually improved for the Enterprise System	1. Contact the vendor to fix this problem 2. Weekly meetings will often be held to display performance reports both with vendors and with the IT team
	Interface management is still not friendly		Improvement interface management	

**Fig 8. FMEA Table**

Referring to the previous discussion that explains the company's current system, the writer tries to improve the business processes that currently exist in the company. This is so that all data that enters the Enterprise System database is valid data. This can prevent or improve service management of PT Telin customers. This is useful for improving the performance of the production process and making things better, cheaper, and faster. The Six Sigma team will review the results of the trial to refine the solution, if needed, and then implement the solution if needed [8].



**Fig 9. New Bisnis Process**

**E. Control**

Control stage is the last stage in solving problems using the six sigma DMAIC method, where this stage is useful for monitoring the results of improvements made so as to achieve the expected target. In this stage an evaluation of each proposed improvement is carried out in accordance with the FMEA table in the Improve stage. Some things that need to be done at this stage are as follows:

- 1) Evaluate the number of problems that might make SLA broke every end of the month to see if there are significant positive effects either on the service management process. This is done by documenting the number of SLAs that are broken and then compared with their respective databases.

- 2) Making documentation for all efforts made in improving Service Management and included in Weekly and Monthly meetings.
- 3) Making Control Chart to control the Service Management process for customers at PT Telin every three months so that it can be evaluated whether the number of customer complaints is reduced or not.

**V. CONCLUSION**

Based on the results of research using the Six Sigma method that aims to improve the quality of Service Management by reducing the number of SLA Customers that have broken, it can be concluded about solving problems related to business processes that occur in the Service Management process represented by the Enterprise System by PT Telin, that is:

- 1) The use of the DMAIC Method to analyze the Service Management Process in units related to handling customer disturbances at PT Telin has found a solution, namely improvement made into 3 parts and made privilege for each unit needs only.
- 2) The quality of the Service Management process at PT Telin can be reminded with the following recommendations:
  - a) Standardize Documents
  - b) Conduct Business Process Improvement
  - c) Implementation of new Business Process recommendations on the Enterprise System
  - d) Conduct technical training to several HR who still do not understand IT
  - e) Implement internal sharing regularly every month to be able to share technical knowledge between team members
  - f) Establish document standardization upload in the Enterprise Database System
- 3) After the recommendations are implemented optimally, the sigma level of PT Telin's Service Management quality increases by  $0.39\sigma$  ( $3.80\sigma$  to  $4.19\sigma$ ) which can be seen in the appendix

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