

QUALITY PROBLEM IMPROVEMENT ON STEEL CRATE PRODUCTION

AT PT TOTAL TANJUNG INDAH

Study case on Customer : PT Toyota Motor Manufacturing Indonesia



THESIS

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A THESIS

**Submitted in a partial fulfillment of the requirements for the degree of
Bachelor of Business Administration**

Appendix 1 : CERTIFICATE OF APPROVAL

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Topic :

QUALITY PROBLEM IMPROVEMENT ON STEEL CRATE PRODUCTION
AT PT TOTAL TANJUNG INDAH

(Study case on Customer : PT Toyota Motor Manufacturing Indonesia)

We hereby declare that this Thesis is from student's own work, has been read and presented to Institut IPMI Board of Examiners, and has been accepted as part of the requirements needed to obtain a Bachelor of Business Administration Degree and has been found to be satisfactory.

Jakarta, 31 Agustus 2026

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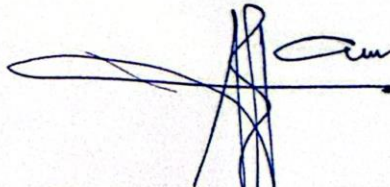


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NON-PLAGIARISM DECLARATION FORM

This Thesis is a presentation of our original research work. Wherever contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.

Also, this work is being submitted in partial fulfillment of the requirements for the Bachelor of Business Administration degree and has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Jakarta, 21 September 2026



Muhammad Akram

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CHAPTER I INTRODUCTION

1.1 Background

Production efficiency and market expansion are among the main factors that drive international trade between countries. When a country can produce goods efficiently at lower costs while maintaining internationally recognized quality standards, it gains the opportunity to expand into foreign markets through export and import activities.

International trade plays an important role in supporting a country's economic growth while also strengthening relationships with other nations, particularly in the economic sector. Exports and imports refer to the exchange of goods and services between countries to meet the needs of their populations. Although exports and imports serve different purposes and provide different benefits, one of the key reasons they are carried out is to build cooperation and maintain strong relationships between countries through the exchange of products between parties that work together.

One of Indonesia's leading export sectors is the automotive industry, which includes motor vehicles and automotive components. This industry has become one of the country's key commodities in global trade. As of 2024, Indonesia is the largest automotive market in ASEAN and ranked as the world's 11th largest automobile producer based on 2023 data from the Indonesian Automotive Industry Association (GAIKINDO).

The rapid growth of Indonesia's automotive manufacturing industry has been supported by the presence of multinational companies with globally recognized brands, including Toyota, Daihatsu, Hino, Mitsubishi, Hyundai Motor, Suzuki, and Honda. These manufacturers have played an important role in strengthening the domestic automotive industry ecosystem. According to GAIKINDO, Indonesia's automotive sector is supported by 32 manufacturers of four-wheeled and larger motor vehicles, with a combined annual production capacity of approximately 2.35 million units (Kompas, December 30, 2025). The industry directly employs around 99,700 workers and supports more than 1.5 million additional jobs across

approximately 600 automotive suppliers, including 950 small and medium-sized enterprises (SMEs).

As Indonesia's automotive industry continues to expand, vehicle exports have also shown steady growth. Indonesia exports vehicles to a wide range of international markets, including ten major developing countries: Malaysia, the Philippines, Vietnam, Thailand, Pakistan, South Africa, Saudi Arabia, the United Arab Emirates, South Korea, and India. These countries represent significant export markets with strong growth potential for Indonesia's automotive industry.

Ekspor produk otomotif dari Indonesia umumnya dikategorikan ke dalam tiga tipe utama :

1. CBU (Completely Built Up) refers to vehicles that are exported to the destination country in a fully assembled, ready-to-use condition. These vehicles require no further assembly upon arrival and are delivered directly to authorized dealerships for sale or distribution.
2. CKD (Completely Knocked Down) refers to vehicles that are exported in a disassembled form, with their components and parts packaged separately. Upon arrival in the destination country, these components are reassembled at a local assembly plant to produce a complete vehicle. This approach enables manufacturers to support local production while reducing shipping costs and complying with local manufacturing or import regulations.
3. Component (Parts/Sparepart) refer to the export of individual vehicle parts or components, such as engines, transmissions, body panels, and smaller spare parts, in large quantities. These components are supplied to overseas assembly plants to support vehicle production or distributed to meet the demand for replacement parts and after-sales service (aftermarket).

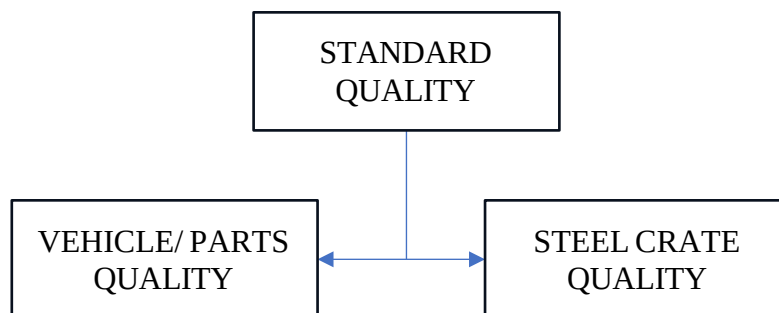
Across all three categories of automotive exports, namely Completely Built-Up (CBU) vehicles, Completely Knocked Down (CKD) kits, and automotive components, the role of supporting industries is indispensable, particularly in the area of packaging. Before being shipped to their destination countries, these products are carefully packed using steel crates, which provide the strength and protection required during handling, storage, and international transportation.

Automotive
Manufacture

Steel Crate
Manufacture



Because these products are exported to countries around the world, compliance with Global Quality Standards is essential. Both the automotive parts being transported and the steel crates used for packaging and shipment must meet the required quality standards established by customers and international regulations.



Within a single vehicle, there are nearly 30,000 small components, such as bolts and nuts, and approximately 3,000 medium to large-sized parts. Each component has its own quality standard depending on its function and location within the vehicle. Outer parts, which are visible from the outside of the vehicle, are subject to the highest quality standards, particularly in terms of surface appearance and finish. In contrast, inner parts generally have less stringent appearance requirements, as they are not visible to the end user.

The quality standards for steel crates differ significantly from those for automotive parts. Since steel crates are primarily used as returnable packaging for transporting automotive components,

their quality requirements focus mainly on structural strength, weld integrity, dimensional accuracy, and component completeness, rather than cosmetic appearance. These standards ensure that the crates can safely protect and transport parts throughout the logistics process while maintaining durability over repeated use.

Why Consistency of quality is important ? According to **Russel and Taylor** (1996) 6 core benefits of quality :

1. **Enhanced Company reputation** : A strong brand image elevates market standing and makes it easier to recruit high quality staff
2. **Reduce Production Cost** : Minimizing waste, defects, and rework saves operational expenses
3. **Expanded Market Share** : A reputation for excellence attracts new customers and opens door lucrative, highly regulated global markets.
4. **Enhanced International Compliance** : A strong quality management system ensures that goods and services meet global standards, minimizing trade barriers and facilitating international supply chain partnerships.
5. **Product responsibility** : Company will responsible for design, process and distribution of product to fulfill and customer's expectation. Delivering reliable and safe products build trust, meets expectations, and secures ongoing.
6. **Product Appearance** : Quality will makes our product famous and makes the company also famous and thrusted by people. Thrusted customer;s level and people will increase and company will be more appreciated and valuable.

In process production sometimes defective product occur, so that the company must always control of quality in process production to reduce product failure and always implement continuous improvement.

PT. Total Tanjung Indah is a company to manufacture steel crate for packaging of spare part of automotive both for four wheel or two wheel cycles for export. PT Total Tanjung Indah place Office in Rawamangun Jakarta Timur and Workshop 30,000 M2 area in Kelurahan Burangkeng kecamatan Setu Kab. Bekasi Jawa Barat. The company started operation in 2004.

To Manufacture steel crate has some processes, starting from :

1. Receiving Ordering from Customers or Marketing Planning
2. Procurement and Ordering Materials
3. Receiving Materials

4. Metal Forming : Cutting Process , Shearing Process,Punching Process, Drawing / Bending Proces , Rolling,
5. Welding and Nut Weld Process
6. Assembling all process from metal forming to welding component
7. Storing and Delivery to Customers.

Each process must be controlled for quality output, to prevent failure product delivered to next process and prevent customers complain. The kinds of failure product for steel pallet are poor welding problem, Dimension problem, Mis assembling problem, mis and shortage delivery and delay delivery. If there are any complain from customers, they will be high impact to cost, reputation also market share, so that why company must be quick response for any complain or problem founded at customers.

According to defect problem or complain customers, We take research about how to solve quality problem in PT Total Tanjung Indah for customer PT. Toyota Manufacturing Indonesia especially, Packing Vanning Export Division Karawang Plant, Jawa Barat.

1.2 Problem Statement

According to background above , problem statement in this research is How to reduce defect in PT Total Tanjung Indah in Toyota Production Line for customer PT. Toyota Manufacturing Indonesia, Packing Vanning Export Division Karawang Plant, Jawa Barat.

1.3 Objective Study

Objective study is

1. To solve the quality problem in Toyota Production Line In PT Total Tanjung Indah
2. To Increase Image of PT Total Tanjung Indah to strive the biggest manufacturer of Steel Pallet in Indonesia.

1.4 Benefit of research

1. For writer : Additional knowledge and study how to identify problem and solve the problem with any tools.
2. For Company : To support and help company to solve the problem and maintain reputation of company to increase market share and get new customers

CHAPTER II LITERATURE

2.1 Manufacturing Process

Kalpakjian, Serope. Schmid, Steven R (2003), 4th edition, Manufacturing Processes for Engineering Materials. Prentice hall. New jersey USA. Page No. 7

Various steps involved in designing and manufacturing a product. Depending on the complexity of the product and the type of material used. The time span between the original concept and the marketing of a product may range from a few months to many years.

Steps of Designing and Manufacturing :

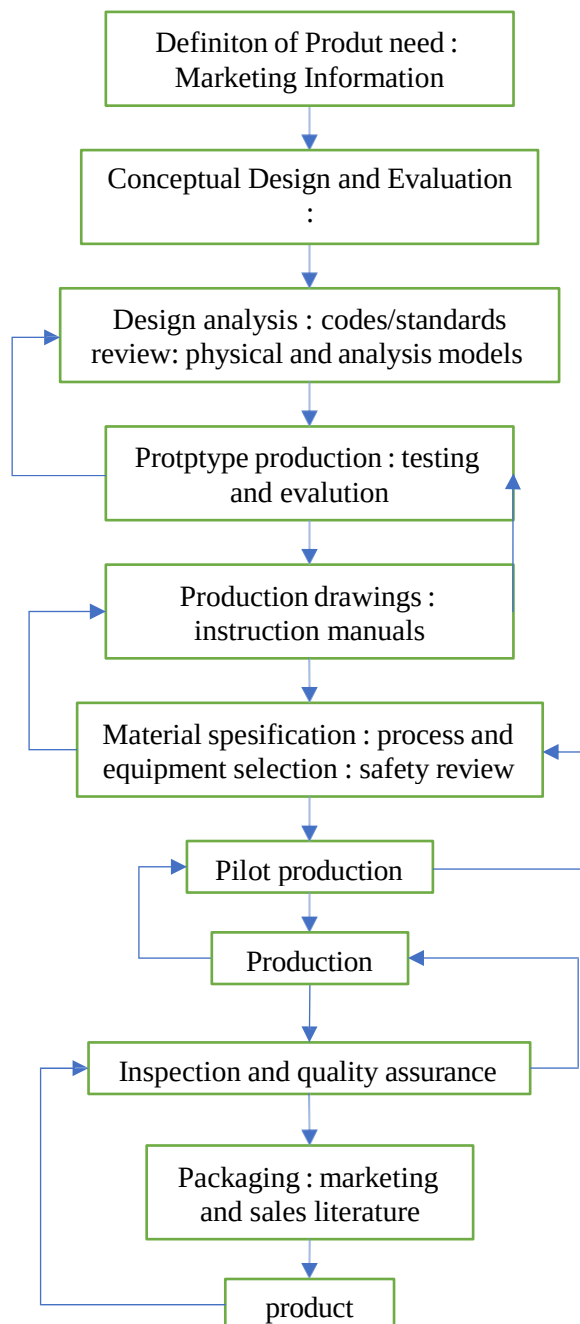
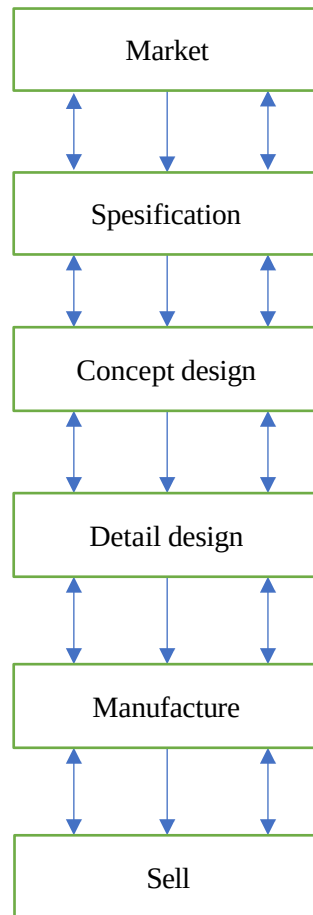


Chart General product flow



2.2. Quality

2.2.1 Definition of Quality

Walujo, Djoko Adi. Koesdijati, Titiek. Utomo, Yitno (22 Juli 2021) Scopindo Media Pustaka. Surabaya. page 3, Mentioned :

1. William Edward Deming from Massachusetts Institute of Technology: “ *quality should be needs of the consumer, present and future*” (Deming1986)
2. Armand Vallin Feigenbaum dari Gneral System Company, Inc.: “ *product and service quality can be defined as the total composite product and service caharcteristic of marketing engineering manufacture, and maintenance through which the product and serve in use wil meet the expectations of customer* (Feigenbaum, 1991)
3. David A. Garvin dari business school define quality from five views (Garvin, 1998) :
 - a. from trancedent, : “quality is synonymous with innate excellence”

- b. from product (product based),: “ quality is a precise and measureable variable”
 - c. from user (user-based),: “ the goods that having the highest quality are the goods that best satisfy the preference of consumers”.
 - d. from produsen (manufacturing-based), : “quality means conformance to requirements”
 - e. from Value (value-based),: “a quality product is one that provides performance or conformance at an acceptable prices cost”.
4. Ishikawa (1943) : Quality as total customer satisfaction, famously stating : people engage in quality control in order to manufacture products with the quality which can satisfy the requirements of the customers. And also Quality is to improve performance of organization with cause and effect diagram to diagnose quality problem
 5. Josep M. Juran dari Juran Institute, Inc, mentioned 2 definitions of quality : *meeting the needs of customer and thereby provide product satisfaction serta freesom from deficiencies.* (Juran dan Gryna. 1998)
 6. Marshal Sashkin dan Kenneh J. Kisser from marshal sashkin & associates and from Oklahoma state University mentioned : *Quality is the constant of customer satisfaction* (Sashkin dan Kisser, 1993)
 7. Crosby (1979) : Quality is conformance to requirements which consist of availability, delivery, reliability, maintability and cost effectiveness
 8. Schekenbach (1991) Quality is determined by the customer wants product and service that match his needs and expectations at certain price level that indicates value of the product.
 9. Elliot (1993) Quality as Subjective concept that varies for different people, depending on time and place, and is ultimately judged by wheter a product or service is fit for its
 10. Goetch and Davis (1995) Quality as Dynamic condition which related to product, service,people,process and environment that fulfil the expectation.
 11. SNI 19-8402-1991 : Quality as Overall features and characteristics product or services whose capabilities can satisfying nees, whether stated in a way firm and disguised the term need, is interpreted as soecifications listed in contract and the criteria that must be met defined moreover before.

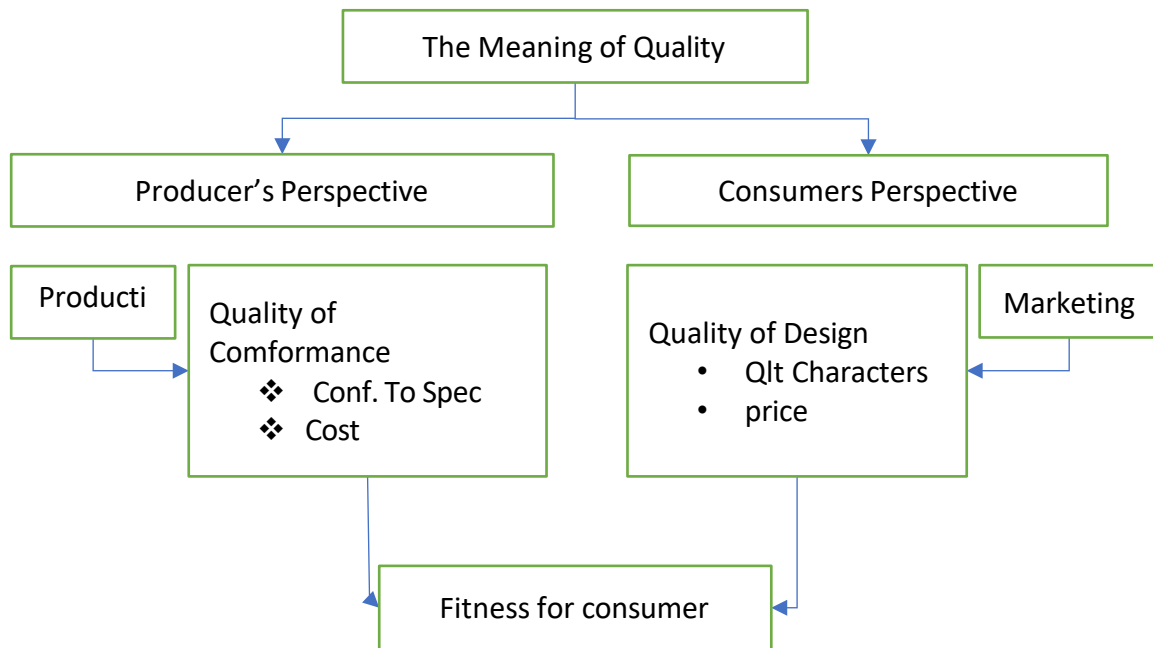
According to experts above, 3 definitions of quality are :

- a. Cutomers satisfaction
- b. Product within standard

c. Reasonable Price

2.2.2 Why quality is important

Russel dan Taylor (1996) ,also define Quality has 2 perspective : produsen dan perspektif konsumen, as figure below :

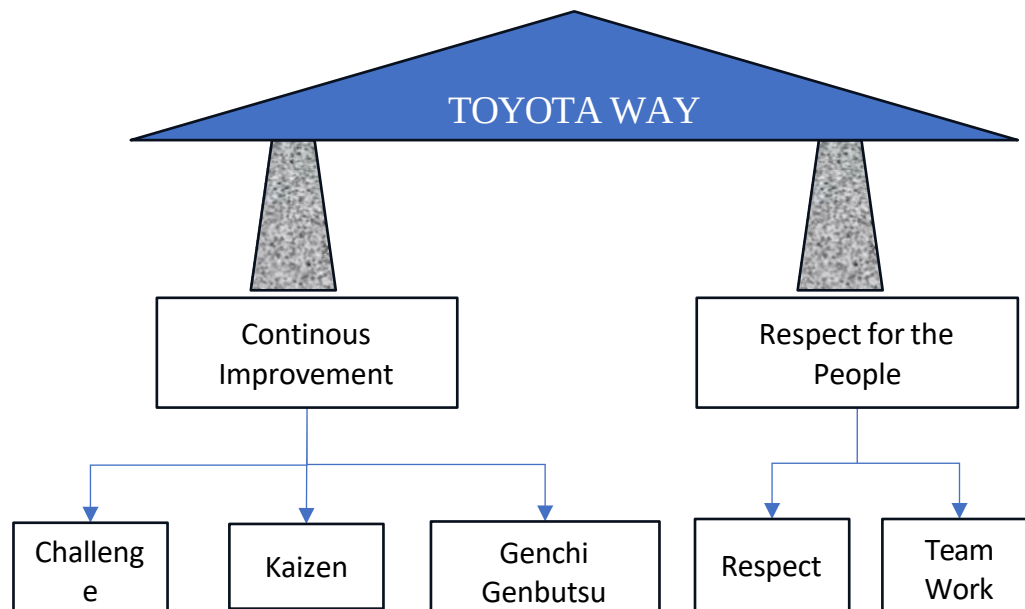


Garvin (1996) define dimentions of quality for manufacturing industry as :

- Performance*, is Confirmity of product with function of the product self or operation characterstic of the product
- Feature*, yaitu Special characteristic of the product which difference from other products and make customers good impressed on product.
- Realitibility*, yaitu Customers thrust on product, may be strong product or high level quality product.
- Comformance*, yaitu Confirmity of product to requirement, design, size, operation, or other standards
- Durability*, yaitu long life of product
- Serviceability*, Easy spare part or Easy to find workshops to maintain product
- Aesthetic*, Aesthetic or attractive power of product

- h. *Perception*, is fanaticism of customer because of branding or reputation. Such as Pump is Sanyo, or vehicle is Toyota and Motorcycle is Honda also Ballpoint is Pilot.

2.3 Toyota Way



Foundations of Toyota Way are Respect for the People and Continuous improvement, Five value of Toyota Way are :

- Challenge : Create long vision and face challenge with creativity
- Kaizen : Continuous improvement and Push innovation and evolution - PDCA
- Genchi Genbutsu : Search and Find the fact to make decision, Build consensus and get the goal with the best velocity
- Respect : Responsibility to get the best and build trust each others
- Teamwork : Optimize personal growth and professionalism also individual performance and team

Problem and Opportunity for Visualization of Toyota Way Kaizen



CHAPTER III DATA AND METHODOLOGY

3.1 Levels to Build Quality Management System

According to Garvin (1988) There are four levels to build quality management system, as following items :

3.1.1 Inspection

The modern concept of quality management began to emerge in the 1920s, when the primary quality function was performed by the inspection department. During the production process, inspectors evaluated products based on established specifications. However, the inspection department was not independent and typically reported directly to the manufacturing department. This organizational structure often resulted in conflicts of interest. When inspectors rejected products that did not conform to the specified requirements, the production department might attempt to pass or accept the nonconforming products in order to meet production targets, potentially compromising product quality.

There are several researchers in statistics, and one of them is Walter A. Stewhart (1924) who developed important concepts of statistic to control variables of product, such as length, Width, Weight, Height and so on. H.F Dodge and H.G Romig (early 1920) are pioneers for sampling check to acceptance of product (Acceptance Sampling).

Methods of inspection :

3.1.1.1 Inspection 100%

100% inspection is considered one of the most comprehensive methods of quality control because every product is inspected before being released. However, this approach is generally feasible only for small production volumes or for products that require extremely high levels of accuracy and safety. In the production of steel cases, implementing 100% inspection is highly challenging. With an average total production volume of more than 200 units per day across all customers, conducting a full inspection would require a significant number of additional workers as well as a large amount of space to accommodate the inspection activities.

3.1.1.2 Inspection in the beginning, middle and end of production (Batch Sampling)

In Toyota Motor Manufacturing Indonesia (PT. TMMIN), they inspect the build in quality system (Production operator as Quality Inspector) with 3 Don't philosophy :

- a. Don't receive defect product
- b. Don't Process defect product
- c. Don't deliver defect product

This method requires a high level of discipline and quality awareness among all production operators to ensure that the concept is applied consistently and continuously throughout the production process.

3.1.1.3 Metode Sampling (AQL – Acceptable Quality Limit)

This is one of the most commonly used methods among businesses. Products to be inspected are selected randomly by designated quality personnel.

There are 3 level of sampling inspection :

1. Level I : Low risky product and low volume production
2. Level II : Normal and common use in industry
3. Level III : High risk product and high volume production

Reference from :

How to use AQL (acceptable Quality Limit) in QC Inspections (Qarma Quality&Compliance. accessed on 31 May 2024 from <https://www.qarmainspect.com/blog/aql>

Table of AQL

Table 1 : Volume Production

LOT OR BATCH SIZE			Special inspection levels				General inspection levels		
			S-1	S-2	S-3	S-4	I	II	III
2	to	8	A	A	A	A	A	A	B
9	to	15	A	A	A	A	A	B	C
16	to	25	A	A	B	B	B	C	D
26	to	50	A	B	B	C	C	D	E
51	to	90	B	B	C	C	C	E	F
91	to	150	B	B	C	D	D	F	G
151	to	280	B	C	D	E	E	G	H
281	to	500	B	C	D	E	F	H	J
501	to	1200	C	C	E	F	G	J	K
1201	to	3200	C	D	E	G	H	K	L
3201	to	10000	C	D	F	G	J	L	M
10001	to	35000	C	D	F	H	K	M	N
35001	to	150000	D	E	G	J	L	N	P
150001	to	500000	D	E	G	J	M	P	Q
500001	to	+	D	E	H	K	N	Q	R

Table 2 : Sample Size

TABLE 2 SINGLE SAMPLING PLANS FOR "NORMAL" INSPECTIONS (MASTER TABLE)											
Sample size code	Sample size	Acceptable Quality Levels									
		0.10	0.25	0.40	0.65	1.0	1.5	2.5	4.0	6.5	
		AC RE	AC RE	AC RE	AC RE	AC RE	AC RE	AC RE	AC RE	AC RE	
A	2									0 ↑ 1	
B	3								0 × 1		
C	5							0 × 1			
D	8					0 × 1	0 × 1			1 2	
E	13				0 × 1	0 × 1			1 ↓ 2	2 3	
F	20				0 × 1			1 ↓ 2	2 3	3 4	
G	32			0 × 1		1 ↓ 2	1 ↓ 2	2 3	3 4	5 6	
H	50		0 × 1			1 ↓ 2	2 3	3 4	5 6	7 8	
J	80				1 ↓ 2	2 3	3 4	5 6	7 8	10 11	
K	125	0 × 1		1 ↓ 2	2 3	3 4	5 6	7 8	10 11	14 15	
L	200		1 ↓ 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22	
M	315		2 3	3 4	5 6	7 8	10 11	14 15	21 22		
N	500	1 2	3 4	5 6	7 8	10 11	14 15	21 22			
P	800	2 3	5 6	7 8	10 11	14 15	21 22				
Q	1250	3 4	7 8	10 11	14 15	21 22					
R	2000	5 6	10 11	14 15	21 22						

3.1.2 Quality Control

In the 1940s, the inspection function evolved into Quality Control (QC). The outbreak of World War II created a critical need for military products to be manufactured with minimal defects, as the quality and reliability of military equipment became an important factor in determining the outcome of the war. This requirement led to greater emphasis on quality control throughout the production process. Responsibility for quality was transferred to an independent quality control department, which operated with full authority and was organizationally separated from the manufacturing department.

Inspectors were equipped with statistical tools, such as control charts and sampling techniques, to monitor and evaluate product quality during production. During this period, Armand V. Feigenbaum emerged as an important figure in the development of quality management. He pioneered the concept of Total Quality Control (TQC) in the 1960s. In the 1970s, Feigenbaum further developed this concept by introducing organization-wide Total Quality Control,

emphasizing that quality should involve the entire organization rather than being limited to the quality control function. In 1983, Feigenbaum introduced the concept of the Total Quality System, which further expanded the scope of quality management into an integrated system covering the organization as a whole.

At this level Control Quality by some technic and measurement tools to observe and control quality. Samsung, using six sigma to control their semi conductor product. Also Coca Cola apply Quality Control thightly when processing their product. For Toyota Motor Manufacturing Indonesia is using 7 Tools, PDCA and Toyota Way as basic philoshopy.

3.1.3 Quality Assurance

Recommendations generated from statistical techniques could often not be effectively addressed within the existing decision-making structure. As a result, Quality Control (QC) gradually evolved into Quality Assurance (QA). The Quality Assurance function focused on ensuring that processes and quality standards were maintained through activities such as operational audits, training, technical performance analysis, and the development of operating guidelines to improve overall quality. Quality Assurance worked closely with other organizational functions, with each department taking full responsibility for the quality performance of its respective activities.

At this stage, companies shifted their focus from detecting quality problems to preventing them before they occurred. This approach also emphasized coordination across all levels of the supply chain, from product design and production to distribution, with the objective of preventing defects and minimizing potential damage. Therefore, responsibility for product quality was no longer limited to the quality department but became a shared responsibility across all organizational functions, reflecting the principle of “building quality into the product.”

At this level, Company focus to prevent quality problem before occur. Samsung has Quality Assurance Division with job description to make sure all of process from design till delivery already fulfilled standard of quality. Another Company as NASA also has Quality assurance Division to make sure space mission will be success. Toyota also has Quality Control Division (QCD) to make sure quality of vehicle from design, production, delivery and after market already fulfilled Toyota Standard.

3.1.4 Total Quality management (TQM)

As quality management continued to evolve, it became evident that customer satisfaction with quality was influenced not only by the production function but also by other functions throughout the organization. Therefore, responsibility for quality could no longer be assigned solely to a particular department. Instead, it became the responsibility of every individual within the organization. This approach became known as Total Quality Management (TQM), which gained prominence around 1985.

The development of a comprehensive and integrated approach to quality, commonly referred to as Total Quality, can be traced back to the early twentieth century through the work of Frederick W. Taylor, who is widely recognized as the *Father of Scientific Management*. Taylor was particularly known for his Time and Motion Studies, which emphasized the systematic analysis and improvement of work processes.

At this level, quality management emphasized its strategic impact through strategic planning, goal setting, and the mobilization of all organizational levels. The functions of quality experts included establishing quality objectives, providing education and training, working collaboratively with other departments in a consultative capacity, and designing quality improvement programs. Therefore, the orientation and approach at this level shifted toward “managing quality,” where quality became an integral part of the organization’s overall management strategy and decision-making process.

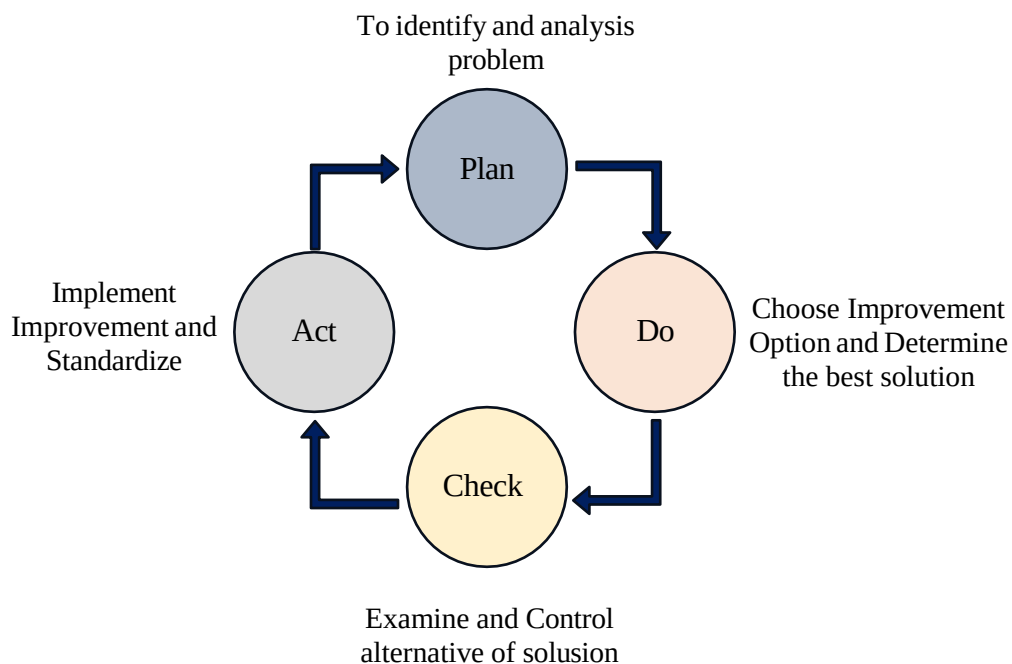
3.2 PDCA

The PDCA cycle is one of the most widely used tools for conducting improvement activities. The PDCA Cycle is often illustrated as a wheel and is commonly referred to as the Deming Cycle. Its fundamental principle is continuous improvement, whereby problems are addressed systematically and continuously to improve the quality of products and services.

The Plan phase involves identifying and analyzing the problem. At this stage, tools such as the Cause-and-Effect Diagram can be used to identify the root cause of the problem in a detailed and systematic manner. The Do phase involves selecting improvement alternatives and determining the most appropriate solution based on established priorities. The Check phase involves evaluating and monitoring the selected solution to determine whether it is effective in addressing the identified problem. If the solution is found to be ineffective, the process returns to the Do phase to evaluate and implement an alternative solution. Finally, the Act phase

involves implementing the effective improvement and standardizing the improved process to ensure that the improvement is maintained and the problem does not recur.

PDCA Cycle(Deming)



As part of Continuous Improvement, Toyota has ben developed eight step simple technic and seven tools to identify and solve All the problem. The eight steps is well known as PDCA. Eight Steps of PDCA as following :

P is Planning, Consist of 5 Steps are :

Step 1 : Determine the main problem or clarify the problem

- a. Not standard
- b. Gap between actual to expected result
- c. Necessity and customers expected is not fullfiled

Step 2 : Detail and specify the problems by studying input-output

Step 3 : Set the target and make commitment also focus to identify the problem

Step 4 : Analysis Root cause

Step 5 : Make plans and develop effective and practical countermeasure

D is “Do”, consist of 1 step is :

Step 6 : Implement countermeasure

C is “check” (Check the result), Consist of 1 steps :

Step 7 : Check, monitor and evaluate the result

A is “Action”, Consist of 1 Steps :

Step 8 : Standardize and share the success to be lean organization and continuous improvement.

3.3 Seven tools

Seven tools are a set of quality problem solving instruments. Seven tools are as follows :

- a. *Check Sheet*. A structured form designed to collect and analyze data. It is a generic tool that can be adapted to and used for a wide variety purposes.
- b. *Cause and Effect diagram (Fishbone Diagram)*. Also known as the Fishbone Diagram, this tool illustrates the relationship between causes and effects. It is used to identify and analyze the root causes of a problem, making it easier to determine appropriate corrective actions.
- c. *Control charts*. A graph used to monitor and study how a process changes over time. It helps determine whether a process is stable and operating within acceptable limits.
- d. *Histogram*. A graph used to monitor and study how a process changes over time. It helps determine whether a process is stable and operating within acceptable limits.
- e. *Pareto chart*. A bar chart that displays factors in descending order of frequency or significance, helping identify the most important issues that contribute to a problem.
- f. *Scatter Diagram*. A graph of paired numerical data used to identify and analyze the relationship or correlation between two variables.
- g. *Stratification*. A technique used to separate collected data from different sources or categories so that patterns and trends can be more easily identified. (In some references, Stratification is replaced by a Flowchart or Run Chart as one of the Seven Quality Tools.)

CHAPTER IV PROBLEM ANALISYS

A comparison of production volume and Quality and Delivery (QD) issues between the company and its industry competitors for PT Toyota Motor Manufacturing Indonesia (TMMIN) during the January to December 2024 period is presented in the attached data.

For the purpose of this study, the analysis is limited to data from a single customer, PT Toyota Motor Manufacturing Indonesia (TMMIN), specifically the PBOD Karawang division. The comparison is made against companies operating in the same industry that supply similar products to the same customer.

Steel pallet manufacturer :

1. PT. Perso Inti Pallet (Perso)
2. PT. Mitra Toyota Indonesia (MTI)
3. PT. Perkakas Rekadaya Nusantara (PRN)
4. PT. Mitratama Prakarsa Solusi (MPS)
5. PT. Mitra Usaha (MTU)

4.1 Problems Comparison Between Companies

The quality problems identified in this study include nut defects, poor welding quality, miscomponents (incorrect parts shipped), dimensional defects (incorrect dimensions), and incomplete shipments (missing or insufficient items).

The delivery problems include shortages (insufficient quantity delivered) and delays (late deliveries).

Quality Problems

Total for the period Jan – Des 2024

Supp	Perso	MTI	PRN	TTI	MPS	MTU
Vol. Prod (A)	2794	2133	5596	4048	3620	2587
Line Stop (B)	88	50	103	143	190	15
Ratio (B/A)	0,031	0,023	0,018	0,035	0,052	0,006

Shortage Delivery

Total for the period Jan – Des 2024

Supp	Perso	MTI	PRN	TTI	MPS	MTU
Vol. Prod (A)	2794	2133	5596	4049	3649	2547
Quantity (B)	0	0	0	0	0	0
Ratio (B/A) %	0	0	0	0	0	0

Delay Delivery

Total for the period Jan – Des 2024

Supp	Perso	MTI	PRN	TTI	MPS	MTU
Vol. Prod	2794	2133	5596	4048	3620	2547
Delay (mnt)	0	0	0	0	0	0
Delay / Vol. Prod	0	0	0	0	0	0

Based on the data presented above, the following conclusions can be drawn :

- A. There were no issues related to delivery shortages or delivery delays. The primary issue identified during the period was product quality.
- B. The quality problems were ranked by comparing the number of quality issues with the total production volume. The results, arranged from the lowest defect rate to the highest, are as follows:

No.	Steel Pallet Manufacturer	TMMIN Target	Problem %
1	PT. Mitra Usaha (MTU)	0,25%	0,57
2	PT. Mitra Toyota Indonesia (MTI)		2,3
3	PT. Perkakas Rekadaya Nusantra (PRN)		1,84
4	PT. Perso Inti Pallet (Perso)		3,1
5	PT. Total Tanjung Indah (TTI)		3,5
6	PT. Mitratama Prakarsa Solusindo (MPS)		5,2

Therefore, PT Total Tanjung Indah needs to improve its quality management system in order to remain competitive with other companies in the same industry.

4.2 Problem Analysis

What : Quality Problem which detail are following below

Who : PT. Total Tanjung Indah as Supplier and PT TMMIN as Customer

When : During Januari – December 2004

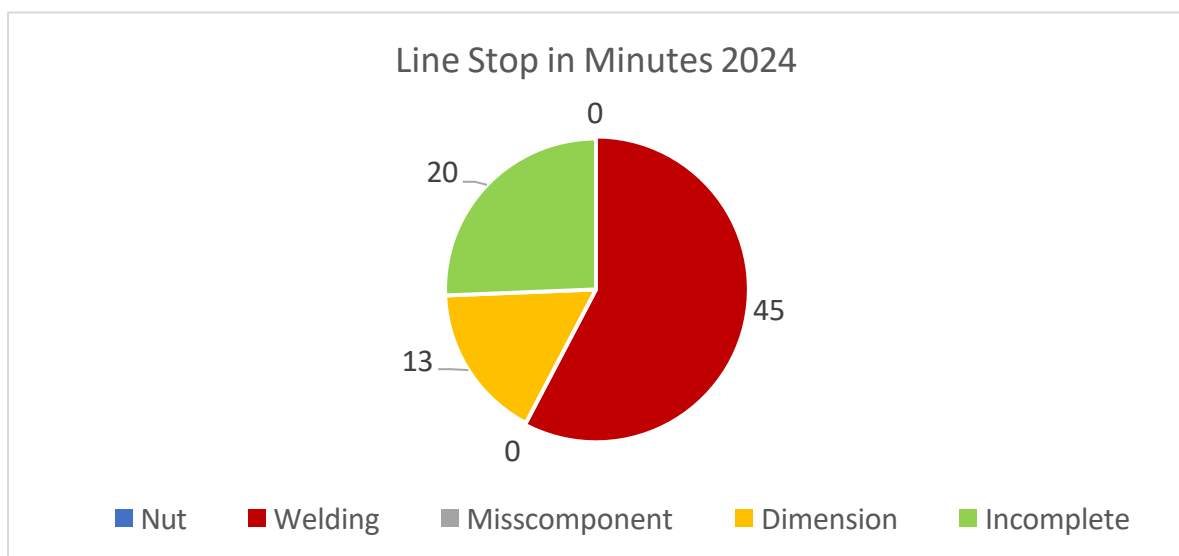
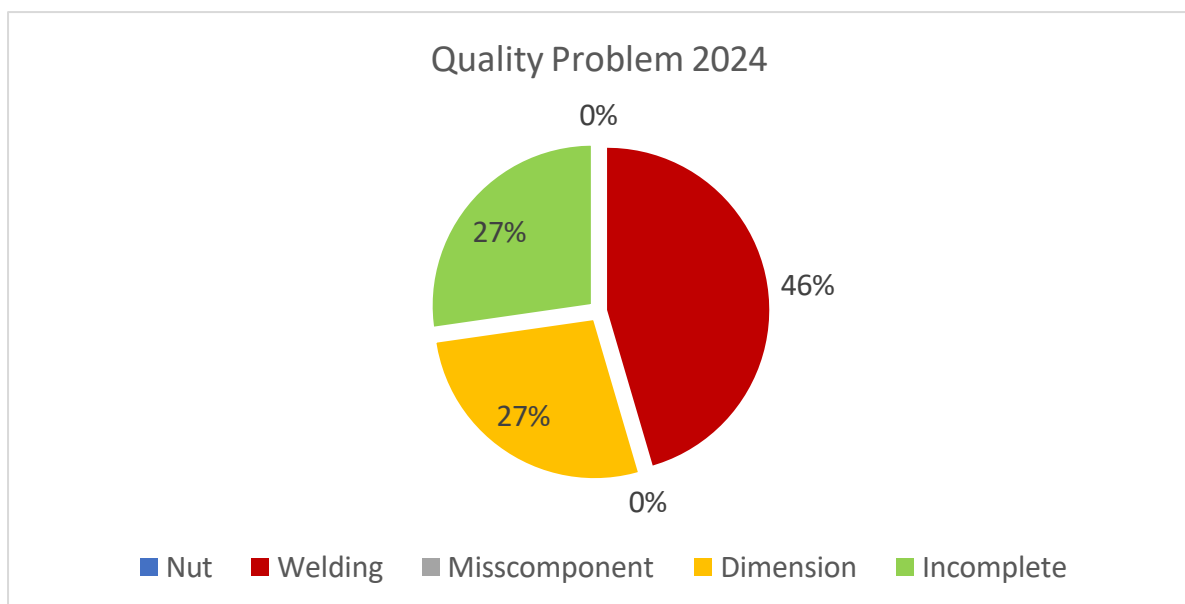
Where : At Customer in this case in PT Toyota Motor Manufacturing Ind

Why : Control of Quality is still not working well

How : Control of Quality must be applied at any process of working Line area

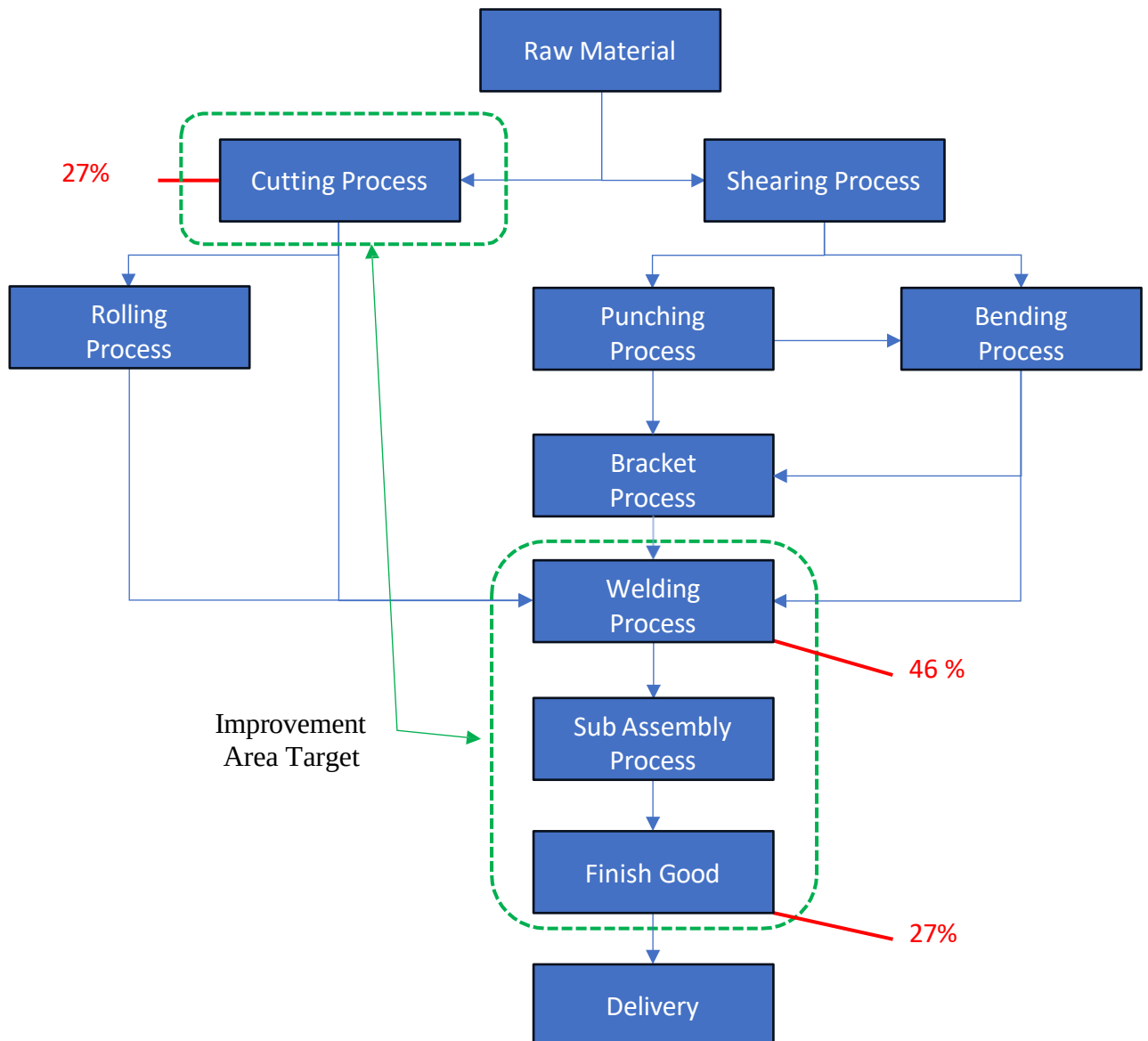
Detail of Problem of PT Total Tanjung Indah in 2024 Jan – Dec Period

Descrip	Nut	Welding	Mis component	Dimension	Incomplete
Frequency (Cases)	0	5	0	3	3
Stop (minutes)	0	45'	0	13'	20'



According to data above, the Pareto problems are Welding. Therefore, We must focust on that Line area or process to be improved

Mapping of Problem in Production Line of PT Total Tanjung Indah



4.2.1 Welding Line Area

Cause	1 st Why	2 nd Why	3 rd Why	4 th Why	5 th Why
Material	Rusty Effect	No Maintenance on daily especially week end	As Side working after main job finish	No special Maintenance worker	Shortage Man Power
Manpower	Worker Not Obey the rule of SOP	Experienced and old Worker feel capable and normal	Daily and Routine Job for years	Worker're fed up and bored	Training Necessary and refresh by multi skill rotation
Method	There is no method of checking result of welding steel crate	The welding requirement Standard is not figured out	There is no original equipment manufacture standard as referencee	Machine Manufacturer is not issued for special purpose	Trial and make new standard and cross check the SNI
Machine	Machine not detected fluctuative current electricity	Some sensor current electicity is less sensitive	Machine is full frequently used	Equipment not yet periodical maintenance	calibrated and periodical maintenance
Environtment	Worker is not focus	Working area is very hot	heat from the engine and material processing	there is no air circulation to absorp heating	area should be equipped blower to circulate air

4.2.2 Incomplete Finish Good Fish Bone

Cause	1 st Why	2 nd Why	3 rd Why	4 th Why	5 th Why
Material	Diversity of Product Type of steel crate and for one set consist of around 100 parts of component	Variation in spec and size also position of material	Grouping Material as Steel crate Totally	Grouping of material part by parts base on position	Detailing each Grouping in SOP
Man	No Pre Delivery Inspection on finished product	Inspection was focused on Working Line	Years Majority problem found on working line	Lack of Man Power	Additional recruitment
Method	SOP for Totally Finished Product	To many component in SOP and difficult to check	Grouping Material as Steel crate Totally	Grouping of material part by parts base on position	Detailing each Grouping in SOP
Machine	There is no tool to check completely product	Too Many Various type of Product in Spec, Size, Position	Grouping material as steel crate totally	Separated check sheet base on position	Detailing each grouping in SOP
Environtment	Area was fully for material storage and working line also Finish product	There is no inspection for finished product	Inspection is only for output of working line process	There is no area for pre delivery inspection (PDI)	Prepare special area for PDI

4.2.3 Dimension Problem

Cause	1 st Why	2 nd Why	3 rd Why	4 th Why	5 th Why
Material	Residual (end) raw material was processed accidentally	Normally end material must be scrapped	There is no checking before and after process for end material	Worker was unfamiliar the rule	New Worker
Man	New Worker	Still not Familiar with the manufacturing process	Operator is still in training	New workers is left alone without assistance	Leader must accompany til they can
Method	Difficult to read SOP	Font size of SOP is too small	Too many type of material size in one paper	One SOP for many product type	Each size has it's own SOP
Machine	Cutting stopper is damage and shifted easily	Locking mechanism is not working	Locking stopper is worn out	the tools is frequently often used	Renewal
Environment	Worker is not focus	Working area is very hot	Heating from the engine and material processing	there is no air circulation to absorp heating	Area should be equipped blower to circulate air

After identifying the root causes of the problem through Fishbone Diagram analysis, the next step is to determine which corrective action is the most effective and objective among the available alternatives. To support the decision-making process, a Pugh Matrix is used, in which each evaluation criterion is assigned a weight according to its level of importance.

The steps for developing the Solution Matrix are as follows::

Steps to make matrix solution selection as following :

- Identify the problem to be solved.
- Determine the alternative solutions. In the case of the Fishbone Diagram, there are typically more than five alternatives corresponding to the categories of Man, Method, Material, Machine, and Environment.

- c. Establish the evaluation criteria and assign a percentage weight to each criterion. The criteria used in this study are :
 - Cost of implementing the solution (Cost)
 - Ease of implementation (ability)
 - Implementation time (Time)
 - Resources required (Resources)
 - Long-term impact of the proposed solution (Impact for long term)
- d. Assign a weight to each criterion according to its importance (using a scale of 1 to 5).
- e. Evaluate each alternative solution against each criterion (using a scale of 1 to 5).
- f. Calculate the final score by multiplying the criterion weight by the solution rating.
- g. Select the alternative with the highest total score as the preferred solution.

4.3 Quality Issues in PT TTI

For the quality issues encountered by PT Total Tanjung Indah, the evaluation criteria are defined as follows :

4.3.1 Evaluation Criteria

a. Cost

The cost required to implement a corrective action is the most important consideration. Improvement initiatives should provide meaningful benefits without requiring excessive expenditure. Therefore, Cost is assigned the highest weighting of 50%.

Cost = 50%

b. Ease of Implementation (Ability)

The ease with which a corrective action can be implemented is also a critical factor. Even an effective solution may not produce the desired results if it is difficult to implement, as this can lead to wasted time, effort, and resources. Therefore, Ability is assigned a weighting of 30%.

Ability = 30%

c. Implementation Time (Time)

The shorter the time required to implement a corrective action, the greater its value to the organization. Some improvements may require specialized equipment with long procurement lead times or approvals from external authorities, regulatory agencies, or

certification bodies, which can delay implementation by several months or even a year.

Consequently, solutions that can be implemented more quickly receive higher scores.

Time = 20%

4.3.2 Rating Scale

Each proposed corrective action is evaluated using a five-point rating scale (1 to 5). Solutions that require little or no additional cost, are easy to implement, and can be completed quickly receive the highest rating of 5, indicating the most favorable option.

Conversely, solutions that require high implementation costs, are difficult to implement, and take a long time to complete receive the lowest rating of 1.

The detailed rating criteria are presented as follows :

Description	Bobot Biaya				
	Very Expensive	Expensive	Moderate	Cheap	Very Cheap
Machine Maintenance				4	
Man Power Training				4	
Welding testing					5
Digitalisation	1				
Instal Alluminium Foil	1				
Material Maintenance			3		
Management Control					5
Punishment Reward				4	
Simplify SOP					5
Sharing Session					5
Measuring instrument procurement					5
Jig Sample				4	

Description	Ability				
	Very Hard	Hard	Normal	Easy	Very Easy
Machine Maintenance				4	
Man Power Training				4	
Welding testing					5
Digitalisation		2			
Instal Alluminium Foil	1				
Material Maintenance			3		
Management Control					5
Punishment Reward					5
Simplify SOP					5
Sharing Session					5
Measuring instrument procurement					5
Jig Sample				4	

Description	Time
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	Very Long	Long	Normal	Short	Very Short
Machine Maintenance			3		
Man Power Training			3		
Welding testing					5
Digitalisation					5
Instal Alluminium Foil	1				
Material Maintenance			3		
Management Control					5
Punishment Reward					5
Simplify SOP					5
Sharing Session					5
Measuring instrument procurement					5
Jig Sample				4	

Time Schedule of Improvement

Point Improvement	P.I.C	Goal	Aug	Sept	Oct	Nov	Dec
A. Making of SOP dan Key Point		W D F					
- Making SOP							
- Sosialisasi							
- Implementation							
- Evaluasi							
- Implementation of Evaluation result							
B. Procure Measuring Instrument Check Welding and Dimension		W D					
- Procuring Instrument							
- Training							
- Implementation							
- Evaluation							
- Implementation of Evaluation result							
C. Sharing Session every Morning and Afternoon (Closed Communication)		W D F					
- Implementasi Sharing							
- Evaluasi							
- Implementation of Evaluation result							
D. Program Punishment and Reward Reward : Zero Defect Line for 6 Month : calculated as additional point for Additional Bonus (10%)		W D F					

Punishment : 1 Defect Problem will be calculated as point to reduce Bonus (Max Reduce 10%)							
- Making							
- Socialization							
- Implementation							
- Evaluation							
- Implementation of Evaluation result							

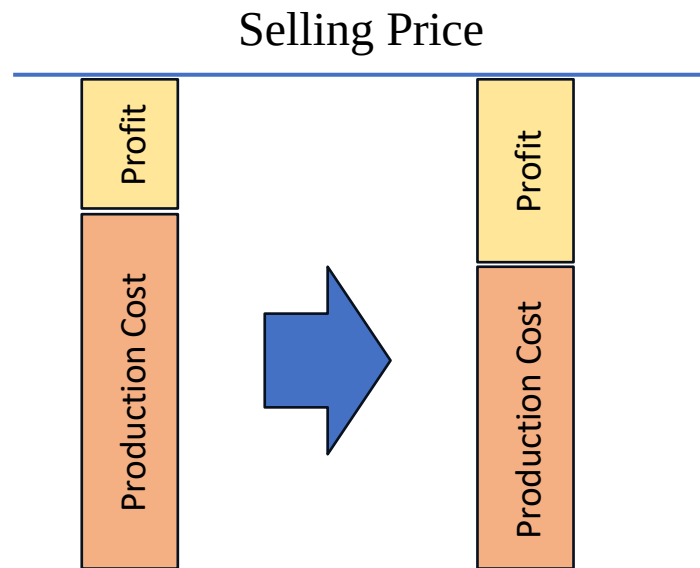
4.4 Expected Result after Improvement Above

4.4.1 Quality Problem

Now : 2024 Condition			2025 After improvement		
Seq	Company	Rasio x 1.000	Seq	Company	Rasio x 1.000
1	PT. MTU	6,47	1	PT. MTU	6,47
2	PT. MTI	15,37	2	PT. TTI	10,15
3	PT. PRN	19,11	3	PT. MTI	15,37
4	PT. PERSO	28,23	4	PT. PRN	19,11
5	PT. TTI	27,20	5	PT. PERSO	28,23
6	PT. MPS	43,54	6	PT. MPS	43,54

1. Increase Order Volume Portion
2. Reduction in Production Costs Through Lower Reject Rates

In accordance with Toyota's Lean Production principles and the Toyota Way philosophy of Continuous Improvement (Kaizen) and Genchi Genbutsu, which focuses on eliminating Muda (waste), Mura (unevenness), and Muri (overburden), reducing the reject rate contributes directly to higher profitability by lowering production costs. A lower reject rate reduces material waste, minimizes production interruptions, and improves overall manufacturing efficiency. As a result, the company can achieve higher productivity while maintaining product quality and controlling operating costs.



4.4.2 Reduction in Production Costs by Minimizing Rework

Defective products require rework, which increases overall production costs. Rework not only results in higher labor costs but also incurs additional expenses related to equipment usage, material handling and transportation, as well as electricity consumption during the rework process. Therefore, quality problems reduce profitability and create a broader domino effect by lowering productivity, increasing operational costs, and disrupting production efficiency.

4.4.3 Non Financial Benefit

a. Corporate image

As part of the Toyota Global supply chain, PT Toyota Motor Manufacturing Indonesia (TMMIN) maintains high standards for all of its suppliers. Becoming a supplier to a multinational company such as TMMIN significantly enhances a supplier's reputation and credibility. This achievement not only serves as an effective marketing tool but also demonstrates the company's capability to meet internationally recognized quality standards.

Continuous quality improvement strengthens the company's image in the eyes of TMMIN and enhances its reputation among other automotive manufacturers. As a result, it provides a solid foundation for expanding business opportunities with other companies in Indonesia's automotive industry.

b. Employee Motivation

Continuous quality improvement also increases employee motivation by demonstrating that their work contributes directly to the company's long-term growth and sustainability. When employees recognize that their efforts have a meaningful impact on organizational success, they become more committed to achieving higher performance standards. Furthermore, improvements in company performance create greater opportunities for employee career development and help employees achieve their long-term professional goals.

c. Implementation of the 5R Workplace Culture

The implementation of the Toyota Way as part of continuous quality improvement encourages the development of a workplace culture based on the 5R principles: Sort, Set in Order, Shine, Standardize, and Sustain.

By adopting these principles, employees can work in a clean, organized, and safe environment where Standard Operating Procedures (SOPs), measuring instruments, reference samples, raw materials, and finished products are systematically arranged and clearly identified. In addition, recognition and disciplinary systems reinforce accountability and support Toyota's philosophy of Respect for People.

4.5 Activities has been done

4.5.1 Welding Cracked (Broken)

Factors of Welding Broken	Cost (50%)	Ability (30%)	Time (20%)	Total Score
Score	A = Rating x 50%	B = Rating x 30%	C = Rating x 20%	A + B + C
Maintenance Machine	4	4	3	3,8
Training Man Power	4	4	3	3,8
Testing Welding Quality (by Random)	5	5	5	5,0
Digitalisasi SOP	1	5	2	2,4
Install Foil on the roof	1	1	1	1,0
Raw Material Rusty Maintenance	3	3	3	3,0

Solution : Testing Welding Quality (by Random)

4.5.2 Incomplete Finish Good

Factors of Imcompleted FG	Cost (50%)	Ability (30%)	Time (20%)	Total Score
Score	A = Rating x 50%	B = Rating x 30%	C = Rating x 20%	A + B + C
Monitoring by Management	5	5	5	5.0
Training Man Power	4	4	3	3.8
Punishment and Reward Prog	4	5	5	4.5
Digitalization of SOP	1	5	2	2.4
Install Foil on the roof	1	1	1	1.0

Solution : Monitoring by Management

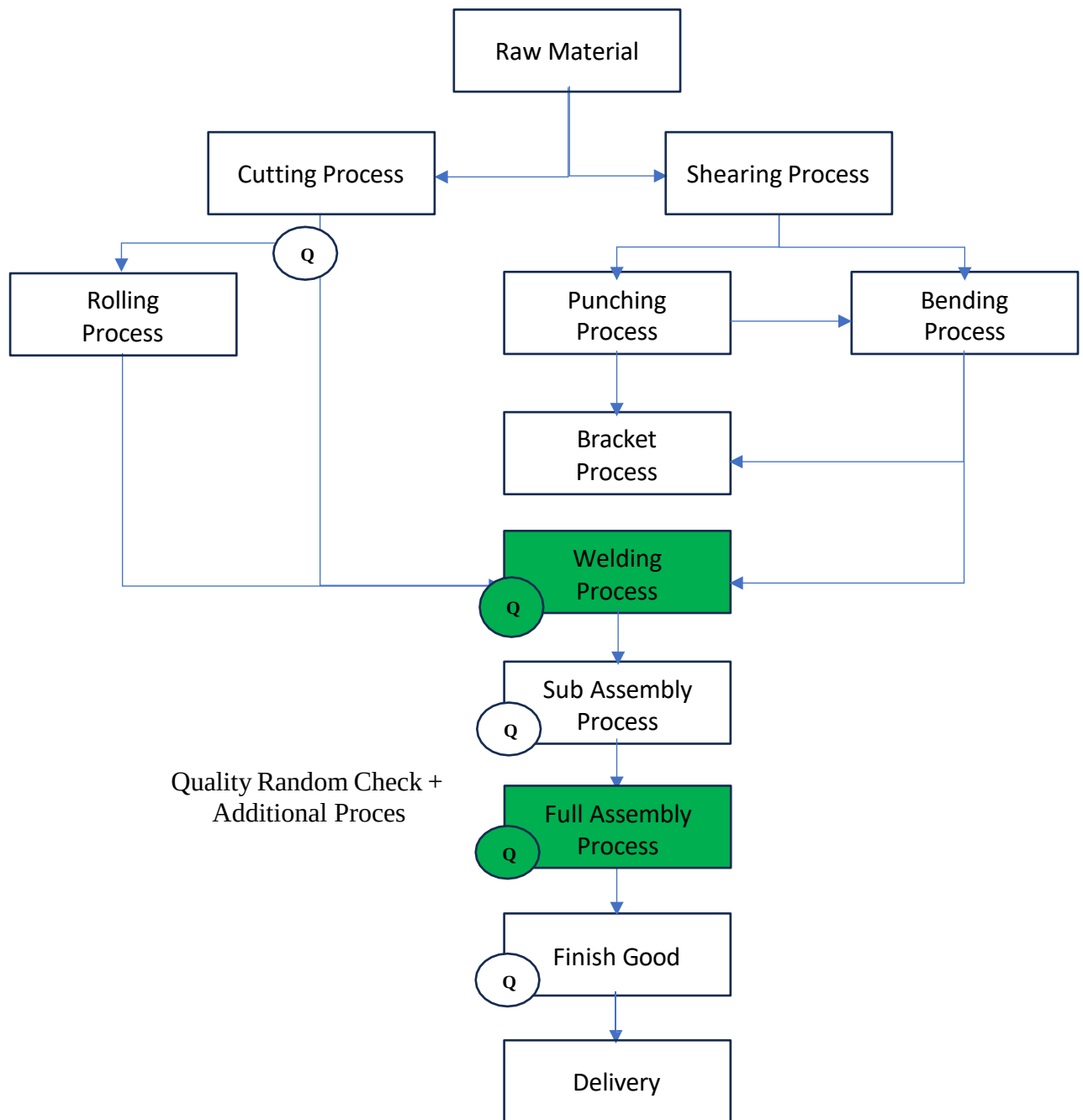
4.5.3 Dimension Problem

Factors of Dimension Problem	Cost (50%)	Ability (30%)	Time (20%)	Total Score
Score	$A = \text{Rating} \times 50\%$	$B = \text{Rating} \times 30\%$	$C = \text{Rating} \times 20\%$	$A + B + C$
Simplify SOP	5	5	5	5
Intensive Sharing Session	5	5	5	5
Procure measurement Tools	5	5	5	5
Jig Sample Making	4	4	4	4

Solution :

1. Simplify SOP
2. Intensive sharing session
3. Procure Measurement Tool

Process improvement) and Random Quality Control area :



4.6 Sampling Check

Sampling check Inspection According to acceptance quality level at AQL Table on Chapter III, Getting as following :

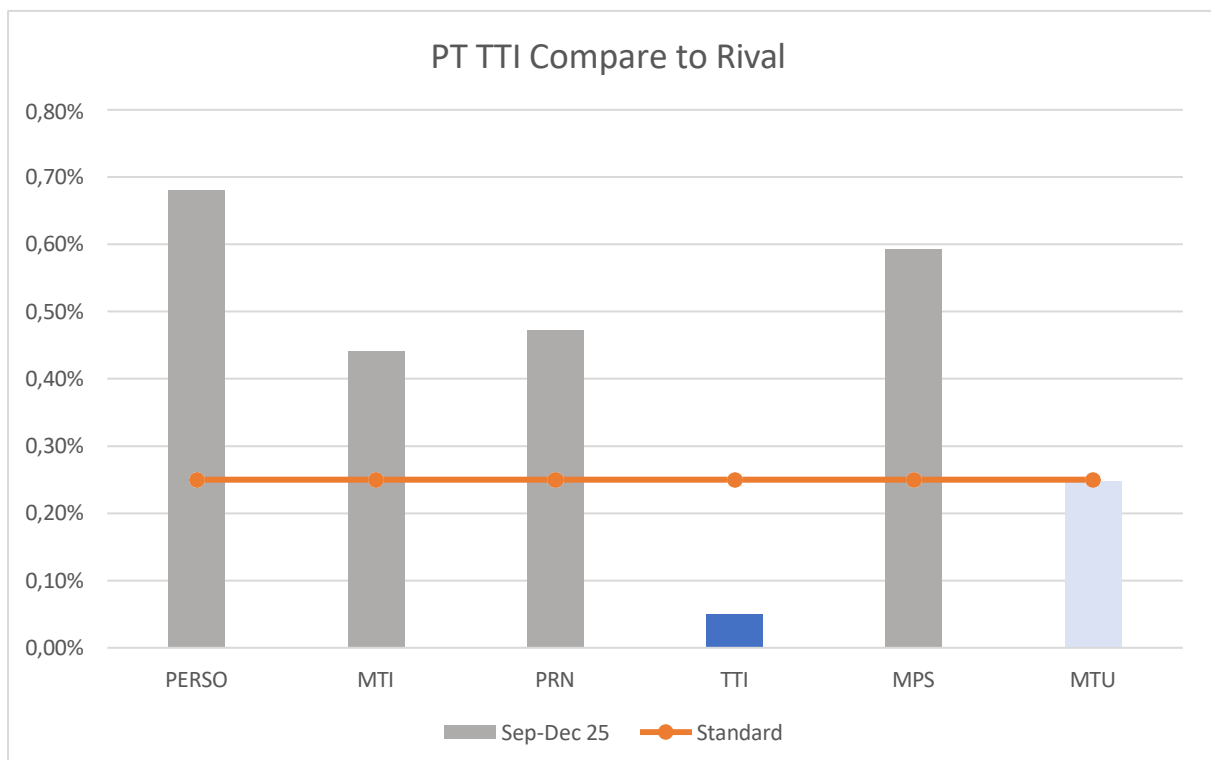
2024

Product/y	Product/M	Product/D	Inspection Level	Sample Size	Acceptance	Reject
4048	338	16	General C	5	0	1

And we got the result improvement and feedback from PT TMMIN as following and comparison to TMMIN Standard :

Problem	Sept'25	Oct'25	Nov'25	Dec'25
Production Volume (Unit)	594	456	494	128
Nut Weld	0	0	0	0
Welding NG	0	0	1	0
Miscomponent	0	0	0	0
Dimension	0	0	0	0
Hole vs Nut (Not Center)	0	0	0	0
Rusty	0	0	0	0
Imcomplete	0	0	0	0
Percentage	0	0	0,2%	0
TMMIN Standard	0,25%			

4.7 Compare to rival's competitor after Improvement



CHAPTER V : CONCLUSION

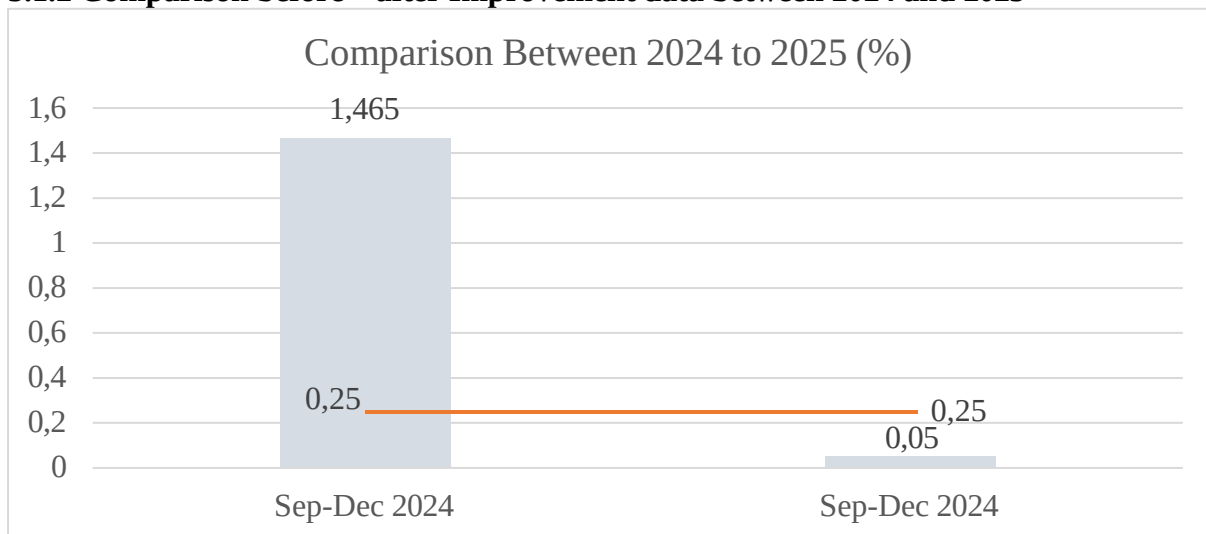
5.1 Conclusion

5.1.1 Improvement Has been Done already achieve the target

There are some improvement has been done for the problem at Toyota Production Line in PT Total Tanjung Indah, :

1. Non Destroy Testing Welding Quality by Hitting with Rubber Hammer
2. Simplify Standard Operational Procedure
3. Management-Worker Sharing Session
4. Procurement of Measurement Tools (Measuring Tape)

5.1.2 Comparison before – after Improvement data between 2024 and 2025



For four (4) consecutive months with Sept-Dec 2025 the quality problem was below than TMMIN Standard and we could achieve the target.

5.1.3 Comparison to Rival's competitor after improvement

Seq	Company	Ratio x 1.000
1	PT TTI	0,5
2	PT TMU	2,5
3	PT MTI	4,4
4	PT PRN	4,7
5	PT MPS	5,9
6	PT PERSO	6,8

5.2 Recommendation

To Make Consistency good quality control result, we recommend to PT Total Tanjung Indah as following :

1. Management must search and find the fact of quality problem on the shopfloor to make decision, Build consensus and get the goal with the best velocity, Management is not only get report and work in the office without know the real condition.
2. Build Teamwork and Motivate the team to get the performance of the quality.
3. Build continuity communication and intensive sharing session for Management and employee (two party).
4. Build culture of continuous improvement and start from the small things
5. Build QCC (Quality Control Circle) on the shopfloor to perform Employee's awareness about quality.(Prof. Kaoru Ishikawa, as founder of QCC Japan).
6. It is benefit for PT Total Tanjung Indah to study (Benchmark/Yokoten) from PT TMMIN which part of Global company with The best quality system.

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NON-PLAGIARISM DECLARATION FORM

This Thesis is a presentation of our original research work. Wherever contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.

Also, this work is being submitted in partial fulfillment of the requirements for the Bachelor of Business Administration degree and has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Jakarta, 21 September 2026



Muhammad Akram