International Journal Publishing
INFLUENCE: International Journal of Science Review
Volume 8, No. 2, 2026
https://influence-journal.com/index.php/influence/index

Quality Control Analysis to Reduce Defects in Drawn Textured Yarn Products Using the Six Sigma Method (DMAIC)

Ade Irpansah[1], Muhammad Ihsan[2], Indra Gumelar[3]
[1,2,3]Sekolah Tinggi Teknologi Wastukancana, Purwakarta, Indonesia
Email: irpansahade@gmail.com

Abstract. PT XYZ is a company engaged in the production of Drawn Textured Yarn (DTY) that continued to experience a high level of product defects, particularly the Dyeing Reject defect type, which accounted for 91.712% of total defects during the January-December 2025 period. This condition indicated that the production process was not yet statistically stable and operated at a low sigma capability level of 2.68 sigma. This study aimed to identify the root causes of defects and to formulate improvement proposals to reduce the number of defective products in the DTY production process using the Six Sigma method with the DMAIC (Define, Measure, Analyze, Improve, Control) approach. In the Measure stage, process stability was assessed using a P-Control Chart, along with DPMO and sigma-level calculations. In the Analyze stage, root causes were identified using a Pareto Diagram, a Fishbone Diagram, and Failure Mode and Effect Analysis (FMEA). The results showed that the root causes originated from machine, man, material, and method factors, with a total Risk Priority Number (RPN) of 2,155. In the Improve stage, improvement proposals were developed using 5W+1H analysis, which reduced the total RPN to 454, a decrease of 1,701 points (78.9%). The Control stage focused on process standardization, continuous monitoring, and operator training to sustain the improvements achieved and to drive the production process toward a zero-defect target.

Keywords: *Quality Control; Six Sigma; DMAIC; Drawn Textured Yarn; Defect Reduction.*

A. INTRODUCTION

The textile industry is a manufacturing sector that makes a significant contribution to the Indonesian economy. In the production process, yarn is the primary raw material that significantly influences the quality of final products, such as fabric and clothing. Therefore, proper thread quality control and maintenance are essential to ensure production meets established standards and remains competitive in the international market.

Good yarn quality significantly impacts the quality of the final product. Companies need to ensure consistent production processes to produce yarn of high-quality standards. In this context, the application of the Six Sigma approach is relevant because it is designed to minimize defect rates and increase production process effectiveness. Through the use of various Six Sigma tools and techniques, companies can identify sources of variation during the yarn production process, thereby reducing the causes of defects and improving product quality. Previous research has shown that the Six Sigma method with the DMAIC approach can reduce waste, maintain quality consistency, and make the production process more efficient (Sholikin, Nugrahadi, Devi, & Primasanti, 2025).

PT XYZ, a company that produces Drawn Textured Yarn (DTY), faces challenges in maintaining the stability of its product quality. Monthly production data for the period January-December 2025 shows fluctuations in the number of defective products. For example, in January, out of 285,709 units produced, there were 7,532 defective units, while in March, with almost the same production volume, 8,928 defective units were found. This fluctuation indicates an inconsistency in the production process that requires further investigation. A summary of production and defect data for one year is presented in Table 1.

Table 1. DTY Production and Product Defect Data for the Period January-December 2025

Month	Production Volume	Total Defects	Defect Rate
January	285,709	7,532	2.64%
February	264,230	9,813	3.71%
March	285,440	8,928	3.13%
April	300,568	8,599	2.86%
May	292,862	9,358	3.20%
June	293,203	9,419	3.21%
July	289,194	7,769	2.69%
August	308,470	7,116	2.31%
September	287,930	6,132	2.13%
October	295,863	10,894	3.68%
November	260,181	7,337	2.82%
December	286,360	9,822	3.43%
Total	**3,450,010**	**102,719**	**2.98%**

Source: Production Department of PT. XYZ (2025)

Based on the description, this study aims to examine the quality control of DTY yarn at PT XYZ using the Six Sigma method with the DMAIC (Define, Measure, Analyze, Improve, Control) approach. The problem formulation in this study is (1) what are the root causes of defects in DTY products, and (2) how the application of the Six Sigma DMAIC method can provide suggestions for improvements to reduce the number of defects. The study is limited to the analysis of DTY product defects without discussing the aspects of cost or time efficiency, with a focus on controlling and improving the quality of the production process.

Several previous studies have applied similar approaches to various industries. Agsanu, Nugraha & Herwanto (2025) analyzed polycotton yarn defects in the winding department and obtained a DPMO of 2,331 with a sigma level of 4.33, with the dominant defect being crossed threads (50%). Rinjani, Wahyudin, and Nugraha (2021) applied Lean Six Sigma DMAIC to lens products and obtained a DPMO of 242 with a sigma level of 5.3. Mardiansyah, Muttaqin & Susanto (2025) in the sugar industry obtained a DPMO of 4,839.96 with a sigma level of 3.75, with the main causes of failure being inconsistency in SOP implementation and operator fatigue. These studies consistently show that the combination of Pareto Diagrams, Fishbone, and FMEA is effective in identifying the root causes of defects across industry sectors, but the characteristics of defects and the dominant factors causing them are specific to each production process. This is the basis for this research to specifically examine the characteristics of defects in the DTY production process at PT XYZ, which have not been widely discussed in similar studies, especially regarding the dominance of Dyeing Reject defects.

B. METHOD

This research was conducted at PT XYZ, a textile and petrochemical manufacturing company located in West Java, from February to August 2026. Quantitative data were collected, including monthly production volumes and yarn defects. Primary data were obtained through direct observation of the production process and interviews with relevant parties. Secondary data were sourced from production reports and internal quality inspections from the company for the period January to December 2025, supported by literature review of books, scientific journals, and relevant previous research.

The collected data were analyzed using the Six Sigma DMAIC approach (Gasperz, 2002), which consists of the following five stages:

1. Define: This stage aims to identify the most impactful types of defects by determining Critical to Quality (CTQ) and creating a SIPOC (Supplier, Input, Process, Output, Customer) diagram to understand the overall process flow.
2. Measure: This stage measures process performance through P-Chart calculations to evaluate the stability of the defect proportion, as well as Defects Per Million Opportunities (DPMO) calculations and sigma levels to determine current process capabilities.
3. Analyze: This stage uses a Pareto Chart to prioritize defect types based on the 80/20 principle, a Fishbone Diagram to trace the root causes of defects based on human, machine, method, material, and environmental factors, and a Failure Mode and Effect Analysis (FMEA) to calculate the Risk Priority Number (RPN) for each potential failure based on Severity, Occurrence, and Detection.
4. Improve: This stage develops a corrective action plan using the 5W+1H analysis (What, Why, Who, When, Where, How) for each root cause identified in the Analyze stage.
5. Control, this final stage focuses on standardizing new processes, documenting best practices, and implementing ongoing monitoring mechanisms so that the improvements achieved can be maintained.

C. RESULT AND DISCUSSION

1. Define Stage

In the Define stage, quality issues were clearly formulated based on DTY production and product defect data from January to December 2025 (Table 1). The average defect proportion during this period was 2.98%, with a total of 102,719 defective units out of a total production of 3,450,010 units. Next, four critical quality characteristics (Critical to Quality/CTQ) were determined as the focus of the research, as presented in Table 2.

Tabel 2. Critical to Quality (CTQ) DTY Products

No.	CTQ	Description
1	Dyeing Reject	Uneven color absorption resulting in inconsistent dyeing quality
2	DP M/C	Yarn contamination caused by oil or grease from the machine
3	LF	Yarn layers slipping from their intended position on the bobbin
4	XST	Irregular cross-wound yarn pattern on the bobbin

In addition to determining CTQ, at this stage a SIPOC (Supplier, Input, Process, Output, Customer) diagram is also prepared to map the relationship between the DTY production process and its suppliers, inputs, outputs and customers, so that the scope of improvements to be made can be understood comprehensively.

2. Measure Stage

The Measure stage is carried out to measure the stability of the production process using the P-Chart. The proportion of defects (p), center line (CL), upper control limit (UCL), and lower control limit (LCL) are calculated using the following equations (1)-(4), where Np is the number of defects and n is the monthly production volume.

$$p = Np / n \quad (1)$$
$$CL = \bar{p} = \Sigma Np / \Sigma n \quad (2)$$
$$UCL = \bar{p} + 3\sqrt{\bar{p}(1-\bar{p})/n} \quad (3)$$
$$LCL = \bar{p} - 3\sqrt{\bar{p}(1-\bar{p})/n} \quad (4)$$

The calculation yields a centerline (CL) of 0.0298 with a UCL of 0.0307 and an LCL of 0.0288. The results of mapping the data onto the P-Control Chart are shown in Figure 1.

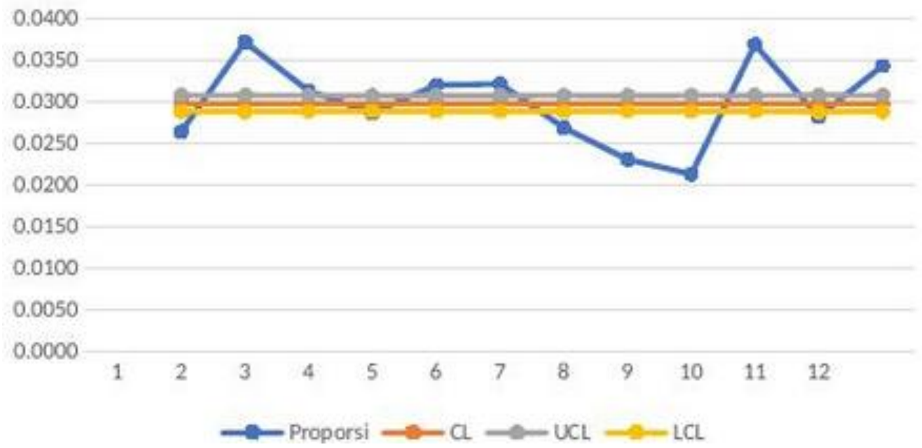

Figure 1. P-Control Chart of Defective Products DTY PT. XYZ
Source: Data Processing Results (2026)

The P-Control Chart shows that six data points are above the UCL (February, March, May, June, October, and December) and six data points are below the LCL, indicating that the DTY production process is not yet statistically stable and is affected by special causes that require further investigation.

Next, the Defects Per Million Opportunities (DPMO) and sigma levels were calculated for each month using the DPMO to sigma conversion. The calculation results are presented in Table 3.

Table 3. Calculation of DPMO and Monthly Sigma Value

Month	Production Volume	Total Defects	DPMO	Sigma Level
January	285,709	7,532	105,449.95	2.75
February	264,230	9,813	148,552.40	2.54
March	285,440	8,928	125,112.11	2.65
April	300,568	8,599	114,436.67	2.70
May	292,862	9,358	127,814.47	2.64
June	293,203	9,419	128,498.00	2.63
July	289,194	7,769	107,457.28	2.74
August	308,470	7,116	92,274.78	2.83
September	287,930	6,132	85,187.37	2.87
October	295,863	10,894	147,284.39	2.55
November	260,181	7,337	112,798.40	2.71
December	286,360	9,822	137,197.93	2.59
Average/Total	**3,450,010**	**102,719**	**119,094.15**	**2.68**

Based on Table 3, an average DPMO value of 119,094.15 is obtained, which is equivalent to a process capability level of 2.68 sigma. This value is below the Indonesian industry average (2-sigma) and far from the world-class Six Sigma standard of 3.4 DPMO (Gasperz, 2002), thus emphasizing the need for overall process improvement.

Analyze Stage

The Analyze stage aims to identify the root causes of defects that dominate the production process. A Pareto diagram is used to prioritize defect types based on frequency of occurrence (Table 4 and Figure 2).

Table 4. Number and Percentage of Defect Frequency

No.	Defect Type	Total Defects	Percentage	Cumulative Percentage
1	Dyeing Reject	94,206	91.712%	91.712%
2	DP M/C	2,870	2.794%	94.506%

3	LF	2,067	2.012%	96.519%
4	XST	1,820	1.772%	98.290%
5	BF	833	0.811%	99.101%
6	Less	588	0.572%	99.674%
7	Loops	159	0.155%	99.829%
8	Stepy	57	0.055%	99.884%
9	Sadle	52	0.051%	99.935%
10	Vibration	35	0.034%	99.969%
11	Winding Defect	20	0.020%	99.988%
12	Miss	5	0.005%	99.993%
13	Over	4	0.004%	99.997%
14	No Tail	2	0.002%	99.999%
15	Stripe Defect	1	0.001%	100.000%

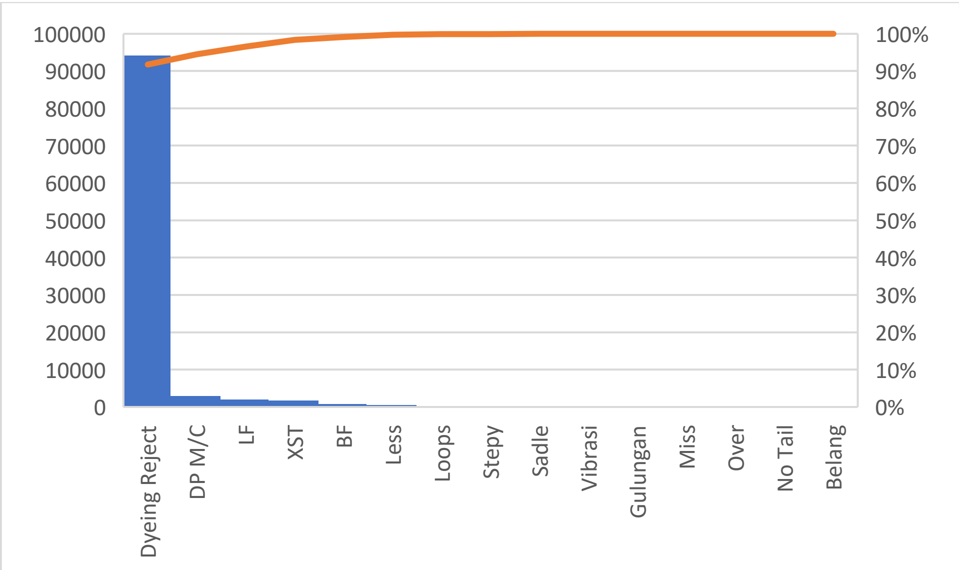

Figure 2. Pareto Diagram of DTY Product Defect Types
Source: Data processing results (2026)

The Pareto analysis results show that dyeing rejects are the most dominant type of defect, contributing 91.712% of the total defects, far exceeding other types of defects such as DP M/C (2.794%) and LF (2.012%). In accordance with the 80/20 principle, repairs are prioritized for dyeing rejects because they contribute the most to total product damage. This finding is consistent with Nugraha, Arifianti, and Tresna (2026), who also found that defects in the dyeing process are the dominant contributor to textile product quality control.

The root causes of dyeing rejects were then traced using a Fishbone Diagram (Figure 3), which groups causes based on human, machine, material, and method factors.

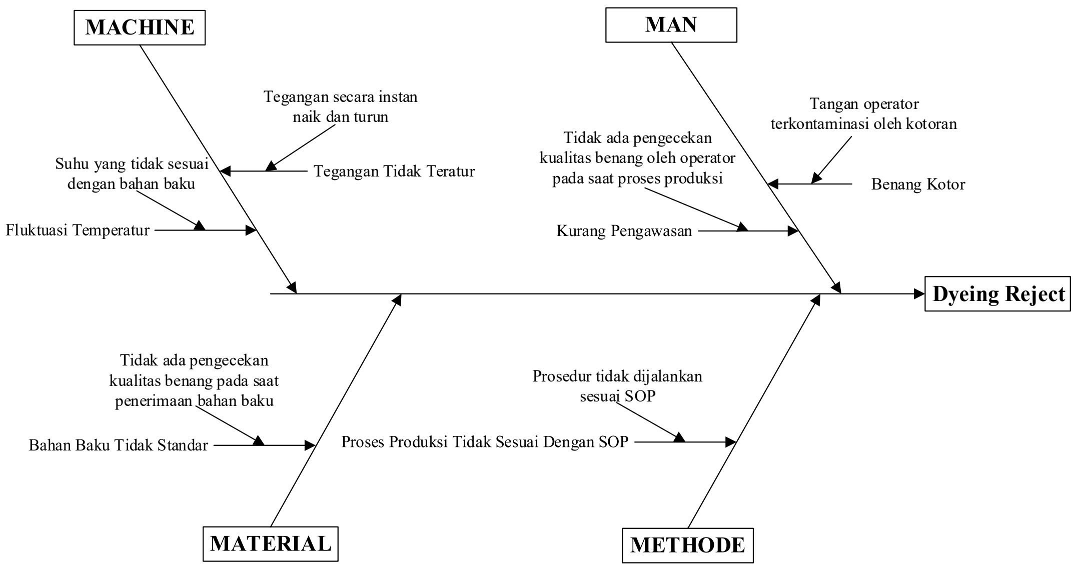

Figure 3. Fishbone Diagram of Causes of Dyeing Reject Defects
Source: Data processing results (2026)

Machine factors were identified as unstable tension in the texturizing machine due to the lack of regular calibration, as well as heater temperature fluctuations that caused changes in the crystallinity and orientation of the yarn polymer molecules, resulting in uneven dye absorption. Human factors stemmed from a lack of operator supervision of process conditions and yarn quality, as well as yarn contamination by dirt due to operators not using personal protective equipment (PPE) when handling yarn. Material factors were identified as the lack of incoming quality control procedures upon raw material receipt, allowing substandard raw materials to pass through to the production floor. Method factors stemmed from production processes not being carried out according to Standard Operating Procedures (SOPs) due to weak training, socialization, and SOP compliance audits.

To measure the risk level of each root cause, a Failure Mode and Effect Analysis (FMEA) was conducted by assessing Severity (Sev), Occurrence (Occ), and Detection (Det) to obtain a Risk Priority Number (RPN) value, as presented in Table 5.

Table 5. Failure Mode and Effect Analysis (FMEA) Before Repair

Factor	Potential Failure Mode	Severity (S)	Occurrence (O)	Detection (D)	Risk Priority Number (RPN)
Machine	Temperature is not suitable for the raw material	8	7	8	448
Machine	Instantaneous fluctuations in machine voltage	8	7	7	392
Material	No quality inspection of yarn upon raw material receipt	8	6	8	384
Man	No yarn quality inspection by operators during the production process	7	7	7	343

Man	Operator's hands contaminated with dirt or impurities	7	6	7	294
Method	Production procedures are not performed in accordance with the Standard Operating Procedure (SOP)	7	7	6	294
Total RPN					**2,155**

The total RPN value before repair was 2,155, with the two highest-risk causes being heater temperature that did not match the raw material (RPN 448) and instantaneous fluctuating machine voltage (RPN 392). These two causes were the top priority in developing the repair plan at the Improve stage.

3. Improvement Stage

In the Improve phase, a corrective action plan is developed for each root cause using the 5W+1H approach (What, Why, Who, When, Where, How). A summary of the proposed corrective actions for each factor is presented below.

a. Machine Factor: Regularly calibrate and check the tension of the texturizing machine and adjust the machine settings to the raw material specifications; perform scheduled maintenance on the machine's heater system and install an automatic temperature limit alarm to detect temperature fluctuations early.
b. Human Factor: Create a routine inspection schedule and checklist for operators and increase the role of supervisors in monitoring operator discipline; require the use of clean gloves (PPE) when handling yarn, accompanied by occupational hygiene training and PPE compliance audits.
c. Material Factor: Implement incoming quality control procedures by testing samples on each lot of raw materials received, and reject raw materials that do not meet specification standards.
d. Method Factor: Conduct regular SOP retraining, post visual work instructions in the machine area, and conduct regular SOP compliance audits by supervisors.

The effectiveness of the improvement plan was tested by recalculating the FMEA values after improvement (Table 6), assuming that the Occurrence and Detection values decreased due to the implementation of preventive and early detection measures.

Table 6. Failure Mode and Effect Analysis (FMEA) After Repair

Factor	Potential Failure Mode	Severity (S)	Occurrence (O)	Detection (D)	Risk Priority Number (RPN)
Method	Production procedures are not performed in accordance with the Standard Operating Procedure (SOP)	7	7	3	147
Machine	Instantaneous fluctuations in machine voltage	8	3	3	72
Machine	Temperature is not suitable for the raw material	8	3	3	72

Material	No quality inspection of yarn upon raw material receipt	8	3	3	72
Man	No yarn quality inspection by operators during the production process	7	3	3	63
Man	Operator's hands contaminated with dirt or impurities	7	2	2	28
Total RPN					**454**

The total RPN value after repair decreased to 454. Comparison of RPN values before and after repair for each root cause is presented in Table 7.

Tabel 7. Comparison of RPN Values Before and After Repair

Potential Cause of Failure	RPN Before	RPN After	Reduction
Instantaneous machine voltage fluctuations	392	72	320
Heater temperature not suitable for the raw material	448	72	376
No yarn quality inspection by operators during the production process	343	63	280
Operator's hands contaminated with dirt or impurities	294	28	266
No quality inspection of raw materials upon receipt	384	72	312
Production procedures are not performed in accordance with the Standard Operating Procedure (SOP)	294	147	147
Total	**2,155**	**454**	**1,701**

Table 7 shows that the implementation of proposed improvements using the 5W+1H analysis successfully reduced the total RPN value from 2,155 to 454, or a decrease of 1,701 points (78.9%). The largest reductions in RPN occurred for factors such as heater temperature that did not match the raw material (a decrease of 376 points) and fluctuating machine voltage (a decrease of 320 points), confirming that improvements in machine factors had the most significant impact on reducing the risk of process failure. These results align with the findings of Lutfianto and Prabowo (2022), who also reported a significant reduction in RPN after implementing FMEA-based corrective actions in the manufacturing process, as well as Andita, Rahayu, and Windyatri (2025), who emphasized the importance of integrating Six Sigma and FMEA for improving product quality in the manufacturing industry.

4. Control Stage

The Control phase focuses on three main efforts to maintain the achieved improvement results. First, standardization of the process through the permanent integration of all 5W+1H improvement proposals into the company's work procedures, accompanied by official documentation and socialization to all relevant departments. Second, a continuous quality control mechanism through routine monitoring of the P-Control Chart as an early warning system, strengthening raw material control, and a continuous training program for operators regarding the latest SOPs, work hygiene, and raw material inspection procedures. Third, communication and coaching through close coordination between the Production Department, Machine Technicians, and Human Resources so that each improvement step can be optimally implemented.

By consistently implementing the Control mechanism, PT XYZ is expected to achieve statistically stable process conditions, reduce the number of Dyeing Reject defects sustainably, and move towards the zero-defect target as a form of the company's commitment to implementing Six Sigma comprehensively.

D. CONCLUSION

This study shows that the Drawn Textured Yarn (DTY) production process at PT XYZ is statistically unstable, with six data points outside the upper control limit and six points outside the lower control limit on the P-Control Chart, and process capability at the 2.68 sigma level. The most dominant type of defect is Dyeing Reject, contributing 91.712% of the total defects. The identified root causes are machine factors (voltage and temperature instability), human factors (weak supervision and contamination due to failure to use PPE), material factors (lack of incoming quality control), and method factors (non-compliance with SOPs).

The application of Six Sigma with the DMAIC approach successfully developed improvement proposals based on the 5W+1H analysis, which reduced the total Risk Priority Number (RPN) from 2,155 to 454, equivalent to a 78.9% reduction. These results demonstrate the effectiveness of integrating Pareto Diagrams, Fishbone Diagrams, and FMEA in identifying and mitigating root causes of defects in the textile yarn production process. This study has limitations because it only analyzes quality aspects without considering cost and time efficiency aspects, and the FMEA value after improvement is still estimated because the improvement proposals have not been implemented in practice at the time of the study. Further research is recommended to measure the impact of the implementation of improvement proposals directly in the field, including evaluating the cost of quality and the sustainability of the implementation of Control mechanisms in the long term.

ACKNOWLEGDEMENT

The author would like to thank the Industrial Engineering Study Program, Wastukancana Purwakarta College of Technology, as well as the management and employees of PT XYZ who have provided permission and data support during the research process.

REFERENCES

Agsanu, F. R., Nugraha, A. E., & Herwanto, D. (2025). Analisis Pengendalian Kualitas Produk Cacat Benang Polycotton IRPETAC35D Menggunakan Metode Six Sigma DMAIC di Departemen Winding PT KUMATEX. *MATRIK, 26*(1). https://doi.org/10.350587/Matrik

Andita, S. A., Rahayu, S., & Windyatri, H. (2025). Penerapan Metode Six Sigma dan FMEA untuk Meningkatkan Kualitas Produk di Industri Manufaktur Otomotif. *Jurnal Kalibrasi, 8*(2), 58–69.

Apwa, S. N., & Prasinta, W. R. (2025). Analisis Pengendalian Kualitas Produk Menggunakan Metode Seven Tools dan FMEA pada UMKM Sukarasa Snack Tasikmalaya. *Jurnal Ilmu Komputer dan Bisnis, 16*(2), 81–101.

Arifianti, R., & Fordian, D. (2023). Proses Produksi Keramik di Kecamatan Plered Purwakarta. *Jurnal Organisasi dan Manajemen Bisnis Logistik, 1*(3), 301–310.

Aurel, N., Hamdan, U., & Firah, A. (2023). Analisis Peranan Manajemen Produksi dalam Meminimalisir Produk Gagal pada PT Sumatera Hakarindo di Medan. *EMANIS: Jurnal Ekonomi Manajemen dan Bisnis, 2*(2), 377–387.

Devi, A. R., & Setiafindari, W. (2023). Analisis Pengendalian Kualitas Produk *Disc Holder* Menggunakan Metode Six Sigma di PT A. *Jurnal Ilmiah Widya Teknik, 22*(1), 1–6.

Fajar, F. A., Komaro, M., & Larutama, W. (2025). Penerapan Metode Six Sigma untuk Meminimalkan Produk Cacat pada UMKM X di Industri Manufaktur Sepatu. *Jurnal Riset Rumpun Ilmu Teknik, 4*(2), 185–197.

Gandi, M. Y., Nugraha, A. E., Maksum, A. H., & Nugraha, B. (2022). Identifikasi Kecacatan Produk Menggunakan Lean Six Sigma melalui Pendekatan Konsep DMAIC. *Angkasa: Jurnal Ilmiah Bidang Teknologi, 1*(1), 101–110.

Gaspersz, V. (2002). *Pedoman Implementasi Program Six Sigma*. Gramedia.

Hermawan, F. R., & Safariyani, E. (2024). Pengendalian Kualitas dalam Perencanaan Produksi Menggunakan Alat Bantu Seven Tools di Perusahaan Konstruksi. *INDUSTRIKA, 8*(4).

Hidayah, N. (2022). Implementasi Six Sigma dalam Meningkatkan Manajemen Mutu Pendidikan Islam. *Jurnal Pendidikan dan Konseling, 4*(1), 673–681.

Khoiri, H. A., Kusuma, Y. A., & Aryaningtyas, D. (2024). Implementasi Six Sigma pada Produksi Kain Rayon Lebar PT XYZ. *Performa: Media Ilmiah Teknik Industri, 23*(2), 126–135.

Kurniawan, A., Pere, E. S., & Faisal, M. (2021). Analisis Pengendalian Kualitas Produk Skirt: Studi Kasus pada Bagian Sewing PT XXX. *Festival Riset Ilmiah Manajemen Akuntansi, 1*(4), 445–452.

Lestari, A. D., & Widajanti, E. (2024). Pengendalian Kualitas Produk dengan Metode Statistical Quality Control untuk Mengurangi Produk Rusak pada UMKM Gethuk Anyar di Ngawi. *Riset Ilmu Manajemen Bisnis dan Akuntansi, 2*(3).

Lestari, D. T., & Supardi, S. (2022). Metode Six Sigma dalam Pengendalian Kualitas pada *Home Industry* Tempe. *Fair Value: Jurnal Ilmiah Akuntansi dan Keuangan, 5*(2), 790–797.

Lutfianto, M. A., & Prabowo, R. (2022). Implementation of Six Sigma Methods with Failure Mode and Effect Analysis (FMEA) as a Tool for Quality Improvement of Newspaper Products (Case Study: PT ABC Manufacturing, Sidoarjo, East Java, Indonesia). *Journal of Integrated System, 5*(1), 87–98. https://doi.org/10.28932/jis.v5i1.4615

Mardiansyah, B. T., Muttaqin, A. Z., & Susanto, D. (2025). Analisis Six Sigma untuk Mengurangi Cacat Produk dan Peningkatan Kualitas di Pabrik Gula XYZ. *JUTIN: Jurnal Teknik Industri Terintegrasi, 8*(3), 3387–3396. https://doi.org/10.31004/jutin.v8i3.47838

Natalia, E. P. (2023). *Analisa Pengendalian Kualitas Menggunakan Metode Fault Tree Analysis (FTA) dan Failure Mode and Effect Analysis (FMEA) untuk Mengurangi Jumlah Produk Cacat di PT XYZ* [Unpublished undergraduate thesis].

Nugraha, C. N., Arifianti, R., & Tresna, P. W. (2026). Pengendalian Kualitas Produk Tekstil Menggunakan Metode Six Sigma pada Departemen Dyeing and Finishing Perusahaan Tekstil. *JANE (Jurnal Administrasi Negara), 17*(2), 277–290.

Nuralisa, R. A., & Musfiroh, I. (2022). Analisis Kapabilitas Proses Produk Farmasi X dengan Pendekatan Six Sigma di PT Y. *Majalah Farmasetika, 7*(5), 494–506.

Nurhayani, N., Putri, S. R., & Darmawan, A. (2023). Analisis Pengendalian Kualitas Produk *Outsole* Sepatu *Casual* Menggunakan Metode Six Sigma DMAIC dan Kaizen 6S. *Jurnal Hasil Penelitian dan Karya Ilmiah dalam Bidang Teknik Industri, 9*(1), 248–258.

Ramadhany, S. W., & Sumantika, A. (2022). Analisis Pengendalian Kualitas Produk Cacat Housing pada PT XYZ. *Jurnal Comasie, 7*(2), 136–145.

Riansyah, R., & Darajatun, R. A. (2022). Proses Stamping Press Pembuatan Part Bracket Harness (Studi Kasus di PT Ichii Industries Indonesia). *Jurnal Ilmiah Wahana Pendidikan, 8*(3), 1–5. https://doi.org/10.5281/zenodo.6301622

Rinjani, I., Wahyudin, W., & Nugraha, B. (2021). Analisis Pengendalian Kualitas Produk Cacat pada Lensa Tipe X Menggunakan Lean Six Sigma dengan Konsep DMAIC. *Jurnal Pendidikan dan Aplikasi Industri, 8*(1), 18–29.

Saepullah, A. (2024). Analisis Kecacatan Produk pada Perusahaan Furnitur Menggunakan Metode Failure Mode and Effect Analysis (FMEA). *Jurnal Ekselenta, 1*(1).

Salangka, A. H., Palandeng, I. D., & Karuntu, M. M. (2022). Analisis Pengendalian Kualitas Produk pada UD Tarsius di Desa Kinnali Kecamatan Kawangkoan. *Jurnal EMBA, 10*(4), 813–825.

Sausan, P. H. K., & Iftadi, I. (2022). Penerapan Metode Six Sigma dan Failure Mode and Effect Analysis untuk Perbaikan Pengendalian Kualitas Produksi Gula. *Jurnal INTECH: Teknik Industri Universitas Serang Raya, 8*(2), 90–98.

Shiyamy, A. F., Rohmat, S., & Sopian, A. (2021). Analisis Pengendalian Kualitas Produk dengan Statistical Process Control. *Jurnal Ilmiah Manajemen, 2*(2), 1–14.

Sholikin, N., Nugrahadi, B., Devi, A. O. T., & Primasanti, Y. (2025). Penerapan Lean Six Sigma dalam Upaya Mengurangi Waste Produk Cacat pada Proses Produksi Cetak di PT XYC. *JIMSTEK, 7*(1), 85–94.

Tanjung, D. P., Zega, J. H. Y., Zai, I. I., & Harefa, D. I. P. (2025). Kualitas dalam Memproduksi Suatu Barang dan Jasa. *JUKONI: Jurnal Ilmu Ekonomi dan Bisnis, 2*(1), 15–22.

Widad, A. (2026). Penerapan Metode Seven Tools untuk Meningkatkan Kualitas Produksi di CV Budidaya Jamur Sejati. *JUTIN: Jurnal Teknik Industri Terintegrasi, 9*(1). https://doi.org/10.31004/jutin.v9i1.47141

Wijaya, H., Arrofi, R., & Wirawati, S. M. (2022). Analisis Pengendalian Kualitas dengan Menggunakan Metode Statistical Quality Control di UD Penggilingan Beras Putri Jaya. *Jurnal InTent, 5*(1), 131–142.

Yusup, R., & Nurmahdi, A. (2023). Analisis Kualitas Produk dan Kualitas Pelayanan terhadap Keputusan Pembelian dan Implikasinya pada Kepuasan Pelanggan Two Way Cake Claresta Karawang. *Jurnal Manajemen, 1*(1), 1–9.