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Analysis of QRQC Meeting Effectiveness Using The PDCA Method To Increase The Quality Rate in An Indonesian Automotive Company

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ABSTRACT

Fierce competition within the automotive industry in Indonesia demands perfect quality standards, however, in reality, production lines frequently encounter efficiency constraints that result in a low quality rate. This research is motivated by the initial condition of an automotive company possessing a quality rate of 50%, where the quality problem-solving process remained reactive and unstructured. The purpose of this study is to evaluate the effectiveness of Quick Response Quality Control (QRQC) meetings through the integration of the Plan-Do-Check-Act (PDCA) method to increase the quality rate toward a maximum target of 100%. The research method employed is a case study approach featuring direct observations in the Genba area (the actual workplace) and the analysis of historical production data. The data processing results indicate that through a disciplined PDCA cycle—ranging from root cause identification using a Fishbone Diagram to the standardization of operational procedures—a significant improvement in quality performance was achieved. Post-implementation calculation data demonstrates an increase in the quality rate from 50% to 94.5%, alongside a reduction in problem-solving time from 3 days to a mere 4 hours. The discussion of the results indicates that the key to success lies in the synchronization between a rapid response on the production floor and the validation of physical data (real parts). The conclusion of this study confirms that implementing the PDCA method within the QRQC framework is not only effective in instantly rectifying product defects, but is also capable of establishing a sustainable mitigation system. Although the 100% target represents an operationally challenging achievement, this system has successfully steered the company out of its quality inefficiency zone.

Keywords*: QRQC, PDCA, Quality Rate, Automotive Industry, Continuous Improvement.*

ABSTRAK

Persaingan yang semakin ketat dalam industri otomotif di Indonesia menuntut standar kualitas yang tinggi. Namun, pada praktiknya, lini produksi masih sering menghadapi kendala efisiensi yang berdampak pada rendahnya *quality rate*. Penelitian ini dilatarbelakangi oleh kondisi awal sebuah perusahaan otomotif yang memiliki *quality rate* sebesar 50%, di mana proses penyelesaian masalah kualitas masih bersifat reaktif dan belum terstruktur. Penelitian ini bertujuan untuk mengevaluasi efektivitas penerapan *Quick Response Quality Control* (QRQC) melalui integrasi metode *Plan-Do-Check-Act* (PDCA) dalam meningkatkan *quality rate* menuju target maksimal 100%. Metode penelitian yang digunakan adalah studi kasus dengan pendekatan observasi langsung di area *Genba* (tempat kerja aktual) serta analisis data historis produksi. Hasil penelitian menunjukkan bahwa penerapan siklus PDCA secara disiplin, mulai dari identifikasi akar penyebab menggunakan *Fishbone Diagram* hingga standardisasi prosedur

operasional, mampu meningkatkan kinerja kualitas secara signifikan. Setelah implementasi, *quality rate* meningkat dari 50% menjadi 94,5%, sementara waktu penyelesaian masalah berkurang dari tiga hari menjadi hanya empat jam. Temuan penelitian menunjukkan bahwa keberhasilan implementasi ditentukan oleh sinkronisasi antara respons cepat di lantai produksi dengan validasi data berdasarkan kondisi aktual (*real parts*). Dengan demikian, penerapan metode PDCA dalam kerangka QRQC terbukti efektif tidak hanya dalam memperbaiki cacat produk secara cepat, tetapi juga dalam membangun sistem mitigasi berkelanjutan. Meskipun target *quality rate* sebesar 100% masih menjadi tantangan operasional, sistem ini berhasil meningkatkan efisiensi kualitas perusahaan secara signifikan.
Kata Kunci: QRQC, PDCA, *quality rate*, industri otomotif, perbaikan berkelanjutan.

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INTRODUCTION

The automotive industry in Indonesia represents one of the manufacturing sectors with highly intense competition and stringent quality standards. Along with rising consumer expectations and global competition, automotive companies are demanded to not only manufacture vehicles in high volumes but also to ensure that every component complies with *zero defect* standards. However, in production floor reality, quality fluctuations are often inevitable due to various factors such as machine performance, material variations, and human factors. When quality issues arise, failure to respond quickly and systematically can lead to inflated operational costs resulting from waste, rework, and ultimately, a decline in customer trust.

The primary issue frequently encountered is the sluggish process of root cause analysis and the weak implementation of preventive actions to ensure that similar problems do not recur. In many companies, quality meetings often become mere formal routines devoid of actual execution on the shop floor. If the company's Quality Rate falls below the established standards, it poses a serious threat to the efficiency of the production line. Therefore, a responsive and integrated quality control mechanism is highly required to bridge the communication gap between management and operators in the Genba area (the actual workplace).

Quick Response Quality Control (QRQC) emerges as a quality management approach that emphasizes the speed of problem-solving directly at the scene of the occurrence. However, the implementation of QRQC alone is insufficient without a continuous improvement cycle. Integrating QRQC with the *Plan-Do-Check-Act* (PDCA) method becomes crucial to ensure that every finding in quality meetings is followed up with mature planning, measurable implementation, and permanent standardization. Through the PDCA cycle, the effectiveness of every decision made during *QRQC meetings* can be objectively evaluated to drive consistent quality performance enhancement.

Based on this background, this research was conducted to evaluate the extent to which the implementation of coordination within quality meetings can provide a significant impact on production line performance. This study aims to optimize the company's *quality rate* from an initial condition of 50% toward a more optimal level, with an increase targeting a maximum of 100% through the application of the PDCA method within the *QRQC meeting* workflow. Through this research, the company is expected to build a more robust and sustainable product defect mitigation system.

RESEARCH METHOD

This study employed a case study approach to evaluate the effectiveness of implementing the Plan-Do-Check-Act (PDCA) method within the Quick Response Quality Control (QRQC) system in improving the quality rate of an automotive production line. The research was conducted in the production area (Genba), where daily QRQC meetings were observed to obtain real-time data regarding problem identification, analysis, and corrective actions. Data were collected through direct field observations, company quality reports, production output records, scrap rate documentation, and structured interviews with production supervisors and quality engineers. The research procedure followed the PDCA cycle, beginning with the identification of quality problems through historical defect data and Pareto analysis. Improvement actions were then implemented by strengthening root cause analysis using the 5-Whys method and ensuring that corrective actions were carried out directly at the source of the problem. The effectiveness of the improvements was evaluated by comparing the quality rate before and after implementation, while successful practices were standardized through updated Standard Operating Procedures (SOPs) and Work Instruction Sheets (LIK). The collected data were analyzed descriptively and comparatively to evaluate the effectiveness and consistency of quality improvements following the implementation of the PDCA-based QRQC system.

RESULTS AND DISCUSSION

Problem Identification Through Historical Data

Based on observations conducted on the automotive component production line, the initial quality rate was found to be only 50%, indicating considerable inefficiencies in the quality control process. Pareto analysis revealed that approximately 80% of all quality failures originated from three dominant defect categories: misalignment, surface scratches, and incomplete processing. These findings suggest that the previous QRQC meeting mechanism was primarily reactive and had not effectively addressed the technical root causes of recurring production problems.

Table 1. Product Defect Distribution Before PDCA Implementation

Defect Type	Frequency (Unit)	Percentage (%)	Cumulative (%)
Misalignment	250	50	50
Surface Scratch	150	30	80
Incomplete Process	100	20	100
Total	**500**	**100**	**-**

Reconstruction of QRQC Meetings Using the PDCA Cycle

The QRQC meeting process was improved by restructuring communication patterns and strengthening field-based verification during problem-solving activities. Previous discussions that relied mainly on verbal reports were replaced with direct physical verification in the production area (Genba), consistent with recommendations from industrial quality management literature. During the Plan and Do stages, the quality team conducted direct observations and identified unstable machine vibration as the primary cause of the misalignment defect. Corrective actions included machine recalibration and replacement of worn jigs, reflecting the QRQC principles of Real Place and Real Part, where problem analysis is conducted directly at the actual workplace using the actual defective product.

During the Check and Act stages, production performance was monitored for one month following implementation. The monitoring results demonstrated a substantial reduction in the number of defective products and a significant improvement in overall production quality. The optimized machine parameters and corrective procedures were subsequently documented in the company's Work Instruction Sheet (LIK) to ensure standardized implementation and prevent operators from returning to previous operating conditions.

Figure 2. Illustration of QRQC and PDCA Integration Workflow on the Production Floor
(Source: Processed by the Author, 2026, adapted from industrial quality management literature).

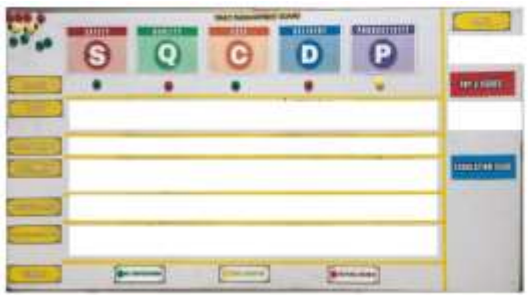

Figure 3. Implementation of the QRQC Board in the Company

Effectiveness Analysis: Comparison Before and After Implementation

The implementation of the PDCA methodology produced measurable improvements in production quality and operational efficiency. Significant improvements were observed in the quality rate, scrap cost, and problem-solving time, indicating that systematic quality management can substantially improve production performance.

Table 2. Comparison of Production Line Quality Performance

Performance Indicator	Before (Baseline)	After (Improvement)	Improvement
Quality Rate	50%	94.5%	+44.5%
Scrap Cost (Estimated)	Rp 15,000,000	Rp 1,500,000	−90%
Problem-Solving Time	3 Days	4 Hours	−94%

Discussion

The findings demonstrate that the improvement in the quality rate from 50% to 94.5% was achieved through the successful synchronization of rapid response mechanisms provided by QRQC and the structured analytical approach of the PDCA cycle. This finding is consistent with the quality management concept proposed by Ir. Yudi Prastyo, S.T., M.T., which emphasizes that quality improvement in the Indonesian automotive industry depends heavily on managerial discipline and systematic problem-solving at the operational level. Although the quality rate did not reach the ideal target of 100%, this result is considered reasonable because manufacturing processes remain influenced by stochastic human error and operational variability. Nevertheless, achieving a quality rate above 90% indicates that the company successfully moved beyond its previous quality inefficiency zone. Furthermore, the implementation of the PDCA method transformed the quality team's approach from reactive problem-solving to proactive continuous improvement.

Literature Comparison and Synthesis of Findings

The improvement of the quality rate from 50% to 94.5% observed in this study is consistent with previous findings in the automotive manufacturing literature. Within the Toyota Production System (TPS), the effectiveness of QRQC is closely associated with the Jidoka principle, which emphasizes the immediate detection and correction of abnormalities during production. Likewise, Imai (2012) explained through the Kaizen philosophy that continuous small-scale improvements produce more sustainable quality enhancement than occasional large-scale interventions. This concept explains why the daily implementation of QRQC meetings became a critical factor in improving production quality in the present study.

The findings are also supported by the IATF 16949 automotive quality management standard, which identifies the PDCA cycle as the core framework of continuous quality improvement. Previous studies published in the *International Journal of Production Research* reported that companies integrating effective cross-functional communication within quality meetings significantly reduced internal failure costs by as much as 60%. These findings support the substantial reduction in scrap costs observed after implementing the PDCA-based QRQC system in this research.

Analysis of Problem Dynamics in the Production Area

The quality improvement process did not occur linearly but evolved through several adaptation stages. During the early weeks of implementation, the primary challenge was operator resistance to changes in machine settings. However, objective performance data collected during the Check stage of the PDCA cycle demonstrated that the optimized machine parameters reduced rework and simplified production activities, ultimately encouraging operator acceptance.

The analysis indicates that achieving a substantial increase in the quality rate depended primarily on two critical factors. First, the use of Real Parts, namely the actual defective components, during QRQC meetings minimized subjective assumptions and accelerated technical decision-making. Second, strict follow-up discipline ensured that corrective actions implemented during the Do stage were always verified during the Check stage before being standardized, effectively preventing recurring quality problems.

Implications for Operational Efficiency

Beyond improving the quality rate, the implementation of QRQC supported by the PDCA methodology generated broader operational benefits. The company's Overall Equipment Effectiveness (OEE) increased from 85.7% to 89.2% due to reduced machine downtime associated with quality-related problems. These findings support previous Lean Manufacturing studies in Indonesia, which concluded that close coordination between production and maintenance teams within QRQC forums is one of the most effective approaches for achieving production targets while maintaining high product quality. Consequently, the integration of QRQC and PDCA contributes not only to product quality improvement but also to sustainable operational excellence in the automotive manufacturing industry.

CONCLUSION

Based on the findings and discussion, this study concludes that the implementation of the Plan-Do-Check-Act (PDCA) cycle within the Quick Response Quality Control (QRQC) framework effectively transformed the company's quality problem-solving approach from reactive to proactive and systematic. The integration of the QRQC 3 Reals principles—Real Place, Real Part, and Real Data—with the structured PDCA cycle enabled faster and more accurate identification of root causes, resulting in more effective corrective actions. The implementation significantly improved production quality, increasing the quality rate from an initial 50% to 94.5%. Although the target of 100% quality rate has not yet been achieved, the substantial improvement demonstrates that the implemented quality management system has successfully moved the company toward optimal production performance. Furthermore, the Act phase, through the standardization of updated Standard Operating Procedures (SOPs) and Work Instructions (WI), played a critical role in sustaining the achieved improvements and preventing recurring quality problems. Overall, this study confirms that continuous quality improvement in the automotive industry depends not only on advanced technology but also on effective communication, cross-functional coordination, and disciplined implementation of data-driven QRQC practices supported by the PDCA methodology.

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