

ENHANCING OVERSEAS SUPPLIER QUALITY PERFORMANCE IN PLAN-DO-CHECK-ACT METHOD THROUGH OPTIMIZING SUPPLIER COLLABORATION IN THE AUTOMOTIVE SECTOR

MENINGKATKAN PERFORMA KUALITAS PEMASOK LUAR NEGERI DIDALAM METODE PLAN-DO-CHECK-ACT MELALUI OPTIMALISASI KOLABORASI PEMASOK DI SEKTOR OTOMOTIF

Muhammad Thoriq Aziz¹, Andika Putra Pratama²

School of Business and Management, Institut Teknologi Bandung, Indonesia^{1,2}

Thor.5714@gmail.com¹

ABSTRACT

In today's global automotive industry, collaboration with overseas suppliers is very important but is often affected by slow response times, poor transparency, and cultural barriers. At PT. Global Motor Manufacturing (GMM), the implementation of the Plan-Do-Check-Act not handled adequately the recurring quality issues and long investigation lead times, in this study, suppliers in China, India and South Korea. These persistent gaps are caused by limited access to supplier processes, unstructured communication, and a lack of alignment. This study applies a qualitative approach through semi-structured interviews with members of internal QA, Overseas suppliers, HQ QA, and competitor QA experts. Thematic analysis highlights key challenges in each PDCA phase. The study proposes a set of universal and country-specific business solutions. These include standard defect reporting templates, collaborative digital tools, regular supplier performance reviews, and targeted cultural competency development. These solutions are designed to strengthen trust, increase responsiveness, and align quality standards and quality performance in overseas supplier network. By combining these solutions in each phase of the PDCA, This study contributes a refined PDCA adapted to the realities of global supplier collaboration. By combining ethical practices, cultural understanding and process discipline, this framework transforms QA from a reactive task to a proactive strategic function and supports long term competitiveness in the automotive sector.

Keywords: PDCA cycle, Overseas Supplier Collaboration, Cultural Communication, Cross-Cultural Management.

ABSTRAK

Dalam industri otomotif global saat ini, kolaborasi dengan pemasok luar negeri sangat penting tetapi sering terpengaruh oleh waktu respons yang lambat, kurangnya transparansi, dan hambatan budaya. Di PT. Global Motor Manufacturing (GMM), penerapan Plan-Do-Check-Act tidak menangani secara memadai masalah kualitas yang berulang dan lamanya waktu investigasi, dalam studi ini, pemasok berasal dari China, India, dan Korea Selatan. Kesenjangan yang terus-menerus ini disebabkan oleh akses terbatas terhadap proses pemasok, komunikasi yang tidak terstruktur, dan kurangnya keselarasan budaya dan teknis. Studi ini menggunakan pendekatan kualitatif melalui wawancara semi-terstruktur dengan anggota internal QA, pemasok luar negeri, QA Head Quarter, dan pakar QA dari perusahaan kompetitor. Analisis tematik menyoroti tantangan utama di setiap fase PDCA dan memungkinkan perumusan Solusi yang ditargetkan dan dapat ditindak lanjuti. Studi ini mengusulkan seperangkat Solusi bisnis universal dan spesifik negara. Ini termasuk standar template pelaporan cacat, alat digital kolaboratif, tinjauan kinerja pemasok secara berkala, dan pengembangan kompetensi budaya yang ditargetkan. Solusi ini dirancang untuk memperkuat kepercayaan, meningkatkan responsivitas, dan menyelaraskan standar kualitas dan performa kualitas dalam jaringan pemasok luar negeri. Dengan menggabungkan solusi ini dalam setiap siklus PDCA, studi ini memberikan kontribusi berupa PDCA yang disempurnakan yang disesuaikan dengan realitas kolaborasi pemasok global. Dengan menggabungkan praktik etis, pemahaman budaya, dan disiplin proses, kerangka ini mengubah QA dari tugas reaktif menjadi fungsi strategis proaktif dan mendukung daya saing jangka panjang disektor otomotif.

Kata Kunci: Siklus PDCA, Kolaborasi Pemasok Luar Negeri, Komunikasi Budaya, Manajemen Lintas Budaya

INTRODUCTION

In the fierce competitive automotive manufacturing industry, in

order to achieve world-class quality performance, it requires not only adherence to structured improvement methods but also effective collaboration over the supply chain. One of the key frameworks adopted in global to drive continuous improvement is the Plan-Do-Check-Act (PDCA) cycle. While this methodology provides a clear path for problem identification, countermeasure implementation, and improvements validation, the implementation can face severe limitations when applied in complex and cross-border or overseas supplier ecosystems. For specific, delays in investigation resolution and recurring quality issues with overseas suppliers have become significant challenges for quality assurance (QA) teams in automotive manufacturing plants.

At PT. Global Motor Manufacturing (PT. GMM), a company operating in the automotive manufacturing sector that this study refer, the Quality Improvement (QI) section within QA department has been facing persistent inefficiencies in resolving market quality issues, especially when involve overseas suppliers. Despite already implement PDCA based process, the company has observed a high rare of delay investigation times and repeatd defect cases, especially with overseas supplier partners. This points of systemic problem beyond procedural compliance to deeper problem rooted in communication gaps, misaligned accountability, and inconsistent in supplier engagement practices related overseas supplier.

An internal analysis that utilize the fishbone diagram (4M: Man, Machine, Method, Material) identified various contributing factors. These analysis include internal challenges like misalignment of quality expectations, limited accountability in problem ownership, and reactive instead of

proactive problem-solving approaches within the QA team. For external, overseas suppliers often display inconsistent responsiveness, cultural misunderstandings, and lack of trust, which all of these factors contribute to delayed problem solving cycles. In addition, tools and platforms that used to communicate quality problems, mainly email and QVOC systems, prove insufficient in building active collaboration and trust between QA team and overseas suppliers.

This research have objective to explore the key factors that contribute to delay investigation times and recurring quality issues in overseas supplier relationships. For the specific, it investigates internal challenges within the QI team. It also examines the concerns and obstacle faced by overseas suppliers. Furthermore, this study seeks to identify practical ways to improve the collaboration process between QI members and overseas suppliers. Ultimately, the goal is to refine the traditional PDCA framework by embedding cross-border collaboration and minimizing investigation delays through structured engagement and strategic alignment between all stakeholders involved.

This study contributes both to academic literature and industry practice by demonstrate how PDCA, a classic quality tool, can evolve in response to contemporary supply chain challenges. More importantly, it provides PT. GMM and similar companies with a concrete roadmap for reducing long investigation times, robust supplier engagement, and ensure more stable quality performance across their global supply network.

Literature Review

Rangel-Sánchez et al. (2024) underline that even though PDCA is useful for root cause analysis and

continuous improvement, the common PDCA application will focus more on operational and procedural side, and it overlook the human capital management or ethical consideration in complex scenarios like overseas supplier collaboration. [16] The study by Malega et al. (2021) highlight as an example of PDCA application in automotive assembly company and highlight techniques like 5 whys and Factor Tree Analysis (FTA) and the leverage of LCC (Lesson Learned Card). [12] Jagusiak-Kocik (2014) improved PDCA in the automotive area that focus on standardization with using BOST questionnaire to evaluate critical factors for continuous improvement and find that document standardization is the key. [8] internal communication barriers and skill gaps in long term collaboration between manufacturer and supplier, that studied by Aditi et al. (2024), shows poor communication, lack of training and low trust between stakeholder become challenges for quality improvement activity. [2] Spichak et al. (2021) shows the important of SWOT analysis for assessment of internal strengths, weaknesses, opportunities, and threats within quality management systems. [17]

Nguyen et al. (2021) emphasize the importance of communication-cultural compatibility (CCC) in global supply chain management by identifying reactive, initiative, and proactive configurations. [14] Rachman (2020) used Nonaka and Takeuchi's SECI model (Socialization, Externalization, Combination, Internalization) to structure knowledge-sharing processes. [15] Modungwa et al. (2021) discussed strategic supplier relationships in fostering supply chain innovation within the automotive industry. [13] Vanalle et al. (2014) studied sustainable practices in the Brazilian automotive sector and

they show the importance of supplier selection criteria considering environmental, financial, and operational performance. [19]

Koley et al. (2018) presented an approach using the Thomas-Kilmann Conflict Mode Instrument (TKI) to adapt negotiation strategies. [10] Brown don Achu et al. (2021) stated that organizational environments can be enhanced by collaboration and accommodation in conflict management. [5] Graça et al. (2019) defined the role of cognitive trust in buyer-supplier relationships across different cultural bases. [7]

Xie et al. (2023) highlighted the effect of collaborative innovation on supplier-manufacturer relationships and innovation outcomes. [20] Kristensen et al. (2019) provided a framework for sustainable value propositions in product-service systems, emphasizing the transition from transactional relationships to long-term partnerships. [11] Encinas Bartos et al. (2024) showed the role of structured sustainable training in improving supplier performance in the automotive sector. [6]

Bağış et al. (2022) presented the integration between PDCA and HCM (Human Capital Management) regarding production line innovation capabilities development in the automotive industry. [4] Ahmad et al. (2013) emphasized the importance of business ethic integration in total quality management (TQM) frameworks. [3]

Valentini et al. (2018) highlighted ethical issues in the automotive supply chain by examining Volkswagen's 2015 scandal, using an ethical judgment framework. [18] Jermisittiparsert et al. (2019) determined key ethical factors like honesty, integrity, and fairness affecting SCM processes and showed the correlation between ethics and organizational culture in supplier

collaboration. [9] Abuzaid et al. (2024) discussed the role of ethical leadership, needing fairness, transparency, and trust, in fostering proactive behaviors. [1]

RESEARCH METHODS

This research implements a qualitative method to solve inefficient collaboration in overseas supplier quality management within Quality Assurance at PT. Global Motor Manufacturing (GMM), specifically the Quality Improvement Section, by integrating overseas supplier collaboration into the PDCA (Plan-Do-Check-Act) cycle. The goal is to develop a comprehensive framework that enhances overseas supplier quality performance in terms of quality.

The main method for this research is conducting semi-structured interviews with four different participant groups: QA internal members (QA members and HOD (Head of Department) of QA), HQ QA members, Competitor's QA experts, and overseas suppliers. These groups were chosen to provide different insights and points of view into the challenges and opportunities in overseas supplier collaboration. Internal QA members (QA members) insights are crucial for exploring internal factors affecting overseas supplier collaboration and contributing to improvement strategies within the PDCA cycle. Internal QA members (HOD of QA) input is important for understanding internal factors and the alignment between supplier expectations and company quality standards affecting collaboration. HQ QA members insight provides best practices for structuring collaboration and enhancing engagement frameworks. Overseas suppliers that from India, China, and South Korea, which are the top 3 countries of suppliers contributing to PT. GMM's supply chain, helps discover external factors affecting

collaboration and how conflict resolution and communication improvements can be implemented. Competitor's QA experts offering insights into industry-wide best practices for overseas supplier collaboration and PDCA process improvement.

The Conceptual Framework in this research is a structure or map that describes the relationship between concepts that are relevant to the research topic. The first step in this research is to establish the business issue as the research purpose. After that, the problem that may have caused the issue is defined. For controllable variables, there are two: internal factors and external factors. These are then integrated into TKI (Thomas-Kilmann Conflict Mode Instrument) conflict resolution, with support from stakeholder theory and the Interest-Based Relational (IBR) approach. After obtaining the resolution, it is embedded into the current PDCA process; the current PDCA can also provide feedback to the TKI conflict resolution to find an effective method to solve this phenomenon. In this research, a root cause analysis will be conducted based on the qualitative data. After identifying the real cause of each problem and integrating it into the current PDCA, a solution is proposed to counter the issue addressed in this research. A timeline for the solution proposal is also created for clear implementation. The visual representation of the conceptual framework can be referred to figure 1.

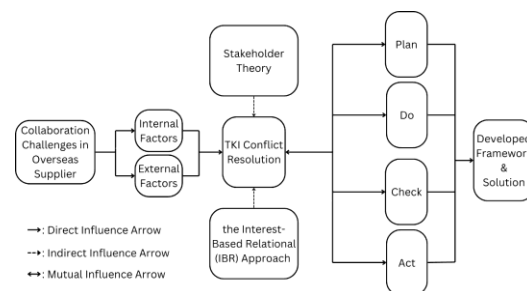


Figure 1. Conceptual Framework

This research leveraged a manual qualitative data analysis approach to investigate in depth the complexity of overseas supplier collaboration at the Quality Improvement section of PT. Global Motor Manufacturing (GMM). By focusing on themes related to the PDCA cycle, workforce capability, supplier collaboration ethics, and leveraging conflict management principles such as the Thomas-Kilmann Conflict Mode Instrument (TKI) and the interest-based relational (IBR) approach, this research aims to provide a comprehensive perspective on systemic inefficiencies and interpersonal challenges faced by QI PT. GMM in collaboration with overseas suppliers. The analysis begins with data preparations where all interview recordings are transcribed verbatim to ensure the integrity of participant responses. This initial step involved multiple readings of the data to capture patterns, key phrases, and areas where conflict dynamics influence challenges. The coding process involved reviewing transcripts line by line and assigning codes to significant segments of text that relate to the PDCA cycle, workforce capability, and supplier collaboration ethics. Conflict management insights were embedded into this process to help uncover the root causes of conflicts and their impact on collaboration and quality outcomes. The findings from this interconnected analyzation were merged into a comprehensive framework for overseas supplier collaboration improvement. This framework integrates improvements to the PDCA cycles with targeted workforce development initiatives and ethical supplier engagement strategies in collaboration between QI members and overseas suppliers for PT. GMM's market quality problem solving.

RESULTS AND DISCUSSIONS

Internal Factor and External Factor

The data analysis delves into the internal factors within PT. GMM's QI QA team that contribute to inefficiencies and the key concerns and challenges faced by overseas suppliers in their collaboration with this team. There are eight points that found in internal factors and five points that reveal in external factors. This study also found the country-specific challenges especially suppliers from India, China, and South Korea.

Internal Factors in Quality Improvement (QI) QA Team PT. GMM That Contribute to Inefficiencies and Delays in Quality Issues Investigation Collaboration with Overseas Suppliers

- Limited Direct Investigation and Auditing Access: Constraints due to limited business trip budgets restrict firsthand validation at supplier sites, leading to dependence on supplier-reported data.
- Gaps in Technical Capability and Problem-Solving Skills: Varying skill levels within the QA team regarding problem-solving, product knowledge, and critical analysis of supplier countermeasures.
- Delayed Implementation Due to Inventory and Forecast Constraints: Stock buffers for overseas parts (typically 3 to 5 months) delay visibility of improvements. Cross-functional coordination, especially when suppliers serve multiple plants, adds to delays.
- Absence of Standardized QA Procedures for Overseas Collaboration: Lack of a unified standard or SOP leads to varied approaches by QA members.

- Dependence on Regional Quality Centers: Reliance on regional centers (e.g., in India, China, or Korea) for validation and audits introduces additional coordination layers and reduces direct visibility.
- Language Barriers and Time Zone Misalignment: Communication inefficiencies, particularly with suppliers with limited English fluency and time zone differences, cause misinterpretations and delays.
- Lack of Supplier Transparency and Ethical Gaps: Some suppliers are not fully transparent, providing misleading or vague reports, requiring cross-verification.
- Unclear Responsibility and Supplier Ownership: Practical accountability is not always observed, especially with new or passive suppliers, shifting the burden to PT. GMM's QA team.

Key Concerns and Challenges Faced by Overseas Suppliers to Collaborate with QI Team

- Communication difficulties and responsiveness in quality control cycles: Need for clearer, structured communication, timely data sharing, and addressing issues with delayed responses and reliance on asynchronous tools.
- Cultural and organizational differences: Differences in work habits and attitudes toward urgency leading to misunderstandings or misaligned priorities.
- Ethical concerns and trust: Hesitation by some suppliers to fully disclose internal problems due to fear of repercussions, hindering transparency.
- Misalignment in process expectations: Gaps between PT. GMM's expectations (problem-solving speed, reporting format,

documentation depth) and what suppliers deem sufficient.

- Weaknesses in feedback mechanisms: Lack of structured systems for tracking progress, validating root causes, and confirming countermeasure effectiveness.

Country-Specific Supplier Challenges

India supplier tend to be slow to respond unless followed up regularly or involved in structured meetings. Generally cooperative and respectful, valuing direct clarification. Chinese supplier often provide short/unclear responses (e.g., "NTF"), especially if defects are hard to reproduce. Technically competent, prefer quick, mobile-based communication (WeChat), and comply once evidence is clear but may not admit faults early. And Supplier from South Korea have high skill but often unresponsive unless issues are escalated to HQ. they also have a behavior that frequent staff turnover. Value formality and respond well to high-level engagement, conducting robust analysis once engaged.

Business Solutions

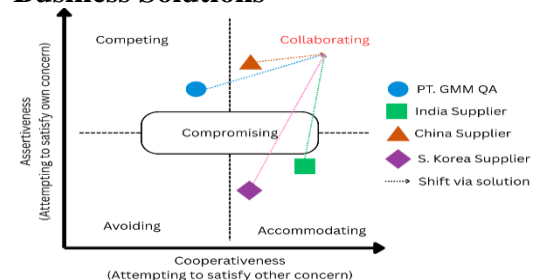


Figure 2 TKI Conflict Modes and Targeted Shift to Collaboration for PT. GMM QA and Overseas Suppliers

An analysis through the lens of the Thomas-Kilmann Conflict Mode Instrument (TKI), like figure 2, revealed varying conflict patterns among stakeholders, underpinning collaboration challenges. The PT. GMM QA Team

often operates in a "Competing Mode" due to performance pressures but may shift to "Avoiding" when faced with resource limitations, frequently leading to escalations. Indian suppliers tend towards "Accommodating" and "Collaborating" styles when positively engaged, though there's a risk of them shifting to "Avoiding" or "Competing" if engagement is inconsistent or if they feel their technical reasoning is misunderstood. Chinese suppliers demonstrate a readiness for fact-based "Competing" or "Collaborating" but may resort to "Avoiding" (e.g., NTF responses) if the problem definition lacks clarity. South Korean suppliers, despite strong technical capabilities for "Collaborating," often exhibit "Avoiding" or "Accommodating" tendencies at lower levels of involvement, responding decisively primarily under hierarchical pressure; staff rotation also impedes sustained collaboration. The proposed solutions aim to shift all stakeholders towards a more effective "Collaborating" mode.

Universal Business Solutions

A set of universal business solutions, designed to address common collaboration challenges across all overseas suppliers, has been developed and embedded within the PDCA phases, like figured in figure 3.

- PLAN Phase (Problem Identification and Root Cause Clarity)
 - Digital Problem Definition Templates
 - Remote Verification with Visual Tools
 - Risk-Based Prioritization System
- DO Phase (Implementation of Countermeasures)
 - Global Action Tracker Platform (Supplier Portal)
 - Regional Quality Liaisons or Certified Auditors
 - Lean Logistics Implementation for Quality Campaigns
- CHECK Phase (Monitoring the Effectiveness of Improvements)
 - IoT-Enabled Monitoring on High-Risk Parts
 - Monitoring Unit Programs
 - Automated KPI Dashboard
- ACT Phase (Sustaining Improvements and Preventing Recurrence)
 - Virtual Supplier Quality Audits (Bi-Annual)
 - Supplier Scorecard System with Reward Linkage
 - Global Quality Learning Portal
- Cross-Cutting Theme (Enhancing Communication & Cultural Understanding)
 - Cross-Cultural Competency Training
 - Real-Time AI Language Tools
 - Supplier Collaboration Summits

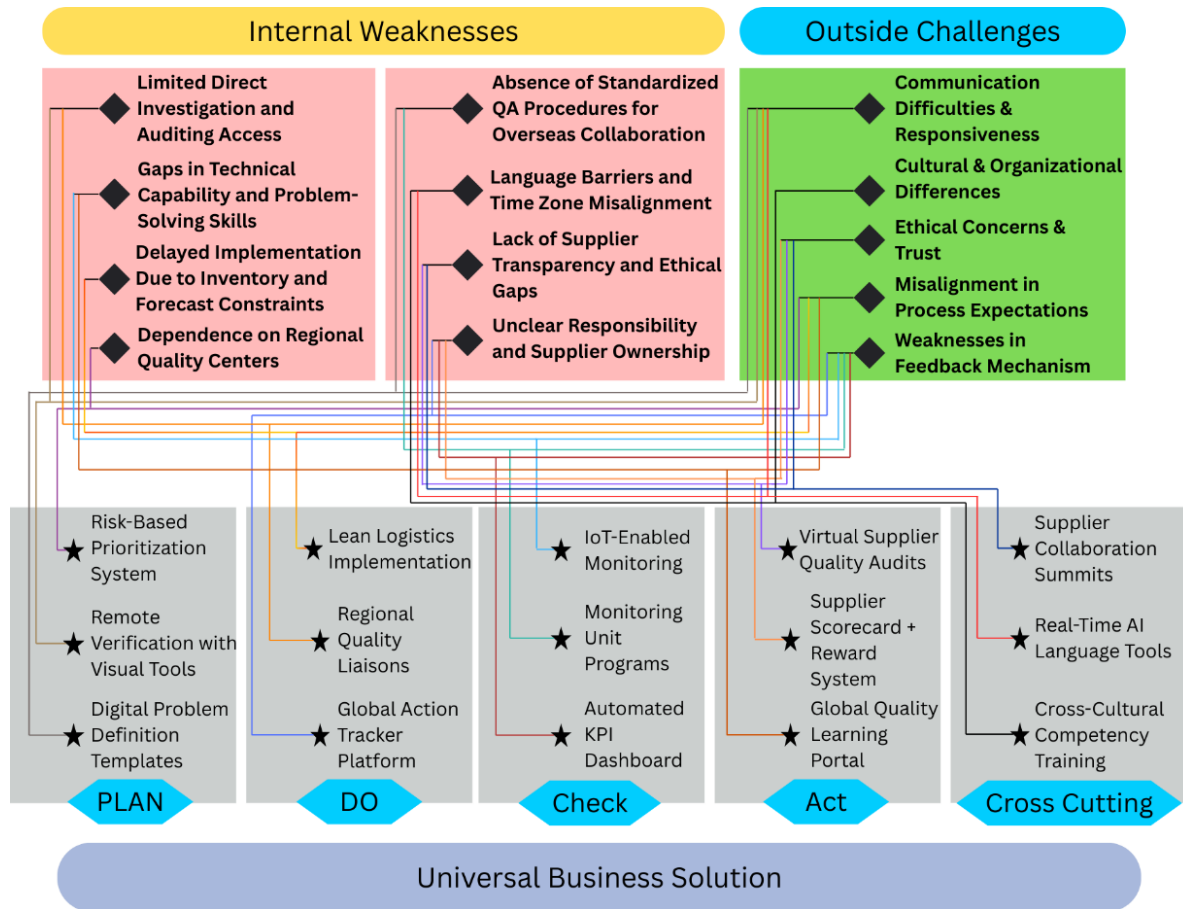


Figure 3. Universal Business Solutions Diagram

Country Specific Business Solution

Because of distinct cultural and operational characteristics necessitate tailored interventions, country-specific business solutions were developed for India, China, and South Korea and integrated into relevant PDCA phases like shows in figure 4.

India Supplier Collaboration Business Solution

- Plan phase – Weekly or Monthly Supplier Alignment Briefing and Reiteration
- Do phase – Biweekly Escalation Meeting
- Check – Monthly PPM and quality KPI review

China Supplier Collaboration Business Solution

- Plan – Symptom Reproduction and Video Based Template
- Check – WeChat For Multimedia Verification

South Korea Supplier Collaboration Business Solution

- Plan – Shared CKD Model and SOP (Start Of Production) timeline visibility
- Do – HQ level escalation kickoff meeting
- Act – PIC role mapping and formal handover Standarization

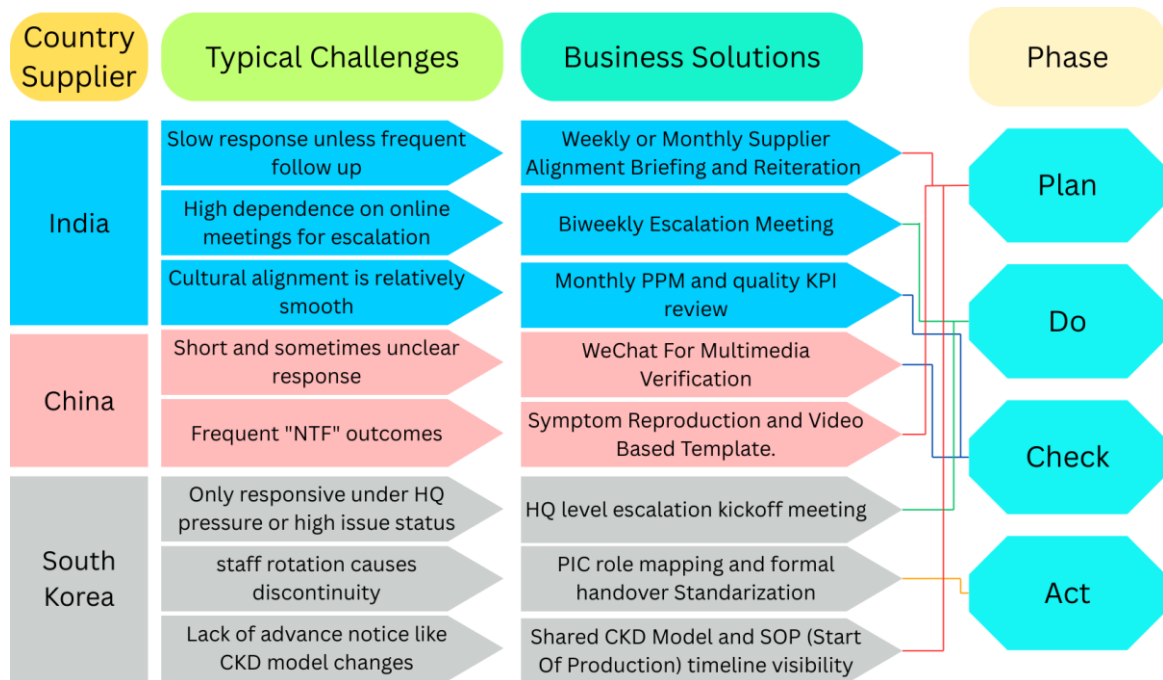


Figure 4. Country Specific Business Solution Diagram

CONCLUSION AND SUGGESTION

Conclusion

This study has comprehensively examined the challenges and opportunities for improving overseas supplier collaboration within the Quality Assurance (QA) framework of PT. Global Motor Manufacturing (PT. GMM), particularly through the application and refinement of the Plan-Do-Check-Act (PDCA) cycle. The key conclusions drawn from this research are as follows:

- Identify internal factors within PT. GMM QI team that hinder effective collaboration with overseas suppliers: his research found that PT. GMM QI QA's internal inefficiencies, like limited auditing access, inconsistent follow-up investigation, gaps in technical capability, and lack of standardized QA procedures, have weakened the execution of PDCA cycles especially in overseas supplier collaboration. These constraints have contributed to delayed problem solving and difficulty in managing recurring market issues.
- Understand the external challenges faced by overseas suppliers when collaborating with PT. GMM QA's team: Suppliers from China, India, and South Korea reported issues like unclear communication, delayed feedback, unclear responsibilities, and inadequate model launch visibility. Cultural and organizational differences, such as language barriers, reliance on hierarchy, and preferred communication styles, have also contributed to poor alignment when solving problems, especially for market issues.
- Formulate business solutions to improve the effectiveness of overseas supplier collaboration: This study developed universal and country-specific business solutions that aligned with PDCA phases or framework. These include standardized digital problem templates, escalation protocols, visual-based validation, performance dashboards, and supplier engagement activities. These solutions enable faster, clearer, and more structured

collaboration with diverse supplier profiles.

- Refine the PDCA framework to enhance its relevance for overseas supplier collaboration: The proposed enhancements embed tactical tools and trust-building mechanisms into each stage of PDCA. PLAN includes timeline sharing and clarity templates, DO introduces real-time engagement and regional liaisons, CHECK emphasizes monitoring systems and structured communication channels, and ACT promotes supplier audits, feedback, and recognition. This increases consistency, ownership, and sustainability of quality improvement of PT.GMM in a global supply chain context. In conclusion, optimizing the PDCA process through internal capability enhancement and external collaboration strategies offers a transformative pathway for PT. GMM to elevate its overseas supplier quality performance and strengthen global competitiveness in the automotive sector.

Suggestion

Based on the findings and conclusions of this study, the following suggestions are proposed for PT. GMM and its stakeholders:

- Develop a PDCA-Based Supplier Collaboration Playbook: Standardize procedures for engaging with overseas suppliers during each phase of the PDCA cycle. [706] This playbook should include investigation templates, expected communication formats, timeline benchmarks, and escalation protocols.
- Implement a Centralized Supplier Communication Platform: Replace fragmented email-based communication with an integrated digital portal that supports issue logging, deadline tracking, real-time chat, and document sharing to accelerate feedback cycles and countermeasure implementation.
- Establish Continuous Learning and Monitoring Systems: Institutionalize internal “monitoring units,” conduct bi-annual virtual audits, and create a global supplier learning hub that shares best practices and recurring issue analysis across all regions.
- Invest in Cross-Cultural and Ethical Training: Equip QA and QI team members with the skills to navigate cultural nuances and ethical dilemmas. [710] Training in empathy, negotiation, and international communication should be made mandatory for those working with overseas partners.
- Incentivize Supplier Performance: Develop a supplier scorecard system that ties collaboration performance to tangible incentives such as project prioritization, future business opportunities, and public recognition.
- Collaborate with Headquarters for Strategic Support: Leverage the resources and experience of HQ QA teams to benchmark successful strategies and co-develop long-term supplier development programs that go beyond issue resolution toward continuous quality enhancement.
- Conduct Further Research on Scalability: While this study focuses on PT. GMM’s current overseas suppliers, future research should explore how this framework can be adapted and scaled across different supplier regions, product lines, and emerging technologies in electric vehicles (EVs). Through these actions, PT. GMM can systematically strengthen its overseas supplier collaboration, reduce quality issue recurrence, and achieve a more proactive, transparent, and ethical

approach to global quality management.

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