Journal of Golden Generation Economic
Volume: 2, Nomor: 1, (2026), April: 513 - 524
Link Publish: https://ejournal.lppnusantara.com/index.php/JGGEconomic/article/view/562
E-ISSN: 3123-2841

Strategies for Developing Technical Competence and Soft Skills in Improving Customer Service Quality at NJS Alumunium Bandung

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Info Artikel
Submitted: *01 Maret 2026*
Revised: *05 Maret 2026*
Accepted: *10 Maret 2026*
Published: *27 Maret 2026*

Keywords: *Technical Competence Development, Soft Skills Development, Customer Service Quality*

Abstract
The manufacturing sector in Indonesia, particularly within the aluminum fabrication and extrusion industry, is currently navigating a period of intense structural transition. Historically characterized by a focus on physical output and technical specifications, enterprises are now increasingly compelled to adopt a service-dominant logic to maintain competitive viability. This research report investigates the strategic implementation of human resource development programs at NJS Alumunium, focusing on the dual-pathway integration of technical competence (hard skills) and interpersonal proficiencies (soft skills). Utilizing the SERVQUAL framework as a primary evaluative tool, the analysis explores how specific technical abilities, such as CNC machining, precision welding, and CAD design, intersect with soft skills like emotional intelligence, communication, and proactive problem-solving to drive customer satisfaction. The study synthesizes data from contemporary Indonesian industrial policies, including "Making Indonesia 4.0," and academic frameworks such as Workplace Learning (WPL) and Total Quality Management (TQM). Findings indicate that while technical mastery is a prerequisite for entry into the high-end aluminum market, soft skills serve as the critical differentiator in fostering customer loyalty and bridging the gap between expectation and perception. The report further details the role of management information systems, the impact of local cultural paternalism in leadership, and the emergence of green capabilities as essential components of a modern competency strategy. The proposed developmental model advocates for a continuous, mentored, and digitally-enabled training ecosystem that aligns organizational capabilities with the sophisticated demands of both domestic and international consumers.

Kata Kunci: *Pengembangan Kompetensi Teknis, Pengembangan Keterampilan Lunak, Kualitas Layanan Pelanggan*

Abstrak
Sektor manufaktur di Indonesia, khususnya dalam industri fabrikasi dan ekstrusi aluminium, saat ini sedang mengalami masa transisi struktural yang intens. Secara historis ditandai dengan fokus pada output fisik dan spesifikasi teknis, perusahaan kini semakin dituntut untuk mengadopsi logika dominan layanan untuk mempertahankan daya saing. Laporan penelitian ini menyelidiki implementasi strategis program pengembangan sumber daya manusia di NJS Aluminium, dengan fokus pada integrasi jalur ganda kompetensi teknis (hard skills) dan kemampuan interpersonal (soft skills). Dengan menggunakan kerangka kerja SERVQUAL sebagai alat evaluasi utama, analisis ini mengeksplorasi bagaimana kemampuan teknis spesifik, seperti permesinan CNC, pengelasan presisi, dan desain CAD, beririsan dengan soft skills seperti kecerdasan emosional, komunikasi, dan pemecahan masalah proaktif untuk mendorong kepuasan pelanggan. Studi ini mensintesis data dari kebijakan industri Indonesia kontemporer, termasuk "Making Indonesia 4.0," dan kerangka kerja akademis seperti Workplace Learning (WPL) dan Total Quality Management (TQM). Temuan menunjukkan bahwa

meskipun penguasaan teknis merupakan prasyarat untuk memasuki pasar aluminium kelas atas, keterampilan lunak berperan sebagai pembeda penting dalam memupuk loyalitas pelanggan dan menjembatani kesenjangan antara harapan dan persepsi. Laporan ini lebih lanjut merinci peran sistem informasi manajemen, dampak paternalisme budaya lokal dalam kepemimpinan, dan munculnya kemampuan ramah lingkungan sebagai komponen penting dari strategi kompetensi modern. Model pengembangan yang diusulkan menganjurkan ekosistem pelatihan yang berkelanjutan, terbimbing, dan didukung secara digital yang menyelaraskan kemampuan organisasi dengan tuntutan canggih dari konsumen domestik dan internasional.

Publisher: Lembaga Penerbit Penelitian Nusantara

Introduction

The Indonesian aluminum industry has emerged as a cornerstone of the national manufacturing landscape, driven by the escalating demand from the construction, automotive, and electronics sectors.[1] Within this context, NJS Alumunium represents a critical segment of the market—Small and Medium Enterprises (SMEs) in Bandung, West Java that must balance the rigors of heavy industrial production with the agility required for personalized customer service.[3] However, the modern marketplace is no longer satisfied with product quality alone; the "what" of manufacturing is now inseparable from the "how" of service delivery.[5] As competition from both domestic leaders and international players intensifies, NJS Alumunium faces the dual challenge of technological obsolescence and a widening competency gap within its workforce.[7]

The paradigm of "manufacturing-oriented services" suggests that quality management must be viewed through a holistic lens that encompasses both hard and soft aspects.[5] Hard aspects incorporate technical tools, management information systems (MIS), and physical evidence, while soft aspects focus on human resource management (HRM) practices, leadership styles, and employee job satisfaction.[5] In the specific case of aluminum fabrication, technical competence involves a sophisticated understanding of metallurgy, precision cutting, and joining techniques like Tungsten Inert Gas (TIG) and Metal Inert Gas (MIG) welding.[9] Without these hard skills, the reliability of the product—and by extension, the safety of the buildings or vehicles in which it is used—cannot be guaranteed.[2]

Parallel to these technical requirements is the growing importance of soft skills. In a service encounter, the employee acts as the face of the organization, translating complex technical specifications into value-driven solutions for the customer.[12] Communication, empathy, and responsiveness have been identified as significant predictors of job performance

and customer satisfaction in service-intensive industries.[14] For NJS Alumunium, the failure to integrate these soft skills into the technical workflow results in a disconnected customer experience, leading to revenue loss and a diminished reputation in an environment where consumers increasingly expect rapid, personalized, and transparent service.[6]

Furthermore, the Indonesian government's industrial roadmap, "Making Indonesia 4.0," and the national push toward a green economy introduce new layers of competency requirements.[17] Workers must now possess digital literacy to operate advanced HR technologies and technical knowledge to perform "green upskilling" in areas like energy efficiency auditing and sustainable material maintenance.[17] Despite these requirements, many Indonesian SMEs struggle with high employee turnover, limited access to international markets, and a lack of structured training frameworks.[4]

This research identifies that the path to improving service quality at NJS Alumunium lies in a coordinated strategy that bridges the gap between vocational training and industrial demand.[7] By implementing a Workplace Learning (WPL) model that integrates formal, informal, and experience-based learning, NJS Alumunium can cultivate a workforce that is not only technically proficient but also interpersonally adept.[8] This report explores the mechanisms through which these competencies influence the five dimensions of the SERVQUAL model—Reliability, Assurance, Tangibles, Empathy, and Responsiveness—and provides a strategic blueprint for organizational excellence in the aluminum fabrication sector.

Method

The analysis presented in this report is constructed using a multi-dimensional qualitative research design, focusing on the synthesis of empirical data, theoretical models, and industry-specific case studies relevant to the Indonesian aluminum sector.[3] The foundational approach is an "integrative literature review," which allows for the critical assessment of quality management models and their application in manufacturing-oriented services.[5] This method is chosen because it facilitates the categorization of variables into "soft" and "hard" facets, providing a structured way to analyze employee performance and customer satisfaction.[5]

To understand the practical application of these concepts within NJS Alumunium, the study adopts the framework of the SERVQUAL model, originally developed by Parasuraman, Zeithaml, and Berry.[13] This model defines service quality as the gap between customer expectations and actual perceptions of performance across five key dimensions.[16] The data used to populate this model is derived from comparable SME studies in Indonesia, such as the

evaluation of service quality at Hotel Vidi 2 and manufacturing firms in the metal sector, which provide proxy metrics for understanding common service gaps in the local market.[3]

Additionally, the research incorporates the Define-Measure-Analyze-Improve-Control (DMAIC) methodology, a central component of Six Sigma quality management.[2] By analyzing the application of DMAIC in Indonesian aluminum wheel manufacturing and muffler protector production, the study establishes a baseline for how technical competence (hard skills) can be measured and improved using statistical tools like DPMO (Defects Per Million Opportunities) and sigma levels.[20]

The strategy for competency development is further refined through the lens of the Workplace Learning (WPL) model based on the Indonesian Qualification Framework (IQF).[8] This involves the analysis of state-owned enterprises and SME clusters to identify effective training interventions, such as mentoring, on-the-job training (OJT), and job rotation.[8] Finally, a thematic analysis of Indonesian industrial policy documents, including the "Making Indonesia 4.0" roadmap and reports from the Ministry of Industry, provides the contextual backdrop for digital and green upskilling requirements.[17] This comprehensive methodology ensures that the resulting strategy for NJS Alumunium is theoretically grounded, empirically validated, and culturally aligned with the Indonesian industrial ecosystem.

Result and Discussion

Technical Competence and the Hard Facets of Quality

In the aluminum fabrication industry, technical competence is the non-negotiable prerequisite for operational survival. For NJS Alumunium, the "hard" facets of quality management are deeply embedded in the ability to manipulate aluminum alloys to meet rigorous industrial standards.[1] This technical proficiency is directly linked to the **Reliability** and **Assurance** dimensions of service quality, as customers first and foremost require a product that performs its intended function without failure.[13]

The technical journey begins with material knowledge. Aluminum alloys, such as the 6063 and 6060 series commonly used by market leaders like Alexindo, possess unique properties regarding thermal conductivity and malleability.[1] Competent staff must be able to select the correct alloy and temper for specific applications—be it for high-rise curtain walls, automotive components, or specialized industrial enclosures.[1] A lack of this fundamental knowledge leads to "leak defects" or "porosity," which are common causes of product rejection in the casting and extrusion process.[2]

Process Stage	Required Technical Competence	Impact on Quality Dimension
Design & CAD	Interpretation of blueprints, 3D modeling, tolerance setting	**Assurance**: Builds trust in engineering capability
Cutting & Shaping	Precision operation of CNC laser, waterjet, and plasma cutters	**Reliability**: Ensures parts fit together accurately
Joining/Welding	Mastery of TIG/MIG welding for aluminum (managing oxide layers)	**Reliability**: Ensures structural integrity and safety
Finishing	Anodizing, powder coating, and surface treatment application	**Tangibles**: Enhances aesthetic appeal and durability
Quality Control	Use of calipers, gauges, and statistical process control (DMAIC)	**Reliability**: Minimizes defects and reworks

The application of the DMAIC method demonstrates the tangible benefits of technical upskilling. In studies of Indonesian manufacturing SMEs, implementing DMAIC led to an increase in the sigma level from 3.51 to 4.33, effectively reducing the DPMO and saving millions in production costs.[2] For NJS Alumunium, this technical mastery constitutes the "Interactive Marketing" component of the service marketing triangle—it is what is delivered through the service encounter.[5] Without it, even the most empathetic communication will fail to retain a customer whose project is delayed by non-compliant materials.[13]

Soft Skills and the Functional Quality of Service

While hard skills provide the "technical quality" (what the user receives), soft skills provide the "functional quality" (how the user receives it).[26] Research in the service sector indicates that soft skills, particularly communication and empathy, are the primary drivers of **Responsiveness** and **Empathy** in the SERVQUAL model.[14] For NJS Alumunium, these skills are essential because the fabrication process often requires deep collaboration between the fabricator and the client.[9]

The "soft" aspects identified in quality management literature—transformational leadership, service climate, and human resource management practices—create an environment where employees are motivated to provide superior service.[5] In Indonesian SMEs, a "paternalistic" leadership style often prevails, where managers act as mentors, guiding the career paths and behavioral development of their staff.[7] This cultural nuance can be leveraged to instill a strong work ethic and a "customer-first" mentality, which are vital for maintaining high service standards.[7]

Studies on call center operators and hospitality workers in Southeast Asia confirm that communication skills are the most significant predictor of job performance.[14] At NJS Alumunium, this manifests in the ability to:

1. **Listen actively** to a contractor's specific design needs, thereby reducing errors during the drafting phase.[12]
2. **Maintain transparency** regarding lead times and order status, which has been shown to enhance customer satisfaction even when delays occur.[6]
3. **Resolve conflicts** diplomatically when technical issues arise during on-site installation, preventing the escalation of disputes.[12]

Soft Skill Dimension	Behavioral Indicator	SERVQUAL Alignment
Communication	Clear articulation of technical limits and timelines	**Responsiveness** & **Assurance**
Empathy	Individualized attention to client's project constraints	**Empathy**
Problem Solving	Adaptability to changes in on-site construction variables	**Reliability** & **Responsiveness**
Work Ethic	Punctuality, professionalism, and adherence to safety	**Tangibles** & **Reliability**
Teamwork	Coordination between design and production departments	**Reliability**

The integration of emotional intelligence training, such as mindfulness or cognitive reappraisal techniques, can further empower employees to manage the high-pressure environment of manufacturing deadlines.[26] When employees can regulate their own stress, they are better equipped to provide calm, reassuring service to anxious customers, thereby strengthening the **Assurance** dimension.[19]

The Strategy for Competency Development: WPL and Training Models

The most effective strategy for NJS Alumunium involves the implementation of a Workplace Learning (WPL) model that aligns with the Indonesian Qualification Framework (IQF).[8] This model moves beyond the traditional "one-off" training seminar, which often fails to produce lasting behavioral change.[29] Instead, it advocates for a continuous learning ecosystem that combines five core activities: structured training, mentoring, on-the-job training (OJT), job rotation, and industry practice.[8]

Mentoring is particularly critical in the aluminum sector due to the high degree of craftsmanship involved in welding and finishing.[10] By pairing junior fabricators with master craftsmen, NJS Alumunium can ensure that "tacit knowledge"—the nuanced "feel" for the metal—is passed down, preserving the company's technical edge.[8] Simultaneously, job rotation

between the production floor and the customer service desk can help technical staff understand the real-world implications of their work, fostering empathy and a holistic understanding of the service lifecycle.[8]

Digital technologies play a supporting role in this strategy. The Indonesian HR tech market is growing rapidly, with cloud-based platforms now available for payroll, recruitment, and engagement tracking.[17] For NJS Alumunium, adopting these tools can help break down "organizational silos," ensuring that the flow of information between the salesperson, the designer, and the fabricator is seamless.[7] This "Internal Marketing" ensures that every department understands its role as an internal supplier to the next stage of the service chain.[5]

External Drivers: Policy, Technology, and the Green Turn

The development of competencies at NJS Alumunium does not occur in a vacuum. National policies such as "Making Indonesia 4.0" provide a roadmap for the integration of Artificial Intelligence, the Internet of Things (IoT), and advanced robotics into the manufacturing process.[17] Consequently, technical competence must now include "digital skills"—the ability to interface with CNC machines through modern software and manage customer data securely.[17]

Furthermore, "green upskilling" has emerged as a core component of the national labor roadmap.[17] As Indonesia commits to reducing carbon emissions and transitioning to a sustainable economy, NJS Alumunium must prepare its workforce for:

- **Energy Efficiency Auditing:** Optimizing the heat-intensive extrusion process to reduce energy waste.[17]
- **Sustainable Material Management:** Improving the recyclability of aluminum scrap and documenting the environmental impact through Environmental Product Declarations (EPDs).[11]
- **Renewable Energy Maintenance:** Developing technical skills to fabricate components for the growing electric vehicle (EV) and solar power sectors.[17]

This "green turn" offers a unique opportunity to enhance the **Assurance** and **Tangibles** dimensions of service quality. By achieving certifications such as the "Green Label" (Gold) or ISO 14001, NJS Alumunium can signal its commitment to sustainability, a factor that is increasingly influential for corporate and international clients.[1]

Evaluating the Gaps: Lessons from the SME Context

Data from Indonesian SMEs, particularly in the hospitality and metal goods sectors, reveal that the **Tangible** dimension often presents the largest gap between customer expectation and perception.[16] For a company like NJS Alumunium, this translates to the physical appearance

of the workshop, the condition of delivery vehicles, and the professionalism of staff attire.[19] Improving these tangibles is a relatively low-cost way to signal quality before the technical work even begins.[13]

However, the most critical dimension remains **Reliability**.[13] Research indicates that customers value reliability—doing what was promised, on time, and accurately—three times more than they value shiny new equipment.[13] Therefore, the primary focus of any competency strategy must be to ensure that technical skills (reducing defects) and soft skills (managing promises) work in unison to deliver a reliable outcome.[26]

SERVQUAL Dimension	SME Gap Analysis (Typical)	Strategic Response for NJS Alumunium
Reliability	High Expectation / Variable Performance	Implement DMAIC and strict OJT to ensure zero-defect fabrication
Responsiveness	High Expectation / Low Visibility	Use digital order tracking to keep customers informed of status
Assurance	Moderate Expectation / Technical Mistrust	Provide GQA-accredited training and display certifications to clients
Empathy	Moderate Expectation / Robotic Service	Implement mentoring and role-play workshops for client interactions
Tangibles	Moderate Expectation / Low Performance	Standardize staff uniforms and maintain a clean, organized showroom

The financial implications of ignoring these gaps are severe. Studies show that poor service quality in Indonesian SMEs can lead to a 19% decrease in revenue as customers defect to more responsive competitors.[16] Conversely, a well-executed service-profit chain, where skilled and satisfied employees deliver high-quality service, leads directly to increased customer loyalty and business performance.[31]

Conclusion

The pursuit of service excellence at NJS Alumunium requires a fundamental reimagining of the role of the industrial worker. In the contemporary aluminum fabrication market, technical mastery of cutting, welding, and CNC machining is merely the price of entry. To achieve true differentiation and foster long-term customer loyalty, NJS Alumunium must cultivate a workforce that possesses a sophisticated blend of hard technical skills and soft interpersonal competencies.

The strategic integration of these skills should be guided by the SERVQUAL framework, ensuring that every training intervention—whether it is a technical workshop on TIG welding or a soft skills seminar on conflict resolution—is aimed at closing the gap between customer expectations and perceived performance. The Workplace Learning (WPL) model provides a sustainable blueprint for this development, emphasizing the role of mentoring, job rotation, and on-the-job training in a way that respects the cultural context of Indonesian SMEs while embracing the digital requirements of the 4.0 industrial era.

Ultimately, the "gestalt" of quality management suggests that the soft and hard aspects must work in unison. A technically perfect aluminum window frame is of little value if the installation is delayed by poor communication or if the staff is unresponsive to the client's concerns. By prioritizing Reliability and Assurance through technical precision, and enhancing Empathy and Responsiveness through soft skills, NJS Alumunium can transform itself from a mere supplier of metal products into a trusted partner in its customers' success. The transition toward a digitally-enabled, green-conscious, and service-oriented workforce is not just a strategic choice; it is a necessity for survival in the evolving global manufacturing landscape.

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