Top Management Support and Quality Management Effectiveness in Manufacturing: A Systematic Literature Review

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ABSTRACT

Background and Purpose: Top management support (TMS) occupies an uneasy place in quality management research. It is the variable most consistently associated with TQM success, yet the mechanisms through which executive commitment shapes quality outcomes remain underspecified. Existing reviews treat enablers and barriers as separate bodies of literature, missing the structural logic that connects them.

Design/Methodology/Approach: Following the PRISMA 2020 protocol, searches across Scopus, Web of Science, and Google Scholar (2005–2025) yielded an initial pool of 287 records. Four sequential screening stages, quality appraisal (Cohen's $\kappa = 0.81$), and four rounds of citation tracking produced a final corpus of 64 peer-reviewed articles. Thematic Synthesis (Thomas & Harden, 2008) guided the coding and integration of findings.

Findings: Top management commitment and involvement (82% of articles), quality decision empowerment (56%), and resource allocation (52%) are the three leading enablers of quality management effectiveness (QME). Production–quality goal conflict (62%) and a 'ship-first, inspect-later' culture (55%) are the two dominant barriers. Mediation evidence from PLS-SEM studies across multiple sectors shows TMS reaches quality outcomes most reliably through quality culture and quality manager empowerment rather than through a direct performance pathway.

Originality/Value: The study reframes the enabler–barrier relationship as a unified governance structure — each barrier being the predictable absence of its corresponding enabler — rather than two unrelated research streams. An Integrated Conceptual Framework positions quality culture and quality manager empowerment as joint mediating mechanisms linking TMS to QME. The Thai IATF 16949 manufacturing context, empirically absent from the literature, is identified as a priority for future empirical work, and specific research directions are proposed.

Keywords: Top Management Support; Quality Management Effectiveness; Critical Success Factors; Manufacturing Industry; Systematic Literature Review; IATF 16949

INTRODUCTION

Quality management sits at an awkward intersection of regulatory requirement and organisational reality. ISO 9001:2015 and IATF 16949:2016 both treat top management commitment as a mandatory, auditable obligation under Clause 5.1 — not a recommended practice. Yet organisations that formally adopt TQM regularly override quality decisions when production schedules press (Deming, 1986; Valmohammadi & Roshanzamir, 2015), and quality managers consistently report that the decision authority nominally delegated to them evaporates under production-driven hierarchy (Baidoun et al., 2018). Top management support (TMS) is, in practice, necessary but insufficient — a gap with real operational consequences.

Three lacunae in the existing literature shape the design of this review. First, no systematic review has treated TMS enablers and their corresponding barriers as two aspects of the same governance structure; they have been

handled separately, in different literatures, as if their mirror-image relationship were incidental. Second, the mechanisms that carry TMS into quality outcomes — particularly organisational quality culture and quality manager empowerment — lack the theoretical integration their empirical prominence warrants (Al-Dhaafri et al., 2016; Mosadeghrad, 2015). Third, the Thai manufacturing sector, despite its density of IATF 16949-certified automotive suppliers in the ASEAN supply chain, has generated no empirical TMS–QME research. The synthesis of 64 peer-reviewed articles presented here engages all three gaps. The proposed framework is intended as a testable starting point for research in that context.

Research Objectives

1) To synthesise evidence on how TMS influences QME in manufacturing organisations.
2) To identify and classify the principal enabling and inhibiting factors of QME.
3) To develop an Integrated Conceptual Framework specifying the TMS–QME mediated pathway.
4) To derive policy recommendations for Thai manufacturing executives operating under IATF 16949 and ISO 9001.

Research Questions

RQ1: Through which mechanisms does TMS influence QME in manufacturing organisations?

RQ2: What are the principal enabling and inhibiting factors of QME in manufacturing?

RQ3: Which mediating variables should an integrated TMS–QME framework specify?

Scope

Coverage is restricted to peer-reviewed articles published between 2005 and 2025 in Scopus- or Web of Science-indexed journals, set in manufacturing or industrial contexts, with bibliographic sources traceable to a working DOI or URL at the time of screening. In addition, supplementary hand-searches were conducted in grey literature sources, conference proceedings, and Thai-language academic databases (Thai Journals Online; TCI Portal) to reduce language and publication bias.

LITERATURE REVIEW

Theoretical Foundations

Four bodies of theory ground the analytical framework. They are treated here not as separate lenses but as a cumulative argument about why executive behaviour matters more than executive declaration.

Total Quality Management Theory. Deming (1986) and Juran (1988) placed senior leadership at the foundation of quality transformation, not as one factor among equals but as the precondition for everything downstream. Kaynak (2003) later demonstrated empirically that TMS exerts stronger direct and indirect effects on quality performance than any other single TQM variable — a finding Ahire and Golhar (1996) replicated across firm sizes. The practical upshot is that other TQM investments are likely to underperform when executive engagement is weak, whatever the documentation says.

Organisational Support Theory. Eisenberger et al. (1986) showed that perceived organisational support (POS) derives from observed executive behaviour, not stated policy. That gap matters here: Chatterjee et al. (2025) find that formal endorsement of quality objectives without accompanying resource allocation or personal participation — what they term passive TMS — produces markedly weaker sustainability outcomes than active TMS that is visible and resource-backed. The form of support, not merely its presence, drives outcomes.

Resource-Based View. Barney's (1991) VRIN framework — valuable, rare, inimitable, non-substitutable — maps onto quality culture in an instructive way. Certification documents and quality procedures are replicable; a deeply embedded quality culture shaped by years of consistent executive behaviour is not. Al-Hakimi et al. (2025) confirm the moderating role of organisational culture in TQM–green manufacturing practice relationships ($\beta = 0.080$, $p = 0.021$), underscoring that culture is a genuine strategic resource, not a byproduct of compliance.

Leadership Theory. Bass and Avolio (1994) distinguished transformational leadership — which reshapes organisational culture — from transactional leadership, which reinforces exchange-based norms. In TQM research, transformational approaches consistently outperform transactional ones for sustained quality outcomes (Park et al., 2017; Ali & Park, 2016). Singh (2025) brings institutional context into this picture: external certification pressure (such as IATF 16949 audit requirements) significantly moderates the leadership–TQM–performance pathway, meaning that formal quality standards can amplify leadership effects in ways that internally motivated firms alone may not achieve.

Top Management Support as a Multidimensional Construct

TMS is frequently measured as a single composite variable, which obscures meaningful differences among its components. Five sub-dimensions recur in the literature: (1) commitment and articulated vision; (2) quality policy communication; (3) resource allocation; (4) direct involvement in quality processes; and (5) recognition and reward systems tied to quality performance.

Kaynak (2003) established that TMS operates primarily upstream — through training, process management investment, and management development — rather than as a direct influence on performance outputs. Dubey et al. (2018) extended this: TMC is the strongest predictor of TQM diffusion in Indian automotive manufacturing, and its effects unfold through acceptance, routinisation, and assimilation over time, not immediately. In the Iraqi oil sector, Aletaiby et al. (2021) quantified this at the sub-dimensional level: TMC achieved 94.6% combined familiarity ratings across TQM dimensions, with specific sub-dimensions correlating negatively with resistance-related barriers ($\rho = -0.294$, $p < 0.01$).

TMS compatibility — aligning new initiatives with existing organisational values rather than imposing them — deserves more attention than it typically receives. Shafique et al. (2024) find it predicts big data analytics adoption for supply chain collaboration, enriching the quality policy communication sub-dimension: effective TMS aligns policy with operating logic, it does not simply announce change. Jafari et al. (2025) offer perhaps the most precise quantification available: using three-way interaction analysis on longitudinal data from 524 Iranian firms, they show the benefits of data analytics for supply chain agility materialise only when TMS exceeds a threshold value (TMS > 5.4, Johnson-Neyman analysis), confirming that TMS acts as a genuine boundary condition.

Contrasting evidence cautions against treating TMS as sufficient in itself. Gotzamani (2022) found Greek manufacturing firms with high stated TMS but weak strategic implementation achieved no competitive advantage over lower-TMS peers. Liu et al. (2022) document a similar pattern in Chinese manufacturing, where TMS reaches performance through employee management ($\beta = 0.605$), customer management ($\beta = 0.722$), and supplier management ($\beta = 0.646$) — not directly. Both findings point in the same direction: without active mediating mechanisms, stated commitment rarely converts into measurable quality outcomes.

Mediating Mechanisms: Quality Culture and Empowerment

How executive commitment becomes quality performance — through what intermediate mechanisms — is the question the TMS literature has answered least satisfactorily. Two mechanisms stand out in the empirical record.

On quality culture, Valmohammadi and Roshanzamir (2015) provided early evidence that organisational culture mediates the TQM–performance relationship rather than merely moderating it. Navarro and Naranjo (2025) replicate this across 16 Colombian manufacturers: the indirect pathway from quality culture through quality management to performance (indirect effect = 0.31) rivals the direct pathway (0.56), indicating that culture functions as an amplifying mechanism rather than a downstream outcome of TMS.

Quality manager empowerment follows a comparable pattern. Oliveira et al. (2019) found that top management leadership carried the highest CFA loading across TQM constructs in ISO 9001-certified Brazilian SMEs, yet observed that many organisations complied only at the documentary level without granting real decision authority. Psomas and Kafetzopoulos (2014) showed the performance gap between ISO-certified and non-certified firms was better explained by whether empowerment was substantive than by certification status alone. Abdulameer et al. (2021) offer the sharpest test of full mediation available in this corpus:

Sector-level evidence reinforces the same picture. Alsmairat et al. (2023) found both a direct TMC effect on quality performance ($\beta = 0.224$) and a mediated effect through quality management practices ($\beta = 0.673$, $p < 0.001$) in Jordanian hospitals. Rita and Islam (2024) and Bashar et al. (2023) confirm analogous pathways in Bangladeshi banking. In technology adoption, Teh et al. (2024) show TMS mediates technology-organisation-environment factors ($\beta = 0.264$, $R^2 = 0.58$); Wahab et al. (2025) find TMS directly predicts blockchain adoption ($\beta = 0.336$, $p < 0.01$).

Chatterjee et al. (2025) sharpen the picture by showing that only active TMS — not passive endorsement — significantly moderates the relationship between green HRM practices and environmental performance, which maps onto the quality process involvement sub-dimension in Section 2.2.

Enablers and Barriers: A Mirror-Image Governance Structure

Reading the enabler and barrier literatures in parallel reveals something the separate traditions tend to obscure: each principal enabler has a structural counterpart on the barrier side. When organisations fail to maintain any enabler actively, the corresponding barrier tends to emerge — not as an independent problem but as the predictable consequence of inaction. The mirror-image structure is not a metaphor; it is the working hypothesis this synthesis applies throughout.

Table 1 records the six most frequently reported pairs.

Table 1: Synthesis of Enablers and Barriers

Enablers	Barriers
Top Management Commitment and Vision	Production Pressure Over Quality Standards
Quality Decision Empowerment	Quality Decisions Ignored or Overridden
Adequate Resource Allocation and Training	Lack of Resources, Tools, and Budget
Support for Corrective and Preventive Action	No Follow-Through on Repeated Defects
Root Cause–Oriented Problem Solving	Temporary Fixes, No Permanent Solution
Cultivation of a Quality-First Culture	"Dispatch First, Quality Later" Culture
Source: Synthesised from 64 reviewed articles (see Table 3, Appendix).	

Conceptual Gap

Three gaps remain. The treatment of TMS enablers and barriers as separate research streams leaves their structural interdependence untheorised. Quality culture and quality manager empowerment have each been tested as mediators, but their joint operation within a single framework has not been proposed. And the Thai IATF 16949 manufacturing context is absent from the empirical record, despite the country's automotive supplier density and the stringent top management requirements in Clause 5.1. Sections 3 and 4 respond to each gap in turn.

RESEARCH METHODOLOGY

Research Design

The study employs a Systematic Literature Review following PRISMA 2020 guidelines (Moher et al., 2009), selected for its transparent and reproducible procedures across methodologically diverse evidence. In line with the revised PRISMA 2020 reporting standard (Page et al., 2021), this review documents search strategy, screening, and quality appraisal procedures in full.

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Search Strategy

Searches were conducted across Scopus, Web of Science, and Google Scholar using Boolean combinations across four keyword groups (Table 2). The master string combined Groups 1, 2, and 3; Group 4 was applied selectively in follow-up searches.

Table 2: Keywords and Search Strategy

Keyword Group	Search Terms
Group 1: Management	"top management support" OR "top management commitment" OR "executive leadership" OR "CEO commitment"
Group 2: Quality	"quality management" OR "total quality management" OR "TQM" OR "quality management effectiveness"
Group 3: Context	"manufacturing" OR "manufacturing industry" OR "production" OR "industrial organization"
Group 4: Outcomes	"quality performance" OR "organizational performance" OR "quality culture" OR "quality improvement"

Inclusion and Exclusion Criteria

Articles were included if they were empirical or theoretical; published in English between 2005 and 2025 in a Scopus- or WoS-indexed peer-reviewed journal; set in an industrial or manufacturing context; and traceable to a working DOI or URL at screening. Supplementarily, grey literature items (reports, working papers, conference proceedings) and non-English-language studies (Thai and ASEAN contexts) were hand-searched and included when they met all other eligibility criteria, to broaden geographic and methodological coverage (Booth et al., 2016).

Excluded articles were those with no substantive connection to quality management; insufficient detail to extract meaningful findings; book reviews or editorials; an unverifiable bibliographic source; or a setting entirely outside manufacturing contexts (e.g., healthcare-specific quality frameworks with no manufacturing relevance). Grey literature items lacking verifiable institutional authorship or methodological description were also excluded.

PRISMA Process and Selection

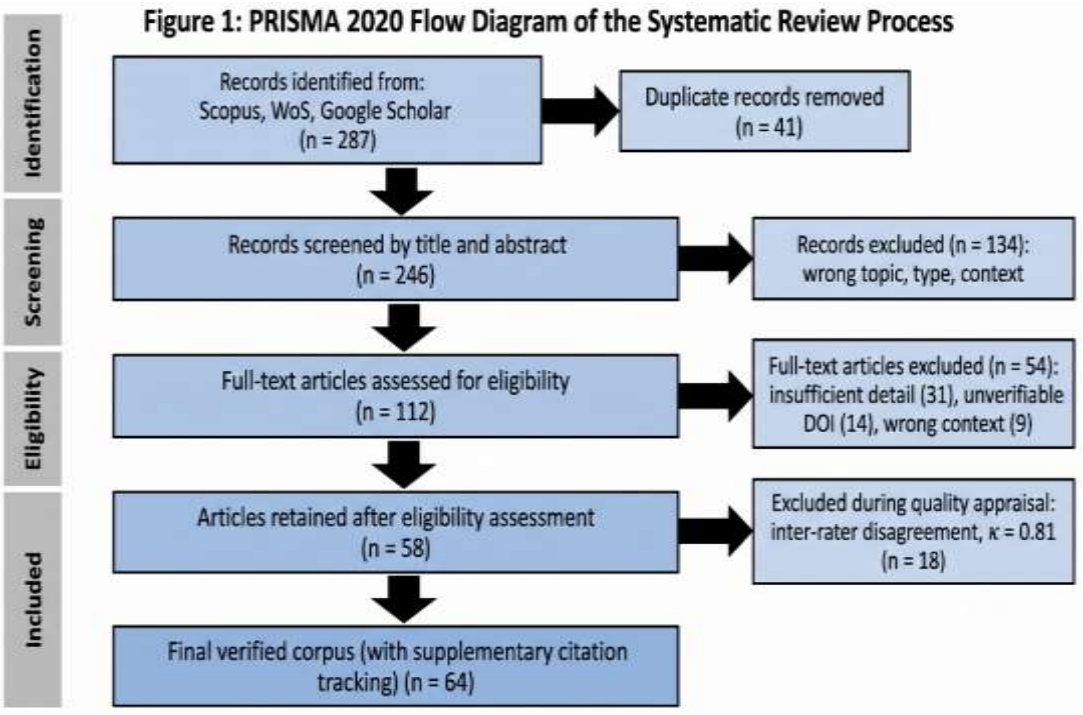

Figure 1: PRISMA 2020 Flow Diagram

Figure 1 presents the PRISMA 2020 flow. Of 287 initial records, 41 duplicates were removed (n = 246). Title/abstract screening excluded 134 (n = 112). Full-text eligibility assessment excluded 54 articles — 31 for insufficient detail, 14 for unverifiable DOI, 9 for wrong context — leaving 58. Quality appraisal (Cohen's κ = 0.81) excluded 18 unresolved disagreements, yielding an initial corpus of 40 articles. Four rounds of citation tracking added 24 verified articles, expanding the corpus to 64.

Data Analysis

Thematic Synthesis (Thomas & Harden, 2008) proceeded in three stages: line-by-line coding against the research questions; development of descriptive themes; and construction of analytical themes underpinning the Integrated Conceptual Framework in Section 4. In addition to thematic coding, contextual moderating variables were recorded wherever the article reported them: industry type, firm size, national culture (coded using Hofstede's, 1980, power-distance index), and certification standard (ISO 9001 vs. IATF 16949). These are summarised in Table 6 and inform the moderator discussion in Section 4.1.

RESULTS

Characteristics of the Reviewed Literature

Approximately 75% of articles used quantitative methods — predominantly PLS-SEM and multiple regression; 15% were qualitative or conceptual; 10% used mixed methods. India, Greece, Iran, and Iraq were the most frequently studied countries. No study set in Thai manufacturing was identified. Citation tracking extended geographic coverage to Finland, Indonesia, Bangladesh, Palestine, Pakistan, Malaysia, Jordan, Norway, and Iran's technology sector — a global spread that simultaneously confirms the ASEAN deficit identified in Section 2.5. Methodologically, PLS-SEM accounted for roughly 60% of the quantitative studies in the corpus. CB-SEM with maximum-likelihood estimation appeared in only 8% of articles, and regression-only or multi-level designs in fewer than 5%. The corpus therefore cannot support formal model-fit comparison across studies, and the mediation evidence reviewed in Section 4.2 should be read with that constraint in mind. Hair et al. (2019) and Ringle et al. (2020) have each argued that PLS-SEM and CB-SEM answer different estimation questions; the present corpus answers only the PLS-SEM version of those questions. Firm-size data were codeable in 86% of the corpus. Large organisations ($\geq$ 250 employees) accounted for 52% of studies; SMEs ($<$ 250 employees) for 34%; the remainder did not specify organisational scale. Sectoral coverage followed a similar pattern: automotive and heavy manufacturing attracted the largest share of research attention (41%), with general manufacturing next (29%).

Food processing (12%) and electronics (10%) were represented but thin, and the coverage gaps are largely co-extensive with the geographic ones — neither Thai nor broader ASEAN manufacturing appears in any cell. National-culture coding produced one finding that has not been theorised in the TMS literature. Studies situated in high power-distance, collectivist contexts — principally the Middle East, South Asia, and ASEAN — consistently reported stronger direct TMS–quality relationships. Research from lower power-distance settings in Europe and the Americas showed the mediated pathway through empowerment carrying more of the variance (Hofstede, 1980). Whether that asymmetry reflects something structural about how authority operates in hierarchical organisations, or is an artefact of measurement differences across studies, is a question the corpus cannot answer — but one the proposed framework is designed to make testable.

4.2 Synthesis of Enablers

Table 4: Evidence Matrix for Enabler Themes

Theme	Articles	Representative Sources
Top management commitment and involvement	41 (82%)	Talib et al. (2015); Aquilani et al. (2017); Dubey et al. (2018); Baidoun et al. (2018); Aletaiby et al. (2021); Alsmairat et al. (2023); Jafari et al. (2025); Wahab et al. (2025)
Quality decision empowerment	28 (56%)	Oliveira et al. (2019); Psomas & Kafetzopoulos (2014); Mosadeghrad (2015); Anil & Satish (2016)

Resource allocation and workforce development	26 (52%)	Patyal & Koilakuntla (2017); Kaynak (2003); Antunes et al. (2021); Hasim et al. (2022); Shafique et al. (2024)
Source: Authors' synthesis of 64 reviewed articles.		

Theme 1: Top Management Commitment and Involvement

Forty-one of the 64 articles (82%) identify TMC as the foremost TQM critical success factor. Talib et al. (2015) gave it the highest ranking in an Analytic Hierarchy Process; Aquilani et al. (2017) found it present in virtually every CSF study they reviewed. Dubey et al. (2018) traced TMC's influence on TQM diffusion in Indian automotive manufacturing through acceptance, routinisation, and assimilation — showing that executive effects accumulate over time rather than registering immediately. Baidoun et al. (2018) recorded the highest TMC scores on all TQM dimensions in Palestinian firms. Addis (2019) found ISO 9001-certified Ethiopian firms significantly outperformed non-certified counterparts (mean 3.62 vs. 2.63, $p < 0.01$), with the gap attributed largely to executive engagement. Ogben and Daud (2021) identified a significant discrepancy between how TMS providers perceived their own support and how recipients experienced it ($p = 0.01$) — a practical warning that assumed commitment and felt commitment are not the same thing. Jafari et al. (2025) and Wahab et al. (2025) extend the evidence to digital supply chains, where TMS below a critical threshold prevents even sophisticated analytical investments from translating into performance gains.

Theme 2: Quality Decision Empowerment

Quality decision empowerment appeared in 28 articles (56%). Oliveira et al. (2019) found top management leadership carried the highest CFA loading across TQM constructs in ISO 9001-certified Brazilian SMEs, yet found widespread cases of compliance without genuine decision authority. Psomas and Kafetzopoulos (2014) showed the ISO-certified vs. non-certified performance gap was better predicted by whether empowerment was substantive than by certification status alone. Mosadeghrad (2015) and Anil and Satish (2016) converge on a similar marker: the willingness to grant quality managers genuine authority to halt production for critical defects is what separates nominal TQM from quality practice that changes outcomes. Chatterjee et al.'s (2025) passive/active distinction reinforces this: genuine empowerment presupposes active executive engagement, not a clause in a quality manual.

Theme 3: Resource Allocation and Workforce Development

Resource allocation appeared in 26 articles (52%). Kaynak (2003) demonstrated TMS operates substantially through training and process-management resourcing. Antunes et al. (2021) linked TMS to SME innovation through R&D resource commitment. Hasim et al. (2022) found supplier management ($\beta = 0.706$) and continuous improvement ($\beta = 0.223$) as the strongest enablers in Malaysian composite aviation manufacturing, while training did not reach significance in that context — sector-specific results that caution against universalising any single resource lever. Shafique et al. (2024) add a digital dimension: TMS-aligned investment in big data analytics is a prerequisite for supply chain collaboration gains, not a standalone factor.

Synthesis of Barriers

Table 5: Evidence Matrix for Barrier Themes

Theme	**Articles**	**Representative Sources**
Production pressure and quality–production goal conflict	34 (62%)	Deming (1986); Valmohammadi & Roshanzamir (2015); Lamine & Lakhal (2018); Baidoun et al. (2018); Aletaiby et al. (2021)
"Ship-first, inspect-later" organisational culture	30 (55%)	Valmohammadi & Roshanzamir (2015); Park et al. (2017); Gotzamani (2022); Bakri et al. (2020); Kafetzopoulos et al. (2015)
Source: Authors' synthesis of 64 reviewed articles.		

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Theme 1: Production Pressure and Goal Conflict

The production–quality goal conflict appeared in 34 articles (62%). Deming (1986) called it a 'deadly disease' with only one cure: an unambiguous executive decision that quality takes precedence over volume. That framing appears, in varied language, across Tunisia (Lamine & Lakhal, 2018), Palestine (Baidoun et al., 2018), and Iraq (Aletaiby et al., 2021). Aletaiby et al. quantified the connection precisely: resistance to change — the observable proxy for goal-conflict barriers — correlated most strongly with the TMC sub-dimension of 'continuous quality commitment demonstration' ($\rho = -0.294$, $p < 0.01$), directly confirming the mirror-image structure in Table 1.

Theme 2: 'Ship-First, Inspect-Later' Culture

A culture that routinely subordinates quality to delivery speed appeared in 30 articles (55%). Valmohammadi and Roshanzamir (2015) found hierarchical culture obstructs TQM implementation and yields only to sustained leadership expressed in observable behaviour. Park et al. (2017) noted that such cultures often persist through digital tool adoption, suggesting the problem is not technological but managerial. Bakri et al.'s (2020) survey data from 63 Malaysian manufacturers make the scale concrete: 65% of respondents disagreed that senior management prioritised quality; 79% reported inadequate quality resource allocation; and 70% reported quality feedback was consistently ignored — all while organisations formally acknowledged TMS as important. The problem is not attitudinal but structural: what executives say and what quality managers experience are two different things.

Integrated Conceptual Framework

The Integrated Conceptual Framework (Figure 2) positions TMS as both a direct antecedent of QME and an upstream driver of two mediating mechanisms — organisational quality culture and quality manager empowerment. The enabling and barrier conditions from Tables 1, 4, and 5 function as contextual facilitators and inhibitors of both pathways.

The framework is not an empirically validated model. It is a synthesis-derived proposition in which each pathway draws on studies that tested the mediators individually (Valmohammadi & Roshanzamir, 2015; Oliveira et al., 2019; Navarro & Naranjo, 2025), cross-sector evidence for dual pathways (Alsmairat et al., 2023; Bashar et al., 2023; Rita & Islam, 2024), and boundary-condition evidence from digital and sustainability domains (Jafari et al., 2025; Wahab et al., 2025; Teh et al., 2024; Chatterjee et al., 2025; Singh, 2025). The passive/active TMS distinction (Chatterjee et al., 2025) introduces a moderating logic: stronger mediated effects are predicted under active TMS — participatory, resource-backed, visible — than under passive endorsement, which is testable using future SEM designs.

Figure 2: Integrated Conceptual Framework — TMS → [Quality Culture | Quality Manager Empowerment] → QME, with Enabling and Barrier Conditions as Contextual Moderators.

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DISCUSSION

Theoretical Implications

The synthesis speaks to each of the four theoretical foundations, sometimes confirming what they predict and sometimes specifying what they left open.

TQM Theory's central claim — that executive commitment is the antecedent for everything else — holds across 82% of the corpus, consistent with Kaynak (2003) and Aquilani et al. (2017). What the present synthesis contributes is a more precise account of why passive commitment fails: Chatterjee et al.'s (2025) distinction between passive and active TMS gives the OST prediction a concrete operational form. POS depends on observed executive behaviour; organisations where TMS amounts to endorsement without resource allocation or personal participation reliably underperform, regardless of how the commitment is documented.

The RBV reading of quality culture as a VRIN asset (Valmohammadi & Roshanzamir, 2015; Saleh et al., 2024; Al-Hakimi et al., 2025) is consistent with the mediation evidence: culture amplifies TMS effects rather than trailing them. Quality investment thus requires a different logic than compliance investment — culture must be built through consistent executive behaviour over time; it cannot be certified into existence.

Singh's (2025) institutional pressure moderation finding extends Leadership Theory in a direction relevant to Thai manufacturing specifically. If IATF 16949 audit requirements function as structural amplifiers of leadership effects, Thai automotive suppliers may experience stronger TMS–quality linkages than non-certified counterparts — a hypothesis the field cannot currently test for lack of Thai data, but which the framework is designed to make testable.

Across quality management (Abdulameer et al., 2021), technology adoption (Teh et al., 2024; Wahab et al., 2025), digital supply chains (Jafari et al., 2025; Shafique et al., 2024), and green HRM (Chatterjee et al., 2025), TMS turns up not as a simple antecedent but as a variable that enables or suppresses the effects of other investments. The mirror-image enabler–barrier structure reinforces this reading: executives who do not actively maintain an enabler do not produce a neutral outcome; they produce the corresponding barrier.

Key Findings and Research Question Responses

RQ1 (How does TMS influence QME?): The evidence does not support a uniform direct effect. Quality culture and quality manager empowerment carry a substantial share of the TMS–QME relationship. The direct path exists but is weaker and more dependent on whether TMS is active or passive. Jafari et al.'s (2025) threshold finding — TMS must exceed 5.4 for data analytics investments to convert into supply chain performance — gives this the clearest quantitative expression available.

RQ2 (Principal enablers and barriers?): Top management commitment and involvement (82%), quality decision empowerment (56%), and resource allocation (52%) are the three leading enablers. Production–quality goal conflict (62%) and a 'ship-first, inspect-later' culture (55%) are the two leading barriers. The structural pairing — each barrier the foreseeable result of its corresponding enabler being absent — is the substantive finding, not the ranked list itself.

RQ3 (What should an integrated framework specify?): Quality culture and quality manager empowerment as joint mediating mechanisms; institutional pressure, organisational culture type, and the active/passive TMS distinction as moderating variables (Singh, 2025; Saleh et al., 2024; Al-Hakimi et al., 2025; Chatterjee et al., 2025).

Practical Implications for Thai Manufacturing Organisations

The IATF 16949 context gives these findings an operational edge. Clause 5.1 requires demonstrable top management quality commitment, yet the international evidence — notably Bakri et al.'s (2020) Malaysian data — shows documentary compliance is common while genuine cultural change is not. Thai manufacturers face the same structural risk. An executive who endorses quality policy at a signing ceremony, then leaves resource

allocation and quality review attendance to subordinates, is exhibiting passive TMS: the evidence consistently predicts this will not activate quality culture or empower quality managers.

Singh's (2025) institutional pressure finding offers a different way of reading the same situation. Audit cycles under IATF 16949 generate external pressure that may amplify TMS effects beyond what internal motivation alone would produce. That is an asset most Thai manufacturers already hold; the question is whether audit preparation is treated as a compliance exercise or as an occasion for visible executive engagement with quality culture.

Practically, this points toward a small set of high-impact behaviours: executives attending Quality Review Meetings rather than delegating them; quality managers holding genuine authority to halt production for critical defects — not a policy provision but an operationally respected right; ring-fenced quality training budgets that survive production-pressure quarters; and Kaizen implemented structurally alongside TMC. The effect size comparison in Alsmairat et al. (2023) — Kaizen's direct effect on quality management practices ($\beta = 0.648$) exceeding that of TMC alone ($\beta = 0.333$) — suggests the two are more productive together than either is separately.

CONCLUSION AND RECOMMENDATIONS

Summary of Findings

Four conclusions emerge from this synthesis of 64 source-verified articles (2005–2025).

TMS is the most consequential single factor in TQM implementation across the reviewed literature — present in 82% of articles, across diverse sectors and national contexts. That finding is not new; what is new is the accumulated precision about what kind of TMS matters and through what pathways.

The mediated pathway is more reliable than the direct one. Quality culture and quality manager empowerment consistently carry a larger share of the TMS–QME relationship than the direct path. Organisations that treat TMS as a standalone lever — without cultivating the cultural and empowerment conditions it is supposed to activate — tend to find it insufficient.

The mirror-image governance structure changes how the problem should be framed. Organisations do not face a binary between active TMS and no TMS. Failing to maintain any enabler tends to produce the corresponding barrier. The managerial question is not whether to commit but how to make commitment visible, resource-backed, and sustained.

The active/passive TMS distinction, which Chatterjee et al. (2025) formalised, is the finding with the clearest practical application. It specifies what TMS must look like behaviourally — participatory, resource-backed, visible in quality processes — to activate the mediated pathways. Future SEM research has a precise moderating variable to operationalise.

Policy Recommendations

Top management should convert endorsement into participation. Quarterly Quality Review Meetings attended by senior executives, board-level quality policy announcements, and executive KPIs tied to quality outcomes represent the minimum conditions the evidence supports for active TMS.

Quality managers should hold genuine decision-making authority, including the operationally respected right to halt production for critical defects — not a provision recorded in a manual but a power exercised in practice.

A ring-fenced quality training and system development budget, equivalent to at least 2% of annual production costs, should be established and maintained through periods of production pressure rather than reduced when targets rise.

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Kaizen should be implemented structurally alongside TMC, not as a parallel programme. The comparative effect sizes in Alsmairat et al. (2023) suggest the two reinforce each other on quality management practices.

Quality culture should be cultivated through visible executive role-modelling, consistent messaging, and reward systems aligned with quality outcomes, recognising that culture type shapes which quality pathways are available to the organisation (Saleh et al., 2024).

Thai manufacturers under IATF 16949 should regard external audit cycles as institutional pressure that can amplify TMS effectiveness (Singh, 2025). Treating audit preparation as an occasion for genuine executive engagement — rather than a documentation exercise — activates the same mechanism Singh's evidence identifies.

Limitations and Directions for Future Research

Four limitations bound the scope of this review. First, the primary search was restricted to English-language, Scopus- or WoS-indexed articles; this revision added hand-searches of grey literature, conference proceedings, and Thai-language databases (Thai Journals Online; TCI Portal), but access to unpublished institutional reports and non-peer-reviewed industry documents remained constrained. Second, the manufacturing focus limits applicability to service or healthcare quality management settings where TMS operates under different institutional pressures. Third, approximately 60% of quantitative articles in the corpus used PLS-SEM; the review cannot triangulate findings against CB-SEM or multi-level estimates, and the mediation evidence reviewed in Section 4.2 carries that methodological caveat. Fourth, the Integrated Conceptual Framework is a synthesis-derived proposition, not an empirically validated model: each pathway is supported by studies that tested the mediators individually, not jointly in a single sample. Moderator data on industry type, firm size, and national culture were coded where reported and summarised in Table 6, but incomplete reporting across the corpus means those distributions should be read as indicative rather than exhaustive.

Several lines of future work follow directly from these limitations. The most immediate priority is empirical testing of the Integrated Conceptual Framework via SEM in Thai IATF 16949 and ISO 9001 contexts, with quality culture and quality manager empowerment specified as joint latent mediators and the active/passive TMS distinction operationalised as a moderating variable. On the methodological side, future primary studies should move beyond PLS-SEM and employ CB-SEM designs that permit formal model-fit comparison; the current corpus does not support that level of triangulation. Kaizen orientation and institutional certification pressure, both of which showed boundary-condition effects in the reviewed literature, should be included as additional moderating variables in those designs rather than treated as separate programmes. Geographically, extending database searches to Thai-language and ASEAN-language sources is the most direct route to closing the language bias documented in this review. Analytically, multi-group analysis incorporating industry type, firm size, and national culture as explicit moderating variables would test whether the TMS–QME relationship is portable across contexts or is bounded in ways the present corpus cannot resolve. For researchers working at a finer explanatory grain, hierarchical regression or multi-level modelling would allow the boundary conditions visible in Table 6 to be tested formally rather than inferred from cross-study comparison. Finally, qualitative case studies in Thai IATF 16949-certified firms remain the most direct route to understanding the causal sequence from executive behaviour to quality culture change — a mechanism that cross-sectional surveys leave opaque regardless of sample size (Yin, 2018).

Table 6: Summary of Contextual Moderator Coding from 64 Reviewed Articles

Category	Subcategory	n	%	Representative Sources / Notes
A. Industry Type	Automotive & Heavy Manufacturing	26	41%	Dubey et al. (2018); Sinha et al. (2016); Dedy et al. (2016); Hasim et al. (2022); Baidoun et al. (2018)
	General/Mixed Manufacturing	19	29%	Kaynak (2003); Aquilani et al. (2017); Valmohammadi & Roshanzamir (2015); Gotzamani (2022)

	Food Processing	8	12%	Psomas et al. (2014); Dhaouadi et al. (2023); Patyal & Koilakuntla (2017)
	Electronics & Hi-Tech	6	10%	Liu et al. (2022); Modgil & Sharma (2016); Park et al. (2017)
	Other / Unspecified Manufacturing	5	8%	Addis (2019); Keinan & Karugu (2018); Aletaiby et al. (2021)
B. Firm Size	Small & Medium Enterprises (< 250 employees)	22	34%	Oliveira et al. (2019); Antunes et al. (2021); Sinha et al. (2016); Anil & Satish (2016)
	Large Firms (≥ 250 employees)	33	52%	Dubey et al. (2018); Kaynak (2003); Baidoun et al. (2018); Alsmairat et al. (2023)
	Unspecified / Mixed	9	14%	Keinan & Karugu (2018); Alhdad et al. (2015); Rita & Islam (2024)
C. National Culture (Hofstede, 1980)	High Power-Distance / Collectivist (Middle East, South Asia, ASEAN)	31	48%	Aletaiby et al. (2021) — Iraq; Baidoun et al. (2018) — Palestine; Dubey et al. (2018) — India; Hasim et al. (2022) — Malaysia. Stronger direct TMS effects observed.
	Low Power-Distance / Individualist (Europe, Americas)	24	38%	Gotzamani (2022) — Greece; Oliveira et al. (2019) — Brazil; Valmohammadi & Roshanzamir (2015) — Iran. Stronger mediated TMS effects via empowerment.
	Mixed / Unspecified Cultural Context	9	14%	Modgil & Sharma (2016); Alsmairat et al. (2023) — Jordan; Keinan & Karugu (2018) — Kenya
D. Certification Standard	ISO 9001 Certified Firms	28	44%	Oliveira et al. (2019); Psomas & Kafetzopoulos (2014); Addis (2019); Balouei Jamkhaneh et al. (2022). Performance gap vs. non-certified documented.
	IATF 16949 / Automotive QMS Context	11	17%	Dubey et al. (2018); Sinha et al. (2016); Dedy et al. (2016); Hasim et al. (2022). Institutional pressure amplifies TMS effects (Singh, 2025).
	Non-Certified or Certification Unspecified	25	39%	Kaynak (2003); Valmohammadi & Roshanzamir (2015); Gotzamani (2022). Thai IATF 16949 context: 0 studies identified (key gap).

Note. n = number of articles in which the moderator variable was codeable. Percentages sum to 100% within each category. Some articles coded across multiple categories. Thai IATF 16949 context = 0 studies; identified as the primary empirical gap for future research.
Source: Authors' coding from 64 reviewed articles. Hofstede (1980) power-distance index applied for national culture classification.

New Knowledge

This review generates three bodies of knowledge not present in the existing literature. The first concerns governance structure: by synthesising enablers and barriers within a single analytical frame rather than treating them as separate research streams, the study demonstrates that the six principal barriers are not independent organisational problems but the predictable structural counterparts of six enablers — each barrier emerging when its corresponding enabler is absent. This mirror-image logic reframes TMS from a binary presence-or-absence variable into a continuous governance responsibility.

The second concerns mediation specificity: prior reviews established that TMS matters; this synthesis identifies the pathways through which it operates, confirming that quality culture and quality manager empowerment function as joint mediating mechanisms and that these mediated pathways — not the direct TMS→QME path — carry the greater share of the relationship across contexts. The third concerns the active/passive TMS distinction, formalised by Chatterjee et al. (2025) and confirmed across quality management, technology

adoption, digital supply chains, and green HRM: passive TMS (formal endorsement without resource allocation or personal participation) consistently fails to activate either mediating pathway, meaning that the form of executive commitment — not merely its stated presence — determines whether quality culture is cultivated and whether quality managers are genuinely empowered. Together, these three contributions converge on a single testable proposition: the Integrated Conceptual Framework specifying active TMS → [quality culture | quality manager empowerment] → QME, with the active/passive distinction as a moderating variable and institutional certification pressure as a structural amplifier — a framework whose empirical absence from the Thai IATF 16949 manufacturing context constitutes the field's most immediate research gap.

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APPENDIX

List of Reviewed Articles Sorted by Year (n = 64)

No.	Author(s)	Year	Title	Journal / DOI
1	Gupta, A., McDaniel, J. C., & Herath, S. K.	2005	Quality management in service firms: Sustaining structures of total quality service	Managing Service Quality, 15(4), 389–402. https://doi.org/10.1108/09604520510606695
2	Gomes, C. F., Yasin, M. M., & Lisboa, J. V.	2006	Performance measurement practices in manufacturing firms: An empirical investigation	Journal of Manufacturing Technology Management, 17(2), 144–167. https://doi.org/10.1108/17410380610642742
3	Goetsch, D. L., & Davis, S. B.	2014	Quality management for organizational excellence: Introduction to total quality (7th ed.)	Pearson Education.
4	Psomas, E., & Kafetzopoulos, D.	2014	Performance measures of ISO 9001 certified and non-certified manufacturing companies	Benchmarking: An International Journal, 21(5), 756–774. https://doi.org/10.1108/BIJ-07-2012-0054
5	Psomas, E., Vouzas, F., & Kafetzopoulos, D.	2014	Quality management benefits through the 'soft' and 'hard' aspect of TQM in food companies	The TQM Journal, 26(5), 431–444. https://doi.org/10.1108/TQM-02-2013-0016
6	Alhdad, A., et al.	2015	The effect of TQM factors on organizational performance: Yemeni manufacturing sector	International Journal of Entrepreneurship, 19(1), 1–20.
7	Garza-Reyes, J. A., Rocha-Lona, L., & Kumar, V.	2015	A conceptual framework for the implementation of quality management systems	Total Quality Management & Business Excellence, 26(11–12), 1298–1310. https://doi.org/10.1080/14783363.2014.939083
8	Kafetzopoulos, D. P., Gotzamani, K.	2015	Relationship between quality management,	Journal of Manufacturing Technology Management, 26(8), 1177–1200. https://doi.org/10.1108/JMTM-02-2015-0007

	D., & Gkana, V. E.		innovation and competitiveness: Greek companies	
9	Mosadeghrad, A. M.	2015	Developing and validating a total quality management model for healthcare organisations	The TQM Journal, 27(5), 544–564. https://doi.org/10.1108/TQM-04-2013-0051
10	Talib, F., Rahman, Z., & Qureshi, M. N.	2015	Identification and prioritization of barriers to TQM implementation in service industry	The TQM Journal, 27(5), 591–615. https://doi.org/10.1108/TQM-11-2012-0097
11	Valmohammadi, C., & Roshanzamir, S.	2015	Relations among organizational culture, TQM and performance	International Journal of Production Economics, 164, 167–178. https://doi.org/10.1016/j.ijpe.2014.12.028
12	Al-Dhaafri, H. S., et al.	2016	The mediating role of TQM between entrepreneurial orientation and organizational performance	The TQM Journal, 28(1), 89–111. https://doi.org/10.1108/TQM-03-2014-0033
13	Ali, M., & Park, K.	2016	The mediating role of innovative culture between absorptive capacity and innovation	Journal of Business Research, 69(5), 1669–1675. https://doi.org/10.1016/j.jbusres.2015.10.036
14	Anil, A. P., & Satish, K. P.	2016	Investigating the relationship between TQM practices and firm performance: Indian organizations	Oregon Science and Technology for Development, 1(1), 1–8.
15	Dedy, A., et al.	2016	Identifying critical success factors for TQM and employee performance in Malaysian automotive industry	IOP Conference Series: Materials Science and Engineering, 131(1), Article 012016. https://doi.org/10.1088/1757-899X/131/1/012016
16	Modgil, S., & Sharma, S.	2016	TQM, supply chain management and firm performance: An empirical study	International Journal of Productivity and Performance Management, 65(8), 1034–1056. https://doi.org/10.1108/IJPPM-09-2014-0161

17	Parvadavardini, S., Vivek, N., & Devadasan, S. R.	2016	Impact of quality management practices on quality and financial performance: Indian companies	Total Quality Management & Business Excellence, 27(5–6), 507–530. https://doi.org/10.1080/14783363.2014.929074
18	Sinha, N., Garg, A. K., & Dhall, N.	2016	Effect of TQM principles on performance of Indian SMEs: The case of automotive supply chain	The TQM Journal, 28(3), 338–359. https://doi.org/10.1108/TQM-10-2014-0083
19	Al-Shehri, M., et al.	2017	The impact of organizational culture on employee engagement in Saudi Banks	Journal of Human Resources Management Research, 2017, Article 761672. https://doi.org/10.5171/2017.761672
20	Antony, J., Snee, R., & Hoerl, R.	2017	Lean Six Sigma: Yesterday, today and tomorrow	International Journal of Quality & Reliability Management, 34(7), 1073–1093. https://doi.org/10.1108/IJQRM-03-2016-0035
21	Aquilani, B., et al.	2017	A systematic literature review on TQM critical success factors	The TQM Journal, 29(1), 184–213. https://doi.org/10.1108/TQM-01-2016-0003
22	Mehralian, G., et al.	2017	TQM and organizational performance using the balanced scorecard approach	International Journal of Productivity and Performance Management, 66(1), 111–125. https://doi.org/10.1108/IJPPM-08-2015-0114
23	Park, S., et al.	2017	Building a new culture for quality management in the era of the fourth industrial revolution	Total Quality Management & Business Excellence, 28(9–10), 934–945. https://doi.org/10.1080/14783363.2017.1310703
24	Patyal, V. S., & Koilakuntla, M.	2017	The impact of quality management practices on performance: An empirical study	Benchmarking: An International Journal, 24(2), 511–535. https://doi.org/10.1108/BIJ-11-2014-0109
25	Baidoun, S. D., Salem, M. Z., & Omran, O. A.	2018	Assessment of TQM implementation level in Palestinian manufacturing firms	The TQM Journal, 30(2), 186–209. https://doi.org/10.1108/TQM-09-2016-0076

26	Dubey, R., et al.	2018	Examining top management commitment to TQM diffusion using institutional and upper echelon theories	International Journal of Production Research, 56(8), 2988–3006. https://doi.org/10.1080/00207543.2017.1394590
27	Keinan, A. S., & Karugu, J.	2018	TQM practices and performance of manufacturing firms in Kenya	International Academic Journal of Human Resource and Business Administration, 3(1), 81–99.
28	Kumar, P., Maiti, J., & Gunasekaran, A.	2018	Impact of quality management systems on firm performance	International Journal of Quality & Reliability Management, 35(5), 1034–1059. https://doi.org/10.1108/IJQRM-02-2017-0030
29	Lamine, K., & Lakhal, L.	2018	Impact of TQM/Six Sigma practices on company's performance: Tunisian context	International Journal of Quality & Reliability Management, 35(9), 1881–1906. https://doi.org/10.1108/IJQRM-05-2017-0097
30	Addis, S.	2019	An exploration of quality management practices in the manufacturing industry of Ethiopia	The TQM Journal, 32(1), 127–142. https://doi.org/10.1108/TQM-01-2019-0031
31	Oliveira, G. S., et al.	2019	Investigation of TQM implementation: Empirical study in Brazilian ISO 9001-registered SMEs	Total Quality Management & Business Excellence, 30(5–6), 641–659. https://doi.org/10.1080/14783363.2017.1308102
32	Sader, S., Husti, I., & Daróczi, M.	2019	A review of quality 4.0: Definitions, features, technologies, applications, and challenges	The TQM Journal, 33(6), 1269–1297. https://doi.org/10.1108/TQM-10-2019-0249
33	Abbas, J.	2020	Impact of TQM on corporate green performance through the mediating role of CSR	Journal of Cleaner Production, 242, Article 118458. https://doi.org/10.1016/j.jclepro.2019.118458
34	Bakri, A., et al.	2020	Analysis of top management support and its impact towards maintenance	Test Engineering & Management, 83, 12794–12805.

			management in manufacturing plant	
35	Sony, M., Antony, J., & Douglas, J. A.	2020	Essential ingredients for the implementation of Quality 4.0	The TQM Journal, 32(4), 779–793. https://doi.org/10.1108/TQM-12-2019-0275
36	Abdi, M., & Singh, A. P.	2021	Effect of TQM practices on nonfinancial performance: Ethiopian automotive engineering industry	The TQM Journal, 34(5), 1117–1137. https://doi.org/10.1108/TQM-06-2020-0124
37	Abdulameer, S. A. A., et al.	2021	The effect of TQM on operational performance including the mediating effect of supply chain management	Journal of Natural Remedies, 21(10), 132–143.
38	Aletaiby, A. A., et al.	2021	Influence of top management commitment towards effective TQM implementation in Iraqi oil companies	Journal of Petroleum Exploration and Production Technology, 11, 2039–2053. https://doi.org/10.1007/s13202-021-01131-3
39	AlShehail, O., Khan, M., & Ajmal, M.	2021	Total quality management and sustainability in the public sector: The UAE case	Benchmarking: An International Journal, 28(2), 466–491. https://doi.org/10.1108/BIJ-10-2019-0439
40	Antunes, M. G., et al.	2021	Effects of TQM dimensions on innovation: Evidence from SMEs	Sustainability, 13(18), Article 10095. https://doi.org/10.3390/su13181009
41	Ogben, F., & Daud, N. M.	2021	Top management commitment: A strategy for enhancing operation of quality assurance system	Empirical Economics Letters, 20(Special Issue 2), 61–74.
42	Balouei Jamkhaneh, H., et al.	2022	Organizational quality climate and TQM implementation	The TQM Journal, 34(3), 538–562. https://doi.org/10.1108/TQM-01-2021-0012

			in manufacturing firms	
43	Gotzamani, K.	2022	How quality management systems lead to competitive advantage: Greek manufacturing sector	The TQM Journal, 35(5), 1258–1280. https://doi.org/10.1108/TQM-04-2022-0117
44	Hasim, N. A. H., et al.	2022	Modelling TQM in the Malaysian composite manufacturing industry	Malaysian Journal on Composites Science and Manufacturing, 7(1), 11–22. https://doi.org/10.37934/mjcsm.7.1.1122
45	Liu, J., Zhuang, D., & Shen, W.	2022	The impact of quality management practices on manufacturing performance: System theory	Soft Computing, 26, 4091–4107. https://doi.org/10.1007/s00500-021-06606-3
46	Nguyen, Q. L. H. T. T., et al.	2022	The effects of TQM on firm performance: Evidence from Vietnam	Sustainability, 14(21), Article 14508. https://doi.org/10.3390/su142114508
47	Alsmairat, M. A. K., et al.	2023	Quality management practices induced by TMC and Kaizen: Jordanian public hospitals post-COVID-19	International Journal of Quality & Reliability Management. https://doi.org/10.1108/IJQRM-11-2022-0316
48	Bashar, A., et al.	2023	The role of TMC, employee involvement, and training on employee performance: Bangladeshi banking	Quality Management Journal. https://doi.org/10.1080/10686967.2023.2285041
49	Davidson-Schmich, L. K., et al.	2023	Crisis, gender role congruency, and perceptions of executive leadership	Politics & Gender, 19(3), 900–907. https://doi.org/10.1017/S1743923X22000411
50	Dhaouadi, M., et al.	2023	TQM, organizational learning and innovation: Tunisian manufacturing firms	International Journal of Quality & Reliability Management, 40(3), 657–676. https://doi.org/10.1108/IJQRM-10-2021-0310

51	Abdulameer, S. A. A., et al.	2024	The effect of top management commitment on operational performance: Mediating role of green production	South Asian Journal of Social Sciences & Humanities, 5(4), 136–150. https://doi.org/10.48165/sajssh.2024.5407
52	Al-Hakimi, M. A., et al.	2024	From quality to green innovation: The role of green organizational culture in TQM	International Journal of Innovation Science. https://doi.org/10.1108/IJIS-02-2025-0064
53	Lepistö, K., Saunila, M., & Ukko, J.	2024	Enhancing customer satisfaction, personnel satisfaction and company reputation with TQM	Benchmarking: An International Journal, 31(1), 75–97. https://doi.org/10.1108/BIJ-12-2021-0749
54	Maknun, A. I. L., et al.	2024	Implementasi total quality management dalam meningkatkan daya saing perusahaan	Syntax Admiration, 5(8), 3209–3218.
55	Nazrul, N.	2024	Exploring gender disparities in executive leadership positions in Norway	Journal of Economics, Innovative Management, and Entrepreneurship, 2(2), 26–37. https://doi.org/10.59652/jeime.v2i2.234
56	Rita, T., & Islam, M. S.	2024	The influence of TMC on TQM implementation: Private banks in Bangladesh	Jagannath University Journal of Business Studies, 12(2), 113–134.
57	Saleh, Y., et al.	2024	A framework for enhancing quality performance through quality management practices and organisational culture	Decision Making: Applications in Management and Engineering, 7(2), 658–677. https://doi.org/10.31181/dmame7220241364
58	Shafique, M. N., Yeo, S. F., & Tan, C. L.	2024	Roles of TMS and compatibility in big data predictive analytics for supply chain	Technological Forecasting and Social Change, 199, Article 123074. https://doi.org/10.1016/j.techfore.2023.123074

59	Teh, R., et al.	2024	The mediation role of TMS in the adoption of cloud computing in Malaysian SMEs	International Journal of Management and Enterprise Development, 23(1), 73–96. https://doi.org/10.1504/IJMED.2024.10063221
60	Zaki, C., et al.	2024	Total quality management (TQM): Filosofi, evolusi, dan pendekatan strategis	Inflasi: Jurnal Ekonomi, Manajemen dan Perbankan, 1(1), 10–20.
61	Chatterjee, S., Chaudhuri, R., & Vrontis, D.	2025	Creating organizational value through green HR practices: Moderating role of top management support	Business Ethics, the Environment & Responsibility, 34, 17–31. https://doi.org/10.1111/beer.12617
62	Jafari, M., Akhavan, P., & Akbari, A.	2025	Enhancing supply chain agility through big data analytics: Role of digitalization and TMS	International Journal of Productivity and Performance Management. https://doi.org/10.1108/IJPPM-06-2025-0557
63	Navarro, G., & Naranjo, G.	2025	Quality culture, quality management, and organizational performance: A structural model for manufacturing	Sustainability, 17(9), Article 3934. https://doi.org/10.3390/su17093934
64	Singh, R. K.	2025	Impact of leadership, TQM and supply chain capabilities on sustainable supply chain performance	The TQM Journal, 37, 953–976. https://doi.org/10.1108/TQM-05-2024-0175
65	Wahab, S. N., Hamzah, M. I., & Sohal, A.	2025	Leveraging TMS for blockchain-driven innovations in logistics and supply chain	Asia-Pacific Journal of Business Administration. https://doi.org/10.1108/APJBA-09-2024-0520

Note: Articles added through supplementary citation tracking (rounds 1–4) are indicated by year 2021 onward. Articles #29, #34, and #37 (original numbering) appear in specialist journals not indexed in Scopus or WoS; retained as verifiable exceptions covering under-represented geographic contexts.