

Implementation of Lean Production and Target Costing: A Systematic Literature Review of Cost Reduction Strategies

Sindy Elisia Husna¹, Zakia Ramadhani^{2*}, Yusnaini³

^{1,2,3}Accounting, Faculty of Economics, Universitas Sriwijaya, Palembang, Indonesia

Email: ¹sindyelisiahusna@gmail.com, ^{2*}zkiaramadhani09@gmail.com, ³yusnaini@fe.unsri.ac.id

Abstract

Escalating global competition has driven manufacturing companies to seek more structured and measurable approaches to cost management. This study synthesizes contemporary literature examining the integrated application of lean production and target costing as complementary cost reduction frameworks. Employing a Systematic Literature Review (SLR) approach guided by the PRISMA protocol, data were drawn from Scopus, Web of Science, Google Scholar, and ScienceDirect, covering publications from 2021 to 2025. Of 309 articles initially retrieved, 10 studies satisfied all inclusion criteria and underwent thematic synthesis analysis. The findings demonstrate that combining lean production with target costing mechanisms yields measurable reductions in operational expenditure across multiple industry sectors, including iron and steel manufacturing, food processing, and supply chain management. Key determinants of successful implementation encompass adaptive organizational culture, alignment of cost accounting systems with lean principles, active employee participation, and robust information technology infrastructure. An emerging trajectory in the literature highlights the incorporation of digital innovations — particularly the Internet of Things (IoT) and machine learning algorithms — as accelerators for maximizing the joint effectiveness of both methodologies. Three empirically testable hypotheses are advanced, accompanied by an integrated conceptual framework designed to guide both scholarly inquiry and industrial practice.

Keywords: Lean Production, Target Costing, Cost Reduction, Systematic Literature Review, Operational Efficiency.

1. INTRODUCTION

Intensifying global competitive dynamics have compelled manufacturing enterprises to transition toward more disciplined and cost-conscious operational paradigms. The philosophy of *Lean Production* has emerged as one of the most extensively embraced management doctrines in contemporary industry, fundamentally oriented toward the systematic elimination of waste (*Waste Elimination*) across every node of the production *value chain*. The application of *lean* principles transcends mere operational efficiency gains; it exerts profound and far-reaching consequences on the holistic cost architecture of organizations. Empirical evidence consistently affirms that the convergence of production systems with cost management frameworks constitutes a foundational pillar of sustained competitive positioning in the era of Industry 4.0 [1], [2].

Critically, however, conventional cost accounting systems — particularly *Standard Costing* — have demonstrated a fundamental incompatibility with *lean* operating environments. *Standard Costing* was architecturally designed for mass-production settings where variance analysis and absorption of fixed overhead constitute the primary cost control mechanisms. In *lean* contexts, where inventory is deliberately minimized and *batch* sizes are reduced, *Standard Costing* frequently generates misleading performance signals, penalizing efficiency improvements and incentivizing overproduction. This structural misalignment between traditional cost reporting and *lean* operational logic represents a critical but underexplored dimension of the *research gap* in existing literature [1], [2].

Concurrently, *Target Costing* has established itself as a distinctively market-responsive cost management methodology (*Market-driven cost management*), uniquely capable of reconciling organizational profitability objectives with prevailing customer value expectations. Unlike the conventional *cost-plus pricing* paradigm — wherein selling prices are derived by accumulating incurred costs and appending a profit margin — *Target Costing* inverts this logic entirely. It commences from the market-acceptable selling price and works backward to establish the permissible cost ceiling, subsequently engineering the product and production process to conform to this predetermined financial constraint. This *upstream* orientation fosters intensive *cross-functional* collaboration during the product design phase, enabling proactive and structurally embedded cost reduction decisions well before manufacturing operations commence [3], [4].

The convergence of *Lean Production* and *Target Costing* generates powerful and mutually reinforcing synergies within comprehensive *Cost Reduction Strategies*. While *Lean Production* furnishes the operational toolkit for excising *non-value-added activities* from production workflows, *Target Costing* provides the overarching strategic architecture to ensure that residual costs remain market-competitive. Crucially, this integrated framework repositions the management accountant from a passive "cost recorder" to an active "strategic partner" — one who is deeply embedded in product design decisions and waste elimination initiatives. The synthesis of these two approaches empowers organizations to concurrently elevate quality standards, compress *Cycle Time*, and achieve durable reductions in production costs [5], [6].

Notwithstanding the independent proliferation of scholarship on each of these constructs, rigorously structured investigations that simultaneously examine the integrated deployment of *Lean Production* and *Target Costing* as a unified cost reduction strategy remain conspicuously scarce. This *literature gap* carries considerable practical significance, given the accelerating industrial demand for coherent implementation guidance — a demand rendered especially urgent in the context of *post-pandemic recovery*, wherein cost efficiency has ascended to primacy among organizational survival imperatives [7], [8].

The strategic pertinence of this integrated cost management paradigm receives further empirical corroboration from diverse industrial contexts. Bermana et al. demonstrate that the concurrent implementation of *Supply Chain Management* (SCM) and *Total Quality Management* (TQM) can compress operational expenditures by 20–30% over extended timeframes through supply chain rationalization and the systematic elimination of *non-value-added activities* — an outcome conceptually consonant with foundational *lean* principles [9]. Complementarily, Ramadhityo et al. establish that cost efficiency exerts consequences that transcend operational performance alone, carrying direct implications for corporate valuation (*Firm Value*); their findings reveal that internally optimized liquidity management wields greater influence over investor perception than governance mechanisms or capital structure policies, particularly within Indonesia's food and beverage manufacturing sector [10].

Against this backdrop, a rigorously executed systematic literature review emerges as the methodologically appropriate instrument for charting the evolution of scholarly knowledge, delineating emergent research trajectories, and crystallizing propositions that can anchor both future empirical investigations and practitioner implementation strategies. This study aspires to bridge the identified gap by synthesizing the most current empirical and conceptual findings pertaining to *lean production* and *target costing* within a unified, structurally coherent analytical architecture.

The central problematic animating this inquiry is the absence of a comprehensive literature synthesis addressing the concurrent implementation of *lean production* and *target costing* as an integrated cost reduction strategy. Accordingly, this study is organized around three focal research questions: (1) How has the scholarly literature on *lean production* and *target costing* implementation evolved during the period from 2021 to the present? (2) What integration patterns characterize the deployment of these two approaches as cost reduction strategies across diverse industrial sectors? (3) Which organizational and contextual factors govern the success of the simultaneous implementation of *lean production* and *target costing*?

This study is designed to conduct a systematic literature review with the explicit objectives of identifying, evaluating, and synthesizing the most current research findings concerning *lean production* and *target costing* as cost reduction strategies. More specifically, it seeks to delineate emergent research trends and configurational patterns, to analyze the critical success determinants of both approaches, and to construct an integrated conceptual framework capable

of serving as an authoritative reference for researchers and practitioners engaged in the design and execution of sustainable cost efficiency strategies.

The anticipated contributions of this study are simultaneously theoretical and practical in character. On the theoretical plane, this research advances the disciplinary frontiers of cost management and operations science by furnishing a structured synthesis of knowledge regarding the *lean production–target costing* nexus. On the practical plane, the findings offer actionable guidance for operational managers, management accountants, and Chief Financial Officers (CFOs) in architecting effective cost reduction systems. Furthermore, this study provides a substantive reference for industrial policymakers engaged in more efficient, customer value-oriented resource allocation decisions.

2. RESEARCH METHODS

2.1 Research Types and Design

This study uses the *Systematic Literature Review* (SLR), which is a research method designed to identify, evaluate, and synthesize all relevant empirical evidence in a systematic and transparent manner. This approach was chosen because it is able to produce more objective conclusions than conventional literature reviews, because each stage of the process is carried out based on a previously established protocol. The framework used in this study refers to the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA), which is an internationally recognized reporting standard in systematic review-based research [11].

2.2 Data Sources and Search Strategies

Data collection was carried out through a literature search on several leading academic databases, including *Scopus*, *Web of Science*, *Google Scholar*, and *ScienceDirect*. The selection of this database is based on the wide scope of publications as well as its reputation for ensuring the quality of indexed articles. The search strategy uses a combination of keywords that have been systematically determined, including "*Lean Production*", "*Target Costing*", "*Cost reduction*", "*Waste Elimination*", and "*Lean Manufacturing*", with Boolean operators *AND* and *OR* to broaden or narrow the scope of search results. Searches are limited to articles published between 2021 and 2025 to ensure the relevance and up-to-date of the findings analyzed [12].

2.3 Inclusion and Exclusion Criteria

The determination of articles that are worth analyzing is carried out based on the inclusion and exclusion criteria that have been explicitly set. Inclusion criteria include: articles published in journals *Peer-reviewed* in English or Indonesian, discuss the implementation of *Lean Production* and/or *Target Costing* in the context of cost reduction, as well as having a clear and verifiable research methodology. Meanwhile, the exclusion criteria include articles in the form of editorials, *Conference Proceedings* that are not indexed, and publications that do not go through the process *Peer-review*. This selection process is carried out in stages starting from the screening of titles, abstracts, to complete text (*Full-text screening*), to ensure that only high-quality articles go into the final synthesis [13].

2.4 Selection and Quality Assessment Procedures

Article selection is carried out through several stages that follow the PRISMA flowchart. In the first stage, all search results are identified and duplicates are eliminated automatically or manually. The second stage involves filtering by title and abstract to assess the appropriateness of the topic. The third stage is the evaluation of the full text to verify the relevance and quality of the methodology. Article quality assessment is carried out using *Mixed Methods Appraisal Tool* (MMAT), which allows the evaluation of quantitative, qualitative, and *mixed methods* within a consistent assessment framework [14].

2.5 Data Analysis and Synthesis

The data analysis process in this study uses *the thematic synthesis* technique, which is an approach that aims to identify the main themes that appear repeatedly in all the literature analyzed. Each article that meets the criteria is analyzed in depth to extract information regarding the context of the implementation, key findings, and practical implications. The extraction results are then coded and grouped into thematic categories relevant to the research objectives. This approach allows researchers to not simply summarize the literature, but to produce new interpretations that are more comprehensive and of high scientific contribution value.

3. RESULTS AND DISCUSSION

3.1 Results of Literature Selection (PRISMA)

The literature selection process in this study was carried out systematically following the flow of the PRISMA 2020 diagram. Of the total 309 journals that were successfully identified through the search of various academic databases, as many as 102 duplicate records were eliminated at the initial stage, leaving 207 journals that were then filtered based on the suitability of titles and abstracts. In the advanced screening stage, as many as 95 journals were expelled because they did not meet the topic criteria, so 112 journals were forwarded to search for the full text. After a feasibility evaluation of 56 journals, as many as 46 journals were excluded based on two main reasons, namely 24 journals did not meet the methodological criteria and 22 journals were not relevant to the focus of the research. In the end, as many as 10 journals were designated as the main sources that met all inclusion criteria and were used in the synthesis process of this research.

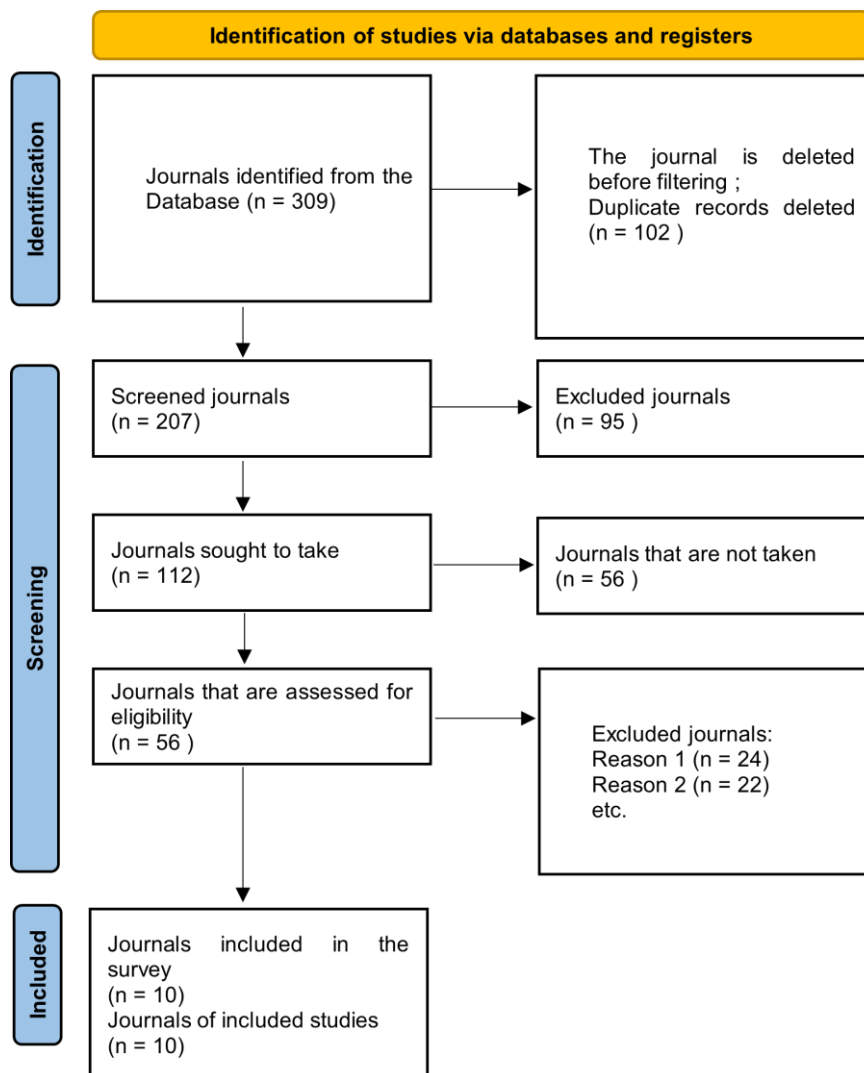


Figure 1. PRISMA Flow Diagram *Lean Production Literature Selection Process and Target Costing Implementation: A Systematic Literature Review of Cost Reduction Strategies*

3.2 Characteristics of the Analyzed Study

The ten studies incorporated in this review exhibit substantial diversity across methodological orientations, sectoral contexts, and geographic distributions. Methodologically, the corpus encompasses survey-based quantitative designs employing *Structural Equation Modeling* (SEM), in-depth qualitative *case studies*, and hybrid *mixed methods* frameworks. Geographically, the studies traverse organizations operating across European markets, Southeast Asia, the Middle East, and emerging economies — a distribution that underscores the universal salience of cost reduction imperatives through *lean* and *target costing* applications [15], [16].

3.2.1 *Lean Accounting Tools* as Cost Decision-Support Instruments

A dimension that warrants dedicated analytical attention — and that has gained substantial traction in recent literature — is the deployment of *Lean Accounting Tools* as structured instruments for managerial decision-making within *lean* operating environments. Unlike conventional accounting mechanisms, which were architecturally designed for *batch-and-queue* production systems, *Lean Accounting Tools* are purposefully calibrated to generate cost information that is both timely and operationally meaningful within continuous-flow manufacturing contexts.

Among the most prominent of these instruments are *Value Stream Costing* (VSC) and *Standard Variable Costing* (SVC). *Value Stream Costing* disaggregates cost reporting along *value stream* lines rather than departmental or product silos, thereby providing managers with a holistic and waste-sensitive view of cost flows. Evidence from Alshanti & Al-refae [16] involving 279 managers across 18 Jordanian industrial firms confirms that *Lean Accounting Tools* — encompassing VSC, *target costing* (TC), and *Kaizen Costing* (KCO) — exert statistically significant and positive effects on competitive advantage, with *target costing* registering particularly high levels of organizational adoption and utilization.

Complementarily, Kristensen [17] furnishes empirical substantiation — through a second-order *Structural Equation Model* combined with qualitative investigation — that *Standard Variable Costing* configured in an *enabling* modality demonstrably enhances organizational performance and attenuates dysfunctional behavioral tendencies within *lean* contexts. The *enabling* design empowers employees to exercise creative autonomy in deploying cost data for problem-solving, in direct contrast to *coercive* accounting architectures that suppress initiative and reinforce hierarchical rigidity.

3.2.2 *Target Costing as Upstream Cost Control and Lean Production as Downstream Cost Control*

A conceptually clarifying framework that emerges from the synthesized literature is the complementary positioning of *Target Costing* and *Lean Production* along the longitudinal cost management spectrum. *Target Costing* functions as a preemptive *upstream cost control* mechanism — embedded at the product conceptualization and design stage — wherein allowable cost ceilings are determined before a single unit enters production. This proactive orientation ensures that cost reduction is structurally engineered into the product architecture from inception, rather than being reactively pursued post-manufacture.

Lean Production, by contrast, operates as a *downstream cost control* instrument — intervening at the execution phase of the production process to eliminate *waste*, optimize material flows, reduce *cycle times*, and maximize resource utilization. The empirical evidence from Zaky et al. [18] in iron and steel manufacturing illustrates this *downstream* function vividly: *lean* implementation via the DMAIC methodology yielded throughput improvements of 70.6%, inventory turnover gains of 54%, delay reductions of 78%, and labor hour compression of 52.4% per production unit.

The strategic power of integrating these two complementary mechanisms resides precisely in their temporal and functional complementarity. *Target Costing* establishes the cost destination from *upstream*; *Lean Production* navigates the operational pathway to reach that destination from *downstream*. Together, they constitute a full-spectrum, market-anchored cost management system that addresses cost imperatives from product conception through production execution — a configuration that neither approach can achieve in isolation.

Table 1. Journal Synthesis of *Lean Production and Target Costing Implementation: A Systematic Literature Review of Cost Reduction Strategies*

Yes	Author	Title	Method	Sample	Researchers' Findings	Relevance to the Topic
1	Hardcopf et al. (2021) [15]	Lean production and operational performance: The influence of organizational culture	Quantitative – survey & statistical analysis	Global manufacturing companies	Lean is able to maximize cost reduction across all organizational cultures, but it requires a supportive culture to improve quality, delivery, and	Relevant: that shows lean production has an effect on cost reduction as the main strategy of operational efficiency

License: Creative Commons Attribution 4.0 International (CC BY 4.0)

					flexibility. Developmental culture is most supportive of lean.	
2	Kristensen (2021) [17]	Enabling use of standard variable costing in lean production	Quantitative – Second-order Structural Equation Model (SEM) + qualitative	Two case companies	The use of standard variable costing (SVC) which is enabling to improve performance and reduce behavior that is not in line with objectives in the context of lean production.	Relevant: discussing the integration of costing systems with lean production as a cost control strategy
3	Zaky et al. (2023)[18]	Lean manufacturing implementation in iron and steel industries: effect of wastes management on the production costs	Case study – Six Sigma (DMAIC) + qualitative & quantitative	Three iron and steel companies in developing countries	Lean implementation resulted in increased throughput (70.6%), inventory turnover (54%), and decreased delays (78%) and man-hours (52.4%). Production costs have been significantly reduced.	Highly relevant: proving lean manufacturing directly reduces production costs through waste management
4	Veseli et al. (2024) [19]	The Implementation of Lean Manufacturing on Zero Waste Technologies in the Food Processing Industry	Qualitative – multiple case studies & thematic analysis	9 food processing companies in Kosovo and North Macedonia	Lean practices (JIT, TPM, SPC, employee engagement) improve efficiency, and responsiveness. There is a close link between lean and sustainability goals and waste reduction.	Relevant: shows the application of lean manufacturing in the food industry contributes to cost efficiency and sustainability
5	Garcia-Garcia et al. (2022) [20]	Optimising Changeover through Lean-Manufacturing Principles: A Case Study in a Food Factory	Case study – SMED (Single Minute Exchange of Dies) & line hopping	One ready-to-eat food factory in South Yorkshire, UK	Changeover time is reduced by nearly 30%, OEE increases above 70%, and labor costs are reduced by 10% after lean implementation.	Relevant: showing lean manufacturing as a real tool for reducing operational costs and improving production efficiency
6	ALShanti et al. (2025) [16]	Lean accounting tools and competitive advantage in Jordanian industrial companies	Quantitative – online survey & multiple regression (SPSS)	279 managers from 18 industrial companies in Jordan	Lean accounting tools (VSC, TC, KCO) have a significant impact on competitive advantage, especially on improving quality,	Highly relevant: directly discusses costing targets and lean accounting as cost reduction strategies and

				innovation, and time efficiency. Target costing indicates high usage.	competitive advantage
7	Alkababji (2023) [21]	The impact of applying the target cost and continuous improvement (Kaizen) on achieving the sustainable competitive advantage of Palestinian industrial companies	Descriptive-analytical – questionnaire & regression analysis	415 industrial companies in South Palestine	The implementation of costing and kaizen targets at a high level has a positive impact on sustainable competitive advantage, especially in market share, differentiation, and cost reduction. Highly relevant: directly examine the implementation of costing targets and kaizen (continuous improvement) as a cost reduction strategy
8	Khawka et al. (2025) [22]	Trim the fat, gain the edge: lean supply chain activities for cost reduction and competitive advantage	Quantitative – SEM (SmartPLS4)	375 food and beverage SMEs in Iraq	Lean supply chain activities (LSCA) have a significant effect on reducing supply chain costs and gaining competitive advantage. IT capabilities moderate those relationships positively. Relevant: discussing lean in the supply chain as a cost reduction strategy that supports competitive advantage
9	Sodkomkham et al. (2024) [23]	A novel integrated material flow cost accounting (MFCA)-IoT-lean management system approach to improving water use efficiency and reducing costs in the beverage industry	Case study – MFCA + IoT + lean management & scenario simulation	One beverage company (beverage industry)	The integration of MFCA, IoT, and lean management resulted in a 24.1% increase in production rates and a 4.5% reduction in costs (equivalent to 71,010 THB/year) through water use efficiency. Relevant: integrating lean management with cost accounting systems (MFCAs) for sustainable cost reduction strategies
10	Presciuttini et al. (2025) [24]	Integrating Lean Management and Emerging Technologies for Enhanced Sustainable Performance	Quantitative – survey & Double Machine Learning algorithm	Manufacturing companies that use lean management (broad-scale)	The integration of digital technology with lean management has been proven to improve sustainable performance and drive zero-defect production. The combination of the two results in cost efficiency and superior quality. Relevant: shows lean management integrated with digital technology can improve cost efficiency and production performance in a sustainable manner

3.3 Development of *Lean Production Implementation* Literature and *Target Costing* for the 2021–2025 Period

Literature development on *Lean Production* and *Target Costing* In the period 2021 to 2025, it shows increasingly dynamic and diverse trends, both in terms of methodological approaches and sectoral coverage. At the beginning of this period, the focus of research was still largely on testing effectiveness *lean* in conventional manufacturing environments with a statistical approach and a single case study. Hardcopf, Hardcopf et al. For example, exploring the influence of organizational culture on performance *lean* in global manufacturing companies [15], while Christianity simultaneously examines how the *Standard Variable Costing* which is *Enabling* can support implementation *lean* more effectively [17]. Both of these studies laid an important foundation that success *lean* cannot be separated from the organizational context and the cost control system that surrounds it.

Entering 2022 to 2023, the literature began to shift towards more applicable and sectoral studies. Alkababji expands the discussion by integrating *Target Costing* and *Kaizen* as a competitive strategy for the industry in Palestine [21], while Garcia-Garcia, Singh, & Jagtap focus their studies on optimization *Changeover* in the food industry using the SMED method [20]. Zaky et al. then strengthened the empirical basis *lean* in heavy industries by proving the real impact of waste management on the reduction of production costs in the steel sector. This pattern reflects the shift of researchers' attention from the conceptual level to more specific and measurable empirical validation [18].

In the period 2024–2025, the development of literature has experienced a significant leap with the inclusion of technology and sustainability dimensions into the discussion *lean* and *Target Costing*. Sodkomkham et al. introduced the integration of MFCA with IoT and *Lean Management* [23], while Veseli et al. explore the linkages *lean* with the purpose *Zero Waste* in the food industry [19]. Then in 2025, three studies at once emerged with an increasingly broad perspective: Alshanti & Al-refae (2025) confirmed the role of *Lean Accounting* Includes *Target Costing* in competitive advantage, Ephesians expand *lean* to the realm *Supply Chain*, and Presciuttini et al. prove the synergy between *Lean Management* with digital technology using algorithms *Machine Learning*. This overall development illustrates that the literature *lean* and *Target Costing* continues to evolve from a partial approach to a more holistic and multidimensional integration [3], [16], [24].

3.4 Pattern of Integration of *Lean Production* and *Target Costing* in Cost Reduction Strategies in Various Industrial Sectors

Integration patterns between *Lean Production* and *Target Costing* As a cost reduction strategy, it shows quite interesting variations when examined across industry sectors. In heavy manufacturing sectors such as the iron and steel industry, integration is carried out through the *Six Sigma* (DMAIC) which incorporates the principles *lean* in the management of waste with strict cost measurement, resulting in an increase in *Throughput* by 70.6% and a decrease in working hours per ton by 52.4% [18]. This pattern reflects the integration that is *Process-Driven*, where cost reduction is achieved through direct optimization of the production process flow.

In the food and beverage industry sector, the integration pattern tends to be more diverse and adaptive. In the ready-to-eat food industry, *lean* implemented through the SMED method with a focus on efficiency *Changeover*, which indirectly reduces labor costs and increases machine utilization [20]. Meanwhile, in the beverage industry, integration involves a material flow-based cost accounting system (MFCA) combined with IoT, so that cost reductions not only occur at the operational level but also at the resource management level in real-time [23]. This pattern is more of a *technology-enabled*, leveraging digital data to identify and eliminate waste more precisely.

In a broader industry-oriented sector, the pattern of integration shifted towards *Market-Driven*, where *Target Costing* become the starting point for cost reduction strategies. Industrial enterprises in Jordan and Palestine show that the use of *Target Costing* combined with practice *Kaizen* create a continuous cost improvement cycle, as companies not only strive to meet the market-side cost targets, but also actively make process improvements to keep the actual cost below the set target [16], [21] A similar pattern is also seen in *Lean Supply Chain* among Iraqi SMEs, where the *lean* in the supply chain is integrated with information technology capabilities to achieve more comprehensive cost reduction [3].

The cost reduction imperative extends beyond lean and target costing alone; converging evidence from supply chain and quality management literature reinforces the strategic logic underpinning integrated operational frameworks. Bermana et al. established through a systematic review of

manufacturing-sector studies that the concurrent deployment of Supply Chain Management (SCM) and Total Quality Management (TQM) yields compounded efficiency gains that neither discipline achieves independently [9]. SCM contributes by streamlining material procurement, inventory governance, and logistics coordination, while TQM complements these gains by institutionalizing defect prevention, continuous process refinement, and workforce capability development across all organizational tiers. Crucially, their synthesis demonstrates that organizations successfully unifying both approaches documented operational expenditure contractions in the range of 20 to 30 percent over extended implementation horizons — a magnitude of cost improvement directly comparable to outcomes observed in lean-integrated environments. The mechanistic parallels are notable: just as lean production targets non-value-added activity elimination at the process level, TQM addresses quality failure costs at the systemic level, while SCM simultaneously compresses transactional and logistical inefficiencies across the entire value network. This convergence of findings across methodologically distinct literature streams suggests that cost efficiency in manufacturing is most durably achieved not through isolated technique adoption, but through the deliberate architectural integration of complementary management frameworks that collectively address waste, quality deviation, and supply chain friction as interdependent cost drivers [9].

3.5 Factors Affecting the Successful Implementation of *Lean Production* and *Target Costing* Simultaneously

The literature synthesis identifies a number of critical factors that consistently emerge as determinants of successful implementation *Lean Production* and *Target Costing* simultaneously. The first and most fundamental factor is the culture of the organization. Research on global manufacturing companies proves that the culture *Developmental*, which is characterized by openness to innovation and orientation to learning, is the organizational context most conducive to success *lean*. On the other hand, companies with rigid and hierarchical cultures tend to experience resistance in the transformation process *lean*, so that the potential cost reduction cannot be maximized [15].

The second factor is the suitability of the cost accounting system used. Kristensen's findings show that the *Standard Variable Costing* designed in a *Enabling*, which gives employees the flexibility to use cost information creatively in problem solving, has proven to be more effective in supporting implementation *lean* compared to a coercive system [17]. This means that the successful integration *lean* and *Target Costing* It relies heavily on how the accounting system is designed to support, rather than simply control, the operational behavior of employees.

The third factor is employee engagement and cross-functional collaboration. In the food industry in Kosovo and North Macedonia, the practice of *lean* which involves the active participation of employees from different levels of the organization is proven to result in more sustainable efficiency improvements [19]. The fourth factor is information technology capabilities, which have been shown to moderate the relationship between activities *Lean Supply Chain* with cost reductions for SMEs in Iraq [3]. Finally, the integration factor of digital technologies such as IoT and algorithms *Machine Learning* Proven to strengthen effectiveness *Lean Management* in achieving cost efficiency and superior production quality [23], [24].

Table 2. Summary of Quantitative Findings and Key Factors of the Analyzed Study

Yes	Author (Year)	Method	Sectors	Key Quantitative Results	Key Factors
1	Hardcopf et al. [15]	Surveys Statistics	– Global manufacturing	Developmental culture → <i>optimal lean effect</i>	Organizational culture
2	Kristensen [17]	Order-2 SEM + qualitative	Case study	SVC <i>enabling</i> → performance ↑	Accounting systems
3	Zaky et al. [18]	Case study DMAIC	– Iron & Steel	<i>Throughput</i> ↑70.6%; Kindergarten cost/ton ↓52.4%	Waste management
4	Veseli et al. [19]	Multiple case studies	Food	JIT+TPM+SPC → efficiency & sustainability ↑	Employee engagement

5	Garcia-Garcia et al. [20]	Case study – SMED	Food	<i>Changeover</i> ↓30%; ↑70%; Kindergarten fee ↓10%	OEE	Process optimization
6	Alshanti & Al-refae [16]	Survey Regression (n=279)	Jordanian Industry	<i>Costing target</i> → significant competitive advantage		<i>Lean accounting</i>
7	Alkababji [21]	Questionnaire Regression (n=415)	Palestinian Industry	<i>Costing + kaizen target</i> → competitive advantage ↑		Continuous improvement
8	Ephesians [3]	SEM SmartPLS4 (n=375)	Iraqi SMEs	LSCA significant reduction in supply chain costs		IT Capabilities
9	Sodkomkham et al. [23]	Case study – MFCA+IoT	Drinks	Production ↑24.1%; Cost ↓4.5%		Digital technology
10	Presciuttini et al. [24]	Survey <i>Double ML</i>	Global manufacturing	Lean + digital <i>zero-defect</i> → cost efficiency ↑		Technology integration

3.6 Hypothesis Formulation

Based on a thorough synthesis of the three problem formulations above, this study formulates three hypotheses that can be the basis for further research.

H1 – Implementation *Lean Production* has a positive and significant effect on reducing operational costs of manufacturing companies. This hypothesis builds on the consistency of cross-sector empirical findings that show a significant decrease in post-implementation costs *lean*, from the steel, food, to beverage industries [18], [19], [20].

H2 – Implementation *Target Costing* integrated with practice *Kaizen* have a positive and significant effect on the sustainable competitive advantage of industrial companies. The foundation of this hypothesis is derived from empirical evidence in various industry contexts that consistently shows a positive relationship between *Target Costing* with cost efficiency and competitive position of the company [3], [16], [21].

H3 – Organizational culture, information technology capabilities, and digital technology integration positively moderate the relationship between implementations *Lean Production* and *Target Costing* with the company's cost efficiency. This hypothesis is formulated based on the identification of critical factors that repeatedly appear in the literature as determinants of the success of the simultaneous implementation of the two approaches [15], [17], [23], [24].

4. CONCLUSION

This systematic literature review successfully charts the developmental trajectory of *lean production* and *target costing* as integrated cost reduction strategies over the 2021–2025 period. Analysis of the ten qualifying studies reveals unambiguously that these two methodologies have transcended their original operational utility to emerge as mutually reinforcing strategic frameworks for comprehensive cost governance. Organizations that structurally integrate *lean* principles with *target costing* mechanisms consistently demonstrate superior cost reduction outcomes — both in measurability and sustainability — relative to those deploying either approach in isolation. The critical success determinants identified across the literature converge around four primary constructs: adaptive organizational culture, alignment of accounting systems with *lean* operational logic, sustained employee engagement, and adequate information technology infrastructure.

From a theoretical standpoint, this review contributes to the cost management and operations management literature by establishing a structured synthesis of the *lean production–target costing* relationship and proposing an integrated conceptual framework grounded in cross-

sectoral empirical evidence. It further advances theoretical understanding by articulating the functional complementarity of *Target Costing* as an *upstream cost control* mechanism and *Lean Production* as a *downstream cost control* instrument — a conceptual distinction with significant implications for both theory construction and practical system design.

The practical implications of these findings are directed with particular specificity toward management accountants and Chief Financial Officers (CFOs). These professionals are strategically positioned to serve not merely as custodians of financial records, but as proactive architects of cost-competitive organizational systems. A concrete and urgent recommendation emerging from this review is the need to fundamentally redesign internal financial reporting systems to eliminate structural impediments to *lean* initiatives. Conventional reporting architectures — particularly those reliant on inventory absorption *costing* and standard overhead allocation — can actively penalize *lean* improvements by generating adverse variance reports when inventory levels are intentionally reduced. Management accountants and CFOs are therefore advised to transition toward *lean*-compatible reporting frameworks, such as *Value Stream Costing* and plain-language *box scores*, which accurately reflect the financial value generated by *lean* transformations.

Future empirical investigations are recommended to rigorously test the three hypotheses advanced in this study, with particular prioritization of manufacturing contexts in developing and emerging economies that remain underrepresented in the current literature. Practitioners and organizational leaders are further counseled to reconceptualize *lean production* and *target costing* not as discrete operational programs with finite implementation horizons, but as enduring cultural transformations demanding consistent, cross-functional institutional commitment. Finally, the accelerating integration of digital technologies — including *Internet of Things* (IoT) platforms and *machine learning* algorithms — warrants strategic consideration as potent catalysts for amplifying the joint effectiveness of both approaches in the pursuit of optimal and durable cost efficiency.

REFERENCES

- [1] D. Fettermann, C. Cavalcante, G. Tortorella, and T. Domingues de Almeida, "How does Industry 4.0 contribute to operations management?," *J. Ind. Prod. Eng.*, vol. 35, Apr. 2022, doi: 10.1080/21681015.2018.1462863.
- [2] X. Chen and B. Lin, "Energy and CO2 emission performance: A regional comparison of China's non-ferrous metals industry," *J. Clean. Prod.*, vol. 274, p. 123168, 2020, doi: <https://doi.org/10.1016/j.jclepro.2020.123168>.
- [3] I. Eferakeya, "Does environmental uncertainty influence the application of strategic management accounting? An investigation of listed manufacturing firms in Nigeria," *J. Econ. Manag.*, vol. 47, no. 1, pp. 355–384, 2025, doi: 10.22367/jem.2025.47.14.
- [4] A. Z. Salem, R. Abdelhaq, and B. Awwad, "Artificial Intelligence and Big Data Analytics for Sustainable Accounting in Emerging Economies: Contemporary Approaches and Future Prospects BT - Technology and Innovation Towards a Future of Business Sustainability: Insights in the Digital Age," B. Awwad and R. A. Awwad, Eds., Singapore: Springer Nature Singapore, 2026, pp. 57–70. doi: 10.1007/978-981-95-6469-9_5.
- [5] W. M. Shewakh, A. Masrahi, A. K. Abudiyah, and Y. A. Alsharedah, "People-Centered Lean Manufacturing: Drivers of Operational Performance in Saudi Arabian Industries," no. Lm, pp. 1–19, 2026.
- [6] L. Apilioğulları, "Digital transformation in project-based manufacturing: Developing the ISA-95 model for vertical integration," *Int. J. Prod. Econ.*, vol. 245, p. 108413, 2022, doi: <https://doi.org/10.1016/j.ijpe.2022.108413>.
- [7] J. A. Rojas-García, C. Elias-Giordano, S. Nallusamy, and J. C. Quiroz-Flores, "Enhancement of the distribution process on light logistics SMEs in times post-pandemic Covid-19 with Ukraine-Russia conflict by lean logistics and big data," *Soc. Sci. Humanit. Open*, vol. 10, p. 100945, 2024, doi: <https://doi.org/10.1016/j.ssaho.2024.100945>.
- [8] K. Kapoor, A. Z. Bigdeli, Y. K. Dwivedi, and R. Raman, "How is COVID-19 altering the manufacturing landscape? A literature review of imminent challenges and management interventions," *Ann. Oper. Res.*, vol. 335, no. 3, pp. 1567–1599, 2024, doi: 10.1007/s10479-021-04397-2.

- [9] N. A. Bermana, S. Ayu, L. P. Amanda, and K. A. Early, "Analisis Pengaruh Penerapan Supply Chain Management Dan Total Quality Management Terhadap Efisiensi Biaya Pada Industri Manufaktur," *Neraca Manajemen, Ekon.*, vol. 16, no. 12, 2025, doi: 10.8734/mnmae.v1i2.359.
- [10] I. Ramadhityo, S. Maryati, and H. Prasetyo, "Corporate Governance, Cash Holdings, and Debt Policy: Implications for Firm Value," *Res. Econ. Bus.*, vol. 1, no. 2, pp. 137–145, 2025, [Online]. Available: <https://doi.org/10.70895/roe>
- [11] M. J. Page *et al.*, "The PRISMA 2020 statement: An updated guideline for reporting systematic reviews," *Bmj*, vol. 372, 2021, doi: 10.1136/bmj.n71.
- [12] D. Tranfield, D. Denyer, and P. Smart, "Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review," *J. Int. Manag.*, vol. 19, no. 4, pp. 390–406, 2013, doi: 10.1016/j.intman.2013.03.011.
- [13] H. Snyder, "Literature review as a research methodology: An overview and guidelines," *J. Bus. Res.*, vol. 104, pp. 333–339, Aug. 2023, doi: 10.1016/j.jbusres.2019.07.039.
- [14] Q. N. Hong *et al.*, "Improving the content validity of the mixed methods appraisal tool: a modified e-Delphi study," *J. Clin. Epidemiol.*, vol. 111, pp. 49–59.e1, 2021, doi: <https://doi.org/10.1016/j.jclinepi.2019.03.008>.
- [15] R. Hardcof, G. (Jason) Liu, and R. Shah, "Lean production and operational performance: The influence of organizational culture," *Int. J. Prod. Econ.*, vol. 235, p. 108060, 2021, doi: <https://doi.org/10.1016/j.ijpe.2021.108060>.
- [16] A. M. Alshanti, K. M. A. Al-Refae, and M. Jebreel, "Lean accounting tools and competitive advantage in Jordanian industrial companies," *Cogent Bus. Manag.*, vol. 12, no. 1, p., 2025, doi: 10.1080/23311975.2024.2447414.
- [17] T. B. Kristensen, "Enabling use of standard variable costing in lean production," *Prod. Plan. & Control*, vol. 32, no. 3, pp. 169–184, 2021, doi: 10.1080/09537287.2020.1717662.
- [18] N. Zaky, M. Z. Ahmed, A. Alarjani, and E.-A. Attia, "Lean manufacturing implementation in iron and steel industries: effect of wastes management on the production costs," *J. Eng. Des. Technol.*, vol. 23, no. 2, pp. 525–545, 2023, doi: 10.1108/JEDT-01-2023-0012.
- [19] A. Veseli, A. Bajraktari, and A. Trajkovska Petkoska, "The Implementation of Lean Manufacturing on Zero Waste Technologies in the Food Processing Industry: Insights from Food Processing Companies in Kosovo and North Macedonia," *Sustain.*, vol. 16, no. 14, 2024, doi: 10.3390/su16146016.
- [20] G. Garcia-Garcia, Y. Singh, and S. Jagtap, "Optimizaci3n del cambio a trav3s de Lean Manufacturing Principios: un estudio de caso en una f3brica de alimentos," *Sustain.*, vol. 14, no. 14, pp. 1–20, 2022.
- [21] M. W. Alkababji, "The impact of applying the target cost and continuous improvement (Kaizen) on achieving the sustainable competitive advantage of Palestinian industrial companies," *J. Bus. Socio-economic Dev.*, vol. 3, no. 4, pp. 372–387, 2023, doi: 10.1108/JBSED-11-2022-0121.
- [22] Z. M. H. Khawka, A. A. Rahman, S. Bin Sidek, S. A. B. Ahmed, and R. H. F. Al-Hadeethi, "Trim the fat, gain the edge: lean supply chain activities for cost reduction and competitive advantage," *J. Open Innov. Technol. Mark. Complex.*, vol. 11, no. 3, p. 100579, 2025, doi: 10.1016/j.joitmc.2025.100579.
- [23] T. Sodkomkham, C. Ratanatamskul, and A. Chandrachai, "A novel integrated material flow cost accounting (MFCA)- IoT-lean management system approach to improving water use efficiency and reducing costs in the beverage industry," *Clean. Environ. Syst.*, vol. 15, no. July, p. 100232, 2024, doi: 10.1016/j.cesys.2024.100232.
- [24] A. Presciuttini, S. Frecassetti, M. Ferrazzi, A. Cantini, and A. Portioli-Staudacher, "Integrating lean management and emerging technologies for enhanced sustainable performance: empirical evidence based on double machine learning approach," *Data Sci. Manag.*, 2025, doi: 10.1016/j.dsm.2025.08.004.