

Review of Literature on TQM and LEAN Management

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Abstract

Total Quality Management (TQM) and Lean Management are two of the most influential approaches used to improve organisational performance, quality, productivity and customer satisfaction. Although they developed from different traditions, the literature shows considerable overlap between the two approaches. TQM places emphasis on customer requirements, prevention of defects, employee involvement, leadership commitment and continuous improvement, while Lean Management concentrates on customer value, elimination of non-value-adding activities, smooth flow, pull-based operations and the systematic pursuit of perfection. This paper reviews selected literature on the development, principles, practices, benefits and implementation challenges of TQM and Lean Management. The review also examines the relationship between the two approaches and the conditions under which their integration can support operational excellence. Classic contributions by Deming, Juran, Crosby, Ishikawa, Ohno and Womack and Jones are considered alongside later empirical and review studies. The literature indicates that successful implementation depends less on isolated tools and more on leadership, organisational culture, employee capability, supplier involvement, process discipline and continuous improvement. Recent research further connects these approaches with Industry 4.0 and Quality 4.0, suggesting that digital technologies can strengthen data-driven improvement when the underlying management system is mature. The paper concludes that TQM and Lean should not be treated as competing philosophies; rather, they can be viewed as complementary approaches for building a quality-oriented and waste-conscious operating system.

Keywords: Total Quality Management, TQM, Lean Management, Lean Manufacturing, Continuous Improvement, Quality Management, Operational Excellence.

Introduction

In the present business environment, organisations are expected to deliver products and services of consistent quality while controlling cost, reducing delays and responding quickly to changing customer requirements. These expectations have made quality management and continuous improvement important parts of operations and supply chain strategy. Total Quality Management and Lean Management are among the approaches that have received sustained attention from both practitioners and researchers.

The roots of modern quality management can be traced to statistical quality control and the work of Walter A. Shewhart, followed by major contributions from W. Edwards Deming, Joseph M. Juran, Armand Feigenbaum, Kaoru Ishikawa and Philip Crosby. The development of the Toyota Production System, associated particularly with Taiichi Ohno and Shigeo Shingo, created another stream of thinking centred on flow, just-in-time production, waste reduction and problem solving. The term Lean became widely known after Womack, Jones and Roos described the differences between Toyota and conventional mass production in *The Machine That Changed the World*.

TQM is generally understood as an organisation-wide philosophy in which quality is not limited to inspection or the quality department. Instead, quality becomes the responsibility of management, employees, suppliers and other participants in the value chain. Lean Management, similarly, is broader than a collection of tools such as 5S, Kanban or Value Stream Mapping. It is a way of managing processes by understanding customer value, removing waste and continuously improving the flow of work.

The literature has increasingly moved from asking whether TQM or Lean works to asking how these approaches can be implemented and sustained under different organisational and environmental conditions. This is important because organisations often obtain short-term improvements from individual tools but struggle to maintain the change. Recent reviews repeatedly identify leadership, culture, employee participation, knowledge, resources and supplier relationships as important conditions for successful implementation.

Objectives

- To review the major literature and conceptual development of Total Quality Management.
- To examine the evolution, principles and major practices associated with Lean Management.
- To identify common critical success factors and implementation challenges reported in TQM and Lean literature.
- To examine the relationship between TQM and Lean Management and understand the potential benefits of integrating the two approaches.
- To identify emerging research directions, particularly in relation to Industry 4.0, Quality 4.0 and sustainable operations.

Research Methodology

The study follows a narrative literature review approach. The review draws on peer-reviewed journal articles, established books and review papers dealing with TQM, Lean Management, continuous improvement and operational performance. Classic works were considered to understand the historical development of the concepts, while later systematic reviews were used to identify major themes, implementation factors and emerging research directions. The literature was examined thematically rather than through primary data collection. The main themes considered were conceptual foundations, critical practices, implementation factors, organisational outcomes, integration of TQM and Lean, and future research.

The review is therefore interpretive in nature. It does not claim to be a statistical meta-analysis, and the findings should be understood as a synthesis of the selected literature rather than as evidence from a new field survey.

Conceptual Understanding of Total Quality Management

Total Quality Management developed from the gradual movement of organisations away from inspection-based quality control toward prevention, process improvement and organisation-wide responsibility for quality. Deming emphasised variation, systems thinking, leadership and continual improvement; Juran highlighted quality planning, quality control and quality improvement; Crosby focused on conformance to requirements and the principle of zero defects; Ishikawa emphasised employee participation, quality circles and systematic problem solving. Together, these contributions shaped the broad philosophy that is now associated with TQM.

TQM places the customer at the centre of improvement. Quality is not simply the absence of defects but the organisation's ability to understand requirements and consistently deliver what customers value. This requires processes that are capable, measurable and continuously improved. The literature also makes it clear that TQM is strongly connected with organisational culture. A quality programme introduced only as a formal procedure is unlikely to produce lasting change if employees do not understand its purpose or if senior managers do not support it.

Major Principles of TQM

Customer focus – understanding customer expectations and using customer feedback to guide improvement.

Leadership commitment – senior management establishes direction, allocates resources and creates an environment in which quality is valued.

Employee involvement – employees at different levels participate in problem identification, decision-making and improvement activities.

Process approach – activities are treated as interconnected processes rather than isolated departmental tasks.

Continuous improvement – improvement is treated as an ongoing organisational responsibility rather than a one-time project.

Fact-based decision making – data, measurement and analysis are used to understand problems and evaluate improvement.

Supplier partnership – suppliers are treated as part of the quality system because purchased materials and services influence final performance.

Literature Review on TQM

Ahire, Landeros and Golhar (1995) reviewed 226 TQM-related articles published in 44 refereed management journals between 1970 and 1993. Their work showed that TQM research had developed from practical organisational needs but lacked a sufficiently unified theoretical structure. The review classified studies around areas represented in the Malcolm Baldrige framework and provided an important foundation for later TQM research.

Martínez-Lorente, Dewhurst and Dale (1998) examined the origins and evolution of the term TQM. Their work is useful because it shows that the modern concept did not originate from one individual or one event. Rather, the contributions of Feigenbaum and Ishikawa to the language of total quality, together with the ideas of Deming, Juran and Crosby, shaped the practices and mechanisms associated with TQM.

The literature subsequently became more empirical. Studies examined the relationship between TQM practices and operational or business performance, while also investigating implementation conditions. A recurring finding is that TQM practices are most effective when they are implemented as a coherent system. Training employees without changing decision-making, measurement or leadership behaviour, for example, does not create the same effect as an integrated quality culture.

Sreedharan, Sunder and Raju (2018) reviewed critical success factors across TQM, Lean, Six Sigma and Lean Six Sigma. Their review of 41 peer-reviewed papers highlighted the importance of factors such as leadership, employee involvement, training, organisational culture and structured improvement practices. This is significant because it places TQM and Lean within the broader continuous-improvement literature rather than treating them as completely separate management systems.

A systematic review by Psomas and Antony (2017) identified different clusters within TQM research, including studies concerned with identifying critical factors, studies concerned with implementation and studies examining impact on performance. The review also noted that customer focus had become increasingly important and that a universally

accepted implementation model had not emerged. This suggests that TQM has to be adapted to organisational context rather than copied mechanically.

Conceptual Understanding of Lean Management

Lean Management emerged from the production practices developed within Toyota and related Japanese manufacturing systems. The central idea is straightforward: provide what the customer values while using fewer resources and removing activities that do not contribute to that value. Womack, Jones and Roos (1990) popularised the term Lean, while Womack and Jones (1996) later expressed Lean Thinking through five principles: specify value, identify the value stream, create flow, establish pull and pursue perfection.

Lean is therefore not limited to manufacturing. Although many Lean practices were developed in factories, later literature has applied Lean thinking to healthcare, services, logistics, construction, administration and supply chains. The common thread is the examination of end-to-end processes from the customer's point of view and the removal of unnecessary effort, waiting, movement, inventory, defects and other forms of waste.

Major Principles and Practices of Lean Management

- Value – define value from the perspective of the customer rather than only from the producer's viewpoint.
- Value stream – identify all activities required to deliver a product or service and distinguish value-adding from non-value-adding work.
- Flow – arrange work so that materials, information and tasks move with minimum interruption and waiting.
- Pull – produce or replenish in response to actual demand instead of creating unnecessary output in advance.
- Perfection – continuously identify and remove sources of waste and variation through Kaizen and structured problem solving.

Common Lean practices include 5S, Just-in-Time, Kanban, standardised work, visual management, Poka-Yoke, Total Productive Maintenance, Kaizen and Value Stream Mapping. These tools are useful when they are connected to a clear operational problem; using tools simply because they are labelled 'Lean' can create activity without meaningful improvement.

Literature Review on Lean Management

Shah and Ward (2003) examined Lean manufacturing through practice bundles rather than treating Lean as a single technique. Their study considered 22 manufacturing practices and identified interrelated bundles including Just-in-Time, TQM, Total Preventive Maintenance and human resource management. Their findings showed that Lean bundles were associated with operating performance and that organisational context influenced implementation.

Shah and Ward (2007) later addressed confusion surrounding the measurement of Lean production. Through an extensive literature review and empirical analysis, they developed a structured set of measures representing major components of Lean production. This work reinforces the idea that Lean should be evaluated as a system of connected practices rather than by the presence of one or two tools.

Danese, Manfè and Romano (2018) conducted a systematic literature review of 240 articles published in 25 peer-reviewed journals between 2003 and 2015. They found that Lean research had become diverse and fragmented as the concept moved into different sectors and contexts. The review helped organise research into mature, intermediate and emerging themes and highlighted the continuing need for stronger implementation and context-specific research.

Antony, Psomas, Garza-Reyes and Hines (2022) reviewed 403 Lean Manufacturing articles published in 62 journals between 2010 and 2019. Their review focused on practical implications and future research directions. The large body of literature demonstrates the continued interest in Lean, but also shows that the field covers a wide range of tools, sectors and implementation settings.

Recent research has paid increasing attention to why Lean programmes fail to become sustainable. Aripin and colleagues (2024) identified five broad themes associated with preventing Lean implementation failure: leadership, culture, knowledge, resources and suppliers. These findings are consistent with the broader TQM literature and support the argument that Lean is fundamentally an organisational change programme, not simply a set of shop-floor techniques.

TQM and Lean Management: Areas of Similarity

The literature shows substantial overlap between TQM and Lean. Both approaches are customer-oriented, process-focused and improvement-driven. Both require management commitment and employee participation. Both depend on measurement, standardisation, problem solving and learning from process performance. The major difference is emphasis: TQM historically gives stronger attention to quality as an organisation-wide philosophy, while Lean gives stronger attention to value, flow and waste elimination. In practice, however, these areas frequently overlap.

One particularly important point is that quality and waste are not independent. Defects create rework, inspection, delays, scrap, additional inventory and customer dissatisfaction. In the same way, poor process flow can create conditions in which defects are hidden or discovered late. A combined perspective therefore allows an organisation to improve both the effectiveness of a process and the efficiency with which that process uses resources.

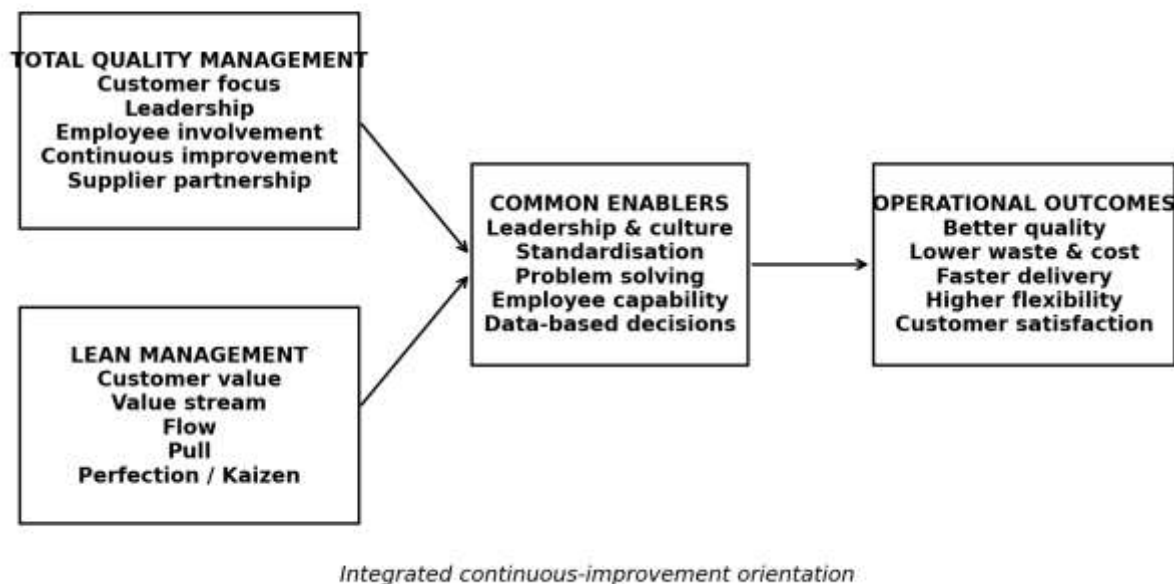


Figure 1: Conceptual linkage between TQM and Lean Management

Integration of TQM and Lean Management

The relationship between the two approaches can be understood as complementary rather than competitive. TQM provides a broad quality-oriented management philosophy, whereas Lean provides a strong process-improvement logic for identifying value and removing waste. When integrated, quality becomes an important condition for flow and Lean provides a practical way of exposing process problems that affect quality.

Shah and Ward's (2003) empirical treatment of TQM as one component within a wider Lean practice bundle is particularly relevant. It suggests that Lean systems may depend on quality practices rather than operating independently from them. Similarly, the literature on continuous improvement identifies common success factors across TQM, Lean and Six Sigma, including leadership, training, employee involvement and an improvement-oriented culture.

Integration does not mean that an organisation must launch every TQM and Lean tool simultaneously. A more practical approach is to establish a common management direction, identify customer and process requirements, understand current performance, select the most relevant improvement methods and then develop standard work and measurement systems. The emphasis should remain on solving actual business problems.

Findings from the Literature

- TQM has evolved from quality control toward a broader organisation-wide philosophy involving leadership, people, processes and customers.
- Lean has evolved from manufacturing practice into a wider management approach applicable to different sectors and value chains.
- Both approaches depend heavily on leadership, employee involvement, organisational culture and continuous improvement.
- TQM and Lean show substantial conceptual overlap, especially in process focus, problem solving, standardisation and customer orientation.
- Research supports the use of integrated practice bundles rather than isolated improvement tools.
- Implementation results are influenced by organisational context; therefore, copying a successful model without adaptation can produce weak results.
- Long-term sustainability is a major research and managerial challenge, with leadership, culture, knowledge, resources and supplier relationships repeatedly identified as important factors.
- Industry 4.0 and Quality 4.0 are creating new opportunities to strengthen TQM and Lean through real-time data, analytics and connected processes.

Conclusion

The review of literature indicates that Total Quality Management and Lean Management have developed from different historical streams but now share many fundamental ideas. TQM emphasises an organisation-wide commitment to quality, customer satisfaction, prevention and continuous improvement. Lean focuses on customer value, waste elimination, flow, pull and the pursuit of perfection. Both require disciplined processes and, more importantly, people and leadership capable of sustaining improvement.

The literature does not support viewing TQM and Lean as competing alternatives. Instead, their strongest contribution may come from integration. TQM can provide the quality culture, customer orientation and management commitment, while Lean can provide a practical process lens for exposing waste and improving flow. Their integration can therefore contribute to operational excellence when implementation is adapted to organisational context and supported by employee involvement, measurement, training and long-term leadership.

At the same time, the review highlights an important caution: successful improvement is not created by tools alone. 5S, Kanban, quality circles, Value Stream Mapping and other techniques are useful only when they support a clear improvement purpose. The future of TQM and Lean is likely to involve a combination of human problem-solving capability, disciplined management systems and digital technologies. Organisations that can connect these elements are better positioned to improve quality, reduce waste, respond to customers and build sustainable operational performance.

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