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TOTAL QUALITY MANAGEMENT AND ORGANIZATIONAL PERFORMANCE IN THE MANUFACTURING INDUSTRY: A QUALITATIVE INQUIRY FROM CONTINGENCY AND RESOURCE-BASED PERSPECTIVES

CHAO XU
DHONBURI RAJABHAT UNIVERSITY

JIRAPONG RUANGGOON
DHONBURI RAJABHAT UNIVERSITY

JAKKRIT THAVORN
THAMMASAT UNIVERSITY

Abstract: This study examined how Total Quality Management (TQM) influenced organizational performance in China's manufacturing industry through the combined lenses of the Resource-Based View (RBV) and Contingency Theory. A qualitative research design was employed, and data were collected through semi-structured interviews with 21 purposively selected middle- and senior-level managers from enterprises in Hubei, Jiangxi, Beijing, and Shenzhen. Content analysis, supported by NVivo software, was applied using open and axial coding to identify recurring themes, while trustworthiness was enhanced through data triangulation and member checking. The findings showed that organizational structure and technical resources served as foundational enablers of TQM practices, whereas organizational culture and innovation capability acted as mediating mechanisms that transformed quality initiatives into measurable performance outcomes. Firms that adopted flexible divisional or matrix structures, invested strategically in advanced technologies, and fostered a quality-oriented and innovation-driven culture reported notable improvements in financial performance, product quality, customer satisfaction, employee skills, and process efficiency. Theoretically, this study extended the RBV by demonstrating the role of intangible resources (culture and innovation) in complementing tangible resources (structure and technology). It also enriched Contingency Theory by highlighting the moderating role of structural flexibility in dynamic environments. Practically, the study provided actionable guidance for managers to align structural design, resource allocation, and cultural development to maximize TQM outcomes. Future research was suggested to conduct comparative industry analyses, adopt longitudinal designs, and pursue cross-cultural studies to refine and generalize these insights.
Keywords: Total Quality Management (TQM); Organizational performance; Organizational culture; Innovation capability; Technical resources; Manufacturing industry

INTRODUCTION:

With the increasing competition and globalization of the economy, manufacturing companies are being compelled more and more to improve efficiency, product quality, and responsiveness to changing customer needs. Among the most well-liked management philosophies for meeting these needs through continuous improvement, employee empowerment, and customer focus is Total Quality Management (TQM) (Juran, 2003; Ikhsannudin & Pakpahan, 2021). Several studies have supported that TQM practices can result in organizational performance improvements, specifically in the areas of quality, cost savings, and customer satisfaction (Kaynak, 2003; Prajogo & Sohal, 2006; Kulenović et al., 2021). The performance impact of TQM, however, is anything but consistent across firms, implying that underlying organizational and contextual contingencies determine the degree to which TQM is translated into long-term performance improvements.

In spite of decades of research, there exist two significant gaps. Primarily, the majority of the literature has focused on quantitative reports of TQM-performance relationships, in most cases ignoring the detailed organizational processes that mediate or moderate the effects (Sila, 2007; Dubey & Gunasekaran, 2015; Raj et al., 2024). Second, there is relatively less knowledge about how intangible dimensions—like innovation ability and organizational culture—combine with technical and structural resources to shape TQM results in the particular setting of China's manufacturing sector, which encounters distinctive institutional, technological, and market pressures.

These gaps are bridged in this study by combining the Resource-Based View (RBV) and Contingency Theory to understand how TQM practices are facilitated by structural and technical resources, and mediated through organizational culture and innovation capability, to affect organizational performance. RBV focuses on the strategic contribution of tangible and intangible assets in developing sustained competitive advantage (Barney, 1991; Reed et al., 1996; El Nemar et al., 2025), and Contingency Theory emphasizes that organizational effectiveness relies on the alignment of internal design and external environmental contingencies (Donaldson, 2001; Sousa & Voss, 2001; Mahmud et al., 2021). Collectively, the views offer an integrated theoretical basis for describing TQM implementation in a multifaceted manufacturing context.

Therefore, this study had three aims: (1) to explore the role of organizational structure and technical resources in spanning TQM practices and organizational performance; (2) to study role of organizational culture and innovation capability in the relationship between Total Quality Management (TQM) and organizational performance; and (3) to propose a model of Total Quality Management (TQM) implementation to drive the organizational performance of China's manufacturing industry. With the qualitative research design being adopted, the study not only gives contextualized knowledge of the mechanisms by which TQM influences performance but also adds to the development of RBV and Contingency Theory within the research on quality management.

LITERATURE REVIEW

Total Quality Management and Organizational Performance

Total Quality Management (TQM) has been identified as a broad philosophy of management that places a significant stress on customer focus, continuous improvement, and employee participation (Shewhart & Deming, 1986; Juran, 2003; Ababneh, 2021). Empirical research repeatedly proved that the use of TQM practices leads to greater product quality, greater customer satisfaction, and greater operational efficiency (Prajogo & Sohal, 2006; Sadikoglu & Olcay, 2014). In production environments, TQM promotes defect reduction, cost savings, and process improvement, hence contributing to organizational performance (Kaynak, 2003; Zu, Robbins, & Fredendall, 2010). But researchers hold that the effects of TQM on performance are not equal across companies, meaning that contextual factors and mediating mechanisms must be handled (Sila, 2007; Dubey & Gunasekaran, 2015).

The Resource-Based View (RBV) Perspective

From the perspective of the Resource-Based View (Barney, 1991), companies achieve sustained competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable (VRIN) assets. In TQM, tangible assets (i.e., technology, organizational design) and intangible assets (i.e., organizational culture, innovation capacity) both contribute equally to determining performance results (Powell, 1995; Thunyachairat et al., 2024). Existing literature stresses that organizational culture—especially quality culture—can be an intangible asset that is distinct and indispensable to successful TQM execution (Detert et al., 2000; Qin et al., 2025). Similarly, the capacity for innovation sustains the transformatory role of TQM by allowing companies to rescope processes, products, and services in response to altering market needs (Terziovski, 2010; Kanan et al., 2023). Consequently, RBV constitutes a theoretical explanation of how resource bundling enhances the effectiveness of TQM.

Contingency Theory Perspective

There is no one best approach to managing, says Contingency Theory, but organizational performance is contingent on the fit between strategies, structures, and procedures and environmental conditions (Lawrence & Lorsch, 1967; Donaldson, 2001; Amhalhal et al., 2022). With regard to TQM, contingency researchers point out that organization design and compatibility across environments are significant factors in the success of quality management programs (Sousa & Voss, 2001; Aichouni et al., 2023). For instance, divisional or matrix types of organization can support cross-functional cooperation needed by TQM, and strict hierarchical types of organization can limit quality improvement activities (Rahman & Bullock, 2005; Al-Shammari, 2023). Similarly, utilization of advanced technical tools necessitates harmonization with organizational mechanisms and worker competencies in order to implement efficiently (Zeng et al., 2015; Enstroem et al., 2025). The above consideration emphasizes the need for structural and situational adjustments in realizing the full potential of TQM for performance.

Synthesis of RBV and Contingency Approaches in TQM Studies

Recent studies further indicate the significance of integrative theories with the Resource-Based View (RBV) and Contingency Theory in explaining differences in TQM efficacy among companies (Dubey et al., 2018; Barney et al., 2021; D'Oria et al., 2021). Companies gain a sustainable competitive advantage in the RBV school of thought by gaining access to valuable, rare, inimitable, and non-substitutable (VRIN) resources such as employee skills, knowledge-sharing customs, and quality culture (Barney, 1991; Prajogo & Sohal, 2006). In TQM environments, these intangible assets, particularly organization learning and innovation capability, are central to internalizing quality improvement into everyday operations and sustaining performance outcomes (Zhang et al., 2020).

In contrast, Contingency Theory emphasizes that TQM practice effectiveness is contingent upon how they enable situational variables, including structural, size, technology use, and environmental turbulence (Donaldson, 2001; Sousa & Voss, 2008). For instance, empirical research shows that small structure, flexible

communication systems, and consumer needs responsiveness significantly enhance the positive relationship between TQM and firm performance (Sadikoglu & Zehir, 2010; Yusr, 2016). At the same time, compliance with external contingencies, such as regulatory paradigms, market competition forces, and supply chain events, will enable TQM programs to realize tangible increments in efficiency, quality, and customer satisfaction. By integrating the resource leverage focus of RBV and the context-fit logic of Contingency Theory, authors propose more comprehensive theories to account for TQM performance.

Dubey et al. (2018), for instance, argue that organizational performance by TQM redesign depends on dynamic capacities of an organization to reconfigure in-house resources in relation to market forces. D'Oria et al. (2021) also ascertain that organizations with a strong quality-oriented culture and leadership resources excel under uncertainty because they can adapt practices without dissociation. This fusion prevents the limitation of adopting a single school of theories, and allows researchers to trace both the internal capabilities that facilitate TQM and the external contingencies influencing its performance. Hence, an integrated RBV-Contingency model not only explains why some firms derive superior performance from TQM while others cannot do so, but provides managers with valuable information: building unique intangible assets is required, but not enough—firms must calibrate their TQM systems to structural, technical, and environmental demands in order to deliver higher competitive performance.

RESEARCH METHODOLOGY

This study adopted a qualitative approach using in-depth interviews, with key informants purposively selected based on their roles and direct involvement in Total Quality Management (TQM) practices, (i) were supervisory or managerial personnel with direct quality decision-making authority, (ii) belonged to the major TQM-related departments like administration, executive, quality, and technical units, and (iii) were employed in companies with formal or emergent TQM activities in various industries. Geographical location was also taken into account to have different organizational settings. The data were analyzed through content analysis with open and axial coding, supported by the NVivo software program. Trustworthiness was ensured through triangulation and member checking. Contingency Theory and the Resource-Based View were applied to interpret the findings to emphasize the mechanisms among TQM practices and organizational performance.

Key Informants

The 21 key informants selected for this research were organizational representatives of manufacturing enterprises scattered in quite a number of provinces in China, such as Hubei, Jiangxi, Beijing, and Shenzhen. Participants were middle- to sen-ior-level individuals in managerial positions, including management representatives, directors, man-agers, and supervisors, who were responsible for areas such as quality assurance, technical opera-tions, and executive management. They were between 31 and 46 years of age, and their educational levels varied from an associate's degree to a master's degree, ensuring a mix of professional experi-ence and experience gained from implementing Total Quality Management (TQM).

The research engaged with active firms operating in various manufacturing industry sectors, including construction materials (e.g., concrete manufacturing), automotive parts (e.g., seating systems), medical devices (e.g., diagnostic and treatment machines), and industrial goods and trading (e.g., raw materials and semi-finished products). This focus within the manufacturing industry provided a solid foundation for studying how organizational structure, technical resources, organizational culture, and innovation capability affect the impact of TQM performance.

Data Collection

The data were collected through semi-structured interviews by an interview guide prepared to provide rich information regarding the implementation of Total Quality Management (TQM) and organizational performance. Ninth thematic issue for open-ended questions in the guide was: (1) background and motivation for implementing TQM, (2) practice of TQM step by step, (3) organizational structure support, (4) technical resources' role and complexity, (5) effect on organizational culture, (6) innovation capability inclusion, (7) performance measurement and encouragement of organizational performance, (8) problems and coping strategies, and (9) future planning and ongoing improvement. Probing questions were used in the interviews to follow up on participants' responses in order to obtain richer and more elaborative data (Robinson, 2023). The interview guide was used in a flexible way such that the researcher could modify or expand the questions to explore emerging concerns. This allowed for the collection of reflective qualitative data, which picked up the complex relationships between organizational mechanisms, TQM practices, and performance outcomes.

Data Analysis

Interview data were content analyzed to summarize recurring themes and distill theoretical insights. All interviews were first transcribed verbatim and anonymized for the purposes of presenting accurate data and protecting confidentiality. Transcripts were then open coded to lay bare important concepts, and these were then categorized and subcategorized through iterated comparison. Axial coding also assisted in synthesizing and aggregating these codes to produce broader themes applicable to TQM implementation, organizational design, technical capabilities, culture, innovation, and performance. Where possible, qualitative data analysis tools like NVivo or Atlas.ti were applied to assist in the reliability of data grouping and theme recognition

(Allsop et al., 2022). Triangulation of complementary data sources was employed to ensure the trustworthiness (Donkoh & Mensah, 2023). Member checking was also carried out with certain interviewees to establish accuracy and reliability of the thematic interpretations (McKim, 2023). The measures supplemented each other and improved both reliability and validity of findings.
Finally, the emerging themes were integrated into a narrative, and findings were compared and contrasted with Contingency Theory and Resource-Based View theoretical framework. This enabled the study to identify convergences and divergences with the literature body and make explicit theoretical contributions on the impact of TQM on organizational performance.

FINDINGS

Word frequency analysis

Word frequency analysis can reflect the core idea and theme of the text to the greatest extent. After stage division, the functions of "text search" and "word frequency statistics" of NVivo11 Pro software were used to analyze the search results of 20-word frequency from different interview questionnaires respectively, so as to understand and grasp the occurrence frequency of different keywords under specific grouping conditions. Of course, with the help of NVivo11 Pro qualitative research tools, coding keywords and counting and comparing the frequency of keywords is not the ultimate goal of word frequency analysis. The main purpose of the word frequency analysis of the interview questionnaire in this chapter is to understand and grasp the important focused keywords in the overall quality management by conducting a qualitative analysis of the frequency of occurrence and coverage of the keywords presented in each stage.

FIGURE 1Word frequency cloud

Keyword association and word frequency analysis indicate that Total Quality Management (TQM) and quality are the most pervasive themes in the data, i.e., they are most emphasized in organizational practice. The most pervasive words, including company, management, employees, technology, innovation, products, customers, and market, indicate that the TQM discourse is most entrenched in most corporate fields of management, technological innovation, human resources, and customer orientation. These results recognize that the successful deployment of TQM is not only considered a quality improvement process but also a grand strategy that has direct consequences on various organizational factors.
Thematic clustering of keywords yields five closely related thematic clusters: (1) Quality Management, emphasizing systematic quality management through the implementation of TQM; (2) Corporate Management, with organisational design, worker participation, and management attitude; (3) Technology and Innovation, with technical competences and product development being the drivers of competitiveness; (4) Customer and Market Orientation, where TQM's strategic linkage with customers' needs and market trends is emphasized; and (5) Process Improvement, emphasizing continuous improvement, improvement of efficiency, and procedural improvements. All of the above issues reflect that TQM is a link between organisational assets, strategic results, and systems.
Hierarchical coding analysis divides the data into nine dimensions as follows: background and motivation (A1), TQM practice and the evaluation of effectiveness (A2), organisational structure and implementation (A3), technical utilisation of assets and problems (A4), organisational culture (A5), innovation capacity (A6),

performance measurement and improvement (A7), problems and countermeasures (A8), and vision (A9). Among these, three dimensions emerge as most critical:

A7 - Explaining the continuous emphasis by firms to reinforce performance measurement, develop novel measurement methods, and adopt improvement mechanisms in their management systems.

A4 - Explaining the functional challenges of digital transformation, triggered by innovations in technology, integration of resources, and talent deficiencies.

A8 - Challenges and Countermeasures for the Implementation of TQM, assigning organisational challenges such as cultural conflicts, institutional rigidity, and implementation hurdles, and indicative countermeasures to mitigate these challenges.

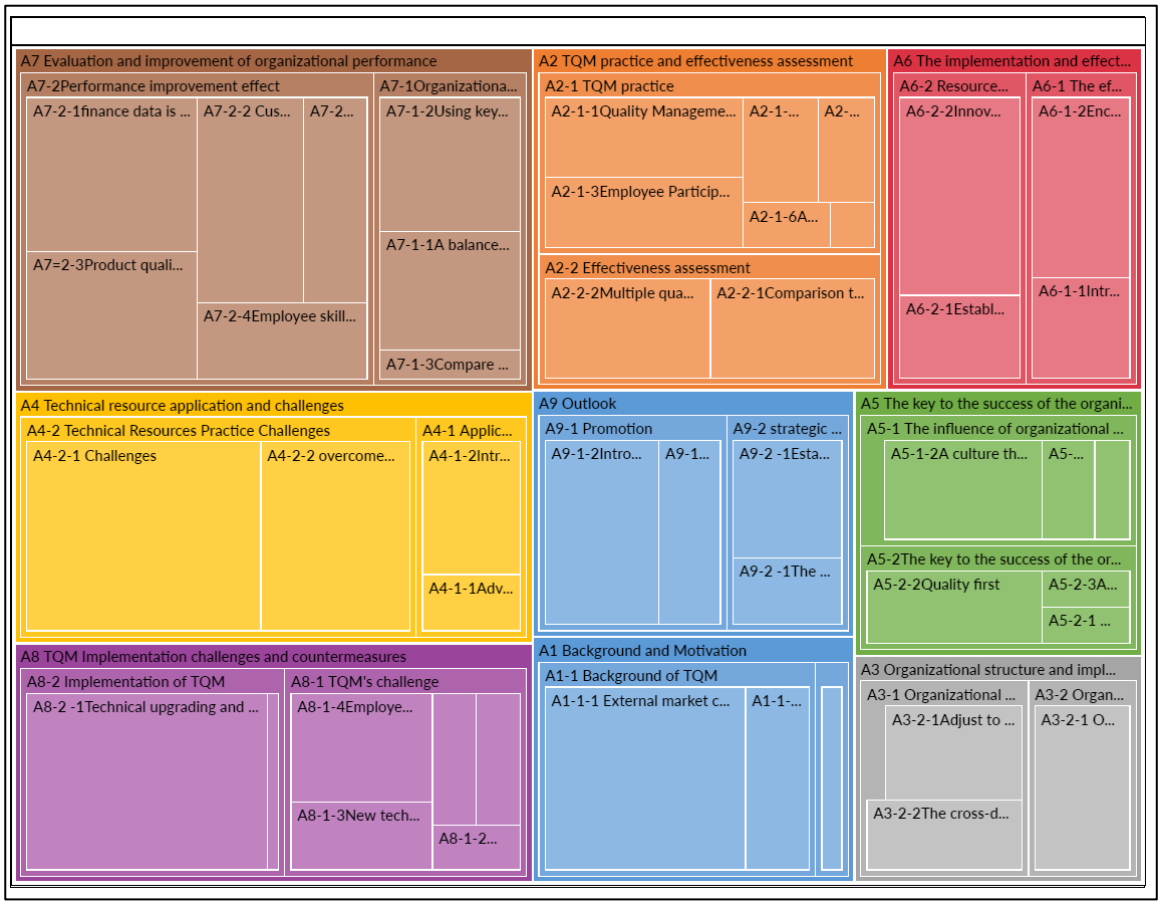

FIGURE 2Hierarchical chart

All together, these corroborate the argument that TQM in Chinese manufacturing environments transcends an issue of quality improvement; instead, it is a coherent system that integrates organisational performance, technological innovation, and adaptive management practices. Managerial practice implications are also uncovered in the results - primarily, linking TQM activities to strategy, investments in technical skills, and overcoming cultural and institutional barriers. Theoretically, the research enhances the Resource-Based View (RBV) as it identifies internal capabilities and resources as mediating variables of TQM effectiveness, and the argument of Contingency Theory can be seen in the way structural and contextual changes precondition effective TQM implementation.

TABLE 1 Open Coding, Axial Coding, and Selective Coding Summary

Selective Coding (Core Category)	Axial Coding (Analytical Category)	Open Coding (Initial Node Examples)
A1. Background and Motivation	A1-1 Background of TQM	External market competition; Internal drive; Need to improve production efficiency
	A1-2 Motivation of TQM	Industry benchmark data improved; Internal demand of enterprise
A2. TQM Practices and Effectiveness	A2-1 TQM Practice	Quality management system construction; Process control and improvement; Employee participation and training; Supervision and feedback; Supply chain management; After-sales service

	A2-2 Effectiveness Assessment	Quantitative evaluation indicators (defect rate, complaints, satisfaction, response time)
A3. Organizational Mechanisms	A3-1 Organizational Implementation	Adjustment to divisional/matrix structure; Establishment of independent quality department
	A3-2 Organizational Structure Teams	Cross-departmental quality work groups; Key roles of design, production, and service departments
A4. Technical Resources	A4-1 Application of Resources	Advanced production management software; Automation equipment; Testing instruments
	A4-2 Resource Challenges	High investment cost; Fast tech updates; Employee resistance; Training difficulties
A5. Organizational Culture	A5-1 Cultural Influence	Quality-first culture; Teamwork emphasis; Innovation-first values
	A5-2 Cultural Success Factors	Customer-first orientation; Continuous improvement culture; Collaboration and learning
A6. Innovation Capability	A6-1 Innovation Effect	Digital management tools; Employee innovation initiatives
	A6-2 Innovation Resource Balance	Flexible resource allocation; Innovation management support
A7. Performance Evaluation & Improvement	A7-1 Evaluation	Balanced Scorecard; Key Performance Indicators (KPIs)
	A7-2 Improvement	Better financial results; Higher product quality; Improved customer satisfaction; Enhanced employee skills; Greater process efficiency
A8. TQM Challenges & Countermeasures	A8-1 Challenges	Cross-department barriers; Process conflicts; Resistance to change; Inconsistent standards
A9. Outlook & Strategic Direction	A9-1 Promotion	Build quality ecosystem with suppliers/customers; Advanced quality tools (e.g., Six Sigma)
	A9-2 Strategic Alignment	TQM evaluation aligned with strategic goals; Regular assessment of TQM effects

Analysis coding reveals that Chinese manufacturing firms' Total Quality Management (TQM) is internally driven by the organization and externally driven by the market; its impact depends on related practices, structural fit, technical capability, cultural sponsorship, and innovation capacity. Research emphasizes, in particular, the fact that while TQM introduces systematic evaluation and continuous improvement into organizational performance efficiently, there are cost barriers, resistance to change, and cross-departmental issues. Overall, the findings confirm TQM as a global management philosophy that not only enhances quality, but also supports competitiveness, and is both theoretically and practically useful for enterprise transformation.

Background and Motivation for TQM Implementation

In today's globalized economic environment, enterprises are confronted with unprecedented challenges and opportunities. The rapid changes in the external market environment, particularly the intensification of competition and the ever-increasing customer demands, constitute a significant external context for business operations. Simultaneously, within enterprises, there is a pursuit to optimize management and enhance efficiency to respond to market changes and maintain competitiveness. Total Quality Management (TQM), as an advanced management philosophy and methodology, has emerged in this context, becoming a crucial means for enterprises to address challenges and achieve sustainable development.

The intensification of external market competition serves as a significant driving force for the implementation of TQM. With market liberalization and heightened competition, enterprises must continuously break through in product quality, service levels, and innovation capabilities to meet the increasingly discerning demands of customers. As one participant noted:

"We adopted TQM due to both external and internal pressures. Customers demand more customization, faster after-sales service, and more reliable products from the outside; competitors are enhancing quality while minimizing cost through Total Quality Management (TQM), thus increasing competition. Internally, there was poor coordination between departments, defective product rates were high, and production efficiency was not constant, all of which resulted in greater costs and reduced customer satisfaction. We sorely needed such a structured approach as TQM to systematize the operations in a way to relieve these problems."

Another interviewee elaborated as follows:

"Two types of key events and data prompted us to adopt TQM practices. On one hand, it was the warn-ing from operational data: Our product defective rate was as high as 10% at that time, much higher than the industry excellent level of 2% - 3%; the customer complaint rate reached 8%, and we lost nearly 200-300 million yuan in orders due to customer churn each year. In terms of finance, the qual-ity cost (including

rework cost and waste cost) accounted for 15% of the production cost, which seri-ously affected the profit level"

"It was the benchmarking effect of industry peers: We found through research that companies imple-menting TQM had an average gross profit margin 10% - 15% higher than those not implementing it, and their customer satisfaction exceeded 90%. For example, a peer enterprise in the same industry reduced the defective rate from 8% to 2% after implementing TQM, and its market share increased by 28% within one year. These data and cases made us realize that TQM was an effective way to solve our current problems, so we decided to promote TQM practice"

At the same time, customer expectations for product quality and service are also rising, with a focus not only on basic product functionality but also on reliability, durability, and after-sales service. These shifts in exter-nal demands compel enterprises to re-examine their quality management strategies and seek more efficient and comprehensive quality management methods to satisfy market and customer needs.

In addition to external driving factors, there is an urgent internal need for enterprises to implement TQM. On one hand, enterprises need to optimize production processes and improve production efficiency to reduce costs and enhance competitiveness. On the other hand, there is a need to establish a culture of continuous improvement within the organization, encouraging employees to actively participate in quality management activities and collectively elevate product quality and service levels.

TQM, as a management approach that involves whole-team participation and continuous improvement, pre-cisely meets these internal needs, making it a vital pathway for enterprises to enhance management levels and competitiveness.

In summary, the intensification of external market competition, the rise in customer demands, and the internal need to improve production efficiency and establish a culture of continuous improvement collectively form the background and motivation for TQM implementation. The adoption of TQM not only helps enterprises address market challenges and enhance competitiveness but also promotes the optimization of internal man-agement and the formation of a culture of continuous improvement.

TQM Practice and Effectiveness Assessment

In the exploration of Total Quality Management (TQM) practices, enterprises have adopted a series of com-prehensive measures to enhance product quality and service levels. These measures include the establishment of a quality control system to ensure that every stage from product design to production delivery meets high standards; the implementation of full-process control, emphasizing continuous monitoring and adjustment during production; the optimization of production processes through the introduction of new technologies and management methods to reduce waste and improve efficiency; the encouragement of whole-team par-ticipation in quality improvement activities to stimulate employees' quality awareness and innovative spirit; and the establishment of quality supervision and feedback mechanisms to ensure the timely identification and effective resolution of quality issues. Additionally, enterprises have strengthened supply chain manage-ment to ensure the stability of raw materials and components, and improved after-sales service systems to provide customers with satisfactory service experiences. The implementation of these measures has not only improved product quality but also effectively controlled production costs by reducing rework and scrap rates.

As one participant noted:

"We encourage TQM on four fronts. First, set clearly defined goals and systems based on standards such as ISO 9001 with clearly identifiable responsibility and timeline. Second, encourage worker participation through training programs, incentive schemes, and responsibility. Third, achieve end-to-end control—from design and purchase to production, testing, and after-sales servicing. Fourth, utilize technology by utilizing real-time data systems, big data, and automation in order to lower errors and improve quality."

Another interviewee mentioned:

"We quantify effectiveness of TQM against four sets of criteria: product quality, customer satisfaction, operating efficiency, and financial performance. Product quality is measured using defect rate and qualification rate, customer feedback by satisfaction rating, complaint percentage, and repeat buys, operating efficiency by production cycle time, equipment utilization, and delivery performance, and financial performance by quality costs, rework costs, and return on investment. By benchmarking pre-implementation and post-implementation outcomes and industry practices, we bring unbiased evaluation and establish areas of continued improvement."

The implementation of the aforementioned TQM practices has significantly enhanced the product quality and service levels of enterprises. The reduction in product defect rates, the decrease in customer complaint rates, and the improvement in customer satisfaction are direct reflections of the effectiveness of TQM prac-tices. These achievements have not only strengthened the market competitiveness of enterprises but also increased customer loyalty and satisfaction, bringing more market share and brand value to the enterprises. At the same time, due to the improvement in product quality, the return rates and compensation costs of enterprises have significantly decreased, further enhancing their profitability.

To comprehensively evaluate the effectiveness of TQM implementation, enterprises have adopted quantita-tive indicators for measurement. Indicators such as product defect rates, customer complaint rates, customer satisfaction survey results, and after-sales service response times are regularly collected and analyzed to objectively reflect the effects of TQM practices. Additionally, enterprises have introduced financial-related indicators, such as the proportion of quality costs to sales revenue and additional costs caused by quality

issues, to more comprehensively assess the impact of TQM practices on their financial status. By comparing data before and after implementation, enterprises can accurately determine whether TQM practices have achieved the expected goals and make continuous improvements and optimizations based on identified issues. This quantitative indicator-based evaluation method not only enhances the transparency and measurability of TQM practices but also provides robust data support for future quality management efforts.

In summary, in the practice of Total Quality Management (TQM), enterprises have significantly improved product quality and service levels through a series of comprehensive measures, including the construction of a rigorous quality control system, the implementation of full-process control, the optimization of production processes, the encouragement of whole-team participation, the establishment of quality supervision mechanisms, the strengthening of supply chain management, and the improvement of after-sales service systems. These efforts have not only enhanced the market competitiveness of enterprises and increased customer satisfaction and loyalty but have also directly improved their financial performance by reducing defect rates, customer complaints, return rates, and quality costs. Through the regular evaluation of quantitative indicators, enterprises can precisely measure the effectiveness of TQM practices and make continuous improvements accordingly, laying a solid foundation for future quality management.

Organizational Structure and Implementation

The study indicates that enterprises have made corresponding adjustments to their organizational structures to adapt to the implementation of Total Quality Management (TQM), such as adopting divisional or matrix organizational structures and establishing independent quality management departments and cross-departmental quality task forces to ensure the smooth advancement of TQM practices. Additionally, the creative planning department, production department, and quality management department play crucial roles in TQM practices.

In the context of Total Quality Management (TQM) practices, enterprises have adjusted their organizational structures to effectively promote this management model. Specifically, companies tend to adopt divisional or matrix organizational structures to meet TQM's high demands for cross-departmental collaboration and resource integration. These adjustments aim to break down traditional departmental barriers and promote information sharing and optimal resource allocation. Furthermore, enterprises have established independent quality management departments responsible for planning and overseeing the entire TQM process, ensuring the effective execution of various quality management measures. The creation of cross-departmental quality task forces further strengthens collaboration among departments, providing organizational support for the successful implementation of TQM. As participants noted:

“To support the demands of TQM, we leveled out the organization to be less vertical and more horizontal and created cross-functional teams to enhance problem-solving. We allocated quality responsibilities for every department and job so that there was full coverage, and eliminated duplications to avoid overlaps and boost efficiency in deployment of TQM.”

“Structural adjustment is there to complement TQM by enabling interdepartmental coordination, enhancing management efficiency by speeding up decisions and defining better responsibilities, and facilitating employee participation by making roles clearer and promoting participation in quality enhancement.”

Another interviewee mentioned:

“In TQM, the quality department specifies standards, audits the process, and pressures for improvement; production ensures compliance and oversees processes; R&D builds quality into design; procurement brings in consistent raw materials; and customer service collects feedback for improvement. Management helps out with resources, culture, and overall direction.”

In TQM practices, the creative planning department, production department, and quality management department play pivotal roles. The creative planning department is responsible for proposing product design solutions that meet market demands and quality standards, laying a solid foundation for TQM practices. The production department undertakes the critical task of transforming design plans into actual products, with its quality control during the production process directly determining the final product quality. The quality management department, on the other hand, is involved throughout the TQM process, not only setting and supervising quality standards but also collecting and analyzing quality data to provide a scientific basis for continuous improvement. The close collaboration among these three departments collectively drives the effective implementation of TQM practices.

The adjustments to organizational structures and the collaborative efforts of key departments in TQM practices have jointly facilitated the in-depth implementation of TQM. On one hand, the adoption of divisional or matrix organizational structures, along with the establishment of independent quality management departments and cross-departmental quality task forces, has significantly enhanced decision-making efficiency and execution capabilities, providing strong organizational support for the smooth advancement of TQM practices. On the other hand, the close collaboration among the creative planning department, production department, and quality management department ensures comprehensive quality control throughout the entire product lifecycle—from design to production and delivery—significantly improving product quality and service levels. These achievements have not only strengthened the market competitiveness of enterprises but also enhanced customer satisfaction and brand value.

Technical Resource Application and Challenges

In the realm of technical resource application, enterprises have actively introduced advanced production management software, automated production equipment, quality inspection instruments, as well as cutting-edge network construction and detection technologies. These initiatives have significantly improved production efficiency, making production processes more efficient and precise. Meanwhile, the application of quality inspection instruments ensures the stability and consistency of product quality, effectively reducing the defective rate. The advanced network construction and detection technologies provide enterprises with powerful information support, enabling them to monitor production status in real-time and respond promptly to market changes. The investment in these technical resources has not only enhanced enterprises' production capacity and market competitiveness but also provided consumers with higher-quality products and services. As one participant noted:

"We back up TQM with three technical pillars. Data collection and analysis software gather actual production and inspection data, enhancing accuracy and minimizing downtime. Intelligent detection and monitoring tools, e.g., machine vision, improve accuracy and efficiency in identifying defects. Digital management systems, e.g., QMS and CRM, provide whole-process control and swift problem tracing, minimizing customer complaints by a big percentage."

Another interviewee elaborated as follows:

"We have three main issues we encounter in the implementation of technical resources to TQM: high cost and extended payback, which we respond to with phased investment, priority to critical links, and subsidy pursuit; low capabilities of personnel, which we address with graded training, on-site support, and technical support groups; and system integration, which we handle by demanding compatibility tests, establishing joint development teams, and connecting new systems to existing ones. We also keep abreast of industry developments by tracking through research partners to preclude obsolescence."

Despite the numerous advantages brought by technical resource application, enterprises also face numerous challenges. High investment costs are the primary concern for enterprises, as advanced technology equipment and software often require substantial capital investment. Furthermore, in an increasingly competitive industry environment, the rapid iteration of technical resources poses pressure on enterprises. The difficulty of employee technology transformation is also a problem that cannot be ignored, as employees need time to adapt to and master new technologies, which to some extent affects the effective utilization of technical resources. Additionally, the rapid pace of technological updates requires enterprises to constantly update and upgrade equipment to maintain their competitiveness, undoubtedly increasing operational costs and management difficulties.

To overcome the challenges faced in technical resource application, enterprises have adopted multiple measures. Firstly, through cost control strategies, enterprises have rationally planned and allocated investments in technical resources to ensure the effective utilization of funds. Secondly, innovation-driven strategies have become key for enterprises to cope with the rapid pace of technological updates, focusing on independent research and development (R&D) and innovation capabilities to gain a competitive edge in the market.

Furthermore, enterprises have established technical evaluation teams responsible for screening and assessing advanced technologies suitable for the company's development, ensuring that investments in technical resources can bring practical benefits. Meanwhile, strengthening employee training has become an important means for enterprises to enhance employees' technical capabilities and adaptability to new technologies. Through regular technical training and exchange activities, employees can better master and apply new technologies, contributing to the development of the enterprise.

The Key to the Success of the Organizational Culture

Research has shown that organizational culture plays a crucial role in the successful implementation of Total Quality Management (TQM). Enterprises actively advocate for an organizational culture that emphasizes "quality first, continuous improvement, and team collaboration," which not only underscores the core position of quality but also promotes the concepts of continuous improvement and the importance of team collaboration. By fostering such a cultural atmosphere, enterprises can stimulate employees' pursuit of quality, facilitate practices of continuous improvement, and strengthen collaboration and communication among teams. This cultural orientation lays a solid foundation for the successful implementation of TQM, enabling enterprises to achieve excellence in quality management. As participants noted:

"Our organizational culture influences TQM participation by enhancing quality-first and customer-oriented values, open communication and teamwork, and an incentive and learning atmosphere with rewards and training. These aspects increase workers' initiative and decrease resistance, and quality improvement participation is therefore greatly enhanced."

Another interviewee mentioned:

"Successful TQM depends on four elements of culture: core values, supporting customer orientation and quality awareness; cooperation and trust, enabling teamwork and preventing resistance; learning and improvement, keeping continuous skill development and a relentless pursuit of quality; and leadership and rewards, where leaders lead by example and equitable systems of rewards reward efforts. Collectively, they provide commitments, abolish opposition, and propel continuous improvement in quality."

During the successful implementation of TQM, a series of key cultural elements play a significant role. Firstly, a customer-oriented culture urges enterprises to always prioritize customer needs, ensuring that products and services meet market expectations. Secondly, the cultivation of quality awareness makes employees highly sensitive to quality issues, enabling them to promptly identify and resolve potential quality hazards. Furthermore, the spirit of innovation encourages employees to constantly explore new quality management methods and tools to cope with the ever-changing market environment. Additionally, team collaboration emphasizes synergistic cooperation among teams, working together to achieve quality goals. These cultural elements intertwine, collectively constituting the cultural support system for the successful implementation of TQM.

To further promote the in-depth implementation of TQM, enterprises need to continuously strengthen their organizational culture. This includes deepening the core values of "quality first, continuous improvement, and team collaboration," as well as enhancing the influence of key cultural elements such as a customer-oriented culture, quality awareness, the spirit of innovation, and team collaboration. By formulating a clear organizational culture strategy, conducting targeted cultural training and promotional activities, and establishing effective incentive mechanisms, enterprises can stimulate employees' enthusiasm and creativity, promoting a deep understanding and widespread practice of TQM among all employees. Ultimately, this will help enterprises maintain a leading position in the fiercely competitive market and achieve sustainable development.

The Implementation and Effect of Innovation and Resource Balance

In pursuit of a balance between innovation and efficient resource utilization, enterprises have adopted a series of strategies. Firstly, they actively encourage employees to innovate in product design, production processes, and service flows, aiming to enhance the quality and efficiency of products and services through novel thinking and methodologies. Additionally, to cope with increasingly complex management demands, enterprises have introduced digital management tools, such as ERP systems and data analysis platforms. The application of these tools has significantly improved the accuracy and efficiency of management decisions, providing strong support for the enterprise's innovation development.

To ensure the smooth progress of innovation activities, enterprises have established flexible resource allocation mechanisms. These mechanisms adjust resource allocation flexibly according to the actual needs of innovation projects, ensuring that key innovation projects receive sufficient resource support. Furthermore, enterprises have innovated management processes by simplifying approval procedures and strengthening cross-departmental collaboration, thereby improving the execution efficiency and success rate of innovation projects. The establishment of these mechanisms not only provides a solid institutional guarantee for enterprise innovation but also stimulates employees' enthusiasm for innovation and promotes the continuous emergence of innovation achievements. As participants noted:

“We cultivate TQM through three forms of innovation. Technical innovation uses intelligent control and edge computing to minimize defects and maximize data accuracy. Management innovation uses digital platforms with artificial intelligence and big data to forecast risks, avoid problems, and streamline processes. Service innovation involves pilots and feedback with customers to enable us to enhance services and enhance satisfaction. The innovations cumulatively minimize defect rates, reduce complaints, and enhance overall quality performance.”

Another interviewee elaborated as follows:

“We balance operations and innovation with four strategic steps. We invest 15-20% of our profits in TQM initiatives at the cost of non-core resources, apply agile project management and work off-peak hours, build mechanisms to move successful innovations into routine operations immediately, and develop an innovation culture with rewards and incentives. Together, these steps provide ongoing TQM improvement along with standard work.”

By implementing the aforementioned strategies balancing innovation and resource allocation, enterprises have significantly enhanced their innovation capabilities and market competitiveness. On the one hand, the continuous development of innovation activities enables enterprises to continuously launch competitive new products and services, meeting market demands and improving customer satisfaction. On the other hand, the application of digital management tools and the establishment of flexible resource allocation mechanisms have improved enterprise operational efficiency and resource utilization, reducing costs and enhancing profitability. Therefore, enterprises have maintained a leading position in the fiercely competitive market and achieved sustainable development.

Evaluation and Improvement of Organizational Performance

In contemporary enterprise management practice, Key Performance Indicators (KPIs) and the Balanced Scorecard have emerged as two core tools for assessing organizational performance. By integrating these two methods, enterprises have established a comprehensive and multidimensional performance evaluation system. This system not only covers the financial dimension but also delves into crucial areas such as customers, internal processes, and learning and growth, enabling a thorough understanding and deep insight into organizational performance. This comprehensive evaluation model aids enterprises in accurately grasping their operational status and provides strong support for formulating and adjusting strategic decisions. As participants noted:

"We quantify performance changes from TQM by comparing the key drivers—quality, customer, efficiency, and finance—before and after implementation. Through the use of supports such as statistical analysis, fishbone diagram, 5Why, and balanced scorecard, we work on improvements separately; for instance, first-pass qualification at 100%, complaints reduced to 0%, and the cost of quality lowered by 40%."

Another interviewee elaborated as follows:

"Since we introduced TQM, we have observed definite improvements on four fronts. Product quality has been improved with defect levels significantly lower, customer service has been improved as customer satisfaction levels rose from 75% to 96%, repeat orders increased by 28%, operational efficiency has been improved with the production cycle lowered by 30%, and equipment utilization levels rose from 70% to 85%. Cumulatively, these findings point to the strong overall advantages of TQM."

To delve deeper into the improvement effects of Total Quality Management (TQM) on corporate performance, this study conducted a comparative analysis of performance data before and after TQM implementation. The results showed that in terms of financial data, key indicators such as profitability, cost control, and asset turnover significantly improved. In terms of product quality, the implementation of TQM led to a substantial decrease in product defect rates, accompanied by an increase in customer satisfaction and loyalty. Additionally, notable progress was made in customer satisfaction, employee skill enhancement, and internal process efficiency. These changes indicate that the implementation of TQM not only contributes to improving corporate financial performance but also promotes comprehensive development across multiple dimensions.

In summary, TQM, as an advanced quality management approach, has a significant impact on enhancing organizational performance. By comparing performance data before and after TQM implementation, we can clearly observe its positive effects on financial data, product quality, customer satisfaction, employee skills, and internal process efficiency. Therefore, enterprises should actively draw upon and apply TQM principles, continuously improving their quality management systems to enhance overall performance and market competitiveness. Meanwhile, enterprises should flexibly adjust and optimize their performance evaluation systems based on their actual situations to ensure the accuracy and validity of evaluation results.

TQM Implementation Challenges and Countermeasures

In the process of implementing Total Quality Management (TQM), enterprises inevitably encounter a series of challenges. Firstly, cross-departmental collaboration barriers pose a significant issue, as differences in goal setting, workflow, and information sharing among different departments lead to inefficient collaboration. Secondly, conflicts between new management processes and existing processes are also a major difficulty, as the introduction of new processes often requires employees to change their original work habits and ways of thinking, which increases the difficulty of implementation to some extent. Additionally, with the continuous emergence of new technologies and businesses, enterprises need to quickly adapt and integrate these changes to maintain their competitive advantage. Lastly, employee resistance to change is also a factor that cannot be ignored, as fear and concern about unknown changes may lead employees to have a resistant mentality towards TQM practices. As participants noted:

"Three problems we encountered while implementing TQM are employee opposition to the new way, ineffective cross-department coordination that resulted in delays, and inadequate data analysis capability, which hindered effective quality improvement."

To overcome the challenges faced in the implementation of TQM, enterprises have adopted a series of strategies and measures. At the technical level, enterprises have upgraded their technology and introduced advanced quality management software and tools to improve the accuracy and efficiency of data processing. Simultaneously, enterprises have strengthened employee training, enhancing employees' understanding and application abilities of TQM concepts through regular training and exchange activities, and improving team collaboration and communication skills. In terms of process management, enterprises have established unified quality standard implementation specifications, clarifying the responsibilities and roles of each department in quality management to ensure smooth connection between new and existing processes. Furthermore, enterprises have focused on communication with employees, explaining the necessity and benefits of change to alleviate employees' resistance to change and enhance their sense of participation and belonging. As participants noted:

"We dealt with TQM difficulties by lessening employee resistance through communication and incentives, spurring interdepartmental cooperation through senior-managed coordination teams and common platforms, and more effective use of data through professional aids, training, and computerized programs—guaranteeing continued and efficient TQM growth."

Through the implementation of the aforementioned strategies and measures, enterprises have provided strong guarantees for the smooth advancement of TQM practices. Technological upgrades and employee training have enhanced enterprises' quality management capabilities and team collaboration abilities, laying a solid foundation for the in-depth implementation of TQM. Unified quality standard implementation specifications

ensure coordination and consistency among departments in quality management, improving overall efficiency. At the same time, by strengthening communication with employees, enterprises have successfully resolved employees' resistance to change, stimulating their enthusiasm and creativity. These measures, working together, enable enterprises to effectively address the challenges in the implementation process of TQM, promoting the continuous deepening and improvement of TQM practices.

CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Conclusion

This study confirms the critical role of organizational culture, innovation capability, organizational structure, and technical resources in bridging the relationship between TQM practices and organizational performance (see Figure 3). The model of TQM implementation derived from this study. Firms that evolved to matrix or divisional structures, established independent quality departments, and launched cross-departmental task forces were more capable of overcoming functional silos, achieving resource sharing, and enabling effective TQM implementation. Similarly, uses of high-technology equipment—computer-assisted tools, testing equipment, planning tools, and automation—introduced productivity and quality using very high investment expenditures, very high replacement technology levels, as well as also adjustment issues for employees to be addressed through interventions such as employees' retraining, technical inspection, cost management, and innovation intervention.

Organizational culture and innovation capability are also identified by studies as intervening variables. Quality first culture, continuous improvement, teamwork, and customer focus cultivated employees' commitment and teamwork, and innovation ability, enabled by digital technology, flexibility of resources, and employees' self-leadership, complemented TQM performance in product type innovation, process innovation, and services and competitiveness innovation. Culture and innovation, respectively, acted as intervening mechanisms for enabling TQM practices in producing tangible performance improvement.

Finally, the study depicts a comprehensive model of TQM deployment where tools such as KPI and Balanced Scorecard facilitated multi-view measurement along finance, customer, process, and learning axes. Profitability improvement, cost control, improvement in product quality, customer satisfaction, employee competency, and process efficacy are the model's performance metrics, and issues were addressed through standardization, communication, training, and continuous improvement mechanisms.

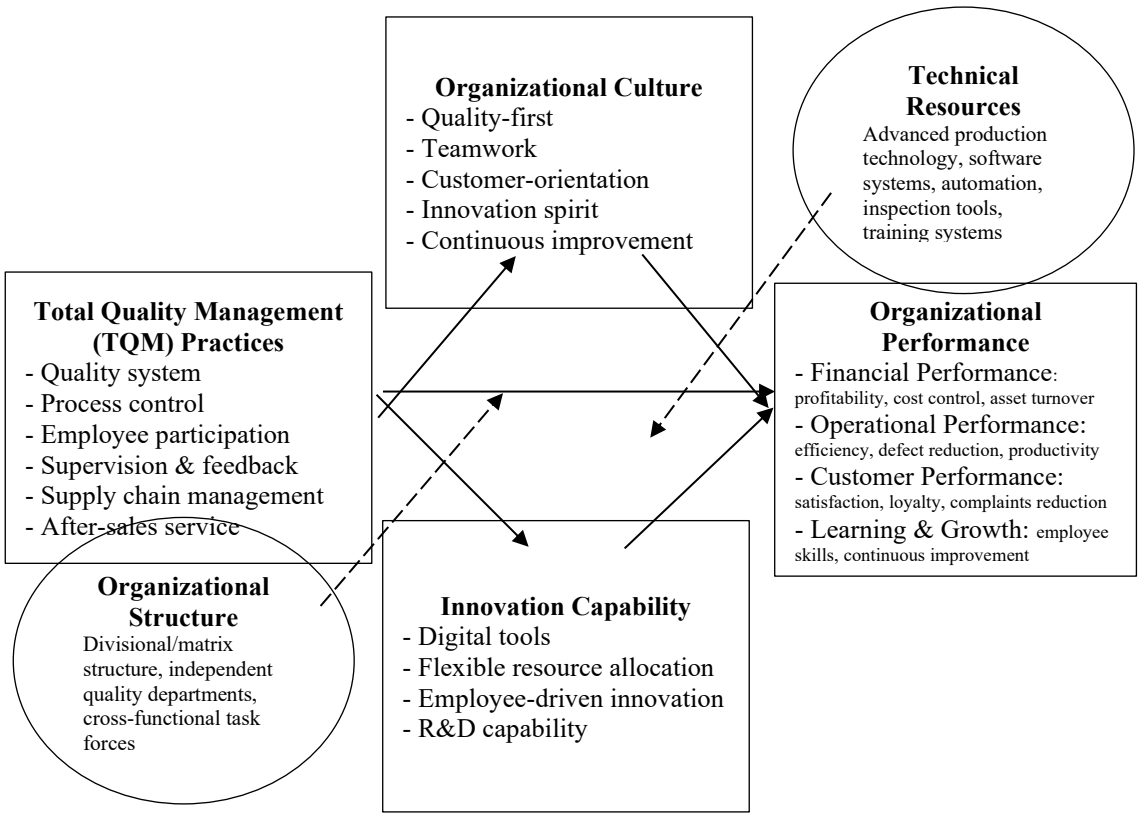

FIGURE 3 Model of Total Quality Management (TQM) Implementation to Drive the Organizational Performance of China's Manufacturing Industry

This Resource-Based View hypothesis, through capability and internal resource leverage, and Contingency Theory, through structural fit and contextuality thus constructs an integrative model to explain the effect of TQM on organizational performance in China's manufacturing industry.

Discussion

The TQM implementation model based on this research identifies the interplay role of organizational structure, technical resources, culture, and innovation capability in the determination of organizational performance. Companies that changed to matrix or divisional structures, formed independent quality departments, and developed cross-functional task forces were better able to overcome functional silos, improve resource sharing, and enable successful TQM implementation. These results are augmented by previous research that says structural flexibility and cross-functional teamwork are key facilitators of TQM success (Powell, 1995; Kaynak, 2003; Yadeta et al., 2022).

Likewise, use of advanced technology—e.g., computer-aided design and planning, test machines, and automation—improved productivity and quality performance. But with these expenditures came challenges of high cost of acquisition, high replacement rates, and employee fit issues. These findings validate earlier claims that technology embedding in quality management calls for enabling actions like retraining, technical audit, and adaptation based on innovation (Zeng et al., 2015; Tari et al., 2017). These actions are needed to counter risks and facilitate effective use of technical resources for continuous improvement in performance.

Organizational culture and innovation capability were also found to be mediating processes between TQM practices and performance outcomes. A "quality first" culture, continuous improvement, teamworking, and customer priority facilitated worker commitment and cooperation, as found in earlier research stressing culture as a key factor to maintain quality programs (Zu et al., 2010; Liao et al., 2024). At the same time, digital technology-enabled innovation capacity, flexible resource allocation, and self-leadership of personnel amplified the impact of TQM through encouraging product innovation, process innovation, and services innovation. This is in support of the view of the Resource-Based View that it places emphasis on organisational resources and innovative capacities as strategic factors for producing competitive advantage (Barney, 1991; Teece et al., 1997; Lukovszki et al., 2021).

Lastly, use of performance measurement instruments like Key Performance Indicators (KPIs) and Balanced Scorecard were found in this study to enable multi-dimensional assessment on financial, customer, process, and learning dimensions. Increase in profitability, cost reduction, quality of products, customer satisfaction, employees' ability, and process effectiveness underpin the argument that TQM has a multifaceted effect on performance of the firm (Sadikoglu & Zehir, 2010; Shbool et al., 2025). Concurrently, resistance to change issues, varying standards, and conflict processes were reduced using standardization, communication, training workers, and continuous improvement processes.

Combined, the results universalize both Contingency Theory and Resource-Based View (RBV). The RBV is confirmed with evidence that internal capabilities like innovation capability, culture, and technical resources mediate the performance impact of TQM. Contingency Theory is confirmed by evidence that structural changes—divisional structure and matrix structure—are a necessity in making organizational processes congruent to the dynamic external environment. The synthesis offers a better theoretical explanation of how TQM enhances organizational performance in the manufacturing sector in China.

Recommendations

Practical Recommendations

Practically, various prescriptions are put forward for companies that aim to leverage the performance impact of TQM. First and foremost, companies need to implement more adaptive organizational forms—e.g., divisional or matrix forms—while establishing autonomous quality departments and cross-functional teams to remove silos, provide collaboration opportunities, and implement TQM practices skillfully. Second, while innovative technology like automation, software testing tools, and web-based applications can deliver huge amounts of quality and efficiency, they must be accompanied by cost-control measures, incremental technology innovation, and regular employees' training programs to avoid adjustment issues. Third, there is a need to build a culture of quality through the first inculcation of quality values, teamwork, customer focus, and continuous improvement in HR practices, incentive systems, and training programs to create employee commitment and motivation. Fourth, there is a need for the application of innovation as a performance driver through employee-initiated activity support, digital management tool adoption, and flexible resource allocation enablement to drive product, process, and service innovation and thus improve competitiveness. Last but not least, firms ought to adopt multi-dimensional performance measurement systems through integrating the Balanced Scorecard with KPIs so that they can adopt changes in financial results, customer satisfaction, internal process efficiency, and employee improvement, and make sure that TQM performance benefits are monitored continuously and maintained.

Theoretical Contributions

Theoretically, the study makes several significant contributions. First, it builds on RBV theory by showing that intangible resources like organizational culture and innovation capability are not just support variables but mediating mechanisms that convert TQM practices into long-term performance results. Future research

must continue to theorize the connection of these "soft resources" with more concrete "hard resources," including technology and organizational structure, to delineate their interdependent effect on competitive advantage. Second, the findings enrich Contingency Theory by highlighting that structural design and contextual fit ascertain TQM implementation success. This implies that theoretical extensions are necessary to more accurately account for the influence of structural flexibility on the effectiveness of TQM within dynamic and uncertain environments. Last, the research makes a contribution to integrative modeling through the conceptual development of a comprehensive TQM model showing how structural alignment, resource integration, cultural support, and innovation come together to influence organizational performance. By spanning RBV and Contingency Theory, this integrative model enhances theoretical insight and pushes the frontiers of quality management literature.

Future Research suggestions

Future research could build on these findings in several important ways. First, industry comparisons need to be carried out to study the degree to which these mediating and moderating processes identified in this research hold true for industries like the automotive, electronics, or healthcare industries or otherwise, and if so, in what ways. Second, longitudinal studies would also yield more convincing evidence on the longitudinal development of cultural transformation, developing innovation capacity, and structural change over time, providing insights into long-term and long-lasting impacts of TQM implementation. Third, since organizational culture is also highly context-dependent, cross-cultural research comparing Chinese manufacturing companies with companies in other nations could enhance insights into how cultural diversity influences the implementation of TQM and the resultant impacts on performance outcomes.

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