SCIENTIFIC OASIS

Decision Making: Applications in Management and Engineering

Journal homepage: www.dmame-journal.org
ISSN: 2560-6018, eISSN: 2620-0104

Role of Total Quality Management and Shared Decision-Making in Enhancing Operational Performance and Enterprise Risk Management Effectiveness

Jehad Abdallah Atieh Afaneh[1,*] Khaled Mohammed Ahmed Alqasa[2]

1 Department of Management, College of Business Administration, King Faisal University, Al-Ahsa, Saudi Arabia. Email: jafaneh@kfu.edu.sa
2 College of Commerce and Business, Lusail University, Qatar. Email: kalqasa@lu.edu.qa

ARTICLE INFO

Article history:
Received 15 May 2025
Received in revised form 18 July 2025
Accepted 07 August 2025
Available online 05 September 2025

Keywords:
Total Quality Management, Enterprise Risk Management Effectiveness, Operational and Quality Performance, Shared Decision Making, Client Focus

ABSTRACT

This study examines how total quality management (TQM) contributes to enterprise risk management (ERM) effectiveness, with a focus on the mediating role of operational and quality performance and the moderating role of shared decision making. The research aims to provide insights into how quality-driven practices enhance both organizational performance and resilience against risks. A quantitative, cross-sectional design was adopted, using a structured questionnaire administered to a sample of 275 employees engaged in quality and risk-related functions. Total quality management was measured across four key dimensions, while operational and quality performance, enterprise risk management effectiveness, and shared decision making were assessed using established scales. Data were analyzed using SmartPLS to evaluate both the measurement and structural models. The results reveal that TQM has a significant positive effect on both ERM effectiveness and operational and quality performance. Operational and quality performance significantly mediates the TQM–ERM relationship, while shared decision making strengthens the link between TQM and operational and quality performance. This study integrates quality and risk management research, demonstrating that TQM's impact on ERM is enhanced through performance improvements and participatory governance, offering both theoretical advancement and practical guidance for building resilient organizations.

1. Introduction

In the modern multi-polar and competitive business world, companies have the two-fold challenge of both achieving a constant level of quality in their products and services and handling an enormous number of risks that can jeopardize their long-term operational stability and business success [36]. TQM has also developed during the recent decades as an overall philosophy, which incorporates customer orientation, improvement of processes, employee involvement, and technological improvement to promote global organizational performance [47]. Simultaneously, ERM has emerged as an encompassing approach to risk identification, assessment, mitigation, and

* *Corresponding author.*
E-mail address: jafaneh@kfu.edu.sa

https://doi.org/10.31181/dmame8220251542

management at every organizational level [21; 26]. The convergence of TQM and ERM suggests that the risks will be dealt with reactively and not proactively and on a quality basis [3; 33; 35]. The companies are also gaining the realization that quality-driven practices such as continuous improvement loops, standard operating procedures, and open reporting can assist them in expanding their capacity for predicting risks and responding promptly [15].

The empirical data of the last twenty years has a lot of evidence that supports the positive impact of TQM on the performance of the organization. Initial studies reported that application of TQM is linked to greater efficiency of processes, better quality of products and enhanced customer satisfaction [2; 41]. The more recent discoveries continue to make emphasis on the ability of TQM to develop an adaptive organizational culture that is favorable to innovation and increased sensitivity to risk [7]. Surveys that combine quality management and ERM have found that an organization that is quality driven has a superior quality risk identification procedure, a superior quality control mechanism, and a superior quality corrective action process [33; 39]. [30] discovered in their research that companies that practices strong TQM said they had high ERM maturity, which translated to greater coordination amongst departments in risk identification and mitigation efforts. The contribution of operational and quality performance as TQM outcomes that also affect risk management capability indirectly have been noted in other research [43]. In addition, shared decision making and participative leadership styles have demonstrated the ability to amplify the effect that TQM has on operational and strategic performance through the increased involvement and sharing of knowledge by a wider range of employees [9]. All these results are points towards the complication of quality management, operational performance, and risk management in ensuring organization resilience.

In spite of increasing evidence on the interdependence of ERM and TQM, numerous gaps of research still exist. Most studies have directed their main interest on the direct impact of TQM on operational performance or financial performance without considering its role in contributing to the risk management effectiveness [46]. Journals published studies integrating TQM and ERM tend to be more theoretical and descriptive with relatively weaker empirical analysis of the processes by which quality management activities can initiate improvement in ERM results [4]. Although performance on operations and quality has been widely known to be the most critical outcomes of TQM, relatively little has been researched on them as mediating variables that bridge the gap between TQM practices and improved ERM performance [37]. This hinders our knowledge on the contribution of process discipline, defect reduction and efficiency gains towards improving organizations' risk detection and response capabilities [11]. Similarly, scant empirical work has been devoted to the contextual position of shared decision making as something that can strengthen the TQM-performance link. Existing research often neglects how participatory governance practices, which encourage open communication and collaborative problem-solving, might amplify the impact of TQM initiatives on operational and quality performance [23]. These gaps underscore the need for integrated models that examine both mediating and moderating mechanisms in explaining how TQM contributes to ERM effectiveness, thereby advancing theory and practice in risk-oriented quality management.

This study aims to bridge the identified gaps by examining the mechanisms and contextual factors that shape the relationship between TQM and ERM effectiveness. The primary objective is to investigate the direct impact of TQM comprising client focus, process improvement, employee needs satisfaction, and administrative and technological readiness on ERM effectiveness. Building on this, the study seeks to determine the mediating role of operational and quality performance in translating TQM practices into improved risk management outcomes. Furthermore, the research explores whether shared decision making moderates the relationship between TQM and

operational and quality performance, enhancing the effectiveness of quality initiatives. These objectives give rise to the following research questions: How does TQM influence ERM effectiveness in organizations? To what extent does operational and quality performance mediate the relationship between TQM and ERM effectiveness? And what is the moderating effect of shared decision making on the effect of TQM on operational and quality performance? Out of these questions, the study will attempt to present an evidence-based framework of how to incorporate quality management principles into ERM strategies.

Research importance lies in the fact that it may contribute to the development of academic and practical management. Through the empirical study of mediating and moderating mechanisms between TQM and ERM performance, the study provides new data on the role of the quality-based processes in the risk strategic management [26]. The findings to the practitioners are constituting implementable pathways and these are improving the discipline of the processes, improving the quality of operations, and ensuring the participative decision making that can transform the risk responsiveness and the performance outcome [25]. This combined view is especially useful to the companies that are in turbulent markets, the ability to coordinate their efforts in terms of quality and risk management is a key to their future viability and sustainability [8; 24].

2. Literature Review

2.1 TQM and ERM effectiveness

TQM is widely regarded as a strategic framework that embeds continuous improvement, client orientation, employee participation, and technological readiness into an organization's core operations [47]. ERM effectiveness is conceptualized as the organization's ability to identify, assess, respond to, and monitor risks in ways that support strategic goals and minimize exposure [28]. Past research highlights that organizations that adopt TQM develop stronger process discipline, transparent information systems, and a culture of accountability, which naturally complement ERM routines. Studies on integrated management systems (such as ISO 9001 and ISO 31000) show that quality-based governance practices enhance cross-functional coordination and data reliability, thereby supporting timely risk detection and mitigation [15; 34; 48]. Empirical evidence also suggests that the presence of strong leadership for quality, customer-driven innovation, and employee engagement improves the quality of information flows and reduces operational blind spots, both of which are essential for effective ERM [18].

Building on these findings, it is reasonable to expect that TQM serves as a capability foundation for ERM by institutionalizing proactive sensing, documentation, and corrective-preventive actions [43]. Client focus increases attention to external risks such as customer dissatisfaction or reputational loss, while continuous process improvement enhances the precision of risk identification and assessment [9]. Satisfying workers' needs contributes to psychological safety, encouraging employees to report near-misses and irregularities that often precede risk events [10]. Administrative and technological readiness further strengthens ERM by providing the data infrastructure and analytic tools necessary for coordinated responses [20]. Together, these mechanisms suggest that higher levels of TQM maturity will significantly improve ERM effectiveness, supporting the hypothesis that TQM positively influences ERM effectiveness [33].

H1: *TQM significantly influences the ERM effectiveness.*

2.2 TQM and Operational and Quality Performance

TQM is also strongly linked to operational and quality performance, which refer to the organization's ability to produce goods and services efficiently, consistently, and in line with

customer expectations [7]. Prior research consistently reports that organizations applying TQM practices such as process standardization, employee involvement, and continuous improvement achieve lower defect rates, higher productivity, improved delivery reliability, and better customer satisfaction [32]. Meta-analyses and large-scale surveys show that leadership commitment to quality, employee empowerment, and a focus on clients and suppliers foster learning and innovation that lead to superior operational outcomes [32]. With the rise of digital technologies and Industry 4.0 tools, scholars note that integrating advanced analytics and automated quality monitoring further accelerates these gains, demonstrating that technological readiness in TQM directly enhances operational efficiency and product/service quality [31].

Drawing on these empirical insights, the theoretical expectation is that the four key dimensions of TQM client focus, process improvement, worker-need satisfaction, and administrative/technological readiness jointly create an organizational climate that prioritizes precision, error prevention, and responsive problem-solving [27]. Client focus aligns production and service processes with actual market needs, reducing waste and rework; continuous process improvement fosters systematic elimination of bottlenecks and variability; attending to workers' needs increases motivation and adherence to quality procedures; and strong administrative and technological infrastructures enable data-driven decision-making [5; 12; 48]. As these capabilities mature, they translate into tangible gains in both operational metrics and quality performance indicators, thus providing empirical support for the hypothesis that TQM positively and significantly influences operational and quality performance [38].

H2: *TQM significantly influences the operational and quality performance.*

2.3 Operational and Quality Performance as Mediator

Operational and quality performance refers to an organization's ability to deliver consistent, efficient, and customer-focused outputs by minimizing defects, streamlining processes, and fostering continuous improvement [22]. It has been identified in a significant body of empirical studies that the TQM practices, such as process standardization, employee participation, and continuous improvement, positively affect the operational reliability and compliance with the quality standards [14; 48]. These enhancements not only increase customer satisfaction and waste reduction, but also provide credible information and feedback cycles that are critical towards prompt detection of risks and proper reaction. As an example, Hargie [16] demonstrated that organizations with a high level of operational performance were more capable of converting risk assessment into actionable measures of mitigation measures, which enhanced the intermediation between quality management and effective risk management. This is an indicator that operational and quality performance is an additional important mechanism through which the benefits of TQM can be directed towards more productive and proactive risk management outputs [13].

The precursors of reputational and market risk are identified and reported, operational risk is reduced through elimination of inefficiencies and bottlenecks, and the workforce is ready to report and respond mitigation measures, and administrative and technological readiness is high to integrate data analytics, which eases the process of risk measurement [5]. These operational and quality enhancements are cumulative because it results in more robust organisational system capable of better predicting, detecting, and responding to threats [3]. Thus, operational and quality performance serves as the mediating link through which TQM exerts its influence on ERM effectiveness, reinforcing the proposition that operational excellence is not merely an outcome of quality management but also a driver of more effective risk management processes [10].

H3: *Operational and quality performance significantly mediates the relationship of TQM and the ERM effectiveness.*

2.4 Shared Decision Making as Moderator

Shared decision making refers to the collaborative involvement of managers, frontline staff, and other stakeholders in setting objectives, diagnosing issues, and formulating improvement actions [19]. In the context of TQM, shared decision making plays a pivotal role by ensuring that the insights and experiences of employees across all levels are integrated into quality improvement initiatives [39]. Prior research in participative management and quality-driven organizations suggests that inclusive decision-making processes increase buy-in, foster innovation, and enhance the alignment of improvement efforts with operational realities [40]. Empirical evidence revealed that organizations with a high level of employee involvement in decision making are more successful in their processes, quality compliance and flexibility to customer needs than the organizations characterized by top-down decision-making models [49]. To illustrate, Ju and Zhu [24] added that participatory practices enhance the application of continuous improvement initiatives, and [20] concluded that collaborative decision processes enhance responsiveness to changes in technology and the market.

According to this evidence, it is hypothesized that the positive effect of TQM on the performance of operation and quality is more significant when it is implemented in an organization whose decision-making process is not centralized [4]. Shared decision making allows employees to provide input on how the processes are not operating optimally, provide solutions for the problems that continually arise regarding quality, and be able to react in a timely manner to the emerging challenges that arise in their operations [26]. Employees become more committed to the TQM efforts when they are empowered to participate in decision making, and more likely to adhere to standardized procedures, leading to better process discipline and quality uniformity [44]. Furthermore, the incorporation of a broad base of perspectives can accelerate the learning process and problem-solving, and hence TQM activities will be translated into visible performance improvements [25]. Therefore, shared decision making is a contextual factor that reinforces the power of TQM by acting as a moderator of the relationship between TQM and operational and quality performance by enhancing the organizational climate for collaboration, innovation, and continuous improvement.

H4: *Shared decision making significantly moderates the relationship of TQM and the operational and quality performance.*

2.5 Theoretical Framework Supporting the Research

The theoretical foundation of this research is grounded in the RBV and DCT, both of which explain how internal capabilities such as TQM serve as strategic resources that can be leveraged to enhance ERM effectiveness. RBV emphasizes that organizational resources and routines, including client focus, process discipline, employee involvement, and technological readiness, are valuable, rare, inimitable, and non-substitutable assets that provide sustainable competitive advantages [6; 45]. DCT complements this by highlighting how firms continuously sense, seize, and transform resources to respond effectively to environmental uncertainties [42]. Integrating these perspectives suggests that TQM practices help develop operational and quality performance as a dynamic capability that translates quality-driven routines into effective risk identification, mitigation, and learning processes, thereby acting as a mediator between TQM and ERM effectiveness. Moreover, Shared Decision-Making Theory underscores that participative and collaborative approaches in decision processes amplify knowledge sharing, commitment, and adaptability [44], enhancing the influence of TQM on operational and quality performance. Hence, the theoretical model posits that TQM strengthens ERM effectiveness both directly and indirectly through operational and quality performance, with shared decision making acting as a contextual factor that moderates this link.

These relationships are depicted in Figure 1: Conceptual Framework (Figure 1), which visually presents TQM as the primary predictor, ERM effectiveness as the outcome, operational and quality performance as the mediating mechanism, and shared decision making as the moderating variable shaping the path between TQM and operational and quality performance.

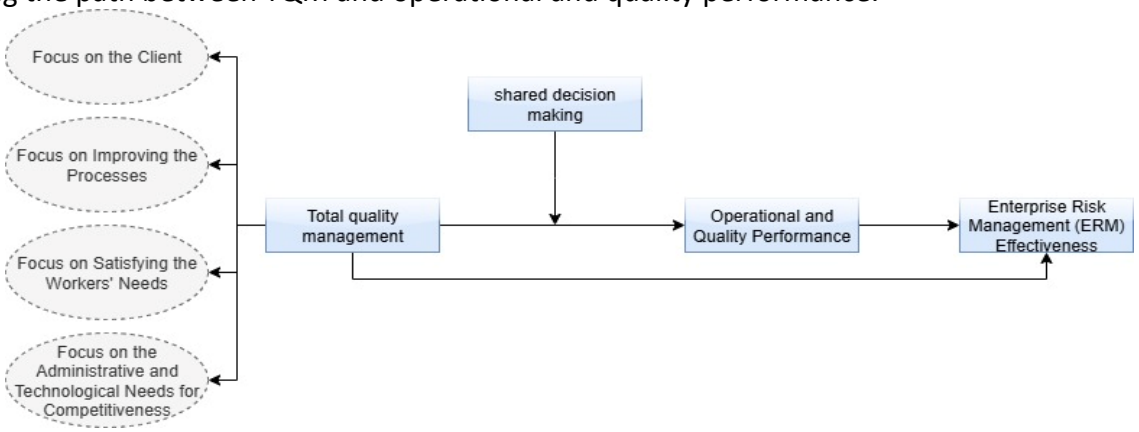

Fig.1: Conceptual Model

3. Methodology

This study employed a quantitative, cross-sectional research design to examine the relationships between TQM, operational and quality performance, ERM effectiveness, and shared decision making. The main purpose was to assess the proposed hypothesized direct, mediating, and moderating effect between the constructs in the conceptual framework proposed. The primary data collection tool was structured questionnaire, which enabled the researchers to collect the standardized answers and maintain the level of comparison of all respondents. SmartPLS, a popular structural equation modeling (SEM) tool, was chosen to analyze the hypothesized relationships, a tool that is especially suitable to predictive models, multi-faceted relationships, and that can be effectively used in studies involving relatively small to medium samples.

The sample of the study consisted of 275 respondents who were identified through purposive sampling strategy in different organizations where quality management and risk management practices were actively undertaken. This was a size that satisfied the recommended minimum size required in SEM in SmartPLS to have sufficient statistical power to identify meaningful path relationships. It was determined that these respondents were knowledgeable enough about the organizational quality and risk management systems and therefore suitable sources of information to the goals of the study.

To attain validity and reliability, the data collection instrument was designed by borrowing the well established scales of measurement used in past studies. The measurement of TQM was based on a 32 item scale created by Al-Bourini et al. [2], which includes four main dimensions of focus on the client, focus on the improvement of the processes, focus on the needs of the workers, and focus on the administrative and technological needs to be competitive. Operational and quality performance in terms of efficiency, consistency, and quality-focused results of the organization was measured based on 9-item develop by [48]. A 7-item scale borrowed from Hassan and Yazid [17] was used to measure the effectiveness of ERM, as the 7 items assess the organization in terms of its capacity to recognize, evaluate, and deal with risks strategically. The scale assessing shared decision making was 4 items created by Maeda and Socha-Dietrich [29], which addresses the aspects of participatory governance and the use of shared decision making in organizations. The rating scale for all items was a five-point Likert scale between 1 (strongly disagree) and 5 (strongly agree) and could be easily interpreted and analyzed statistically.

A pilot test was carried out involving a small number of respondents prior to the actual data

collection in order to test the clarity, relevance, and the understanding of the items applied within the particular organizational setting. Minor wording changes were done where needed so as to make the items clearer and do not change the original meaning of the item. The final questionnaire was then sent to the target respondents through the internet and paper mode to ensure that the response rate is maximized. A total of 275 complete and usable responses were obtained and included in the final analysis.

SmartPLS 4.0 was used to analyse the data to assess the measurement and structural models. To measure reliability and validity of measurement model, it was done using indicator loadings, Cronbach alpha, composite reliability and average variance extracted (AVE) which measure internal consistency and convergent validity. The heterotrait-monotrait ratio (HTMT) was used to determine the validity of discrimination between the constructs and this validity method validated the distinctiveness of the constructs. After the determination of the adequacy of the measurement model, the structural model was tested to verify the specified direct and mediating, as well as moderating, impact. Significance of path coefficients were evaluated through a bootstrapping method of 5,000 resamples which provided estimates of the standard errors, t-statistics and p-values. The model fit was also assessed by examining other indices like the standardized root mean square residual (SRMR) and the coefficient of determination (R2) which showed that the overall fit of the model is good and the model has a high capacity to explain the dependent variables.

4. Results

The measurement model (Figure 2) is evaluated and the reliability and validity of all constructs in the study reported in Table 1. The findings confirm that each of the constructs was sufficiently internally consistent with a Cronbach alpha of more than 0.70 and composite reliability of more than 0.80. This means that the indicators were always valid in measuring their latent variables. To ensure effectiveness of ERM, the alpha of Cronbach was 0.918 with the composite reliability (CR) at 0.934 which is a high degree of internal consistency. It extracted an average variance of 0.670 indicating that over 67 percent of the variance in the indicators was accounted by the construct, more than the minimum threshold of 0.50 in convergent validity.

Table 1
Variables reliability and validity

Variables	Indicator	Original Sample	Cronbach's Alpha	CR	AVE
Enterprise risk management effectiveness	ERME1	0.848	0.918	0.934	0.670
	ERME2	0.794			
	ERME3	0.814			
	ERME4	0.833			
	ERME5	0.821			
	ERME6	0.829			
	ERME7	0.788			
Total quality management					
Focus on the administrative and technological needs for competitiveness	FATNC1	0.724	0.864	0.877	0.599
	FATNC10	0.706			
	FATNC11	0.766			
	FATNC12	0.795			
	FATNC13	0.791			
	FATNC14	0.752			
	FATNC2	0.719			
	FATNC3	0.763			

Table 1 (continued)
Variables reliability and validity

Variables	Indicator	Original Sample	Cronbach's Alpha	CR	AVE
	FATNC4	0.774			
	FATNC5	0.801			
	FATNC6	0.804			
	FATNC7	0.791			
	FATNC8	0.646			
	FATNC9	0.712			
Focus on the client	FC1	0.799	0.870	0.902	0.607
	FC2	0.772			
	FC3	0.778			
	FC4	0.798			
	FC5	0.800			
	FC6	0.724			
Focus on improving the processes	FIP1	0.735	0.849	0.899	0.691
	FIP2	0.843			
	FIP3	0.835			
	FIP4	0.904			
Focus on satisfying the workers needs	FSWN1	0.703	0.872	0.900	0.531
	FSWN2	0.734			
	FSWN3	0.717			
	FSWN4	0.763			
	FSWN5	0.782			
	FSWN6	0.780			
	FSWN7	0.551			
	FSWN8	0.774			
Operational and quality performance	OQP1	0.553	0.888	0.910	0.533
	OQP2	0.683			
	OQP3	0.657			
	OQP4	0.723			
	OQP5	0.704			
	OQP6	0.792			
	OQP7	0.789			
	OQP8	0.806			
	OQP9	0.819			
Shared decision making	SDM1	0.885	0.891	0.924	0.753
	SDM2	0.848			
	SDM3	0.900			
	SDM4	0.836			

The TQM four dimensions that comprise administrative and technological competitiveness, customer orientation, process improvement, and employee satisfaction also exhibited good measurement properties. The alpha values were between 0.849 and 0.872 and composite reliability ranges were between 0.877 and 0.902. The values of all the AVEs were within the required benchmark to verify that the indicators represented the main dimensions of each dimension. Additional strong psychometric properties were also demonstrated by operational and quality performance and shared decision making. The Cronbach alpha of the operational and quality performance was 0.888, and the composite reliability was 0.910, which established the reliability of the nine indicators. The AVE value was found to be 0.533; this is higher than the 0.50 criterion, and

this value confirms the presence of convergent validity. The strongest results were seen in shared decision making, which reported a Cronbachs alpha of 0.891, composite reliability of 0.924, and AVE of 0.753, which are good indicators of reliability and validity. A combination of these results is a good indication that the measurement model is reliable and valid. The indicators of the constructs are adequate, and it enhances the level of confidence in the further analysis of the structural model presented in Figures 2 and 3.

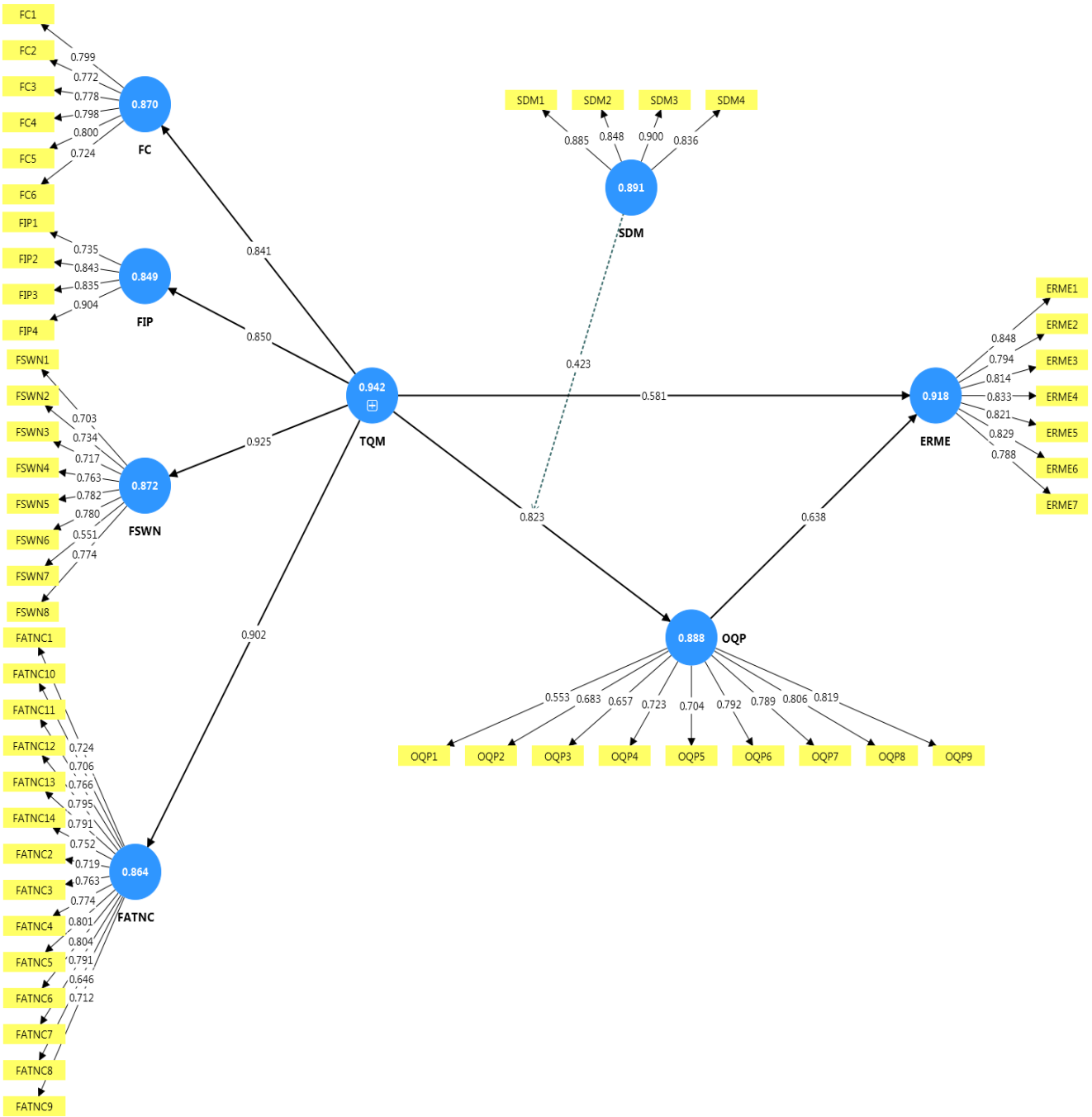

Fig.2: Estimated Model

Table 2 reports the heterotrait-monotrait ratio of correlations (HTMT) to assess the discriminant validity of the constructs. The HTMT values show the degree to which each construct is distinct from the others, with recommended thresholds being below 0.90 to confirm discriminant validity. The results reveal that all HTMT ratios across the constructs fall well below this threshold, indicating that the constructs are empirically distinct. For example, the HTMT ratio between ERM

effectiveness and operational and quality performance is 0.689, demonstrating a moderate correlation that supports discriminant validity while also confirming their theoretical linkage. Similarly, the HTMT values between the dimensions of TQM such as between focus on the client and focus on improving the processes (0.847) or between focus on satisfying the workers' needs and focus on the administrative and technological needs for competitiveness (0.818) remain below the threshold, suggesting that each dimension captures a unique facet of the TQM framework.

The ratio between shared decision making and operational and quality performance (0.752) also supports discriminant validity, implying that although shared decision making interacts with operational and quality performance, it remains a distinct construct. The HTMT value between TQM (as an overall construct) and operational and quality performance (0.888) is the highest among the reported ratios but still below the acceptable upper limit of 0.90, confirming that the two constructs are related yet conceptually distinct. These findings collectively confirm the discriminant validity of the measurement model, ensuring that the latent constructs measured in this study do not overlap excessively and represent distinct theoretical concepts. This validation enhances the robustness of the structural relationships examined in the subsequent path analysis.

Table 2
Heterotrait-Monotrait Ratio (HTMT)

	ERME	FATNC	FC	FIP	FSWNOQP	SDM	TQM
Enterprise risk management effectiveness							
Focus on the administrative and technological needs for competitiveness	0.571						
Focus on the client	0.560	0.663					
Focus on improving the processes	0.530	0.688	0.847				
Focus on satisfying the workers needs	0.610	0.818	0.778	0.881			
Operational and quality performance	0.689	0.769	0.849	0.787	0.840		
Shared decision making	0.793	0.709	0.622	0.655	0.728	0.752	
Total quality management	0.631	0.841	0.805	0.829	0.796	0.888	0.756

Table 3 presents the results of the explanatory power of the model (Figure 3) through R-square values, the effect sizes of the predictors (F-square), and overall model fit statistics. The R-square values indicate that the model has substantial explanatory power for both dependent variables. Specifically, TQM and shared decision making collectively explain 69.8 percent of the variance in operational and quality performance (R-square = 0.698), which reflects a strong predictive ability. Similarly, TQM and operational and quality performance explain 41.2 percent of the variance in ERM effectiveness (R-square = 0.412), which represents a moderate but meaningful explanatory capacity in line with other empirical studies in organizational and management research.

Table 3
R-square, F-Square, and Model Fit Statistics

	F Square		R Square	
	ERME	OQP	R Square	R Square Adjusted
Enterprise Risk Management Effectiveness			0.412	0.412
Operational and Quality Performance	0.135		0.698	0.698
Shared Decision Making		0.078		
TQM	0.017	0.759		
Model Fit				
	Saturated Model		Estimated Model	
SRMR	0.054		0.057	
d_ULS	46.737		48.759	

The F-square values indicate the magnitude of the contribution of each predictor to the endogenous variables. TQM demonstrates a small effect on ERM effectiveness (F-square = 0.017)

but a substantial effect on operational and quality performance (F-square = 0.759), highlighting the pivotal role of TQM in driving performance outcomes. Operational and quality performance exhibits a medium effect on ERM effectiveness (F-square = 0.135), supporting its mediating role in the model. Shared decision making has a modest yet meaningful effect on operational and quality performance (F-square = 0.078), reinforcing its moderating influence. The model fit indices further demonstrate that the model is well-specified, with the standardized root mean square residual (SRMR) value for the saturated model (0.054) and the estimated model (0.057) both below the recommended threshold of 0.08, indicating a good fit between the hypothesized model and the observed data. The d_ULS values for both models are also within acceptable limits, reinforcing the appropriateness of the model for structural testing.

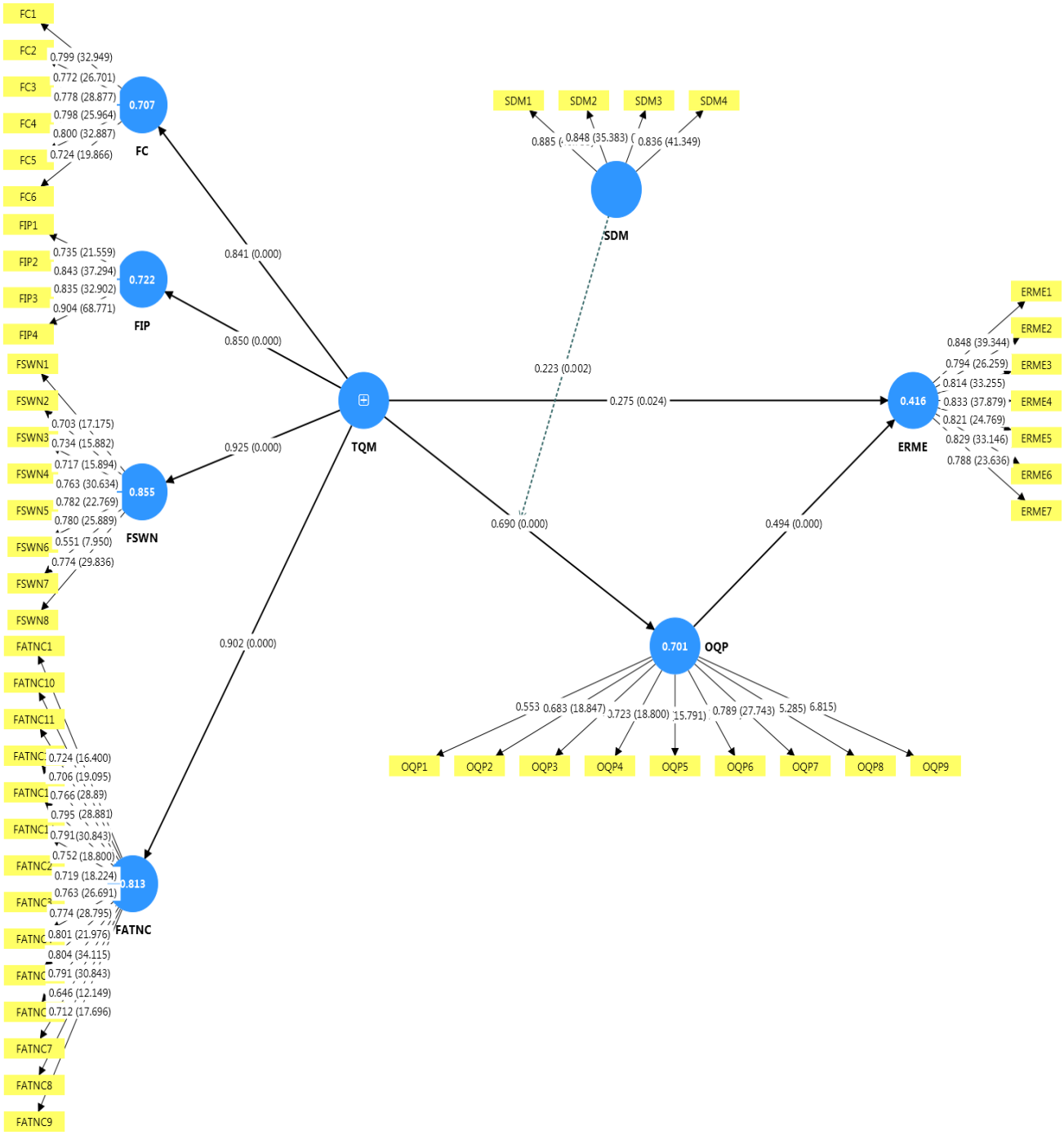

Fig.3: Structural Model for Path Analysis

Table 4 summarizes the results of the structural model and hypothesis testing using path analysis. All four hypothesized relationships are statistically significant, providing strong support for the proposed conceptual framework. The path from TQM to ERM effectiveness (H1) has a standardized coefficient of 0.275 with a p-value of 0.024, indicating a positive and significant relationship. This demonstrates that organizations with stronger quality management practices are more effective in managing enterprise-level risks. The second hypothesis (H2) shows a particularly strong relationship, with TQM positively influencing operational and quality performance ($\beta = 0.690$, $p < 0.001$), highlighting that quality-driven practices substantially enhance performance outcomes.

Table 4
Path Analysis

Hypotheses	Original Sample	Standard Deviation	T Statistics	P Values
H1: TQM significantly influences the ERM effectiveness.	0.275	0.115	2.379	0.024
H2: TQM significantly influences the operational and quality performance.	0.690	0.044	15.679	0.000
H3: Operational and quality performance significantly mediates the relationship of TQM and the ERM effectiveness.	0.341	0.063	5.413	0.000
H4: Shared decision making significantly moderates the relationship of TQM and the operational and quality performance.	0.223	0.078	2.834	0.002

The third hypothesis (H3), which examined the mediating role of operational and quality performance between TQM and ERM effectiveness, is also supported, with a path coefficient of 0.341 and a p-value of 0.000, confirming the importance of operational performance as a conduit through which TQM strengthens risk management capabilities. Finally, the fourth hypothesis (H4) is validated, as shared decision making significantly moderates the relationship between TQM and operational and quality performance ($\beta = 0.223$, $p = 0.002$), emphasizing that participatory governance enhances the effectiveness of TQM initiatives in improving performance. These results, collectively supported by significant t-statistics and low p-values, corroborate the robustness of the conceptual framework illustrated in Figure 3. The findings highlight that TQM serves as a central driver of both performance and risk management outcomes, and that its impact is amplified when mediated by operational and quality improvements and further strengthened through collaborative decision-making practices.

5. Discussion

The findings of the research provide a long-range outlook of how TQM is not only a set of tools of implementation but a strategic stage of enhancing performance outcomes and risk-management behaviours. In the present organisational environment that is characterised by unprecedented volatility, organisations are seeking models that lie between operational excellence and uncertainty tolerance. The article demonstrates that quality-based organisational behaviours like client orientation, disciplined operations, employee participation, and technological readiness extend beyond the day-to-day running of organisations by influencing the manner in which organisations perceive, recognise, and react to risks. According to the analytical synthesis of the hypotheses made, the discussion indicates that the impact that TQM has on effective ERM is non-linear, and therefore, it is moderated by operational performance and mediated by participatory decision-making process. This holistic view highlights the fact that quality and risk management integration is beyond the normal organisational formation or culture, which involves the use of frameworks and compliance standards.

The acceptance of the first hypothesis, according to which the TQM has a decisive impact on the effectiveness of the ERM, indicates the crucial role of qualitydriven practice in assessing the ability

of an organisation to detect, analyse, and react to risks in a systematic and proactive fashion. This is in line with the previous research that has identified a complementary relationship between TQM and ERM [33]. This wide-ranging effect in this study demonstrates that organisations with a client orientation, process controls, employee engagement, administrative and technology preparedness, are in a better position to entrench risk management in their organisational and strategic models. These practices produce plausible information, transparency of the processes and the ease of reporting any irregularities- factors that are essential to avoiding risks on time. These findings also complement theoretical concepts under the RBV and DCT, to the effect that capabilities forged in-house like quality-related routines are assets that can be configured according to evolving risk environments [6; 42].

This study is an empirical illustration of the fact that TQM not only represents a means to optimize ERM functions, but also a risk resilience enabler at an enterprise-wide level. It illustrates that TQM is not merely an operational improvement instrument, but also a strategic resource. The alignment of these results in relation to the previous empirical research, e.g., the integration of ISO 9001– ISO 31000 (Sadikoglu and Zehir, 2010) indicates that the success of ERM programmes often relies on the quality-oriented culture, ongoing improvement, and empowerment of staff existing in the organisation. The result also captures growing awareness that contemporary risk management is more about building systems and cultures that can sense, learn from, and react to risk in a manner conducive to sustaining long-term performance rather than adhering to compliance.

The validation of the second hypothesis, which argued that TQM has a strong impact on operational and quality performance, further substantiates the point that quality-centered practices are core building blocks of organizational prosperity. This result is in line with a wide range of literature [9; 28] showing that TQM improves process efficiency, minimizes defects, increases product and service quality, and grows responsiveness to customer demands. This essay demonstrates that the impact is significant; firms that implement TQM can bring in continuous improvement cycles and standardization procedures that not only decrease waste and variability, but also enhance coordination in and across departments and single supply chains. These improvements in operations and quality performance build an environment of discipline, dependability that in turn allows for management of risks through the provision of stable procedures and rapid feedback systems [15]. Theoretically, these results can validate the RBV that TQM skills are intangible resources that create value through improvement of the core operational abilities. Additionally, the findings are supported by data in that the ability of organizations to implement quality-oriented routines is more likely to indicate the capacity to spot environmental changeability and to re-engineer procedures to sustain high performance in the face of uncertain conditions [43]. It should be noted that this study shows that the expected positive effect of TQM on the effectiveness of ERM is two-way and is complemented by the fact that the quality practices become the measurable changes in performance. The provided empirical data further strengthens the proposition that the final outcomes of risk management are based on the risk-specific tools and models, as well as on the inbuilt quality capabilities that strengthen the processes, enhance the credibility of information, and equip employees with the capability to manage the emergent risks.

The third hypothesis, stating the presence of a mediating relationship between TQM and ERM effectiveness through operational and quality performance, is accepted, providing good information on how quality-based practices can make an organization a stronger organization. This means that the benefits of TQM to ERM are not in a vacuum but are primarily achieved by enhancing quality and operations within the organization. Consistent with the current empirical research [1; 7], findings suggest that continuous process improvement, standardisation of workflow, defect prevention, and creation of stable data systems are the practices that help develop operational

discipline and transparency and therefore are likely to make an organisation identify and respond to risks. The mediation effect highlights how TQM enhances ERM; process-based quality offers a platform on which good reporting systems, trustworthy performance measures and early warning signs, usable as risk identification and management inputs, can be constituted. The discovery is also consistent with the DCT in showing how operational and quality performance are dynamic capabilities that span the gap between resource-based practices like TQM and strategic consequences like ERM effectiveness [42]. It also enriches the RBV perspective by showing that operational excellence itself can be treated as a valuable organizational resource that enhances the strategic use of risk management frameworks. In practical terms, this finding highlights for managers that merely adopting TQM principles is insufficient for achieving risk management excellence; the true value lies in transforming these principles into tangible performance improvements improved reliability, reduced variability, and faster response times that make risk management systems more effective and actionable.

The acceptance of the fourth hypothesis, which proposed that shared decision making significantly moderates the relationship between TQM and operational and quality performance, highlights the importance of participatory governance and collaborative practices in maximizing the impact of quality initiatives. This finding suggests that when employees at different levels are actively engaged in decision-making processes related to quality improvement such as identifying process bottlenecks, suggesting corrective actions, and participating in continuous improvement efforts the benefits of TQM on operational and quality performance are significantly enhanced [34]. This outcome resonates with existing research that emphasizes the role of employee involvement and participative leadership in reinforcing TQM's success [47]. The moderating effect highlights that shared decision making fosters a sense of ownership, encourages knowledge sharing, and creates a culture of transparency and innovation, which collectively strengthen the implementation of quality practices. From a theoretical standpoint, this result supports Shared Decision-Making Theory, which argues that inclusiveness in decision processes improves organizational learning, adaptability, and commitment to quality goals [19]. It also complements the RBV and Dynamic Capabilities perspectives by illustrating that organizational culture and participatory structures can act as critical contextual factors that enhance the value of internal resources and capabilities. Practically, this finding provides a clear directive to managers and leaders: organizations seeking to leverage TQM for improved operational and quality performance should foster inclusive decision-making practices that encourage employee voice and collaborative problem solving. By demonstrating the moderating effect of shared decision making, this study shows that the pathway from TQM to performance is not merely technical but also socio-cultural, and that the full potential of quality initiatives is unlocked when employees are empowered to contribute to and influence the decisions that shape their work processes.

Taken together, the acceptance of all four hypotheses affirms the central argument of this study that TQM acts as a pivotal driver of both performance and risk management success when supported by strong operational foundations and collaborative decision-making cultures. The findings demonstrate that TQM directly enhances ERM effectiveness while also improving operational and quality performance, which in turn mediates its impact on risk-related outcomes. Moreover, the moderating role of shared decision making underscores that the effectiveness of TQM is amplified in organizations that value inclusivity and collective problem-solving. These results align with theoretical perspectives such as the RBV, DCT, and Shared Decision-Making Theory, showing that organizations gain competitive and resilient advantages by cultivating quality-oriented routines, transforming them into operational excellence, and empowering employees to contribute to decision processes.

6. Implications of the study

This research offers important theoretical contributions by integrating quality management and risk management literature through a multi-level framework that emphasizes both mediating and moderating mechanisms. By demonstrating that operational and quality performance mediates the relationship between TQM and ERM effectiveness, the study advances the RBV by identifying operational excellence as a valuable organizational resource that converts quality practices into enhanced risk responsiveness. The findings further enrich DCT by revealing that operational and quality performance functions as a dynamic capability, enabling organizations to sense, respond, and adapt to emerging risks in volatile environments. Additionally, by establishing the moderating effect of shared decision making, the study introduces participatory governance as a critical contextual factor that amplifies the performance benefits of TQM, thus bridging the gap between structural resource-based perspectives and socio-cultural approaches in organizational theory. This integration highlights that the success of quality-driven risk management is not solely determined by tangible resources or formalized processes but is also shaped by decision-making cultures and collaborative practices. Consequently, the study extends the theoretical conversation beyond direct relationships to more nuanced pathways that explain how and under what conditions TQM contributes to organizational resilience and performance, offering a more comprehensive model for future research in quality and risk management domains.

From a managerial perspective, the findings of this study provide actionable guidance for organizations seeking to improve both operational performance and risk management effectiveness through quality-driven strategies. The evidence that TQM directly enhances ERM effectiveness underscores the need for leaders to embed client focus, disciplined process improvement, employee involvement, and technological readiness as part of their core organizational practices. Furthermore, the mediating role of operational and quality performance suggests that organizations must prioritize continuous improvement, standardization, and robust performance monitoring to translate quality initiatives into tangible risk management gains. The confirmation of the moderating role of shared decision making emphasizes the importance of fostering participatory governance, empowering employees at all levels to contribute to decision-making processes related to quality improvement and risk mitigation. Such an inclusive culture not only strengthens the implementation of TQM practices but also enhances organizational learning, responsiveness, and resilience. For practitioners, the study highlights that integrating quality management with risk management requires not just technical tools or frameworks but also cultural and structural changes that encourage collaboration, transparency, and empowerment, ultimately enabling organizations to achieve sustainable performance and better navigate complex risk landscapes.

7. Limitations and Future Research Directions

Although this study provides meaningful insights into the interplay between TQM, operational and quality performance, ERM effectiveness, and shared decision making, it is not without limitations, which open avenues for future research. First, the cross-sectional design restricts the ability to make strong causal inferences about the relationships among the constructs, suggesting that future studies could employ longitudinal or experimental designs to capture the dynamic and evolving nature of quality and risk management practices over time. Second, the data were collected from organizations within a specific regional and industrial context, which may limit the generalizability of the findings; future research could test the model across diverse sectors and cultural settings to explore contextual variations and improve external validity. Third, the study relied on self-reported data, which may be influenced by common method bias and social desirability effects; subsequent research could incorporate objective performance indicators or

multi-source data to strengthen the robustness of the results. Additionally, this study focused on a limited set of mediators and a single moderator, leaving room for future exploration of other potential mediators, such as innovation capability or organizational learning, and other moderators, such as leadership style, regulatory environment, or digital transformation maturity. Future researchers may also examine the longitudinal impact of TQM-driven ERM initiatives on sustainability outcomes, including environmental and social performance, to expand the theoretical and practical relevance of the framework.

Funding

This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Grant Number KFU253460]'.

References:

[1] Abbas, J., & Kumari, K. (2023). Examining the relationship between total quality management and knowledge management and their impact on organizational performance: a dimensional analysis. *Journal of Economic and Administrative Sciences*, *39*(2), 426-451. https://doi.org/10.1108/JEAS-03-2021-0046

[2] Al-Bourini, F. A., Al-Abdallah, G. M., & Abou-Moghli, A. A. (2013). Organizational culture and total quality management (TQM). *International Journal of Business and Management*, *8*(24), 95. http://dx.doi.org/10.5539/ijbm.v8n24p95

[3] AL-Khatib, A. w. (2025). The impact of Industry 4.0 capabilities on operational performance: the mediating effect of supply chain ambidexterity. *The TQM Journal*, *37*(1), 125-149. https://doi.org/10.1108/TQM-06-2023-0193

[4] Ali, S. I., Abdulqader, D. M., Ahmed, O. M., Ismael, H. R., Hasan, S., & Ahmed, L. H. (2024). Consideration of web technology and cloud computing inspiration for AI and IoT role in sustainable decision-making for enterprise systems. *Journal of Information Technology and Informatics*, *3*(2), 4. https://qabasjournals.com/index.php/jiti/

[5] Bag, S., Rahman, M. S., Sharma, J., Chiarini, A., Srivastava, S. K., & Gupta, S. (2025). Building digital technology and innovative lean management capabilities for enhancing operational performance: An empirical study. *Production Planning & Control*, *36*(8), 1009-1028. https://doi.org/10.1080/09537287.2024.2327344

[6] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, *17*(1), 99-120. https://doi.org/10.1177/014920639101700108

[7] Biswas, D., Manna, A., & Pahari, S. (2023). Technology management (TM) on corporate sustainability performance (CSP): The moderating role of total quality management (TQM). *FIIB Business Review*, 23197145231168726. https://doi.org/10.1177/23197145231168726

[8] Crawford, J., & Jabbour, M. (2024). The relationship between enterprise risk management and managerial judgement in decision-making: A systematic literature review. *International Journal of Management Reviews*, *26*(1), 110-136. https://doi.org/10.1111/ijmr.12337

[9] Dezi, L., Hysa, X., Calabrese, M., & Mercuri, F. (2025). Open Total Quality Management in the Circular Economy age: a social enterprise perspective through the case of Patagonia. *Total Quality Management & Business Excellence*, *36*(3-4), 309-323. https://doi.org/10.1080/14783363.2022.2051698

[10] Druhova, O., & Jang, D. (2024). The role of the principles of total quality management in enterprise activity, 2524-0455. https://repo.btu.kharkov.ua//handle/123456789/56839

[11] Eastman, E. M., Ehinger, A. C., & Xu, J. (2024). Enterprise risk management and corporate tax planning. *Journal of Risk and Insurance*, *91*(3), 529-566. https://doi.org/10.1111/jori.12469

[12] Fayyaz, A., Liu, C., Xu, Y., & Ramzan, S. (2025). Effects of green human resource management, internal environmental management and developmental culture between lean six sigma and operational performance. *International Journal of Lean Six Sigma*, *16*(1), 109-140. https://doi.org/10.1108/IJLSS-04-2023-0065

[13] Gomaa, A. H. (2025). Lean 4.0: A Strategic Roadmap for Operational Excellence and Innovation in Smart Manufacturing. *International Journal of Emerging Science and Engineering (IJESE)*, *13*(4), 1-14. https://doi.org/10.35940/ijese.D2592.13050425

[14] Habib, M. A., Rizvan, R., & Ahmed, S. (2023). Implementing lean manufacturing for improvement of operational performance in a labeling and packaging plant: A case study in Bangladesh. *Results in Engineering*, *17*, 100818. https://doi.org/10.1016/j.rineng.2022.100818

[15] Hananta, S. A., & Susyanti, J. (2024). Implementation of Total Quality Management (TQM) in Organizations and Business. *International Journal of Economics and Management Research*, *3*(2), 322-332. https://doi.org/10.55606/ijemr.v3i2.227

[16] Hargie, O. (2025). Skill in practice: An operational model of communicative performance. In *The handbook of communication skills* (pp. 41-82). Routledge. https://doi.org/10.4324/9781003367796

[17] Hassan, M. F., & Yazid, A. S. (2019). The mediating effect of top management support on the relationship between organizational culture and enterprise risk management effectiveness among Malaysian public listed companies: a conceptual framework. *Research Journal of Finance and Accounting*, *10*(2), 103-111. https://doi.org/10.7176/RJFA

[18] Hchaichi, R. (2023). The key success factors of total quality management implementation in state-owned enterprise. *International Journal of Public Administration*, *46*(2), 156-167. https://doi.org/10.1080/01900692.2021.1993902

[19] Huang, X., Zhan, W., Li, C., Ma, T., & Hong, T. (2025). Collaborative decision-making of the supply chain system considering green innovation capability. *Kybernetes*, *54*(8), 4515-4548. https://doi.org/10.1108/K-10-2023-2183

[20] Ismail, M. M., Ahmed, Z., Abdel-Gawad, A. F., & Mohamed, M. (2024). Toward supply chain 5.0: An integrated multi-criteria decision-making models for sustainable and resilience enterprise. *Decision making: applications in management and engineering*, *7*(1), 160-186. https://doi.org/10.31181/dmame712024955

[21] Jermias, J., Fu, Y., Fu, C., & Chen, Y. (2023). Budgetary control and risk management institutionalization: a field study of three state-owned enterprises in China. *Journal of Accounting & Organizational Change*, *19*(1), 63-88. https://doi.org/10.1108/JAOC-06-2021-0086

[22] Jia, F., Xu, Y., Chen, L., & Fernandes, K. (2025). Does supply chain concentration improve sustainability performance: the role of operational slack and information transparency. *International Journal of Operations & Production Management*, *45*(1), 269-300. https://doi.org/10.1108/IJOPM-12-2022-0807

[23] Jiang, L. (2024). The use of blockchain technology in enterprise financial accounting information sharing. *Plos one*, *19*(2), e0298210. https://doi.org/10.1371/journal.pone.0298210

[24] Ju, C., & Zhu, Y. (2024). Reinforcement Learning-Based Model for Enterprise Financial Asset Risk Assessment and Intelligent Decision-Making. https://www.preprints.org/frontend/manuscript/76ca8d1093ca570682400636c0e05cc5/download_pub

[25] Juyal, P., Manukonda, P., Saratchandran, D., Trehan, A., Shah, K. N., & Rao, C. (2024). The Role

of Artificial Intelligence in Enhancing Decision-Making in Enterprise Information Systems. https://doi.org/10.52783/jisem.v10i3s.371

[26] Lavanya, D., Rangineni, S., Reddi, L. T., Regin, R., Rajest, S. S., & Paramasivan, P. (2024). Synergizing efficiency and customer delight on empowering business with enterprise applications. In *Data-Driven Decision Making for Long-Term Business Success* (pp. 149-163). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-2193-5.ch010

[27] Lee, K. L., Wong, S. Y., Alzoubi, H. M., Al Kurdi, B., Alshurideh, M. T., & El Khatib, M. (2023). Adopting smart supply chain and smart technologies to improve operational performance in manufacturing industry. *International Journal of Engineering Business Management*, *15*, 18479790231200614. https://doi.org/10.1177/18479790231200614

[28] Lepistö, K., Saunila, M., & Ukko, J. (2023). The effects of soft total quality management on the sustainable development of SMEs. *Sustainable Development*, *31*(4), 2797-2813. https://doi.org/10.1002/sd.2548

[29] Maeda, A., & Socha-Dietrich, K. (2018). Feasibility study on health workforce skills assessment: supporting health workers achieve person-centred care. *Paris: Organisation for Economic Co-operation and Development*. https://doi.org/10.1787/68fb5f08-en

[30] Mohsin, M., Shamsudin, M. N., Jaffri, N. R., Idrees, M., & Jamil, K. (2025). Unveiling the contextual effects of total quality management to enhance sustainable performance. *The TQM Journal*, *37*(3), 680-708. https://doi.org/10.1108/TQM-05-2023-0124

[31] Nurjannah, N., YUNUS, M. H., Nurimansjah, R. A., & Erwina, E. (2024). Total Quality Management and Productivity Performance of SMEs: The Moderating Effect of Marketing Strategy. *Quality-Access to Success*, *25*(199). https://doi.org/10.47750/QAS/25.199.30

[32] Nwokeocha, I. (2024). Total quality management in media outfits and organizational performance. *International Journal of Economic, Finance and Business Statistics*, *2*(1), 31-42. https://doi.org/10.59890/ijefbs.v2i1.1383

[33] Olaniyi, O. O., Omogoroye, O. O., Olaniyi, F. G., Alao, A. I., & Oladoyinbo, T. O. (2024). CyberFusion protocols: Strategic integration of enterprise risk management, ISO 27001, and mobile forensics for advanced digital security in the modern business ecosystem. *Journal of Engineering Research and Reports*, *26*(6), 31-49. http://content.msforpublish.com/id/eprint/4087

[34] Olayiwola, R. K., Tuomi, V., Strid, J., & Nahan-Suomela, R. (2024). Impact of Total quality management on cleaning companies in Finland: A Focus on organisational performance and customer satisfaction. *Cleaner Logistics and Supply Chain*, *10*, 100139. https://doi.org/10.1016/j.clscn.2024.100139

[35] Olson, D. L., & Wu, D. (2023). Data mining models and enterprise risk management. In *Enterprise risk management models: focus on sustainability* (pp. 119-141). Springer. https://doi.org/10.1007/978-3-662-68038-4_9

[36] Prakash, S., Sharma, V. P., Singh, R., Vijayvargy, L., & Nilaish. (2023). Adopting green and sustainable practices in the hotel industry operations-an analysis of critical performance indicators for improved environmental quality. *Management of Environmental Quality: An International Journal*, *34*(4), 1057-1076. https://doi.org/10.1108/MEQ-03-2022-0090

[37] Qulyubi, A., Suprayitno, E., Asnawi, N., & Segaf, S. (2023). Effect of company size ownership concentration auditor reputation board of commissioners and risk management committee on disclosure of enterprise risk management. *Enrichment: Journal of Management*, *13*(3), 1851-1860. https://doi.org/10.35335/enrichment.v13i3.1495

[38] Rashid, A., Rasheed, R., & Altay, N. (2025). Greening manufacturing: the role of institutional pressure and collaboration in operational performance. *Journal of Manufacturing Technology*

Management, *36*(2), 455-478. https://doi.org/10.1108/JMTM-04-2024-0194

[39] Rauf, M. A., Shorna, S. A., Joy, Z. H., & Rahman, M. M. (2024). Data-driven transformation: Optimizing enterprise financial management and decision-making with big data. *Academic Journal on Business Administration, Innovation & Sustainability*, *4*(2), 94-106. https://doi.org/10.69593/ajbais.v4i2.75

[40] Ravikumar, N. (2025). Enterprise Security Mesh Architecture: Distributed Security Decision Making in Complex Organizations. *Journal of Computer Science and Technology Studies*, *7*(7), 370-379. https://doi.org/10.32996/jcsts.2025.7.7.41

[41] Susiati, D., Judijanto, L., Suprayitno, D., & Suarni, E. (2024). Integration of total quality management (tqm) in business practice: a bibliometric analysis. *West Science Business and Management*, *2*(1), 56-63. https://doi.org/10.58812/WSBM.V2I01.736

[42] Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, *18*(7), 509-533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

[43] Tetteh, F. K., Nyantakyi, B., Owusu Kwateng, K., & Osei, H. V. (2025). The mediation role of innovation in the relationship between total quality management and performance of small and medium scale enterprises. *International Journal of Quality & Reliability Management*, *42*(2), 676-705. https://doi.org/10.1108/IJQRM-12-2021-0427

[44] Tewu, M., Suwarno, S., Lisdiono, P., Friska, R., & Pramono, A. J. (2024). Enterprise risk management and supply chain management: The mediating role of competitive advantage and decision making in improving firms performance. *Uncertain Supply Chain Management*, *12*(2), 1131-1140. http://repository.uki.ac.id/id/eprint/13224

[45] Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic management journal*, *5*(2), 171-180. https://doi.org/10.1002/smj.4250050207

[46] Xu, Z., Guo, L., Zhou, S., Song, R., & Niu, K. (2024). Enterprise supply chain risk management and decision support driven by large language models. *Academia Nexus Journal*, *3*(2). http://academianexusjournal.com/index.php/anj/article/view/10

[47] Zaid, A. A., & Sleimi, M. (2023). Effect of total quality management on business sustainability: the mediating role of green supply chain management practices. *Journal of Environmental Planning and Management*, *66*(3), 524-548. https://doi.org/10.1080/09640568.2021.1997730

[48] Zehir, S., & Zehir, C. (2023). Effects of total quality management practices on financial and operational performance of hospitals. *Sustainability*, *15*(21), 15430. https://doi.org/10.3390/su152115430

[49] Zhu, D., Li, Z., & Mishra, A. R. (2023). Evaluation of the critical success factors of dynamic enterprise risk management in manufacturing SMEs using an integrated fuzzy decision-making model. *Technological Forecasting and Social Change*, *186*, 122137. https://doi.org/10.1016/j.techfore.2022.122137