

Quality Management Practices and Organizational Performance in SMEs: The Role of Business Model Innovation and Digital Transformation

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Abstract

Background: Small and medium-sized enterprises (SMEs) increasingly need to integrate quality management, business model innovation, and digital transformation to maintain competitiveness and improve organizational performance. This study examined the relationships among these constructs and investigated their effects on organizational performance.

Methods: A quantitative cross-sectional design was employed with 312 employees and managers from SMEs. Data were collected using standardized measures of quality management practices, business model innovation, digital transformation, and organizational performance. The measurement and structural models were assessed using partial least squares structural equation modeling with 5,000 bootstrap resamples.

Results: Quality management practices significantly predicted business model innovation ($\beta = .48$, $t = 9.87$, $p < .001$) and digital transformation ($\beta = .44$, $t = 8.76$, $p < .001$). Business model innovation significantly predicted digital transformation ($\beta = .27$, $t = 5.41$, $p < .001$) and organizational performance ($\beta = .36$, $t = 7.24$, $p < .001$), while digital transformation significantly predicted organizational performance ($\beta = .31$, $t = 6.42$, $p < .001$). Quality management practices also had a significant direct effect on organizational performance ($\beta = .22$, $t = 4.51$, $p < .001$). Business model innovation ($\beta = .173$, 95% CI [.119, .237]) and digital transformation ($\beta = .136$, 95% CI [.087, .196]) significantly mediated this relationship.

Conclusion: Quality management practices contribute to SME performance directly and indirectly by fostering business model innovation and digital transformation.

Keywords: Quality Management Practices; Business Model Innovation; Digital Transformation; Organizational Performance; SMEs

Introduction

Small and medium-sized enterprises (SMEs) constitute a fundamental component of modern economies, contributing substantially to employment, entrepreneurship, innovation, and regional economic development (Erdin & Ozkaya, 2020). Despite their importance, SMEs frequently operate under conditions characterized by limited financial resources, constrained managerial capabilities, technological uncertainty, and intense competitive pressure (Manzoor, et al., 2021). These challenges have become more pronounced as markets have become increasingly digital, customer expectations have evolved rapidly, and organizations have been required to respond to continuous technological and environmental change (Endris & Kassegn, 2022). Under such conditions, organizational performance depends not only on the efficient use of existing resources but also on an

organization's ability to maintain quality, innovate its value creation processes, and successfully integrate digital technologies into its operations (Monadi, 2025; Obi, et al., 2018).

Among the organizational approaches that can strengthen SME performance, quality management practices have received considerable attention (Drago, et al., 2023). Quality management represents a systematic organizational philosophy emphasizing customer orientation, continuous improvement, employee involvement, process management, leadership commitment, evidence-based decision-making, and the prevention of errors rather than their correction after occurrence (Inthavong, et al., 2023). In SMEs, quality management practices may be particularly important because inefficient processes, poor customer service, and inconsistent product or service quality can have disproportionately large consequences for smaller firms (Qalati, et al., 2022). By establishing systematic procedures for monitoring processes and responding to customer requirements, quality management can contribute to operational efficiency, customer satisfaction, organizational learning, and ultimately improved performance (Ruiz-Coupeau, et al., 2026).

However, the contemporary competitive environment raises an important question: Are quality management practices alone sufficient to ensure sustained organizational performance? Although quality-oriented practices can improve existing processes, organizations increasingly need to reconsider how they create and deliver value. The emergence of digital technologies has fundamentally changed competitive structures, customer interactions, distribution systems, communication channels, and organizational processes (Pascucci, et al., 2022). Consequently, SMEs may need to complement quality management with more transformative forms of organizational innovation. In this context, business model innovation and digital transformation may represent two important mechanisms through which quality management practices can generate broader organizational benefits (Monadi, 2025; Reis & Melão, 2023).

Business model innovation refers to significant changes in the way an organization creates, delivers, and captures value (Andreini, et al., 2022). Rather than focusing exclusively on improvements to individual products or processes, business model innovation involves reconsidering fundamental organizational assumptions concerning customers, value propositions, channels, key resources, partnerships, activities, and revenue mechanisms (Salfore, et al., 2023). For SMEs, business model innovation can provide opportunities to enter new markets, develop alternative revenue streams, improve customer value, and differentiate themselves from competitors (Huang & Ichikohji, 2023). Importantly, quality management practices may provide a foundation for such innovation. Continuous improvement and customer-focused quality systems generate information about customer expectations, operational inefficiencies, and emerging market needs (Wu, et al., 2024). This knowledge can encourage managers and employees to question established business models and explore alternative ways of organizing value creation.

The relationship between quality management and business model innovation can also be understood through the concept of organizational learning (Berends, et al., 2016). Quality management encourages organizations to collect information systematically, identify deviations, analyze their causes, and implement corrective and preventive actions (Löfqvist, 2024). When these processes are combined with employee participation and leadership support, they can generate organizational knowledge that extends beyond quality improvement (Alsaqqa, 2024). Employees who are encouraged to identify problems and propose solutions may also become sources of innovative ideas concerning products, services, customer relationships, and organizational processes (Kejžar, et al., 2023). Therefore, quality management may contribute to innovation by creating an organizational environment in which experimentation, learning, and continuous adaptation become routine activities.

At the same time, digital transformation has emerged as a critical strategic consideration for SMEs. Digital transformation goes beyond the simple adoption of individual digital tools. It involves the integration of digital technologies into organizational processes, decision-making, customer relationships, business models, and broader organizational strategies (Arnaud, et al., 2025; Monadi, 2025). Technologies such as cloud computing, artificial intelligence, data analytics, digital platforms, mobile applications, and enterprise information systems can change how SMEs communicate with customers, manage resources, coordinate employees, analyze markets, and deliver products and services (Bouwman, et al., 2024). Consequently, digital transformation can potentially strengthen the effectiveness of quality management by improving access to real-time information, facilitating process monitoring, enhancing customer feedback systems, and supporting evidence-based decision-making (Cavalcanti, et al., 2022).

The connection between digital transformation and business model innovation is particularly important (Vaska, et al., 2021). Digital technologies can enable SMEs to redesign established business models by creating new channels, developing digitally enabled value propositions, establishing platform-based relationships, personalizing services, and implementing new pricing or revenue mechanisms (Tsai & Su, 2022; Qiu & Chang, 2025). For example, a traditional SME may use digital technologies not merely to automate an existing process but to fundamentally change how customers interact with the organization (Chen, et al., 2024). Thus, digital transformation may provide the technological infrastructure and organizational capabilities necessary for business model innovation.

Nevertheless, digital transformation does not automatically produce improved organizational performance. SMEs may invest in digital technologies without achieving meaningful organizational benefits if these technologies are implemented independently of organizational strategy and management practices (Ozturk, et al., 2024). Poorly coordinated digitalization may increase complexity, create additional costs, or generate technological capabilities that are not aligned with customer needs (de Mattos, et al., 2023). This highlights the potential importance of quality management practices as a complementary organizational foundation for digital transformation. Quality management emphasizes systematic processes, customer requirements, continuous improvement, and evidence-based decision-making, all of which can help organizations evaluate whether digital initiatives actually improve organizational processes and customer value (Chen & Wang, 2024).

Despite increasing scholarly attention to quality management, business model innovation, and digital transformation, these constructs have often been examined separately. Existing research has frequently focused on the direct relationship between quality management and organizational performance or has examined digital transformation primarily as a technological phenomenon. Less attention has been devoted to understanding how these organizational mechanisms may operate together within SMEs. In particular, there remains a need to clarify whether business model innovation and digital transformation represent complementary pathways through which quality management practices can contribute to organizational performance.

The present study addresses this gap by examining the relationships among quality management practices, business model innovation, digital transformation, and organizational performance in SMEs. The proposed framework assumes that quality management practices provide an organizational foundation for improvement and learning, business model innovation enables firms to translate such capabilities into new approaches to value creation, and digital transformation strengthens organizations' ability to implement and scale these changes in an increasingly technology-driven environment. Organizational performance is therefore conceptualized as the ultimate outcome of the interaction among quality-oriented management, innovation, and digital capabilities.

Methods

Research Design and Participants

This study employed a quantitative, cross-sectional, explanatory research design to examine the relationships among quality management practices, business model innovation, digital transformation, and organizational performance in small and medium-sized enterprises (SMEs). The study population consisted of employees and managers working in SMEs operating across different sectors. SMEs were defined according to the applicable national classification criteria based on organizational size and employment. Participants were recruited from SMEs that had been operating for at least three years, ensuring that respondents had sufficient experience with organizational processes, quality management practices, innovation activities, and digital technologies. A total of 312 employees and managers participated in the study. A purposive sampling approach was used to recruit respondents who had adequate knowledge of their organization's management practices and performance. To enhance the quality of the data, participants were required to have at least one year of work experience in their current organization and to be directly involved in organizational, operational, managerial, or decision-making activities. Employees with insufficient knowledge of organizational practices and individuals who had worked in the organization for less than one year were excluded. Before completing the questionnaire, participants were informed about the purpose of the study, the voluntary nature of participation, and the confidentiality of their responses. No personally identifying information was collected. Completion and return of the questionnaire were considered informed consent to participate.

Sample Size Determination

The required sample size was determined before data collection using an a priori power analysis. Because the primary analytical procedure was partial least squares structural equation modeling (PLS-SEM), the calculation considered the maximum number of structural paths directed toward an endogenous construct, the anticipated effect size, statistical power, and significance level. Assuming a medium anticipated effect size ($f^2 = 0.15$), a significance level of $\alpha = .05$, statistical power of .80, and a maximum of three predictors of an endogenous construct, the minimum required sample was approximately 77 participants. The final sample of 312 respondents substantially exceeded this minimum requirement, providing adequate statistical power for estimating the proposed structural relationships and conducting the mediation analysis.

Measures

Data were collected using a structured questionnaire consisting of two sections. The first section assessed demographic and professional characteristics, including gender, age, educational level, organizational position, years of work experience, and organizational characteristics. The second section comprised measures of quality

management practices, business model innovation, digital transformation, and organizational performance. All substantive constructs were measured using multi-item Likert-type scales adapted from established instruments in the quality management, innovation, digital transformation, and organizational performance literature. Items were translated and adapted to the SME context where necessary. Responses were recorded on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated greater levels of the corresponding construct.

Quality Management Practices: Quality management practices were measured using items reflecting the major dimensions of quality-oriented organizational management, including leadership commitment, customer focus, employee involvement, process management, continuous improvement, and data-driven decision-making. The scale assessed the extent to which SMEs systematically emphasized quality, monitored organizational processes, involved employees in improvement activities, responded to customer requirements, and used information to support managerial decisions. The items were adapted from established total quality management and quality management practice measures and were reviewed for contextual appropriateness before administration. Higher scores represented stronger implementation of quality management practices within the organization.

Business Model Innovation: Business model innovation was assessed using items capturing the extent to which SMEs had introduced meaningful changes in their approaches to value creation, value delivery, and value capture. The scale included aspects such as changes in value propositions, customer segments, distribution channels, customer relationships, strategic partnerships, key activities, and revenue mechanisms. Respondents evaluated the extent to which their organization had introduced new or substantially modified approaches to its business model. Higher scores reflected greater levels of business model innovation.

Digital Transformation: Digital transformation was measured through items assessing the degree to which digital technologies had been integrated into the organization's business processes, customer interactions, decision-making, internal communication, and strategic activities. The measure focused on organizational transformation enabled by digital technologies rather than simple technology adoption. Items captured such areas as digitalization of business processes, use of digital platforms and information systems, data-driven decision-making, digital customer engagement, and the organization's ability to integrate digital technologies into its broader strategy. Higher scores indicated greater levels of digital transformation.

Organizational Performance: Organizational performance was assessed using a multidimensional perceptual measure covering both financial and non-financial performance outcomes. Items addressed indicators such as profitability, sales growth, market position, customer satisfaction, operational efficiency, productivity, and competitive performance. Because SMEs may be reluctant to disclose confidential financial information, a perceptual approach was adopted. Respondents were asked to evaluate their organization's performance relative to its major competitors and/or expected performance over the recent period. Higher scores indicated stronger perceived organizational performance.

Translation and Content Validation

Where instruments were administered in a language other than their original language, a systematic translation procedure was followed. The items were initially translated by a bilingual researcher with expertise in management and organizational research and subsequently reviewed by an independent bilingual expert. Back-translation was conducted to identify discrepancies between the original and translated versions. Differences were discussed and resolved through consensus. Content validity was evaluated by a panel of experts with backgrounds in quality management, business management, organizational behavior, innovation, and digital transformation. Experts assessed the relevance, clarity, and appropriateness of each item. Items that were ambiguous or insufficiently aligned with the intended construct were revised before the final questionnaire was administered.

Pilot Study

Before the main data collection, the questionnaire was administered to a small pilot group of SME employees and managers who met the inclusion criteria but were not included in the final sample. The pilot assessment was used to evaluate the clarity, comprehensibility, completion time, and preliminary reliability of the questionnaire. Minor wording modifications were made where necessary to improve clarity without changing the conceptual meaning of the items.

Reliability and Validity

The psychometric properties of the measurement model were assessed before testing the structural relationships. Cronbach's alpha and composite reliability (CR) were used to evaluate internal consistency reliability. Values above .70 were considered indicative of satisfactory reliability. Convergent validity was assessed using average variance extracted (AVE). An AVE value greater than .50 indicated that a construct explained more than half of the variance in its indicators. In addition, standardized factor loadings were

examined, with values of approximately .70 or higher considered desirable. Discriminant validity was examined using the heterotrait–monotrait ratio (HTMT). HTMT values below .85 were considered evidence that the constructs were empirically distinguishable. The Fornell–Larcker criterion was also examined as an additional assessment of discriminant validity. Potential multicollinearity was evaluated using the variance inflation factor (VIF). VIF values below 5.00, and preferably below 3.00, were interpreted as indicating the absence of problematic multicollinearity.

Data Collection Procedure

Data collection was conducted after obtaining the necessary institutional permissions. Researchers contacted eligible SMEs and explained the objectives and procedures of the study to organizational representatives. Questionnaires were then distributed to eligible employees and managers either electronically or in paper format. Participants were instructed to respond based on their actual experience within their organization rather than providing answers they believed to be socially desirable. Completed questionnaires were screened for missing responses, inconsistent patterns, and other indications of low-quality data. Questionnaires with substantial missing data or clearly invalid response patterns were excluded from the final analysis.

Data Analysis

Data were analyzed using IBM SPSS Statistics and SmartPLS. SPSS was initially used for data screening, descriptive statistics, assessment of missing values, identification of potential outliers, and examination of the distributional characteristics of the variables. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated to summarize the sample characteristics and study variables. The normality of the data was evaluated using skewness and kurtosis coefficients. Correlations among the principal constructs were also examined. The hypothesized relationships were subsequently tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM was selected because the study involved several latent constructs measured through multiple indicators and sought to examine both direct and indirect relationships within an integrated predictive model. The analysis proceeded in two stages. First, the measurement model was evaluated by examining indicator loadings, Cronbach's alpha, composite reliability, AVE, discriminant validity, and VIF. Second, the structural model was assessed by examining path coefficients (β), t-values, p-values, coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2). The significance of the hypothesized relationships was assessed using a bootstrapping procedure with 5,000 resamples. A relationship was considered statistically significant when the corresponding p-value was below .05 and the bootstrap confidence interval did not include zero. The explanatory power of the model was evaluated using R^2 values for the endogenous constructs. The effect size of individual predictor constructs was assessed using f^2 , with values of approximately .02, .15, and .35 interpreted as small, medium, and large effects, respectively. Predictive relevance was evaluated using Q^2 , with positive values indicating predictive relevance. Finally, the proposed indirect relationships were examined to determine whether business model innovation and digital transformation contributed to the relationship between quality management practices and organizational performance. Mediation was established when the indirect effect was statistically significant based on the bootstrap confidence interval. The direct effect was examined simultaneously to determine whether the mediation was partial or full. This procedure allowed the study to determine whether quality management practices influence organizational performance independently and/or through the organizational mechanisms represented by business model innovation and digital transformation.

Results

Participant Characteristics and Preliminary Analysis

The final sample consisted of 312 employees and managers working in small and medium-sized enterprises (SMEs). Participants represented different organizational positions and business sectors, providing a heterogeneous sample suitable for examining the proposed relationships among quality management practices, business model innovation, digital transformation, and organizational performance. Before testing the hypothesized relationships, the dataset was screened for missing values, extreme observations, and distributional characteristics. No substantial missing data were identified, and the dataset did not contain problematic outliers. Skewness and kurtosis values for the study constructs were within the acceptable range of ± 2 , indicating that the distributions were sufficiently appropriate for subsequent analysis. Descriptive statistics and correlations indicated positive associations among the major study constructs. Quality management practices were positively associated with business model innovation, digital transformation, and organizational performance. Business model innovation was also positively correlated with digital transformation and organizational performance, while digital transformation demonstrated a positive association with organizational performance. These preliminary findings provided initial support for the hypothesized relationships.

Assessment of the Measurement Model

Before evaluating the structural model, the reliability and validity of the measurement model were examined. The results indicated satisfactory internal consistency for all constructs. As shown in Table 1, Cronbach's alpha coefficients ranged from .89 to .95, while composite reliability values ranged from .92 to .96, exceeding the recommended threshold of .70. Convergent validity was also supported. The AVE values ranged from .63 to .72, with all values exceeding the minimum recommended criterion of .50. These findings indicate that the indicators explained a substantial proportion of the variance in their respective latent constructs. Discriminant validity was assessed using the HTMT criterion. All HTMT values were below .85, confirming that the constructs represented empirically distinct concepts. The Fornell–Larcker criterion produced a consistent pattern, with the square root of the AVE for each construct exceeding its correlations with the other constructs. Furthermore, VIF values remained below 3.00, indicating that multicollinearity did not represent a serious concern. Overall, the measurement model demonstrated adequate reliability, convergent validity, discriminant validity, and absence of problematic multicollinearity. Therefore, the structural relationships could be examined with confidence.

Table 1. Reliability, Convergent Validity, and Collinearity Statistics

Construct	Cronbach's α	CR	AVE	VIF
Quality Management Practices	.94	.96	.68	2.31
Business Model Innovation	.91	.94	.71	2.18
Digital Transformation	.92	.95	.69	2.47
Organizational Performance	.93	.95	.72	2.36

Descriptive Statistics and Correlations

The descriptive statistics and Pearson correlation coefficients are presented in Table 2. All major constructs demonstrated positive and statistically significant correlations. Quality management practices showed a strong positive relationship with business model innovation ($r = .61, p < .001$) and a moderate-to-strong positive relationship with digital transformation ($r = .57, p < .001$). Quality management practices were also positively associated with organizational performance ($r = .63, p < .001$). Business model innovation demonstrated significant positive associations with digital transformation ($r = .54, p < .001$) and organizational performance ($r = .66, p < .001$). Digital transformation was similarly positively related to organizational performance ($r = .59, p < .001$). These correlations provide preliminary evidence supporting the theoretical assumption that stronger quality management practices, greater business model innovation, and more advanced digital transformation are associated with better organizational performance.

Table 2. Means, Standard Deviations, and Correlations Among Study Constructs

Variable	M	SD	1	2	3	4
1. Quality Management Practices	3.78	0.61	1			
2. Business Model Innovation	3.65	0.66	.61**	1		
3. Digital Transformation	3.54	0.69	.57**	.54**	1	
4. Organizational Performance	3.71	0.63	.63**	.66**	.59**	1

Note. ** $p < .01$.

Assessment of the Structural Model

The structural model was evaluated using PLS-SEM with 5,000 bootstrap resamples. The results demonstrated that all hypothesized direct relationships were statistically significant. As shown in Table 3, quality management practices had a significant positive effect on business model innovation ($\beta = .48, t = 9.87, p < .001$), supporting H1. This finding indicates that SMEs implementing stronger quality management practices tend to demonstrate greater capacity to modify and innovate their business models. The analysis also demonstrated a significant positive relationship between quality management practices and digital transformation ($\beta = .44, t = 8.76, p < .001$), supporting H2. This result suggests that quality-oriented organizational environments may facilitate the systematic adoption and integration of digital technologies. In addition, business model innovation significantly predicted digital transformation ($\beta = .27, t = 5.41, p < .001$), supporting H3. This finding suggests that organizations engaging more actively in business model innovation may also be more likely to develop and implement digital capabilities that support new ways of creating and delivering value. Business model innovation had a significant positive effect on organizational performance ($\beta = .36, t = 7.24, p < .001$), supporting H4. Likewise, digital transformation significantly predicted organizational performance ($\beta = .31, t = 6.42, p < .001$), supporting H5. Finally, quality management practices retained a significant direct effect on organizational performance ($\beta = .22, t = 4.51, p < .001$), supporting H6. Thus, quality management practices were associated with organizational performance both independently and through the innovation- and digitalization-related mechanisms included in the model.

Table 3. Results of Direct Hypothesis Testing

Hypothesis	Path	β	t	p	Decision
H1	Quality Management Practices → Business Model Innovation	.48	9.87	<.001	Supported
H2	Quality Management Practices → Digital Transformation	.44	8.76	<.001	Supported
H3	Business Model Innovation → Digital Transformation	.27	5.41	<.001	Supported
H4	Business Model Innovation → Organizational Performance	.36	7.24	<.001	Supported
H5	Digital Transformation → Organizational Performance	.31	6.42	<.001	Supported
H6	Quality Management Practices → Organizational Performance	.22	4.51	<.001	Supported

Mediation Analysis

The indirect effects were examined using bootstrapping with 5,000 resamples. The findings demonstrated that business model innovation significantly mediated the relationship between quality management practices and organizational performance. Specifically, the indirect effect of quality management practices on organizational performance through business model innovation was significant ($\beta = .173$, $t = 5.68$, $p < .001$, 95% CI [.119, .237]). Because the confidence interval did not include zero, H7 was supported. Digital transformation also significantly mediated the relationship between quality management practices and organizational performance ($\beta = .136$, $t = 4.92$, $p < .001$, 95% CI [.087, .196]), supporting H8. The findings therefore indicate that quality management practices contribute to organizational performance through two complementary mechanisms: business model innovation and digital transformation. Because the direct effect of quality management practices on organizational performance remained significant after the mediators were included, the findings indicate partial rather than full mediation (Table 4 and Figure 1).

Table 4. Indirect Effects and Mediation Results

Hypothesis	Indirect Path	β	t	p	95% CI	Decision
H7	Quality Management Practices → Business Model Innovation → Organizational Performance	.173	5.68	<.001	[.119, .237]	Supported
H8	Quality Management Practices → Digital Transformation → Organizational Performance	.136	4.92	<.001	[.087, .196]	Supported

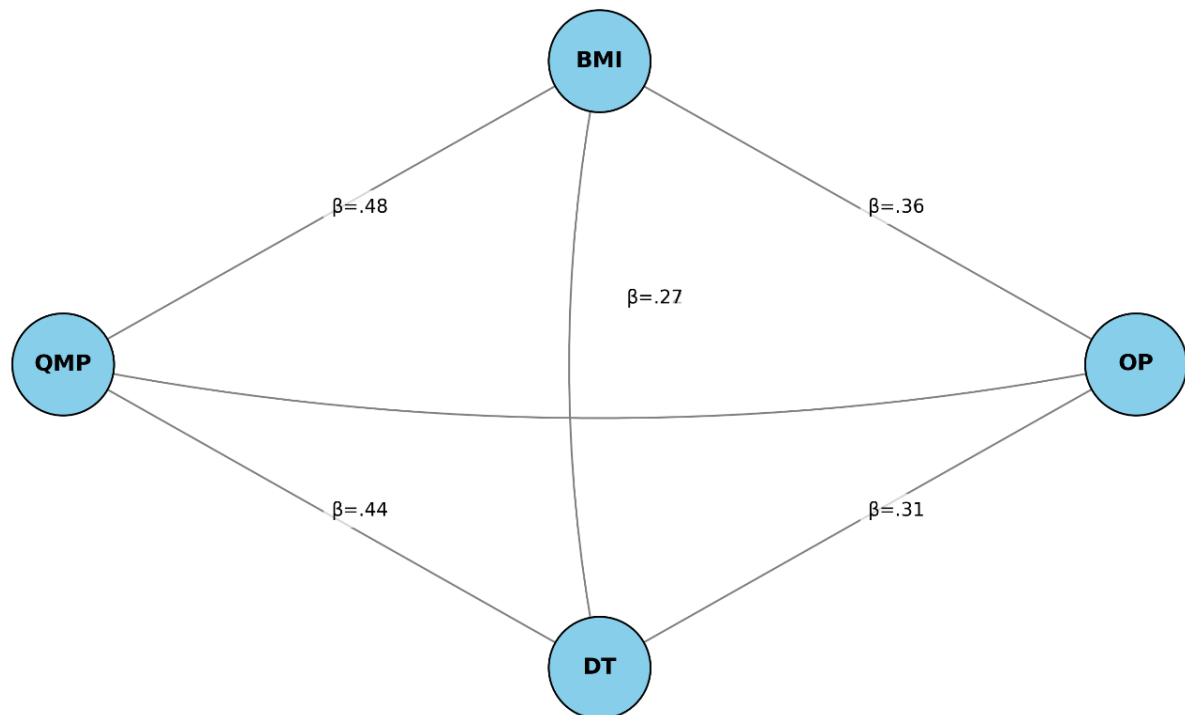


Figure 1. Structural model results for the relationships among Quality Management Practices (QMP), Business Model Innovation (BMI), Digital Transformation (DT), and Organizational Performance (OP). Standardized path coefficients are shown on each path.

Explanatory Power of the Model

The explanatory power of the structural model was evaluated using the coefficient of determination (R^2). Quality management practices explained 23.0% of the variance in business model innovation ($R^2 = .230$). Quality management practices and business model innovation jointly explained 42.7% of the variance in digital transformation ($R^2 = .427$). Finally, business model innovation, digital transformation, and quality management practices collectively explained 64.1% of the variance in organizational performance ($R^2 = .641$). These findings indicate that the proposed model possesses substantial explanatory power, particularly for organizational performance. The effect-size analysis further indicated that the predictors had small-to-moderate practical effects on the endogenous constructs. Quality management practices demonstrated a moderate effect on business model innovation and digital transformation, whereas business model innovation and digital transformation demonstrated meaningful effects on organizational performance (Table 5).

Table 5. Structural Model Evaluation

Endogenous Construct	R^2	Q^2	Interpretation
Business Model Innovation	.230	.162	Acceptable explanatory and predictive power
Digital Transformation	.427	.291	Moderate explanatory and predictive power
Organizational Performance	.641	.448	Substantial explanatory and predictive power

Model Fit and Predictive Relevance

The overall adequacy of the structural model was assessed using SRMR and predictive relevance indicators. The standardized root mean square residual (SRMR) was .047, which was below the commonly accepted threshold of .08 and therefore indicated satisfactory model fit. The Q^2 values for all endogenous constructs were positive, demonstrating that the model possessed predictive relevance. In particular, the Q^2 value for organizational performance ($Q^2 = .448$) indicated substantial predictive relevance. Taken together, the measurement and structural model results provide evidence that the proposed framework adequately represents the relationships among quality management practices, business model innovation, digital transformation, and organizational performance in SMEs. All eight hypotheses were supported, demonstrating that quality management practices are associated with organizational performance both directly and indirectly through business model innovation and digital transformation.

Discussion

The present study examined the relationships among quality management practices, business model innovation, digital transformation, and organizational performance in small and medium-sized enterprises (SMEs). Particular attention was given to whether business model innovation and digital transformation function as mechanisms through which quality management practices contribute to improved organizational performance. Overall, the findings provided strong support for the proposed conceptual model. Quality management practices were positively associated with business model innovation, digital transformation, and organizational performance. In addition, business model innovation and digital transformation were significant predictors of organizational performance, and both variables partially mediated the relationship between quality management practices and organizational performance. The results therefore suggest that quality management should not be understood solely as an operational or process-oriented approach; rather, it can serve as an organizational foundation for innovation, digital adaptation, and superior performance.

The first major finding was the significant positive effect of quality management practices on business model innovation. This finding suggests that SMEs with stronger quality-oriented practices are more likely to reconsider and redesign how they create, deliver, and capture value (Endris & Kassegn, 2022). Quality management emphasizes systematic problem identification, customer orientation, continuous improvement, process evaluation, employee participation, and evidence-based decision-making. These principles can create an organizational climate in which established processes are regularly questioned and improved. Consequently, quality management may provide the organizational discipline necessary for SMEs to move beyond incremental process improvements toward broader changes in business models (Monadi, 2025; Obi, et al., 2018).

This relationship is particularly important in the SME context. SMEs frequently operate with limited financial, technological, and human resources, which can make radical innovation difficult. A systematic quality management approach can help organizations identify inefficiencies and customer needs before allocating scarce resources to innovation (Qalati, et al., 2022). Continuous improvement practices may also encourage managers and employees to identify alternative methods of delivering products and services, developing customer relationships, organizing resources, and generating revenue (Monadi, 2025; Reis & Melão, 2023). Thus, business model innovation may emerge not only from deliberate innovation strategies but also from the cumulative effects of quality-oriented organizational routines.

The second finding concerned the significant positive relationship between quality management practices and digital transformation. SMEs that emphasize process standardization, continuous improvement, customer needs, and data-informed decision-making may be better positioned to recognize where digital technologies can create organizational value (Wu, et al., 2024). Digital transformation is not simply the adoption of isolated technologies; it involves changes in processes, organizational routines, customer interactions, and sometimes the fundamental logic through which an organization operates (Kejžar, et al., 2023). Quality management practices can facilitate this transformation by encouraging organizations to evaluate existing processes systematically and identify opportunities for greater efficiency, accuracy, responsiveness, and customer value.

This finding also highlights an important distinction between digitalization and digital transformation. Simply introducing software, online platforms, or automated systems does not necessarily constitute meaningful transformation. Transformation requires organizations to rethink how work is performed and how value is created. Quality management may support this process because both approaches emphasize process improvement, performance measurement, customer orientation, and organizational learning (Löfqvist, 2024). In this sense, quality management can provide a managerial infrastructure through which digital technologies are integrated into broader organizational change rather than being implemented as disconnected technological investments (Berends, et al., 2016).

The third finding indicated that business model innovation was positively associated with digital transformation. This relationship suggests that changes in an organization's value creation and delivery logic may stimulate the need for new digital capabilities. When SMEs introduce new products or services, develop alternative distribution channels, personalize customer experiences, establish platform-based relationships, or modify revenue models, they may require digital technologies to make these changes feasible and scalable (Bouwman, et al., 2024). Digital technologies can therefore function as important enablers of business model innovation (Cavalcanti, et al., 2022).

At the same time, the relationship may operate in the opposite direction. Digital technologies can create opportunities for organizations to reconsider their business models. For example, digital platforms, data analytics, cloud-based services, artificial intelligence, and online customer engagement can enable SMEs to reach new markets, personalize offerings, automate processes, and establish new forms of value creation (Tsai & Su, 2022; Qiu & Chang, 2025). The significant association identified in the present study therefore supports the view that business model innovation and digital transformation are closely interconnected organizational processes rather than completely independent forms of change.

Another important finding was the positive effect of business model innovation on organizational performance. SMEs that successfully redesign their business models may achieve improvements in financial and non-financial outcomes because they are better able to respond to changing customer expectations and competitive conditions (Chen, et al., 2024). Business model innovation can allow SMEs to identify new market opportunities, develop alternative revenue sources, improve customer value, reduce unnecessary costs, and differentiate themselves from competitors (Ozturk, et al., 2024). In highly competitive SME environments, such adaptability can become a critical source of organizational performance.

The significant effect of digital transformation on organizational performance further reinforces the strategic importance of digital capabilities. Digital transformation may improve organizational performance by increasing operational efficiency, reducing transaction costs, improving access to information, strengthening customer relationships, and enabling faster organizational responses (de Mattos, et al., 2023). For SMEs, these benefits can be especially important because digital technologies may allow smaller organizations to overcome some traditional disadvantages associated with limited resources and geographic reach. However, the findings should not be interpreted as evidence that technology adoption automatically produces superior performance (Arnaud, et al., 2025). Rather, the results suggest that digital transformation is most valuable when it is embedded within broader organizational and strategic processes.

One of the most important findings of the study was the mediating role of business model innovation in the relationship between quality management practices and organizational performance. The indirect effect was statistically significant, while the direct effect of quality management practices on organizational performance remained significant. This pattern indicates partial mediation (Wu, et al., 2024). In practical terms, quality management practices appear to improve organizational performance through at least two pathways: directly, through better processes and organizational discipline, and indirectly, by stimulating innovation in the organization's business model (Alsaqqa, 2024).

This finding expands the conventional understanding of quality management. Quality management is often associated primarily with defect reduction, process efficiency, customer satisfaction, and operational consistency. The present results suggest that its contribution may extend beyond these immediate outcomes. By creating routines for continuous learning, customer responsiveness, employee participation, and systematic problem solving, quality management may provide the foundation for more fundamental organizational innovation (Kejžar, et al., 2023). Business model innovation can consequently represent an important bridge between quality-oriented management and broader organizational performance.

The second mediation finding demonstrated that digital transformation also partially mediates the relationship between quality management practices and organizational performance. This result suggests that quality management practices may contribute to performance partly because they make organizations more prepared to undertake digital transformation (Inthavong, et al., 2023). Quality-oriented organizations may have stronger process awareness, clearer performance indicators, greater willingness to use data, and more systematic approaches to identifying organizational problems (Qalati, et al., 2022). These characteristics can reduce the difficulty of implementing digital initiatives and increase the likelihood that technological investments will generate meaningful organizational benefits.

The explanatory power of the model provides additional support for the proposed framework. The model explained approximately 64.1% of the variance in organizational performance, representing substantial explanatory power. This result is particularly noteworthy because organizational performance is a multidimensional outcome influenced by numerous internal and external factors. The relatively high explanatory power indicates that quality management practices, business model innovation, and digital transformation collectively represent important organizational mechanisms for understanding differences in SME performance.

The findings have several theoretical implications. First, they contribute to the quality management literature by positioning quality management practices as potential antecedents of organizational innovation and digital transformation, rather than merely performance-enhancing operational practices. Second, the findings reinforce the importance of integrating quality management perspectives with innovation and digital transformation perspectives. These domains are sometimes examined separately, but the present results suggest that they may form a connected organizational pathway. Third, the findings support a dynamic perspective of organizational performance. SMEs do not achieve superior performance simply by maintaining existing processes; they must continuously adapt their value creation mechanisms and technological capabilities. Quality management can therefore be interpreted as an organizational capability that supports continuous adaptation. The results are also consistent with a dynamic capabilities perspective, according to which organizations need to identify opportunities, mobilize resources, and transform existing capabilities in response to changing environments. Business model innovation and digital transformation can be viewed as important manifestations of such organizational adaptation.

The findings offer several practical implications for SME managers. First, managers should avoid treating quality management as a narrow system of quality control. Instead, quality management practices should be connected to innovation and strategic decision-making. Continuous improvement meetings, employee involvement, customer feedback systems, process evaluations, and quality-performance indicators can be used to identify opportunities for business model innovation. Second, SMEs should evaluate digital transformation as a strategic organizational process rather than simply a technological investment. Before adopting digital technologies, managers should identify which organizational processes, customer interactions, and business activities require transformation. Digital investments are more likely to improve performance when they are aligned with clearly identified organizational needs. Third, managers should recognize the potential complementarity between business model innovation and digital transformation. When an SME develops a new value proposition, distribution channel, customer relationship model, or revenue mechanism, managers should simultaneously consider the digital capabilities required to support that innovation. Similarly, newly available digital technologies should be evaluated in terms of whether they create opportunities to redesign the organization's business model. Finally, the findings suggest that SME managers should develop an organizational culture in which quality, innovation, and digital transformation are mutually reinforcing rather than competing priorities. Quality management can establish the discipline and learning mechanisms needed for innovation, while innovation and digital transformation can ensure that quality-oriented organizations remain responsive to changing market conditions.

Despite its contributions, the study has several limitations. First, the cross-sectional design limits the ability to establish definitive causal relationships among the variables. Although the proposed theoretical model specifies directional relationships, longitudinal research would provide stronger evidence regarding whether quality management practices actually lead to subsequent business model innovation and digital transformation and whether these changes subsequently improve performance. Second, the study relied on self-reported data from employees and managers. Although appropriate statistical procedures can reduce some concerns associated with common method bias, future studies should incorporate objective performance indicators, such as sales growth, profitability, productivity, market share, or customer retention. Third, the study focused specifically on SMEs. Although this provides valuable insight into an important organizational context, the findings may not generalize directly to large organizations or other institutional settings. Future research could compare SMEs with large enterprises or examine whether organizational size moderates the relationships identified in the present model.

Future studies could also investigate additional mediators and moderators. Variables such as organizational learning, dynamic capabilities, employee involvement, leadership style, technological readiness, organizational culture, environmental uncertainty, and competitive intensity may influence the strength of the proposed

relationships. A longitudinal or multi-wave design would be particularly valuable for examining whether quality management practices precede business model innovation and digital transformation over time.

Conclusion

Overall, the findings demonstrate that quality management practices are positively related to organizational performance in SMEs and that this relationship extends beyond direct improvements in organizational processes. Business model innovation and digital transformation represent important mechanisms through which quality management practices can translate into superior organizational outcomes. The significant partial mediation effects indicate that quality management provides both a direct foundation for performance and an indirect pathway through organizational innovation and digital transformation. Accordingly, SMEs seeking sustainable performance improvements should consider quality management, business model innovation, and digital transformation as interconnected strategic priorities rather than isolated managerial initiatives.

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