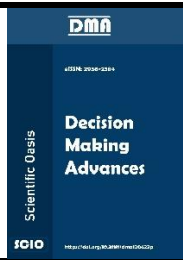




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From Transformational Change to Organizational Performance: Unpacking the Moderating Role of Organizational Agility

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ABSTRACT

The increasing pace of digitalization has made digital transformation a critical strategic priority for small and medium-sized enterprises (SMEs), particularly in developing economies. This study examines the effects of Digital Transformation Leadership (DTL) on Business Model Innovation (BMI) and Firm Performance (FP), while investigating the moderating role of Organizational Agility (OA). Data were collected from 500 employees working in Pakistani SMEs and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that Digital Transformation Leadership has significant positive effects on Organizational Agility, Business Model Innovation, and Firm Performance. However, Organizational Agility does not significantly moderate the relationships between Digital Transformation Leadership and either Business Model Innovation or Firm Performance. The structural model demonstrates satisfactory explanatory and predictive capability, confirming the strategic importance of Digital Transformation Leadership in enhancing organizational innovation and performance. This study contributes to the literature by providing empirical evidence from an emerging economy and by demonstrating that Organizational Agility functions as an important organizational capability but does not strengthen the effects of Digital Transformation Leadership on Business Model Innovation or Firm Performance. The findings suggest that managers should prioritize leadership capabilities and digital transformation initiatives while simultaneously developing complementary organizational capabilities beyond agility to maximize digital transformation outcomes. The study also provides practical implications for policymakers seeking to strengthen SMEs' digital competitiveness through investments in digital infrastructure, digital skills, and innovation support programs.

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1. Introduction

Business Model Innovation (BMI) has become an essential strategic capability that enables organizations to create new value propositions, develop innovative revenue mechanisms, and respond effectively to rapidly changing market conditions [1–3]. Increasing competitive pressure, shorter product life cycles, and continuously evolving customer expectations require firms to redesign their business models to maintain sustainable competitive advantage. Consequently, BMI has attracted growing attention from both researchers and practitioners as a key mechanism for achieving long-term organizational growth and resilience [4,5].

The rapid development of digital technologies has fundamentally transformed the way organizations operate, compete, and create value. Digital Transformation (DT) extends beyond the adoption of digital technologies and represents a comprehensive organizational transformation that integrates digital capabilities into business processes, organizational structures, and strategic decision-making [6,7]. Through digital transformation, firms can improve operational efficiency, enhance customer engagement, optimize resource utilization, and develop innovative business models that strengthen their competitive position [8–10]. Nevertheless, implementing digital transformation remains a complex organizational challenge that requires appropriate leadership, strategic alignment, and organizational capabilities.

Among these capabilities, Digital Transformation Leadership (DTL) has emerged as a critical determinant of successful digital initiatives. Digital transformation leaders establish a strategic vision, promote innovation-oriented cultures, facilitate technology adoption, and support organizational change throughout the transformation process [11–13]. Effective leadership enables organizations not only to implement digital technologies but also to exploit their strategic potential by redesigning business models and improving organizational performance.

Previous studies have reported positive relationships between digital transformation, business model innovation, and firm performance [14–18]. Digital technologies facilitate data-driven decision-making, improve organizational efficiency, and enable firms to respond more rapidly to environmental changes. Consequently, organizations adopting digital transformation are generally expected to achieve superior business performance and greater innovation capability. However, empirical evidence remains inconsistent regarding the mechanisms through which digital transformation creates organizational value, particularly in the context of small and medium-sized enterprises (SMEs).

Organizational Agility (OA) has been recognized as one of the most important organizational capabilities for operating in dynamic business environments. Agile organizations are characterized by flexibility, rapid decision-making, and the ability to continuously adapt organizational processes to changing customer needs and competitive pressures [19,20]. These characteristics suggest that organizational agility may strengthen the effectiveness of digital transformation by enabling firms to translate technological investments into innovative business models and improved organizational performance. Despite its theoretical relevance, empirical findings regarding the moderating role of organizational agility remain limited and inconclusive.

This relationship can be further explained through the perspectives of Path–Goal Theory and New Institutionalism Theory. Path–Goal Theory suggests that leaders facilitate organizational change by providing strategic direction, motivating employees, and removing obstacles that hinder innovation and technology adoption [21]. At the same time, New Institutionalism Theory argues that organizations adopt digital transformation in response to coercive, mimetic, and normative institutional pressures while relying on internal organizational capabilities to successfully implement these changes [22]. Together, these theoretical perspectives provide a robust foundation for

explaining how Digital Transformation Leadership influences Business Model Innovation and Firm Performance and why Organizational Agility may strengthen these relationships.

The Pakistani SME sector provides an appropriate context for examining these relationships. SMEs account for approximately 90% of all enterprises in Pakistan and employ nearly half of the national workforce, making them a fundamental driver of economic development [23]. Despite their economic importance, many Pakistani SMEs continue to experience difficulties in adopting digital technologies because of financial constraints, limited technological capabilities, and organizational barriers. As digital transformation becomes increasingly necessary for maintaining competitiveness, understanding the organizational factors that facilitate successful transformation has become an important research priority.

Although previous research has investigated digital transformation, business model innovation, and firm performance, several important research gaps remain. First, limited empirical evidence exists regarding the role of Digital Transformation Leadership in promoting Business Model Innovation among SMEs in emerging economies. Second, previous findings concerning the relationship between digital transformation and firm performance remain inconsistent across different organizational contexts. Third, the moderating role of Organizational Agility has received relatively little empirical attention, particularly within Pakistani SMEs, despite its theoretical importance.

Accordingly, this study investigates the effects of Digital Transformation Leadership on Business Model Innovation and Firm Performance while examining the moderating role of Organizational Agility among manufacturing SMEs in Pakistan. By integrating these constructs into a single conceptual framework, the study contributes to the existing literature in three ways. First, it provides empirical evidence on the direct effects of Digital Transformation Leadership on Business Model Innovation and Firm Performance. Second, it examines whether Organizational Agility strengthens these relationships in the context of SMEs operating in an emerging economy. Third, it extends the application of Path–Goal Theory and New Institutionalism Theory in explaining how leadership and organizational capabilities jointly influence digital transformation outcomes.

The findings provide theoretical insights into the mechanisms through which digital transformation contributes to organizational innovation and performance while offering practical recommendations for managers and policymakers seeking to accelerate digital transformation and strengthen the competitiveness of SMEs in emerging economies.

2. Literature Review

Recent studies suggest that digital transformation enables organizations to enhance their adaptability, innovation capability, and long-term competitiveness. By integrating digital technologies into business processes, firms can redesign their business models, improve operational efficiency, and deliver greater value to customers. Digital transformation also supports organizational responsiveness by enabling data-driven decision-making, facilitating process integration, and accelerating the adoption of innovative practices. As a result, organizations are better positioned to respond to dynamic market conditions, exploit emerging opportunities, and achieve sustainable growth and superior performance.

2.1 Digital Transformation Leadership & Business Model Innovation

Business Model Innovation (BMI) refers to the process of creating, redesigning, or transforming a firm's business model to develop new value propositions, revenue streams, customer relationships, or market opportunities. It involves reconfiguring the fundamental components of a business model to improve competitiveness, stimulate growth, and respond effectively to changing market

conditions. As noted by [10], business model innovation increasingly relies on digital technologies and emerging market trends to create sustainable and scalable sources of competitive advantage.

Digital Transformation Leadership (DTL) plays a critical role in facilitating Business Model Innovation by promoting the strategic adoption of digital technologies and fostering an organizational culture that supports innovation and continuous change. According to [31], digital transformation leaders encourage organizations to embrace digital technologies, establish a clear strategic vision, and cultivate an innovation-oriented culture that facilitates successful business model innovation and sustainable growth.

Business model innovation is driven by both external and internal factors. External drivers include competitive pressure, environmental uncertainty, and changing customer preferences, whereas internal drivers encompass technological advancements, organizational capabilities, and managerial support for innovation [11,29]. As organizations increasingly integrate digital technologies into their operations, leaders play a pivotal role in guiding organizational transformation and aligning technological capabilities with strategic objectives [32].

The importance of leadership in business model innovation has been widely recognized in the literature. Leaders communicate a clear innovation vision, facilitate organizational change, allocate strategic resources, and motivate employees to embrace new ways of creating and delivering value [3,9]. Furthermore, organizations whose leaders demonstrate an innovation-oriented and sustainability-driven mindset are more likely to develop innovative business models that enhance long-term competitiveness and organizational performance [33].

The proposed relationship between Digital Transformation Leadership and Business Model Innovation can be explained through Path–Goal Theory. This theory argues that effective leaders facilitate goal achievement by providing strategic direction, removing obstacles, motivating employees, and creating an environment that supports learning and innovation [24]. In the context of digital transformation, leaders encourage the adoption of digital technologies, reduce employees' resistance to change, strengthen confidence in implementing new technologies, and promote experimentation with innovative ideas [6,7]. By fostering an organizational climate that supports digital innovation, Digital Transformation Leadership enables firms to redesign existing business models and develop new value creation mechanisms.

Based on these theoretical arguments, it is expected that Digital Transformation Leadership enhances Business Model Innovation. Therefore, the following hypothesis is proposed:

H1: Digital Transformation Leadership has a positive and significant effect on Business Model Innovation.

2.2 Digital transformation Leadership & Firm Performance

Firm Performance (FP) reflects the extent to which an organization achieves its strategic and operational objectives and is commonly evaluated using indicators such as profitability, market share, sales growth, and return on assets [34]. In today's digital economy, digital technologies have become a critical source of competitive advantage, prompting extensive research into how digital transformation influences organizational performance.

Digital Transformation Leadership (DTL) enables organizations to strategically integrate digital technologies into business processes, organizational structures, and decision-making activities. By fostering a digital vision and promoting the adoption of emerging technologies, DTL helps firms enhance operational efficiency, improve customer engagement, and develop new sources of value creation [36]. Consequently, organizations are better positioned to strengthen their competitive advantage and achieve superior performance.

Furthermore, digital transformation enhances firms' capabilities to acquire, process, and utilize large volumes of internal and external data. The integration of advanced digital technologies allows organizations to make more informed strategic decisions, respond more effectively to environmental changes, and anticipate evolving customer needs [37]. These capabilities improve organizational responsiveness and support continuous performance improvement through more efficient resource utilization and evidence-based decision-making.

Digital transformation also contributes to firm performance by improving coordination among business processes, increasing operational efficiency, reducing costs, and facilitating innovation [15,38]. Through greater process integration and enhanced information sharing across organizational functions, firms can optimize their operations, improve service quality, and generate sustainable competitive advantages. These benefits are particularly important for innovative SMEs, which often operate under resource constraints and must continuously improve their efficiency and adaptability to remain competitive [6].

Based on the Resource-Based View and Dynamic Capabilities Theory, Digital Transformation Leadership is expected to enhance organizational capabilities that ultimately improve firm performance. Therefore, the following hypothesis is proposed:

H2: Digital Transformation Leadership has a positive and significant effect on Firm Performance.

2.3 Organizational Agility affects Firm Performance

Organizational Agility (OA) has emerged as a critical organizational capability that enables firms to respond rapidly and effectively to changing market conditions. It enhances organizational performance by improving flexibility, adaptability, and the ability to reconfigure resources and operational processes in response to environmental changes [39]. Through continuous learning, effective knowledge management, and the adoption of advanced technologies, agile organizations are better equipped to sustain competitive advantage in dynamic business environments.

In today's highly uncertain and technology-driven markets, organizations must continuously adapt their strategies, organizational structures, and work practices to remain competitive. Organizational Agility facilitates this adaptation by enabling firms to redesign business processes, accelerate decision-making, and align organizational capabilities with evolving customer needs and market demands [40]. These capabilities are particularly important for SMEs, which often operate under resource constraints and must respond quickly to environmental uncertainty.

Furthermore, Organizational Agility contributes to superior firm performance by enhancing operational efficiency, service quality, customer responsiveness, and organizational resilience. Agile organizations are better able to recover from unexpected disruptions, exploit emerging opportunities, and maintain business continuity through a combination of structured processes, organizational flexibility, and adaptive decision-making. Consequently, organizations characterized by strong leadership, flexibility, proactiveness, and adaptability are more likely to achieve sustainable competitive advantage and superior performance [40].

Based on the Dynamic Capabilities Theory and the existing empirical evidence, Organizational Agility is expected to positively influence firm performance. Therefore, the following hypothesis is proposed:

H3: Organizational Agility has a positive and significant effect on Firm Performance.

2.4 Moderating role of Organizational Agility

According to [41], Organizational Agility (OA) plays an important role in strengthening the relationship between Digital Transformation Leadership (DTL) and Business Model Innovation (BMI). By fostering flexibility, responsiveness, and adaptability, organizational agility enables firms to

implement digital technologies and digital leadership practices more effectively, thereby facilitating business model innovation. Agile organizations are better positioned to respond rapidly to changes in market conditions, exploit emerging opportunities, and redesign their business models to enhance competitiveness and long-term growth [5]. Consequently, Organizational Agility can be viewed as an organizational capability that facilitates the successful implementation of digital transformation initiatives.

The proposed moderating role of Organizational Agility can also be explained through the lens of New Institutionalism Theory. This theory suggests that organizations adapt to institutional pressures through three forms of isomorphism: coercive, mimetic, and normative [42]. External pressures from governments, competitors, customers, and industry norms encourage firms to adopt digital technologies and transform their organizational practices. However, the extent to which organizations successfully respond to these pressures depends on their internal capabilities. Organizational Agility enables firms to absorb institutional pressures, rapidly adapt their processes, and effectively integrate digital technologies into their operations. As noted by [3], agile organizations emphasize knowledge management and organizational learning, enabling them to respond effectively to environmental changes and sustain competitive advantage. Furthermore, data-driven decision-making and analytics enhance organizational agility, which in turn improves the alignment between technological capabilities, employee competencies, operational processes, and customer requirements [16]. Therefore, it can be expected that Organizational Agility strengthens the positive effects of Digital Transformation Leadership on Business Model Innovation and Firm Performance.

Based on these theoretical arguments, the following hypotheses are proposed:

H4: Organizational Agility positively moderates the relationship between Digital Transformation Leadership and Business Model Innovation.

H5: Organizational Agility positively moderates the relationship between Digital Transformation Leadership and Firm Performance.

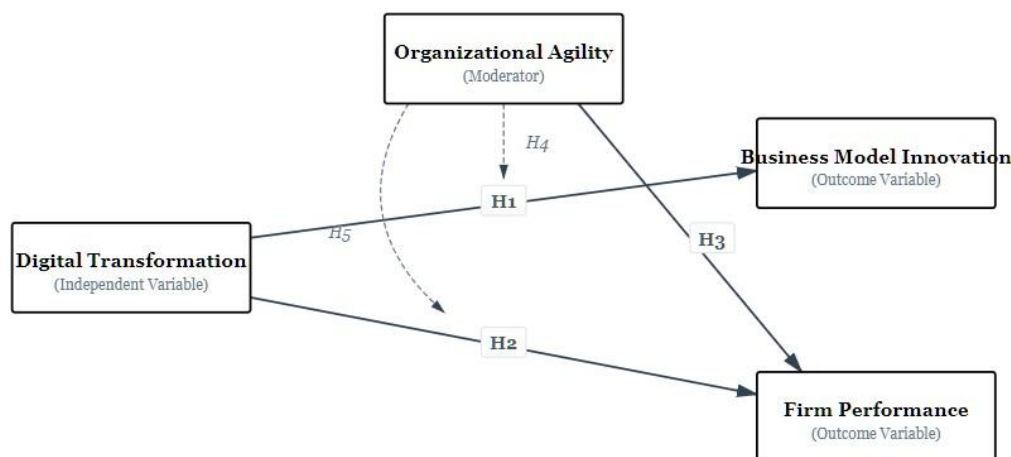


Fig. 1. Conceptual Model of Research

Figure 1 presents the conceptual framework developed based on the existing literature. The framework proposes that Digital Transformation Leadership positively influences Business Model Innovation and Organizational Agility, while Organizational Agility contributes to Firm Performance. Furthermore, the model hypothesizes that Organizational Agility moderates the relationships between Digital Transformation Leadership and both Business Model Innovation and Firm Performance. These proposed relationships are empirically examined using the methodology

described in the following section, with the aim of providing theoretical and practical insights for researchers and policymakers.

3. Methodology

3.1 Collection of Data & Sampling

This study employed a quantitative research design and utilized a convenience sampling technique to collect empirical data from employees of small and medium-sized enterprises (SMEs) in Pakistan. The minimum required sample size was determined using G*Power 3.1.9.7 software following the recommendations of Hair *et al.* [34]. The calculation was performed using a statistical power of 0.80, an effect size of 0.15, a minimum R^2 value of 0.10, and a significance level (α) of 0.05, indicating that the final sample exceeded the minimum required size for reliable statistical analysis.

Data were collected through an online questionnaire administered between 2024 and 2025. SMEs were selected because they constitute the backbone of Pakistan's economy while simultaneously facing significant challenges in adopting digital technologies due to financial and technological constraints. The participating organizations represented a variety of industries, including manufacturing, finance and insurance, pharmaceuticals, information technology, food and beverage, and education.

Prior to data collection, ethical approval was obtained from the relevant ethics committee. Permission to conduct the survey was also obtained from SME owners and managers after explaining the objectives of the study and assuring them of the confidentiality of the collected information. To ensure the clarity and reliability of the measurement instrument, a pilot study involving 30 SME employees was conducted. Based on the participants' feedback, minor revisions were made before the main survey was administered.

SMEs account for approximately 90% of all businesses in Pakistan and employ nearly half of the country's workforce, with micro-enterprises (fewer than ten employees) representing the largest proportion of the sector [43]. Despite their economic importance, conducting research in this sector remains challenging because of limited access to firms and the restricted availability of financial and organizational information [44]. Consequently, data were collected from employees of 20 SMEs located in three industrial zones in Pakistan using a convenience sampling approach.

A total of 590 questionnaires were distributed in January 2025. Within 30 days, 520 completed questionnaires were returned, yielding a response rate of 88.1%. After screening the responses, 20 questionnaires were excluded because of incomplete responses or failure to satisfy the study requirements. Consequently, 500 valid questionnaires were retained for the final analysis.

All respondents participated voluntarily and were assured that their responses would remain anonymous and confidential. They were informed about the purpose of the research and their right to withdraw from the study at any stage without any consequences.

Before estimating the structural model, multicollinearity was assessed by examining the Variance Inflation Factor (VIF). All VIF values were below the recommended threshold of 3.3, indicating that multicollinearity was not a concern. Demographic characteristics, including respondents' age and gender, were collected solely for descriptive purposes and were not incorporated as explanatory variables in the structural model.

3.2 Measurements

All questionnaire items were measured using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The measurement instrument was developed based on previously validated scales reported in the literature. Digital Transformation Leadership (DTL) was measured using six items adapted from Tabrizi *et al.* [45], as operationalized by [35]. Organizational Agility (OA),

Business Model Innovation (BMI), and Firm Performance (FP) were measured using established scales adapted from previous studies [9,15]. The use of validated measurement scales ensured the reliability and validity of the research instrument.

3.3 Analysis

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the proposed research model because it involves multiple latent constructs and complex relationships among them. PLS-SEM is particularly appropriate when the data do not satisfy the assumption of multivariate normality and when the primary objective is prediction and theory development rather than strict theory confirmation [46]. In addition, PLS-SEM performs well with relatively small to medium sample sizes and is robust in handling non-normally distributed data.

PLS-SEM has become one of the most widely applied analytical techniques in the fields of social sciences, business, and information systems research [34]. Owing to its flexibility, it can be used in exploratory, explanatory, predictive, and confirmatory research designs [36]. The analysis was conducted using SmartPLS software, which enables the estimation of both the measurement model (relationships between latent constructs and their indicators) and the structural model (relationships among latent constructs) [4,32]. This approach provides a comprehensive assessment of the reliability and validity of the measurement model, as well as the significance and predictive capability of the proposed structural relationships.

4. Results

This section presents the results of the data analysis and discusses the findings in relation to the research objectives and hypotheses. The results are interpreted in the context of the existing literature. The demographic characteristics of the respondents are presented in Table 1.

As shown in Table 1, the sample consisted of 256 male respondents (51.2%) and 221 female respondents (44.2%). Regarding age, respondents were categorized into several groups ranging from 18 years to over 46 years, with the largest proportion belonging to the 36–45 age group. In terms of educational attainment, most respondents held a bachelor's degree. These demographic characteristics indicate that the sample represents individuals with diverse backgrounds and sufficient professional experience to provide reliable responses.

Table 2 presents the results of the measurement model assessment, including the outer loadings, Cronbach's alpha, rho_A, Composite Reliability (CR), and Average Variance Extracted (AVE). Outer loadings were examined to evaluate the relationships between the observed indicators and their corresponding latent constructs. The reliability and convergent validity of the measurement model were assessed using Cronbach's alpha, rho_A, Composite Reliability, and AVE.

The results indicate that all indicator loadings exceeded the recommended threshold of 0.70, demonstrating satisfactory indicator reliability. Likewise, the values of Cronbach's alpha, rho_A, and Composite Reliability were all above the recommended minimum threshold of 0.70 and below 0.95, confirming adequate internal consistency reliability [47]. Furthermore, all AVE values exceeded the recommended threshold of 0.50, indicating satisfactory convergent validity. Therefore, the measurement model satisfies the established reliability and validity criteria, allowing the analysis to proceed to the assessment of the structural model.

As presented in Table 3, the measurement model was assessed and the results confirmed its satisfactory reliability and validity. The structural model evaluation is subsequently reported in Table 4. According to Henseler *et al.* [36], HTMT values below the threshold of 0.85 indicate adequate discriminant validity between latent constructs. As shown in Table 3, all HTMT values are below the recommended threshold, confirming that the constructs are empirically distinct. The highest HTMT

values were observed between Business Model Innovation and Firm Performance (HTMT = 0.823) and between Organizational Agility and Digital Transformation Leadership (HTMT = 0.823). Although these values indicate relatively strong relationships between the respective constructs, they remain below the recommended cutoff value, thereby supporting discriminant validity. In contrast, the HTMT value between Organizational Agility and Firm Performance was 0.519, indicating a clear distinction between these constructs. Overall, the HTMT results confirm that the measurement model demonstrates satisfactory discriminant validity.

Table 1
Demographic Profile of Respondents

		Percentage	Frequency
Gender	Male	18%	265
	Female	15%	221
Age	18-25	7%	106
	26-35	10%	152
	36-45	12%	182
	46+	4%	60
Educational Level	High School	2%	30
	Bachelors	17%	258
	Masters	8%	121
	PhD	6%	91

Table 2
Measurement model

Constructs	Indicators	Outer Loading	Alpha	Rho-A	CR	AVE
Digital Transformation Leadership	DTL1	0.83	0.75	0.79	0.93	0.74
	DTL2	0.93				
	DTL3	0.78				
	DTL4	0.92				
	DTL5	0.87				
Organization Agility	AG1	0.78	0.72	0.86	0.90	0.69
	AG2	0.8				
	AG3	0.78				
	AG4	0.89				
	AG5	0.85				
Business Model Innovations	BMI1	0.88	0.75	0.80	0.84	0.7
	BMI2	0.86				
	BMI3	0.82				
	BMI4	0.84				
	BMI5	0.88				
Firm Performance	PF1	0.93	0.75	0.76	0.89	0.73
	PF2	0.76				
	PF3	0.9				
	PF4	0.85				
	PF5	0.83				

Table 4 presents the results of the structural model assessment, including the coefficients of determination (R^2), predictive relevance (Q^2), and hypothesis testing. The model explains 40% of the variance in Organizational Agility ($R^2 = 0.40$), indicating that Digital Transformation Leadership (DTL) is a substantial predictor of organizational agility. The Q^2 value of 0.21 indicates moderate predictive relevance for this construct. Furthermore, the model explains 58% of the variance in Business Model

Innovation (BMI) ($R^2 = 0.58$) and 59% of the variance in Firm Performance (FP) ($R^2 = 0.59$). The corresponding Q^2 values of 0.29 and 0.38 demonstrate moderate predictive relevance, confirming the model's satisfactory predictive capability for all endogenous constructs.

Table 3

The Heterotrait–monotrait (HTMT) ratio

	Digital Transformation Leadership	Organizational Agility	Business Model Innovation
Digital Transformation Leadership	-	-	-
Organizational Agility	0.823	-	-
Business Model Innovation	0.711	0.725	-
Firm Performance	0.603	0.519	0.832

Table 4

Structural model and hypothesis testing

Structural Model and Hypothesis Testing					
Direct Effects	Relations	β	t-Statistics	f^2	Decision
H1	DT→BMI	0.193	3.522 ***	0.156	Accepted
H2	DT→FP	0.292	5.503 ***	0.156	Accepted
H3	OAG→FP	0.300	2.849 **	0.067	Accepted
Interaction H4	OAG*DT→BMI	0.308	1.045	0.197	Rejected
Interaction H5	OAG*DT→FP	0.298	1.204	0.189	Rejected
R^2		Q^2			
$R^2_{OAG} = 0.40$		$Q^2_{OAG} = 0.21$			
$R^2_{BMI} = 0.58$		$Q^2_{BMI} = 0.29$			
$R^2_{FP} = 0.59$		$Q^2_{FP} = 0.38$			
SRMR: 0.025; NFI: 0.917 *0.05, **0.01, ***0.001					

Multicollinearity was not a concern, as all Variance Inflation Factor (VIF) values were below the recommended threshold of 3. In addition, the model demonstrated a good overall fit, with SRMR = 0.025 and NFI = 0.917. Collectively, the R^2 , Q^2 , model fit indices, and VIF values indicate that the proposed model possesses satisfactory explanatory and predictive power.

The structural model results reveal that Digital Transformation Leadership (DTL) has a positive and significant effect on Business Model Innovation (BMI) (H1: $\beta = 0.193$, $t = 3.522$, $p < 0.05$) and Organizational Agility (OAG) (H2: $\beta = 0.292$, $t = 5.503$, $p < 0.05$). Moreover, Organizational Agility has a positive and significant effect on Firm Performance (H3: $\beta = 0.300$, $t = 2.849$, $p < 0.05$). These findings confirm that digital transformation leadership contributes directly to organizational agility and business model innovation, while organizational agility enhances firm performance.

However, the moderating role of Organizational Agility was not statistically significant. Specifically, Organizational Agility did not significantly moderate the relationship between Digital Transformation Leadership and Business Model Innovation (H4: $\beta = 0.308$, $t = 1.045$, $p > 0.05$) or the relationship between Digital Transformation Leadership and Firm Performance (H5: $\beta = 0.298$, $t = 1.204$, $p > 0.05$), as both t -values were below the critical threshold of 1.96. Therefore, Hypotheses 4 and 5 were not supported.

As illustrated in Figure 2, the results confirm that Digital Transformation Leadership serves as an important driver of both Business Model Innovation and Organizational Agility, while Organizational Agility positively influences Firm Performance. Nevertheless, Organizational Agility does not strengthen the relationships between Digital Transformation Leadership and either Business Model Innovation or Firm Performance. These findings suggest that, although organizational agility is an

important organizational capability, it does not function as a significant moderator in the proposed research model.

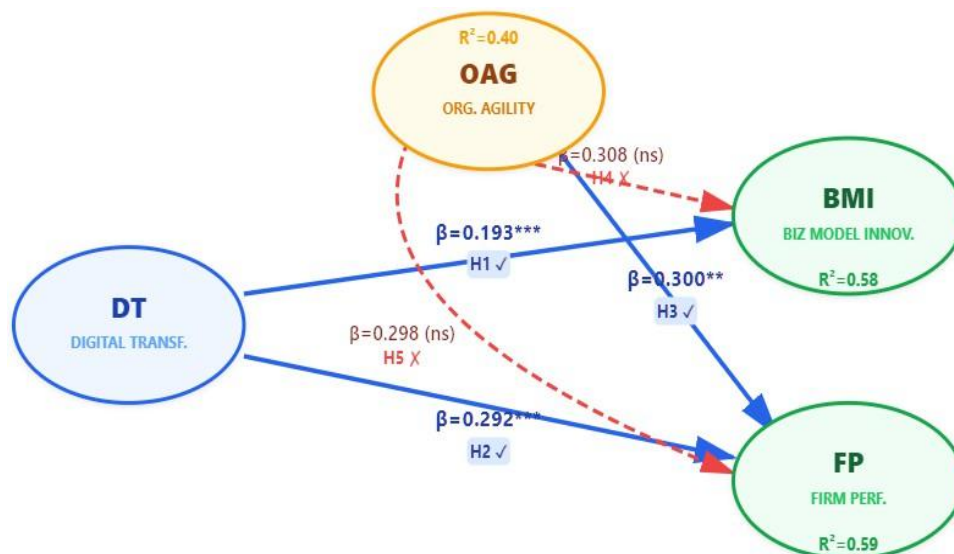


Fig. 2. Path Diagram, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, (ns) = not significant

4. Discussion

This study extends the existing literature by examining the role of Digital Transformation Leadership (DTL) in Business Model Innovation (BMI) and firm performance within the specific context of innovative SMEs in Pakistan. The findings confirm that DTL has a positive and significant effect on BMI, indicating that digital transformation serves as an important driver of business model innovation. As digital technologies continue to reshape competitive environments, SMEs increasingly rely on digital capabilities to redesign value propositions, optimize value creation and delivery processes, and develop new revenue models. These findings reinforce previous research suggesting that digital transformation enables firms to enhance their competitiveness through more innovative and flexible business models [48–50].

The study also demonstrates that DTL positively influences firm performance. This finding suggests that digital transformation contributes to improved operational efficiency, stronger customer relationships, and enhanced organizational competitiveness. For innovative SMEs, digital transformation represents not only a technological initiative but also a strategic capability that supports sustainable growth and long-term performance. Although implementing digital transformation requires considerable financial and organizational resources, the empirical evidence indicates that its benefits outweigh these challenges for innovative SMEs.

Furthermore, the results reveal that Organizational Agility (OA) has a significant positive direct effect on firm performance, supporting previous studies [7,52]. From the perspective of Dynamic Capabilities Theory, organizational agility reflects a firm's ability to sense, respond to, and capitalize on environmental changes, thereby strengthening its competitive position and long-term resilience.

However, the moderating role of Organizational Agility was not supported. Specifically, OA did not significantly moderate the relationship between DTL and BMI (H4: $\beta = 0.308$, $t = 1.045$, $p > 0.05$) nor the relationship between DTL and firm performance (H5: $\beta = 0.298$, $t = 1.204$, $p > 0.05$). These findings suggest that, although organizational agility is beneficial as an organizational capability, it does not necessarily strengthen the effects of digital transformation leadership on business model innovation or firm performance in Pakistani SMEs.

The absence of significant moderating effects indicates that organizational agility alone may be insufficient to amplify the outcomes of digital transformation. Other organizational and environmental factors, such as digital capabilities, innovation culture, leadership commitment, absorptive capacity, technological readiness, or institutional support, may play a more influential role in determining how digital transformation translates into business model innovation and superior performance. Consequently, these findings refine the current understanding of organizational agility by identifying important boundary conditions under which it contributes to digital transformation outcomes.

Overall, this study contributes to the literature by providing empirical evidence from an emerging economy and highlighting that Digital Transformation Leadership directly enhances business model innovation and firm performance, while Organizational Agility primarily acts as an independent organizational capability rather than as a moderator of these relationships. These findings contribute to a more nuanced understanding of the mechanisms through which digital transformation creates value in innovative SMEs.

5. Conclusion

This study examined the effects of Digital Transformation Leadership (DTL) on Business Model Innovation (BMI) and firm performance, while also investigating the moderating role of Organizational Agility (OA). The findings demonstrate that DTL positively influences organizational agility, business model innovation, and firm performance, confirming its role as a key driver of innovation and organizational success among SMEs. However, organizational agility was not found to significantly moderate the relationships between DTL and BMI or between DTL and firm performance.

These findings contribute to the literature by providing further empirical evidence of the positive effects of digital transformation leadership on business model innovation and firm performance in SMEs. In addition, the study offers novel insights by showing that, although organizational agility is positively associated with digital transformation, its expected moderating role in strengthening the effects of digital transformation leadership on business model innovation and firm performance is not empirically supported. This suggests that organizational agility alone may be insufficient to amplify the benefits of digital transformation and that other contextual or organizational factors should be considered when explaining these relationships.

Consequently, this study contributes to the existing literature by highlighting the importance of digital transformation leadership in fostering organizational agility among SMEs in Pakistan. However, the non-significant moderating effects of organizational agility on the relationships between digital transformation and business model innovation, and between digital transformation and firm performance, suggest that organizational agility does not necessarily strengthen the benefits of digital transformation in the post-pandemic context. From the perspective of New Institutionalism Theory, these findings raise important questions regarding the boundary conditions under which digital transformation leadership can effectively facilitate organizational change. They further indicate that organizational agility alone may be insufficient to maximize the outcomes of digital transformation, and that additional contextual factors should be considered when explaining business model innovation and firm performance.

5.1 Theoretical Contributions & Novelty

More specifically, our study makes three contributions, including two key novel aspects. First, it extends the existing literature on digital transformation (DT) and business model innovation (BMI) [9] by demonstrating that DT has a positive and significant effect on BMI. Although DT is widely recognized as a complex, resource-intensive, and potentially risky process that does not always

guarantee success [1,53], our findings suggest that its implementation is highly context-specific. In particular, while the scope and intensity of DT vary across firms, innovative SMEs can leverage DT to transform multiple dimensions of their business models. Our results indicate that DT facilitates business model innovation by enabling firms to develop new value propositions, redesign their portfolio of products and services, establish new collaborative partnerships, reorganize key business activities, introduce alternative pricing mechanisms, and create new revenue streams.

Second, we develop and empirically test the moderating role of organizational agile governance (OAG) in the relationship between DT and BMI. To the best of our knowledge, this is among the earliest empirical studies to demonstrate the significance of this moderating relationship in the context of Pakistani SMEs. In this regard, our study responds to recent calls in the literature to broaden the understanding of OAG as a strategic organizational capability that strengthens the effectiveness of digital transformation initiatives and enhances their contribution to business model innovation.

The empirical research on the indirect impact of OAG on DT and firm performance in the context of SMEs is limited and provides inconsistent evidence. Moreover, to the best of our knowledge, this is among the earliest studies to demonstrate this strong association among Pakistani SMEs.

5.2 Limitations and further research

It is significant to note that our results have certain limitations and, as such, it opens new venues to carry out research. First of all, we had thought of innovative SMEs, focusing on a particular country (Pakistan), therefore establishing a certain level of regional/cultural biases. To validate the result, competitive differences between industries or countries might be examined in a future study. Furthermore, we know that sampling the companies out of a limited list can be vulnerable since it can cause sampling bias since not every company in Pakistan might be in the list and they do not represent the entire population of innovative SMEs in Pakistan. Moreover, we have focused on OAG as intermediate measure between DT and BMI performance. The potential of OAG and BMI needs to be investigated in the future with more studies. Finally, everything we do is measured at the firm level. However, previous research has pointed out the significance of managerial potential to DT [54] and BMI. Therewith, in this way a potentially successful research flow seems to be the study of the correlation between variables in the multilevel approach. Using a more practical example, one field of conceptual development would be to explore how and in what ways dynamic innovative capabilities (individual level) precondition firms to initiate their DT initiatives (firm level).

This research make recommendations for the future researchers to compare the results across industries and countries, to analyze whether the digital transformation and organizational agility have similar effects in different environments; tracking the same companies over time to see how trust, agility, and performance change with repeated digital transformation experiences, thereby capturing the dynamics of the process, not just the current state.

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Conflicts of Interest

The authors hereby declare no conflicts of interest.

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