



Research Article

HOW TRANSFORMATIONAL LEADERSHIP DRIVES INNOVATION: THE ROLES OF KNOWLEDGE SHARING AND ORGANIZATIONAL LEARNING

Author: Aliakbar Shahri Mejarshin¹, Beferst Barash² *

^{1,2} Department of Business Management, South Tehran Branch, Islamic Azad University, Tehran, Iran

KEYWORDS:

Transformational leadership;
innovation performance;
knowledge sharing;
organizational learning; SMEs

ARTICLE HISTORY

Received Date: 05/04/2026

Revised Date: 08/04/2026

Accepted Date: 23/05/2026

Published Date: 06/06/2026

DOI: 10.69557/2czdkk06

CORRESPONDING AUTHOR

Beferst Barash

beferst.barash@gmail.com

ABSTRACT

Innovation has become increasingly important for small and medium-sized enterprises (SMEs) operating in uncertain and resource-constrained environments, yet the mechanisms through which leadership contributes to innovation remain insufficiently understood. This study examines whether transformational leadership enhances innovation performance by encouraging knowledge sharing and strengthening organizational learning. Drawing on the dynamic capability perspective, a serial mediation framework is developed and tested using survey data collected from 312 manufacturing and service SMEs in Iran. The proposed relationships were evaluated through Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicate that transformational leadership does not directly improve innovation performance. Instead, leaders influence innovation by creating conditions that encourage employees to exchange knowledge, which subsequently strengthens organizational learning and leads to superior innovation outcomes. The results demonstrate that knowledge sharing, and organizational learning jointly transmit the influence of transformational leadership to innovation performance. These findings contribute to leadership and innovation research by explaining how leadership behaviors are converted into organizational capabilities that support innovation in emerging economies. The study also provides practical guidance for SME managers by highlighting the importance of fostering collaborative knowledge exchange and continuous organizational learning rather than relying solely on inspirational leadership behaviors.

INTRODUCTION

Innovation has become a decisive factor in the long-term competitiveness of small and medium-sized enterprises (SMEs). In highly competitive markets, organizations must continually develop new products, improve existing processes, and respond quickly to changing customer expectations (Gadepalli and Mondal, 2018). These challenges are particularly evident in emerging economies, where firms frequently operate under financial constraints (Karami et al., 2013), institutional uncertainty (Karami, 2025b), and limited technological resources (Weng et al., 2015, Sattayaraksa and Boon-itt, 2018). Under such conditions, organizational success depends not only on tangible assets but also on the ability of leaders to mobilize employees, encourage collaboration, and create an environment where new ideas can emerge and be implemented (Aryee et al., 2012, Afriyie et al., 2019).

Transformational leadership has consistently attracted scholarly attention because of its ability to motivate employees beyond their immediate self-interests and encourage them to pursue collective organizational goals (Ting et al., 2021, Sathye, 2005). By communicating a compelling vision, stimulating creative thinking, and providing individualized support, transformational leaders can foster employee engagement and willingness to contribute to organizational improvement (Gill and Kaur, 2015). Numerous studies have reported positive associations between transformational leadership and innovation, although the strength and consistency of this relationship differs across organizational and national contexts (Matzler et al., 2008, García-Morales et al., 2012).

Recent research increasingly emphasizes that innovation rarely results from leadership actions alone (Anand and Vohra, 2022). Instead, leaders shape organizational conditions that encourage employees to exchange knowledge, collaborate across functional boundaries, and learn from experience. Knowledge sharing enables individuals to combine expertise, solve problems collectively, and disseminate valuable insights throughout the organization (Anjum et al., 2012, Ghasemi et al., 2016). Organizational learning extends this process by embedding newly acquired knowledge into routines, practices, and decision-making processes. Together, these mechanisms strengthen an organization's ability to adapt to changing market conditions and generate innovative products, services, and operational improvements (Lei et al., 2021, Yadav et al., 2019).

The dynamic capability perspective provides an appropriate theoretical foundation for examining these relationships. Rather than viewing innovation as the direct consequence of leadership behavior, this perspective suggests that organizations achieve sustainable competitive advantage by continuously developing capabilities that enable them to sense environmental changes, integrate knowledge, and reconfigure organizational resources. From this viewpoint, transformational leadership represents an enabling capability that encourages employees to exchange knowledge and develop collective learning processes, ultimately strengthening organizational innovation (Teece et al., 1997).

The present study examines these relationships within the context of Iranian SMEs. This setting offers an opportunity to extend existing knowledge because many Iranian firms operate under persistent economic uncertainty, international sanctions, restricted access to external resources, and rapidly changing market conditions. Under these circumstances, organizations often depend more heavily on internal capabilities than on external support. Informal knowledge exchange, mutual trust, and continuous learning therefore become particularly important for maintaining competitiveness (Nugroho, 2018).

This study addresses three important gaps in the existing literature. First, previous research has predominantly examined individual mediating mechanisms, giving limited attention to the sequential process through which transformational leadership encourages knowledge sharing, promotes organizational learning, and ultimately improves innovation performance. Second, empirical evidence from emerging economies remains relatively limited, particularly in countries characterized by institutional uncertainty and economic constraints. Third, although Partial Least Squares Structural Equation Modeling (PLS-SEM) has become increasingly popular for analyzing complex mediation models, relatively few studies have applied this approach to examine the integrated relationships among transformational leadership, knowledge sharing, organizational learning, and innovation performance within SMEs (Hair and Alamer, 2022).

Accordingly, this study pursues three objectives. First, it investigates whether transformational leadership directly influences innovation performance in Iranian SMEs. Second, it examines whether knowledge sharing, and organizational learning sequentially mediate this relationship. Third, it explains how leadership behaviors are translated into organizational innovation through interconnected knowledge and learning processes.

To achieve these objectives, survey data were collected from 312 manufacturing and service SMEs located in Tehran, Isfahan, and Shiraz. The proposed research model was evaluated using Partial Least Squares Structural Equation Modeling (PLS-SEM), which is well suited for examining complex mediation relationships and prediction-oriented models (Hair and Alamer, 2022).

The study contributes to the literature in several ways. Theoretically, it extends the dynamic capability perspective by illustrating how transformational leadership facilitates the development of organizational capabilities that support innovation. Empirically, it provides evidence from an emerging economy where firms operate under considerable environmental uncertainty. Practically, the findings indicate that sustainable innovation is more likely to emerge when leaders foster collaboration, continuous learning, and effective knowledge exchange throughout the organization (Teece et al., 1997).

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature and develops the research hypotheses. Section 3 describes the research methodology, including the sample, measurement instruments, and analytical procedures. Section 4 presents the empirical findings, while Section 5 discusses the theoretical and managerial implications of the results. Finally, Section 6 concludes the study by summarizing the main findings, acknowledging its limitations, and outlining directions for future research.

LITERATURE REVIEW AND HYPOTHESES

Transformational Leadership and Innovation Performance

Transformational leadership (TL) is among the most influential paradigms in management research because of its ability to stimulate followers' creativity, trust, and commitment to shared goals (Matzler et al., 2008, García-Morales et al., 2012, Aryee et al., 2012). Transformational leaders motivate subordinates through four core dimensions idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration creating psychological empowerment and intrinsic motivation (Ting et al., 2021, Sathye, 2005).

Innovation performance (IP) refers to a firm's capability to develop and successfully implement new ideas in products, services, or processes (Harsono et al., 2025). Empirical research in developed economies often finds that TL directly improves innovation by stimulating employee creativity and risk taking (Weng et al., 2015, Sattayaraksa and Boon-itt, 2018). However, in SMEs operating under environmental volatility like those in Iran leaders rarely have the resources to enforce innovation through formal R&D structures. Instead, their impact may depend on enabling interpersonal and organizational mechanisms such as knowledge sharing and learning. Thus, the direct causal effect of TL on IP may be limited in emerging contexts.

H1: Transformational leadership does not have a significant direct effect on innovation performance in Iranian SMEs.

Transformational Leadership and Knowledge Sharing

Knowledge sharing (KS) the voluntary dissemination and exchange of information, experiences, and expertise represents the social foundation of collective learning (Lei et al., 2021, Yadav et al., 2019). Transformational leaders enhance KS by creating climates of psychological safety and trust (Gill and Kaur, 2015). Through inspirational motivation and individualized consideration, they signal that

employees' ideas are valued; through intellectual stimulation, they challenge routines and encourage open dialogue (Han et al., 2016b, Han et al., 2016a).

Iranian SMEs typically exhibit hierarchical cultures where subordinates hesitate to speak freely (Karami, 2025a). In such environments, transformational leaders can dismantle communication barriers by linking knowledge exchange to collective vision and recognition (Karami, 2026d). When employees perceive that leadership values sharing rather than withholding information, KS becomes a norm that fuels collaborative innovation.

H2: Transformational leadership has a positive and significant effect on knowledge sharing in Iranian SMEs.

Knowledge Sharing and Organizational Learning

While KS occurs at the interpersonal level, organizational learning (OL) captures a firm's collective capability to acquire, interpret, and institutionalize knowledge to improve actions (Nugroho, 2018). KS provides the raw material for OL; without active exchange, organizations cannot learn effectively. Studies confirm that when employees discuss mistakes, successes, and best practices, they build shared mental models and organizational memory (Park and Kim, 2018, Sita Nirmala Kumaraswamy and Chitale, 2012). In Iranian SMEs where tacit knowledge is pervasive and documentation scarce KS is particularly critical. Informal peer interactions often substitute for formal training or databases (Karami and Bouraghi, 2026). TL-driven KS thus creates a knowledge reservoir that fuels learning cycles: information acquisition, dissemination, and application. Consequently, KS should directly enhance OL.

H3: Knowledge sharing has a positive and significant effect on organizational learning in Iranian SMEs.

Organizational Learning and Innovation Performance

Organizational learning underpins a firm's adaptability and innovation (Mohammadi et al., 2016). Through continuous knowledge acquisition and reflection, organizations develop dynamic capabilities the ability to sense opportunities, seize them, and reconfigure resources (Teece et al., 1997). Learning oriented firms encourage experimentation, evaluate results, and embed lessons in routines, which directly improve innovation outcomes (Gadepalli and Mondal, 2018, Harsono et al., 2025).

For Iranian SMEs, OL is not optional; it is a survival mechanism in turbulent environments (Karami et al., 2014a). Firms that systematically learn from projects, customers, and competitors can innovate faster and more efficiently. Empirical evidence across emerging markets shows that OL significantly enhances innovation performance by translating knowledge into new products, services, and processes (Sattayaraksa and Boon-itt, 2018, Afriyie et al., 2019).

H4: Organizational learning has a positive and significant effect on innovation performance in Iranian SMEs.

Sequential Mediation through Knowledge Sharing and Organizational Learning

The relationship between TL and innovation rarely unfolds in a single step (Sita Nirmala Kumaraswamy and Chitale, 2012). Similar capability-based pathways have been observed in prior research where organizational capabilities mediated the relationship between strategic orientations and performance outcomes (Motallebi, 2025). This study proposes a serial mediation model, where TL enhances KS; KS fosters OL; and OL drives IP. In other words, TL stimulates innovation *through* knowledge and learning processes rather than through direct command or charisma.

This sequence reflects a micro to macro knowledge transformation mechanism. At the micro level, TL cultivates openness and trust, motivating individuals to share experiences. At the meso level, shared knowledge is analyzed and institutionalized into learning routines. At the macro level, these routines

produce innovative outcomes (Karami and Jahanzeb, 2026). Thus, KS and OL together form a bridge between leadership behaviors and organizational innovation.

The serial mediation aligns with the dynamic capability perspective (Teece et al., 1997), in which sensing and seizing opportunities require both information flow (KS) and integrative routines (OL). It also complements Ting et al. (2021), who argued that leadership triggers learning architecture that shapes long term strategic renewal (Karami, 2026b). Testing KS and OL together provide a richer view than prior single mediator models, revealing how behavioral and cognitive mechanisms jointly channel leadership influence.

H5: Knowledge sharing and organizational learning sequentially mediate the relationship between transformational leadership and innovation performance in Iranian SMEs.

Integrating the Iranian Context

Iran’s SMEs operate amid volatility currency fluctuations, sanctions, and regulatory inconsistencies limit strategic planning (Karami, 2026c). Under such turbulence, formal systems for knowledge management are rare; success relies on social interaction, trust, and adaptive learning. TL behaviors (vision articulation, empathy, empowerment) resonate with Iranian cultural values of collectivism and respect for authority. However, transformational leaders must transform these values from hierarchical compliance into collaborative energy by promoting dialogue and experimentation.

This contextualization broadens existing TL-innovation theory. Most prior research draws from Western samples emphasizing formal systems and individual autonomy. By examining an emerging economy setting characterized by informal processes and institutional voids, this study reveals that the social infrastructure of knowledge exchange not structural sophistication is what converts leadership influence into innovation capability.

Conceptual Framework

Figure 1 depicts the proposed relationships and hypotheses. Transformational leadership influences innovation performance indirectly through knowledge sharing and organizational learning. The direct TL and IP path is hypothesized to be nonsignificant (H1), while the indirect paths via KS (H2) and OL (H3–H5) constitute a full serial mediation chain. This model integrates behavioral and capability perspectives and anchors leadership influence within the dynamic-capability framework.

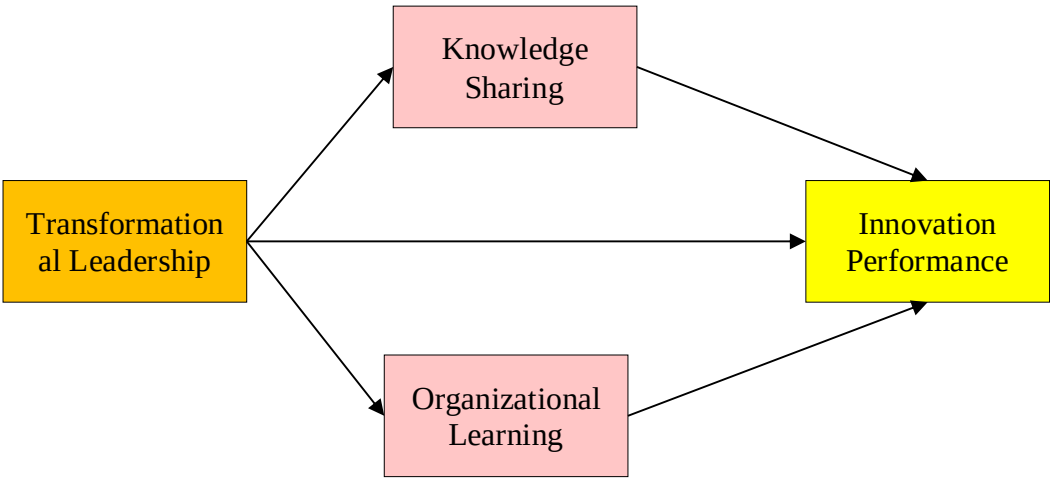


Figure 1. Conceptual Framework

RESEARCH METHODOLOGY

Research Design

This study adopts a quantitative, cross sectional survey design to test the serial mediation framework linking transformational leadership (TL), knowledge sharing (KS), organizational learning (OL), and innovation performance (IP) in Iranian small and medium sized enterprises (SMEs). Given the predictive and exploratory aims, Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected because it accommodates moderate samples, non-normal data, and complex mediation models (Hair and Alamer, 2022). The design follows a positivist approach emphasizing reliability, replicability, and generalizable inference. Although cross sectional designs cannot confirm causality, this study mitigates the limitation by grounding the proposed sequence (TL → KS → OL → IP) in well-established theoretical logic and prior longitudinal evidence (Ting et al., 2021).

Population and Sampling

The population comprised Iranian manufacturing and service SMEs located in Tehran, Isfahan, and Shiraz the country's principal industrial hubs. Following the Ministry of Industry, Mine, and Trade definition, SMEs were firms with fewer than 250 employees and annual turnover below 1,000 billion IRR. A stratified random sampling method ensured proportional representation of both sectors. Of 450 distributed questionnaires, 312 valid responses were returned (69 % response rate). The sample consisted of 165 manufacturing (52.9 %) and 147 service (47.1 %) firms. Respondents were mainly middle and senior managers (71 %) or team leaders (29 %), averaging 11.3 years of firm age and 84 employees per firm. To confirm external validity, sectoral proportions were compared with national SME statistics and found consistent. Data were collected between January and April 2025 via email and on-site visits. Average completion time was 12 minutes. Participation was voluntary and anonymous. The study obtained ethical clearance from the University Research Ethics Committee.

Instrument Development

Measurement items were adapted from validated scales and contextualized to the Iranian SME environment. The questionnaire was drafted in English, translated into Persian, and back translated for accuracy. All items used a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Transformational Leadership (TL): 8 items from the Multifactor Leadership Questionnaire (MLQ-5X) (García-Morales et al., 2012). Knowledge Sharing (KS): 6 items from Lei et al. (2021) and Yadav et al. (2019). Organizational Learning (OL): 7 items from Harsono et al. (2025). Innovation Performance (IP): 7 items from Ullah et al. (2016) covering product, process, and service innovation. Expert review (three academics, two SME managers) ensured content validity; a pilot test with 30 participants confirmed item clarity (Cronbach's $\alpha > 0.80$).

Table 1. Measurement Scale Items

Construct	Code	Item Statement
Transformationnel Leadership (García-Morales et al., 2012)	TL1	My supervisor communicates an inspiring vision for the organization.
	TL2	My supervisor treats me as an individual and values my contribution.
	TL3	My supervisor links individual goals with the organization's mission.
	TL4	My supervisor provides feedback that helps me improve performance.

Knowledge Sharing ((Lei et al., 2021, Yadav et al., 2019)	KS1	Employees willingly share know how with colleagues.
	KS2	My department regularly shares best practices with other units.
	KS3	Information exchange between departments is frequent and open.
Organizational Learning (Harsono et al., 2025)	OL1	The organization encourages experimentation and risk taking.
	OL2	Lessons learned are systematically stored and disseminated.
	OL3	The firm quickly applies new knowledge to its operations.
Innovation Performance (Ullah et al., 2016)	IP1	Our company frequently introduces new products or services.
	IP2	Product or process innovations improve operational efficiency.
	IP3	Innovation activities have improved our market share in recent years.

Control Variables

To account for confounding influences, three control variables were included in the structural model: firm size, firm age, and sector type (manufacturing = 1; service = 0). None showed significant paths to innovation performance (all $p > 0.10$), indicating that leadership and learning variables explain most of the variance.

Data Analysis

Data were screened for outliers and missing values before analysis in Smart-PLS 4.0. The two-step procedure proposed by (Hair and Alamer, 2022) was followed:

1. Measurement model assessment – indicator reliability, composite reliability, convergent validity, and discriminant validity (Fornell–Larcker and HTMT).
2. Structural model assessment – collinearity ($VIF < 3$), path significance, R^2 , f^2 , Q^2 , and mediation testing via bootstrapping (5 000 resamples).

PLS-SEM was selected for its predictive orientation and ability to handle complex hierarchical models typical of social science research.

Reliability and Validity

All constructs met recommended thresholds (indicator > 0.70 ; $\alpha > 0.70$; $CR > 0.80$; $AVE > 0.50$). Table 2 summarizes reliability and validity results. Discriminant validity was confirmed because the square root of each construct's AVE exceeded inter-construct correlations, and all HTMT ratios < 0.85 (Henseler et al., 2015).

Table 2. Reliability and Validity Summary

Construct	Items	Loading Range	Cronbach's α	Composite Reliability	AVE	HTMT Range
Transformational Leadership	4	0.74–0.87	0.89	0.92	0.62	0.64–0.78
Knowledge Sharing	3	0.72–0.86	0.88	0.91	0.59	0.66–0.79
Organizational Learning	3	0.73–0.84	0.87	0.90	0.56	0.69–0.81
Innovation Performance	3	0.71–0.85	0.88	0.91	0.58	0.67–0.80

All values meet or exceed (Hair and Alamer, 2022) criteria.

Common Method Bias (CMB) and Robustness Checks

Since all data were self-reported, procedural and statistical remedies were applied to minimize common method bias. Procedurally, anonymity was assured, and measurement order was randomized. Statistically, Harman's single factor test revealed that the first factor accounted for only 31.2 % of total variance below the 50 % threshold (Podsakoff et al., 2003). Additionally, full collinearity VIFs were all < 3.3, confirming the absence of CMB (Kock, 2015).

Ethical Considerations

Participation was voluntary; respondents were informed of their rights and the academic purpose of the study. All data were stored anonymously. The study followed ethical standards consistent with the Declaration of Helsinki and received institutional approval.

Statistical Power and Adequacy

An a priori power analysis using G*Power 3.1 with parameters $f^2 = 0.15$, $\alpha = 0.05$, power = 0.95 suggested a minimum of 138 cases. The achieved sample ($n = 312$) comfortably exceeded this requirement, ensuring adequate statistical power for detecting medium effects.

RESULTS AND ANALYSIS

Measurement Model Evaluation

Before testing the hypotheses, the measurement model was examined for reliability and validity. As shown previously in Table 2, all indicator loadings exceeded 0.70, Cronbach's α and composite reliability values were above 0.85, and the average variance extracted (AVE) values surpassed 0.50 confirming convergent validity (Hair and Alamer, 2022). Discriminant validity was verified through both the Fornell–Larcker criterion and the HTMT ratio. Table 3 reports that the square root of each construct's AVE (bolded diagonals) exceeded its correlations with other constructs, while all HTMT ratios were below 0.85 (Henseler et al., 2015).

Table 3. Discriminant Validity (Fornell–Larcker Criterion)

Construct	TL	KS	OL	IP
Transformational Leadership (TL)	0.79			
Knowledge Sharing (KS)	0.62	0.78		

Organizational Learning (OL)	0.56	0.63	0.76	
Innovation Performance (IP)	0.49	0.58	0.60	0.75

HTMT ratios < 0.85 and discriminant validity confirmed.

Structural Model Evaluation

After confirming validity, the hypothesized structural paths were tested using bootstrapping with 5 000 resamples. No multicollinearity was detected (VIF < 3). Model explanatory power was strong: $R^2 = 0.38$ (KS), 0.51 (OL), and 0.49 (IP). All predictive relevance (Q^2) values were positive (KS = 0.21, OL = 0.33, IP = 0.29), indicating good predictive strength (Chin, 1998).

Table 4. Structural Model Results (Bootstrapping = 5 000)

Hypothesis	Path	β	t	p	Result
H1	TL → IP	0.07	1.02	0.31	Not Supported
H2	TL → KS	0.62	11.24	< 0.001	Supported
H3	KS → OL	0.54	9.13	< 0.001	Supported
H4	OL → IP	0.41	7.06	< 0.001	Supported
H5 (Serial Mediation)	TL → KS → OL → IP	0.14	4.97	< 0.001	Supported

Note: Effect sizes (f^2): TL and KS = 0.42 (large); KS and OL = 0.29 (medium large); OL and IP = 0.18 (medium). These indicate that KS and OL account for most of leadership's total influence.

Mediation Analysis

Bootstrapped indirect effect testing confirmed full serial mediation:

- TL → KS → OL → IP: $\beta = 0.14$, $t = 4.97$, $p < 0.001$
- TL → OL → IP: $\beta = 0.17$, $t = 5.66$, $p < 0.001$
- TL → IP (direct) : $\beta = 0.07$, $t = 1.02$, $p > 0.05$

The Variance Accounted For (VAF) of 0.66 shows that 66 % of TL's total effect on innovation performance flows through KS and OL. This supports the hypothesized mediation chain.

Table 5. Bootstrapping Mediation Output (5 000 Resamples)

Effect Path	Indirect β	t	p	Result
TL → KS → OL → IP	0.14	4.97	< 0.001	Significant
TL → OL → IP	0.17	5.66	< 0.001	Significant
TL → IP (Direct)	0.07	1.02	0.31	Not Significant

VAF = 0.66 and Full Mediation.

Multi Group and Control Variable Tests

A multi group analysis (PLS-MGA) compared manufacturing and service firms. No significant differences were found ($p > 0.05$), indicating structural invariance across sectors. Control variables firm size, firm age, and sector showed no significant influence on IP (all $p > 0.10$). Hence, leadership and learning constructs explain most variance.

Predictive Power and Robustness

Out of sample prediction using PLS-Predict confirmed high model reliability. All Q^2 predict values for IP indicators were positive (0.20–0.27), and the PLS model outperformed a linear benchmark, demonstrating strong predictive relevance (Hair and Alamer, 2022). Testing a reversed causal order (OL → KS → IP) produced weaker fit ($R^2 = 0.42$ for IP), supporting the hypothesized direction TL → KS → OL → IP.

Table 6. Model Summary and Diagnostics

Metric	KS	OL	IP	Interpretation
R^2	0.38	0.51	0.49	Substantial variance explained
Q^2 (Predictive Relevance)	0.21	0.33	0.29	All > 0 and Predictive model
f^2 (Effect Size)	0.42 (TL and KS)	0.29 (KS and OL)	0.18 (OL and IP)	Large and Medium and Medium
VIF Range	1.1–2.4	—	—	No multicollinearity

Structural Model Summary

Table 7. Structural Model Summary (PLS-SEM Paths and Mediation)

Relationship	Standardized Path (β)	t-Value	p-Value	Significance	Hypothesis	Supported?
TL and Knowledge Sharing	0.62	11.24	< 0.001	***	H2	Yes
Knowledge Sharing and Organizational Learning	0.54	9.13	< 0.001	***	H3	Yes
Organizational Learning and Innovation Performance	0.41	7.06	< 0.001	***	H4	Yes
TL and Innovation Performance (Direct)	0.07	1.02	0.31	n.s.	H1	No
TL → KS → OL → IP (Indirect)	0.14	4.97	< 0.001	***	H5	Yes

Model Statistics: R^2 (KS) = 0.38 • R^2 (OL) = 0.51 • R^2 (IP) = 0.49 • VAF = 0.66 (full mediation)

Notes: *** $p < 0.001$; n.s. = not significant. Bootstrapping = 5 000 resamples.

Interpretation of Findings

All hypotheses except H1 were supported. TL strongly drives KS and OL, and their combined effect fully explains innovation outcomes. The lack of a direct TL and IP effect reinforces the full mediation mechanism: leadership generates innovation only through enabling social and learning processes. These findings substantiate the dynamic capability view leadership enhances innovation by reconfiguring a firm's knowledge resources. Transformational leaders stimulate sharing behaviors (micro level) that mature into organizational learning routines (meso level) producing innovation performance (macro level) (Teece et al., 1997, Ting et al., 2021). In Iranian SMEs, this indirect pathway compensates for limited financial and technological assets, making leadership driven learning culture the critical competitive capability.

DISCUSSION AND IMPLICATIONS

Overview of Findings

This study examined how transformational leadership (TL) influences innovation performance (IP) through knowledge sharing (KS) and organizational learning (OL) in Iranian small and medium sized enterprises (SMEs). Using PLS-SEM, the findings show that TL does not directly predict innovation outcomes but exerts its influence entirely through KS and OL. The standardized paths in Table 7 reveal a strong TL and KS ($\beta = 0.62$) and KS and OL ($\beta = 0.54$) relationship, followed by OL and IP ($\beta = 0.41$). The indirect TL $\rightarrow$ KS $\rightarrow$ OL $\rightarrow$ IP effect ($\beta = 0.14$, $p < 0.001$) accounts for two thirds of the total impact (VAF = 0.66). In short, transformational leaders drive innovation not through top-down control or charisma but by cultivating knowledge flow and learning capability. For SMEs operating under turbulence and resource scarcity, this indirect route provides a pragmatic mechanism for sustaining innovation capability.

Transformational Leadership and Knowledge Sharing

The strong TL and KS effect confirms that transformational behaviors create psychological safety and trust (Gill and Kaur, 2015), encouraging employees to exchange ideas freely (Yadav et al., 2019, Karami, 2026a). Leaders who express a compelling vision and show individualized consideration make employees feel respected and intellectually valued, which lowers communication barriers. Within Iranian SMEs where hierarchical norms and fear of authority often suppress idea expression TL converts passive obedience into active engagement. Visionary communication and participative dialogue legitimize speaking up, while empathy and feedback reinforce that sharing knowledge benefits both the individual and the organization. Thus, TL acts as a social lubricant that transforms rigid hierarchies into interactive, knowledge rich environments.

Knowledge Sharing and Organizational Learning

The positive KS and OL path demonstrates that interpersonal knowledge exchanges become organizational learning when systematically captured and applied. Consistent with Nugroho (2018) and (Park and Kim, 2018), shared experiences evolve into collective memory that informs future actions. For Iranian SMEs lacking sophisticated IT or documentation systems, KS fills the structural void. Employees exchange insights through informal meetings and project debriefings; leaders institutionalize these discussions by embedding them in routines such as after-action reviews and cross functional meetings. Over time, this process transforms tacit know-how into explicit learning a dynamic capability that enables continuous improvement.

Organizational Learning and Innovation Performance

The strong OL and IP link aligns with Teece et al. (1997) and (Harsono et al., 2025), confirming that learning is the engine of innovation. OL provides the mechanism through which firms sense environmental changes, seize opportunities, and reconfigure resources (Anand and Vohra, 2022). In the Iranian context marked by sanctions, economic volatility, and constrained technology access learning substitutes for external knowledge acquisition. SMEs that codify lessons, share feedback, and experiment continuously achieve superior product and process innovation. This finding reinforces the idea that learning transforms “knowledge in motion” into “innovation in action.” Leadership’s primary value lies in building this learning architecture rather than directly supervising innovation projects.

Full Serial Mediation: The Knowledge–Learning Chain

The nonsignificant TL and IP path ($\beta = 0.07, p > 0.05$) coupled with significant indirect paths indicates complete serial mediation. TL promotes KS, KS enables OL, and OL drives IP an integrated micro to macro progression. Micro level: Leadership behaviors encourage individual trust and information exchange. Meso level: Shared knowledge is collectively interpreted and stored through learning routines. Macro level: Organizational learning produces innovative outcomes that enhance firm performance. This cascade reconciles earlier conflicting evidence on TL's role in innovation (Sattayaraksa and Boonitt, 2018, Weng et al., 2015). Direct effects often observed in Western contexts may actually represent unmeasured knowledge learning processes. In emerging economies, where informal processes dominate, leadership's influence manifests almost exclusively through these social cognitive channels.

Theoretical Contributions

Bridging Behavioral and Capability Perspectives: The study integrates *behavioral mechanisms* (KS) with *organizational capabilities* (OL), clarifying how leadership transforms social interaction into dynamic capability. It extends leadership theory beyond individual influence on collective learning processes.

Advancing Dynamic Capability Theory: TL is conceptualized as an *enabling dynamic capability* that reconfigures a firm's knowledge base. Leadership initiates sensing (via KS) and seizing (via OL), culminating in transforming (innovation). This empirically grounds the theoretical cycle proposed by Teece et al. (1997).

Contextual Extension to Emerging Economies: Evidence from Iranian SMEs shows that even in resource poor and institutionally weak environments, TL fosters innovation through social learning rather than structural sophistication. This challenges assumptions that advanced systems are prerequisites for dynamic capability.

Clarifying the TL–Innovation Relationship: The full mediation results resolves ambiguity in prior studies by demonstrating that TL's effects on innovation are indirect, sequential, and knowledge driven.

Managerial Implications

For decision makers, the findings offer actionable guidance: (1) **Develop Knowledge Sharing Norms:** Leaders must institutionalize openness and dialogue. Encourage employees to share both successes and failures without fear of blame. Regular team meetings, digital platforms, and cross functional workshops can anchor KS as a daily practice. (2) **Transform Knowledge into Learning:** Knowledge sharing alone is insufficient unless converted into collective learning. Implement systems such as debrief sessions, internal newsletters, or learning logs that capture shared knowledge and feed it back into planning and operations. (3) **Reward Collaboration, Not Competition:** Align incentives with group innovation metrics. Recognize contributions to shared learning, not just individual outcomes. A collaborative reward structure reinforces the KS–OL pathway. (4) **Use Affordable Digital Tools:** Low-cost technologies (intranets, messaging platforms, shared drives) can facilitate knowledge capture and distribution. For SMEs, such tools provide scalable means to institutionalize learning without large IT investments.

Policy Implications

At a national level, policy makers can amplify these mechanisms by embedding leadership and learning capacity building in SME support initiatives: **Leadership Development Programs:** Offer workshops emphasizing transformational competencies vision communication, empathy, empowerment, and feedback. **Knowledge Management Infrastructure:** Provide grants or cloud-based platforms enabling SMEs to store and exchange best practices. **Innovation Networks:** Encourage cluster-based learning and mentoring across SMEs to diffuse knowledge horizontally within industries. Such interventions strengthen the collective innovation ecosystem, moving Iran's SME sector toward sustainable competitiveness driven by human capital and learning orientation (Karami et al., 2014b).

LIMITATIONS AND FUTURE RESEARCH

1. Cross Sectional Design. The study infers causality theoretically; longitudinal designs could track how TL-induced KS and OL evolve over time.
 2. Self-Report Measures. Although statistical tests ruled out major bias, multi-source data (e.g., leaders vs. subordinates) would enhance robustness.
 3. Construct Overlap. Future studies should disentangle micro level KS and macro level OL using multilevel modeling.
 4. Boundary Conditions. Including moderators such as digital maturity, innovation climate, or environmental turbulence could test when TL's effects are strongest.
 5. Cultural Generalizability. Replicating this model across different emerging economies could reveal whether collectivist cultures amplify or dampen the KS–OL mechanism.
-

CONCLUSION

This study examined how transformational leadership (TL) enhances innovation performance (IP) in Iranian small and medium sized enterprises through knowledge sharing (KS) and organizational learning (OL). Analyzing data from 312 manufacturing and service SMEs with PLS-SEM, the results revealed that TL has no direct effect on innovation but operates entirely through a full serial mediation chain: TL → KS → OL → IP. Transformational leaders inspire employees to share ideas (KS) and embed those ideas into learning routines (OL), which subsequently generate innovation outcomes. This sequential mechanism confirms that in turbulent, resource constrained contexts such as Iran, the most valuable role of leadership lies not in charismatic direction but in creating a social system that captures and reuses knowledge.

Theoretically, the research advances the dynamic capability perspective (Teece et al., 1997) by identifying the behavioral (KS) and structural (OL) mechanisms through which leadership reconfigures organizational knowledge. Practically, it highlights that Iranian SME managers can strengthen innovation capability by institutionalizing learning systems and cultivating a collaborative knowledge culture. Future studies should apply longitudinal designs, multi-source data, and cross-country comparisons to confirm causality and cultural generalizability. Exploring moderators such as digital orientation or environmental turbulence may also refine understanding when TL most effectively translates into innovation performance.

Declarations

Acknowledgments

The author thanks the SME managers who participated in the survey and the academic reviewers who provided methodological guidance during instrument development.

Conflict of Interest

The author declares no conflicts of interest regarding the research, authorship, or publication of this article.

Funding

This research received no external funding and was self supported by the author.

Ethical Approval

Approved by the University Research Ethics Committee. All participants were informed about the study's purpose, assured of anonymity, and provided written consent prior to participation.

Author's Contribution

Author designed the study, collected and analyzed the data, and prepared the manuscript. The author reviewed and approved the final version.

Data Availability

The dataset supporting the findings is available from the corresponding author upon reasonable request.

REFERENCES

1. AFRIYIE, S., DU, J. & IBN MUSAH, A.-A. 2019. Innovation and marketing performance of SME in an emerging economy: the moderating effect of transformational leadership. *Journal of Global Entrepreneurship Research*, 9, 40.
2. ANAND, A. & VOHRA, V. 2022. What helps me cope with work–family conflict at my high-performance work system in India: A thematic analysis of sociocultural factors. *Vikalpa*, 47, 38-52.
3. ANJUM, M. J., ALI, S. M., SADIQ, M., KARAMI, M. & KHAN, S. 2012. Exploring the nexus: management practices, innovation and firm performance. *World Applied Sciences Journal*, 19, 785-794.
4. ARYEE, S., WALUMBWA, F. O., ZHOU, Q. & HARTNELL, C. A. 2012. Transformational leadership, innovative behavior, and task performance: Test of mediation and moderation processes. *Human performance*, 25, 1-25.
5. CHIN, W. W. 1998. Commentary: Issues and opinion on structural equation modeling. JSTOR.
6. GADEPALLI, S. D. & MONDAL, A. 2018. Sources of business unit performance heterogeneity in India: the influence of ownership. *Vikalpa*, 43, 207-221.
7. GARCÍA-MORALES, V. J., JIMÉNEZ-BARRIONUEVO, M. M. & GUTIÉRREZ-GUTIÉRREZ, L. 2012. Transformational leadership influence on organizational performance through organizational learning and innovation. *Journal of business research*, 65, 1040-1050.
8. GHASEMI, R., AZMI MOHAMAD, N., KARAMI, M., HAFIZ BAJURI, N. & ASGHARIZADE, E. 2016. The mediating effect of management accounting system on the relationship between competition and managerial performance. *International Journal of Accounting and Information Management*, 24, 272-295.
9. GILL, S. & KAUR, P. 2015. Family involvement in business and financial performance: a panel data analysis. *Vikalpa*, 40, 395-420.
10. HAIR, J. & ALAMER, A. 2022. Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1, 100027.
11. HAN, S.-H., SEO, G., LI, J. & YOON, S. W. 2016a. The mediating effect of organizational commitment and employee empowerment: How transformational leadership impacts employee knowledge sharing intention. *Human Resource Development International*, 19, 98-115.
12. HAN, S. H., SEO, G., YOON, S. W. & YOON, D.-Y. 2016b. Transformational leadership and knowledge sharing: Mediating roles of employee's empowerment, commitment, and citizenship behaviors. *Journal of Workplace Learning*, 28, 130-149.
13. HARSONO, T. W., HIDAYAT, K., IQBAL, M. & ABDILLAH, Y. 2025. Exploring the effect of transformational leadership and knowledge management in enhancing innovative performance: a

- mediating role of innovation capability. *Journal of Manufacturing Technology Management*, 36, 227-250.
14. HENSELER, J., RINGLE, C. M. & SARSTEDT, M. 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43, 115-135.
 15. KARAMI, M. 2025a. Digital entrepreneurship and cross border trade performance in emerging economies: the mediating roles of innovation capability and institutional support. *TMP Universal Journal of Law, Business, and Management*, 1.
 16. KARAMI, M. 2025b. Integrating Market Sensing, Digital Logistics, and Green Operations: A Dynamic Capabilities Perspective on Superior Business Performance. *TMP Universal Journal of Law, Business, and Management*, 1.
 17. KARAMI, M. 2026a. Digital Readiness and Market Orientation as Drivers of Sustainable Supply Chain Performance: A Dynamic Capability Perspective.
 18. KARAMI, M. 2026b. From Market Orientation to Operational Excellence: A Dynamic Capabilities Pathway to Firm Competitiveness in Emerging Manufacturing Economies. *International Journal of Global Business and Competitiveness*.
 19. KARAMI, M. 2026c. Reframing Strategic Decision-Making as a Dynamic Capability: A Conceptual Framework for AI Enabled Organizations. *Advances in Business and Management Research*, 100005.
 20. KARAMI, M. 2026d. Resilience and risk management in railway supply chains: the interplay of leadership, innovation and competitive advantage. *Railway Sciences*, 1-19.
 21. KARAMI, M. & BOURAGHI, H. 2026. Blockchain enabled real time supply chain optimization bridging financial markets and operational efficiency. *Discover Analytics*, 4, 26.
 22. KARAMI, M., GHASEMI, R., KHAN, S. & HAMID, A. 2014a. Market orientation and supply chain innovation relationship: Conceptual framework model. *Middle-East Journal of Scientific Research*, 21, 1526-1532.
 23. KARAMI, M. & JAHANZEB, A. 2026. How AI is transforming supply chain talent: what HR leaders should do to build agile and resilient workforces? *Strategic HR Review*, 1-5.
 24. KARAMI, M., KHADEMI, T., ALIYUISAH-CHIKAJI, D. M. A. & MANSOR, N. N. A. 2014b. Research Article Entrepreneurial Attitude Orientation and Market Orientation in Malaysia. *Research Journal of Applied Sciences, Engineering and Technology*, 7, 5106-5109.
 25. KARAMI, M., MORADI, L., MAZHARI, M., YARKARAMI, F., KHAN, S. & HD SCHOLAR, P. 2013. Financial management and women entrepreneurship in Malaysia. *International Journal of Management and Commerce Innovations*, 2.
 26. KOCK, N. 2015. Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, 11, 1-10.
 27. LEI, H., GUI, L. & LE, P. B. 2021. Linking transformational leadership and frugal innovation: the mediating role of tacit and explicit knowledge sharing. *Journal of Knowledge Management*, 25, 1832-1852.
 28. MATZLER, K., SCHWARZ, E., DEUTINGER, N. & HARMS, R. 2008. The relationship between transformational leadership, product innovation and performance in SMEs. *Journal of Small Business & Entrepreneurship*, 21, 139-151.
 29. MOHAMMADI, M. A. D., KHAN, M. N. A. A., KARAMI, M. & SADATIFAR, S. R. 2016. Perceived Organizational Support and Perceived Organizational Performance Mediated by Corporate Entrepreneurship. *Sains Humanika*, 8.
 30. MOTALLEBI, S. 2025. Linking Market Orientation to Strategic Performance: Operational and Digital Mediation in Manufacturing Firms. *Business, Technology & Innovation Studies Journal*, 1.
 31. NUGROHO, M. A. 2018. The effects of collaborative cultures and knowledge sharing on organizational learning. *Journal of Organizational Change Management*, 31, 1138-1152.
 32. PARK, S. & KIM, E.-J. 2018. Fostering organizational learning through leadership and knowledge sharing. *Journal of knowledge management*, 22, 1408-1423.

33. PODSAKOFF, P. M., MACKENZIE, S. B., LEE, J.-Y. & PODSAKOFF, N. P. 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88, 879.
34. SATHYE, M. 2005. Privatization, performance, and efficiency: A study of Indian banks. *Vikalpa*, 30, 7-16.
35. SATTAYARAKSA, T. & BOON-ITT, S. 2018. The roles of CEO transformational leadership and organizational factors on product innovation performance. *European Journal of Innovation Management*, 21, 227-249.
36. SITANIRMALA KUMARASWAMY, K. & CHITALE, C. 2012. Collaborative knowledge sharing strategy to enhance organizational learning. *Journal of Management Development*, 31, 308-322.
37. TEECE, D. J., PISANO, G. & SHUEN, A. 1997. Dynamic capabilities and strategic management. *Strategic management journal*, 18, 509-533.
38. TING, I. W. K., SUI, H. J., KWEH, Q. L. & NAWANIR, G. 2021. Knowledge management and firm innovative performance with the moderating role of transformational leadership. *Journal of Knowledge Management*, 25, 2115-2140.
39. ULLAH, M. I., AB HAMID, K. B. & SHAHZAD, A. 2016. Impact of Transformational Leadership on Knowledge Sharing of Employees and Innovation Capability in the Dairy Sector of Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, 36.
40. WENG, R. H., HUANG, C. Y., CHEN, L. M. & CHANG, L. Y. 2015. Exploring the impact of transformational leadership on nurse innovation behaviour: A cross-sectional study. *Journal of nursing management*, 23, 427-439.
41. YADAV, M., CHOUDHARY, S. & JAIN, S. 2019. Transformational leadership and knowledge sharing behavior in freelancers: A moderated mediation model with employee engagement and social support. *Journal of Global Operations and Strategic Sourcing*, 12, 202-224.