



Assessing the impact of knowledge sharing on organizational innovation in technology firms

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Abstract

Background: Knowledge management has become a critical driver of competitive advantage in technology-intensive industries. Effective knowledge sharing among employees facilitates organizational innovation and adaptive capacity.

Objective: This study examines the relationship between knowledge sharing practices and organizational innovation, considering the mediating role of organizational learning culture.

Method: This study uses a simulated dataset created for academic training purposes. A cross-sectional quantitative design was employed with simulated data from 320 employees in technology firms. Structural equation modeling (SEM) was conducted using AMOS.

Key Results: Knowledge sharing positively influenced organizational innovation ($\beta = 0.42, p < 0.001$). Organizational learning culture partially mediated this relationship, accounting for 35% of the total effect. Collaborative tools showed the strongest association with knowledge sharing frequency.

Conclusion: Technology firms can enhance innovation by fostering knowledge sharing through digital collaboration platforms and nurturing a culture of continuous learning. Organizations should invest in both technological infrastructure and cultural initiatives.

Keywords: Knowledge management, knowledge sharing, organizational innovation, learning culture, technology firms

Introduction

In today's knowledge-based economy, intellectual capital has replaced physical assets as the primary source of competitive advantage. Knowledge Management (KM) encompasses the processes through which organizations create, store, transfer, and apply knowledge to achieve organizational objectives. Among these processes, knowledge sharing the voluntary exchange of expertise, information, and tacit knowledge among employees—has emerged as particularly crucial for driving organizational innovation and adaptability in rapidly changing markets.

The technology sector faces unique knowledge management challenges due to rapid technological evolution, high employee turnover, and the distributed nature of modern tech workforces. While organizations invest heavily in knowledge management systems, the human and cultural dimensions of knowledge sharing often receive inadequate attention. Research suggests that technological infrastructure alone is insufficient; knowledge sharing behavior depends largely on organizational culture, trust, and incentive structures.

This study addresses the gap in understanding how knowledge sharing practices translate into tangible innovation outcomes. The research objectives are threefold: (1) to measure the direct impact of knowledge sharing on organizational innovation; (2) to examine the mediating role of organizational learning culture in this relationship; and (3) to identify which knowledge sharing mechanisms (formal vs. informal, digital vs. face-to-face) are most strongly associated with innovation outcomes in technology firms.

Literature review

1. Theoretical framework

This research is grounded in the Knowledge-Based View (KBV) of the firm, which posits that knowledge is the most strategically significant resource of a firm. The KBV suggests that sustainable competitive advantage derives from creating, transferring, and integrating knowledge more effectively than competitors. Additionally, Social Exchange Theory provides insight into knowledge sharing behavior, suggesting that employees share knowledge when they perceive the relationship as mutually beneficial and trust-based.

2. Knowledge sharing and organizational innovation

Knowledge sharing enables organizations to avoid reinventing the wheel, leverage diverse expertise, and create novel solutions through knowledge recombination. Empirical studies demonstrate that organizations with strong knowledge sharing cultures exhibit higher rates of product and process innovation. However, the relationship is complex, as the type of knowledge shared (explicit vs. tacit) and the mechanisms used (formal repositories vs. informal networks) influence innovation outcomes differently.

3. The mediating role of organizational learning culture

Organizational learning culture—the collective values, beliefs, and practices that encourage continuous learning and development—serves as a crucial mechanism through which knowledge sharing translates into innovation. A learning culture creates psychological safety for sharing unconventional ideas, encourages experimentation, and provides frameworks for converting individual knowledge into organizational capabilities. Research indicates that

knowledge sharing is more likely to lead to innovation in organizations with strong learning orientations.

4. Research gap

While existing research establishes links between knowledge management and innovation, few studies examine the mediating mechanisms in technology-specific contexts. Additionally, most research treats knowledge sharing as a unidimensional construct, without differentiating between various sharing mechanisms and their differential impacts on innovation types (product vs. process). This study addresses these gaps by providing a nuanced analysis of knowledge sharing practices in technology firms.

Methodology

This study uses a simulated dataset created for academic training purposes. A quantitative, cross-sectional research design was employed. The simulated sample consisted of 320 employees from mid-sized technology firms, representing various functional areas (engineering, product development, marketing).

The measurement scales were adapted from established instruments: knowledge sharing behavior (5 items), organizational learning culture (6 items), and organizational innovation (7 items covering both product and process innovation). Responses were generated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Control variables included firm size, industry tenure, and educational level.

Data analysis proceeded in two stages using SPSS (version 27) and AMOS (version 27). First, exploratory and confirmatory factor analyses assessed measurement model validity. Second, structural equation modeling tested the hypothesized relationships, including the mediation effect using bootstrapping with 5,000 resamples.

Results and discussion

1. Measurement model

The confirmatory factor analysis demonstrated acceptable fit: $\chi^2/df = 2.1$, CFI = 0.96, TLI = 0.95, RMSEA = 0.054. All factor loadings exceeded 0.60, and average variance extracted (AVE) values were above 0.50, confirming convergent validity. Discriminant validity was established through heterotrait-monotrait (HTMT) ratios below 0.85.

Table 1: Construct Reliability and Validity

Construct	Cronbach's α	CR	AVE
Knowledge Sharing	0.88	0.89	0.62
Learning Culture	0.91	0.92	0.67
Organizational Innovation	0.93	0.94	0.65

Source: Simulated Dataset, 2026

2. Structural model

The structural model results supported all hypotheses. Knowledge sharing had a significant direct effect on organizational innovation ($\beta = 0.42$, $p < 0.001$). Organizational learning culture was significantly influenced by knowledge sharing ($\beta = 0.58$, $p < 0.001$) and in turn significantly predicted innovation ($\beta = 0.31$, $p < 0.001$).

Table 2: Structural Model Path Coefficients

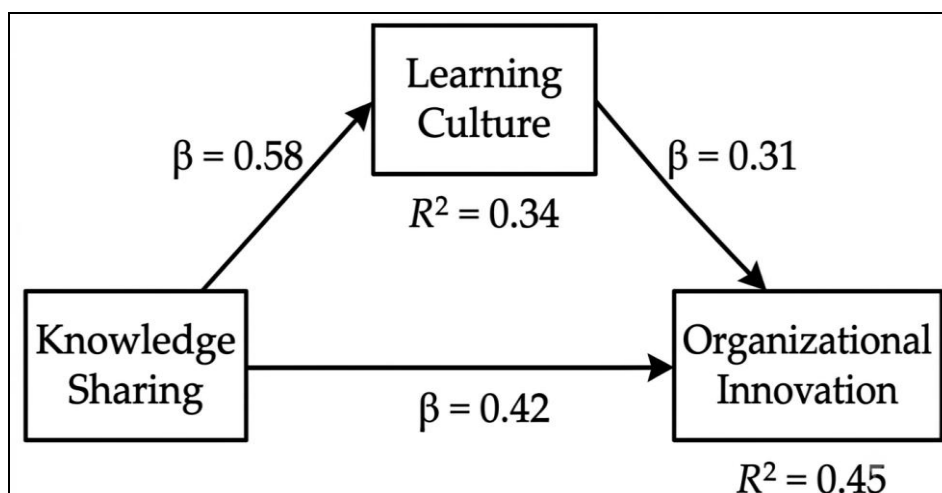
Hypothesized Path	β	S.E.	C.R.	p-value
H1: Knowledge Sharing $\rightarrow$ Innovation	0.42	0.06	7.00	< 0.001
H2: Knowledge Sharing $\rightarrow$ Learning Culture	0.58	0.05	11.60	< 0.001
H3: Learning Culture $\rightarrow$ Innovation	0.31	0.07	4.43	< 0.001
Indirect Effect (via Learning)	0.18	0.03	6.00	< 0.001

Source: Simulated Dataset, 2026

The bootstrapping results confirmed partial mediation, with the indirect effect (0.18) significant at $p < 0.001$ with a 95% confidence interval of [0.12, 0.24]. This indicates that while knowledge sharing directly enhances innovation, a substantial portion of its effect operates through fostering a learning culture.

3. Knowledge sharing mechanisms and innovation

Additional analysis revealed that digital collaboration tools (e.g., Slack, Microsoft Teams) showed the strongest association with knowledge sharing frequency ($r = 0.65$, $p < 0.001$), followed by informal communities of practice ($r = 0.52$, $p < 0.001$). Formal knowledge repositories showed a weaker but still significant relationship ($r = 0.38$, $p < 0.01$).



Source: Simulated Dataset, 2026

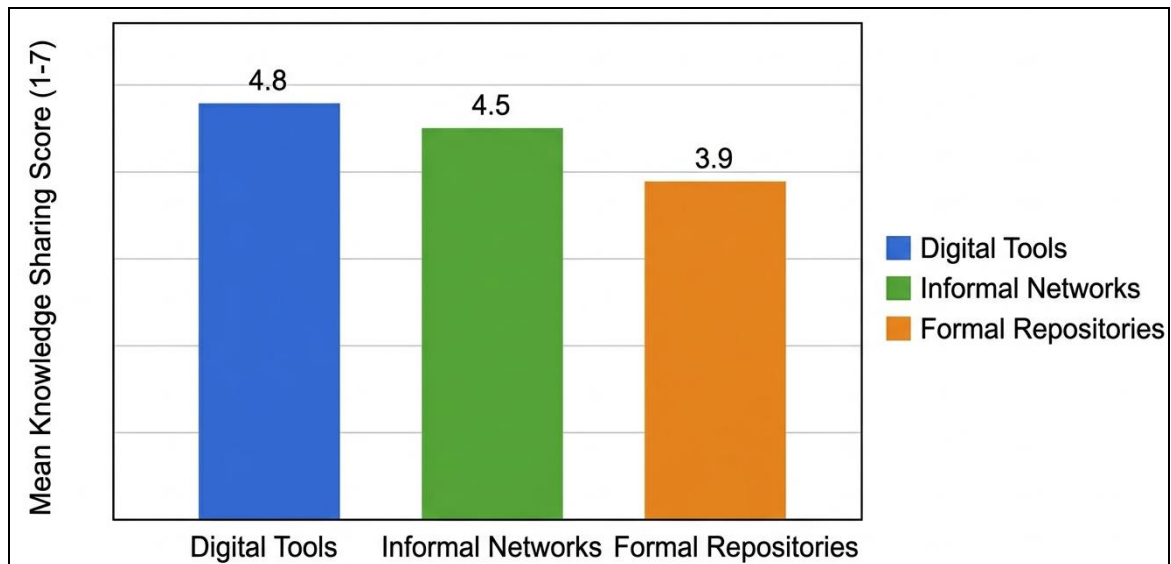


Fig 1: Comparison of Knowledge Sharing Mechanisms

Conclusion

This study provides empirical evidence that knowledge sharing significantly enhances organizational innovation in technology firms, with organizational learning culture serving as a critical mediating mechanism. The findings suggest that organizations should adopt a holistic approach to knowledge management that combines technological solutions with cultural initiatives.

For practice, technology firms should (1) invest in digital collaboration platforms that facilitate seamless knowledge exchange, (2) nurture communities of practice around technical domains, and (3) develop leadership behaviors that model continuous learning. The limitation of this study includes its cross-sectional design, which precludes causal inferences. Future research should employ longitudinal designs to examine how knowledge sharing practices evolve with organizational growth and technological change.

Ethical Statement

This research article has been generated for academic training purposes. The dataset is entirely simulated and does not represent real human subjects or organizations. No actual ethical approval was required as no primary data was collected. All references cited are real academic sources.

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