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Empowering SME Success: Unraveling the Nexus of Knowledge-Oriented Top Management, Knowledge-Sharing Practices, and Open Innovation on Performance

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Abstract

This study investigates the correlation between Knowledge-oriented top management, Inward and outward knowledge-sharing practices, and the impact they have on Inbound open innovation and business performance. Leadership is acknowledged as a crucial factor in effectively managing an organization, particularly in relation to knowledge management success. Our focus is on knowledge-oriented leaders' perspectives on knowledge sharing strategies and practices, and their pivotal role in establishing and implementing open innovation in small and medium-sized enterprises (SMEs). Such practices contribute to long-term success by reducing costs, expediting time to market, enhancing market differentiation, and creating new revenue streams for SMEs.

To test our theoretical model, we utilized SMARTPLS version 4 and collected data from a sample of 247 IT, marketing, and sales managers in Tehran, the capital of Iran. The results indicate that knowledge-oriented top management has a positive and significant influence on

both inward and outward knowledge-sharing strategies and practices, inbound open innovation, and ultimately, business performance.

Hence, the top manager and chief executive officer of a company, as role models with higher positions and authority, play a pivotal role in mobilizing the tangible and intangible resources of the company. They can establish a conducive culture, foundation, and incentives for sharing valuable and relevant knowledge across the organization and departments. This, in turn, fosters creativity, innovation, and departmental outputs, ultimately leading to improved overall business performance for the firm.

Keywords: Knowledge-oriented top management, Inward & outward knowledge sharing practices, Inbound open innovation, business performance, SMEs

1. Introduction

Today, the significance of knowledge management and innovation in determining success is widely acknowledged (Dayan et al., 2017). According to knowledge-based theory, a firm's most crucial and strategic asset is its knowledge (Curado & Bontis, 2006; Dayan et al., 2017), which, when effectively utilized, must be transformed into commercial value for survival and growth in today's competitive environment. Consequently, a key concern for managers and practitioners is how to manage knowledge and information effectively (Carneiro, 2000), develop knowledge and information flow within the organization, and identify and update relevant parameters to assess knowledge accumulation and the recycling of existing databases.

To address these challenges, prior research has emphasized the paramount role of top managers and leaders in facilitating the effective management of knowledge resources within organizations (Iqbal et al., 2018; Lonati, 2020; Rehman & Iqbal, 2020; Sahibzada et al., 2022; Uhl-Bien et al., 2007). However, the implications of knowledge-oriented top management may vary across different regions and contexts due to various factors, such as distinct cultural work values (Shamim & Abbasi, 2012). In other words, for successful and efficient knowledge management within an organization, leaders need to employ a combination of different leadership styles, such as transformational, ethical, humble, and authoritarian leadership (Shamim & Abbasi, 2012). This entails adapting their characteristics to suit changing situations (Naowakhoaksorn et al., 2022). Effective knowledge-oriented top management fosters an organizational culture and drives internal learning processes that involve the creation, acquisition, dissemination, sharing, and application of knowledge among members (Abbasi & Zamani-Miandashti, 2013). Knowledge-oriented top management plays a pivotal role in the successful adoption of open innovation, particularly for small to medium-sized businesses (SMEs) (Ahn et al., 2018), as SMEs can often derive greater benefits from open innovation compared to larger firms due to their willingness to take risks, ability to respond to changing environments, and reduced bureaucracy (Gentile-Lüdecke et al., 2020). Open innovation is a paradigm that challenges the traditional approach to innovation by highlighting that companies should not solely rely on their internal innovation capacities but also leverage a wide range of external actors and resources to advance their innovation processes and access new markets (Gann & Dahlander, 2010). Open

innovation enables firms to enhance their innovation performance by accessing new ideas and knowledge beyond their boundaries, reducing R&D investment costs, sharing risks, accelerating time to market, and achieving market differentiation (Elia et al., 2020; Leckel et al., 2020). There are two primary forms of open innovation: inbound and outbound open innovation (Cassiman & Valentini, 2016; Chesbrough, 2003).

Understanding the distinctions between inbound and outbound open innovation is vital for SMEs seeking to optimize their innovation strategies and overall business performance.

Although there are various studies examining the influence of Knowledge-Oriented Top Management, Knowledge-Sharing Practices, and Open Innovation on performance in organizations (Chaithanapat et al., 2022; Le & Le, 2022; Singh et al., 2021), it is essential to note that these studies may not always explicitly differentiate between inbound and outbound open innovation or Inward and Out ward knowledge sharing practices. While some research may focus on the overall impact of open innovation strategies on performance, it may not provide specific insights into the separate effects of inbound and outbound open innovation practices, or in some study the effect of knowledge sharing practice and quality was assessed in general without categorizing it in inward and outward knowledge sharing practices. so To better understand the specific contributions of inbound and outbound open innovation on performance, and role of inward and our ward knowledge sharing on innovation it is crucial for future research to delve into these concepts separately and investigate their respective effects on business outcomes. Such studies can provide valuable insights into the optimal combination of inbound and outbound strategies and using inward knowledge and applying outward knowledge practice and their implications for organizational growth and competitiveness in and out of organization in the ever-evolving business landscape.

This research paper makes three significant contributions to the knowledge expansion in the field of inbound open innovation in SMEs. Firstly, it underscores the critical role of top management in supporting inbound open innovation through inward and outward knowledge-sharing strategies and practices. Secondly, it posits that inbound open innovation positively influences the organizational performance of SMEs. Thirdly, it highlights how inward and outward knowledge-sharing practices act as mediators to facilitate openness in innovation, particularly in today's uncertain and unknowable world.

The paper is divided into six sections. It begins with the theoretical background, concepts, and hypotheses in sections 2 and 3, followed by the methodology in section 4. Section 5 presents the results, and section 6 comprises the discussion and Implications.

2. Theoretical Background

2.1 Small to Medium sized Firm

Small and medium-sized enterprises (SMEs) play a crucial role in driving a country's economic development. These enterprises have the advantage of being able to generate employment opportunities while utilizing local resources, thanks to the availability of various external partners for collaboration (such as competitors, distributors, suppliers, and research institutions) (Bagherzadeh, Markovic, & Bogers, 2019). SMEs tend to rely more on their

internal capabilities to foster progress (Wijaya & Suasih, 2020). However, emerging markets often face ongoing disruptions in politics, economics, and institutions, which negatively impact the operations of SMEs. Therefore, innovation is vital for SMEs to create competitive advantages, ensure their survival, and promote growth (Chabbouh & Boujelbene, 2020). Additionally, SMEs benefit from their flexible organizational structure compared to larger companies, as it facilitates both formal and informal communication within the organization. A conducive culture further supports the generation of new ideas and knowledge (Chabbouh & Boujelbene, 2020; Jasimuddin & Hasan, 2015).

Firstly, through exploring the link between Knowledge-oriented top management and knowledge-sharing practices, SMEs can gain valuable insights into how effective leadership and a culture of knowledge exchange can foster innovation within the organization. This deeper understanding can then inform the development of strategies that promote a more innovative and adaptable approach, enabling SMEs to maintain a competitive edge in their respective industries.

Secondly, investigating the impact of Inward and outward knowledge-sharing practices allows SMEs to unlock the potential of tapping into external knowledge sources, such as customers, partners, suppliers, and research institutions like universities. By leveraging these external knowledge reservoirs, SMEs can access fresh insights, best practices, and technological advancements, crucial elements that bolster their competitive advantage.

Furthermore, comprehending the relationship between Knowledge-oriented top management, knowledge-sharing practices, and Inbound and outbound open innovation empowers SMEs to foster a culture of open innovation. Embracing open innovation enables SMEs to engage in collaborative efforts with external entities, facilitating the reciprocal sharing of knowledge and leading to the co-creation of innovative products, services, and solutions.

Lastly, the findings from this study offer valuable insights into the influence of Knowledge-oriented top management and knowledge-sharing practices on business performance. Identifying key drivers and correlations allows SMEs to adopt evidence-based strategies aimed at improving their overall performance and achieving sustainable growth.

In conclusion, examining the interplay between Knowledge-oriented top management, Inward and outward knowledge-sharing practices, Inbound open innovation, and business performance provides SMEs with actionable knowledge to optimize their operations, drive innovation, and thrive in an ever-evolving business environment.

2.2 Knowledge-oriented Top Management

Knowledge-oriented leadership is a unique leadership approach that combines the characteristics of transactional and transformational leadership styles to effectively manage knowledge within an organization (Naqshbandi & Jasimuddin, 2018). Transactional leadership emphasizes the exchange of benefits, rewards, incentives, and self-interest between the leader and followers (Birasnav, 2014). On the other hand, transformational leadership focuses on motivating and inspiring followers or team members to perform at their best (Donate & de Pablo, 2015).

In the context of knowledge management, knowledge-oriented leaders play a crucial role in developing the collective capabilities of an organization. They serve as role models, motivators, communicators, and facilitators, supporting the success of knowledge management initiatives within the organization (Naowakhoaksorn et al., 2022).

2.3 Inward and Outward Knowledge-sharing Practices

Knowledge sharing refers to the transfer of knowledge from those who possess it to those who receive it (Zapata Cantú et al., 2009). In the business context, knowledge is essential for comprehending the state of customers, suppliers, employees, competitors, and the entrepreneurial landscape, which is crucial for achieving competitiveness (Byukusenge et al., 2016). It allows employees to access various knowledge and information, which significantly influences their own innovative capabilities. This is because acquiring new knowledge can lead to innovative and flexible approaches, resulting in high levels of innovation performance (Zhao et al., 2021). The practice of knowledge sharing can be classified into two levels: internal knowledge sharing within firms, among different business units , departments and employees, facilitates the assimilation and utilization of external knowledge during the innovation process, ultimately leading to increased innovation performance (Bagherzadeh, Markovic, & Bogers, 2019). On the other hand, external knowledge sharing equips firms with additional information regarding the resources, customers, and suppliers of external partners, enabling them to better comprehend and synthesize external resources (Faems et al., 2008).

2.4 Inbound Open Innovation

Open innovation is a novel approach to managing innovation that challenges the traditional closed innovation model. It is viewed as the opposite of closed innovation and involves processes that transcend organizational boundaries (Huang et al., 2013). The concept of open innovation encompasses practices that go beyond internal sourcing and acquisition of ideas and technologies. It also encompasses the exploration of options for sharing and disseminating innovation outcomes externally (Gann & Dahlander, 2010; Huizingh, 2011). Inbound open innovation involves leveraging external knowledge to support internal innovation activities, often achieved through establishing relationships and collaborations with external partners to access their technical expertise (Sengupta & Sena, 2020).

2.5 Business Performance

Business performance encompasses various aspects, encompassing financial indicators such as sales, market share, ROI, profit, and overall success from the perspective of a product or firm. It also includes factors such as desired product quality, design standards, sales objectives, and the time needed to reach breakeven(Wang, 2018). Thus, evaluating business performance provides insights into the organization's accomplishments. From a broader perspective, business performance is seen as a key indicator by investors, shareholders, stakeholders, and for economic development (Tahmasebinia et al., 2022). Therefore, the attainment of organizational goals can be gauged through business performance (Hult et al., 2004).

3. Hypotheses Development

3.1 Knowledge-oriented Top Management, Inward and Outward Knowledge-sharing Practices

Knowledge sharing within organizations is ingrained in the culture and norms that exist (Elrehail et al., 2018). It is evident through the exchange of knowledge-based content among members at all levels of the organization (Zhao et al., 2021). However, leaders who prioritize knowledge-oriented approaches have the potential to promote this flow by motivating employees and cultivating an environment conducive to development (Elrehail et al., 2018). They also play a role in establishing knowledge infrastructures (Naqshbandi & Jasimuddin, 2018). Leaders hold the responsibility of driving organizational change, emphasizing collaboration, fostering innovation, and understanding emerging market demands (Alkathiri et al., 2019; Badran & Khalifa, 2016; Morsy et al., 2016). To effectively acquire and integrate knowledge from external sources, firms rely on leaders who encourage activities supporting knowledge development and acquisition (Bell DeTienne et al., 2004). This process also requires employees to adapt their thinking, actively seek unfamiliar knowledge, and reduce the time and energy costs associated with employee innovation. Additionally, knowledge transfer within and outside the organization, including with external agents such as suppliers, customers, related institutions, and universities, should be seen as an ongoing and dynamic long-term process (Van Wijk et al., 2008) that can be initiated, encouraged, and sustained by leaders.

H1. KOTM has positive effect on IKSP

H2. KOTM has positive effect on OKSP

3.2 Inward and Outward Knowledge-sharing Practices and Inbound Open Innovation

Inward Knowledge sharing among organization members can increase organizations' knowledge reserves and revitalize knowledge flow (Zhao et al., 2021), it improves innovation performance and cooperate with others in solving problems and developing new ideas (Wang & Noe, 2010) and reduce interdepartmental conflicts (Nguyen et al., 2018). Outward knowledge sharing can strengthen the frequency of communication between organization and outside (Todorova & Durisin, 2007), By sharing knowledge with partner firms can enrich respective knowledge stocks with access to an enlarged external knowledge pool, in such a manner, knowledge sharing in R&D alliance networks can advance firms' innovation performance (Zhang et al., 2019). purposive Inward and outward of knowledge sharing accelerate internal innovation and expand the markets for external use of innovation (Chesbrough, 2007) to translate Inbound open innovation into improved innovation performance, firms need to constantly and systematically share knowledge within and beyond their boundaries (Bagherzadeh, Markovic, Cheng, et al., 2019). Zhao et al (2021) believes, contribution of knowledge includes not only the diffusion of knowledge within organization into the knowledge of organization but also the distribution of knowledge to organizations and integration with the knowledge of other organizations and are closely related to the Inbound OI process, that can boost innovation performance.

H3. IKSP positively influences IOI

H4. OKSP positively influences IOI.

3.3 Inbound Open Innovation and Business Performance

Innovation can emerge from various sources, as indicated by the inbound open innovation model. According to this model, companies have the opportunity to obtain external knowledge from diverse market-based partners, including customers, suppliers, and even competitors (Ferraris et al., 2017; Wang & Noe, 2010). Science-based partners such as research centers and universities also play a role in this knowledge acquisition process (Carayannis et al., 1998; Santoro et al., 2018). Open innovation accelerates progress by allowing businesses to leverage each other's expertise and contribute to the overall knowledge pool (Sengupta & Sena, 2020). This collaborative approach is particularly crucial in today's economy, which experiences uneven growth in productivity and prosperity (Bogers et al., 2018).

SMEs often face resource limitations in developing internal innovations, unlike larger companies. Therefore, their survival and growth heavily rely on collaborations with various business partners (Hult et al., 2004; Leckel et al., 2020; Wijaya & Suasih, 2020), including suppliers, customers, and both public and private enterprises. Moreover, collaborations between competitors within the same industry or market are also important for SMEs (Sengupta & Sena, 2020). Innovation plays an undeniable role in SMEs by enabling them to establish competitive advantages, ensure survival, and foster growth (Chabbouh & Boujelbene, 2020). It enhances access to new ideas and knowledge beyond their organizational boundaries while reducing the costs associated with Research and Development (R&D) investments and sharing risks (Elia et al., 2020; Leckel et al., 2020).

However, while openness to external ideas and collaborations is valuable, it can also lead to potential challenges. These challenges include information overload, the generation of impractical ideas, conflicts over ownership of ideas, the "not-invented-here" syndrome, and the risk of critical knowledge leakage to competitors. Nevertheless, the importance of openness in innovation cannot be undermined (Lauritzen & Karafyllia, 2019). Therefore, based on these observations, we anticipate that:

H5. IOI has a positive impact on BP

3.4 Inbound Open Innovation as Mediator

Open innovation is characterized as a decentralized process of innovation that involves the intentional exchange of knowledge across organizational boundaries, driven by both monetary and non-monetary incentives (Chesbrough et al., 2014). This approach to innovation encompasses two main directions of knowledge flow: outside in and inside out.

The outside-in aspect of open innovation involves gathering information and insights from external sources, such as customers. By engaging with customers, organizations can acquire knowledge about the technical aspects and specificities of a product. This knowledge empowers them to develop products that are distinct and stand out from the competition

(Yli-Renko et al., 2001).

In essence, open innovation recognizes the value of external knowledge and encourages organizations to tap into external sources for insights, ideas, and expertise. This collaborative and boundary-spanning approach broadens the organization's capacity to innovate and creates opportunities for unique and differentiated products (Yli‐Renko et al., 2001). Therefore, knowledge sharing, inside and outside firms among the departments, units or with external partners, is one of internal practices that are closely related to the Inbound open innovation process, and can boost innovation performance (Bagherzadeh, Markovic, Cheng, et al., 2019).

H6. IOI mediates the influence of IKSP on BP.

H7. IOI mediates the influence of OKSP on BP.

3.5 Outward and Inward Knowledge-sharing Practices as Mediator

A management team that prioritizes knowledge fosters an environment that promotes teamwork and trust among employees. This, in turn, leads to positive behaviors, including the sharing of knowledge among colleagues (Fullwood & Rowley, 2017). Recognizing and rewarding knowledge sharing creates a culture of continuous learning, which is a key factor in the success of organizations (Choudhary et al., 2013)

Effective leadership that focuses on knowledge-oriented practices has a significant impact on employees' positive attitudes. Such leadership influences the creation of a positive work environment and encourages employees to willingly share their knowledge and information (Charbonneau et al., 2001; Grojean et al., 2004; Von Krogh et al., 2012; Yang, 2007) .It is important to recognize that individuals play a central role in driving innovation, and their attitudes and behaviors are critical for sustaining competitiveness and fostering inventiveness within an organization (Aboobaker & KA, 2021). knowledge-sharing practices have a major effect on an organization’s innovative capabilities, sharing and exchanging information among employees would increase innovation and creativity in an organization.

scholars believe that knowledge sharing guarantees the improvement of organizational innovation ability and enhancement of organizational innovation performance by reducing the workload of repeated learning (Elrehail et al., 2018; Lin, 2007).

Thus, By implementing reward systems for knowledge sharing, organizations cultivate a culture of continuous learning that contributes to their success. Recognizing that individuals are the driving force behind innovation, their attitudes and behaviors are crucial for maintaining competitiveness and fostering innovation within the organization.

H8. IKSP mediates the influence of KOTM on IOI

H9. OKSP mediates the influence of KOTM on IOI

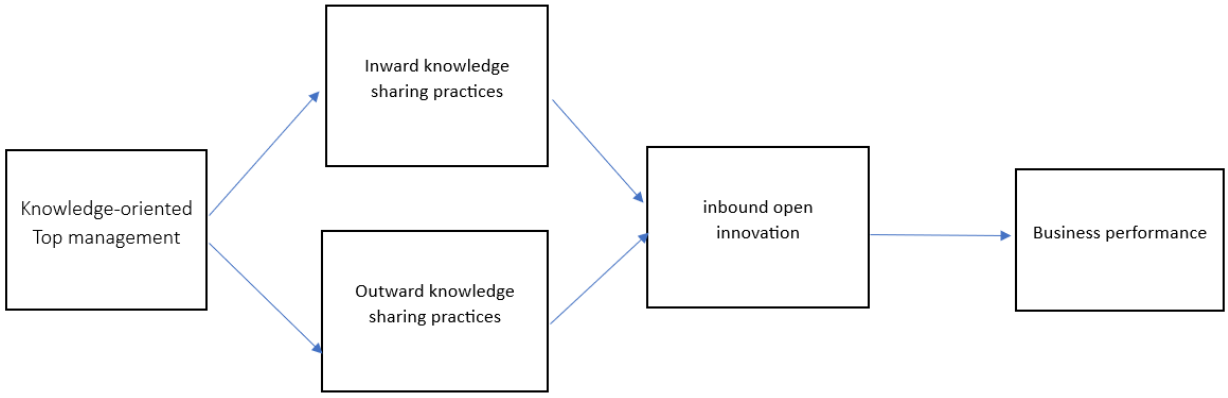

Figure 1. Conceptual research model

4. Method

4.1 Data, Sample, and Measures

The current study aims to explore the relationship between knowledge-oriented top management, inward and outward knowledge-sharing practices, and inbound open innovation, and how they directly and indirectly impact business performance. This research is conducted using a cross-sectional and quantitative approach. A Likert scale ranging from 1 (low) to 5 (high) was used to assess the variables in the questionnaire. The collected data were from a sample of 247 IT, marketing, and sales managers in Tehran, the capital of Iran.

Table 1. Descriptive statistics

Items	Frequency	Percentage (%)
Gender		
Male	163	65.99
Female	84	34.01
Total	247	100.00
Education		
Bachelor's	97	39.27
Master	125	50.61
PhD	25	10.12
Total	247	100.00
Age (in years)		
25 - 35	35	14.17
35 - 45	138	55.87
above 45	74	29.96
Total	247	

To measure knowledge-oriented top management, six items from Donate & de Pablo (2015) were utilized (Donate & de Pablo, 2015). Business performance was assessed using eight items from (Chabbouh & Boujelbene, 2020). Inbound open innovation was measured using five items from a study in 2013 (Sisodiya et al., 2013) and a study in 2016 (Naqshbandi, 2016; Naqshbandi & Jasimuddin, 2018). Inward knowledge-sharing practices were evaluated using six items from a study in 2021(Singh et al., 2021) . Finally, outward knowledge-sharing practices were assessed using five items from a study conducted in 2014 (Taherparvar et al., 2014).

4.2 Validity and Reliability

To ensure the questionnaires' validity, a content check was performed. The research targeted small and medium-sized companies located in Tehran, Iran. The key respondents were marketing, sales, and IT managers from these companies. Data collection was conducted through 460 electronic questionnaires, which were sent virtually. A total of 247 completed and usable questionnaires were received and used for data analysis.

To assess the reliability and internal consistency of the constructs, composite reliability and Cronbach's alpha coefficient were measured (Table 2). The construct validity was confirmed based on the range of values in the table for both measures. The Cronbach's alpha coefficient for each individual construct ranged from 0.73 to 0.78, which is above the threshold value of 0.7, indicating acceptable reliability. The recommended threshold for composite reliability is 0.7. The average variance extracted (AVE), which measures convergent validity, ranged from 0.51 to 0.56, surpassing the minimum AVE threshold of 0.5. Therefore, the construct validity of this study is established.

Discriminant validity was confirmed by comparing the correlations among the different constructs. Based on these comparisons, the construct validity of this study is further supported.

The statistical analysis was conducted using SmartPLS software version 4, employing the partial least squares approach to test the hypotheses (Mohebi, Fardmehrgan, et al., 2022; Mohebi, Salempoor, et al., 2022).

The choice of statistical method for this study is the Partial Least Squares (PLS) approach. PLS is a popular and suitable method for structural equation modeling (SEM) that is particularly well-suited for studies with multiple latent constructs and relatively smaller sample sizes. This research aims to explore the relationship between knowledge-oriented top management, inward and outward knowledge-sharing practices, inbound open innovation, and their direct and indirect impacts on business performance. As such, PLS proves advantageous for several reasons:

Complex Models: The study involves five latent constructs, each with multiple measured indicators. PLS can handle such complexity and provides accurate estimates of the relationships between constructs even with limited data points.

Smaller Sample Size: With 247 usable questionnaires received from 460 electronic

questionnaires, the sample size is relatively smaller. PLS is known for its robustness in cases of small sample sizes, ensuring reliable results and preventing issues of statistical power.

Non-Normal Data: Social science studies often collect Likert scale data, which can deviate from the normal distribution. PLS is less sensitive to normality assumptions and remains effective even with non-normally distributed data.

Convergent and Discriminant Validity: PLS allows for the assessment of both convergent and discriminant validity. The study employed the Average Variance Extracted (AVE) to measure convergent validity, which reflects the amount of variance captured by a construct's indicators. Discriminant validity was confirmed by comparing the correlations among different constructs, ensuring that each construct measures a distinct concept.

Composite Reliability and Cronbach's Alpha: To assess the reliability and internal consistency of the constructs, the study used both Composite Reliability and Cronbach's alpha coefficient. PLS is well-suited for these reliability analyses, which ensure that the measurement scales used in the study are dependable.

Hypothesis Testing: PLS facilitates hypothesis testing, enabling researchers to investigate the direct and indirect effects of the predictor variables (knowledge-oriented top management, inward and outward knowledge-sharing practices and inbound open innovation) on the outcome variable (business performance). This enables a comprehensive analysis of the relationships among the variables in the conceptual model.

SmartPLS Software: The study utilized SmartPLS software version 4 for the statistical analysis. SmartPLS is a widely recognized and user-friendly software package specifically designed for PLS-SEM analysis, which streamlines the modeling process and allows researchers to obtain reliable results efficiently.

In conclusion, the PLS approach was adopted for this study due to its ability to handle complex models, accommodate smaller sample sizes, and tolerate non-normally distributed data. It is a robust and reliable method for examining the relationships between latent constructs and their impact on business performance. Utilizing SmartPLS software version 4 further facilitated the analysis, ensuring the study's validity and contributing to the knowledge in the field of knowledge-oriented top management, Inward and outward knowledge sharing practice and inbound open innovation in small and medium-sized companies.

Table 2. Measurement model evaluation

Latent Variable	Indicators	Loads	Cronbach's Alpha	Composite Reliability	**Convergent validity (AVE)**
Knowledge-oriented Top management			0.73	0.81	**0.52**
	KOTM1	0.608			
	KOTM2	0.634			
	KOTM3	0.726			
	KOTM4	0.699			
	KOTM5	0.440			
	KOTM6	0.751			
Inward knowledge sharing practices			0.79	0.85	**0.50**
	IKSP1	0.572			
	IKSP2	0.727			
	IKSP3	0.585			
	IKSP4	0.682			
	IKSP5	0.807			
	IKSP6	0.816			
Outward knowledge sharing practices			0.73	0.82	**0.51**
	OKSP 1	0.740			
	OKSP 2	0.765			
	OKSP3	0.575			
	OKSP 4	0.652			
	OKSP 5	0.734			
inbound open innovation			0.75	0.84	**0.56**
	IOI1	0.609			
	IOI2	0.484			
	IOI3	0.843			
	IOI4	0.756			
	IOI5	0.853			
Business performance			0.78	0.84	**0.51**
	BP1	0.469			
	BP2	0.892			
	BP3	0.603			
	BP4	0.605			
	BP5	0.451			
	BP6	0.878			
	BP7	0.872			
	BP8	0.430			

5. Results

5.1 Testing for Direct Effect

Based on the analysis presented in Table 3, the independent variables (IVs) in this study provide a comprehensive explanation of the dependent variables (DVs). The results indicate that the IVs account for a significant portion of the variance in the DVs. For instance, the BP R-square value of 0.63 suggests that 63% of the variance in business performance (BP) can be explained by the IVs. Overall, the latent variables in this study explain 68% of the variance in inward knowledge sharing practices (IKSP), 67% of the variance in outward knowledge sharing practices (OKSP), and 80% of the variance in inbound open innovation (IOI).

Regarding H1, which examines the relationship between knowledge-oriented top management (KOTM) and IKSP, the findings support the hypothesis. The t-value of 23.064 ($\beta = 0.83$, $p < 0.001$) indicates that KOTM has a positive influence on IKSP in SME companies.

Similarly, H2, which explores the relationship between KOTM and OKSP, is supported. The t-value of 27.164 ($\beta = 0.82$, $p < 0.001$) suggests that KOTM has a positive impact on OKSP in SME companies.

H3 investigates the relationship between IKSP and IOI. The results support this hypothesis, with a t-value of 8.086 ($\beta = 0.59$, $p < 0.001$) indicating that IKSP has a positive effect on IOI in SME companies.

Likewise, H4 examines the relationship between OKSP and IOI, and the results support the hypothesis. The t-value of 4.506 ($\beta = 0.33$, $p < 0.001$) suggests that OKSP positively influences IOI in SME companies.

Finally, H5 explores the relationship between IOI and BP. The findings support this hypothesis, with a t-value of 14.638 ($\beta = 0.79$, $p < 0.001$) indicating that IOI has a positive impact on business performance (BP) in SME companies.

Table 3. Structural Model-Direct Roles

Hypotheses	Relationship Between constructs	Coefficients	t-Statistics	Results
H1	KOTM ⟶ IKSP	0.83***	23.064	Supported
H2	KOTM ⟶ OKSP	0.82***	27.164	Supported
H3	IKSP ⟶ IOI	0.59***	8.086	Supported
H4	OKSP ⟶ IOI	0.33***	4.506	Supported
H5	IOI ⟶ BP	0.79***	14.638	Supported

Notes: *p < .05; **p < .01; ***p < .001 (One-tailed test for hypotheses and two-tailed test for control variables).

5.2 Testing for Indirect Effect

In this study, bootstrap statistics in Smart-PLS were employed to determine the significance of the indirect effects. The standard error of a × b was calculated, and a pseudo-t-test was performed. The results of these calculations are presented in Table 4. To assess the significance of indirect and mediating effects, the methodology of two studies was followed.

Regarding H6, which examines the mediating role of inbound open innovation (IOI) in the relationship between inward knowledge sharing practices (IKSP) and business performance (BP), the results do not support the hypothesis. The t-value of 7.077 ($\beta = 0.47$, $p < 0.001$) indicates that IOI does not mediate the relationship between IKSP and BP.

On the other hand, H7, which explores the mediating role of IOI in the relationship between outward knowledge sharing practices (OKSP) and BP, is supported. The t-value of 4.306 ($\beta = 0.26$, $p < 0.001$) suggests that IOI mediates the relationship between OKSP and BP.

Furthermore, H8 investigates the mediating role of IKSP in the relationship between knowledge-oriented top management (KOTM) and IOI. The results support this hypothesis, with a t-value of 7.630 ($\beta = 0.49$, $p < 0.001$) indicating that IKSP mediates the relationship between KOTM and IOI.

Similarly, H9 examines the mediating role of OKSP in the relationship between KOTM and IOI, and the results support the hypothesis. The t-value of 4.445 ($\beta = 0.28$, $p < 0.001$) suggests that OKSP mediates the relationship between KOTM and IOI.

Overall, the analysis using bootstrap statistics and pseudo-t-tests confirms the significance of the mediating effects in these relationships.

Table 4. Structural Model: Mediation Roles

Hypotheses	Relationship Between constructs	Direct effect	Indirect Effect	t-Statistics	Results
H6	IKSP····> IOI····> BP		0.47*	7.077	Not Supported
H7	OKSP····> IOI····> BP		0.26*	4.306	Supported
H8	KOTM····> IKSP····> IOI		0.49*	7.630	Supported
H9	KOTM····> OKSP····> IOI		0.28*	4.445	Supported

Notes: *p < .05; **p < .01; ***p < .001 (One-tailed test for hypotheses and two-tailed test for control variables).

6. Discussion

This study investigated the relationship between knowledge-oriented top management, inward and outward knowledge-sharing practices, inbound open innovation, and business performance in small and medium-sized enterprises (SMEs). Despite the growing recognition of the importance of knowledge-oriented leadership and knowledge-sharing practices in SMEs (Chaithanapat et al., 2022; Le & Le, 2022; Singh et al., 2021), there remains a gap in the literature regarding how these factors specifically relate to Inbound open innovation and its direct influence on overall business performance. Addressing this gap in the literature can provide valuable insights to inform SMEs' strategic decision-making processes, fostering their growth and sustainability in a challenging business environment.

This research paper makes three significant contributions to the knowledge expansion in the field of inbound open innovation in SMEs. The research findings highlight the critical role of knowledge-oriented top managers in promoting knowledge sharing and driving open innovation initiatives within organizations. The results align with previous studies that have recognized the critical role of knowledge-oriented leadership in driving innovation and knowledge sharing within organizations (Chaithanapat et al., 2022; Le & Do, 2023; Naqshbandi & Jasimuddin, 2018; Rehman & Iqbal, 2020; Sahibzada et al., 2023).

The study revealed that knowledge-oriented top management positively influences both inward and outward knowledge-sharing practices and strategies, as well as inbound open innovation and business performance. Leaders who prioritize knowledge-oriented approaches create a conducive culture, foundation, and incentives for sharing valuable knowledge across

departments, fostering creativity, innovation, and departmental outputs. These leaders serve as role models, motivators, communicators, and facilitators, supporting the success of knowledge management initiatives within the organization.

Inward knowledge sharing among organization members enhances knowledge flow, innovation performance, and cooperation within the organization. External knowledge sharing equips firms with additional information about resources, customers, and suppliers, enabling better comprehension and synthesis of external resources. Both inward and outward knowledge-sharing practices play a mediating role in facilitating openness in innovation. Previous research has also shown that inward knowledge sharing among organization members significantly impacts knowledge flow, innovation performance, and cooperation within the organization (Lai et al., 2016; Žemaitis, 2014; Zhao et al., 2021). Moreover, external knowledge sharing has been found to offer firms access to valuable information about resources, customers, and suppliers, which helps in better comprehension and synthesis of external resources (Arfi et al., 2018; Kruse, 2012; Segarra-Ciprés et al., 2014; Simao & Franco, 2018). Both inward and outward knowledge-sharing practices are known to play a mediating role in facilitating openness in innovation, fostering an atmosphere conducive to leveraging external expertise and ideas (Bogers, 2012; Singh et al., 2021).

Furthermore, the study highlights the positive impact of inbound open innovation on business performance. The positive impact of inbound open innovation on business performance has been well-documented in previous studies as well (Parida et al., 2012; Sisodiya et al., 2013; Wang et al., 2015). Inbound open innovation allows organizations to access external knowledge, collaborate with partners, reduce R&D costs, and accelerate time to market. This collaborative approach is particularly beneficial for SMEs, as it enables them to leverage external expertise and resources, establish competitive advantages, ensure survival, and foster growth.

The findings emphasize the significance of knowledge-oriented top management in mobilizing organizational resources, establishing a culture of knowledge sharing, and driving open innovation. These practices contribute to long-term success by reducing costs, expediting time to market, enhancing market differentiation, and creating new revenue streams for SMEs.

6.1 Implication of Theory

The findings of this study have important implications for the theory of knowledge management, open innovation, and organizational performance, particularly in the context of small and medium-sized enterprises (SMEs).

Firstly, the study highlights the crucial role of knowledge-oriented top management in driving knowledge-sharing practices and fostering a culture of openness and innovation. These results emphasize the significance of leadership behavior in facilitating knowledge flow and enhancing organizational performance. Theoretical frameworks and models that examine the influence of leadership on promoting knowledge sharing and open innovation can be further developed and refined based on these findings.

Secondly, the study reveals the mediating role of both inward and outward knowledge-sharing practices in facilitating open innovation. By recognizing the importance of internal and external knowledge flows, the study underscores the need for a holistic approach to knowledge management and innovation. Theoretical frameworks that explore the interplay between knowledge sharing, open innovation, and organizational performance can be expanded to incorporate the specific mechanisms through which knowledge is exchanged within and outside the organization.

Additionally, the study demonstrates the positive impact of inbound open innovation on SMEs' business performance. This contributes to existing literature by providing empirical evidence of the benefits derived from collaborating with external partners, accessing external knowledge, and leveraging external resources. Theoretical perspectives on open innovation in SMEs can be enriched by further investigating the factors that enable successful inbound open innovation and its specific implications for different dimensions of performance.

Furthermore, the study suggests that knowledge-oriented top management acts as a catalyst for organizational success by mobilizing resources, fostering a culture of knowledge sharing, and driving open innovation. This finding underscores the importance of aligning leadership behaviors with knowledge management strategies and innovation goals. Theoretical frameworks that examine the role of leadership in enabling knowledge-oriented practices and facilitating open innovation can be extended to explore the specific leadership behaviors and mechanisms that lead to improved organizational performance.

Overall, the implications of this study for theory underscore the need to integrate knowledge-oriented leadership, knowledge-sharing practices, and open innovation within theoretical frameworks. By incorporating these elements, future research can gain a deeper understanding of the mechanisms through which knowledge management and open innovation contribute to organizational performance in SMEs. The findings of this study provide a foundation for further theoretical development and empirical investigation in these areas.

6.2 Implication of Practice

The findings of this study have significant implications for practitioners in the field of knowledge management, open innovation, and organizational performance, particularly for small and medium-sized enterprises (SMEs).

Firstly, the study highlights the critical role of top management in fostering a knowledge-sharing culture and promoting open innovation practices. Practitioners should recognize the influence of leadership behavior on knowledge exchange and innovation within their organizations. By prioritizing knowledge-oriented leadership, organizations can create an environment that encourages employees to share their knowledge, collaborate with external partners, and engage in open innovation activities. This can lead to improved organizational performance and competitive advantage.

Secondly, the study emphasizes the importance of both internal and external knowledge sharing for facilitating open innovation. Practitioners should focus on creating mechanisms

that encourage employees to share their knowledge and expertise within the organization, such as through the use of digital platforms, communities of practice, and cross-functional collaboration. Additionally, efforts should be made to establish partnerships and collaborations with external stakeholders, including customers, suppliers, and research institutions, to access valuable external knowledge and resources. By integrating both inward and outward knowledge-sharing practices, organizations can enhance their capacity for open innovation and increase the likelihood of successful outcomes.

Furthermore, the study highlights the benefits of inbound open innovation for SMEs. Practitioners should actively seek opportunities to collaborate with external partners, such as through joint research projects, technology licensing, or co-creation initiatives. This can enable SMEs to tap into external expertise, technologies, and market insights that may not be available internally. Implementing effective mechanisms for identifying and evaluating potential collaboration opportunities is crucial for leveraging inbound open innovation to drive business performance.

Additionally, practitioners should recognize the pivotal role of leadership in mobilizing resources and aligning knowledge management strategies with innovation goals. Leaders should foster a supportive environment that values and rewards knowledge sharing, experimentation, and risk-taking. They should also provide the necessary resources, infrastructure, and training to facilitate knowledge exchange and open innovation practices. By aligning leadership behaviors with knowledge-oriented practices, organizations can create a strong foundation for enhancing organizational performance through effective knowledge management and open innovation.

Overall, the practical implications of this study emphasize the importance of leadership, knowledge-sharing practices, and open innovation for SMEs. Practitioners should strive to develop a culture that values and promotes knowledge exchange, collaboration, and openness to external inputs. By adopting these practices, organizations can enhance their innovation capabilities, improve performance, and gain a competitive advantage in today's dynamic business environment.

6.3 Limitations and Directions to Future Research

While this study contributes valuable insights into the relationship between knowledge oriented top management, open innovation, and organizational performance, it is important to acknowledge certain limitations that provide opportunities for future research.

Firstly, the study focused on SMEs within a specific industries, which may limit the generalizability of the findings to other sectors. Future research should aim to replicate this study in different industries to examine the consistency and applicability of the proposed theoretical framework.

Secondly, the study primarily relied on self-reported data, which may introduce biases and potential inaccuracies. Future research could employ objective measures or longitudinal data to provide a more comprehensive understanding of the dynamics between knowledge-oriented top management, open innovation, and organizational performance.

Furthermore, this study predominantly examined the direct effects of knowledge oriented top management and open innovation on organizational performance. Future research could explore potential mediating or moderating variables that may influence this relationship, such as organizational culture, absorptive capacity, or the role of information technology.

Additionally, the study focused on the internal and external dimensions of knowledge sharing and open innovation, but other forms of innovation, such as user innovation or outbound open innovation, were not specifically addressed. Future research could delve into these alternative forms of innovation and their impact on organizational performance.

Moreover, this study primarily considered the perspective of the organization and its internal processes. Future research could adopt a multi-stakeholder approach to investigate the impact of knowledge management and open innovation on various external stakeholders, such as customers, suppliers, and communities.

Lastly, this study examined the relationship between knowledge-oriented top management, open innovation, and organizational performance at a specific point in time. Longitudinal studies could provide insights into the long-term effects and dynamics of these constructs, allowing for a more comprehensive understanding of their relationship over time.

7. Conclusion

In conclusion, this study underscores the importance of knowledge-oriented leaders in promoting knowledge sharing, driving inbound open innovation, and ultimately improving business performance in SMEs. The findings provide valuable insights for organizations seeking to enhance their knowledge management practices and leverage open innovation for sustainable growth and success. However, it is crucial to acknowledge its limitations and consider future research directions. Future studies should explore different industries, employ objective measures, investigate mediating or moderating variables, consider alternative forms of innovation, adopt a multi-stakeholder perspective, and conduct longitudinal studies to further enhance our understanding of the complex interplay between knowledge management, open innovation, and organizational performance.

References

Abbasi, E., & Zamani-Miandashti, N. (2013). The role of transformational leadership, organizational culture and organizational learning in improving the performance of Iranian agricultural faculties. *Higher Education, 66*, 505-519. https://doi.org/10.1007/s10734-013-9618-8

Aboobaker, N., & KA, Z. (2021). Digital learning orientation and innovative behavior in the higher education sector: effects of organizational learning culture and readiness for change. *International Journal of Educational Management, 35*(5), 1030-1047. https://doi.org/10.1108/IJEM-09-2019-0345

Ahn, J. M., Minshall, T., & Mortara, L. (2018). *How do entrepreneurial leaders promote open innovation adoption in small firms?* In *Researching Open Innovation in SMEs*. World Scientific. pp. 137-177. https://doi.org/10.1142/9789813230972_0005

Alkathiri, M. S., Khalifa, G. S., Abuelhassan, A. E., Isaac, O., & Alrajawi, I. (2019). Ethical Leadership as a Predictor for Employee's Performance: The Mediating Role of Affective Organizational Commitment. *Journal of Engineering and Applied Sciences, 14*(21), 7857-7869. https://doi.org/10.36478/jeasci.2019.7857.7869

Arfi, W. B., Hikkerova, L., & Sahut, J.-M. (2018). External knowledge sources, green innovation and performance. *Technological forecasting and social change, 129*, 210-220. https://doi.org/10.1016/j.techfore.2017.09.017

Badran, N., & Khalifa, G. (2016). Diversity management: Is it an important issue in hotel industry in Egypt. *Intlernational Journal of Heritage, Tourism, and Hospitality, 7*(2), 275-286.

Bagherzadeh, M., Markovic, S., & Bogers, M. (2019). Managing open innovation: A project-level perspective. *IEEE Transactions on Engineering Management, 68*(1), 301-316. https://doi.org/10.1109/TEM.2019.2949714

Bagherzadeh, M., Markovic, S., Cheng, J., & Vanhaverbeke, W. (2019). How does outside-in open innovation influence innovation performance? Analyzing the mediating roles of knowledge sharing and innovation strategy. *IEEE Transactions on Engineering Management, 67*(3), 740-753. https://doi.org/10.1109/TEM.2018.2889538

Bell DeTienne, K., Dyer, G., Hoopes, C., & Harris, S. (2004). Toward a model of effective knowledge management and directions for future research: Culture, leadership, and CKOs. *Journal of leadership & organizational studies, 10*(4), 26-43. https://doi.org/10.1177/107179190401000403

Birasnav, M. (2014). Knowledge management and organizational performance in the service industry: The role of transformational leadership beyond the effects of transactional leadership. *Journal of business research, 67*(8), 1622-1629. https://doi.org/10.1016/j.jbusres.2013.09.006

Bogers, M. (2012). Knowledge sharing in open innovation: An overview of theoretical perspectives on collaborative innovation. *Open innovation in firms and public administrations: Technologies for value creation*, 1-14. https://doi.org/10.4018/978-1-61350-341-6.ch001

Bogers, M., Chesbrough, H., & Moedas, C. (2018). Open innovation: Research, practices, and policies. *California management review, 60*(2), 5-16. https://doi.org/10.1177/0008125617745086

Byukusenge, E., Munene, J., & Orobia, L. (2016). *Knowledge management and business performance: Mediating effect of innovation.* https://doi.org/10.1080/23311975.2017.1368434

Carayannis, E. G., Rogers, E. M., Kurihara, K., & Allbritton, M. M. (1998). High-technology spin-offs from government R&D laboratories and research universities. *Technovation, 18*(1), 1-11. https://doi.org/10.1016/S0166-4972(97)00101-6

Carneiro, A. (2000). How does knowledge management influence innovation and competitiveness? *Journal of Knowledge Management, 4*(2), 87-98. https://doi.org/10.1108/13673270010372242

Cassiman, B., & Valentini, G. (2016). Open innovation: are inbound and outbound knowledge flows really complementary? *Strategic Management Journal, 37*(6), 1034-1046. https://doi.org/10.1002/smj.2375

Chabbouh, H., & Boujelbene, Y. (2020). Open innovation in SMEs: The mediating role between human capital and firm performance. *The Journal of High Technology Management Research, 31*(2), 100391. https://doi.org/10.1016/j.hitech.2020.100391

Chaithanapat, P., Punnakitikashem, P., Oo, N. C. K. K., & Rakthin, S. (2022). Relationships among knowledge-oriented leadership, customer knowledge management, innovation quality and firm performance in SMEs. *Journal of Innovation & Knowledge, 7*(1), 100162. https://doi.org/10.1016/j.jik.2022.100162

Charbonneau, D., Barling, J., & Kelloway, E. K. (2001). Transformational leadership and sports performance: The mediating role of intrinsic motivation 1. *Journal of applied social psychology, 31*(7), 1521-1534. https://doi.org/10.1111/j.1559-1816.2001.tb02686.x

Chesbrough, H., Vanhaverbeke, W., & West, J. (2014). *New frontiers in open innovation*. Oup Oxford. https://doi.org/10.1093/acprof:oso/9780199682461.001.0001

Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.

Chesbrough, H. W. (2007). Why companies should have open business models. *MIT Sloan management review*.

Choudhary, A. I., Akhtar, S. A., & Zaheer, A. (2013). Impact of transformational and servant leadership on organizational performance: A comparative analysis. *Journal of business ethics, 116*, 433-440. https://doi.org/10.1007/s10551-012-1470-8

Curado, C., & Bontis, N. (2006). The knowledge-based view of the firm and its theoretical precursor. *International Journal of Learning and Intellectual Capital, 3*(4), 367-381. https://doi.org/10.1504/IJLIC.2006.011747

Dayan, R., Heisig, P., & Matos, F. (2017). Knowledge management as a factor for the formulation and implementation of organization strategy. *Journal of Knowledge Management, 21*(2), 308-329. https://doi.org/10.1108/JKM-02-2016-0068

Donate, M. J., & de Pablo, J. D. S. (2015). The role of knowledge-oriented leadership in knowledge management practices and innovation. *Journal of business research, 68*(2), 360-370. https://doi.org/10.1016/j.jbusres.2014.06.022

Elia, G., Petruzzelli, A. M., & Urbinati, A. (2020). Implementing open innovation through virtual brand communities: A case study analysis in the semiconductor industry. *Technological forecasting and social change, 155*, 119994.

https://doi.org/10.1016/j.techfore.2020.119994

Elrehail, H., Emeagwali, O. L., Alsaad, A., & Alzghoul, A. (2018). The impact of transformational and authentic leadership on innovation in higher education: The contingent role of knowledge sharing. *Telematics and Informatics, 35*(1), 55-67. https://doi.org/10.1016/j.tele.2017.09.018

Faems, D., Janssens, M., Madhok, A., & Looy, B. V. (2008). Toward an integrative perspective on alliance governance: Connecting contract design, trust dynamics, and contract application. *Academy of management journal, 51*(6), 1053-1078. https://doi.org/10.5465/amj.2008.35732527

Ferraris, A., Santoro, G., & Dezi, L. (2017). How MNC's subsidiaries may improve their innovative performance? The role of external sources and knowledge management capabilities. *Journal of Knowledge Management, 21*(3), 540-552. https://doi.org/10.1108/JKM-09-2016-0411

Fullwood, R., & Rowley, J. (2017). An investigation of factors affecting knowledge sharing amongst UK academics. *Journal of Knowledge Management, 21*(5), 1254-1271. https://doi.org/10.1108/JKM-07-2016-0274

Gann, D., & Dahlander, L. (2010). How open is innovation? *Research Policy, 39*, 699-709. https://doi.org/10.1016/j.respol.2010.01.013

Gentile-Lüdecke, S., Torres de Oliveira, R., & Paul, J. (2020). Does organizational structure facilitate inbound and outbound open innovation in SMEs? *Small Business Economics, 55*(4), 1091-1112. https://doi.org/10.1007/s11187-019-00175-4

Grojean, M. W., Resick, C. J., Dickson, M. W., & Smith, D. B. (2004). Leaders, values, and organizational climate: Examining leadership strategies for establishing an organizational climate regarding ethics. *Journal of business ethics, 55*, 223-241. https://doi.org/10.1007/s10551-004-1275-5

Huang, H.-C., Lai, M.-C., Lin, L.-H., & Chen, C.-T. (2013). Overcoming organizational inertia to strengthen business model innovation: An open innovation perspective. *Journal of Organizational Change Management, 26*(6), 977-1002. https://doi.org/10.1108/JOCM-04-2012-0047

Huizingh, E. K. (2011). Open innovation: State of the art and future perspectives. *Technovation, 31*(1), 2-9. https://doi.org/10.1016/j.technovation.2010.10.002

Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial marketing management, 33*(5), 429-438. https://doi.org/10.1016/j.indmarman.2003.08.015

Iqbal, A., Latif, F., Marimon, F., Sahibzada, U. F., & Hussain, S. (2018). From knowledge management to organizational performance: Modelling the mediating role of innovation and intellectual capital in higher education. *Journal of Enterprise Information Management, 32*(1), 36-59. https://doi.org/10.1108/JEIM-04-2018-0083

Jasimuddin, S. M., & Hasan, I. (2015). Organizational culture, structure, technology infrastructure and knowledge sharing. *Vine, 45*(1), 67-88. https://doi.org/10.1108/VINE-05-2014-0037

Kruse, P. (2012). The role of external knowledge in open innovation-A systematic Review of literature. European Conference on Knowledge Management.

Lai, J., Lui, S. S., & Tsang, E. W. (2016). Intrafirm knowledge transfer and employee innovative behavior: The role of total and balanced knowledge flows. *Journal of Product Innovation Management, 33*(1), 90-103. https://doi.org/10.1111/jpim.12262

Lauritzen, G. D., & Karafyllia, M. (2019). Perspective: leveraging open innovation through paradox. *Journal of Product Innovation Management, 36*(1), 107-121. https://doi.org/10.1111/jpim.12474

Le, P. B., & Do, Y. H. (2023). Stimulating innovation performance through knowledge-oriented leadership and knowledge sharing: the moderating role of market turbulence. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-08-2022-0166

Le, P. T., & Le, P. B. (2022). Influence of knowledge-oriented leadership and knowledge sharing on radical and incremental innovation: the moderating role of market turbulence. *VINE Journal of Information and Knowledge Management Systems*. https://doi.org/10.1108/VJIKMS-07-2022-0238

Leckel, A., Veilleux, S., & Dana, L. P. (2020). Local Open Innovation: A means for public policy to increase collaboration for innovation in SMEs. *Technological forecasting and social change, 153*, 119891. https://doi.org/10.1016/j.techfore.2019.119891

Lin, H. F. (2007). Knowledge sharing and firm innovation capability: an empirical study. *International Journal of manpower, 28*(3/4), 315-332. https://doi.org/10.1108/01437720710755272

Lonati, S. (2020). What explains cultural differences in leadership styles? On the agricultural origins of participative and directive leadership. *The leadership quarterly, 31*(2), 101305. https://doi.org/10.1016/j.leaqua.2019.07.003

Mohebi, A., Fardmehrgan, S., Mohebi, H., & Salempoor, H. (2022). *The Effect of Knowledge-Based Human Resource Practices on the Retention of Generation Y Employees.* 1st International Conference on Researches in Accounting, Economics, Management and Humanities. https://doi.org/10.2139/ssrn.4181878

Mohebi, A., Salempoor, H., Fardmehrgan, S., & Mohebi, H. (2022). *Impact of Career Development on the Retention of Generation Y*. 3rd International Conference in Management & Industry, Forthcoming. https://doi.org/10.2139/ssrn.4207489

Morsy, M., Ahmed, G., & Ali, N. (2016). Impact of effective training on employee performance in hotel establishments. *International Journal of Heritage, Tourism, and Hospitality, 10*(1/2), 92-109.

Naowakhoaksorn, P., Suwannarat, P., Pratoom, K., & Pataraarechachai, V. (2022). Knowledge Management Capability and Innovativeness of Public Organizations: Examining the Moderating Roles of Social Capital and Creative Organizational Climate. *Suranaree Journal of Social Science, 16*(1), 107-125. https://doi.org/10.55766/DZXJ8971

Naqshbandi, M. M. (2016). Managerial ties and open innovation: examining the role of absorptive capacity. *Management Decision, 54*(9), 2256-2276. https://doi.org/10.1108/MD-03-2016-0161

Naqshbandi, M. M., & Jasimuddin, S. M. (2018). Knowledge-oriented leadership and open innovation: Role of knowledge management capability in France-based multinationals. *International Business Review, 27*(3), 701-713. https://doi.org/10.1016/j.ibusrev.2017.12.001

Nguyen, N. P., Ngo, L. V., Bucic, T., & Phong, N. D. (2018). Cross-functional knowledge sharing, coordination and firm performance: The role of cross-functional competition. *Industrial marketing management, 71*, 123-134. https://doi.org/10.1016/j.indmarman.2017.12.014

Parida, V., Westerberg, M., & Frishammar, J. (2012). Inbound open innovation activities in high‐tech SMEs: the impact on innovation performance. *Journal of small business management, 50*(2), 283-309. https://doi.org/10.1111/j.1540-627X.2012.00354.x

Rehman, U. U., & Iqbal, A. (2020). Nexus of knowledge-oriented leadership, knowledge management, innovation and organizational performance in higher education. *Business Process Management Journal, 26*(6), 1731-1758. https://doi.org/10.1108/BPMJ-07-2019-0274

Sahibzada, U. F., Janjua, N. A., Muavia, M., & Aamir, S. (2023). Knowledge-oriented leadership and organizational performance: modelling the mediating role of service innovation, knowledge sharing quality. *Journal of Organizational Effectiveness: People and Performance*. https://doi.org/10.1108/JOEPP-10-2022-0296

Sahibzada, U. F., Jianfeng, C., Latif, K. F., Shafait, Z., & Sahibzada, H. F. (2022). Interpreting the impact of knowledge management processes on organizational performance in Chinese higher education: mediating role of knowledge worker productivity. *Studies in Higher Education, 47*(4), 713-730. https://doi.org/10.1080/03075079.2020.1793930

Santoro, G., Ferraris, A., Giacosa, E., & Giovando, G. (2018). How SMEs engage in open innovation: a survey. *Journal of the Knowledge Economy, 9*, 561-574. https://doi.org/10.1007/s13132-015-0350-8

Segarra-Ciprés, M., Roca-Puig, V., & Bou-Llusar, J. C. (2014). External knowledge acquisition and innovation output: an analysis of the moderating effect of internal knowledge transfer. *Knowledge Management Research & Practice, 12*, 203-214. https://doi.org/10.1057/kmrp.2012.55

Sengupta, A., & Sena, V. (2020). Impact of open innovation on industries and firms–A dynamic complex systems view. *Technological forecasting and social change, 159*, 120199.

https://doi.org/10.1016/j.techfore.2020.120199

Shamim, S., & Abbasi, A. S. (2012). Interethnic culture orientation of business managers in Pakistan. *Middle-East Journal of Scientific Research, 12*(5), 632-642.

Simao, L., & Franco, M. (2018). External knowledge sources as antecedents of organizational innovation in firm workplaces: a knowledge-based perspective. *Journal of Knowledge Management, 22*(2), 237-256. https://doi.org/10.1108/JKM-01-2017-0002

Singh, S. K., Gupta, S., Busso, D., & Kamboj, S. (2021). Top management knowledge value, knowledge sharing practices, open innovation and organizational performance. *Journal of business research, 128*, 788-798. https://doi.org/10.1016/j.jbusres.2019.04.040

Sisodiya, S. R., Johnson, J. L., & Grégoire, Y. (2013). Inbound open innovation for enhanced performance: Enablers and opportunities. *Industrial marketing management, 42*(5), 836-849. https://doi.org/10.1016/j.indmarman.2013.02.018

Taherparvar, N., Esmaeilpour, R., & Dostar, M. (2014). Customer knowledge management, innovation capability and business performance: a case study of the banking industry. *Journal of Knowledge Management, 18*(3), 591-610. https://doi.org/10.1108/JKM-11-2013-0446

Tahmasebinia, Z., Jokar, A., Mohebi, A., Fardmehregan, S., Beigi, M., & Tahmasebinia, F. (2022). A Study on the Impact of Market and Strategic Orientations on Business Performance by Emphasizing the Role of Innovation as a Mediator. *Business Management and Strategy, 13*(2), 67. https://doi.org/10.5296/bms.v13i2.19907

Todorova, G., & Durisin, B. (2007). Absorptive capacity: Valuing a reconceptualization. *Academy of management review, 32*(3), 774-786. https://doi.org/10.5465/amr.2007.25275513

Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The leadership quarterly, 18*(4), 298-318. https://doi.org/10.1016/j.leaqua.2007.04.002

Van Wijk, R., Jansen, J. J., & Lyles, M. A. (2008). Inter‐and intra‐organizational knowledge transfer: a meta‐analytic review and assessment of its antecedents and consequences. *Journal of management studies, 45*(4), 830-853. https://doi.org/10.1111/j.1467-6486.2008.00771.x

Von Krogh, G., Nonaka, I., & Rechsteiner, L. (2012). Leadership in organizational knowledge creation: A review and framework. *Journal of management studies, 49*(1), 240-277. https://doi.org/10.1111/j.1467-6486.2010.00978.x

Wang, C.-H., Chang, C.-H., & Shen, G. C. (2015). The effect of inbound open innovation on firm performance: Evidence from high-tech industry. *Technological forecasting and social change, 99*, 222-230. https://doi.org/10.1016/j.techfore.2015.07.006

Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human resource management review, 20*(2), 115-131. https://doi.org/10.1016/j.hrmr.2009.10.001

Wang, X. (2018). The effect of inbound open innovation on firm performance in Japanese manufacturing firms: Comparative study between research centre and business unit. *International Journal of Innovation Management, 22*(07), 1850054. https://doi.org/10.1142/S1363919618500548

Wijaya, P. Y., & Suasih, N. N. R. (2020). The effect of knowledge management on competitive advantage and business performance: A study of silver craft SMEs. *Entrepreneurial Business and Economics Review, 8*(4), 105-121. https://doi.org/10.15678/EBER.2020.080406

Yang, J.-T. (2007). Knowledge sharing: Investigating appropriate leadership roles and collaborative culture. *Tourism management, 28*(2), 530-543. https://doi.org/10.1016/j.tourman.2006.08.006

Yli‐Renko, H., Autio, E., & Sapienza, H. J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic Management Journal, 22*(6-7), 587-613. https://doi.org/10.1002/smj.183

Zapata Cantú, L., Rialp Criado, J., & Rialp Criado, A. (2009). Generation and transfer of knowledge in IT‐related SMEs. *Journal of Knowledge Management, 13*(5), 243-256. https://doi.org/10.1108/13673270910988088

Žemaitis, E. (2014). Knowledge management in open innovation paradigm context: high tech sector perspective. *Procedia-Social and Behavioral Sciences, 110*, 164-173. https://doi.org/10.1016/j.sbspro.2013.12.859

Zhang, J., Jiang, H., Wu, R., & Li, J. (2019). Reconciling the dilemma of knowledge sharing: A network pluralism framework of firms' R&D alliance network and innovation performance. *Journal of Management, 45*(7), 2635-2665. https://doi.org/10.1177/0149206318761575

Zhao, S., Jiang, Y., Peng, X., & Hong, J. (2021). Knowledge sharing direction and innovation performance in organizations: do absorptive capacity and individual creativity matter? *European Journal of Innovation Management, 24*(2), 371-394. https://doi.org/10.1108/EJIM-09-2019-0244

Appendix

Variable Symbol	Questionnaire's Items
KOTM	Top manager has been creating an environment for responsible employee behavior and teamwork. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Managers are used to assuming the role of knowledge leaders, which is mainly characterized by openness, tolerance of mistakes, and mediation for the achievement of the firm's objectives. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Managers promote learning from experience, tolerating mistakes up to a certain point. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Managers behave as advisers, and controls are just an assessment of the accomplishment of objectives. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Managers promote the acquisition of external knowledge. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐

	Managers reward employees who share and apply their knowledge. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
❖ Note to below statements and specify your answer in each item	
BP	Very significant changes in your company's marketing strategies to bring a new or significantly improved good or service to market, including market research and launch advertising. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	The internal or external training of your staff, directly and specifically related to product or process innovations. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Increase in sales volume of new or improved products/services. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Increase in profitability of sales of new or improved products. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Increase in overall company growth. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Improving the quality of products and services Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Creation of new knowledge Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Acting as a competitive company in market Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
IOI	Scanning external environment for Technology, information, ideas, etc. usable in our industry. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Scanning external environment for Knowledge and know-how to develop new products or improved products. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Scanning external environment for finding external sources to supplement R&D Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Scanning external environment for Information and know-how to use in combination with own R&D Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	Scanning external environment for Know-hows and copyrights from outside Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
IKSP	My organization Uses mentoring. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization Uses work team. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization disseminates data on past failures & lessons learned amongst employees. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization Uses IT systems to share knowledge. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization Uses knowledge sharing mechanisms. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization Uses of incentives to encourage the employee's sharing knowledge. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
OKSP	My organization provides sufficient information about current and innovative products for suppliers. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization makes customers aware of information about the benefits of current and new products. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization helps consumers to make better decisions in choosing from our product's Portfolio. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization provides related and sufficient information to support wholesalers and retailers. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐
	My organization prepares a platform or website to share knowledge about our products. Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐