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KNOWLEDGE-ORIENTED LEADERSHIP AND SUSTAINABLE PERFORMANCE: THE MEDIATING ROLE OF KNOWLEDGE WORKER PERFORMANCE IN IT ORGANIZATIONS

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ABSTRACT

In the era of accelerated digital transformation, organizations face increasing pressure to innovate while sustaining long-term performance. This study investigates the role of Knowledge-Oriented Leadership (KOL) in driving Sustainable Performance (SP), particularly through the mediating mechanism of Knowledge Worker Performance (KWP), within IT-intensive environments. Grounded in the Path-Goal Theory of leadership, the research conceptualizes KOL as a strategic leadership model that leverages organizational knowledge as a core resource for innovation, motivation, and performance. Using a sample of 550 respondents from IT-driven firms, the study employed quantitative analysis to examine direct and indirect relationships among KOL, KWP, and SP. Results demonstrated excellent internal consistency for all scales (Cronbach's alpha > 0.87). Correlation analysis revealed strong, positive associations among the constructs ($r > 0.82$, $p < .01$). Regression analysis confirmed that both KOL and KWP significantly predict SP ($R^2 = .820$), with KWP exerting a slightly stronger standardized influence ($\beta = .528$) than KOL ($\beta = .419$). Mediation analysis further confirmed that KWP partially mediates the relationship between KOL and SP, with a significant indirect effect (effect = 0.4075, 95% CI [.3531, .4619]). These findings underscore the critical role of knowledge-oriented leadership in cultivating high-performing knowledge workers, thereby enabling sustainable organizational outcomes in digitally dynamic contexts.

Keywords: *Knowledge-Oriented Leadership, Sustainable Performance, Knowledge Worker Performance, IT, Organization.*

INTRODUCTION

In the backdrop of rapidly accelerating digitalization, modern organizations are experiencing mounting pressure to continuously innovate while simultaneously maintaining sustainable performance (SP) (Jibril, Kesidou et al. 2024). The digital revolution has introduced powerful technologies that serve as foundational tools for innovation (Mäkitie, Hanson et al. 2023). However, it is not merely the presence of digital tools that ensures long-term organizational success, but rather the strategic deployment of organizational knowledge—an endeavor fundamentally driven by effective and adaptive leadership (Chughtai and Khan 2024) Within this evolving landscape, Knowledge-Oriented Leadership (KOL) has gained prominence as a pivotal enabler of sustainability, especially in technology-driven and IT-intensive environments (Donate and de Pablo 2015). This leadership approach emphasizes the cultivation, dissemination, and application of knowledge across the organization, treating it not as a

peripheral element but as a central, strategic asset that directly supports innovation, learning, and continuous organizational advancement.(Donate and de Pablo 2015)

Although the strategic importance of knowledge as an organizational resource is widely acknowledged in both academic literature and industry practices, the integration of knowledge-centric principles into leadership models has not been fully realized or extensively examined (Sahibzada, Janjua et al. 2023). In particular, there remains a significant gap in understanding how KOL contributes to sustainable performance outcomes by fostering a culture deeply rooted in shared learning, mutual motivation, and innovation (Tarnovskaya 2023). KOL plays an instrumental role in helping organizations navigate and thrive amidst the fast-evolving challenges of digital landscapes (Sahibzada, Latif et al. 2022). Despite this potential, empirical research exploring the direct and indirect impact of KOL on sustainable performance—especially within IT-driven organizational contexts—remains limited, leaving a gap in both theory and practice (Sahibzada, Janjua et al. 2023)

One critical yet often overlooked component within this framework is the performance of knowledge workers, formally referred to as Knowledge Worker Performance (KWP) (Sahibzada, Jianfeng et al. 2022, Malik, Abbas et al. 2023). In digital-centric workplaces, where adaptability, innovation, and agility are paramount, the performance of these individuals—defined by their capacity to generate, apply, and disseminate knowledge—becomes essential for driving organizational goals related to both innovation and sustainability (Mubarak, Khan et al. 2022, Al Wali, Muthuveloo et al. 2023). Nevertheless, scholarly attention to the mediating role of KWP in the relationship between KOL and SP has been minimal (Lin, Huang et al. 2020). The success of any leadership strategy often hinges on the responsiveness and performance of knowledge workers, who serve as the backbone of innovation and sustainability initiatives in the digital age (Jibril, Kesidou et al. 2024)

To explore this intricate relationship, the current study adopts the Path-Goal Theory of leadership(House and Mitchell 1975). This theoretical lens emphasizes the alignment between leadership behaviors and the specific needs, expectations, and motivational drivers of employees (Famakin and Abisuga 2016). In this context, KOL can be operationalized through both intrinsic strategies—such as role modeling and supportive behaviors—and extrinsic mechanisms—such as recognition, incentives, and structured rewards (Donate and Guadamillas 2015). Together, these approaches can foster a workplace environment in which knowledge workers feel empowered, motivated, and equipped to contribute effectively (Duke, Igwe et al. 2023, Khaksar, Chu et al. 2023) However, the influence of such strategies is context-dependent, and uniform application may not yield consistent results across diverse organizational settings (Sahibzada, Jianfeng et al. 2022). Therefore, it becomes essential to evaluate the varying impacts of these leadership styles on KWP and how this, in turn, shapes sustainable performance outcomes(Sahibzada, Latif et al. 2022).

In conclusion, this study seeks to deepen the understanding of how Knowledge-Oriented Leadership indirectly influences Sustainable Performance through the mediating role of Knowledge Worker Performance. This framework presents a novel and underexplored pathway for achieving enduring sustainability in IT organizations undergoing digital transformation.

Literature Review

Knowledge-Oriented Leadership and sustainable performance

Knowledge-Oriented Leadership (KOL) has emerged as a key leadership style in knowledge-intensive industries, particularly within IT environments undergoing rapid digital transformation. Rooted in knowledge management principles, KOL emphasizes the acquisition, sharing, and application of knowledge to drive innovation and performance (Donate and de Pablo 2015, Donate and Guadamillas 2015). Leaders who adopt a knowledge-oriented approach facilitate a culture of learning, empower employees to contribute intellectually, and align knowledge strategies with organizational goals (Chughtai and Khan 2024). Research suggests that KOL fosters creativity, collaboration, and adaptive capacity—traits vital for sustaining competitiveness in digital economies (Ganguly, Talukdar et al. 2020). Sustainable Performance (SP) encompasses an organization's ability to maintain consistent operational, financial, and innovation outcomes while aligning with long-term social and

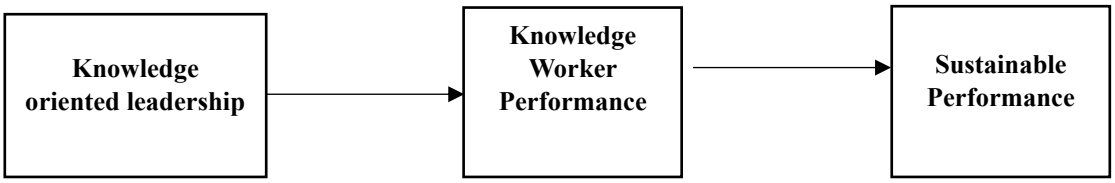
environmental goals (Del Río Castro, González Fernández et al. 2021, Tarnovskaya 2023). In the digital age, SP is increasingly linked to intangible assets such as knowledge, innovation capacity, and human capital. Achieving SP requires more than efficient operations—it demands strategic leadership that leverages knowledge as a core resource (Malik, Abbas et al. 2023), While traditional leadership styles have been examined in relation to sustainability, the role of KOL in enabling SP through knowledge processes remains under-theorized (Sahibzada, Jianfeng et al. 2022). However, the direct relationship between KOL and long-term sustainable performance remains underexplored in empirical studies, particularly within the sustainability context (Stuermer, Abu-Tayeh et al. 2017, Faridian 2023). While various leadership styles—such as transformational, servant, responsible, and sustainable leadership—have been studied for their potential impact on organizational sustainable performance (SP), the literature remains fragmented and lacks a comprehensive synthesis (Molla 2013, Farooq Sahibzada, Thomas et al. 2022). Existing studies often focus on isolated leadership models or specific dimensions of sustainability (economic, social, or environmental) without offering a holistic understanding of how leadership behaviors collectively influence SP (Latif, Mas-Machuca et al. 2023, Janjua, Shi et al. 2024). This gap presents an opportunity to explore how knowledge-driven leadership can shape sustainable outcomes.

H1: Knowledge oriented leadership impacts sustainable performance.

Mediating role of knowledge worker performance

Knowledge Worker Performance (KWP) refers to the efficiency and effectiveness with which employees generate, process, and utilize knowledge to create value (Razzaq, Shujahat et al. 2018). In digital and innovation-driven environments, knowledge workers are instrumental in translating information into actionable solutions(Drucker 1998, Drucker 1999). Their performance is influenced by both individual competencies and organizational factors, including leadership, culture, and technological infrastructure (Kianto, Shujahat et al. 2019, Malik, Abbas et al. 2023). The relationship between knowledge-oriented leadership and Knowledge Worker Performance has indeed become a unity in the field of knowledge between leaders and employees (Sahibzada, Jianfeng et al. 2022, Malik, Abbas et al. 2023). where as a process to increase maximum work results, on the other hand, knowledge-oriented leadership has been given a special status in the field of management and its application and to create good employee performance that is oriented towards knowledge (Sahibzada, Jianfeng et al. 2022). it is necessary to have a knowledge-oriented leader who prioritizes, encourages, and values new ideas from employees, and is actively involved and committed to supporting knowledge and learning activities in the organization(Razzaq, Shujahat et al. 2018, Sokół and Figurska 2021). Although several studies have investigated factors affecting KWP, limited attention has been given to its mediating role between leadership behaviors—especially KOL—and organizational outcomes (Donate and de Pablo 2015, Sahibzada, Latif et al. 2022, Sahibzada, Janjua et al. 2023). Understanding KWP as an intermediary can provide deeper insights into how leadership strategies translate into tangible, sustainable results (Liu, Zheng et al. 2022). The integration of digital technologies has transformed the nature of work and leadership, making the interplay between KOL, KWP, and SP more critical than ever. The Path-Goal Theory provides a useful framework to understand this dynamic, suggesting that effective leaders align their behaviors with the needs and motivations of their employees (House and Mitchell 1975). When leaders adopt knowledge-oriented strategies, they can activate both intrinsic and extrinsic motivations among knowledge workers, ultimately enhancing performance and contributing to sustainable organizational outcomes (Farooq Sahibzada, Xu et al. 2021, Latif, Afzal et al. 2021) However, empirical validation of this mediated relationship remains limited in current literature, especially in the IT sector. This study addresses this gap by investigating KWP as a mediating variable in the relationship between KOL and SP.

H2: |Knowledge worker performance mediates between knowledge oriented leadership and sustainable performance.



Conceptual Framework

Research Methodology

Research Design

Research design advocates a research venture cycle (Zikmund 2009). The design of an examination is described by a researcher's plan, which defines the methodology and system for collecting and analyzing the relevant data. This research is based on quantitative in nature and employs a time horizon. The data is cross-sectional and gathered at a single point in time. The quantitative objective is to scrutinize the numerical properties and relationships emerging from the data for each topic, aiding in the development and support of the research's theoretical foundations. Consequently, researchers can make informed judgments and address inquiries about the problem by accumulating numerical data and establishing connections using statistical models. To validate the current research data and arrive at the correct findings, this study performed a thorough quantitative analysis. A legitimate strategy for the data collection process was chosen to obtain significant information. Survey questionnaires have been widely utilized for research purposes (Zikmund, Babin et al. 2013) and thus, this research employed questionnaires as the primary source for data collection.

Sample and Procedure

IT firms play a significant role in the economic development of developing countries. Consequently, the effective performance of IT firms has gained increased attention in emerging economies like Pakistan (Ahmad, Zhu et al. 2019). Where there is growing interest in adopting effective leadership practices. Existing literature identifies leadership as a critical factor in driving sustainable performance (Latif, Mas-Machuca et al. 2023). The adoption of knowledge-oriented leadership (KOL) practices has become increasingly important due to the complexity of organizational operations and the need for strategies to manage rapidly changing customer demands, which are essential for achieving sustainable performance (SP) (Shin, Mollah et al. 2023). Moreover, fostering a supportive work environment is vital for IT professionals to transform innovative ideas into tangible digital products (Shahzadi, Li et al. 2021). Therefore, it is crucial to examine the relationship between knowledge-oriented leadership and sustainable performance, particularly within highly skilled IT firms. This research focuses on evaluating the proposed research model among employees working in IT companies in Pakistan. Specifically, the study targets IT firms, recognizing their capacity for broader implementation of KOL practices (Shahzadi, Li et al. 2021, Vo, Nguyen et al. 2024).

This is a quantitative, cross-sectional, and survey-based research study. In the context of quantitative research, surveys and experiments are commonly used data collection methods (Creswell and Creswell 2005), with survey research being widely recognized (Hertzog 2008). This study employs a correlational design to investigate the impact of KOL on SP, with the mediating role of knowledge worker performance (KWP).

The sample population consists of employees from IT firms in Pakistan. Data was collected from the IT industry to facilitate analysis and enable generalization of the findings. The units of analysis include managers and team members. A convenience sampling method was used. Survey questionnaires were distributed both personally and via online Google Forms to managers and team members working in IT firms across Pakistan. Participants were assured of the confidentiality of their responses.

The questionnaire had two sections: the first gathered demographic information such as gender, age, qualifications, and experience, while the second focused on the study variables—KOL, SP, and KWP. Out of 550 distributed questionnaires, 430 were returned. After excluding 42 incomplete or improperly filled responses, 388 valid responses were used for analysis, resulting in a 70.5% response rate.

Among the respondents, 341 (87.9%) were male and 47 (12.1%) were female. A majority (268 or 69.1%) held a graduation degree or international

certification. The average job tenure ranged from 4 to 12 years. Most participants were relatively young, aged between 26 and 42 years. Data collection took place from June 2024 to December 2024.

Instrumentation and Measures

The measurement scales for all variables were adopted from established instruments in the extant literature. The questionnaire covered three primary constructs as outlined in the research model: Knowledge oriented Leadership (KOL), Sustainable performance (SP), and Knowledge Worker Performance (KWP). All items were measured using a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The scale for Knowledge Oriented Leadership (KOL) was adopted from relevant prior studies and included items that assess the influence, credibility, and thought leadership of individuals within the organization. A sample item is, "The leader is recognized as a credible and influential source of information within the organization." The scale for sustainable performance (SP) was adopted from established literature, measuring how organizations integrate and leverage digital technologies for business improvement. A representative item includes, "Our organization actively integrates digital technologies to improve business processes." Lastly, the scale for Knowledge Worker Performance (KWP) was adapted from previous research focusing on the productivity and output of knowledge-based employees. A sample item includes, "I effectively apply knowledge and expertise to achieve work goals." All items were retained in their original form to ensure content validity, and each scale has been widely applied and validated in previous scholarly work.

Data Analysis Procedure

For data analysis, IBM SPSS version 21 software was utilized. The analysis process involved several key steps. Initially, data entry and screening were conducted using IBM SPSS, and only the filtered and clean data were used for further analysis. To assess the reliability of the variables, Cronbach's alpha was examined. Descriptive statistics and correlation analyses were conducted to understand the relationships among variables. Additionally, the Preacher and Hayes method was employed to test mediation effects and to explore the role of mediators between the independent and dependent variables. Regression analyses were used to examine the significant relationships among the study variables.

Analysis And Results

The internal consistency reliability of the scales was evaluated using Cronbach's alpha. The results indicated excellent reliability for all three scales. Specifically, the KOL scale with 6 items demonstrated good internal consistency reliability with a Cronbach's alpha value of 0.877. The SP scale with 21 items exhibited excellent reliability with a Cronbach's alpha value of 0.960. Similarly, the KWP scale with 10 items showed excellent internal consistency reliability with a Cronbach's alpha value of 0.920. These results suggest that the items within each scale are consistently measuring the underlying construct, thereby supporting the reliability of the scales.

Correlation		KOL	SP	KWP
KOL	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	802		
SP	Pearson Correlation	.856**	1	
	Sig. (2-tailed)	.000		
KWP	Pearson Correlation	.827**	.875**	1
	Sig. (2-tailed)	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).				

The correlation analysis indicates strong and statistically significant relationships among Knowledge-Oriented Leadership (KOL), Sustainable Performance (SP), and Knowledge Work Performance (KWP). KOL is strongly positively correlated with SP ($r = .856$, $p < .01$) and KWP ($r = .827$, $p < .01$), suggesting that higher levels of knowledge-oriented leadership are associated with better sustainable performance and improved knowledge work performance. Furthermore, SP also shows a strong positive correlation with KWP ($r = .875$, $p < .01$), indicating

that organizations with higher sustainable performance tend to exhibit better knowledge work performance. All correlations are significant at the 0.01 level, based on a sample of 550 respondents, demonstrating robust and meaningful associations among the three variables.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.906[a]	.820	.820	.42100
a. Predictors: (Constant), KWP, KOL				

The regression model including Knowledge-Oriented Leadership (KOL) and Knowledge Work Performance (KWP) as predictors of Sustainable Performance (SP) demonstrates a strong overall fit. The R value of .906 indicates a very high correlation between the observed and predicted values of the dependent variable (SP). The R Square value of .820 shows that approximately 82% of the variance in Sustainable Performance can be explained by the combined effect of KOL and KWP. The Adjusted R Square (.820) confirms the model's robustness, accounting for the number of predictors in the model. The standard error of the estimate is .421, indicating the average distance between the actual data points and the regression line.

Coefficients of Variables						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.322	.050		6.430	.000
	KOL	.390	.025	.419	15.681	.000
	KWP	.515	.026	.528	19.802	.000
a. Dependent Variable: SP						

The regression coefficients indicate that both Knowledge-Oriented Leadership (KOL) and Knowledge Work Performance (KWP) are significant predictors of Sustainable Performance (SP). The unstandardized coefficient for KOL is 0.390 ($p < .001$), suggesting that a one-unit increase in KOL leads to a 0.390 unit increase in SP, holding KWP constant. Similarly, the unstandardized coefficient for KWP is 0.515 ($p < .001$), indicating that a one-unit increase in KWP results in a 0.515 unit increase in SP, controlling for KOL. The standardized beta coefficients show that KWP ($\beta = .528$) has a slightly stronger influence on SP compared to KOL ($\beta = .419$). Both predictors are highly statistically significant, as evidenced by their large t-values (15.681 for KOL and 19.802 for KWP), and the model demonstrates strong explanatory power with 82% of the variance in SP accounted for.

Mediation analysis Total effect of X on Y

Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
.7976	.0171	46.7704	.0000	.7641	.8311
Direct effect of X on Y					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
.3901	.0249	15.6809	.0000	.3413	.4389
Indirect effect(s) of X on Y:					
Effect	SE	BootLLCI	BootULCI		
.4075	0276	.3531	.4619		

The mediation analysis reveals that Knowledge-Oriented Leadership has a significant total effect **on** Sustainable Performance (effect = 0.7976, $p < .001$), indicating a strong overall relationship between the two variables. The direct effect of KOL on SP is also significant (effect = 0.3901, $p < .001$), suggesting that KOL directly contributes to sustainable performance even when accounting for the mediator. The indirect effect**,** mediated through Knowledge Work Performance, is 0.4075, with a bootstrapped 95% confidence interval ranging from 0.3531 to 0.4619. Since this confidence interval does not include zero, the indirect effect is statistically significant, confirming that KWP partially mediates the relationship between KOL and SP. This implies that KOL enhances SP both directly and indirectly by improving KWP.

Discussion, Implications and Future Direction

Discussion

This study investigates the influence of Key Opinion Leadership (KOL) on sustainable performance (SP), along with the mediating role of Knowledge Worker Performance (KWP) within IT firms. The findings confirm a significant positive relationship between KOL and DI, supporting the theoretical foundations of the Path Goal Theory. The results align with prior studies demonstrating that effective leadership enhances innovation-related outcomes in technology-driven environments (Molla 2013, Donate and de Pablo 2015). Within IT firms, KOL appears to inspire innovation by fostering trust, facilitating knowledge flow, and encouraging experimentation—factors that are essential in dynamic and rapidly evolving technological landscapes.

The study's findings further affirm that KOL significantly influences SP, validating the first hypothesis. Prior research has also underscored the pivotal role of leadership in enhancing innovation capabilities. For instance, (House and Mitchell 1975, Drucker 1999, Turriago-Hoyos, Thoene et al. 2016) confirmed that leadership behavior plays a crucial role in promoting performance and innovation. Similarly, (Sahibzada, Janjua et al. 2023, Chang, Chen et al. 2024) documented a strong association between visionary leadership and innovation success.(Janjua, Shi et al. 2024) emphasized that transformational characteristics in leadership, such as the ability to influence, inspire, and support team members, play a central role in driving innovation-oriented results.

The mediating role of Knowledge Worker Performance (KWP) between KOL and DI was also examined, and the results indicate a statistically significant indirect effect. This suggests that the presence of KOL enhances individual and collective performance among knowledge workers, which in turn facilitates higher levels of innovation. (Le and Lei 2018) highlighted that leaders contribute to employee performance by nurturing a shared identity and purpose, which aligns with this study's findings. Likewise, (Gilli, Lettner et al. 2024) and (Chughtai and Khan 2024) emphasized that leadership styles that engage employees cognitively and emotionally foster higher productivity and innovation output.

The mediating influence of KWP reflects broader insights from prior literature. For example, (Malik, Abbas et al. 2023) found that performance outcomes are significantly affected by employee empowerment and control, often shaped by leadership behavior. Similarly, (Sahibzada, Latif et al. 2022) and (Wong 2013) emphasized that empowering leadership improves performance, which directly correlates with innovation. In IT firms where adaptability, continuous learning, and agility are essential, KWP emerges as a critical channel through which leadership indirectly drives innovation.

This research contributes to the growing body of literature by emphasizing that KOL not only directly influences SP but also indirectly fosters innovation by enhancing knowledge workers' performance. Prior studies have similarly noted the significance of team- and individual-level mediators in leadership-innovation dynamics. For instance, (Chin Wei, Siong Choy et al. 2009) investigated team identity as a mediator between leadership and innovation outcomes, while (Mulyanti 2024) focused on the mediating effect of employee performance. In summary, this study highlights the dual path through which KOL enhances DI—both directly and through the mediating influence of KWP. The findings underscore the importance of fostering leadership practices that not only guide but also empower knowledge workers to achieve innovative results. In the context of IT firms, where employee expertise and creativity are central to organizational success, leveraging the influence of opinion leaders can be a strategic advantage in

driving digital transformation and sustained innovation.

Conclusion

This research identifies Key Opinion Leadership (KOL) and knowledge worker-related outcomes as critical drivers that significantly influence Sustainable performance (SP) in IT firms. It is among the pioneering efforts to propose and empirically validate a framework linking KOL with SP, while considering Knowledge Worker Performance (KWP) as a mediating factor. By emphasizing the strategic role of KOL in fostering high-performing knowledge workers, this study illustrates how effective leadership catalyzes innovation in dynamic, technology-intensive environments. The findings confirmed that KOL has a substantial direct effect on SP and that KWP significantly mediates this relationship.

Accordingly, the study concludes that KOL is essential for nurturing a culture of innovation, particularly by improving individual performance, promoting collaboration, and empowering knowledge workers. IT firms should, therefore, invest in leadership practices that identify, develop, and empower opinion leaders within the organization. These leaders play a vital role in fostering innovation through improved decision-making, collaboration, and adaptability. Moreover, the study suggests that strategic emphasis on enhancing knowledge worker capabilities will further strengthen innovation outcomes. Overall, this research underscores the central role of KOL and KWP in enabling sustained innovation and technological advancement in IT firms.

Research Implications

This research presents valuable theoretical and practical implications for the IT sector. From a theoretical standpoint, it reinforces the Resource-Based View (RBV) and Social Identity Theory (SIT) by demonstrating how internal leadership capital and workforce performance contribute to innovation. Practically, the study emphasizes that Key Opinion Leadership has a decisive impact on enhancing knowledge worker performance, which in turn drives sustainable performance. Effective KOL fosters trust, stimulates professional development, encourages open communication, and cultivates a proactive organizational culture—leading to higher levels of innovation.

For IT firms, this suggests a need to identify and support individuals with influential leadership potential. Encouraging knowledge-sharing behaviors, providing targeted professional growth opportunities, and creating inclusive work environments can significantly enhance KWP. This, in turn, improves the organization's capacity to innovate and stay competitive. The findings advocate for leadership development programs focused on cultivating KOL attributes such as expertise, credibility, and communication skills. By investing in such strategies, firms can achieve stronger innovation outcomes and maintain a resilient, future-ready workforce.

Limitations and Future Research Directions

Despite its contributions, this study has several limitations. First, the data were collected from knowledge workers employed in Pakistan's IT sector, which may limit the generalizability of the results. Future studies should apply the proposed model across diverse industries and geographic contexts. Second, the research employed a cross-sectional design, which restricts the ability to draw causal inferences. Longitudinal studies would offer more robust insights into the long-term effects of KOL on innovation outcomes.

Additionally, this study focused solely on Knowledge Worker Performance as a mediating variable. Future research could expand this model by incorporating other potential mediators such as team efficacy, organizational learning, innovation climate, or knowledge sharing. Exploring moderators like organizational culture, digital maturity, or technological turbulence may also yield deeper insights.

With increasing attention to sustainability and the integration of Sustainable Development Goals (SDGs) in business strategy, it would be valuable to examine how sustainable leadership influences sustainable innovation. Future work might explore the mediating roles of green innovation or frugal innovation, and assess how knowledge-centric cultures moderate the relationship between sustainable leadership and knowledge absorptive capacity. These avenues hold promise for developing more holistic leadership-innovation models aligned with future global challenges.

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IT firms vary in their performance to improve the environmental sustainability of their own operations and in their ability to provide products and solutions that enable and transform the environmental sustainability of other industries. In the parlance of the balanced scorecard, performance has two dimensions, that is, “drivers” and “outcomes”. The drivers, also known as leading performance indicators, refer to learning and innovation, processes, and customer value propositions. The outcomes, also known as lagging performance indicators, refer to financial results. This study has developed and validated an instrument to measure the environmentally sustainable IT performance (eSITP) drivers. We established the nomological network of the eSITP by drawing from several theoretical domains in the areas of innovation antecedents and values, balanced performance measurement and IT and eco-sustainability. Based on a survey of 133 IT firms, we developed and validated a four-dimension, 17 items eSITP instrument covering eco-learning, eco-process, eco-brand and eco-value governance. The instrument is validated by following a seven step rigorous process. The paper breaks new ground from both research and practice perspectives. The instrument makes it easier for other researchers who wish to explain the leading (drivers) and lagging (outcomes) of IT firms’ environmental sustainability and for IT business managers who want to improve their environmental sustainability performance.

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