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Driving Project Excellence: Mindful Leadership and Knowledge Dynamics in Fostering Project Performance. Perspective from Pakistan

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Abstract

This study investigates the roles of mindful leadership, employee creativity at work, and knowledge management enablers in enhancing project performance within project-based firms in Pakistan. Grounded in Social Exchange Theory and the Knowledge-Based View of the firm, we propose that mindful leadership enhances project performance directly and indirectly, through creativity at work, and that knowledge management enablers strengthen this effect. We collected survey data from 249 professionals working on various construction projects in Pakistan. We used SmartPLS 4 (v4.0.1.9) for structural equation modeling. The results indicate that mindful leadership positively and significantly affects project performance. Mindful leadership alone had a weak and non-significant impact on employee creativity, but when coupled with strong knowledge management enablers, its influence on creativity became strongly positive. Mediation analysis confirms that employee creativity at work is a key mechanism linking mindful leadership to higher project performance. These findings enhance our understanding of how leadership and knowledge management practices intersect to drive project success, providing theoretical insights and practical implications for managing construction projects.

Keywords
Mindful leadership, Creativity at work, Knowledge management enablers, Project performance, Pakistan

1. Introduction

Global construction spending is projected to reach $16 trillion by 2025 (Fernanda Hernandez, 2024), underscoring the industry's pivotal role as a cornerstone of economic growth worldwide (Abeysinghe & Jayathilaka, 2022). Project-based organizations have experienced significant growth in the modern business era (Woolcott et al., 2024), giving rise to what some scholars refer to as a "project society" (Whyte et al., 2022). This shift disrupts traditional management structures—altering task definitions, hierarchies, career paths, and decision-making processes (Cortellazzo et al., 2019) and elevating the importance of human factors like leadership in determining project success (Dacre et al., 2021).

In response to these changes, research is increasingly highlighting leadership as a pivotal factor in project success (Nauman et al., 2024). A range of leadership styles have been linked to enhanced employee innovation and project outcomes, including transformational leadership (Potter et al., 2018), entrepreneurial leadership (Khairuddin et al., 2021), servant leadership (Nauman et al., 2024), and ambidextrous leadership (Zheng et al., 2023).
In developing countries, construction projects create substantial employment opportunities and drive infrastructure development and urbanization (Durdyev et al., 2019). However, the construction industry also suffers from persistent inefficiencies, including schedule delays, cost overruns, and suboptimal performance, which amount to an estimated $1.7 trillion in global waste (Barbosa et al., 2017; Sander & Keller, 2021). These issues underscore the need for improved management practices, particularly in leadership and knowledge management, to bolster project performance.

Mindful leadership has emerged as a promising approach for navigating the uncertainties and complexities of modern projects. It is defined as a leadership style emphasizing self-awareness, emotional intelligence, and focused attention on the present moment (Tan, 2023). Such leaders maintain a heightened awareness and respond calmly yet swiftly to challenges (Mayer & Oosthuizen, 2020) (Mayer & Oosthuizen, 2020). Mindful leadership fosters an environment where empathy, compassion, and open communication flourish (Bahadorestani et al., 2020), enabling teams to better handle stress and adapt to change.

At the team level, mindfulness in leadership has been linked to knowledge sharing and effective conflict resolution (Assi et al., 2022; Gerpott et al., 2020; Saleem et al., 2021). Mindful leaders help improve their followers' adaptability and resilience (Oguntuase & Sun, 2022) and assist teams in coping with stress and recovering from setbacks, thereby improving overall performance (Schulte & Hübenthal, 2022). By staying present and attentive, mindful leaders can make more thoughtful decisions and build stronger relationships with their team members (Lomas et al., 2019).

In this study, we build on Social Exchange Theory (SET) and the Knowledge-Based View (KBV) of the firm to examine how mindful leadership contributes to project performance through employee creativity at work, and how knowledge management enablers influence this process. We propose that mindful leadership cultivates a culture of reciprocity (Cropanzano & Mitchell, 2005) where leaders' attentiveness and support encourage employees to reciprocate with creative efforts. Simultaneously, knowledge management enablers, such as knowledge-sharing systems, technology integration, and a culture of continuous learning, are expected to amplify the impact of mindful leadership on creativity by facilitating information flow and collaboration (Boamah et al., 2022).

To date, only a few studies have examined mindful leadership in organizational settings. (Reb et al., 2014) found that leader mindfulness improves both in-role and extra-role employee performance, increases job satisfaction, and reduces stress. (Mubarak et al., 2024) reported that leadership mindfulness promotes employee innovation in IT project teams, although this effect may not extend to larger, highly uncertain project environments. These studies highlight the potential of mindfulness in leadership, but further investigation is needed, particularly in the context of construction projects.

Against this backdrop, we propose and test a model in which mindful leadership positively influences project performance both directly and through creativity at work, with knowledge management enablers serving as a boundary condition. We collected cross-sectional data from senior managers and executives in construction projects to examine these relationships. Specifically, our study addresses the following research questions:
1. What is the role of mindful leadership in improving construction project performance, both directly and via employee creativity at work (as informed by Social Exchange Theory)?
2. How do knowledge management enablers build the foundation to improve creativity at work and project performance (from a Knowledge-Based View perspective)?

2. Theory and Hypotheses

Social exchange theory:

According to the Social Exchange Theory, when employees receive support from their leaders, they develop an obligation to reciprocate (Blau, 1964). Such exchanges, whether economic or socio-emotional, foster strong employee–leader relationships (Cropanzano & Mitchell, 2005). If employees perceive unwavering support from a mindful leader, they are likely to respond with extra effort and creative contributions to improve the workplace. This support also provides motivation during the implementation of new ideas, when optimism and confidence are especially needed (Cropanzano & Mitchell, 2005).

Knowledge-based view theory of the firm:

Launched by (Grant, 1996), the Knowledge-Based View (KBV) of the firm posits that knowledge is a crucial, scarce, and valuable organizational resource. Possessing rich knowledge-based resources, or intellectual capital, is vital in fast-changing environments (Ali et al., 2021). Such resources can reduce costs, stimulate innovation, enhance productivity, and deliver customer value (Ferreira et al., 2020), thereby improving overall performance. Because knowledge assets are complex and difficult to replicate, they offer firms a sustainable competitive advantage.

Mindful leadership and project performance:

Mindful leadership is characterized by a leader's present-moment awareness, self-regulation, and attentiveness (Wibowo & Paramita, 2022). It creates a work environment where empathy, compassion, and open communication flourish (Burmansah et al., 2020). According to (Hunter & Chaskalson, 2013), mindful (or "conscious") leadership involves intentionally focusing on the present moment without judgment. Leaders who practice mindfulness are better equipped to address workplace issues thoughtfully and build strong team relationships (Lomas et al., 2019). Developing mindfulness in leaders has been shown to improve various leadership outcomes (Fama, 1980); moreover, mindful leadership is increasingly recognized as a valuable asset in complex and demanding environments (Harvey & Kudesia, 2023). (Shomaker et al., 2019) found that such leadership boosts employee creativity, flexibility, and openness to new ideas, which in turn enhances team and organizational performance.

In project settings, scholars have started to explore mindfulness as a factor in success. (Reina, 2015) introduced a mindful leadership framework for project management, emphasizing adaptability, a positive attitude, and the ability to handle stress and pressure. Mindful leaders demonstrate self-regulation, interpersonal control, effective communication, and problem-solving abilities—qualities crucial in high-pressure project environments. In megaprojects, mindfulness among team members improves conflict resolution and project outcomes, especially when senior teams maintain mindful attention throughout the project lifecycle (Wang et al., 2020). Incorporating mindful management practices has been linked to more successful results in complex global projects, such as international IT outsourcing, by enabling leaders to notice and address issues early (Derakhshan et al., 2019). A mindful approach is also suggested to build organizational resilience in megaprojects as (He et al., 2021) argued, heightening awareness and vigilance. Conversely, a lack of mindfulness can lead to the unconscious and rigid execution of control mechanisms, causing project managers to overlook emerging problems (Chen & Jin, 2023). Thus, we hypothesize:
H1: Mindful leadership is positively and significantly related to project performance.

Creativity at work as a mediator:

Mindful leadership encourages a reflective and inclusive approach in the workplace (Wibowo & Paramita, 2022). Mindful leaders stay sharply focused on the present and respond thoughtfully to situations (King & Badham, 2020), maintaining a clear awareness of current events and experiences (Baron et al., 2018). This approach can also cultivate mindfulness among employees, motivating them to engage in creative problem-solving (Harvey & Kudesia, 2023). For example, mindful leadership has been linked to greater "green" creativity—employees devising innovative, eco-friendly ideas—beyond merely encouraging pro-environmental behavior (Gerpott et al., 2020; Shah & Guild, 2022). By being open to diverse perspectives and creating a psychologically safe environment (Reb et al., 2014), mindful leaders reduce employees' uncertainty (Zhang et al., 2023) and build their confidence in achieving ambitious goals. Such leaders inspire employees to question conventional practices and propose novel solutions, including sustainable initiatives (Faraz, 2022). Research indicates that mindfulness facilitates individuals in absorbing new information and broadening their perspectives, thereby enhancing their creative performance (Ferreira et al., 2020).

Leaders who exhibit mindfulness also tend to create inclusive, secure workplaces where employees feel valued (Reb et al., 2014). In turn, employees in these conditions are more willing to take risks and think creatively. Accordingly, we hypothesize:

H2: Creativity at work mediates the relationship between mindful leadership and project performance.

Knowledge management enablers as moderator:
Knowledge management enablers refer to the structures and mechanisms that support knowledge sharing and utilization in an organization. Ensuring effective knowledge management requires addressing critical success factors from the early planning stages (Köhler et al., 2019). Appropriate knowledge management (KM) enablers help organizations utilize resources efficiently—conserving time, materials, and human effort—to achieve their knowledge management goals. To prevent unsystematic knowledge growth, organizations should establish clear enablers that guide a consistent and systematic approach to knowledge development (Abeysinghe & Jayathilaka, 2022). These enablers help overcome barriers and motivate members to share their knowledge and experiences (Daniel, 2022).
In our framework, knowledge management enablers are expected to strengthen the effect of mindful leadership on employee creativity and project outcomes. Mindful leaders can serve as role models for knowledge sharing and creative behavior (Mohd Som et al., 2023). When leaders encourage open information exchange and value diverse viewpoints, their teams are likely to emulate these behaviors, cultivating a culture that supports continuous learning and knowledge sharing. Implementing robust knowledge management systems can also directly improve organizational performance—for example, by helping teams overcome operational hurdles more frequently and better understand customer requirements (Ahmad et al., 2021). Effective knowledge management (KM) systems provide enhanced decision support, enabling more informed decision-making (Anser et al., 2021). With strong KM enablers in place, the positive influence of mindful leadership on employees' creativity should be amplified. Thus, we hypothesize (Figure 1):

H3: Knowledge management enablers moderate the relationship between mindful leadership and creativity at work, such that strong KM enablers lead to higher project performance (and vice versa).

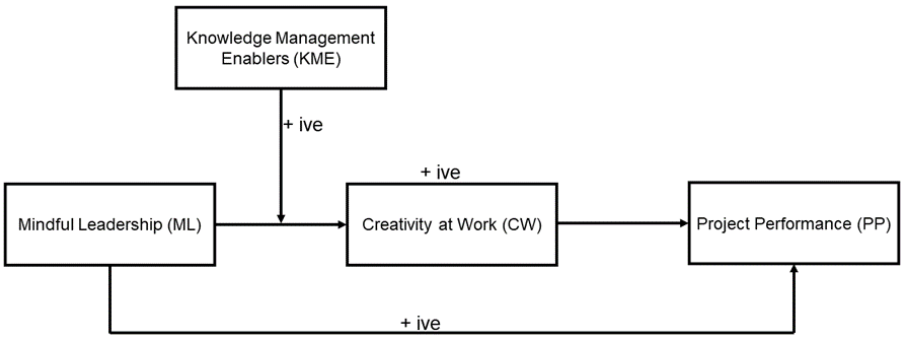

Figure 1. Model Framework

3. Methodology, Data Collection, and Measurements

For this study, data were collected using a questionnaire survey and a convenience sampling technique (Etikan et al., 2016), which ensured timely responses. The sample consisted of 249 professionals working on both large and small construction projects in Pakistan. Participants were drawn from diverse roles, including civil engineer, project manager, construction manager, and line manager. Surveys were distributed via an online Google Form through social media and email over a four-month period (September to December 2024). Out of 300 questionnaires distributed, 255 responses were received, and 249 were deemed valid, yielding an effective response rate of approximately 83%. To address the possibility of common method bias (since all data were self-reported), we performed Harman's single-factor test. The results showed that the first factor accounted for only 21% of the variance, which is well below the 40% threshold (Podsakoff et al., 2003). This suggests that common method bias is not a significant concern in our dataset. We used SmartPLS 4 (version 4.0.1.9) for structural equation modeling, including data preprocessing and descriptive analyses. Prior to examining the structural model, we evaluated the measurement model to ensure the reliability and validity of the constructs.

Measurements:

Before sending the survey questionnaire to the respondents, the chosen questions and Likert scale points were reviewed by the researchers to ensure that these scales accurately represented the study objectives. As stated by Elangovan and Sundaravel (2021), a questionnaire review is a necessary step before sending it to respondents to to ensure the quality of the questions. Likert scale-point, ranging from 1, indicating "Strongly disagree", to 5, denoting "Strongly agree". The subsequent section outlines the measurements employed in this study.

Mindful leadership (ML): We adopted 12 items from (Liu et al., 2021) to measure mindful leadership. (The original scale had 15 items; we selected the 12 items with the highest factor loadings.) A sample item is "My supervisor has a hard time focusing on what is happening at the moment." Cronbach's alpha for this scale was 0.951, indicating excellent reliability.

Employee's Creativity at work (CW): We measured creativity at work using 9 items adapted from (Ghosh, 2015). (The original scale had 12 items; we selected the 9 with the strongest loadings.) A sample item is "I am good at looking at subjects with new perspectives." Cronbach's alpha was 0.856, demonstrating good reliability.

Knowledge management enablers (KME): We used 12 items from (Lee & Choi, 2003) to assess knowledge management enablers. A sample item is "Our organization's members are satisfied with the degree of collaboration." Cronbach's alpha for this scale was 0.855, indicating good reliability.

Project performance (PP): Project performance was evaluated with 6 items adapted from (Ling et al., 2009). A sample item is "The project tends to finish within the allocated budget." Cronbach's alpha for this scale was 0.845, indicating good reliability.

5. Results

Analysis of Variance (ANOVA):

We conducted one-way ANOVA tests to check for any significant differences in creativity at work or project performance across demographic groups (gender, education level, job role, project duration). The results (Table 1) showed no significant effects of any demographic factor on creativity or performance (all p-values are greater than 0.005). Hence, it is not wrong to say that variance caused by demographics is not significantly impacting the role of creativity at work and project performance directly. Therefore, we excluded demographic variables from further analysis.

Table 1. Analysis of Variance Test (AVT)

Demographics	Creativity at Work (CW)		Creativity at Work (CW)	
	F	ρ-Value	F	ρ-Value
Gender	1.111	.329	.678	.859
Education	1.155	.280	1.191	.257
Designation	1.434	.255	.676	.861
Project Duration	1.139	.307	.846	.666

Mean, Standard Deviation, Correlation, and Reliability Analysis:

Table 2. presents the means, standard deviations, inter-correlations, and reliability coefficients for all variables. Mindful leadership showed a strong positive correlation with project performance ($r = 0.622^{**}$, $p < 0.001$), supporting H1. Knowledge management enablers were also positively correlated with project performance ($r = 0.442^{**}$, $p < 0.001$). Mindful leadership had no significant correlation with creativity at work ($r = 0.022$, $p = 0.716$). Creativity at work was moderately correlated with project performance ($r = 0.335^{**}$, $p < 0.001$). Finally, knowledge management enablers were highly correlated with creativity at work ($r = 0.831^{**}$, $p < 0.001$) and with project performance ($r = 0.728^{**}$, $p < 0.001$). (Cronbach's alpha values are shown on the diagonal of Table 2.)

Table 2. Mean, SD, Correlation

S. No	Variables	Mean	SD	1	2	3	4
1	ML	4.127	.773	(0.82)			
2	CAW	3.524	.768	.022	(0.798)		
3	KME	4.000	.528	.422**	.831**	(0.854)	
4	PP	3.906	.802	.622**	.335**	.728**	(0.866)

Note: TM=mindful leadership, CAW=creativity at work, KME=knowledge management enablers, PP=project performance

All constructs demonstrated good reliability and convergent validity. Specifically, all item loadings exceeded the 0.50 threshold of practical significance (Hair et al., 2013). Each construct's Cronbach's alpha was above 0.70, indicating acceptable internal consistency (Tavakol & Dennick, 2011). The average variance extracted (AVE) for each construct was above 0.50, supporting adequate convergent validity (Hair et al., 2013). Table 3 provides the factor loadings, composite reliability, and AVE values for the measurement model.

Table 3. Factor loading, Cronbach's Alpha, Compositive Reliability, AVE

Measurement scale	**Factor loading**	**Cronbach's alpha**	**Composite reliability**	**AVE**
Mindful Leadership		0.951	0.879	0.676
ML1	0.782			
ML2	0.779			
ML3	0.813			
ML4	0.774			
ML5	0.758			
ML6	0.723			
ML7	0.765			
ML8	0.757			
ML9	0.791			
ML10	0.825			
ML11	0.817			
ML12	0.811			
Creativity at work		0.856	0.837	0.865
CAW1	0.864			
CAW2	0.845			
CAW3	0.888			
CAW4	0.838			
CAW5	0.863			
CAW6	0.657			
CAW7	0.583			
CAW8	0.883			
CAW9	0.844			
Knowledge management enablers		0.855	0.943	0.813
KME1	0.759			

KME2	0.753			
KME3	0.845			
KME4	0.86			
KME5	0.837			
KME6	0.753			
KME6	0.837			
KME7	0.848			
KME8	0.735			
KME9	0.792			
KME10	0.832			
KME11	0.818			
KME12	0.898			
KME13	0.869			
Project performance		0.845	0.919	0.798
PP1	0.862			
PP2	0.837			
PP3	0.868			
PP4	0.855			
PP5	0.845			
PP6	0.752			

Direct and Indirect effects:
We tested our hypotheses using mediation and moderation analyses, employing bootstrapping for robust inference. The results are summarized in Table 4. Mindful leadership had a significant direct effect on project performance, *reaffirming H1*. The indirect effect of mindful leadership on project performance through creativity at work was positive and significant, *supporting H2*. In other words, mindful leadership improved project performance via increased employee creativity at work. We also found a significant interaction between mindful leadership and knowledge management enablers in predicting creativity at work. The positive interaction coefficient indicates that the effect of mindful leadership on employee creativity is strongest when knowledge management enablers are high. *Thus, H3 is supported*. Teams exhibited the highest creativity when both leadership mindfulness and knowledge enablers were strong.

Table 4. Mediation and Moderation analysis

Direct Relations	Coefficients	SE	T	P
ML – PP	0.622**	0.047	13.499	0.000
CAW – PP	0.335**	0.054	7.787	0.000
ML – CAW	0.022	0.061	0.364	0.716
KME – CAW	0.831**	0.043	19.38	0.000
KME *ML -> CAW	0.168**	0.033	5.157	0.000
Indirect Relations				
ML – CAW – PP	0.277**	0.06	4.568	0.000

Note:
TM=mindful leadership, CAW=creativity at work, KME=knowledge management enablers, PP=project performance. (95% biased-correlated interval)

6. Discussion
Anchored in SET and KBV, this study explored how mindful leadership influences project performance through employee creativity at work, and how knowledge management enablers condition this relationship. Our ANOVA results did not show any significant relationship. Hence, it can be said that in the context of the project environment, much focus is on task completion and achieving the objectives. In order to avoid overfitting and to maintain model

parsimony, we excluded it from further mediation and moderation analysis. Our findings H1, confirmed that mindful leadership has a direct positive impact on project performance. This aligns with prior evidence; for example, (Zheng et al., 2022) found that leader mindfulness promotes employee innovative behavior in China's healthcare sector. We extend such findings to construction projects in Pakistan, suggesting that mindful leadership can be broadly beneficial across different contexts. We also found that employee creativity at work plays a significant mediating role between mindful leadership and project performance, supporting H2. In today's fast-paced, technology-driven era, creativity is highly prized, and leadership paradigms are shifting to emphasize greater mindfulness, resilience, and agility in decision-making. Our mediation result resonates with the findings of (Alzghoul et al., 2018), who observed a similar mediating role of creativity (under authentic leadership) in a different industry. By demonstrating this effect in the construction sector, our study broadens the application of mindful leadership in fostering creativity and improving performance. Regarding H3, the moderating effect of knowledge management enablers was significant. Notably, mindful leadership alone was a relatively weak predictor of employee creativity; however, in the presence of strong knowledge management enablers, its effect on creativity became highly positive. This outcome is consistent with (Ho, 2009), who reported that knowledge management enablers enhance project performance. Our results confirm that in construction project settings, effective knowledge management practices (e.g., knowledge-sharing systems and culture) amplify the influence of mindful leadership on employees' creative outcomes.

Practical, theoretical implications, and limitations:
Theoretically, this research contributes to the literature by integrating SET and KBV to explain how leadership mindfulness and knowledge management jointly affect project success. We add to the understanding of mindful leadership (Zheng et al., 2022) and employee creativity (Zhou & George, 2003) in project environments by uncovering the underlying mechanisms and boundary conditions. Specifically, we shed light on the cognitive and social processes through which a leader's mindfulness translates into employee creativity and improved performance, highlighting the critical role of a knowledge-sharing environment.

Practically, our findings offer valuable insights for project-based organizations, especially those in challenging and dynamic environments. The results suggest that cultivating mindfulness in leaders can make employees more resilient and proactive when facing project challenges. Organizations should consider training programs to develop mindfulness and situational awareness among their leaders (and even team members) as a strategy to enhance project performance. Additionally, establishing a supportive knowledge management climate—through appropriate tools, systems, and cultural norms that encourage knowledge sharing—is crucial. Ensuring smooth and comprehensive knowledge flow will empower employees to be more creative and effective in their work, thereby maximizing the benefits of mindful leadership.

Despite its contributions, this study has a few limitations. First, we focused on project performance outcomes and did not measure other individual-level behavioral outcomes. Future research could include additional outcomes (e.g., employee well-being or team cohesion) to provide a more holistic view of the impact of mindful leadership. Second, our cross-sectional survey design limits causal inference and may not capture changes over time. Longitudinal studies tracking the same project teams through different phases (project initiation, execution, completion) would help determine how these relationships evolve and whether timing influences the effects. Thirdly, in different countries, the context of demographics can be further analyzed, in order to consider that these demographics are set for countries other than Pakistan. Qualitative research in other developing countries could also enrich our understanding by exploring how mindful leadership and knowledge-sharing practices unfold in practice. Finally, future studies might introduce control variables or consider external factors (such as economic conditions or organizational culture) to test the robustness of our findings under different conditions.

7. Conclusion

Project-based companies in developing countries face intense pressure to improve performance amid numerous challenges. Our study highlights that mindful leadership is a viable approach to enhance project outcomes, particularly when it is supported by strong knowledge management enablers and a creative workforce. Using a SEM approach, we validated a model grounded in SET and KBV that links mindful leadership, knowledge management enablers, and employee creativity to better project performance. Conducted in the context of construction projects in economically challenged region. this research underscores the value of fostering mindfulness in leadership and an organizational culture of knowledge sharing to drive project success. Overall, our work contributes to a deeper understanding of effective leadership in project settings and offers actionable insights for enhancing performance in the construction industry and beyond.

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Biographies

Muhammad Shoaib Iqbal is a Ph.D. student at National Taiwan University, Taipei, Taiwan. He holds an Outstanding Graduate Scholarship for the 4-year Ph.D. program at the Division of Construction Engineering Management, Department of Civil Engineering. NTU, a globally recognized institution ranked 69th in the QS World University Rankings. Additionally, I have secured a special research grant from the NSTC Council Taiwan to focus on developing ESG-based frameworks for construction projects. My research focuses on leadership, Project governance, and stakeholder perspectives in megaproject performance, with a particular emphasis on ESG frameworks in the construction industry. As a co-author, I have published a paper in the prestigious Q1-ranked Project Management Journal (PMJ), which focuses on enhancing project success in megaprojects by introducing servant leadership and project governance, which has been cited seven times. Additionally, his 2024 study, "Experimental analysis of concrete with partial cement replacement using incinerated hospital waste ash," featured in *Budownictwo i Architektura*, explores sustainable construction materials. Recently, I have had the honor of presenting his research at the MeRIT (Megaproject Research Interdisciplinary Team) International Conference, held in Piacenza, Italy, in November 2024. where I addressed the complexities and sustainability challenges in megaprojects and proposed a suitable framework to overcome these challenges in emerging economies.

Professor Dr. Shih Ping Ho is a full-time Professor at the Department of Civil Engineering, National Taiwan University, Taipei, Taiwan. Professor S. Ping Ho is a renowned scholar at National Taiwan University, specializing in Construction Management, Public-Private Partnerships (PPPs), Strategic Management, and Sustainable Development with a growing emphasis on ESG (Environmental, Social, and Governance) practices. With over 1,800 citations, his impactful research addresses institutional challenges in emerging economies, governance in international projects, and strategies to promote green building adoption. His recent publications include a 2024 article in *Building*

and Environment on consumer behavior models for green buildings, as well as a 2023 study in the Journal of Management in Engineering, which explored strategic responses to institutional pressures in developing countries. Professor Ho's work continues to make significant contributions to the fields of infrastructure development and sustainable project management. Professor Ho recently presented a novel approach at a conference for assessing environmental management performance in ESG reporting. His study proposes the use of semantic variables and a multiple logic fuzzy inference system to create a more objective and quantifiable method for evaluating sustainability outcomes. This fuzzy theory-based model seeks to address discrepancies in traditional ESG evaluations by generating fair and adaptable performance scores through customized membership functions and logical rules. Professor Ho's contributions continue to shape the discourse on sustainable infrastructure and responsible enterprise practices in the construction industry and beyond.

Nosheen Qadeer is a Ph.D. Scholar at Tomas Bata University in Zlín, Czech Republic, focusing her research on engineering disciplines, particularly green innovation and knowledge sharing. Her scholarly contributions include the 2021 publication "How Green Knowledge Sharing Enhances Green Innovation: The Roles of Innovation Capacity and Knowledge Creation," which has been cited twice, reflecting its impact in the field. In 2023, she presented "MODELING GREEN ORGANIZATIONAL CAPITAL AND ENVIRONMENTAL PERFORMANCE; MEDIATING AND MODERATING ROLE OF GREEN KNOWLEDGE SHARING AND GHRM PRACTICES" at the 13th International Scientific Conference "Business and Management 2023." Additionally, her work, "Opting the green culture in manufacturing firms and its impact on environmental performance", was featured at MIC 2023 in Trieste, Italy. Nosheen's research endeavors contribute to advancing sustainable practices within the engineering sector.