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The Nexus of Management Innovation, Performance Management, and Organizational Performance in the Pakistani Construction Industry

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Abstract

Purpose: The construction industry in Pakistan faces a turbulent environment and multiple challenges to achieve its targets. In such situations, the interest in innovation grows, especially in management innovation, and the conviction about its significant role in boosting organizational performance gains researchers' interest. Accordingly, this article examines the mediating role of performance management in the relationship between management innovation and organizational performance.

Design/methodology/approach: Data were collected through a survey-based method from 281 managerial-rank employees working in the construction industry of Pakistan. The data were analyzed using PROCESS macro.

Findings: The results reveal that management innovation and performance management directly influence organizational performance, while we also confirmed the mediating role of performance management.

Implication: The association between management innovation and performance may seem palpable, but the recent literature asks for a reinvestigation. In tough competition and uncertain market situations, management innovation fosters knowledge creation and helps organizations adapt and drive them to higher performance.

Originality/value: The study results enrich the scholarship about the role of management innovation in stimulating organizational performance and performance management.

Keywords: organizational performance, management innovation, construction industry, performance management, Pakistan.

JEL: M1, M19

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Background

The construction industry is one of the leading sectors that constantly develops (Tsiga *et al.*, 2016; Khattak and Mustafa, 2019; Kamal *et al.*, 2021). Chitkara (2005) writes that the construction industry contributes 6–9% of the Gross Domestic Product (GDP) in many countries around the globe. In Pakistan, the construction industry is the major contributor to GDP and plays a magnificent part in national development plans and economic growth (Ali *et al.*, 2019). Moreover, researchers state that the industry is responsible for millions of direct and indirect employments in Pakistan (Ali *et al.*, 2019). Nonetheless, it is also one of the most challenging sectors (Sarwar *et al.*, 2017) in which new ventures come with more complexities (Tsiga *et al.*, 2016). Nevertheless, developing countries have shown a keen interest and put extra effort into delivering construction projects to achieve better economic growth (Zhang *et al.*, 2014). However, many projects fail to deliver despite the advancements in project management (Anantatmula, 2010) and technology (Love *et al.*, 2011), which is no exception in Pakistan. In the dynamic economic environment of developing countries (such as Pakistan), innovation is a must for progression toward higher profitability, sustaining competitive advantage, and market success (Elmquist *et al.*, 2009; Bigos and Michalik, 2020).

Some perceive innovation mainly as a technology-based phenomenon (Nieves and Segarra-Ciprés, 2015; Hervas-Oliver *et al.*, 2018; Benazzouz, 2019; Bertoni *et al.*, 2020). Crossan and Apaydin (2010) found in a review of a large sample of 524 research articles published in 10 reputable economic and business journals over the span of 27 years (1981–2008) that half of the articles focused on innovation types and approximately 3% focused on management innovation. However, scholars of various disciplines have recently begun to consider innovation as "a more comprehensive phenomenon that is not entirely based on technology but also the introduction of new management practices" (Hervas-Oliver *et al.*, 2018, p. 569). It shows that management innovation (MI) is a relatively recent term (Kraśnicka *et al.*, 2018) and has only recently drawn increasing attention and popularity to both research and practice (Khosravi *et al.*, 2019). Hamel (2006) describes MI as a departure from traditional management techniques that alter how management performs work. In other words, "management innovation changes how managers do what they do" (Damanpour and Aravind, 2012, p. 429). According to Birkinshaw *et al.* (2008, p. 829), MI means "the generation and implementation of management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals."

Although researchers (Birkinshaw *et al.*, 2008; Walker *et al.*, 2011; Damanpour and Aravind, 2012) provide a comprehensive review of the MI conceptualization and its

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antecedents, they still encourage further investigation. In this vein, Walker *et al.* (2015) reiterate that most studies consider technology-based innovation and ignore non-technology-based innovation. Thus, Walker and colleagues advise exploring the effect of MI on organizational performance (OP), because it remains unclear (Magnier-Watanabe and Benton, 2017). Few scholarly works highlight the importance of MI for renewal and firm performance (Khosravi *et al.*, 2019). For instance, the positive link between MI, performance, and success is reported by some (e.g. Gallego *et al.*, 2013; Evangelista and Vezzani, 2010). Kraśnicka *et al.* (2018) also evidenced the positive (although weak) association between MI and OP. Similarly, recently Khosravi *et al.* (2019) conducted a meta-analysis of MI research by analyzing 66 research articles from 1981 to 2017 published in 40 scientific journals. Their findings demonstrate that MI is strongly and positively linked to organizational learning, knowledge management, financial performance, and overall performance. In contrast, studies by Magnier-Watanab and Benton (2017) and Walker *et al.* (2011) found no association between MI and OP.

Such contradictory and inconclusive results require more investigation of the MI and OP nexus (Zhang *et al.*, 2019; Kraśnicka *et al.*, 2018). Accordingly, this article will examine the mediating role of performance management (PM) in the MI–OP nexus. Ravi and Saraswathi (2018) argue that PM is linked to the problems faced by organizations in defining, measuring, and stimulating employee performance with the end goal of improving OP. Thus, we may view OP as a process through which firm managers guarantee that employees' operations and outcomes substantially contribute to achieving organizational goals (Taiwo and Omojaro, 2019). We assumed that PM has an indirect role in the MI–OP nexus as this connection has received minimal attention in the literature so far (Walker *et al.*, 2011). Furthermore, to our best knowledge, no work has discussed the mediating effect of PM in the MI–OP nexus in the context of Pakistan's construction industry. Therefore, this research work will focus on the following objectives:

1) to critically analyze the link between MI and OP,
2) to scrutinize the role of PM in the MI–OP nexus.

We structured the paper as follows. The following section will develop the theoretical framework and research hypotheses based on the literature review. Then, we will describe the research methods, including study design, sampling technique, data collection, and study variables operationalization. Next, we will perform statistical analysis and present empirical findings. Finally, the article will discuss the implications, limitations, and future research directions that result from our study.

Literature Review and Hypotheses Development

Management Innovation and Organizational Performance

There is a multi-disciplinary, comprehensive, and diverse body of knowledge on innovation in reducing operating costs, providing added value, and improving organizations' profits (Kim and Chung, 2017; Wadho and Chaudhry, 2018; Lee *et al.*, 2019). Generally, innovation is defined as "the creation and adoption of new ideas" (Martínez-Sánchez *et al.*, 2009, p. 539), the adoption of new production processes (process innovation), new services/products (product innovation), new ways of organizing work [organizational innovation] (Crossan and Apaydin, 2010; Nemlioglu and Mallick, 2017), administrative or structure innovation, and technology innovation (Damanpour and Schneider, 2006). However, in the last two decades, scholars have increasingly focused on the importance of innovation in management practices, because it remains a unique term in organization management research (Damanpour and Aravind, 2012). We follow Birkinshaw *et al.*'s (2008) conceptualization of MI, but several scholars define it using different terminologies, as shown in Table 1.

Table 1. Definitions of management innovation

Study	Terminology	Definitions
Damanpour (1991)	Administrative Innovation	"Innovations in the administrative component that affect the social system of an organization."
OECD (2005)	Organizational Innovation	"The implementation of a new organizational method in the firm's business practices, workplace organization, or external relations."
Birkinshaw et al. (2008)	Management Innovation	"The generation and implementation of management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals."
Armbruster et al. (2008)	Organizational Innovation	"Changes in the structure and processes of an organization due to the implementation of new managerial and working concepts and practices, such as teamwork in production, supply chain management, or quality management systems."
Mol and Birkinshaw (2009)	Management Innovation	"The introduction of management practices that are new to the firm and intended to enhance firm performance."
Battisti and Stoneman (2010)	Organizational Innovation	"Innovation involving new management practices, a new organization, new marketing concepts, and new corporate strategies."
Damanpour and Aravind (2012)	Management Innovation	"New approaches in knowledge for performing management functions and new processes that produce changes in the organization's strategy, structure, administrative procedures, and systems."

Source: own elaboration.

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Volberda *et al.* (2013) define four dimensions of MI as new organizational techniques, structures, managerial processes, and practices. Organizational techniques refer to the method, approaches, and tools adopted by organizations to develop business frameworks. The organizational structure indicates how corporate activities and practices are organized and how the firm arranges responsibility and communication lines. Managerial practices describe the daily activities in a firm, including the innovative administrative practices in which activities, functions, and tasks are done. Finally, management processes concern the "routines that govern the work of managers" (Volberda *et al.*, 2013, p. 5), including performance and systems assessment (Volberda *et al.*, 2013). Moreover, studies note that MI mainly refers to the efficiency of internal organizational processes. According to Damanpour and Aravind (2012), MI is creating and implementing expressively new solutions regarding structures, methods, rules, and processes in the firm's management intended to enhance OP. Gupta and Gupta (2019) argue that MI has a crucial role in an organization's competitive advantage that can improve performance and offer a more exciting working environment. Additionally, Ortiz-Villajos and Sotoca (2018) suggest that organizations can adopt numerous technological and innovative processes required for successful operational activities with MI. Therefore, MI is considered a vital tool for an organization's profitability, growth, and performance.

According to Tsou *et al.* (2015), OP is not an idea but rather a concept that demonstrates an organization's objective and subjective performances by using a theoretical concept and system model that accurately predicts data or through established performance indicators. Furthermore, Bahramnejad *et al.* (2015) claim that performance is the final output a company receives after attaining organizational mission, goals, and objectives through employing different measuring mechanisms. Murtedjo and Suharningsih (2016) explore that achieving goals can be analyzed through results, while the effectiveness of internal processes can be judged using internal activity. They further conclude that the acquisition of high-performance resources could be evaluated using sustainable development criteria. Therefore, organizations must enhance their efficiency, responsiveness, and flexibility because of the volatile nature of local and international business environments and the challenges posed by the competitors (Reuvers *et al.*, 2008), which is to be possible exactly through MI. Han and Nielsen (2018) suggest that the implementation of novel management practices significantly and positively impacts OP. The empirical study by Camisón and Villar-López (2014) observed that MI helps organizations achieve sustainable competitive positions and high performance, hence the strong need for continuous innovation of internal processes, products, services, and behaviors makes operational work more effective (Hervas-Oliver *et al.*, 2018). Therefore, the above studies (Haneda and Ito, 2018; Kraśnicka *et al.*,

2018; Putriyadi *et al.*, 2020) posit that MI is a significant driver of OP. Based on the literature review, we propose the following hypothesis:

H1: Management innovation has a direct and positive effect on organizational performance.

Management Innovation and Performance Management

Performance management is a prevalent organizational practice used to direct, evaluate, and manage employees' work in organizations that originated in the 1970s (Field, 2015). PM is widely used as a tool for business strategy, industrial economics, human resource (HR) management, operations management, political science, manufacturing management, marketing, psychology, organizational behavior, and operational research (Richard *et al.*, 2009; Franco-Santos *et al.*, 2012). According to Armstrong (2006), PM is "a process which contributes to the effective management of individuals and teams in order to achieve high levels of organizational performance." In modern practice, PM indicates an integrated set of structured and formal systems for measuring and evaluating workers' performance (Field, 2015). Performance management includes career planning, performance appraisal, reward strategies, incentive, and objective setting, aiming to ensure that employees are "working together in an optimum fashion to achieve the results desired by organizations" (Biron *et al.*, 2011, p. 1294). Bowen and Ostroff (2004) state that PM is an umbrella term for HR practices and processes of integrating employee management into the organization's goals. Moreover, PM provides strategies for linking micro-level individual performance to macro-level organizational goals within HR management. Thus, PM offers three significant steps that include a clear understanding of organizational goals: (1) creating a strategy for the individual employees and their behavioral standards; (2) monitoring employee progression and providing feedback; (3) performance evaluation through appraisals to reinforce positive behavior toward a job or arrange training for employees in order to reach desired results (Beardwell and Claydon, 2007).

Furthermore, PM is linked with setting clear organizational goals, specifying targets and indicators to link objectives to performance outcomes, and influencing achievements against targets (Boyne, 2010), which is possible through innovation. To remain competitive in the modern world, organizations must focus not only on technological innovation but also on non-technological innovation (Geldes *et al.*, 2017; Anzola-Román *et al.*, 2018; Yang *et al.*, 2020). One of the significant non-technological innovations is MI, which helps organizations to achieve sustainable outcomes (Kim *et al.*, 2016; Walker *et al.*, 2011). Moreover, the literature argues that the significant reason for

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organizational success is superior achievements provided by MI (Birkinshaw *et al.*, 2008). Thus, MI which assists organizations in achieving their goals is more likely to succeed where there is a similarity between current targets, objectives, and the new practices under implementation. Likewise, innovations closely tied to organizational missions and strategies reinforce organizational processes associated with PM (Walker *et al.*, 2011). Based on the above discussion, we argue that MI has a positive connection with PM. Therefore, we propose the following hypothesis:

H2: Management innovation has a direct and positive effect on performance management.

Performance Management and Organizational Performance

As modern businesses become gradually more subtle, varied, and fluid, we require a new approach to management. This new kind of management (e.g. PM) means more employee engagement and direct control of performance by providing a supportive environment (Breevaart *et al.*, 2014). Performance management includes strategic planning, estimated goal setting, performance evaluation, incentives, and rewards that lead to higher performance (Beeri *et al.*, 2019). According to Moynihan (2008), PM employs performance information collected through planning practices and performance measurement in the decision-making procedure, as performance information is to be an effective tool that makes managers and employees more accountable and goal-oriented (Moynihan and Pandey, 2010). The practitioners and policymakers in organizations believe that fostering PM and productivity are two fundamental drivers to enhance a firm's overall capability to be competitive in the global economy (Singh *et al.*, 2016).

Nevertheless, PM and OP in an organization are complex tasks that depend on motivated HR, managed through system-driven HR practices (Singh *et al.*, 2016). These HR systems and policies create an environment that promotes employee engagement, caring about employee concerns, retention, and involvement in the workplace becomes a routine and powerful practice employed by managers. Furthermore, PM as a control device is linked to the high OP which is to improve employees' work-related attitudes, which in turn, enhances job performance and organizational productivity. Furthermore, proponents posit that "when done well," PM enhances employee commitment, engagement, and performance and significantly affects OP (Festing *et al.*, 2012). Therefore, the scholarship expects PM to increase OP by improving employees' accountability and individual job performance (Cho and Lee, 2012). Based on the above literature, we propose the following hypothesis:

H3: Performance management has a direct and positive effect on organizational performance.

Performance Management Mediation

In a continuously complex and rapidly developing global business environment, organizations must build their business practices to survive progressively. The capability to innovate has become the fundamental component in achieving a sustainable competitive edge. The relationship between innovation and OP has been broadly analyzed in previous studies (Kim and Chung, 2017; Wadho and Chaudhry, 2018). Most extant literature examined the impact of innovation on OP (Han and Nielsen, 2018; Gupta and Gupta, 2019). Lee *et al.* (2019) observed that organizations with innovative capabilities positively affect their market value, support adaptation to changing environments, improve individual performance as well as OP, and provide an opportunity for the organization's expansion and growth (Nicolau and Santa-María, 2013). However, the focus of these studies was technological innovation. In contrast to technological innovation, MI is not directly associated with the primary work activities of firms; instead, MI mainly affects an organization's social system, such as all the organization's components and the relationships established among them (Damanpour *et al.*, 2009). Recently, a few studies have investigated the link between MI and OP (Martínez-Román *et al.*, 2011; Hashi and Stojčić, 2013 Zhang *et al.*, 2019) to find that the former enhances the latter and helps to achieve financial goals.

Damanpour and Schneider (2006) argue that the introduction of novel management practices in a firm often experiences resistance at different hierarchical levels. Typically, the management is developing a communication legitimizing the implementation of MI practices by looking to improve overall OP (Heyden *et al.*, 2018). This goal pushes them to implement an effective PM system to legitimize their communication (Gurau *et al.*, 2017). Walker *et al.* (2011) state that both MI's and PM's intended and desired outcome is organizational effectiveness. Pavlov and Bourne (2011) report the positive link between PM systems and OP. Cho and Lee (2012) state that the better implementation of PM could result in a positive OP. Furthermore, Rangone (1997) suggests that the connection between PM with performance and organizational effectiveness is perceived generally. Still, reasons, descriptions, justifications, and analyses of this relationship so far stem from the absence of concrete theoretical evidence. Although previous literature shows the direct and positive link between MI–PM and PM–OP, few studies show the mediating role of PM in the MI and OP relationship. In this vein, Walker *et al.* (2011) argue that the comprehensive analysis of the mediating role of PM

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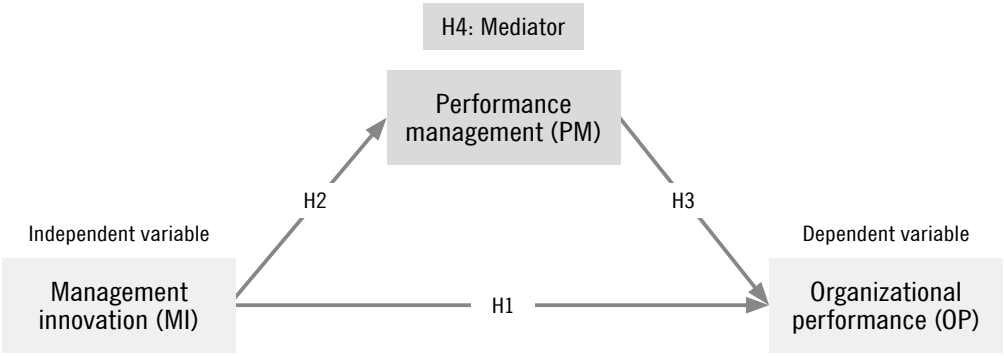
in the MI–OP relationship is an important aspect because PM is a critical component for achieving a sustainable OP. Therefore, we propose the following hypothesis:

H4: Performance management mediates the nexus of management innovation and organizational performance.

Figure 1. The conceptual model



Source: own elaboration.

Research Methods

Research Setting

The construction industry has an integral role in GDP and the success of megaprojects worldwide (Sarwar *et al.*, 2017). In Pakistan, construction organizations contribute to socioeconomic development and provide development and employment opportunities (Kamal *et al.*, 2021). Pakistan is an underdeveloped country, and 30–35% of its population is connected to the construction sector (Kamal *et al.*, 2021). Nonetheless, there are several issues (e.g. energy crisis, inflation, material scarcity, resources, skilled labor, and innovation) that curtail the progress and performance of this sector. The Covid-19 pandemic has also hindered this sector through material shortages, movement restrictions, and nationwide lockdowns. The government of Pakistan is aware of these issues and difficulties, so it plans a major investment for boosting its progress (Kamal *et al.*, 2021).

We targeted the construction organizations of Pakistan because the theoretical framework under investigation fits the country's dynamic market. First, the economy of Pakistan holds the 23rd place in the world in purchasing power parity, and O'Neill (2018) enlisted Pakistan among 11 countries with high potential growth. Second, the Pakistani construction industry operates in fierce competition with strict institutional

policies that disallow innovating and trying new things. In the recent release of the Pakistan Economic Survey, the construction industry saw a decline of 3.6% in the fiscal year 2019–2020 and 1.91% in 2020–2021. Among the key sectors that significantly contribute to the Pakistani economy, the construction industry employs roughly 8% of the national labor force and contributes 2.7% to GDP. In more than 70 years of Pakistani history, the estimated growth of the construction industry is estimated at -0.38%. Therefore, analyzing the impact of MI on PM and OP is of paramount interest to the construction industry of Pakistan.

Measurements

Quantitative data were collected using a survey method, and items of all three constructs were adapted from the literature and measured on a five-point Likert scale, in which "1 = strongly disagree" and "5 = strongly agree." The respondents were requested to mark their choice depending on what they thought is correct. The details are given below:

1. Management innovation: The predictor variable MI was measured from five items by Walker *et al.* (2011). The examples for MI items included "In our organization, we have new approaches to service planning and budgeting" and "In our organization, we have new management information systems."
2. Organizational performance: The criterion variable OP was measured with four items scale by Para-González *et al.* (2018). Its example included "In the last three years, the productivity of our organization has increased" and "In the last three years, the profitability of our organization has increased."
3. Performance management: The mediator PM was measured with four items scale adapted from Walker *et al.* (2011). The examples of PM items included "There is a well-developed framework of clear performance measurement and targets to drive what we do in our organization" and "In our organization, control is devolved to service managers."

Sample and Data Collection Procedure

The data were collected using a cross-sectional design through self-administered survey questionnaires. The list of construction companies was compiled using different sources such as the Islamabad Chamber of Commerce, the Lahore Chamber of Commerce, the Rawalpindi Chamber of Commerce, and the Faisalabad Chamber of Commerce. We randomly selected large 30 construction companies (250+ employees) from 105 companies operating in Pakistan. Although we contacted each organization's HR

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department and sought permission for data collection by ensuring all ethical norms, including company and manager's anonymity, only 23 companies agreed to participate in the research. A pilot study with 16 participants (13 managerial-level employees and three subject specialists) was conducted to remove any errors and establish the content validity of the questionnaire. After minor modifications, a detailed survey was conducted.

The survey questionnaire and cover letter were personally administered to 600 managerial rank employees working in different departments of selected 23 construction companies between October 2020 to January 2021, using simple random sampling. We used the multiple respondents strategy, as it increases results reliability while the single respondent approach can decrease results' accuracy (Huber and Power, 1985). Due to the vulnerability of the pandemic times, we had a hard time convincing the respondents to participate in the survey. After multiple reminders, we finally received data from 309 respondents, with 281 questionnaires (46.83% response rate) selected for final analysis. Thus, the sample size was quite large, considering the "rule of thumb" proposed by Van Voorhis and Morgan (2007), which suggests multiplying the number of variables by 30 to achieve the minimum sample size. Out of 281 respondents, 175 (62.3%) were male. The majority of 47.7% belonged to the 36–45 age group. Most respondents (169; 60.14%) were middle-level managers, while 98 (34.9%) had 6 to 10 years of management experience. The complete demographic profile of the respondents is provided in Table 2.

Table 2. Respondents' features

Variables	Frequency	Percentage %
Sex		
Female	106	37.7
Male	175	62.3
Age ranges		
Less than 30	18	6.4
31–35	104	37
36–45	134	47.7
46 and above	25	8.9
Position		
Upper-level manager	19	6.76
Middle-level manager	169	60.14

Lower-level manager	93	33.10
Management experience		
Less than 5 years	40	14.2
6 to 10 years	98	34.9
11 to 15 years	78	27.8
16 and more	43	15.3

Source: own elaboration.

Common Method Bias

Since the data were collected using a cross-sectional design and from a single source (e.g. construction organizations), there is always the possibility of a common method bias (CMB; Podsakoff *et al.*, 2003). To ensure that our data do not suffer from CMB, we executed Harman's single-factor test. The result indicated that the first factor explained 25.18% of the total variance, which was below the 50% limit (Aftab *et al.*, 2022), thus confirming the dataset did not suffer from CMB.

Results Analysis

The collected data were processed using the Statistical Package for the Social Sciences (SPSS) version 26 and the Hayes PROCESS macro version 25. The PROCESS macro was developed and introduced by Hayes (2013) to immediately become prominent in many research fields, including marketing and business, as confirmed by its presence in many business journals and conferences (Hayes *et al.*, 2017). The PROCESS macro is "a computational tool—a "macro"—available for SPSS and SAS that simplifies the implementation of mediation, moderation, and conditional process analysis with observed (i.e., "manifest") variables" (Hayes *et al.*, 2017, p. 77). Based on a collection of statistical and conceptual diagrams specified by a model number, the researcher selects a model preprogrammed into PROCESS macro, which represents the model she intends to estimate (Hayes *et al.*, 2017, p. 77). Instructions are provided about the roles of study variables in the model (i.e. "independent variable, dependent variable, mediator, moderator, covariate"), and the PROCESS macro estimates all path-coefficients, t-statistic, significance (p-value), and confidence intervals (CI). The PROCESS macro follows a bootstrapping procedure that is a non-parametric approach and removes the condition of data normal distribution, as it is robust irrespective of distribution. Bootstrapping allows for calculating CIs for the mediating effect, which is significant if zero does not appear in the interval (Preacher and Hayes, 2008). The procedure

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is more robust and reliable when testing for mediation compared to Baron and Kenny's (1986) Sobel test (Hayes *et al.*, 2017). Therefore, the PROCESS macro was the appropriate choice for this research.

The analysis began with the execution of the test for Pearson's correlation coefficient. The correlation matrix ranged from -1 to +1 and a value above 0.9 between the two variables, which was a possible indication of multicollinearity. Thereafter, we checked the loadings of each indicator. Hair *et al.* (2016) state that a loading of 0.7 and above for each indicator is recommended, as it should not go below 0.5 and above 0.95. Then, we verified the internal consistency (reliability) with the procedure of Cronbach's alpha and composite reliability (CR). According to Hair *et al.* (2016), a value above 0.7 shows the internal consistency of the scale for these tests. Next, we checked scale validity through average variance extracted (AVE), and a value of 0.5 or above confirmed the scale validity (Fornell and Larcker, 1981). Finally, we executed the PROCESS macro to test the research hypotheses; the t-value was accepted above 1.96 at 95% CI.

Table 3. Mean and correlation

Constructs	Mean	SD	MI	PM	OP
Management innovation	3.773	0.558	1		
Performance management	3.708	0.624	0.492**	1	
Organizational performance	3.825	0.540	0.448**	0.540**	1

Note: ** significant at 0.01 (two-tailed)
Source: own elaboration.

Table 3 shows the results of means, standard deviations, and correlations. The results demonstrated a positive correlation between PM and OP ($r = 0.540$ at $p = 0.05$), MI and PM ($r = 0.492$ at $p = 0.05$), and MI to OP ($r = 0.448$ at $p = 0.05$). Since all correlation values were below 0.9, we noticed no serious issue of multicollinearity. Table 4 shows the results of factor loadings, reliability, and validity as they were tabulated. The results showed that all items had loadings above 0.7 with the lowest being PM4 (0.712) and the highest – PM3 (0.897), thus fulfilling the recommendations of Hair *et al.* (2016). Cronbach's α and CR values for all three constructs were above 0.7. Moreover, the AVE values of MI (0.631), PM (0.626), and OP (0.723) confirmed the scale's validity (Fornell and Larcker, 1981).

Table 4. Reliability and validity

Constructs	Factor loading	AVE	α	CR
Management innovation (MI)				
MI1	0.881	0.631	0.811	0.894
MI2	0.826			
MI3	0.792			
MI4	0.749			
MI5	0.806			
Performance management (PM)				
PM1	0.894	0.626	0.755	0.806
PM2	0.891			
PM3	0.897			
PM4	0.712			
Organizational performance (OP)				
OP1	0.796	0.723	0.825	0.833
OP2	0.883			
OP3	0.877			
OP4	0.841			

Note: AVE: average variance extracted; CR: composite reliability; α: Cronbach alpha.
Source: own elaboration.

Hypothesis Testing

Table 5 presents the results of the regression analysis. First, we obtained the coefficient of determination, or R^2, that showed how much variation in the dependent variable occurred due to predictor variables. The outcomes showed the R^2 value of 0.533, meaning 53.3% variation in dependent variable OP occurred due to predictor variables MI and OP. Second, the results of regression were assessed. The findings indicated that MI directly and positively affected OP with $\beta = 0.2525$, t-value = 4.864 at p-value < 0.05. This result supported hypothesis 1. Moreover, we found that MI was positively and significantly linked to PM with $\beta = 0.5739$, t-value = 11.322 at $p < 0.05$. It meant that hypothesis 2 could be accepted. Furthermore, the results of the third direct hypothesis (e.g. PM directly and positively relates to OP) demonstrated that this relationship is positive and significant with $\beta = 0.4837$, t-value = 10.417 at $p < 0.05$. Consequently,

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hypothesis 3 could be accepted. After checking the direct relationships, we moved to the third and final step of our analysis, e.g. mediation.

Table 5. Hypotheses testing

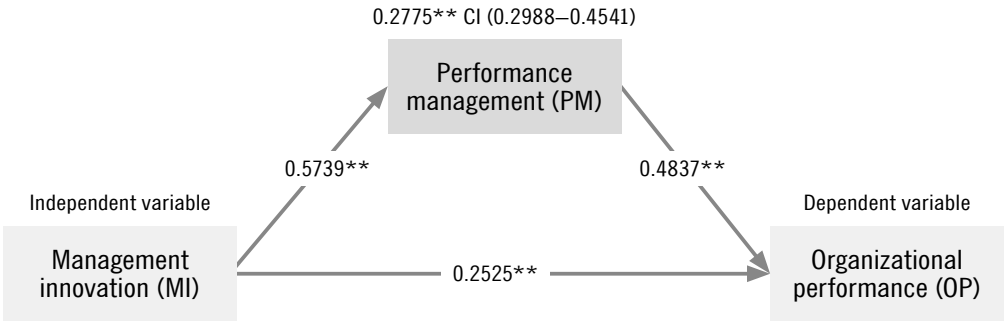
Testing hypotheses	Unstandardized Coefficient		t-value	Sig (p)	Bootstrapping		Remarks
	Coefficient (β)	Std-error			LLCI	ULCI	
MI⟶OP	0.2525	0.051	4.864	0.00	0.1503	0.3546	H_1: accepted
MI⟶PM	0.5739	0.048	11.322	0.00	0.6788	0.8689	H_2: accepted
PM⟶OP	0.4837	0.046	10.417	0.00	0.3923	0.5751	H_3: accepted
MI⟶PM⟶OP	0.2775	0.039			0.2988	0.4541	H_4: accepted

Source: own elaboration.

Mediation Effect

We chose model 4 of Hayes's (2013) PROCESS macro to measure the mediating effect between predictor and criterion variables. More specifically, we performed bootstrapping to examine the mediation of PM in the nexus of MI and OP. In the first step, we defined MI as an explanatory variable, OP as an explained variable, and PM as a mediating variable. In the second step, we tested whether the indirect effect of PM on the relationship between MI and OP was statistically significant: If the 95% CI did not cross value 0, there was mediation in the nexus; if not, there was no mediation. In the third and last step, we tested whether the PM completely and significantly mediated the nexus of MI and OP or whether there was partial mediation: If the coefficient (β) of two direct relationships (e.g. MI to PM x PM to OP)was greater than the coefficient (β) of MI to OP effect, there was full mediation; otherwise, there was but partial mediation. The results shown in Table 5 revealed that PM mediated the MI–OP nexus with CI (0.2988, 0.4541). To check the mediation strength, we calculated the total effect of coefficient (β), which could be measured with the product of MI-PM and PM-OP coefficients (e.g. 0.5739 x 0.4837 = 0.2775), which was greater than the coefficient (β) of MI-OP = 0.2525. Thus, it showed that PM significantly mediated the relationship between MI and OP. Hence, hypothesis 4 was fully supported.

Figure 2. The HAYES PROCESS mediation model



Source: own elaboration.

Discussion and Conclusion

Our study sought to investigate the MI and OP relationship and the mediation of PM. Although some studies have explored the relationship between MI and OP (Walker *et al.*, 2015), our research is the first to incorporate the mediator PM between MI and OP in the context of the Pakistani construction industry. There is little literature on MI and OP, which we nevertheless employed to formulate our theoretical model (Figure 1). We hypothesized that MI and OP share a positive relation, while PM mediates their nexus. We employed a self-administered questionnaire and used various statistical techniques for data analysis. The study's central findings are the following: (1) MI and OP share a robust significant association, (2) MI and PM also share a statistically significant relationship, (3) PM positively and directly influences the OP, and (4) PM has a strong mediating effect on the MI and OP nexus. Therefore, our study findings outline the need to consider the mediating effect of PM on the MI and OP framework. We summarize that PM plays the role of a bridge in the MI and OP relationship, so it cannot be ignored. Consequently, our study results support all four hypotheses for the case of the Pakistani construction industry.

Previous articles stressed the technological innovation concept in both product and process of an organization, discussing them as a means to achieve ultimate organizational goals, but such technology-based cycles are well suited for radical technological transition (Anderson and Tushman, 1991). However, little attention is paid to the MI and OP relationship (Walker *et al.*, 2015). Recently, scholars have begun considering the MI-OP relationship, but most focus on specific organizations (Hamel, 2006), while no one considers large construction organizations. Therefore, we targeted large construction organizations in Pakistan and provided fruitful insights on how the falling

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construction industry can get back on its feet by probing the MI and OP relationship with PM. Our study suggests that MI alone cannot help to achieve optimal performance, and so, upper management must ensure the availability of proper PM models because, without them, it remains improbable to optimize MI in an organization.

Theoretical and Practical Implications

In the rapidly changing modern world, innovation is one of the key requirements for progress not only in technology but also in management practices. More specifically, the importance of innovation is only gained in the difficult times of the Covid-19 pandemic, because businesses now face challenges of survival and sustainable growth. The empirical results presented in this article provide a valuable contribution to the knowledge about the MI–OP relationship. Furthermore, this research enriches the MI and OP literature by investigating the indirect mediating effect of PM. Therefore, the article fills a gap in the literature about PM's role in the MI–OP nexus. More specifically, we provided four significant contributions to the literature:

(1) This study empirically tested and confirmed that MI has a positive effect on OP by indicating that – in innovation construction organizations – MI can improve management processes and strategies, which can help them to improve their organizational performance. This result is consistent with previous studies (e.g. Putriyadi *et al.*, 2020; Khosravi *et al.*, 2019; Hashi and Stojčić, 2013) that studied the MI–OP relationship and reported the positive link between them. Moreover, our study contradicts the findings of Magnier-Watanabe and Benton (2017) as well as Walker *et al.* (2011).
(2) We proposed and validated the positive influence of MI on PM. Our results follow in the footsteps of Gurau *et al.* (2017), who state that MI has a positive role in the PM system.
(3) We confirmed the strong positive association between PM and OP, which agrees with the findings of Kim *et al.* (2016), Walker *et al.* (2011), and Pavlov and Bourne (2011).
(4) Our study statistically validated the significant mediating role of PM in the MI–OP nexus. Thus, MI not only directly but also indirectly improves OP through PM. In other words, the integration of MI with the PM system can bring excellent outcomes for organizations. To the best of our knowledge, this mediation is unique and rarely investigated in the context of construction organizations. Thus, we filled the literature gap and contributed knowledge in innovation and construction management research.

Based on empirical findings, our results provide practitioners and top management with novel insights for shaping organizational policies to achieve sustainable performance outcomes. First, as most organizations only adopt technological innovation and are surprisingly unaware of MI, this study not only showed the reality of MI but also highlighted that it is equally important and beneficial for the success of construction organizations as technological innovation. Second, we recommend that the top management of construction organizations focus on MI and PM for optimal OP rather than engage in traditional management practices, which are no longer sustainable in the extremely difficult times of the Covid-19 pandemic. Moreover, we suggest the organization of workshops for improving employee skills, which could bring innovative ideas and increase OP. Finally, top management should rethink their organizational strategies and invest in innovation, because it is essential for the completion of construction projects on time in the current dynamic environment. Therefore, construction organizations need improved management practices (e.g. MI), along with technological innovation for long-term survival and success. The implications of this research work can be equally fruitful in other emerging economies, which have a similar working environment to Pakistan.

Limitations and Future Research

Despite several implications, there are still some constraints in our study that should be addressed in future research. First, the study only focused on the construction industry of an emerging country (i.e. Pakistan), which follows a specific organizational setup and operates in ways that might differ from developed economies. Thus, our results might appear conservative and limited to one geographical area or similar working environment, thus precluding generalizability. There is a possibility that the same variables may behave differently in a developed country or a different organizational setup. Second, our study data were cross-sectional, and there is a possibility that the results of longitudinal data may differ from current findings. For future research, we recommend a comparative (developed vs. emerging economies) study for results generalizability and further strengthening our research framework.

Conclusion

The construction industry of Pakistan has a substantial role in GDP and national development plans (Irfan *et al.*, 2020). In times of the Covid-19 pandemic, construction companies are struggling to remain competitive in the global market due to the lack of resources (financial, material, and human). The challenges grow, and companies have started focusing on innovative practices to efficiently plan, monitor, and utilize available

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resources. Previous literature shows that companies lacking innovation – not only in technology but also in management practices – suffer more in a competitive market and have a higher probability of failure. In this study, we successfully collected 281 samples from 23 large construction organizations in Pakistan. The results confirm that management innovation is essential to improve performance and the role of the performance management system is equally significant because it accommodates the MI–OP nexus. Thus, this study contributes to innovation literature and recommends various implications for the top management of construction organizations.

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Appendix

Management innovation

1. In our organization, we have new information technology.
2. In our organization, we have new management information systems.
3. In our organization, we have new approaches to service planning and budgeting.
4. In our organization, we have new approaches to organizational improvement (e.g. reengineering, quality management).
5. In our organization, we have new management processes (e.g. new job descriptions, establishing new teams of staff).

Performance management

1. The authority's mission, values, and objectives are clearly and widely owned and understood by all staff in the authority and service areas in our organization.
2. There is a well-developed framework of clear performance measurement and targets to drive what we do in our organization.
3. In our organization, control is devolved to service managers.
4. In our organization, when our results deviate from our plans, the decisions to take appropriate corrective action usually comes from top management or politicians.

Organizational performance

1. In the last three years, the productivity of our organization has increased.
2. In the last three years, the unitary production cost of our products has increased.
3. In the last three years, the benefits of our organization have increased.
4. In the last three years, the profitability of our organization has increased.