Macrothink Institute™

Journal of Management Research
ISSN 1941-899X
2026, Vol. 18, No. 2

The Effect of Knowledge Management Practices on Project Efficiency: The Mediating Role of Innovation Capability

Hana Ahmed

Lincoln University College Malaysia

E-mail: hana.masterscholar@lincoln.edu.my

Received: July 17, 2026 Accepted: Sep. 24, 2026 Published: October 1, 2026

doi:10.5296/jmr.v18i2.24012 URL: https://doi.org/10.5296/jmr.v18i2.24012

Abstract

Project-based organisations increasingly rely on Knowledge Management Practices (KMP) to improve Project Efficiency (PE) in dynamic and competitive environments. However, despite substantial investments in knowledge systems, many projects still fail to meet their established time, cost, and scope objectives. The existing literature suggests that the mere acquisition and storage of knowledge are insufficient; knowledge assets must be actively transformed through an organisation's Innovation Capability (IC) to yield tangible project outcomes. Consequently, this study investigates the direct association of KMP on PE, while specifically examining the mediating role of IC within Saudi Arabia's rapidly growing cultural and entertainment sector. Grounded in the Knowledge-Based View (KBV) and Dynamic Capabilities Theory (DCT), the research adopted a quantitative, deductive, and cross-sectional design. A census approach was utilized to collect primary data from 221 highly experienced project professionals and managers at Knowliom Company, achieving an 88.4% response rate. Data were gathered using a structured, validated 5-point Likert scale questionnaire. The complex triadic relationships and mediation effects were analysed using variance-based partial least squares structural equation modelling via Smart-PLS 4 software. The empirical findings confirmed the robust validity of the proposed conceptual model, supporting all four hypotheses. KMP was found to exert a highly significant association on both PE and IC. Furthermore, IC exhibited a statistically significant direct relationship with PE and successfully functioned as a complementary partial mediator in the relationship between KMP and PE. Notably, KMP produced a large standalone association with efficiency; IC's standalone practical effect was comparatively small due to the transitional learning curves associated with adopting new operational workflows. The study concludes that while structured knowledge ecosystems serve as the fundamental structural anchor for operational

predictability, their full strategic value is realised when actively utilised to fuel dynamic, innovative capabilities. Importance-performance map analysis further indicated that executive management should prioritise the direct application of historical knowledge to minimize resource waste. Ultimately, this research enriches organisational theory by empirically demonstrating the evolutionary mechanism from static knowledge assets to dynamic project execution success.

Keywords: Knowledge management, Innovation capability, Project efficiency, Project management, Dynamic capabilities.

1. Introduction

- *Introduction and Background*

People are beginning to understand that Knowledge Management (KM) is a key part of making projects go more smoothly, especially in organizational ambidexterity with uncertainties. KM is described by Restuputri et al. (2024) as a broad term that describes how businesses get, organize, share, and use information to reach their goals and do better. Further perspective illustrate that KM aims to make sure that the right people get the right information at the right time found in (Zamiri & Esmaeili, 2024) review of methods and technologies for supporting knowledge sharing within learning communities. This helps people make better decisions, solve problems faster, and keep learning. Plenty information about how knowledge management affects an organization's performance is already found (Salehi & Alanbari, 2024), yet how it affects a project's performance is not explored enough. A significant portion of current literature examines KM from a comprehensive, strategic viewpoint or as an essential element of organizational learning and innovation. There has been insufficient focus on the direct enhancement of successful project execution through knowledge management practices concluded by, particularly in complex and knowledge-intensive settings.

Good KM systems act as a catalyst for innovation by helping businesses break down knowledge silos and encouraging cross-functional collaboration (Zia, Zhang, & Alam, 2024). Additionally, their analysis of tacit knowledge management process and innovation capability role in stimulating organizational performance concludes that good KM systems also help in company level resulting in new ideas generation. Companies are always under pressure to get things done faster and better with the use of advanced project management tools and frameworks, according to Andersen et al. (2025) many people still don't reach their original goals for time, cost, and scope. Projects are late, over budget, or don't meet their goals 70% of the time. This occurs all over the world and it shows that even massive corporates have trouble getting things done. This issue is crucial in Saudi Arabia fast growing economy. It is somewhat inevitable that this hurdle is dynamically existential to the way fast growing industries evolve. As Saudi Arabia 2030 Vision pushes the boundaries further with a large focus put into the cultural and entertainment sector, this becomes a vocal point in determining the transformation plan of the vision.

- *Research Gap*

The volatility in innovation driven economies makes it hard to meet end goals consistently, which is a by-product of competitive growth. Knowledge management practices are becoming more widely recognized as strategic assets and businesses with advanced knowledge systems still find it difficult to complete projects without giving up deadlines, budgets, or quality work. knowledge management aim to cut down redundancy, make learning better, and make coordination better, yet not all projects can achieve this. This contradiction whilst having KM systems shows that there is a much deeper problem and suggests the presence of intricate, indirect factors that may affect project success (Celino, Carriero, Azzini, Baroni, & Scrocca, 2025).

Current literature indicates that proficient knowledge management improves overall organizational performance (Obeng, Arhinful, Mensah, & Owusu-Sarfo, 2024). Businesses that know how to get, share, and use information tend to do better than businesses that don't. In project-based environments, particularly characterized by dynamic teams and rigid deadlines, the correlation between knowledge management and project outcomes remains inadequately delineated. People need to know a lot, be able to work together, change, and make decisions on the spot for projects to work. There is, however, not enough real-world proof that KM leads to real improvements in efficiency in these situations. Zuhroh & Rin (2024) found that more and more people believe that innovation capability is a connection between knowledge management and performance. Good knowledge management can help break down knowledge silos and make it easier for new ideas to grow when people from different departments work together (Le, 2024). This means that businesses that are good at coming up with new ideas can deal with project uncertainty better and get better results. Hence, IC is a key factor to consider in the process of understanding why different KM systems have different success rates.

Another perspective for this proposition can be derived from the Knowledge-Based View (KBV) theoretical framework proposed by Grant (1996), where KM is characterized as a dynamic capability that amplifies competitive advantage when integrated with innovation (Kaur, 2022). The KBV posits that the efficacy of project-based organizations relies not solely on the acquisition of knowledge but also on the adept application of that knowledge through innovation to achieve desired outcomes. There is insufficient research regarding the function of innovation capability as a mediator. Nave & Franco (2024) have examined the bidirectional relationships among knowledge management, innovation, and performance. Yet, few have examined the simultaneous interplay of all three. Recent meta-analysis showed that less than 15% of studies in the field of knowledge management looked at mediating factors like innovation. This shows a significant gap in both theory and practice illustrating that Integrated models are lacking, making it difficult to understand how knowledge management fosters innovation that can enhance projects for both researchers and practitioners. Most companies also believe that KM systems are directly useful. If KM's real effect on efficiency is happening indirectly through its association with innovation, then these systems need to be made to encourage creativity, experimentation, and the mixing of knowledge (Nasyiah, et al., 2024). If companies don't use this design logic, they could spend a lot of money on KM systems that work well but don't help them reach their goals.

To address the research gaps this research aims to explore how Knowledge Management Practices (KMP), Innovation Capability (IC), and Project Efficiency (PE) interact within the specific context of Knowliom Company, a Saudi Arabian organization operating in the rapidly expanding cultural and entertainment sector. Exploring how KMP directly influence PE and indirectly via the mediating role of IC within the context of Knowliom company. Although KM has been widely recognized for its contribution to organizational performance, its specific impact on project-level efficiency through the lens of innovation remains underexplored.

- To investigate the impact of knowledge management practices on project efficiency in Knowliom Company.
- To examine the impact of knowledge management practices on innovation capability in Knowliom Company.
- To investigate the effect of innovation capability on project efficiency in Knowliom Company.
- To examine the effect of knowledge management practices on project efficiency through innovation capability in Knowliom Company.
- *Context of the Study*

The research occurred in Saudi Arabia, particularly at Knowliom Company. This choice was made with the focus on the fact that more and more people in the developing region are executing projects in unpresented timeframes. The research is primarily focused on individuals who are directly accountable for knowledge management and project execution. Project managers, team leaders, knowledge management experts, and members of the project team are all people who know how to do both KM and project work. This research follows a deductive approach derived from the KBV model. This method presents significant benefits to the practical field and academia since it is also a cross sectional method of one company as it evaluate how knowledge assets within an organization are not merely preserved and shared but are also utilized to enhance project-level performance. Many parameters are used to measure how well an organization is doing, but project success integration into the KBV model is often overlooked. This technique utilized in the presented study explores the transformation of knowledge into tangible outcomes by illustrating that IC can be defined as a mediator between KMP and PE.

2. Literature Review

Knowledge is accredited as a major asset for achieving competitiveness in a project based environment evident by the past decades as industries shifted to innovation and information for drivers. This dynamic shift created a spot where effective knowledge management and innovative outcomes turned to a crucial asset for organizational performance. Project efficiency emerged as a vital performance indicator in context of successful project completion. Moreover, projects depend on variables such as speed, quality and strategic alignment, in which these variables and their relationships are important to understand. A dynamic environment in which this study takes place in call for the utilization of the Dynamic Capabilities Theory (DCT), which explains how organizations adapt and innovate in dynamic environments (Ahlqvist & Andersson, 2025). Thus, layering and integrating these theories allow for a robust framework to explain how KMP enhances innovation capability, which in turn improves project efficiency in the context of Saudi Arabia cultural and entertainment sectors.

o *Knowledge Management Practices and Project Efficiency*

Before the 20th century the main goal of organizational models was efficiency and resources,

only later did knowledge become more important and critical to resource strategy. This can be attributed to the exponential rise of information magnitude and the shift to knowledge economies where information is considered as a major capital. In project-based environments Chen & Wang (2024) illustrate how this transformation was especially evident, as projects generate large volumes of knowledge that must be captured, shared, and reused to maximize value. KMP have changed in recent years and now sit at the heart of current organizational theory as it names the strategic and systematic coordination of people, processes, and technology within an organization to ensure the effective creation, sharing, utilization, and management of knowledge. Through this method a company deals with two types of knowledge at once, explicit knowledge set down in documents but also simple to hand over and tacit knowledge held inside the abilities, past events as well as personal judgement of people (Ahlqvist & Andersson, 2025). KMP rests on the view that knowledge is a key resource for an organization, often worth more than capital or physical assets when the goal is high performance and a lasting edge. In the current economy that runs on knowledge, an organization's skill at handling its own knowledge decides how well it innovates, reacts to change and keeps growing over time.

The concept of knowledge is divided into the core principles that govern its creation and function. One principle is the *creation of knowledge* which comes about from the interaction between tacit and explicit knowledge and is essential for continuous improvement and innovation (Żywiołek, 2024). These interactions facilitate the creation of new ideas and insights as people collaborate and share learning experiences. Furthermore, the function of knowledge is how it is *stored* and *retrieved*. These functions performed systematically and properly through documentation and recording makes organizational knowledge more accessible and reliable, thereby maintaining institutional memory and supporting informed decision-making.

The same way knowledge is created is how it can be used to enhance collaboration and problem solving. *Sharing knowledge* facilitated through exchanges via departmental, team, and individual levels can also reduce silos respectively. The last core principle of knowledge is in *applying* it to perform practical usage after creating and gathering it. This is where most of the hurdles arise as misunderstandings of knowledge importance leads to less effective outcomes. The research similar to existing literature focuses on the part of applying knowledge. Patwary, et al. (2024) highlights that knowledge only becomes valuable when it is effectively applied to improve project outcomes and organizational performance. Hence, the role of knowledge management becomes more relevant for maintaining seamless flow across project teams.

An integral partner to knowledge management is PE, it governs how well the project is going within the defined parameters. The emphasis is on how project resources are utilized such as people, budget, and technology in the given timeframe. Efficiency is used to measure the ability to achieve a goal under specific constraints and PE is usually used to determine that in addition to measuring individuals performance under said conditions. Government and public sector value PE much more as projects undertaken are part of a much larger strict and coherent ecosystem that also pull resources from the taxpayer. Hence, any misuse or poor

management of resources will result in public mistrust. If these projects don't work out, services could fail and people could lose faith (Lee, Shin, Kim, & Hwang, 2024). From a strategic point of view, organizations value project efficiency in order to maximize resources and create distance between competitors. Completing projects on time allows for greater momentum and adaptability to market shifts. Additionally, it creates more opportunities and allow for the pursuit of them. In a dynamic economy where small effects cascade to greater economic shifts timing is critical and being the first to offer new products or services results in a huge difference (Nwaogbe, Urhoghide, Ekpenyong, & Emmanuel, 2025).

The results of a high efficiency are long term and are reflected after the project has finished such as customer satisfaction. This is relevant for a company that has more than one ongoing project and limited resources. The 'iron triangle' or triple constraint model of project management checks on the project's cost, time, and scope to see how well it is going (Mottee, 2024). Meaning a high PE showcase a project done in the given timeframe, resources were utilized effectively and challenges were addressed within the defined scope.

Time management illustrates that project activities are to be completed within the defined timeline and with few to none schedule overruns (Obiuto, Adebayo, Olajiga, & Festus-Ikhuoria, 2024). Moreover, *cost control* governs the budgeting and monitoring of costs to stay within the prescribed project financial limits (Adeyemi, Ohakawa, Okwandu, Iwuanyanwu, & Ifechukwu, 2024). *Scope adherence* ensures that project deliverables remain aligned with agreed requirements and prevents uncontrolled scope expansion, commonly referred to as scope creep (Kusongwa, Ngalesoni, & Kiende, 2025). Similarly, *quality assurance* holds project outcomes to the predetermined standards excluding excessive work done. This principle maintains efficiency while maintaining performance outcomes (Mwanahapa, 2024). Furthermore, efficient allocation of resources whether it is people, money, or technology falls under *resource optimization*. Therefore, a comprehensive approach to evaluating project efficiency must include all the mentioned factors.

Proper utilization of knowledge management practices is embedded in translating stored information into actionable knowledge that enhances the workflow and decision making processes. And by transforming these practices into effective learning tools positive effects on the innovative capability and overall project performance are obtained. From a KBV point of view, knowledge is a strategic resource that helps companies do their jobs better. This means that projects that build on what people already know are better at avoiding mistakes, cutting down on rework, and making plans more accurate. DCT explains that the ability to combine and reconfigure knowledge makes it easier to respond quickly to changing project conditions and makes execution more effective. All of these theories support the idea that KMP lays the cognitive and structural groundwork needed for successful project delivery.

H1: *Knowledge Management Practices has positive significate effect on Project Efficiency.*

- *Knowledge Management Practices and Innovation Capability*

The capacity and skills to transform knowledge into products and services is what separates a company with excellent IC compared to mediocre competitors. Businesses adapt to changes

in the market and respond faster which makes it a crucial strategic asset that cannot be overlooked. Innovation capability includes a set of adaptable organizational skills that help businesses stay ahead of changes in their field and keep coming up with new ways to add value (Gama & Magistretti, 2023). Additionally, the concept of IC holds many aspects like organizational resources, leadership vision and company culture that collectively cultivate a platform for coming up with new ideas. Innovation capability can also act as a link between internal resources and external revenue streams which helps businesses adapt and sustain progress.

There are many principles which revolve around research and development as well as management and innovation governance. There are also aspects of networking and collaboration that enable learning and unity which collectively enable businesses to stay updated with new technologies and process more information. Similar to absorptive capacity in understanding and processing information, IC helps businesses utilize information from both inside and outside the company in order to stay relevant.

A major core component is the organization *learning capability* which entails the ability to effectively gather, process and utilize internal and external knowledge. Continuous learning supports creativity and fuels innovation processes (Chughtai, Syed, Naseer, & Chinchilla, 2024). In addition, *knowledge integration* represents the linking ability by combining knowledge from multiple functions and perspectives to strengthen innovation capability and generate novel solutions (Attah, Garba, Gil-Ozoudeh, & Iwuanyanwu, 2024). The next principle depicts the application of processed knowledge to solve complications in the project. *Creative problem-solving*, which involves applying innovative thinking to address project challenges and operational inefficiencies (Gama & Magistretti, 2023). With many projects undertaken these aspects start to form a blueprint for innovation capability which is contradictory to the basis by definition. When facing complex issues *adaptability and flexibility* assimilate the process of IC to a more structured and strategic response to changes, wither it be technological or market driven to reinforce sustainable and long term innovation (Teece, 2025). The final core principle governs the implementation of innovation in practice to translate ideas into actionable outcomes, this can be done by introducing new operational mechanisms or by improving existing ones. *Innovation implementation* directly links innovation capability to performance and project efficiency (Sunny, Sakil, Nahian, & Atayeva, 2024).

The significance of innovation capability in culture and entertainment sectors is prominent since the environment in said fields is constantly changing and evolving. Its importance is also reflected in the abilities it allows for companies to be more flexible and creative in using and sharing knowledge. This enables the transition from strategic goals to obtainable results. Bennett, et al. (2025) highlights that IC sustain organization importance and usefulness. In addition to being a tool for exercising innovation, IC is a link between knowledge management and project outcomes. This perspective also help individuals learn and improve on existing expertise as long as different departments inside and outside the organization collaborate effectively.

This helps teams come up with new ways to finish projects by building on what they already know (Karadag, Sahin, & Bulut, 2025). This shows that companies with clear knowledge processes have better innovative performance. Sharing knowledge boosts creativity while keeping knowledge helps both small and big innovations and the ability to innovate is profoundly affected by the effectiveness of knowledge acquisition and its transformation into practical results. KBV paints knowledge is a key resource for innovation and a key driver of it.

H2: *Knowledge Management Practices have a positive significant effect on innovation Capability.*

- *Innovation Capability and Project Efficiency*

The additive nature of the constructs examined in this research are described in a multidimensional relationship that shows the linear pattern of underlying elements. This relationships is increasingly evident in recent academic literature as KM is described as the cognitive foundation for sharing information and IC represents the mechanisms for transforming the knowledge into tangible results. Yet knowledge management systems alone is lacking to encourage experimentation as required. Nuaimi, et al. (2024) emphasize that innovation mediates the effect of KM on project outcomes in Small-Medium Enterprises (SMEs) by translating stored knowledge into actionable solutions. Collaboration between mature KM and IC results in greater project efficiency as Suparwadi, et al. (2024) supports the effect of KMP on innovation and organizational performance in a positive correlation, demonstrating that organizations with effective knowledge practices achieve higher efficiency in project delivery.

KMP are proven to significantly enhances innovation capability by enabling knowledge integration and learning (Avença, Domingues, & Carvalho, 2024). Following the effects of innovation capability can be seen on project efficiency in a positive manner as innovative organizations are better equipped to manage risks and optimize processes (Sunny, Sakil, Nahian, & Atayeva, 2024). This linear relationship is also highlighted by Wogan, et al. (2024) illustrating the role of IC as a mediating factor for knowledge management practices to improve project efficiency when IC is reinforced.

H3: *Innovation Capability has positive significance effect on Project Efficiency.*

H4: *Innovation Capability has mediating role on the relationship between Knowledge*

Management Practices and Project Efficiency.

- *Conceptual Model*

The research model posits that KMP establishes the cognitive and structural groundwork required for successful project delivery by providing teams with critical, actionable knowledge. Simultaneously, KMP fuels IC by supplying the information necessary for creative problem-solving and adaptation. IC then acts as the vital conduit, transforming managed knowledge into innovative practices that optimize resource allocation, enhance flexibility, and ultimately drive Project Efficiency. The KBV posits that knowledge is the

most strategically important asset in an organization. KBV depict that businesses are there to make, keep, and use knowledge in a way that gives them an edge over their competition. The DCT introduced by Teece (2025) broadens this discourse by emphasizing the organization's ability to integrate, develop, and reconfigure both internal and external competencies to adapt to rapidly changing environments.

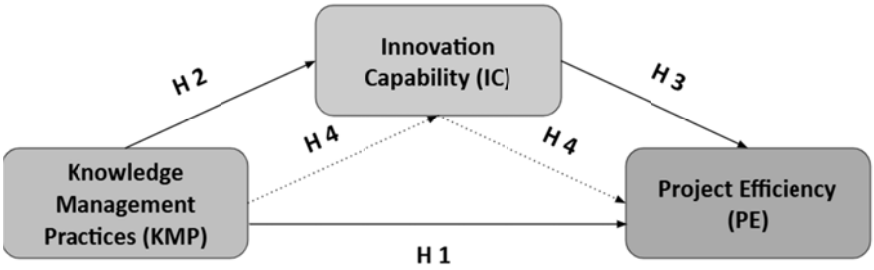

Figure 1. Conceptual model derived from the KBV model (Grant, 1996)

3. Methodology

This study adopts a deductive, quantitative, cross-sectional research design to empirically test the relationships between KMP, IC, and PE. Grounded in the knowledge-based view and dynamic capabilities theory, this approach facilitates objective hypothesis testing through validated constructs and statistical modelling (Bell, Harley, & Bryman, 2022). The aim is to empirically examine how knowledge management mechanisms translate into performance outcomes in a project-based organization. Data collection was performed in a census approach on a single project driven company in Saudi Arabia in a confined timeframe via a cross-sectional questionnaire. Additional analysis is conducted to verify the causality and effects between the variables.

a. Population and Data Collection

The research population comprised all 250 employees and managers at Knowliom Company. These individuals fall into five groups and are actively involved in project-related activities, covering both strategic and operational dimensions of work. *Project Managers* plan, run and complete projects ensuring the results match the company aims. *Project Management Specialists* provide technical and methodological advice, set common ways of working but also draw up project frameworks. *Operation Managers* control resources, coordinate work and implementation across projects. *Team Leaders* supervise and guide team members, ease communication as well as see that deadlines and quality standards are met. *Project Team Members* contribute directly to project execution, offering insights into operational realities and innovative practices. Given the manageable population size, a census approach was adopted rather than a sampling method. This ensured comprehensive organizational representation and enhanced the precision of the findings (Kumar, 2019; Hair J. F., Hult, Ringle, & Sarstedt, 2021). It also eliminates sample selection bias while acknowledging that nonresponse bias remains a factor despite the 88.4% response rate. Data were collected over a

four-week period via a structured online questionnaire distributed through the corporate email system. The unit of analysis was the individual employee, capturing strategic and operational insights from project managers, specialists, and team members. Ethical standards, including voluntary participation, informed consent, and data anonymity, were strictly maintained (Resnik, 2020).

b. Measurement Instruments

The questionnaire utilized a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure the three primary constructs. All measurement items were adapted from established, validated scales in contemporary management literature.

KMP: Assessed through dimensions of knowledge acquisition, sharing, retention, application, and accessibility, adapting scales from.

Table 1. Knowledge management practices items

KMP	Item	Source
KMP1	Our organization encourages continuous learning and knowledge sourcing.	Valmohammadi et al. (2019)
KMP 2	Teams regularly share lessons learned from completed projects.	Duffield & Whitty (2016); Pereira et al. (2019)
KMP 3	Key insights are retained through project documentation systems.	Valmohammadi et al. (2019); Pereira et al. (2019)
KMP 4	Knowledge repositories are updated regularly and easily accessible.	Valmohammadi et al. (2019)
KMP 5	Employees integrate learned knowledge into decision-making processes.	Zaim et al. (2019); Dzenopoljac et al. (2018)
KMP 6	Knowledge resources are available digitally for all employees.	Sofiyabadi et al. (2022)
KMP 7	Employees attend workshops and training to gain new knowledge.	Sofiyabadi et al. (2022)
KMP 8	Our organization promotes cross-departmental collaboration.	Valmohammadi et al. (2019); Pereira et al. (2019)
KMP 9	Knowledge gained from previous projects is applied to current work.	Duffield & Whitty (2016); Pereira et al. (2019)
KMP 10	The company maintains centralized access to best practices.	Valmohammadi et al. (2019); Duffield & Whitty (2016)

IC: Measured as the mediating variable through creative problem-solving, openness to experimentation, idea generation, collaboration, and implementation.

Table 2. Innovation capability items

IC	Item	Source
IC1	Our teams use creative approaches to resolve unexpected project issues.	Giampaoli et al. (2017)
IC2	Employees are supported in experimenting with new technologies.	Valmohammadi et al. (2019)
IC3	Ideas generated by employees are implemented effectively in projects.	Rajapathirana & Hui (2018)
IC4	The organization values innovative thinking during problem-solving.	Sofiyabadi et al. (2022); Rajapathirana & Hui (2018)
IC5	The organization provides platforms for employees to share new ideas.	Rajapathirana & Hui (2018)
IC6	The company views failure as an opportunity for learning.	Ramayah et al. (2016)
IC7	Brainstorming sessions are regularly conducted to enhance creativity.	Rajapathirana & Hui (2018)
IC8	Innovation outcomes are evaluated and scaled across projects.	Sofiyabadi et al. (2022); Rajapathirana & Hui (2018)
IC9	Collaboration between teams enhances innovative results.	Rajapathirana & Hui (2018); Valmohammadi et al. (2019)
IC10	Employees learn from past innovations to improve future ones.	Sofiyabadi et al. (2022); Rajapathirana & Hui (2018)

PE: Evaluated as the dependent variable through time efficiency, cost control, quality and scope adherence, resource utilization, and stakeholder satisfaction.

Table 3. Project efficiency items

PE	Item	Source
PE1	Project milestones are achieved within the planned schedule.	Ali et al. (2021); Aga et al. (2016)
PE2	Project costs are controlled through effective budgeting.	Ali et al. (2021)
PE3	Project deliverables align with predefined quality benchmarks.	Ali et al. (2021)
PE4	Clients confirm that project outputs meet their expectations.	Ali et al. (2021)
PE5	Human and material resources are used effectively.	Kerzner (2022)
PE6	Key stakeholders are satisfied with project performance.	Ali et al. (2021); Zaman et al. (2020); Albert et al. (2017)
PE7	Delays are effectively managed to maintain overall timelines.	Ali et al. (2021)
PE8	The organization minimizes financial waste during project execution.	Ali et al. (2021)
PE9	Project teams demonstrate efficient resource coordination.	Ali et al. (2021)
PE10	Projects enhance the organization's reputation and trust.	Musawir et al. (2017)

To ensure content validity and contextual relevance, an iterative adaptation procedure was employed for all three scales. The original items underwent specific phrasing adjustments to transition from generalized corporate terminology to language directly applicable to the project-based environment of the Saudi Arabian cultural and entertainment sector. The initial draft was subjected to a rigorous review by academic experts specializing in project management and organizational behaviour, alongside industry practitioners from Knowliom. Based on their feedback, minor linguistic modifications were made to tailor the instrument, ensuring the questions accurately reflected dynamic project execution while maintaining the psychometric integrity of the original source scales.

c. Validity and Reliability

To ensure the clarity and functionality of the instrument, content validity was verified by subject-matter experts, followed by a pilot study involving 20 employees. The measurement model was then thoroughly evaluated. Internal consistency was confirmed, with Cronbach's Alpha and Composite Reliability (CR) values across all constructs exceeding the accepted threshold (Ursachi, Zait, & Horodnic, 2015) of 0.70 and 0.80, respectively.

Construct validity was established through Confirmatory Factor Analysis (CFA). Convergent validity was achieved, as all factor loadings exceeded 0.70 and the Average Variance Extracted (AVE) for each construct was greater than 0.50 (Hair J. F., Hult, Ringle, & Sarstedt, 2021). Discriminant validity was also confirmed, satisfying both the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio threshold of <0.85 (Henseler, Ringle, & Sarstedt, 2015).

d. Data Analysis Strategy

The collected data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) via Smart-PLS 4 software. This variance-based SEM approach was selected for its robust capacity to evaluate complex theoretical frameworks, non-normal data distributions, and mediating effects simultaneously (Ramayah, Cheah, Chuah, & Ting, 2016; Richter, Cepeda, Roldán, & Ringle, 2016). Given that data for all latent constructs were gathered simultaneously via a single self-administered questionnaire, common method bias was formally evaluated alongside lateral multicollinearity. A full collinearity assessment was utilized to detect potential method variance; because all inner model Variance Inflation Factor (VIF) scores remained well below the conservative 3.0 threshold, it was confirmed that multicollinearity was absent and that single-source data collection did not introduce significant method bias or distort structural parameter estimates (Kock, 2015). To test the hypothesized direct and indirect relationships, path coefficients (β-values) and mediation effects were estimated using a bootstrapping procedure with 5,000 resamples (Hair J. F., Hult, Ringle, & Sarstedt, 2021). In addition, the predictive power of the model was evaluated using the coefficient of determination (R^2) and effect sizes (f^2).

4. Findings

The empirical evaluation utilized variance-based PLS-SEM due to its predictive capabilities and flexibility in managing complex organizational models and asymmetric data (Gudergan, Moisescu, Radomir, Ringle, & Sarstedt, 2025). A census approach within Knowliom yielded 221 valid responses, reflecting an 88.4% response rate that provides a sufficientl dataset to detect path coefficients with high statistical confidence (Holtom, Baruch, & Ballinger, 2022; Hair, Matthews, Matthews, & Sarstedt, 2017).

Table 4. Shapiro-Wilk, Kurtosis, Skewness normality tests.

		Kurtosis		Skewness		Shapiro-Wilk	
	df	Statistic	Std. Error	Statistic	Std. Error	Statistic	Sig.
KMP	221	1.339	.326	.257	.164	.975	<.001
IC	221	1.680	.326	.035	.164	.968	<.001
PE	221	1.750	.326	.159	.164	.965	<.001

While Shapiro-Wilk tests indicated a departure from a strict normal Gaussian distribution (p

< 0.001) (Islam, 2019) for the constructs, skewness metrics fell firmly within the rigorous -1.0 to +1.0 threshold, confirming the dataset's suitability for PLS-SEM.

Table 5. Cronbach's alpha, composite reliability, average variance extracted tests

	Cronbach's alpha	ρ_a	ρ_c	AVE
Knowledge Management Practices	0.729	0.748	0.831	0.552
Innovation Capability	0.632	0.662	0.794	0.566
Project Efficiency	0.690	0.722	0.813	0.525

The measurement model demonstrated robust psychometric properties. Internal consistency and convergent validity were established, as KMP and PE constructs yielded Composite Reliability (ρ_c) values exceeding the 0.80 threshold with IC fell marginally at 0.794. Additionally, all constructs recorded AVE values above the 0.50 baseline, confirming that each latent construct elucidates more than half the variance of its assigned indicators (Dash & Paul, 2021; Ramayah, Cheah, Chuah, & Ting, 2016). Traditional Cronbach's alpha assumes every survey item contributes equally to the latent construct with identical outer loadings. Because this assumption is rarely met in composite based PLS-SEM, Cronbach's alpha inherently undervalues the actual reliability of the scale in this study. The study methodology correctly relies on ρ_c as a more accurate, holistic calculation of internal consistency.

Table 6. Fornell-larcker criterion

	Knowledge Management Practices	Innovation Capability	Project Efficiency
Knowledge Management Practices	0.743		
Innovation Capability	0.381	0.752	
Project Efficiency	0.452	0.275	0.725

Table 7. Heterotrait-monotrait ratio of correlations

	Heterotrait-monotrait ratio
KMP↔ PE	0.627
KMP↔ IC	0.518
IC↔ PE	0.386

Discriminant validity was conclusively verified through the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio of Correlations. All HTMT ratios fell below the 0.85 threshold, ensuring non-overlapping operational dimensions and no risk of construct redundancy (Roemer, Schuberth, & Henseler, 2021; Franke & Sarstedt, 2019; Henseler J. , 2021). Pearson bivariate correlations confirmed a cohesive network of significant positive linear relationships among all inner constructs ($p < 0.001$) prior to structural estimation.

Table 8. Pearson bivariate correlation analysis

		KMP	IC	PE
KMP	Pearson Correlation	1	**.495***	**.558***
	Sig. (2-tailed)		<.001	<.001
	N	221	221	221
IC	Pearson Correlation	**.495***	1	**.439***
	Sig. (2-tailed)	<.001		<.001
	N	221	221	221
PE	Pearson Correlation	**.558***	**.439***	1
	Sig. (2-tailed)	<.001	<.001	
	N	221	221	221

*. Correlation is significant at the 0.001 level (2-tailed).

It is pertinent to clarify that the bivariate coefficients detailed in table 8 represent composite-score correlations rather than strict latent variable correlations. In alignment with the variance-based PLS-SEM methodology employed in this study, these values are mathematically derived from linear combinations of empirically weighted indicators. Consequently, the matrix reflects the relationships between the exact composite proxies of the respective constructs, a methodological distinction that differentiates these estimates from the unobservable latent variable correlations traditionally reported in covariance-based structural equation modeling frameworks.

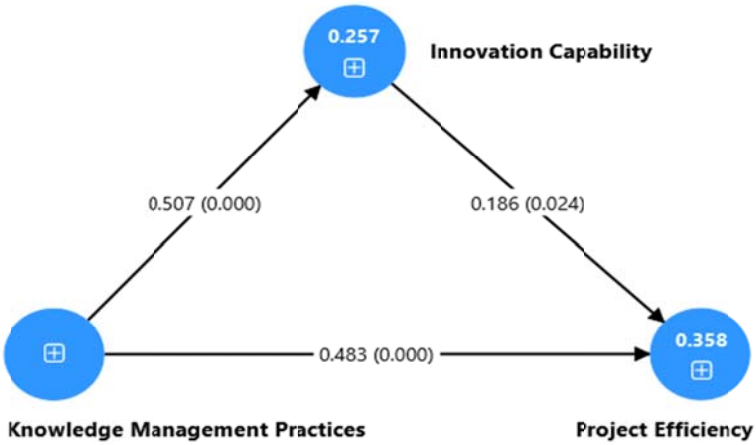

Figure 2. PLS-SEM structural model bootstrapping diagram

The structural model was evaluated to test the hypothesized pathways, beginning with a collinearity assessment. All VIF scores registered well below the 3.0 limit, confirming the absence of multi-collinearity distortions and ensuring stable parameter estimates (Kalnins & Hill, 2023; Vörösmarty & Dobos, 2020; Sarstedt, Ringle, & Hair, 2025). Path coefficients (β) were subsequently estimated using a non-parametric bootstrapping technique with 5,000 resamples.

Table 9. Variance inflation factor analysis

	VIF
KMP→ PE	1.346
KMP → IC	1.000
IC→ PE	1.346

Table 10. SEM bootstrapping path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
KMP → PE	0.483	0.491	0.072	6.667	0.000
KMP → IC	0.507	0.522	0.058	8.757	0.000
IC → PE	0.186	0.183	0.082	2.264	0.024

The empirical synthesis confirmed all four research hypotheses:

- H1: KMP demonstrated a strong, direct positive association with Project Efficiency (PE) ($\beta = 0.483$, $t = 6.667$, $p < 0.001$).
- H2: KMP demonstrated a strong, direct positive association with Innovation Capability ($\beta = 0.507$, $t = 8.757$, $p < 0.001$).
- H3: IC exhibited a statistically significant direct positive association with PE ($\beta = 0.186$, $t = 2.264$, $p = 0.024$).
- H4: IC acted as a statistically significant mediator between KMP and PE ($\beta = 0.094$, $t = 2.049$, $p = 0.041$). The bias-corrected confidence interval [0.007, 0.187] strictly excluded zero, confirming complementary partial mediation (Carrión, Nitzl, & Roldán, 2017).

Table 11. Coefficient of determination analysis

	R-square	R-square adjusted
Innovation Capability	0.257	0.253
Project Efficiency	0.358	0.352

The explanatory power of the model was validated through the coefficient of determination (R^2). The model explained 35.8% of the variance in PE and 25.7% of the variance in IC. Noted that these (R^2) values explicitly represent the explained in-sample variance attributed to the full model, which is distinct from out-of-sample predictive performance not evaluated in this study (Shmueli, et al., 2019; Rigdon, Sarstedt, & Ringle, 2017).

Table 12. Cohen's effect size analysis

	f-square
KMP→ PE	0.270
KMP → IC	0.346
IC→ PE	0.040

Effect size analysis (f^2) revealed that KMP possessed a large associational magnitude with IC (0.346) and associational magnitude with PE (0.270), In contrast, the standalone practical relationship between IC and PE was comparatively minor (0.040) (Funder & Ozer, 2019).

5. Discussion

The empirical findings unequivocally validate the profound association of structured knowledge ecosystems on project execution. The robust association of KMP on PE aligns with scholarly consensus that mature knowledge frameworks exponentially increase project delivery speed and predictability by reducing cognitive load and resource redundancy (Arunima & Thekkat, 2025; Souza, Favoretto, & Carvalho, 2022). By suppressing the

defensive hoarding of knowledge and breaking down information silos, integrated knowledge sharing minimizes inter-departmental friction (Lee, Yang, Kim, & Byun, 2022). Furthermore, actively embedding past successes into current operating standards transforms historical experience into high-yield organizational memory that actively accelerates decision-making (Coraiola & Murcia, 2019; Hadi, 2022).

The structural model also confirms that KMP serves as the fundamental basis for corporate innovation. Effective internal knowledge management equips organizations to better assimilate external market trends (Sancho-Zamora, Gutiérrez-Broncano, Hernández-Perlines, & Peña-García, 2021; Grumadaite & Jucevicius, 2023). Informal peer sharing and cross-functional knowledge pools disrupt groupthink, prompting the intuitive leaps and creative problem-solving required for disruptive innovation (Terhorst, Lusher, Bolton, Elsum, & Wang, 2018; Vestal & Mesmer-Magnus, 2020). Robust documentation protocols subsequently stabilize this innovation baseline, ensuring that proprietary knowledge is institutionalized and protected against employee turnover (Kaufmann, Favretto, Filippim, & Cohen, 2019).

While IC successfully compresses project timelines through process adaptability (Gemünden, Lehner, & Kock, 2018), its statistically significant yet practically small standalone effect size ($f^2 = 0.040$) may reflect a potential 'innovation penalty' (Turner, Monti, & Annosi, 2021; Volberda, Khanagha, Baden-Fuller, Mihalache, & Birkinshaw, 2021). It is important to note that this 'innovation penalty' is proposed here as an untested, theoretical explanation for the small effect size, which requires explicit empirical testing in future longitudinal research. The inherent disruptiveness of introducing new ideas initially slows project teams as they ascend new learning curves, temporarily muting daily operational efficiency despite securing long-term strategic advantages. Crucially, the confirmation of IC as a complementary partial mediator between KMP and PE reinforces the dynamic capabilities view within modern academia (Wang, Huang, Li, & Shrestha, 2023; Hermano, Martin-Cruz, & Pajares, 2022). Knowledge operates as the static raw material, innovation as the active manufacturing engine, and project efficiency as the final product (Sancho-Zamora, Gutiérrez-Broncano, Hernández-Perlines, & Peña-García, 2021; Kastelli, Dimas, Stamopoulos, & Tsakanikas, 2024). This dual-pathway mechanism indicates that knowledge operates on two simultaneous fronts, directly smoothing out current workflows while indirectly inventing superior future workflows (Donate & Pablo, 2015). Ultimately, these findings dictate that organizations must explicitly design knowledge management systems to trigger innovative outputs, averting 'knowledge trap' (Ferraris, Mazzoleni, Devalle, & Couturier, 2018) where information is merely hoarded rather than synthesized into time-saving operational capabilities.

6. Conclusion

6.1 Theoretical Implications

Traditional KBV literature conceptualizes knowledge as the most strategically significant resource an organisation possesses. However, KBV has frequently been critiqued for failing to fully explain the exact empirical mechanisms through which static knowledge repositories are converted into measurable operational performance. This study directly resolves this gap.

By proving that KMP directly explain 35.8% of the total variance in PE, this research provides concrete variance-based proof of KBV core tenets. It demonstrates that knowledge is not merely an asset, but is an active operational mechanism that directly dictates execution predictability and minimizes resource waste in a project-driven environment.

Contribution of a nuanced perspective to project governance literature by empirically isolating the difference between path coefficients and localised effect sizes. While IC was proven to be a statistically significant driver of efficiency, its small standalone effect size provides critical theoretical context regarding the friction of change. This finding enriches organizational behaviour literature by illustrating that process and administrative innovations carry an inherent implementation tax, alerting future scholar that evaluating the success of corporate innovation must not be done using short-term linear assumptions, as the disruptive nature of creative problem-solving introduces transitional adjustments that can temporarily obscure long-term operational value.

6.2 Managerial Recommendations

Given that KMP wield powerful direct footprint on both IC and PE formalizing of knowledge application must be prioritized. Leadership at Knowliom should implement strict governance requiring project teams to execute standardized digital post-mortem logging immediately following every major client deliverable or sprint completion. These logs must be indexed not as dense text documents, but as tagged searchable data points categorizing scope adjustments, budgetary bottlenecks, and technical workarounds. Executive management must invest in advanced internal knowledge retrieval tools that automatically surface historical solution templates when a project manager initiates a baseline charter in the PMO. Thus, bypassing the initial discovery phase will directly minimize billable hours wasted on recreating existing architectural or operational solutions.

Knowliom's workforce (43.4%) possesses over a decade of industry experience, the firm sits on a massive, highly valuable reservoir of tacit knowledge. However, tacit knowledge is inherently vulnerable to corporate amnesia if senior staff depart. Operations management must design formal incentivized mentorship frameworks that actively pair junior developers and newly hired logistics specialists with long-tenured department heads. This structure should include bi-weekly 'technical storytelling' or peer-review roundtables where unwritten client-negotiation nuances and localized supply chain strategies are passed down. To dismantle departmental silos Knowliom should establish cross-functional tactical teams where intradepartmental employees are co-located for specialized sprint designs. Forcing diverse disciplines into a singular knowledge-sharing framework will disrupt groupthink and actively spark process innovations.

The small standalone effect size of IC proves that Knowliom experiences operational drag when new workflows or administrative changes are introduced. To maximize the value of the indirect path leadership must explicitly manage this friction. Rather than launching disruptive organizational overhauls the firm should prioritize low-friction process innovations. Moreover, to minimize the immediate performance dip associated with creative problem-solving, the PMO should create isolated operational sandboxes. When a team

proposes a novel project framework to be tested on small non-critical deliverables first. This allows teams to navigate the initial learning curve without risking the baseline efficiency metrics of major corporate accounts.

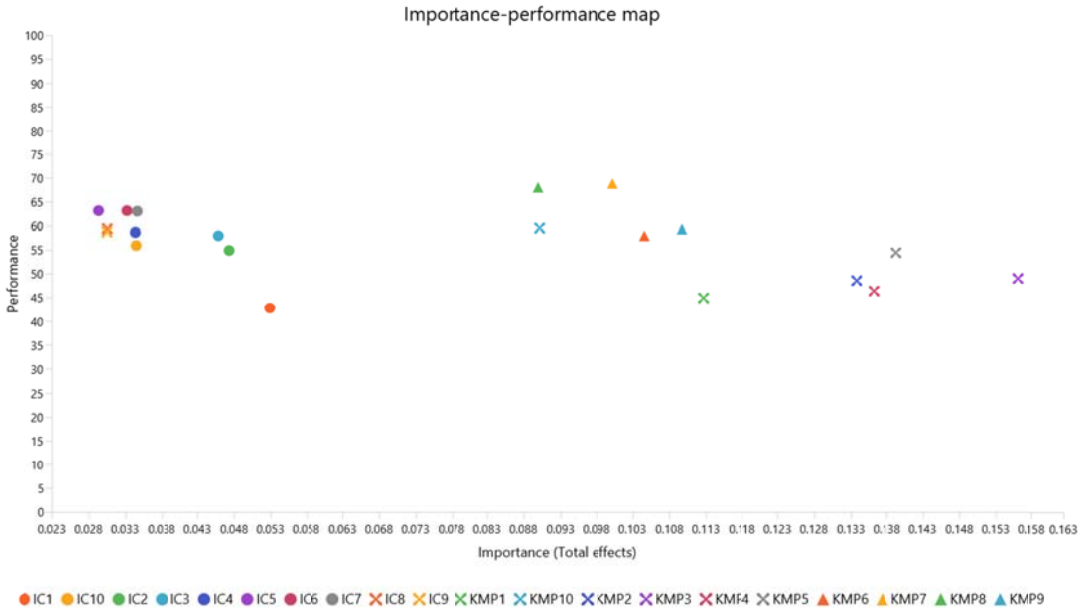

Figure 3. Visual distribution of the importance-performance map analysis

An Importance-Performance Map Analysis (IPMA) was executed as an advanced extension of the standard structural model parameters. While traditional path coefficients (β) purely isolate the linear importance (total effects) of antecedent factors on an endogenous target, the IPMA framework integrates the actual performance scores of these constructs and their underlying indicators, calculated on a standardized scale from 0 to 100. A macro-level analysis reveals a definitive empirical divide, KMP demonstrate substantially higher total importance in driving Project Efficiency compared to Innovation Capability indicators. KMP indicators span the mid-to-high importance spectrum (0.088 to 0.156), whereas all IC indicators are restricted to the low-importance quadrant (0.028 to 0.053). This mathematical polarization confirms that while creative agility is a valuable mediator, foundational knowledge architecture remains the primary lever for operational success.

For targeted asset allocation management must prioritize the high-importance lower-performance zone to address critical operational vulnerabilities. KMP3 emerges as the absolute highest strategic priority, commanding the highest overall importance score (0.156) but exhibiting a suboptimal performance score of 49. Directing capital toward KMP3 will trigger a disproportionately high upward surge in overall efficiency. This critical focus zone represent high-leverage bottlenecks in documenting and storing vital data that demand immediate managerial remediation. Conversely, areas of substantial operational strength fall into the high-importance, high-performance quadrant. KMP7 and KMP8 lead this zone with the highest performance ratings (69 and 68, respectively), alongside healthy momentum from

KMP10, KMP9, and KMP6. For these indicators, management should adopt a 'keep up the good work' posture in order to maintaining stability.

6.3 Limitations of the Study

The primary limitation of this study lies in its cross-sectional design. The survey data gathered from the 221 respondents captures a snapshot of organizational behavior, employee perceptions, and project efficiency at a single point in time. In reality, corporate knowledge cultivation, the maturation of innovation capability, and the realization of long-term project efficiency are deeply dynamic and evolutionary phenomena that unfold over multiple fiscal cycles. Consequently, While the PLS-SEM model establishes significant directional associations, the cross-sectional framework cannot fully track the long-term changes or shifting trends of these constructs over time. Secondly, this study was conducted exclusively within Knowliom. While focusing on a single organization ensures highly tailored internal validity and isolates the variables from confounding macroeconomic noise, it presents distinct boundaries regarding generalizability.

An additional limitation stems from the inherent multi-level structure of the operational environment. The 221 surveyed respondents at Knowliom are naturally clustered within specific project teams, departments, and reporting lines. This clustering can lead to correlated standard errors among participants sharing the same direct managers or project environments, an effect that single-level PLS-SEM does not fully isolate. Furthermore, while the census approach successfully captured the entire target population, the research fundamentally relies on individual employee perceptions as proxies to measure objective organizational and project-level efficiency. Consequently, despite achieving comprehensive organizational representation, the findings carry inherent subjective measurement bias. Individual self-reported assessments of project efficiency may differ from formal organizational outcomes documented in audited financial ledgers or strict milestone tracking software.

The dataset relies entirely on self-administered subjective Likert-scale responses provided by employees. Although the sample is highly authoritative, experienced, and professionally mature, self-reported evaluations are inherently vulnerable to subconscious biases, such as social desirability bias or retrospective recall bias. Employees may naturally overstate the sophistication of their internal knowledge-sharing or rate their localized project efficiency higher than objective, audited financial ledgers or strict milestone tracking software might indicate.

6.4 Suggestions for Further Studies

Scholars could capture baseline metrics of KMP within an organization, and then track changes over time as the company introduces specific innovation initiatives or PMO modifications. Time-lagged data structures would offer deeper insights into the complementary partial mediation model, mapping exactly how long it takes for a raw knowledge asset to successfully transform into an innovative capability and materialize as project efficiency. Furthermore, replicating the study by executing a comparative analysis between high-tech software engineering environments, public works construction

infrastructure projects, and fast-moving consumer goods supply chains would help synthesize whether the potential 'innovation penalty' observed at Knowliom is a universal trait of project management, or if it is heavily moderated by industry specific structural velocity and capital intensity.

Declaration of Conflict of Interest, Ethical Compliance, and Use of AI Tools: The author declares that there are no conflicts of interest related to the research, authorship, or publication of this study. The author confirms strict adherence to all academic ethical standards, actively preventing issues such as plagiarism, research misconduct, and redundant or duplicate submission. Furthermore, informed consent was explicitly obtained from all participants prior to data collection, with measures taken to ensure complete confidentiality and anonymity of the responses. The author states that basic AI tools were utilized strictly to assist with paraphrasing and proofreading this thesis during the writing process. All content was comprehensively reviewed and edited by the author to guarantee factual accuracy, originality, and academic integrity.

References

Adeyemi, A. B., Ohakawa, T. C., Okwandu, A. C., Iwuanyanwu, O., & Ifechukwu, G.-O. (2024). Advanced Building Information Modeling (BIM) for affordable housing projects: Enhancing design efficiency and cost management. *Comprehensive Research and Reviews in Science and Technology*, 02(01), 001–009. https://doi.org/10.57219/crrst.2024.2.1.0029

Aga, D. A., Noorderhaven, N., & Vallejo, B. (2016). *International Journal of Project Management, 34*(5), 806–818. https://doi.org/10.1016/j.ijproman.2016.02.012

Ahlqvist, M., & Andersson, E. (2025, June 26). The Knowledge Management Process during the Rollout of a New Business Practice in a Multinational Corporation A qualitative case study of a headquarters and local market context. *Göteborgs universitet Graduate School*.

Albert, M., Balve, P., & Spang, K. (2017). *International Journal of Managing Projects in Business, 10*(4), 796–821. https://doi.org/10.1108/IJMPB-01-2017-0004

Ali, H., Chuanmin, S., Ahmed, M., Mahmood, A., Khayyam, M., & Tikhomirova, A. (2021). *Frontiers in Psychology, 12,* 689311. https://doi.org/10.3389/fpsyg.2021.689311

Andersen, E. S., Grude, K. V., & Haug, T. (2025). *Goal Directed Project Management.* London: Routledge. https://doi.org/10.4324/9781003604303

Arunima, K. V., & Thekkat, A. K. (2025). Impact of organizational knowledge creation on project knowledge management in multinational and Indian software companies: a comparative analysis. *Cogent Business & Management, 12*(1), 2502541. https://doi.org/10.1080/23311975.2025.2502541

Attah, R. U., Garba, B. M., Gil-Ozoudeh, I., & Iwuanyanwu, O. (2024). Cross-functional team dynamics in technology management: a comprehensive review of efficiency and innovation enhancement. *Engineering Science & Technology Journal, 5*(12), 3248-3265. https://doi.org/10.1080/23311975.2025.2502541

Avença, I., Domingues, L., & Carvalho, H. (2024). Do the Project Manager's soft skills foster knowledge sharing? *Project Leadership and Society*, 5:100139. https://doi.org/10.1016/j.plas.2024.100139

Bell, E., Harley, B., & Bryman, A. (2022). *Business Research Methods*. Oxford: Oxford University Press. https://doi.org/10.1093/hebz/9780198869443.001.0001

Bennett, R., Kottasz, R., & Yuan, P.-Y. (2025). The mediating role of digital innovation capability on the relationship between organisational agility and performance: the case of the UK arts and culture sector. *Cogent Business & Management*, 12(1). https://doi.org/10.1080/23311975.2025.2465893

Carrión, G. C., Nitzl, C., & Roldán, J. L. (2017). Mediation Analyses in Partial Least Squares Structural Equation Modeling: Guidelines and Empirical Examples. In H. Latan, & R. Noonan, *Partial Least Squares Path Modeling* (pp. 173-195). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-64069-3_8

Celino, I., Carriero, V. A., Azzini, A., Baroni, I., & Scrocca, M. (2025). Procedural knowledge management in Industry 5.0: Challenges and opportunities for knowledge graphs. *Journal of Web Semantics*, 84(10):100850. https://doi.org/10.1016/j.websem.2024.100850

Chen, D., & Wang, S. (2024). Digital transformation, innovation capabilities, and servitization as drivers of ESG performance in manufacturing SMEs. *Scientific Reports*, 14(1):24516. https://doi.org/10.1038/s41598-024-76416-8

Chughtai, M. S., Syed, F., Naseer, S., & Chinchilla, N. (2024). Role of adaptive leadership in learning organizations to boost organizational innovations with change self-efficacy. *Current Psychology, 43*, 27262–27281. https://doi.org/10.1007/s12144-023-04669-z

Coraiola, D. M., & Murcia, M. J. (2019). From organizational learning to organizational mnemonics: Redrawing the boundaries of the field. *Management Learning, 5*(2), 227-240. https://doi.org/10.1177/1350507619889737

Dash, G., & Paul, J. (2021). CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. *Technological Forecasting and Social Change, 173*, 121092. https://doi.org/10.1016/j.techfore.2021.121092

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

Duffield, S. M., & Whitty, S. J. (2016). *International Journal of Project Management, 34*(7), 1280–1293. https://doi.org/10.1016/j.ijproman.2016.07.001

Dzenopoljac, V., Alasadi, R., Zaim, H., & Bontis, N. (2018). *Knowledge and Process Management, 25,* 77–87. https://doi.org/10.1002/kpm.1562

Ferraris, A., Mazzoleni, A., Devalle, A., & Couturier, J. (2018). Big data analytics capabilities and knowledge management: impact on firm performance. *Management Decision*, 1923–

1936. https://doi.org/10.1108/MD-07-2018-0825

Franke, G., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: A comparison of four procedures. *Internet Research, 29*(3), 430–447. https://doi.org/10.1108/IntR-12-2017-0515

Funder, D. C., & Ozer, D. J. (2019). Evaluating Effect Size in Psychological Research: Sense and Nonsense. *Advances in Methods and Practices in Psychological Science, 2*(2), 156-168. https://doi.org/10.1177/2515245919847202

Gama, F., & Magistretti, S. (2023). Artificial intelligence in innovation management: A review of innovation capabilities and a taxonomy of AI applications. *Journal of Product Innovation Management, 32*(1), 76-111. https://doi.org/10.1111/jpim.12698

Gemünden, H. G., Lehner, P., & Kock, A. (2018). The project-oriented organization and its contribution to innovation. *International Journal of Project Management*, 147-160. https://doi.org/10.1016/j.ijproman.2017.07.009

Giampaoli, D., Ciambotti, M., & Bontis, N. (2017). *Journal of Knowledge Management,* **21**, 355–375. https://doi.org/10.1108/JKM-03-2016-0113

Grant, R. M. (1996). Toward A Knowledge-Based Theory of the Firm. *Strategic Management Journal, 17*(S2), 109-122. https://doi.org/10.1002/smj.4250171110

Grumadaite, K., & Jucevicius, G. (2023). The Dynamics of the Development of Knowledge Ecosystem. *European Conference on Knowledge Management*, 454-461. https://doi.org/10.34190/eckm.24.1.1728

Gudergan, S. P., Moisescu, O. I., Radomir, L., Ringle, C. M., & Sarstedt, M. (2025). Special issue editorial: Advanced partial least squares structural equation modeling (PLS-SEM) applications in business research. *Journal of Business Research, 188*, 115087. https://doi.org/10.1016/j.jbusres.2024.115087

Hadi, A. (2022). Facilitating multidirectional knowledge flows in project-based organizations: the intermediary roles of project management office. *Int. Journal of Systematic Innovation, 7*, 66-86. https://doi.org/10.6977/IJoSI.202203_7(1).0005

Hair, J. F., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2021). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM).* Thousand Oaks, California: Sage Publishing. https://doi.org/10.1007/978-3-030-80519-7

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis, 1*(2), 107-123. https://doi.org/10.1504/IJMDA.2017.087624

Henseler, J. (2021). *Composite-Based Structural Equation Modeling: Analyzing Latent and Emergent Variables.* New York: The Guilford Press.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing*

Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hermano, V., Martin-Cruz, N., & Pajares, J. (2022). The effect of project management dynamic capabilities on firm performance. *Baltic Journal of Management*, 266–284. https://doi.org/10.1108/BJM-06-2021-0218

Holtom, B., Baruch, Y., & Ballinger, G. A. (2022). Survey response rates: Trends and a validity assessment framework. *Human Relations, 75*(8), 1560-1584. https://doi.org/10.1177/00187267211070769

Islam, T. U. (2019). Ranking of Normality Tests: An Appraisal through Skewed Alternative Space. *Symmetry, 11*(7), 872. https://doi.org/10.3390/sym11070872

Kalnins, A., & Hill, K. P. (2023). The VIF Score. What is it Good For? Absolutely Nothing. *Organizational Research Methods, 28*, 58-75. https://doi.org/10.1177/10944281231216381

Karadag, H., Sahin, F., & Bulut, C. (2025). When does intellectual capital enhance innovation capability? A three-way interaction test. *International Journal of Entrepreneurial Behavior & Research*, 31(2):563–586. https://doi.org/10.1108/IJEBR-12-2021-0976

Kastelli, I., Dimas, P., Stamopoulos, D., & Tsakanikas, A. (2024). Linking Digital Capacity to Innovation Performance: the Mediating Role of Absorptive Capacity. *Journal of the Knowledge Economy*, 15:238–272. https://doi.org/10.1007/s13132-022-01092-w

Kaufmann, E., Favretto, J., Filippim, E. S., & Cohen, E. D. (2019). Relationship between the organizational memory and innovativity: the case of software development companies in the southern region of Brazil. *Journal of Information Systems and Technology Management*, e201916004. https://doi.org/10.4301/s1807-1775201916004

Kaur, V. (2022). Managerial attention and knowledge-based dynamic capabilities: A meta-theoretical approach to competitive advantage. *Journal of General Management, 50*(3), 220-239. https://doi.org/10.1177/03063070221126275

Kerzner, H. (2022). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 13th Edition.* Hoboken: Wileys & Sons.

Kock, N. (2015). *WarpPLS 5.0 User Manual.* Laredo, Texas: ScriptWarp Systems.

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners 5th edition.* Thousand Oaks, CA: Sage Publications, Inc.

Kusongwa, R., Ngalesoni, O., & Kiende, H. (2025). Critical Factors Affecting Construction Project Cost and Schedule Adherence in Sub-Saharan Africa: A Systematic Review. *Management and social perspectives*, 4(1):85-111.

Le, P. B. (2024). Applying knowledge-based human resource management to drive innovation: the roles of knowledge sharing and competitive intensity. *Management Research Review, 47*(4), 602–621. https://doi.org/10.1108/MRR-02-2023-0154

Lee, J., Shin, K., Kim, H., & Hwang, J. (2024). Efficiency of Innovation Policy with

Different Types of R&D Planning: Evidence from South Korea's Information and Communication Technology Sector. *Journal of the Knowledge Economy*, 16(1):630-662. https://doi.org/10.1007/s13132-024-01947-4

Lee, S., Yang, X., Kim, J., & Byun, G. (2022). Effects of Motivational Climate on Knowledge Hiding: The Mediating Role of Work Alienation. *Behavioral Sciences, 12*(3), 81. https://doi.org/10.3390/bs12030081

Mottee, L. K. (2024). Chapter 18: From the iron triangle to the 'iron pentagon'. Prioritising environmental and social issues in project management - lessons learned from Amsterdam's North-South metro line. In G. Silvius, & M. Huemann, *Research Handbook on Sustainable Project Management* (pp. 305–321). Cheltenham: Edward Elgar Publishing. https://doi.org/10.4337/9781800885455.00029

Musawir, A., Serra, C. E. M., Zwikael, O., & Ali, I. (2017). *International Journal of Project Management, 35*, 1658–1672. https://doi.org/10.1016/j.ijproman.2017.07.007

Mwanahapa, S. R. (2024, September 3). Examining The Effect of Quality Assurance Practices on Construction Efficiency: A Case of Tanroads – Kilimanjaro Region. *Masters thesis, The Open University of Tanzania*.

Nasyiah, T., Masudin, I., Zulfikarijah, F., Kannan, D., Rumijati, A., & Wijaya, R. (2024). Explaining Sustainable Performance With SEM–FsQCA: The Role of Traceability Systems, Knowledge Management, Halal SCM Practices, and Spiritual Leadership in Small–Medium Enterprises (SMEs). *IEEE Transactions on Engineering Management, 71*, 5691-5705. https://doi.org/10.1109/TEM.2024.3365660

Nave, E., & Franco, M. (2024). Cross-border cooperation to strengthen innovation and knowledge transfer: An Iberian case. *Innovation: The European Journal of Social Science Research, 37*(4), 1013-1031. https://doi.org/10.1080/13511610.2021.1964354

Nuaimi, F. M., Singh, S. K., & Ahmad, S. Z. (2024). Open innovation in SMEs: a dynamic capabilities perspective. *Journal of Knowledge Management*, 28(2):484-504. https://doi.org/10.1108/JKM-11-2022-0906

Nwaogbe, G., Urhoghide, O., Ekpenyong, E., & Emmanuel, A. (2025). Green construction practices: Aligning environmental sustainability with project efficiency. *International Journal of Science and Research Archive*, 14(01):189-201. https://doi.org/10.30574/ijsra.2025.14.1.0023

Obeng, H. A., Arhinful, R., Mensah, L., & Owusu-Sarfo, J. S. (2024). Assessing the Influence of the Knowledge Management Cycle on Job Satisfaction and Organizational Culture Considering the Interplay of Employee Engagement. *Sustainability, 16*(20), 16:8728. https://doi.org/10.3390/su16208728

Obiuto, N. C., Adebayo, R. A., Olajiga, O. K., & Festus-Ikhuoria, I. C. (2024). Integrating Artificial Intelligence in Construction Management: Improving Project Efficiency and Cost-effectiveness. *International Journal of Advanced Multidisciplinary Research and*

Studies, 4(2), 639-647. https://doi.org/10.62225/2583049X.2024.4.2.2550

Patwary, A. K., Alwi, M. K., Rehman, S. U., Rabiul, M. K., Babatunde, A. Y., & Alam, M. M. (2024). Knowledge management practices on innovation performance in the hotel industry: mediated by organizational learning and organizational creativity. *Global Knowledge, Memory and Communication, 73*(5), 662-681. https://doi.org/10.1108/GKMC-05-2022-0104

Pereira, L., António, N., Dias, Á., & Lopes da Costa, R. (2021). *International Journal of Knowledge Management, 17*(1), 1–14. https://doi.org/10.4018/IJKM.2021010101

Rajapathirana, R. P. J., & Hui, Y. (2018). *Journal of Innovation & Knowledge, 3*(1), 44–55. https://doi.org/10.1016/j.jik.2017.06.002

Ramayah, T., Cheah, J.-H., Chuah, F., & Ting, H. (2016). *Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3.0: An Updated and Practical Guide to Statistical Analysis.* Kuala Lumpur: Pearson Malaysia Sdn Bhd.

Resnik, D. B. (2020, December 23). *What Is Ethics in Research & Why Is It Important?* Retrieved from National Institute of Environmental Health Sciences: https://www.niehs.nih.gov/research/resources/bioethics/whatis

Restuputri, D. P., Masudin, I., Septira, A. P., Govindan, K., & Widayat, W. (2024). The role of knowledge management to improve organizational performance through organizational ambidexterity within the uncertainties. *Business Process Management Journal, 30*(7), 2237-2282. https://doi.org/10.1108/BPMJ-08-2023-0614

Richter, N. F., Cepeda, G., Roldán, J. L., & Ringle, C. M. (2016). European management research using partial least squares structural equation modeling (PLS-SEM). *European Management Journal, 34*(6), 589-597. https://doi.org/10.1016/j.emj.2016.08.001

Rigdon, E. E., Sarstedt, M., & Ringle, C. M. (2017). On Comparing Results from CB-SEM and PLS-SEM: Five Perspectives and Five Recommendations. *Marketing ZFP, 39*(3), 4-16. https://doi.org/10.15358/0344-1369-2017-3-4

Roemer, E., Schuberth, F., & Henseler, J. (2021). HTMT2–an improved criterion for assessing discriminant validity in structural equation mode. *Industrial Management & Data Systems, 121*(12), 2637-2650. https://doi.org/10.1108/IMDS-02-2021-0082

Salehi, M., & Alanbari, S. A. (2024). Knowledge sharing barriers and knowledge sharing facilitators in innovation. *European Journal of Innovation Management, 27*(8), 2701–2721. https://doi.org/10.1108/EJIM-12-2022-0702

Sancho-Zamora, R., Gutiérrez-Broncano, S., Hernández-Perlines, F., & Peña-García, I. (2021). A Multidimensional Study of Absorptive Capacity and Innovation Capacity and Their Impact on Business Performance. *Frontiers in Psychology*, 751997. https://doi.org/10.3389/fpsyg.2021.751997

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2025). Partial Least Squares Structural Equation Modeling. In C. Homburg, M. Klarmann, & A. Vomberg, *Handbook of Market Research* (pp.

1-56). Cham: Springer. https://doi.org/10.1007/978-3-319-05542-8_15-3

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. *European Journal of Marketing, 53*(11), 2322–2347. https://doi.org/10.1108/EJM-02-2019-0189

Sofiyabadi, J., Valmohammadi, C., & ghadam, A. S. (2022). Impact of Knowledge Management Practices on Innovation Performance. *IEEE Transactions on Engineering Management, 69*(6), 3225-3239. https://doi.org/10.1109/TEM.2020.3032233

Souza, D. E., Favoretto, C., & Carvalho, M. M. (2022). Knowledge Management, Absorptive and Dynamic Capacities and Project Success: A Review and Framework. *Engineering Management Journal, 34*(1), 50-69. https://doi.org/10.1080/10429247.2020.1840876

Sunny, M. N., Sakil, M. B., Nahian, A. A., & Atayeva, J. (2024). Project Management and Visualization Techniques A Details Study. *International Refereed Journal of Engineering and Science (IRJES), 13*(5), 28-44.

Suparwadi, Musadieq, M. A., & Riza, M. F. (2024). Leveraging intellectual capital and knowledge management to drive innovation and organizational performance. *International Journal of Engineering Business Management*, 16:1-18. https://doi.org/10.1177/18479790241304563

Teece, D. J. (2025). *Dynamic Capabilities Foundational Concepts.* Cambridge: Cambridge University Press. https://doi.org/10.1017/9781009562713

Terhorst, A., Lusher, D., Bolton, D., Elsum, I., & Wang, P. (2018). Tacit Knowledge Sharing in Open Innovation Projects. *Project Management Journal*, 5-19. https://doi.org/10.1177/8756972818781628

Turner, K. L., Monti, A., & Annosi, M. C. (2021). Disentangling the effects of organizational controls on innovation. *European Management Journal*, 57-69. https://doi.org/10.1016/j.emj.2020.09.004

Ursachi, G., Zait, A., & Horodnic, I. A. (2015). How Reliable are Measurement Scales? External Factors with Indirect Influence on Reliability Estimators. *Procedia Economics and Finance*, 679-686. https://doi.org/10.1016/S2212-5671(15)00123-9

Valmohammadi, C., Sofiyabadi, J., & Kolahi, B. (2019). **Sustainability, 11**(18), 5129. https://doi.org/10.3390/su11185129

Vestal, A., & Mesmer-Magnus, J. (2020). Interdisciplinarity and Team Innovation: The Role of Team Experiential and Relational Resources. *Small Group Research*, 738-775. https://doi.org/10.1177/1046496420928405

Volberda, H. W., Khanagha, S., Baden-Fuller, C., Mihalache, O. R., & Birkinshaw, J. (2021). Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms. *Long Range Planning*, 102110.

https://doi.org/10.1016/j.lrp.2021.102110

Vörösmarty, G., & Dobos, I. (2020). Green purchasing frameworks considering firm size: a multicollinearity analysis using variance inflation factor. *Supply Chain Forum: An International Journal, 21*(4), 290-301. https://doi.org/10.1080/16258312.2020.1776090

Wang, D., Huang, R., Li, K., & Shrestha, A. (2023). Organizational structure and dynamic capabilities on business model innovation in project-driven enterprises: evidence from the construction industry. *Engineering, Construction and Architectural Management*, 578-600. https://doi.org/10.1108/ECAM-01-2023-0090

Wogan, M., Mohan, N., Wolf, G., & Nejat, N. (2024). Synergising Lifecycle Project Management for Sustainability: Towards a Streamlined Approach through different Project Phases. *The 9th International Conference on Civil, Structural and Transportation Engineering* (pp. 157:1-8). Toronto: Avestia ICCSTE 2024. https://doi.org/10.11159/iccste24.157

Zaim, H., Muhammed, S., & Tarim, M. (2019). *Knowledge Management Research & Practice, 17,* 24–38. https://doi.org/10.1080/14778238.2018.1538669

Zaman, U., Nawaz, S., Tariq, S., & Humayoun, A. A. (2019). *International Journal of Managing Projects in Business, 13*(1), 103–127. https://doi.org/10.1108/IJMPB-10-2018-0210

Zamiri, M., & Esmaeili, A. (2024). Methods and Technologies for Supporting Knowledge Sharing within Learning Communities: A Systematic Literature Review. *Administrative Sciences, 14*(1), 17. https://doi.org/10.3390/admsci14010017

Zia, U., Zhang, J., & Alam, S. (2024). Role of tacit knowledge management process and innovation capability for stimulating organizational performance: empirical analysis, PLS-SEM approach. *Kybernetes, 53*(11), 4976–5000. https://doi.org/10.1108/K-03-2023-0444

Zuhroh, S., & Rini, G. P. (2024). Product innovation capability and distinctive value positioning drivers for marketing performance: a service-dominant logic perspective. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-04-2024-0100

Żywiołek, J. (2024). Internet Treatment is a Blessing or a Curse: Health Knowledge Management. *25th European Conference on Knowledge Management* (pp. 967-973). Berkshire: Academic Conferences and Publishing International Limited. https://doi.org/10.34190/eckm.25.1.2373

Appendix A: Survey Instrument

SECTION A DEMOGRAPHIC
This section is used to gather broad demographic information about the respondents.

Gender

- Male
- Female

Age

- 18-24 Years old
- 25-30 Years old
- 31-35 Years old
- 36-40 Years old
- 41-45 years old
- 46-50 years old
- 51 Years and Above

Educational background:

- PHD
- Master's Degree
- Bachelor's Degree
- Diploma
- Higher School Certificate

Department/Unit

- Project Management Office
- Operation Management
- Marketing & Communications
- Supply Chain / Procurement / Logistics
- Information Technology (IT)
- Finance / Accounting
- Human Resources (HR)

Role/position

- Department Manager
- Project Manager
- Team lead
- Project management specialist
- Team member

Experience

- Less than a year
- 1 – 5 Years
- 6 – 10 Years
- 11 – 15 Years
- 16 – 20 Years

- More than 20 Years

SECTION B	Knowledge Management Practices (KMP)
This section measures how organizations manage knowledge through acquisition, sharing, retention, application, and accessibility.	
Definition	*Knowledge Management Practices refer to processes used to acquire, share, store, and apply knowledge within an organization.*

No.	Item
KMP1	The organization effectively acquires new knowledge from external sources.
KMP2	Employees regularly share knowledge with each other.
KMP3	Knowledge is well documented and stored for future use.
KMP4	The organization retains critical knowledge even when employees leave.
KMP5	Employees apply knowledge effectively in their tasks.
KMP6	Knowledge is easily accessible when needed.
KMP7	Training programs support knowledge acquisition.
KMP8	Collaboration tools facilitate knowledge sharing.
KMP9	Lessons learned from past projects are utilized.
KMP10	Knowledge systems improve work efficiency.

SECTION C	Innovation Capability (IC)
This section evaluates the organization's ability to generate, experiment, and implement innovative ideas.	
Definition	*Innovation Capability refers to the ability to develop new ideas and transform them into practical applications.*

No.	Item
IC1	Employees are encouraged to solve problems creatively.
IC2	The organization supports experimentation with new ideas.
IC3	New ideas are effectively implemented.
IC4	Employees frequently generate innovative ideas.
IC5	There is strong collaboration among employees.
IC6	The organization promotes continuous learning.
IC7	Employees feel safe to try new approaches.
IC8	Innovation is supported by management.
IC9	Teams actively share innovative ideas.
IC10	The organization adapts quickly to new opportunities.

SECTION D	Project Efficiency (PE)
This section measures the efficiency of project execution in terms of time, cost, quality, and stakeholder satisfaction.	
Definition	*Project Efficiency refers to the ability to complete projects within time, cost, and quality constraints while optimizing resources.*
No.	**Item**
PE1	Projects are completed on time.
PE2	Projects are completed within budget.
PE3	Project outputs meet quality standards.
PE4	Project scope is effectively managed.
PE5	Resources are utilized efficiently.
PE6	Stakeholders are satisfied with project outcomes.
PE7	Project delays are minimized.
PE8	Cost overruns are well controlled.
PE9	Project teams perform efficiently.
PE10	Overall project performance meets expectations.