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Project Management Capabilities and Inventory Control Impact on Project Success: Does Project Complexity Matters

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Abstract
If project management capabilities and inventory control are not effectively managed in the context of project complexities, it may lead to delays projects, cost increased and quality minimized that could affect the project's success. Therefore, study is designed to test the influence of project management capabilities and inventory control on project's success in the construction industry with the moderating effect of project complexities. A quantitative approach was employed, using survey data from construction industry professionals. Data was collected from 400 construction industry employees using a convenient sampling technique. Both SPSS and Smart PLS were used to test the collected data. The analysis reveals that all project management capabilities namely process management, continuous improvement, project training, project management software and knowledge transfer positively and significantly contribute to project success. The study also finds that inventory control significantly enhances project success. Additionally, the moderating effect of project complexity also positively and significantly moderated among project management capabilities, inventory control, and project success. The implications of these findings emphasize the importance of investing in effective management practices and inventory control systems to ensure successful project delivery in the construction industry. Moreover, the study contributes to the literature by demonstrating the significant moderating role of project complexity

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in shaping the relationship between these factors. This research is unique in its examination of the moderating role of project convolution in the relationship between project management capabilities, inventory control, and project success in the construction industry because this perspective is not widely explored in the existing literature.

Keywords: Project success, Project management capabilities, Inventory control, Construction industry.

Introduction

The project success is an integral factor the companies in achieving their goals, particularly in the construction industry (Kamewor Tetteh et al., 2024). Historically, in the construction industry project success is a major concern which is evaluated based on criteria like terms of scope, time, and budget (Sadikoglu et al., 2024). However, the success of the project is challenging for the construction industry because their projects are very dynamic due to the involvement of multiple team members, and various stakeholders which creates constraints in the completion of the project (Nubuor et al., 2024). Project success is increasingly being recognized in the construction industry as a competitive advantage confirming that desired outcomes have been achieved (Ahuja & Nandakumar, 1985; Shayan et al., 2022). These previous studies emphasized the importance of project success. Given the complexity of the construction project, an understanding of the factors affecting project success is essential to improve efficiency and achieve sustainable development (Nubuor et al., 2024).

Previous literature highlighted that project management capabilities are important in the succession of the project because they directly affect the project's success (Ciric et al., 2021). Various project management capabilities namely, process management, continuous improvement, project training, and knowledge transfer are key to ensuring projects are completed and delivered within budget with a focus on standards management to ensure efficiency, and to improve resource management that ensures project success (Barbosa et al., 2021; Ekemezie & Digitemie, 2024). Functional training equips the operator with the skills needed to be more productive, reduce errors, and improve productivity, while knowledge transfer facilitates the sharing of knowledge and experience among team members decision-making is easier as it promotes knowledge (Emon & Chowdhury, 2023; Irfan et al., 2019). In addition, the integration of project management software helps streamline communication and resource allocation which makes it easier to track progress and address potential issues in real-time (Leong et al., 2023). These findings highlight that project management capabilities are a key determinant for the success of projects in the risky construction industry. In this regard, the study focused on the impact of project management capabilities on the project success of the construction industry.

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Inventory management is also equally important to increase the succession rate of the project (Shaikh et al., 2022). Effective management of the inventory highlights that companies have sufficient material to deal with the operational needs (Kitheka, 2019). Research has also shown that effective inventory management has a direct impact on project management and budgeting (Islam et al., 2024; Ugbebor et al., 2024). Through managing the supply chain through inventory management, construction projects could avoid the risks associated with missing inventory or excess materials, which can lead to delays and increased costs (Sengottaiyan & Jasrotia, 2024). Thus, inventory control is an important part of ensuring that a construction project is completed on schedule and within budget which is significantly contributing to project success. Thus, the study focused on the influence of inventory control on project success of construction industry.

Different studies have been conducted on project management capabilities, inventory control, and project success. So, these studies have found mixed results (Fareed et al., 2021; Irfan et al., 2019; Kerzner, 2022a, 2022b; Mehmood et al., 2024). Baron and Kenny (1986) also argued that when the relationships are inconsistent then there is a need for moderating variables. Various authors found a positive and significant moderating effect of project complexities (Hartono et al., 2019; Vaez-Alaei et al., 2024). Therefore, project complexities can be a potential moderating variable (Hartono et al., 2019; Vaez-Alaei et al., 2024). Therefore, the association between project management capability and project success may be more influenced by the moderating effect of project complexity. As the complexity of a construction project increases, so does the sophistication of the project design (Zierock et al., 2024). Complex projects often have multiple stakeholders, high levels of uncertainty, and increased risk, making it necessary for project managers to implement sophisticated and adaptable business practices to ensure that success can improve project management capabilities that could increase project success (Kermanshachi et al., 2023). In this regard, project complexity plays a significant role in increasing a project management capabilities importance to achieve the succession rate of the project (Igbinenikaro et al., 2024). Thus, seeking this significance, the study aimed to test the moderating effect of project complexities among project management capabilities, inventory control, and project success of the construction industry.

The study with the objective contributed in several ways. Firstly, extant studies attention more on the direct influence of project management capabilities and inventory control on project success with minimal focus on moderating effect. In this regard, the study contributed to moderating the influence of project complexities. Secondly, the study contributed in-depth insights into how project complexity significantly affects relationships with the core project implementation and success. It emphasizes the importance of sophisticated management practices that can adapt to complex projects which could increase the success of the project. Thirdly, the study results also contribute to helping professionals to understand the project complexities

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to boost their projects especially in construction. The critical role of project complexity enables project managers to anticipate risk, intervene effectively, and implement proactive management strategies to enhance project success. Lastly, studthe y also highlighted the importance of flexibility in managing complex construction projects that could contribute to improving project outcomes and project best practices. The rest of the paper is divided into four chapters, review of the literature, research methodology, data analysis, findings, discussion, and conclusion.

Literature Review

Theoretical Review

Project management capabilities which consisted of skills, competencies and tools which are needed to achieve the company's goals. These capabilities ensure that projects align with organizational goals are completed on budget systematically and systematically, and deliver the expected quality and benefits (Fobiri et al., 2022). It includes technical and business skills, such as risk management, and performance management. Project management capabilities are essential for managing challenges, dealing with uncertainties, and getting project teams to work cooperatively toward shared goals according to (Ghorbani, 2023; Unegbu et al., 2022). These capabilities are also essential to adapt to dynamic business environments and to enable organizations to respond effectively to internal and external changes while maintaining the business consistent with a plan the priority is matched (Borges et al., 2024). Process management, knowledge transfer, continuous improvement, project training, and the implementation of project management software are some of the project management capabilities that promote project success (Irfan et al., 2019).

Project success is an important integral factor for the company's ability to gain their companies strategic objectives (Borges et al., 2024). Various factors affect project success while effective project management ensures delivery management efficiently, allocates resources, and manages project deliverables within its schedule and schedule (Irfan et al., 2019). Among the project management capabilities, continuous improvement raises a culture of continuous research and adaptation which allows the industry to adapt to evolving demands and constraints (Irfan et al., 2019). Business training enables team members to develop skills that are needed to perform tasks efficiently, reduce errors, and increase productivity (McKenzie & Woodruff, 2014). Knowledge sharing ensures that valuable insights and knowledge are shared among team members which contributes to informed decision-making (Ni et al., 2018). Project management software adoption could improve communication, work tracking, and resource allocation which makes it easier to manage complex projects (Liberatore & Pollack-Johnson, 2003). Additionally, management supports project success by ensuring the availability of materials and supplies by reducing waste and delays (Filippetto et al., 2021).

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Equally, Inventory control is critical to business success because it ensures that required materials and supplies are available at the right time and in the right quantities, preventing delays and cost overruns (Al-Khazraji et al., 2024). Effective inventory management helps reduce waste on, reduces inventory costs, and improves resource management to maintain project timelines and budgets are important in complex project (Ugbebor et al., 2024). Through as many people including interference and unpredictable variables, strong inventory management is even more important to manage uncertainty and reduce risk (Ugbebor et al., 2024). Through accurately tracking and monitoring inventory on top of that, project managers can increase productivity, avoid complications, and ensure smooth execution (Murthi et al., 2022). This strong inventory management helps to allocate resources more efficiently, improves project efficiency, and increases the chances the success of the project (Putra et al., 2024).

Project complexity can effectively enhance project management capabilities, inventory management capabilities, and overall project success by requiring sophisticated and flexible management practices (Ma & Fu, 2020). As project complexity increases, project managers are forced to adopt new strategies to overcome the high levels of uncertainty and risk exploited by multiple stakeholders (Luo et al., 2020). These challenges require advanced planning, organizing, and communication skills to improve project management capabilities. Furthermore, complex projects require accurate and efficient inventory management to ensure proper maintenance in a dynamic environment, thereby reducing delays and cost overruns (Khattak & Mustafa, 2019). By addressing these challenges, project managers can implement comprehensive strategies that improve the flexibility and adaptability of the project thereby increasing project success (Bhangale et al., 2024). Thus, acknowledging the challenges of complex projects can lead to significant improvements in business practices, resource management, and overall project success. These previous studies emphasize that project complexity is an important factor for project management capabilities, inventory control, and project success. Therefore, based on these study has formulated the study framework which is predicted in Figure 1 below.

Hypothesis Development

Project management capabilities, inventory control and project success

Empirical studies reveal that organizations that process management in the projects increase the success rates in achieving project objectives (Venkataraman & Pinto, 2008). Production control ensures workflow quality, milestones are clearly defined, and resources are used efficiently. Furthermore, found that prioritizing organizations witnessed minimal delays and reduced project costs, contributing to its success (Arefazar et al., 2022).

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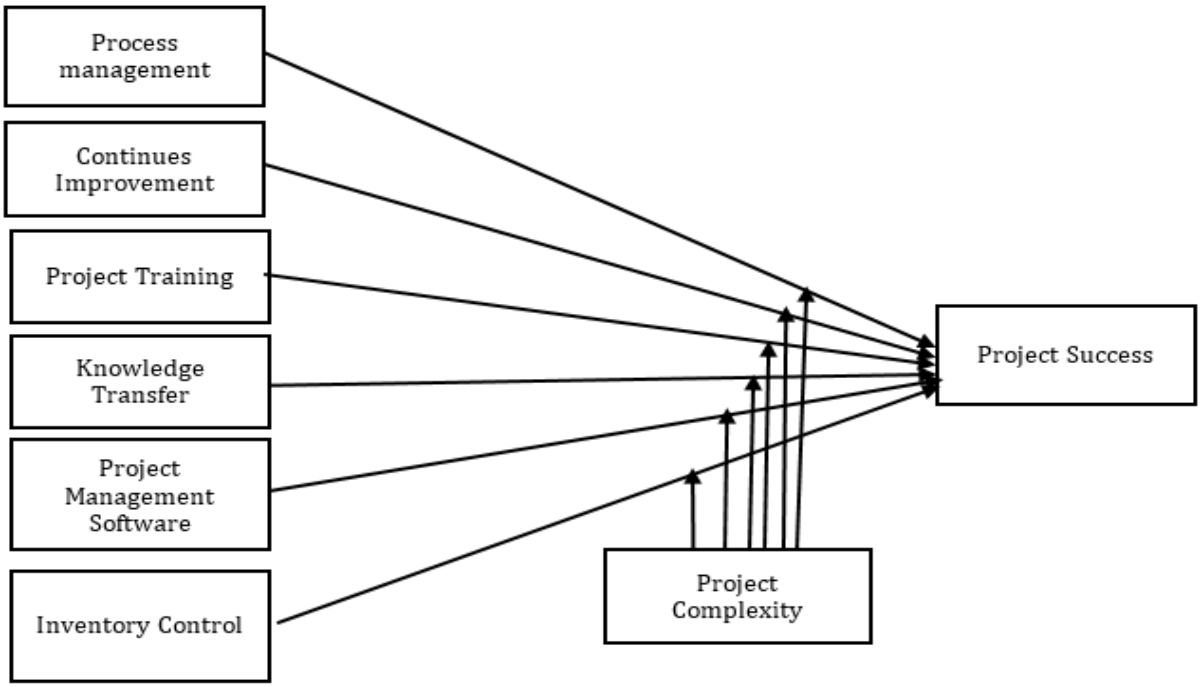

Figure 1: Conceptual Framework.

Furthermore, Boateng et al. (2022); Chen et al. (2022) also emphasized the role of dynamic process management in adapting to the changing requirements of the business. The research shows that projects that incorporate agile process methodologies achieve increased productivity, and better align with organizational objectives. Together, these findings emphasize that scheduling efficiency is an important determinant of project success. In other words, the continuous improvement of the project also enhances the success of the project Pozzi et al. (2023) further supported this view that frequent improvement in the process increases the quality of the projects which ensures that teams promptly address inefficiencies and continue to meet project objectives. Paneerselvam et al. (2024) further highlighted that continuous improvement encourages a culture of excellence and accountability which enables companies to gain their projects succession rate.

Along with continuous improvement of the projects, extant studies also highlighted that employee training also increases the success rate of the projects. Marquardt et al. (1999) found that employees training to deal with the technical part of the projects demonstrated improved skills of employees to identify projects related risk that could lead to improve the project success. Bauman and Lucy (2021) further examined customized training programs' role in improving employee engagement and performance. Research has shown that when organizations provide proper training to their employees then the projects are completed on time with the assigned budget and without compromising the quality. This means that investment in training not only enhances team capacity but also contributes significantly to the success of the project. On the other hand, knowledge transfer also increases project success is well documented (Fattah et al., 2022). They also argued that industries that effectively

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manage open and tacit knowledge ensure the project's success. Furthermore, Hernández-Soto et al. (2021) found that organizations that institutionalize knowledge-sharing practices achieve higher levels of innovation and performance in their projects. Research has shown that teams that benefit from structured knowledge transfer perform better under tight deadlines and challenging work conditions, emphasizing the importance of job security emphasizes the importance of the project success.

In another word, project management software adoption also increases the success of projects (Azeem et al., 2021). This software helps the employees in adopting real time innovation which allowing them to handle the projects related challenges which increases the chances of projects succession (Jackson et al., 2022). Such studies examined integrated cloud-based operating systems and their impact on team structure. The study concluded that businesses using such technologies indicate high stakeholder satisfaction and overall efficiency. These findings highlighted the transformative role that project management software plays in success. In addition, inventory management is also a key factor in improving performance (Khatua et al., 2021). Improved inventory strategies, such as just-in-time (JIT) systems, reducing waste, and improving availability were found to be important for the project timeline. These practices also increase cost efficiency, and a large portion of the project played a role. (Ugbebor et al., 2024; Zhu et al., 2022) also examined the relationship between inventory accuracy and project success. Research has shown that organizations with strong inventory management systems report fewer delays and greater customer satisfaction. These findings highlight the role of inventory management in supporting project objectives and cost delivery that could increase project success. These previous studies emphasized that project management capabilities, and inventory control are important factors in increasing project success. Following hypothesis is developed below,

H1: Process management significantly influences project success.
H2: Continuous Improvement significantly influences project success.
H3: Project training significantly influences project success.
H4: Knowledge Transfer significantly influences project success.
H5: Project management software significantly influences project success.
H6: Inventory control significantly influences project success.

Moderating role of project complexity

In the prior literature relationship among inventory control, project management capabilities and project success has been conducted with mixed trends (Fareed et al., 2021; Irfan et al., 2019; Kerzner, 2022b; Kitheka, 2019; Mehmood et al., 2024). Kerzner (2022a) found that even such as resource shortages, changing customer needs, or changing market conditions develop their effectiveness varies greatly depending on the complexity and scale of the project. For example, tools designed for small

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businesses may prove inadequate to address the multifaceted challenges of larger businesses or larger stakeholders. This equation suggests that the direct influence of project management ability on success is not absolute but is mediated or moderated by other factors such as project complexity (Borges et al., 2024; Irfan et al., 2019). Therefore, project complexity plays an important role as a catalyst which is shaping the relationship between project management capabilities and project success. Complexity refers to the degree of interdependence, uncertainty, and diversity inherent in a project, with factors such as the number of stakeholders, technological complexity, and the environment including dynamic alignment (Zierock et al., 2024). For simple projects with clear objectives and a straightforward workflow, even basic project management skills can be enough to ensure success because there are few variables to manage and risks to be mitigated but as complexity increases, the need for improved management skills becomes paramount (Ekemezie & Digitemie, 2024). For example, in more complex projects, managers not only have to plan and execute projects but also have to continuously adapt to the evolving environment, engaging stakeholders in different perspectives coalesce, and balancing competing priorities. Karunarathne and Kim (2021) emphasize that traditional linear approaches to project management are inadequate in such cases and that there is a need to shift to more dynamic, recursive, and contextual approaches. Thus, the interface amongst project complexity and performance capabilities determines the extent to which the project team can overcome challenges and deliver successful outcomes (Bąk & Jedynak, 2023).

In more complex projects, project management capabilities are an important hedge against the challenges of uncertainty and interdependence. Complexity increases the risks of network breakdown, decline, and distribution inefficiencies, all of which can undermine a project's success. (Kerzner, 2022b; Nwaibe et al., 2022) highlighted that sophisticated project management practices including contextual analysis, real-time analysis, and contingency planning are inevitable in such environments. Thus, these actions enable managers to anticipate potential obstacles, develop new strategies, and maintain alignment with project objectives despite external pressures (Santos et al., 2024). It also increases conflict and improves competence that stakeholders and conflict resolution are critical. In those cases, effective project management raises a shared vision, facilitates clear communication, prevents discrepancies, and manages expectations which increases the project's success. Thus, the complexity of the project not only increases the importance of performance capabilities but also determines how these powers are exercised to ensure the success of the project (Harold, 2021). Thus, based on previous studies and arguments, the current study has formulated the following research hypothesis below with a moderating effect.

H7: Process Management significantly enhance project success through project complexity moderating role.

H8: Continuous improvement significantly enhance project success through project complexity moderating role.

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H9: Project training significantly enhance project success through project complexity moderating role.
H10: Knowledge transfer significantly enhance project success through project complexity moderating role.
H11: Project management software significantly enhance project success through project complexity moderating role.
H12: Inventory control significantly enhance project success through project complexity moderating role.

Methodology

The study objective was to test the influence of project management capabilities and inventory control on project success with the moderating effect of the construction industry's project complexity. To test the study objective, the researcher employed quantitative research approach. This research approach's strong point depends upon its ability to provide better objective and reliable data testing through statistical analysis which is enabling researchers to identify patterns, relationships, and causal connections. Its structured and systematic methodology allows for generalizing findings to larger populations (Borgstede & Scholz, 2021). Cross sectional research adopted to collect data. This design can deliver a picture of data at a specific time, enabling a quick and efficient analysis of relationships and trends in the variables (Davies, 1994). Therefore, the study employed the cross-sectional research design approach. The research instrument comprises extant studies. Project success comprises 5 items. Process management comprises 4 items, the continuous improvement comprises 4 items, project training also measured by four items, knowledge management transfer also comprises 4 items, and project management software also comprises by four items. These items were taken from research of Irfan et al. (2019). Inventory control comprises by four items (Hashmi et al., 2021). Project complexities also comprises by 4 items which were taken from Heredia-Rojas et al. (2022). Likert scales with five points were used to measure each item.

The study population was the employees of the construction industry. The industry was selected because this industry played an important role in economic development through providing a essential infrastructure, housing, and commercial buildings. It supports various industries, creates employment opportunities, and contributes significantly to a country's GDP. Moreover, well-planned construction projects enhance the quality of life and promote sustainable development (Gunduz & Yahya, 2018). Data composed through using non-probability sampling technique. The Convenient sampling is important in research for its ease of use because it allows researchers to quickly gather data from readily available subjects, which is particularly useful in exploratory studies (Golzar et al., 2022). While it may not always represent the entire population, it provides valuable insights for preliminary analysis. The sample size of the study was 470. A sample size of 470 is significant because it provides

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a strong dataset that enhances the reliability and usefulness of study results. Greater sample numbers boost the study's validity and lower the margin of error which is enabling more accurate and confident conclusions about the population under investigation (Adcock, 1997). From 470 respondents, 405 questions were returned and 400 questionnaires were valid for the further analysis. Following two software's namely Smart PLS 4 and SPSS employed for study hypothesis.

Results

The software programs SPSS and Smart PLS were used to evaluate the collected data. Basic screening and demographic analysis were conducted in SPSS software and Smart PLS was used to test the study hypothesis.

Screening Test

The collected data underwent various screening tests in SPSS to enhance the reliability of the research hypotheses. These tests evaluated both the reliability and validity of the data before proceeding with further statistical analysis. The tests were specifically conducted to identify outliers, assess data normality, and check for multicollinearity which is ensuring that data met the necessary assumptions for the intended analysis (Pallant, 2020). Proper screening helps improve result accuracy and minimizes biases (Pallant, 2020). All tests were conducted according to the established criteria, meeting the requirements for data screening.

Demographic Profile

Below Table 1 show the profile of respondents from those data was collected. The data was collected from 400 employees of construction industry. A significant majority of employees are male, constituting 80% of the workforce, while females make up 20%. In terms of age distribution, the largest group of employees (37.5%) is within the 23-27 years age range, followed by 27.5% in the 18-22 years category, 22.5% in the 28-32 years group, and 12.5% are aged 33 years and above.

Regarding job roles, the workforce is predominantly composed of laborers (45%), with supervisors accounting for 30%, engineers making up 12.5%, and smaller proportions of project managers (7.5%) and administrative staff (5%). In terms of education, 50% of employees have completed high school, 30% hold diplomas, 15% possess bachelor's degrees, and 5% have master's degrees. The workforce's experience level shows that 37.5% of employees have 0-2 years of experience, 30% have 3-5 years, 20% have 6-10 years, and 12.5% have more than 11 years of experience. Geographically, the workforce is spread across regions, with 37.5% in the northern region, 25% in the southern region, 20% in the eastern region, and 17.5% in the western region. Finally, in terms of work shifts, 62.5% of employees work the day shift, 25% work the night shift, and 12.5% work rotational shifts. This

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data provides a comprehensive overview of the diverse demographic profile of the construction industry workforce. Above results are anticipated in Table 1.

Table 1: Demographic Analysis

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	320	80.00%
	Female	80	20.00%
Age	18-22 years	110	27.50%
	23-27 years	150	37.50%
	28-32 years	90	22.50%
	33 years and above	50	12.50%
Job Role	Laborer	180	45.00%
	Supervisor	120	30.00%
	Engineer	50	12.50%
	Project Manager	30	7.50%
	Administrative Staff	20	5.00%
Education Level	"High School"	200	50.00%
	"Diploma"	120	30.00%
	"Bachelor's Degree"	60	15.00%
	"Master's Degree"	20	5.00%
Years of Experience	0-2 years	150	37.50%
	3-5 years	120	30.00%
	6-10 years	80	20.00%
	11 years and above	50	12.50%

Measurement Model

The measurement model was assessed through Partial Least Square (PLS)-Structural Equation Modeling (SEM). Measurement could be assessed form two validity criteria namely discriminant and convergent. Among this validity, convergent validity shown the construct measurement that is highly correlated and represent that it is highly correlated (Cheah et al., 2018). The converge validity could be assessed through the alpha, factor loadings, composite reliability (CR), and average variance extracted (AVE) (Cheah et al., 2018). For convergent validity to be established, (1) factor loadings should exceed 0.70, indicating that items strongly represent their constructs (Cheah et al., 2018); (2) Cronbach's alpha should be greater than 0.70 to confirm internal consistency (Nunnally, 1978); (3) CR should be above 0.70, demonstrating that the construct reliably measures its items (Fornell & Larcker, 1981); and (4) AVE should exceed 0.50, indicating that the construct explains more than 50% of the variance in its indicators. In the present study, all values of factor loadings are greater than 0.70. Cronbach's alpha values exceed 0.70 which ensures internal consistency, while CR values are also greater than 0.7

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confirming construct reliability. Finally, AVE values are also greater from 0.5 which demonstrate that the constructs explain an adequate proportion of variance in their items, thus supporting convergent validity. Above results is predicted in Table 2 and Figure 2.

Table 2: Convergent Validity

Variable	Cronbach's Alpha	CR (rho-a)	CR (rho-c)	AVE
PM	0.914	0.893	0.867	0.690
CI	0.801	0.815	0.870	0.628
PT	0.922	0.932	0.907	0.711
KT	0.942	0.949	0.959	0.853
PMS	0.914	0.994	0.935	0.784
IC	0.878	0.897	0.917	0.735
PC	0.812	0.822	0.876	0.640
PS	0.882	0.897	0.920	0.794

Note: Process Management (PM), Continuous Improvement (CI) Project Management Software (PMS), Knowledge Transfer (KT), Inventory Control (IC), and Project Training (PT): Complexity of the Project (PC)

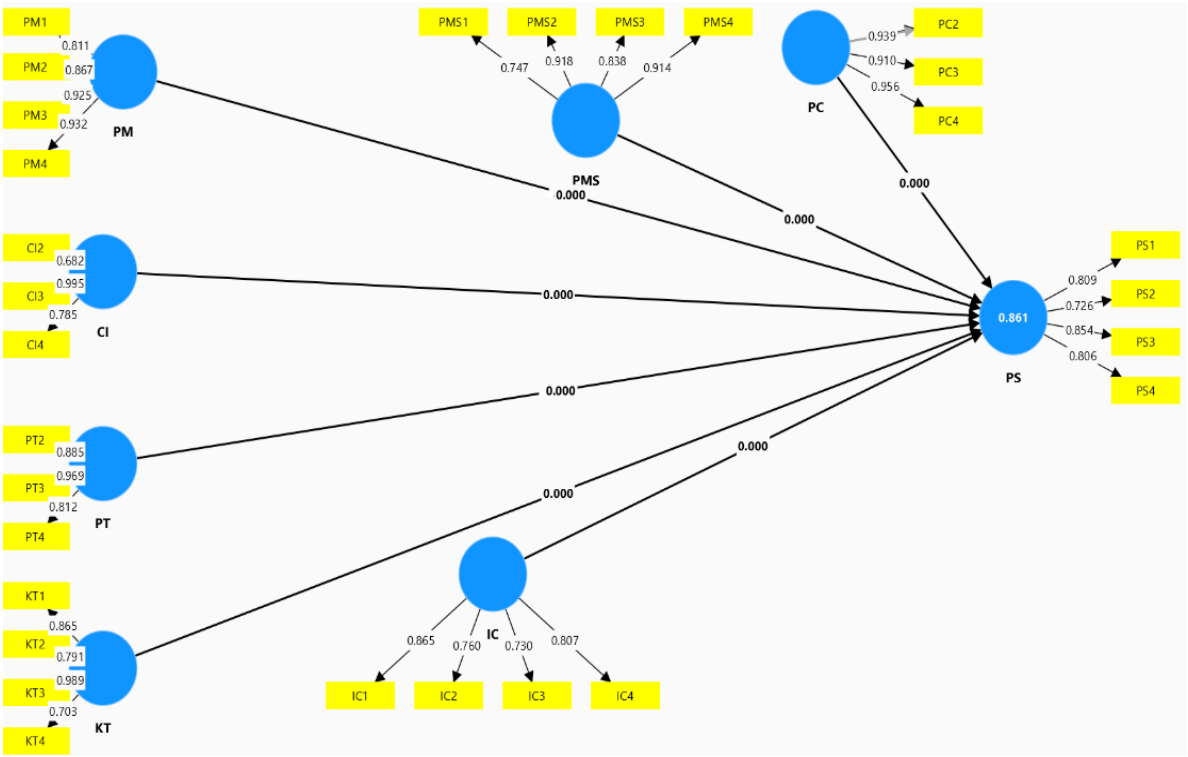

Figure 2: Factor Loadings

Discriminant Validity

Discriminant validity shows that constructs are distinct from others other variables. Construct validity is assessed by showing that a construct and its

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indicators share more variance than other constructs in the model. The Cornell-larger criterion is a widely used method to assess discriminant validity (Fornell & Larcker, 1981). This criterion requires that a construct's square root of the average variance extracted (AVE) (diagonal values) be larger than its correlations with any other construct (off-diagonal values) (Fornell & Larcker, 1981). This threshold ensures that each construct is more closely associated with its indicators than with those of other constructs. In the results, diagonal values (e.g., 0.778 for process management and 0.824 for continuous improvement) exceed all off-diagonal correlations which are approving discriminant validity. For instance, the square root of AVE for process management (0.778) is higher than its associations with continuous improvement (0.625) and project training (0.602). Similarly, continuous improvement's square root of AVE (0.824) is more than its correlations with process management (0.625) and project training (0.308). The correlations between constructs range from low to moderate, ensuring clear distinctions between them. Thus, the results satisfy the Fornell-larger criterion, confirming adequate discriminant validity among the constructs. Discriminant values are presented in Table 3.

Table 3: Discriminant Validity

Constructs	PM	CI	PT	KT	PMS	IC	PC	PS
PM	0.831							
CI	0.625	0.792						
PT	0.602	0.308	0.843					
KT	0.518	0.526	0.321	0.924				
PMS	0.604	0.307	0.343	0.235	0.885			
IC	0.216	0.213	0.454	0.122	0.218	0.857		
PC	0.509	0.332	0.536	0.341	0.236	0.453	0.800	
PS	0.409	0.000	0.430	0.005	0.361	0.167	0.055	0.893

Note: "PM: Process Management, CI: Continuous Improvement, PT: Project Training, KT: Knowledge Transfer, PMS: Project Management Software, IC: Inventory Control PC: Project Complexity".

Hypothesis Testing

There were two types of hypotheses (direct and indirect mediating effect) which were analyzed through using the PLS-SEM bootstrap technique. The 5000 resampling technique was employed to test the study hypothesis. The direct effect results show that project management capability significantly affects the project success of the construction industry. In the projective management capabilities, process management, continuous improvement, project training, and knowledge transfer significantly affect project success. This highlights that having well-defined processes, continuous assessment and improvement, well-trained teams,

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and effective knowledge sharing are crucial for achieving project success. Similarly, project management software and inventory control also significantly enhance to project success which indicates that effective tools for task tracking, communication, and resource management significantly contribute to the overall success of construction projects. Further indirect moderating effect results reveal that project complexity also positively strengthens the relationship between project management capabilities and project success. The results for process management, continuous improvement, and project training demonstrate that project complexity enhances the positive and significant impact of these capabilities on project success. This suggests that these capabilities are even more critical for success in more complex construction projects. Similarly, project management software and inventory control show a positive and significant impact in the context of high project complexity. This relationship also shows the importance of strong systems and practices to handle the increased demands of complex construction projects. Both direct and moderating effect results are shown in Table 4 and Figure 3.

Table 4: Direct and Indirect effect

Relationship	VIF	B	T-Statistic	P-Value	Result
PM → PS	1.281	0.312	4.251	0.000	Supported
CI→ PS	1.790	0.284	3.872	0.000	Supported
PT→ PS	1.478	0.359	5.121	0.000	Supported
KT→ PS	1.043	0.297	4.033	0.000	Supported
PMS → PS	1.071	0.215	2.982	0.003	Supported
IC→ PS	1.992	0.250	3.453	0.000	Supported
PS*PM→ PS	1.242	0.382	3.512	0.000	Supported
PS*CI → PS	1.764	0.287	3.321	0.000	Supported
PS*PT→ PS	1.439	0.364	3.892	0.000	Supported
PS*KT→ PS	1.305	0.299	5.632	0.000	Supported
PS*PMS → PS	1.298	0.226	4.011	0.000	Supported
PS*IC → PS	1.616	0.250	3.642	0.000	Supported

Note: PM: Process Management, CI: Continuous Improvement, PT: Project Training, KT: Knowledge Transfer, PMS: Project Management Software, IC: Inventory Control PC: Project Complexity.

Discussion

The study objective was to test the influence of project management capabilities and inventory control on project success, with the moderating effect of the construction industry's project complexity. Overall results show that all project management capabilities positively and significantly affect project success within the construction industry. These results emphasize the significance of well-structured management practices for achieving desired project success. Further

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findings on project management capabilities, process management positively and significantly impact project success.

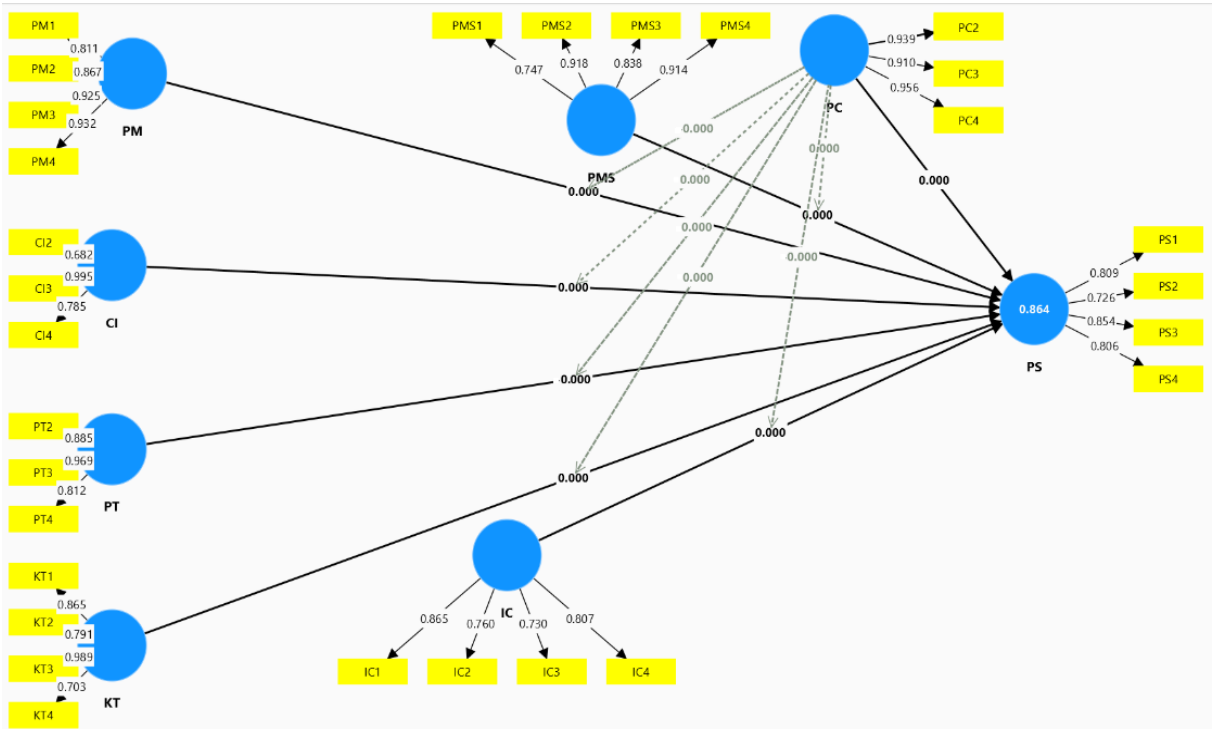

Figure 3: Path Model

These results show that when the process of the project is improved then the project success of construction also increases because this study highlighted the critical role of clear and efficient processes in managing the complexities of construction projects. The results are in line with the findings of Harold (2021) who highlighted that construction projects that confidently ensure the processes and tasks are organized and executed efficiently, minimizing delays and cost of operations and increasing the success of the projects (Irfan et al., 2021). These findings suggest that in the construction industry, where project success is measured by timely delivery, cost control, and quality standards, process management plays an integral role in achieving successful project success, which increases the competitive advantage of the organizations.

Further continuous improvement also positively and significantly increases the project success of the construction industry. The results highlighted that continuous improvement involves regular reviews of project performance and ongoing efforts to refine processes and methodologies to enhance proficiency. Similar results presented by Porath (2023) where they found that construction industry's volatile environment necessitates constant adjustments to work processes to ensure that projects stay on track which increases the project success. This is further supported that construction companies that are engaged in continuous improvement practices tend to deliver projects with better quality, fewer delays, and within budget (Hermawati & Gunawan, 2021). Historically, the positive and significant impact of continuous improvement in

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the present study suggests that increasing an environment of learning and adaptability is essential for managing the ever-changing setting of construction projects that increases the success of success. In the same vein the project training also positively and significantly increases the project's success. These results show that project training significantly plays a crucial role in driving project success. Thus, this finding is consistent with research that emphasizes the importance of skilled and well-trained teams in attaining positive success of project. Generally, in the construction industry, the success of a project heavily depends on the expertise and competence of the workforce, which is directly influenced by training programs. Therefore, continuous training guarantees that workers are up-to-date with the newest technologies, safety standards, and construction methodologies because construction projects become more technologically advanced and complex when they train the workforce which is important to increase the project's success. Furthermore, training contributes to reducing errors and improving productivity which is critical in an industry where delays and rework can be costly. In this regards, positive and significant connection between project training and project success. This research highlighted that investment in workforce development is a key determinant of construction project success that could increase the competitive advantage of the construction industry.

On the other hand, further results reveal that knowledge transfers also have positive and significantly increases project success, particularly in the construction industry. Historically, knowledge transfer involves the sharing of tacit and explicit knowledge among project stakeholders, which can greatly improve decision-making and problem-solving during the project lifecycle. Therefore, the study findings are important for the construction industry where they highlighted knowledge sharing and expertise dissemination are critical for efficient project execution. The result is line with the study of Shi and Xie (2024) where they emphasized that effective knowledge transfer within construction teams can mitigate the risk of miscommunication, enhance collaboration, and improve the overall project delivery process. Based on findings, it is suggested that significant positive impact of knowledge transfer found in this study emphasized its importance in achieving project success, especially in the construction industry which is totally depends on collaboration and information flow among multiple parties. The findings reveal that inventory control also positively and significantly effecting to the project success. This results shown that when inventory control of the companies is increased then project success of construction industry also increased. The results having similar finding with the study of Omoghene (2024), where they found that inventory control is an important factor to increase the success of the organization. Traditionally, results are significant for the construction industry because such findings shown the critical role of inventory control in the construction industry which highlights its significant impact on project success. Effective inventory management ensures timely availability of materials, reduces delays, and enhances project efficiency. This emphasizes the importance for construction companies to

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invest in strong inventory control systems to achieve higher project success rates.

Further moderating effect results highlighted that project success positively and significantly affected the relationship between project management capabilities and project success. Thus, these findings highlight that when the complexity of a construction project increases then the need for effective project management capabilities becomes even more prominent. This argument is further supported by the influence of project management capabilities increased then when project complexity is high. This finding supports the argument that complex projects, which typically involve larger teams, more stakeholders, and greater risks which are required more sophisticated management practices to navigate the challenges they present. Another study also supported by Nubuor et al. (2024) that project complexity directly affects the project management process, requiring a more structured approach to manage the increased uncertainty and coordination efforts. Further, construction industry's project difficulties also favorably and considerably moderate the moderating impact between inventory control and project success. This result shows that project success serves a significant moderating effect in inventory control and project success relationship in the construction industry. This indicates that as project complexity increases the positive impact of effective inventory control on project success becomes even more pronounced. It underscores the need for tailored inventory management strategies that can adapt to varying levels of project complexity to optimize outcomes. This relationship has been tested for the initial time, therefore, direct findings could not be favorable to the study findings. In several studies, project complexities have been used as a moderating variable and found a positive significant moderating effect (Hartono et al., 2019; Vaez-Alaei et al., 2024). Therefore, seeking this moderating effect highlights that project complexity is a significant moderating effect and is a major contribution to the study.

Implications and Future Recommendations

Theoretically, extant studies have primarily examined the direct impression of project management capabilities over project success. Consequently, this contributed a significant moderating effect of project complexities which is offering a strong understanding of how the efficiency of project management practices could be amplified or diminished by the complexity of a project. Furthermore, extant studies were mainly focused on other sectors while ignored the construction industry. Therefore, a study with significant findings contributed to the existing body of knowledge by expanding the scope to include these specific capabilities in a construction industry context, where project success is often linked to multiple internal and external factors. In other sense, prior literature also focused on segregated impact of inventory control or project management capabilities on project success or majorly focused other project factors to increase project success while ignored impact of inventory control on project success. Therefore, this study contributed by giving attention to inventory control, which has been relatively under-explored in the framework

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of project success despite its clear impact on resource management in large-scale construction projects. Lastly, this study also contributed significant literature for the researchers which contributed to the development of a more comprehensive framework for understanding the role of project management capabilities in construction, highlighting the importance of considering both direct and indirect factors, especially when dealing with complex projects.

On a practical level, the study provided valuable insights for construction project managers and contractors seeking to improve project efficiency. By highlighting the positive and significant impact of project management capabilities such as process control, continuous improvement, and on-the-job training, the study provided actionable knowledge for construction companies to deliver their business the management practices improved. Findings also contributed to the understanding of the importance of complexity factors such like project complexity, practical guidance for construction managers based on project size, scope and complexity. Finally, by addressing the importance of inventory management, this study provided practical recommendations for manufacturing companies to manage inventory effectively to minimize the risks associated with delays and cost overruns. This study with these study findings still possess a number of shortcomings that could be resolved by additional study.

Firstly, the study's attention on the construction sector may limit how broadly the results may be applied to other sectors or geographical areas. Future research could discover the impact of inventory control and project management capabilities in different industries and geographic contexts to enhance the broader applicability of the results. Secondly, the study primarily focused on the project complexities as a moderating variable while it has neglected the various others potential influences such as organizational culture, technological advancements, and external economic factors. Future studies should incorporate a wider range of moderating variables to offer a more thorough comprehension of their influence on project success. Thirdly, study focused on the self-reported data which was collected from the construction industry employees which could introduces the potential for response bias, which may affect the accuracy of the findings. Future research should employ diverse data collection methods, such as longitudinal studies, third-party assessments, and observational data, to reduce. Lastly, the study focused on the cross-sectional research design which limited the ability to establish causal relationships between inventory control, project complexity, and project success. Future research could utilize longitudinal studies to better understand the causal dynamics and temporal effects of these factors on project outcomes over time.

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International Journal of Instructional Cases
ISSN: 2399-830x

References

Adcock, C. (1997). Sample size determination: a review. *Journal of the Royal Statistical Society: Series D (The Statistician)*, *46*(2), 261-283. https://doi.org/10.1111/1467-9884.00082

Ahuja, H. N., & Nandakumar, V. (1985). Simulation model to forecast project completion time. *Journal of construction engineering and management*, *111*(4), 325-342. https://doi.org/10.1061/(ASCE)0733-9364(1985)111:4(325)

Al-Khazraji, H., Guo, W., & Humaidi, A. J. (2024). Improved cuckoo search optimization for production inventory control systems. *Serbian Journal of Electrical Engineering*, *21*(2), 187-200. https://doi.org/10.2298/SJEE2402187A

Arefazar, Y., Nazari, A., Hafezi, M. R., & Maghool, S. A. H. (2022). Prioritizing agile project management strategies as a change management tool in construction projects. *International Journal of Construction Management*, *22*(4), 678-689. https://doi.org/10.1080/15623599.2019.1644757

Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing and organizational innovation. *Technology in Society*, *66*, 101635. https://doi.org/10.1016/j.techsoc.2021.101635

Bąk, S., & Jedynak, P. (2023). *Risk management maturity: A multidimensional model*. Taylor & Francis. http://doi.org/10.4324/9781003330905

Barbosa, A. P. F. P. L., Salerno, M. S., de Souza Nascimento, P. T., Albala, A., Maranzato, F. P., & Tamoschus, D. (2021). Configurations of project management practices to enhance the performance of open innovation R&D projects. *International Journal of Project Management*, *39*(2), 128-138. https://doi.org/10.1016/j.ijproman.2020.06.005

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, *51*(6), 1173. https://psycnet.apa.org/doi/10.1037/0022-3514.51.6.1173

Bauman, A., & Lucy, C. (2021). Enhancing entrepreneurial education: Developing competencies for success. *The International Journal of Management Education*, *19*(1), 100293. https://doi.org/10.1016/j.ijme.2019.03.005

Bhangale, K., Joshi, K., Gupta, R., & Gardas, B. (2024). Assessing project complexity factors for railway megaprojects: a Delphi-BWM approach. *Journal of Engineering, Design and Technology*. https://doi.org/10.1108/JEDT-07-2022-0398

Boateng, A., Ameyaw, C., & Mensah, S. (2022). Assessment of systematic risk management practices on building construction projects in Ghana. *International Journal of Construction Management*, *22*(16), 3128-3136. https://doi.org/10.1080/15623599.2020.1842962

Borges, D., B, Soares, C., AP, Najjar, M., Costa, B. B. d., Tam, V. W., & Haddad, A. N. (2024). Project success and critical success factors of construction projects from the perspective of a multicultural team: a case study in Guyana. *International*

International Journal of Instructional Cases
ISSN: 2399-830x

Journal of Construction Management, 1-15. https://doi.org/10.1080/15623599.2024.2397626

Borgstede, M., & Scholz, M. (2021). Quantitative and qualitative approaches to generalization and replication–A representationalist view. *Frontiers in psychology*, *12*, 605191. https://doi.org/10.3389/fpsyg.2021.605191

Cheah, J.-H., Sarstedt, M., Ringle, C. M., Ramayah, T., & Ting, H. (2018). Convergent validity assessment of formatively measured constructs in PLS-SEM: On using single-item versus multi-item measures in redundancy analyses. *International journal of contemporary hospitality management*, *30*(11), 3192-3210. https://doi.org/10.1108/IJCHM-10-2017-0649

Chen, X., Chang-Richards, A. Y., Pelosi, A., Jia, Y., Shen, X., Siddiqui, M. K., & Yang, N. (2022). Implementation of technologies in the construction industry: a systematic review. *Engineering, Construction and Architectural Management*, *29*(8), 3181-3209. https://doi.org/10.1108/ECAM-02-2021-0172

Ciric, D., Delic, M., Lalic, B., Gracanin, D., & Lolic, T. (2021). Exploring the link between project management approach and project success dimensions: A structural model approach. *Advances in Production Engineering & Management*, *16*(1). https://doi.org/10.14743/apem2021.1.387

Davies, R. B. (1994). From cross-sectional to longitudinal analysis. In R. B. D. Angela Dale (Ed.), *Analyzing social & political change: A casebook of methods* (pp. 20-40). http://dx.doi.org/10.4135/9781849208611.n2

Ekemezie, I. O., & Digitemie, W. N. (2024). Best practices in strategic project management across multinational corporations: a global perspective on success factors and challenges. *International Journal of Management & Entrepreneurship Research*, *6*(3), 795-805. https://doi.org/10.51594/ijmer.v6i3.936

Emon, M. M. H., & Chowdhury, S. A. (2023). Assessing the influence of training and skill development initiatives on employee performance: A case study of private banks in Dhaka, Bangladesh. *Bangladesh (August 17, 2023)*. https://dx.doi.org/10.26480/mbmj.02.2023.74.79

Fareed, M. Z., Su, Q., & Awan, A. A. (2021). The effect of emotional intelligence, intellectual intelligence and transformational leadership on project success; an empirical study of public projects of Pakistan. *Project Leadership and Society*, *2*, 100036. https://doi.org/10.1016/j.plas.2021.100036

Fattah, J., Yesiltas, M., & Atan, T. (2022). The Impact of Knowledge Sharing and Participative Decision-Making on Employee Turnover Intention: The Mediating Role of Perceived Organizational Support. *SAGE Open*, *12*(4), 21582440221130294. https://doi.org/10.1177/21582440221130294

Filippetto, A. S., Lima, R., & Barbosa, J. L. V. (2021). A risk prediction model for software project management based on similarity analysis of context histories. *Information and Software Technology*, *131*, 106497. https://doi.org/10.1016/j.infsof.2020.106497

International Journal of Instructional Cases
ISSN: 2399-830x

Fobiri, G., Musonda, I., & Muleya, F. (2022). Reality capture in Construction Project Management: A review of opportunities and challenges. *Buildings*, *12*(9), 1381. https://doi.org/10.3390/buildings12091381

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Ghorbani, A. (2023). A review of successful construction project managers' competencies and leadership profile. *Journal of Rehabilitation in Civil Engineering*, *11*(1), 76-95. https://doi.org/10.22075/jrce.2022.24638.1560

Golzar, J., Noor, S., & Tajik, O. (2022). Convenience sampling. *International Journal of Education & Language Studies*, *1*(2), 72-77. https://doi.org/10.22034/ijels.2022.162981

Gunduz, M., & Yahya, A. M. A. (2018). Analysis of project success factors in construction industry. *Technological and Economic Development of Economy*, *24*(1), 67–80-67–80. https://doi.org/10.3846/20294913.2015.1074129

Harold, K. (2021). *Project management: case studies*. John Wiley & Sons, Inc. http://doi.org/10.1002/9781119389040

Hartono, B., Wijaya, D. F., & Arini, H. M. (2019). The impact of project risk management maturity on performance: Complexity as a moderating variable. *International Journal of Engineering Business Management*, *11*, 1847979019855504. https://doi.org/10.1177/1847979019855504

Hashmi, A., Amirah, N., & Yusof, Y. (2021). Organizational performance with disruptive factors and inventory control as a mediator in public healthcare of Punjab, Pakistan. *Management Science Letters*, *11*(1), 77-86. http://dx.doi.org/10.5267/j.msl.2020.8.028

Heredia-Rojas, B., Liu, L., Ramírez-Correa, P., & Mariano-Melo, A. (2022). Moderating effects of requirements uncertainty and project complexity on value creation processes and project value: a multigroup analysis via partial least squares structural equation modeling. *Mathematical Problems in Engineering*, *2022*(1), 4106360. https://doi.org/10.1155/2022/4106360

Hermawati, A., & Gunawan, E. (2021). The implementation of dynamic capabilities for small and medium-sized enterprises in creating innovation. *VINE Journal of Information and Knowledge Management Systems*, *51*(1), 92-108. https://doi.org/10.1108/VJIKMS-08-2019-0121

Hernández-Soto, R., Gutiérrez-Ortega, M., & Rubia-Avi, B. (2021). Key factors in knowledge sharing behavior in virtual communities of practice: A systematic review. *Education in the knowledge society (EKS)*, *22*, e22715-e22715. http://dx.doi.org/10.14201/eks.22715

Igbinenikaro, O. P., Adekoya, O. O., & Etukudoh, E. A. (2024). Fostering cross-disciplinary collaboration in offshore projects: strategies and best practices. *International Journal of Management & Entrepreneurship Research*, *6*(4), 1176-1189. https://doi.org/10.51594/ijmer.v6i4.1006

International Journal of Instructional Cases
ISSN: 2399-830x

Irfan, M., Hassan, M., & Hassan, N. (2019). The effect of project management capabilities on project success in Pakistan: An empirical investigation. *IEEE Access*, *7*, 39417-39431. https://doi.org/10.1109/ACCESS.2019.2906851

Irfan, M., Khan, S. Z., Hassan, N., Hassan, M., Habib, M., Khan, S., & Khan, H. H. (2021). Role of project planning and project manager competencies on public sector project success. *Sustainability*, *13*(3), 1421. https://doi.org/10.3390/su13031421

Islam, R., Ansari, M. E., Dewan, M. A., Sultana, S., & Rivin, M. A. H. (2024). Supply Chain Management Analysis and Design for a Variety of Economic Scenarios, Including Data and System Administration. *Journal of Software Engineering and Applications*, *17*(10), 770-785. https://doi.org/10.4236/jsea.2024.1710042

Jackson, V., van der Hoek, A., & Prikladnicki, R. (2022). Collaboration tool choices and use in remote software teams: emerging results from an ongoing study. Proceedings of the 15th International Conference on Cooperative and Human Aspects of Software Engineering, https://doi.org/10.1145/3528579.3529171

Kamewor Tetteh, F., Kwatia, D. A., Asante, D., Kyeremeh, A., & Nyame, P. E. (2024). Leveraging procurement capabilities and planning for project success in the construction industry in Ghana. *Built Environment Project and Asset Management*. https://doi.org/10.1108/BEPAM-02-2024-0036

Karunarathne, B. V. G., & Kim, B.-S. (2021). Risk management application-level analysis in South Korea construction companies using a generic risk maturity model. *KSCE Journal of Civil Engineering*, *25*(9), 3235-3244. https://doi.org/10.1007/s12205-021-2277-x

Kermanshachi, S., Nipa, T. J., & Dao, B. (2023). Development of complexity management strategies for construction projects. *Journal of Engineering, Design and Technology*, *21*(6), 1633-1657. https://doi.org/10.1108/JEDT-06-2021-0324

Kerzner, H. (2022a). *Innovation project management: Methods, case studies, and tools for managing innovation projects*. John Wiley & Sons. https://cir.nii.ac.jp/crid/1130004954237762688

Kerzner, H. (2022b). *Project management metrics, KPIs, and dashboards: a guide to measuring and monitoring project performance*. John wiley & sons. https://cir.nii.ac.jp/crid/1130282272903508608

Khattak, M. S., & Mustafa, U. (2019). Management competencies, complexities and performance in engineering infrastructure projects of Pakistan. *Engineering, Construction and Architectural Management*, *26*(7), 1321-1347. https://doi.org/10.1108/ECAM-05-2017-0079

Khatua, D., Maity, K., & Kar, S. (2021). A fuzzy production inventory control model using granular differentiability approach. *Soft Computing*, *25*(4), 2687-2701. https://doi.org/10.1007/s00500-020-05329-1

Kitheka, R. J. M. (2019). *Influence Of Inventory Planning And Control Process On Project Performance; A Case Of Kenya Revenue Authority Headquarters In Nairobi County* UoN]. http://erepository.uonbi.ac.ke/handle/11295/107161

International Journal of Instructional Cases
ISSN: 2399-830x

Leong, J., May Yee, K., Baitsegi, O., Palanisamy, L., & Ramasamy, R. K. (2023). Hybrid project management between traditional software development lifecycle and agile based product development for future sustainability. *Sustainability*, *15*(2), 1121. https://doi.org/10.3390/su15021121

Liberatore, M. J., & Pollack-Johnson, B. (2003). Factors influencing the usage and selection of project management software. *IEEE transactions on Engineering Management*, *50*(2), 164-174. https://doi.org/10.1109/TEM.2003.810821

Luo, L., Zhang, L., & He, Q. (2020). Linking project complexity to project success: A hybrid SEM–FCM method. *Engineering, Construction and Architectural Management*, *27*(9), 2591-2614. https://doi.org/10.1108/ECAM-05-2019-0241

Ma, L., & Fu, H. (2020). Exploring the influence of project complexity on the mega construction project success: A qualitative comparative analysis (QCA) method. *Engineering, Construction and Architectural Management*, *27*(9), 2429-2449. https://doi.org/10.1108/ECAM-12-2019-0679

Marquardt, M. J., Kearsley, G., American Society for, T., & Development. (1999). *Technology-based learning : maximizing human performance and corporate success*. St. Lucie Press. https://cir.nii.ac.jp/crid/1130000794630447872

McKenzie, D., & Woodruff, C. (2014). What are we learning from business training and entrepreneurship evaluations around the developing world? *The World Bank Research Observer*, *29*(1), 48-82. https://doi.org/10.1093/wbro/lkt007

Mehmood, I., Ghafoor, R., Shafiq, M., & Kazmi, S. (2024). Assessing the Moderating Role of Supervisor Support in Am-plifying Total Quality Management Practices and Project Per-formance within Pakistan's Manufacturing Sector Post-Covid-19: An Empirical Study. *Jinnah Business Review*, *12*(1). http://doi.org/10.53369/szfc5838

Murthi, P., Poongodi, K., & Geetha, M. (2022). Inventory Management of Construction Project Through ABC Analysis: A Case Study. National conference on Advances in Construction Materials and Management, https://doi.org/10.1007/978-981-99-2552-0_8

Ni, G., Cui, Q., Sang, L., Wang, W., & Xia, D. (2018). Knowledge-sharing culture, project-team interaction, and knowledge-sharing performance among project members. *Journal of Management in Engineering*, *34*(2), 04017065. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000590

Nubuor, S. A., Akwetey-Siaw, B., & Dartey-Baah, K. (2024). Examining the Relationship Between Project Complexity and Project Success: The Moderating Role of Project Management Competencies in Ghana's Construction Sector. *Journal of African Business*, 1-22. https://doi.org/10.1080/15228916.2024.2400870

Nunnally, J. C. (1978). An overview of psychological measurement. *Clinical diagnosis of mental disorders: A handbook*, 97-146. https://doi.org/10.1007/978-1-4684-2490-4_4

Nwaibe, C. I., Ogbuefi, J. U., & Egbenta, I. R. (2022). Organizational Learning and Risk Management Maturity: Systematic and Meta-Analyses Approach. *Business Ethics and Leadership*, *6*(3), 68-76. http://doi.org/10.21272/bel.6(3).68-76.2022

International Journal of Instructional Cases
ISSN: 2399-830x

Omoghene, R. (2024). Investigation and analysis of inventory management in a construction company-a case study of Hi-Tech Nigeria Limited. *FUPRE Journal of Scientific and Industrial Research (FJSIR)*, *8*(1), 98-107. https://journal.fupre.edu.ng/index.php/fjsir/article/view/256/217

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge. https://doi.org/10.4324/9781003117452

Paneerselvam, N., Muhammad, N. A., Azhan, A. M., & Muhammad, N. (2024). Analyzing critical success factors in Lean Six Sigma training. *International Journal of Productivity and Performance Management*. https://doi.org/10.1108/IJPPM-11-2023-0627

Porath, U. (2023). Advancing managerial evolution and resource management in contemporary business landscapes. *Modern Economy*, *14*(10), 1404-1420. https://doi.org/10.4236/me.2023.1410072

Pozzi, R., Rossi, T., & Secchi, R. (2023). Industry 4.0 technologies: critical success factors for implementation and improvements in manufacturing companies. *Production Planning & Control*, *34*(2), 139-158. https://doi.org/10.1080/09537287.2021.1891481

Putra, H. D., Sriwana, I. K., & Amani, H. (2024). Optimization and Analysis of Supply Chain Management Performance by Improving Inventory Management Model in Residential Construction. *International Journal of Industrial Engineering*, *35*(1), 1-19. http://doi.org/10.22068/ijiepr.35.1.1978

Sadikoglu, E., Jäger, J., Demirkesen, S., Baier, C., Oprach, S., & Haghsheno, S. (2024). Investigating the impact of lean leadership on construction project success. *Engineering Management Journal*, *36*(2), 206-220. https://doi.org/10.1080/10429247.2023.2245317

Santos, C., Varajão, J., Takagi, N., & Manuela Gonçalves, A. (2024). Model of driving factors for success in public health project management using structural equation modeling. *Scientific Reports*, *14*(1), 24647. https://doi.org/10.1038/s41598-024-75437-7

Sengottaiyan, K., & Jasrotia, M. S. (2024). Relocation of Manufacturing Lines-A Structured Approach for Success. *13*, 1176-1181. http://dx.doi.org/10.21275/SR24615221557

Shaikh, A., Memon, A. R., Raza, A., Shaikh, H., & Gul, S. (2022). Determination the Role and Problems of Inventory Management and Supply chain Profitability: A case study of Cement companies in Sindh, Pakistan. *IBT Journal of Business Studies*, *18*(1), 30-41. http://dx.doi.org/10.46745/ilma.jbs.2022.18.01.02

Shayan, S., Pyung Kim, K., & Tam, V. W. (2022). Critical success factor analysis for effective risk management at the execution stage of a construction project. *International Journal of Construction Management*, *22*(3), 379-386. https://doi.org/10.1080/15623599.2019.1624678

Shi, W., & Xie, Y. (2024). From knowledge to success: understanding the crucial role of governance, tacit knowledge sharing, and team leadership in project

International Journal of Instructional Cases
ISSN: 2399-830x

outcomes. *Current Psychology*, *43*(9), 8219-8229. https://doi.org/10.1007/s12144-023-04994-3

Ugbebor, F., Adeteye, M., & Ugbebor, J. (2024). Automated Inventory Management Systems with IoT Integration to Optimize Stock Levels and Reduce Carrying Costs for SMEs: A Comprehensive Review. *Journal of Artificial Intelligence General Science (JAIGS) ISSN: 3006-4023*, *6*(1), 306-340. http://dx.doi.org/10.60087/jaigs.v6i1.257

Unegbu, H., Yawas, D., & Dan-Asabe, B. (2022). An investigation of the relationship between project performance measures and project management practices of construction projects for the construction industry in Nigeria. *Journal of King Saud University-Engineering Sciences*, *34*(4), 240-249. https://doi.org/10.1016/j.jksues.2020.10.001

Vaez-Alaei, M., Deniaud, I., Marmier, F., Cowan, R., & Gourc, D. (2024). How partners' knowledge base and complexity are related to innovative project success: The roles of trust and trust capability of partners. *International Journal of Project Management*, *42*(1), 102557. https://doi.org/10.1016/j.ijproman.2023.102557

Venkataraman, R. R., & Pinto, J. K. (2008). *Cost and value management in projects*. John Wiley & Sons. https://cir.nii.ac.jp/crid/1130000798158115456

Zhu, S., van Jaarsveld, W., & Dekker, R. (2022). Critical project planning and spare parts inventory management in shutdown maintenance. *Reliability Engineering & System Safety*, *219*, 108197. https://doi.org/10.1016/j.ress.2021.108197

Zierock, B., Blatz, M., & Karcher, K. (2024). Team-Centric Innovation: The Role of Objectives and Key Results (OKRs) in Managing Complex and Challenging Projects. Proceedings of the 15th International Conference on Applied Human Factors and Ergonomics (AHFE 2024), https://doi.org/10.54941/ahfe1004717

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Appendix: Measurement Scales

Dimension	Item
Project success	Projects are finished on time
	Projects are finished within budget
	Projects have a minimum number of agreed scope changes
	In projects, activities are carried out as scheduled
	Projects meet planned quality standards
	Projects comply with environmental regulations
	Projects meet safety standards
	In projects, the effectiveness of the work is considered
Process Management	Processes on projects are standardized
	Process ownership is assigned clearly
	The processes form a consistent system
	Project management processes are aligned with other procedures
Continuous Improvement	There is a continuous improvement process which focuses on continuous project management processes.
	The ownership of the continuous improvement process is clearly defined
	Meetings are held routinely to discuss the potential for optimization
	The continuous improvement process is documented
Project Management Training	Investments in project management training are sufficient
	Top management has supported the implementation of training
	Post-project management training evaluation is conducted
	Project managers are trained before the start of projects
Knowledge Management Transfer	Best practices/lessons learned from projects are made available
	Evaluations of previous projects are consulted before new projects
	Information systems make project-related knowledge available
	Knowledge and experiences between project staff are formally exchanged
Project Management Awareness	General awareness of the importance of project management
	Project management is considered a strength
	Included in organizational strategy
	Project staff is competent in using project management software

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	Project staff actively use project management software
	Software is used to analyze and communicate results
	Software is included in the scope of each project
Inventory control	Often face stock-out of crucial items.
	Always have buffer stock.
	Determining inventory order size is crucial.
	Most of the deliveries are delayed.
Project Complexities	The project had a high degree of task novelty.
	The project had a high degree of complexity concerning content.
	The project had a high degree of complexity about interdisciplinary participants and specialties.
	The project was characterized by high risk and uncertainty.
	The country's regulations and politics were challenging.
	The pressure from external stakeholders was high.
	The project had a high degree of task novelty.
	The project had a high degree of complexity concerning content.